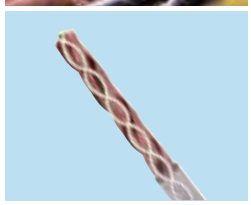
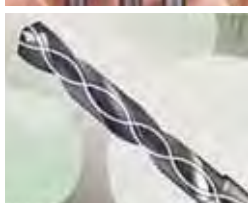
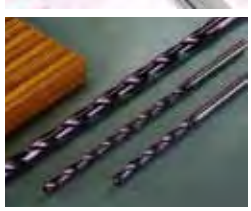
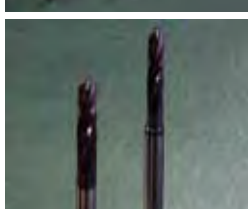
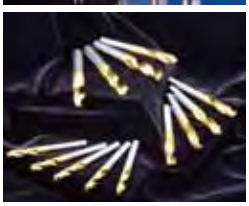
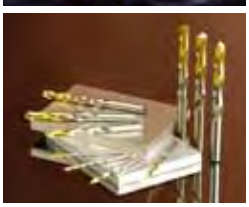
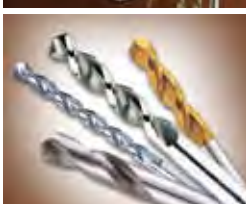
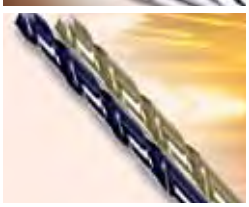
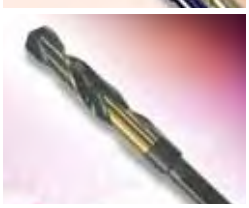
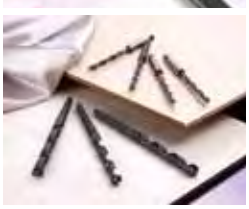
# CUTTING TOOLS



# DRILLING

| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **i-DREAM DRILLS CARBIDE INSERTS** | - For Steels and Stainless Steel Alloys | **41** |
|  | **SOLID CARBIDE DREAM DRILLS - GENERAL** | - With & without Coolant Holes<br>General Purpose HRc30 to HRc50 | **55** |
|  | **SOLID CARBIDE DREAM DRILLS - HIGH FEED** | - 1.5 to 2 times faster feeding speed than 2 Flute drills | **83** |
|  | **SOLID CARBIDE DREAM DRILLS - INOX (with Coolant Holes)** | - With Coolant Holes<br>for Stainless Steels, Nickel Alloys and Titanium up to HRc35 | **93** |
|  | **SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)** | - With Coolant Holes<br>for Aluminum & Aluminum Alloys | **109** |
|  | **SOLID CARBIDE DREAM DRILLS - CFRP** | - For Composite Materials including CFRP, GFRP | **117** |
|  | **SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)** | - With Coolant Holes<br>- Minimum Quantity Lubrication<br>- For Drilling Deep Holes 10D, 15D & 20D | **123** |
|  | **SOLID CARBIDE DREAM DRILLS - For HIGH HARDENED STEELS** | - For High Hardened Steels, HRc50~HRc70 | **131** |
|  | **STANDARD CARBIDE DRILLS** | - General Purpose<br>- 118° Point | **139** |

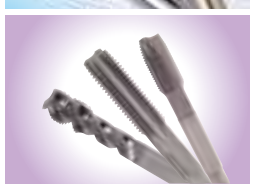
# DRILLING


| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **HSS-PM MULTI-1 DRILLS** | - Multi Purpose Drilling. Particularly for Stainless Steels, Titanium | **147** |
|  | **HPD DRILLS** | - For Stainless Steels | **155** |
|  | **HSS GOLD-P DRILLS** | - Gold-P Coating | **165** |
|  | **HSS STRAIGHT SHANK DRILLS** | - General Purpose | **185** |
|  | **AIRCRAFT DRILLS** | - 6 and 12 inch Length Drills | **207** |
|  | **SILVER & DEMING DRILLS** | - 118° Split Point<br>3 Flats Black and Gold | **217** |
|  | **HSS MORSE TAPER SHANK DRILLS** | - General Purpose<br>Standard Length | **223** |
|  | **HSS (8% Cobalt) NC-SPOTTING DRILLS** | - HSS(8% Cobalt)<br>Centering and Chamfering of Holes | **229** |
|  | **HSS COMBINATION DRILL & COUNTER SINK / CENTER DRILL** | - Regular and Long Length | **235** |

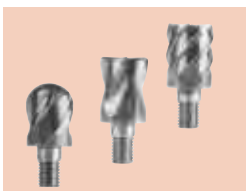
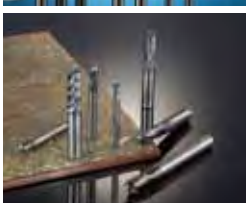
# DRILLING


| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **CARBIDE & HSS-PM SPADE DRILLS** | - Carbide for Long Tool Life, and HSS-PM for General Machines and Large Diameters Higher Productivity than Other Drilling Tools | **239** |
| | **TECHNICAL DATA** | | **283** |

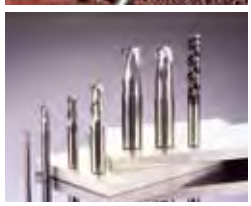
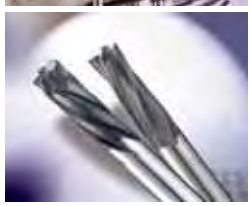
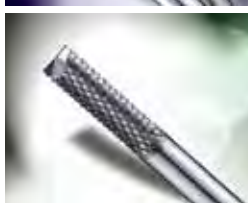
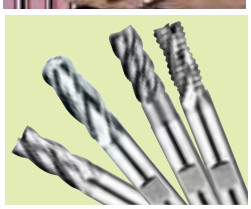
# THREADING


| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **SOLID CARBIDE THREAD MILLS** | - For blind holes and through holes with one single tool<br>- Higher cutting speed and feed than taps | **325** |
|  | **COMBO TAPS** | - Multi Purpose tapping<br>- YG-1's Patent<br>- Super HSS & HSS-E for Prevention of Oversized Threads | **333** |
|  | **SPIRAL FLUTE TAPS** | - Tapping Bling Holes<br>- Super HSS, HSS-E, HSS-PM, HSS-V & HSS | **359** |
|  | **SPIRAL POINT TAPS** | - Tapping Through Holes<br>- Super HSS, HSS-E, HSS-PM, HSS-V & HSS | **397** |
|  | **STRAIGHT FLUTE TAPS** | - Tapping Through & Blind Holes<br>- Carbide, Super HSS & HSS | **439** |
|  | **FORMING TAPS** | - Tapping by Forming Soft Materials (No Chips) | **459** |
|  | **SCREW THREAD INSERT TAPS** | - Tapping STI Threads of Soft Materials (HSS-E) | **469** |
|  | **PIPE TAPS** | - Tapping NPT, NPTF, NPS & NPSF threads | **479** |
| | **TECHNIAL DATA** | | **489** |

# MILLING

| | PRODUCTS | DESCRIPTION | |
|---|---|---|---|
|  | **CBN END MILLS** | - Cubic Boron Nitride<br>- For High Hardened Steels up to HRc70<br>- Mirror Finish | **557** |
|  | **i-Xmill, CARBIDE INSERT END MILLS** | - For General Steels(~HRc50), Hardened Steels(up to HRc65) and Graphite | **563** |
|  | **i-Smart MODULAR TYPE END MILLS** | - Exchangeable Modular Head for Semi-finishing and finishing<br>- Pre-Hardened Steels up to HRc55 | **581** |
|  | **X5070 NANO SOLID CARBIDE END MILLS** | - For High Hardened Steels HRc45 to HRc70<br>- High Speed Machining<br>- Dry Cutting | **595** |
|  | **4G MILLS SOLID CARBIDE END MILLS** | - High Speed Cutting for Pre-Hardened Steels up to HRc55 | **629** |
|  | **X-POWER SOLID CARBIDE END MILLS** | - For Medium Steels and High Hardened Steels up to HRc70 | **815** |
|  | **JET-POWER SOLID CARBIDE & HSS-PM END MILLS** | - For Exotic Materials such as Stainless Steels, Nickel alloys and Titanium | **903** |
|  | **TitaNox-POWER SOLID CARBIDE END MILLS** | - Silent Cutting for Stainless Steels up to HRc40<br>- Designed with Variable Leads<br>- YG-1's Patent | **925** |
|  | **V7 PLUS A SOLID CARBIDE END MILLS** | - Silent Cutting of Steels up to HRc40<br>Designed as Unequal Leads | **947** |

# MILLING

| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **V7 MILL INOX SOLID CARBIDE END MILLS** | - Silent Cutting for Stainless Steels up to HRc40<br>- Designed with Variable Leads<br>- YG-1's Patent | **985** |
|  | **ALU-POWER SOLID CARBIDE & HSS-PM END MILLS** | - For Aluminium Alloys with Silent Cutting<br>- Mirror Surface | **1003** |
|  | **D-POWER GRAPHITE SOLID CARBIDE END MILLS** | - Diamond Coated Carbide End Mills for Graphite | **1047** |
|  | **D-POWER CFRP SOLID CARBIDE END MILLS** | - For Composite Materials including CFRP, GFRP | **1063** |
|  | **CARBIDE ROUTERS** | - For Composite Materials including CFRP, GFRP | **1069** |
|  | **STANDARD SOLID CARBIDE END MILLS** | - General Purpose | **1075** |
|  | **ONLY ONE COATED PM60 END MILLS** | - Perfect solution to protect carbide chipping problems under vibrations | **1127** |
|  | **SINE-POWER HSS END MILLS** | - High performance HSS Rougher for Titanium and Titanium Alloys | **1143** |
|  | **TANK-POWER HSS-PM END MILLS** | - Next Generation of Powdered Metal End Mills<br>- Higher Edge Strength & Feed Rates | **1149** |

# MILLING


| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **COBALT & HSS END MILLS** | - General Purpose, Non-coated, Any Coating Available | **1167** |
| | **TECHNICAL DATA** | | **1251** |


# OTHER TOOLS


| | PRODUCTS | DESCRIPTION | PAGE |
|---|---|---|---|
|  | **TOOL HOLDERS** | - According to CAT + BT Standards | **1261** |

## i-DREAM DRILL - GENERAL

### TOOL

| | |
|---|---|
| HOLDER | ZB0302 |
| INSERT | Y03B07 |

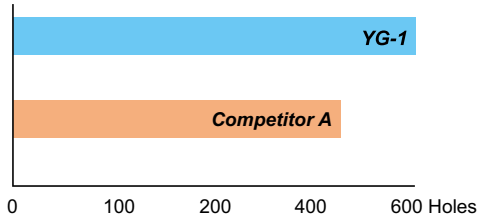
### WORKPIECE - Structural Steels

| | |
|---|---|
| ASTM | A36 |
| DIN | St37-2 |
| JIS | SS400 |

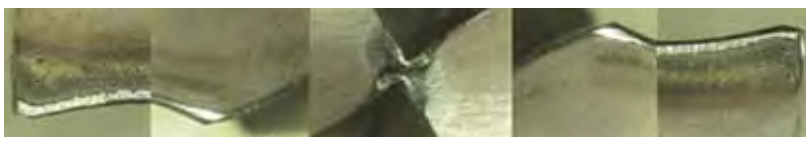
### CONDITIONS

| | |
|---|---|
| Cutting Speed | 262 ft/min. |
| Feed | .0094 inch/rev. |
| Feedrate | 16.59 inch/min. |
| RPM | 1756 rev./min. |
| Drilling | 1.89″ |
| Coolant | Internal |
| Machine type | Vertical Machining Center |

### RESULT




**YG-1 (Total Drilling 600 Holes)**



**Competitor A (Total Drilling 470 Holes)**



## i-DREAM DRILL - INOX

### TOOL

| | |
|---|---|
| HOLDER | ZB0301 |
| INSERT | YI3B01 |

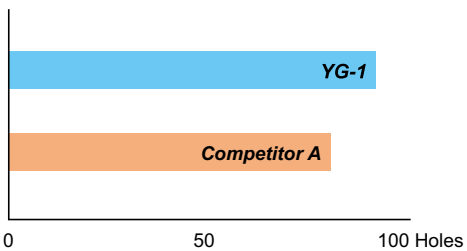
### WORKPIECE - Stainless Steels

| | |
|---|---|
| AISI | 304 |
| DIN | X5CrNi189 |
| JIS | SUS304 |

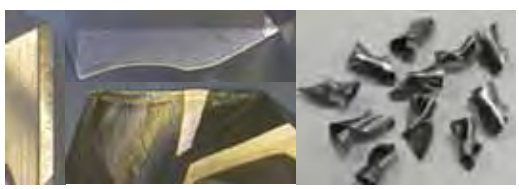
### CONDITIONS

| | |
|---|---|
| Cutting Speed | 180 ft/min. |
| Feed | .0059 inch/rev. |
| Feedrate | 7.402 inch/min. |
| RPM | 1250 rev./min. |
| Drilling | 1.97″ |
| Coolant | Internal |
| Machine type | Vertical Machining Center |

### RESULT




**YG-1 (Total Drilling 100 Holes)**



**Competitor A (Total Drilling 80 Holes)**



# FEATURES OF DREAM DRILLS-HIGH FEED

Dream Drills-High Feed offers 1.5 to 2 times higher feeding speed compared to conventional 2-flute drills. The unique flute design and exceptional surface finish promises extraordinary chip evacuation.

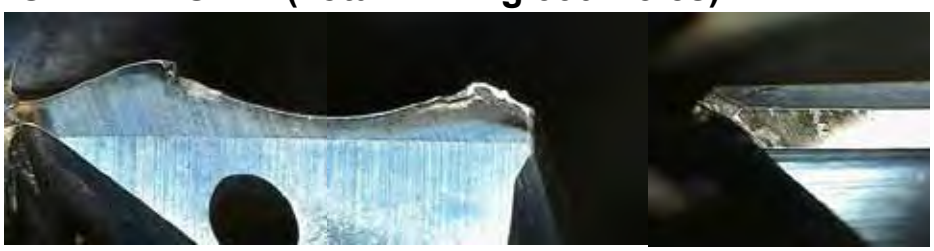
### YG-1 (Total Drilling 330 Holes)



### COMPETITOR A (Total Drilling 330 Holes)



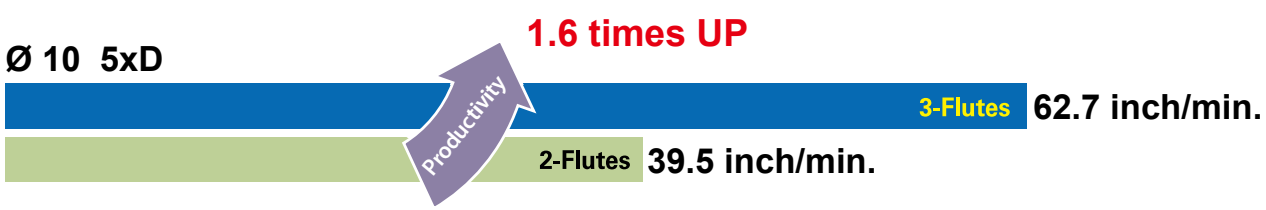
### COMPETITOR B (Total Drilling 330 Holes)



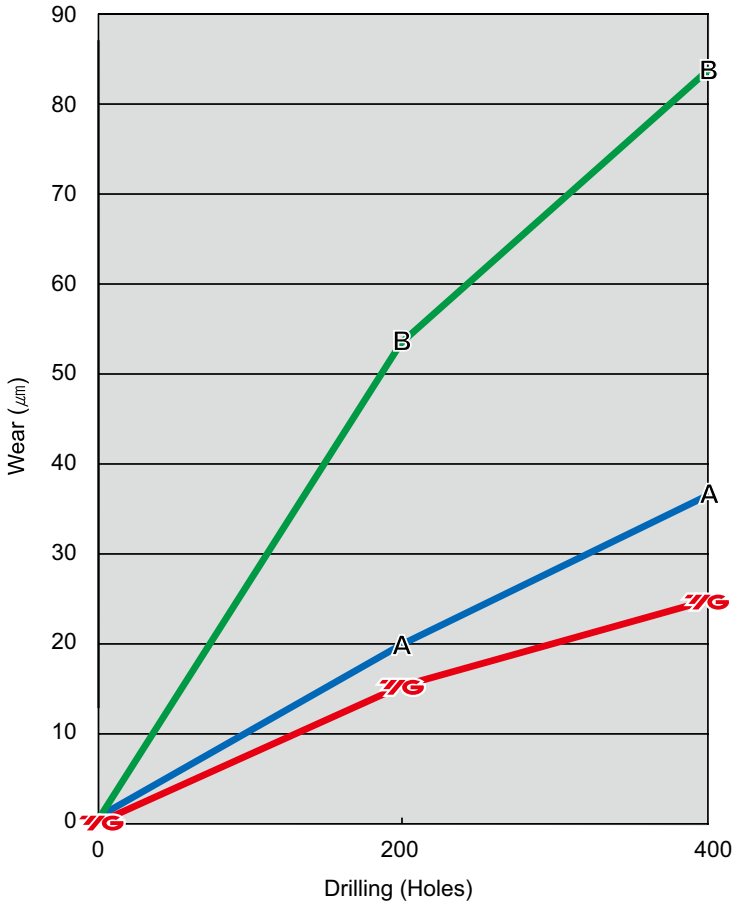
## Cutting Condition

**Tools** : DGR495100
(Dream Drills High Feed)
**Size** : Ø10 x 10 x 61 x 103
**Work Material** : • AISI : 1045
• JIS : S45C (HRc20)
• DIN : C45
**R.P.M** : 3,200 rev./min.
**Feed** : .0197 inch/rev.
**Drilling Depth** : 1.97″ (5xD)
**Drilling Method** : Blind Hole
**Coolant** : Wet Cut
**Machine** : Machining Center

## Productivity (Carbon Steel)



# CASE STUDY ◆ DREAM DRILLS-INOX (Reference page : p.93 ~ p108)




## CUTTING CONDITION

**Tools** : DREAM DRILLS-INOX
**Size** : ∅6 x ∅6 x 44 x 82
**Work Material** : • AISI : 304
• JIS : SUS304
• DIN : X5CrNi1810
(X4CrNi18-10)
**R.P.M** : 3,700 rev./min.
**SFM** : 229 ft/min.
**Feed** : .0028 inch/rev.
**Drilling Depth** : .94″
**Coolant** : Wet Cut

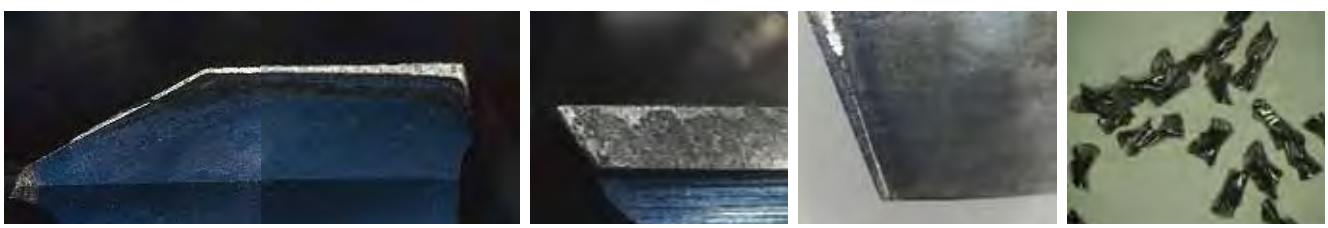
### YG-1 (Total Drilling 400 Holes)



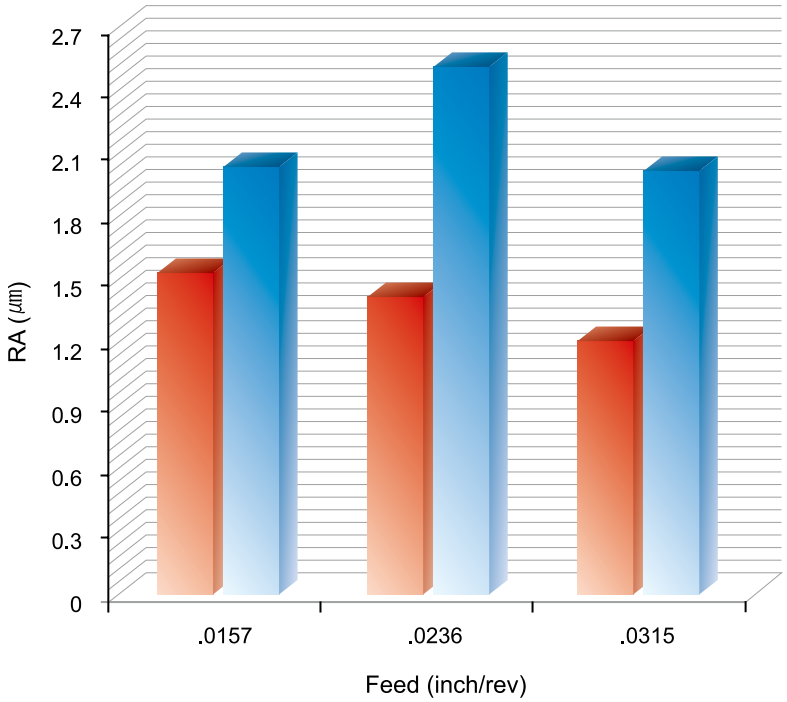
### COMPETITOR A (Total Drilling 400 Holes)



### COMPETITOR B (Total Drilling 400 Holes)



## Surface Roughness of Work Piece




### CUTTING CONDITION

**Tools** : DREAM DRILLS-ALU
**Size** : ∅10
**Work Material** : • AISI : 6061
• JIS : A6061
• DIN : AlMgSiCu
**R.P.M** : 6,367 rev./min.
**SFM** : 656 ft/min.
**Feed** : .0157 ~ .0315 inch/rev.
**Drilling Depth** : 1.77″
**Coolant** : Wet cut

## YG-1 (Total Drilling 820 Holes)





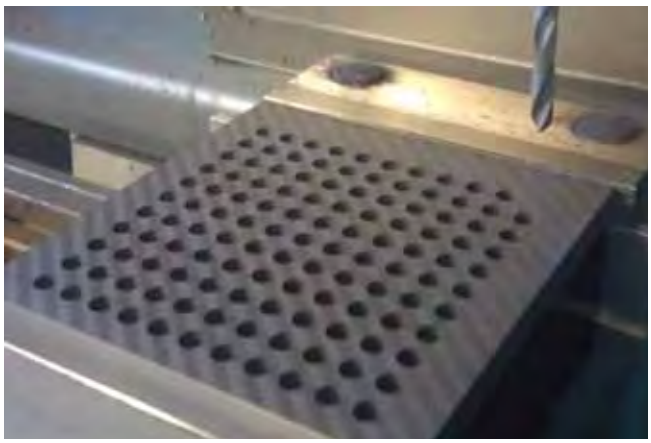
## COMPETITOR (Total Drilling 820 Holes)





# Solid Carbide Drill for Composite Material

## Drilling Test of Composite Material(CFRP)



### Working condition

- Tools : DI473060 (DREAM DRILLS - CFRP)
- Size : ∅6×6×44×82
- Work Material : CFRP
- R.P.M : 6,366 rev./min.
- Feed : 10 inch/min.
- Drilling Depth : .24″, Through Hole
- Coolant : Dry Cut

### YG-1

















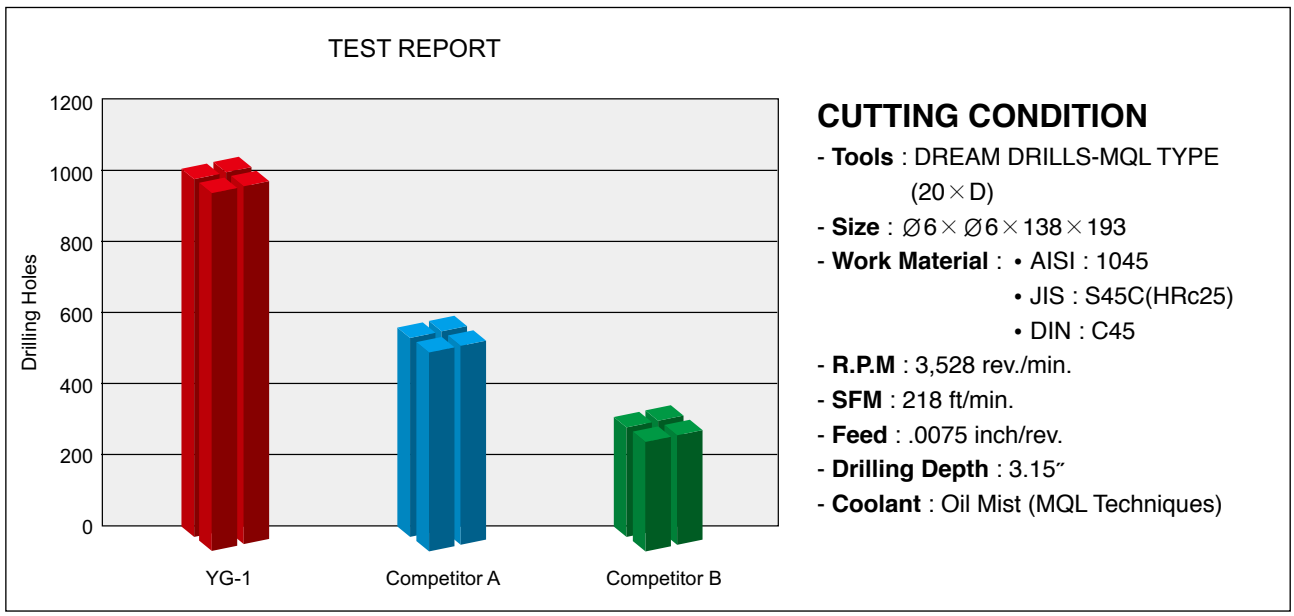



(Reference page : p.123 ~ p.130)

## FEATURES OF DREAM DRILLS-MQL TYPE

- Flute Shape and Point Shape allowing better chip evacuation in deep hole drilling
- Excellent Coating and Surface Treatment for better performance and chip evacuation

## TEST RESULT AGAINST COMPETITOR's DRILLS



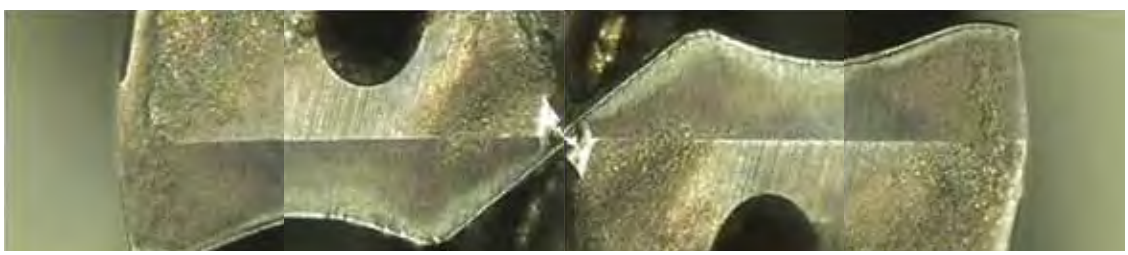

### CUTTING CONDITION

- **Tools** : DREAM DRILLS-MQL TYPE (20×D)
- **Size** : Ø6×Ø6×138×193
- **Work Material** : • AISI : 1045
  • JIS : S45C(HRc25)
  • DIN : C45
- **R.P.M** : 3,528 rev./min.
- **SFM** : 218 ft/min.
- **Feed** : .0075 inch/rev.
- **Drilling Depth** : 3.15″
- **Coolant** : Oil Mist (MQL Techniques)

**YG-1 (After Drilling 1,000 Holes)**



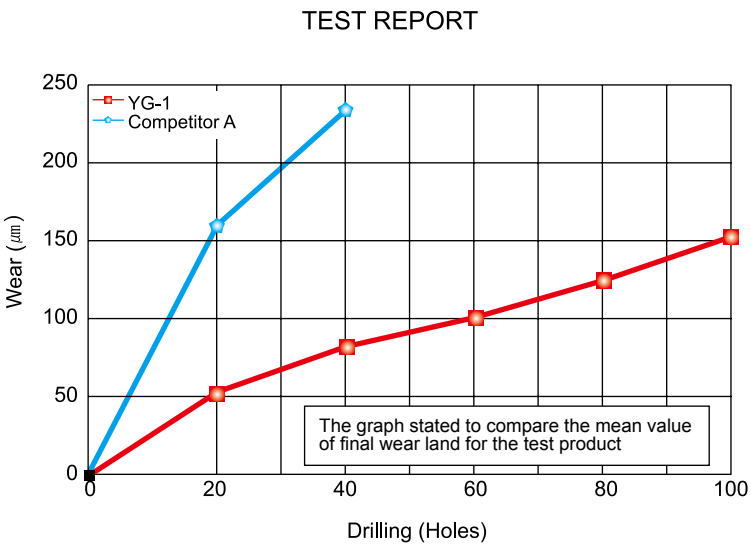
**COMPETITOR A (After Drilling 546 Holes)**



## FEATURES OF DREAM DRILLS FOR HIGH HARDENED STEELS

- Low Helix Angle to maximize tools' rigidity.
- Special Point Thinning to improve chip evacuation.
- Excellent Coating and Surface Treatment for improved surface and better chip evacuation.

## TEST RESULT AGAINST COMPETITOR's DRILLS




### CUTTING CONDITION

- **Tools** : Dream Drills for High Hardened Steels
- **Size** : Ø10×Ø10×63×111
- **Work Material** : • AISI : H13
  • JIS : SKD11(HRc60)
  • DIN : X155CrV-Mo12-1
- **R.P.M** :380 rev./min.
- **SFM** : 39 ft/min.
- **Feed** : .0016 inch/rev.
- **Drilling Depth** : .98″ (2.5D)
- **Coolent** : Wet Cut

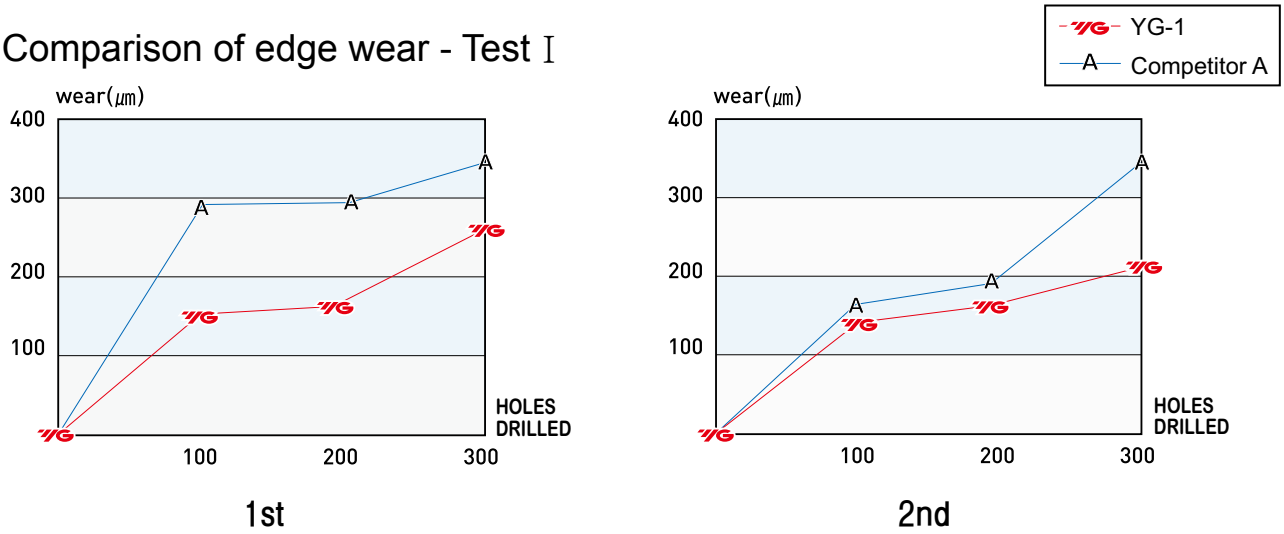
**YG-1 (After Drilling 100 Holes)**



**COMPETITOR A (After Drilling 40 Holes)**



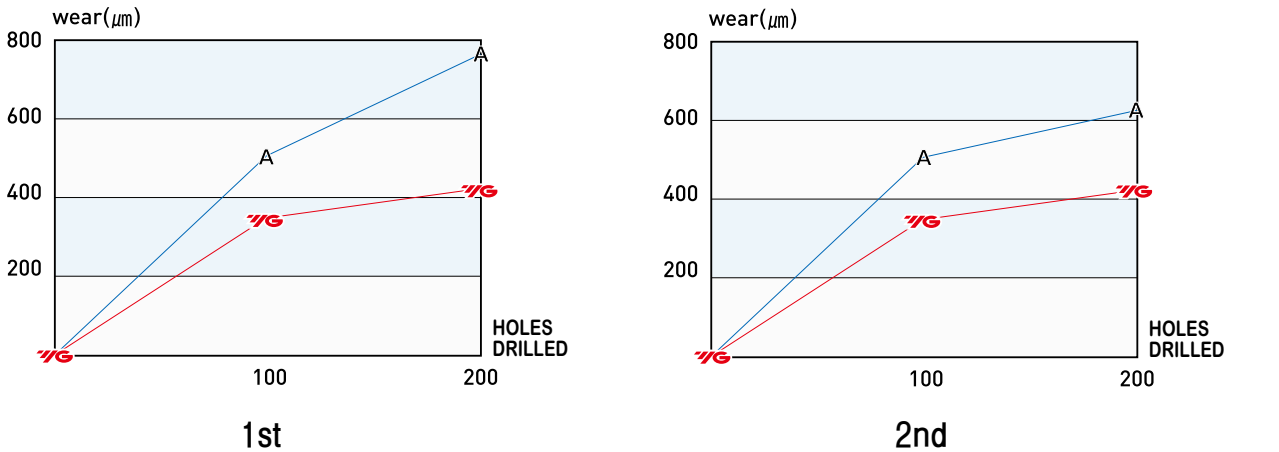
## Comparison of edge wear - Test Ⅰ




CUTTING CONDITION

- **Work material** : • AISI : 316
  • JIS : SUS316
  • DIN : X3CrNiMo17-13-3
- **Drilling Depth** : .94″
- **Total Drilling(hole)** : 300 Holes
- **R.P.M** : 600 rev./min.
- **Feed** : 4.3307 inch/min.

## Comparison of edge wear - Test Ⅱ




CUTTING CONDITION

- **Work material** : • AISI : D2
  • JIS : SKD11
  • DIN : X155CrVMo12-1
- **Drilling Depth** : .94″
- **Total Drilling(hole)** : 200 Holes
- **R.P.M** : 600 rev./min.
- **Feed** : 4.3307 inch/min.

**YG-1**



**COMPETITOR A**



## COMBO - SPIRAL FLUTE

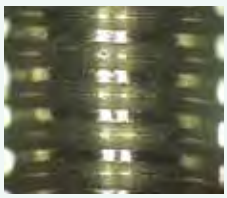
### *Cutting Condition*

- **Tools** : Combo Spiral Flute Tap
- **Size** : M8×1.25
- Work Material : • AISI : 1045
  • JIS : S45C(HRc35)
  • DIN : C45
- Tapping Depth: .79″
- Coolant : Water Soluble Oil
- SFM (Tapping Speed) : 33 ft/min.

**YG-1(Total Tapping 204 Holes)**

Surface Roughness of Work Piece

204 Holes ▶



**COMPETITOR A (Total Tapping 159 Holes)**

Surface Roughness of Work Piece

159 Holes ▶



**COMPETITOR B (Total Tapping 204 Holes)**

Surface Roughness of Work Piece

204 Holes ▶

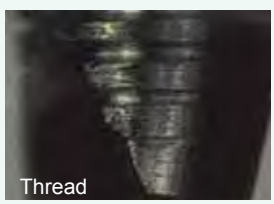


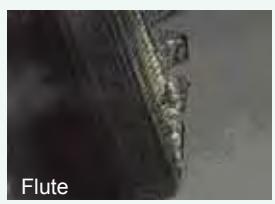
## COMBO - SPIRAL POINT

### *Cutting Condition*

- **Tools** : Combo Spiral Point Tap
- **Size** : M2×0.4
- Work Material : • AISI : 1045
  • JIS : S45C(HRc35)
  • DIN : C45
- Tapping Depth : .24″
- Coolant : Tapping Oil
- SFM (Tapping Speed) : 33 ft/min.

**YG-1(Total Tapping 450 Holes)**




**COMPETITOR A (Total Tapping 318 Holes)**

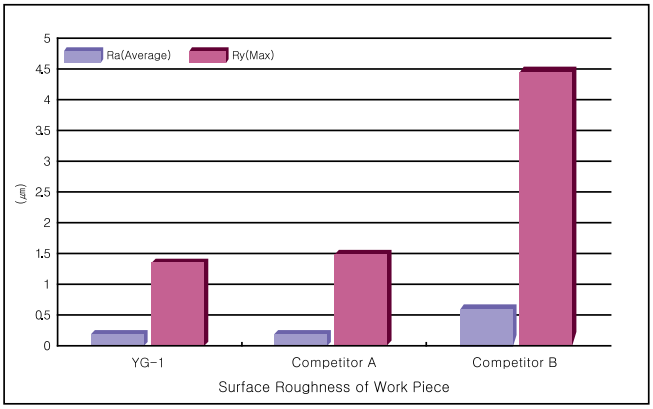
Tool was broken after tapping 318 holes

**COMPETITOR B (Total Tapping 103 Holes)**

Tool was broken after tapping 103 holes

## TEST I (Total Milling Length : 787 ft)

### ▶ Surface Roughness of Work Piece

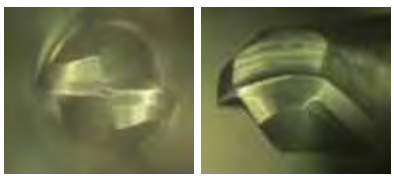



**CUTTING CONDITION (∅1mm)**

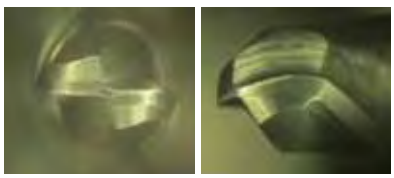
**Tools** : 2Flute, CBN Ball Nose End mill
**Size** : ∅1 × ∅4 × 0.6 × 50
**Work Material** : • JIS : SKD11(HRc60)
• DIN : X155CrV-Mo12-1
• AISI : H13
**Cutting Speed** :**309** ft/min.
**R.P.M** : 30,000 rev./min.
**Feed** : 59.06 inch/min.
**Milling Depth** : .0004″
**Coolant** : Oil Mist
**Machine** : Machining Center

### ▶ Maximum Wear (㎛)

**YG-1 (19.611㎛)**



**COMPETITOR A (32.249㎛)**

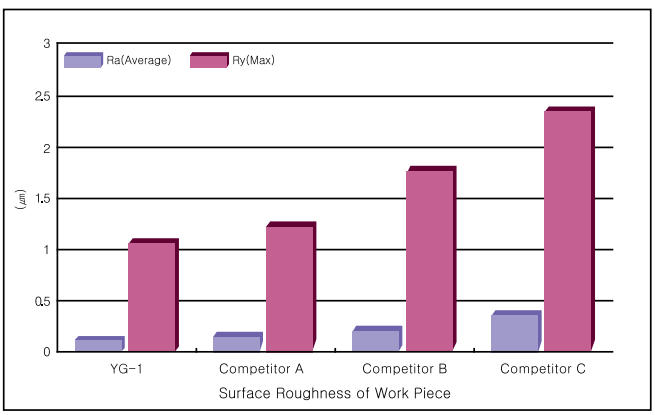


**COMPETITOR B**

**Tool was broken after milling 100 meters**

## TEST II (Total Milling Length : 2,460 ft)

### ▶ Surface Roughness of Work Piece




**CUTTING CONDITION (∅2mm)**

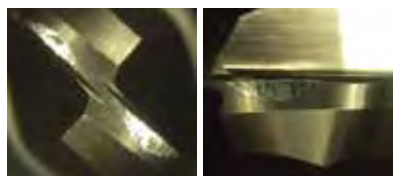
**Tools** : 2Flute, CBN Ball Nose End mill
**Size** : ∅2 × ∅4 × 1.8 × 50
**Work Material** : • JIS : SKD11(HRc60)
• DIN : X155CrV-Mo12-1
• AISI : H13
**Cutting Speed** : 618 ft/min.
**R.P.M** : 30,000 rev./min.
**Feed** : 78.74 inch/min.
**Milling Depth** : .0004″
**Coolant** : Oil Mist
**Machine** : Machining Center

### ▶ Maximum Wear (㎛)

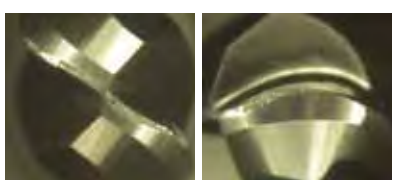
**YG-1 (57.630㎛)**



**COMPETITOR A (100.314㎛)**



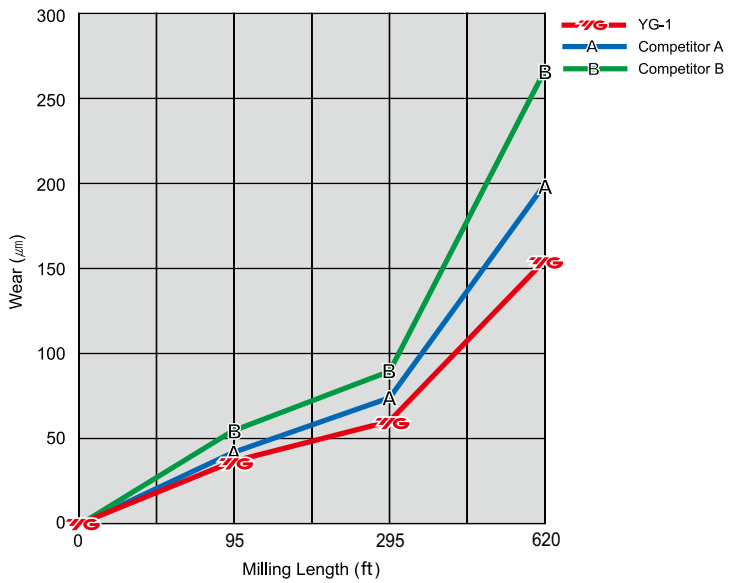
**COMPETITOR B (71.471㎛)**



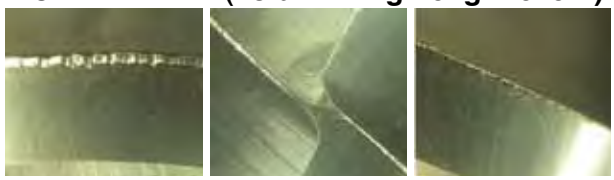
**COMPETITOR C (170.200㎛)**



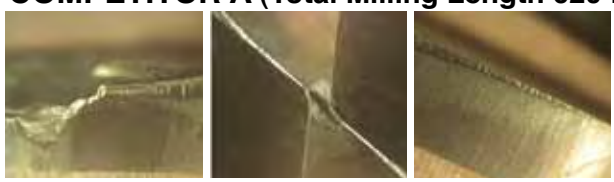
## i-Xmill - **BALL**



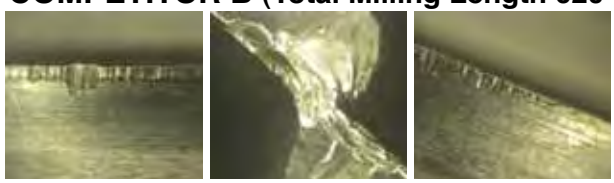

**YG-1 *i*-Xmill (Total Milling Length 620 ft)**



**COMPETITOR A (Total Milling Length 620 ft)**



**COMPETITOR B (Total Milling Length 620 ft)**



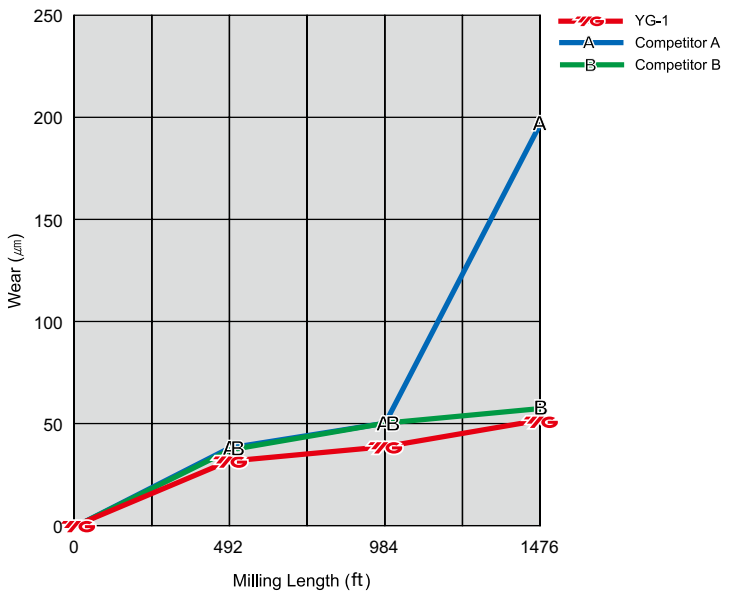
### CUTTING CONDITION

**Tools** : i -Xmill Ball
**Size** : ∅16×R8.0
**Work Material** : JIS : SKD61 (HRc50),
DIN : X40GrMoV51(1.2344)
AISI : H13

**Cutting Speed** : 264 ft/min.
**R.P.M** : 1,600 rev./min.
**Feed** : 15.35 inch/min.
**Feed per tooth** : .0047 inch/tooth
**Milling Method** : Side Cutting

**Milling Depth** : Axial : .0315″
Radial : .0630″
**Coolant** : Oil Mist
**Overhang** : YG-1, Competitor B : 1.89″
Competitor A : 2.20″
**Machine** : Machining Center

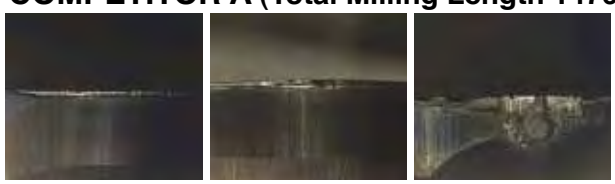
## i-Xmill - **CORNER RADIUS**




**YG-1 *i*-Xmill (Total Milling Length 1476 ft)**



**COMPETITOR A (Total Milling Length 1476 ft)**



**COMPETITOR B (Total Milling Length 1476 ft)**



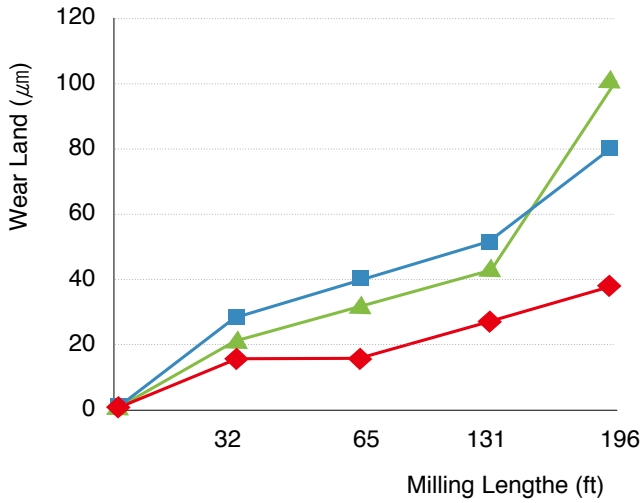
### CUTTING CONDITION

**Tools** : i-Xmill Corner Radius
**Size** : ∅16 x R2.0
**Work Material** : KS : KP4M (Mold steels HRc35)
DIN : 40CrMnNiMo8-6-4(1.2738)
AISI : P20+Ni

**Cutting Speed** : 918 ft/min.
**R.P.M** : 5,570 rev./min.
**Feed** : 87.80 inch/min.
**Feed per tooth** : .0079 inch/tooth
**Milling Method** : Side Cutting

**Milling Depth** : Axial : .1181″
Radial : .0079″
**Coolant** : Oil Mist
**Overhang** : 2.76″
**Machine** : Machining Center

## TEST REPORT

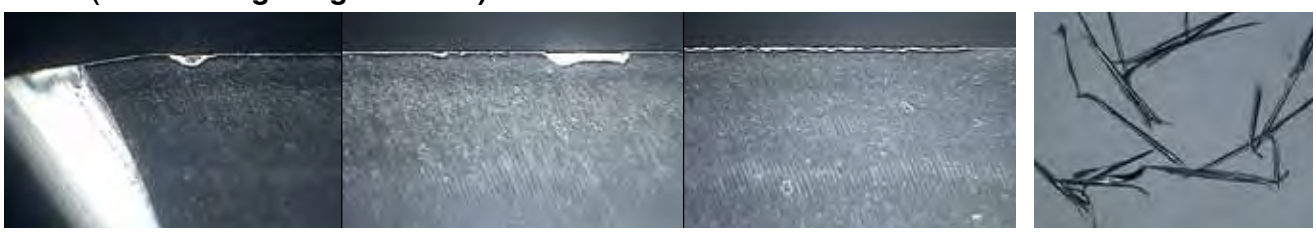



### CUTTING CONDITION

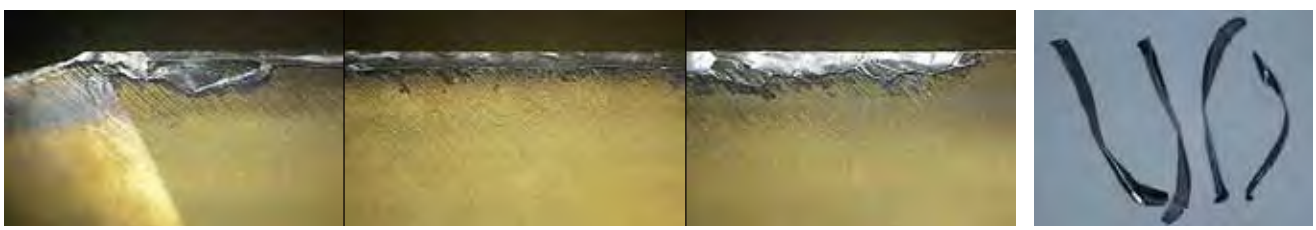
**Tools** : 4Flute Corner Radius, ∅16, R1.0
**Work Material** : KP4M (HRc35 / AISI P20+Ni DIN 1.2738 Improved)
**Cutting Speed** : 511 ft/min.
**R.P.M** : 3,100 rev./min.
**Feed** : 11.02 inch/min.
**Feed per Tooth** : .0656 inch/tooth
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : .4724″
Radial : .0314″
**Overhang/Coolant** : 3.03″/Wet Cut
**Machine** : Machining Center LCV 650

### ▶ Cutting Edges

**YG-1 (Total Milling Length : 196 ft)**



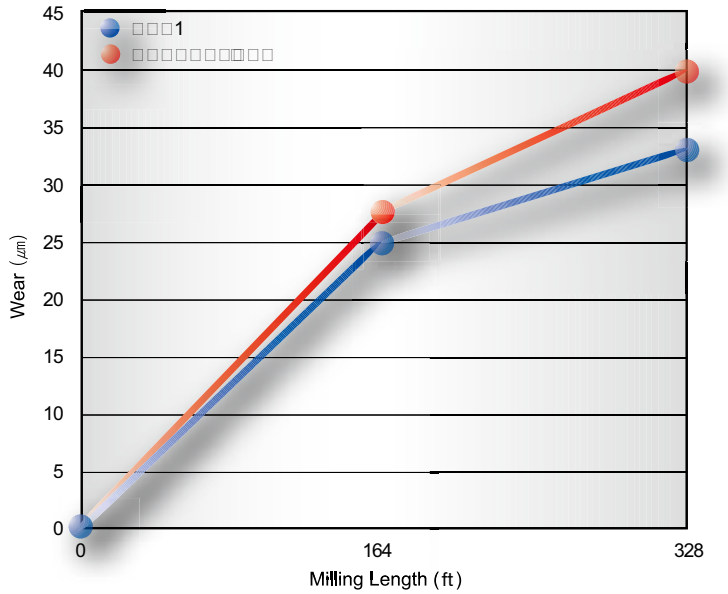
**COMPETITOR A (Total Milling Length : 196 ft)**



**COMPETITOR B (Total Milling Length : 196 ft)**



# Carbide 6 Flute 45° Helix End Mill for Hardened Steel




## CUTTING CONDITION

**Tools** : 6Flute, X5070 45° Helix
**Size** : Ø16 × Ø16 × 40 × 110
**Work Material** : • AISI : H13
• JIS : SKD61(HRc50)
• DIN : X40CrMoV5-1(1.2344)
**Cutting Speed** : 317 ft/min.
**R.P.M** : 1,920 rev./min.
**Feed** : 35.91″
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : .9449″
Radial : .0378″
**Coolant** : Dry Cut
**Overhang** : 2.05″
**Machine** : Machining Center

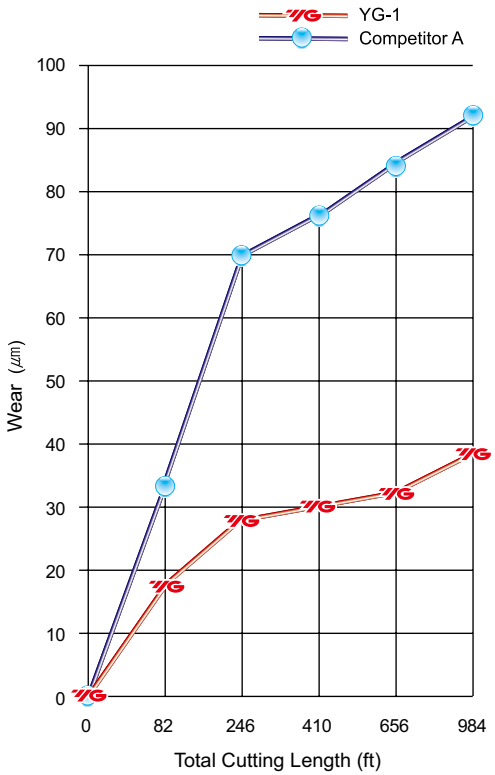
**YG-1**
**(Total Milling Length 328 ft)**



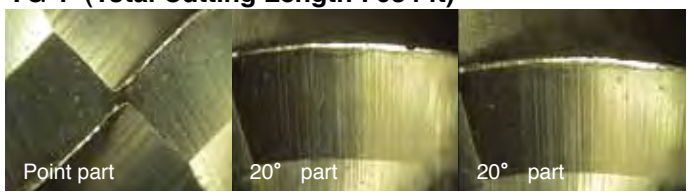
**COMPETITOR A**
**(Total Milling Length 328 ft)**



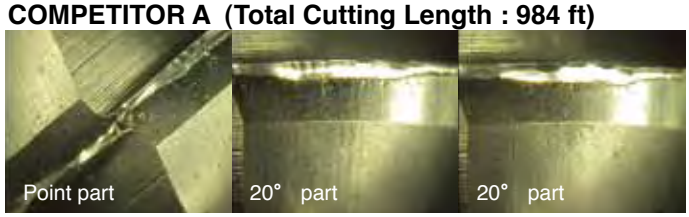
## TEST REPORT (Ball)




**YG-1 (Total Cutting Length : 984 ft)**



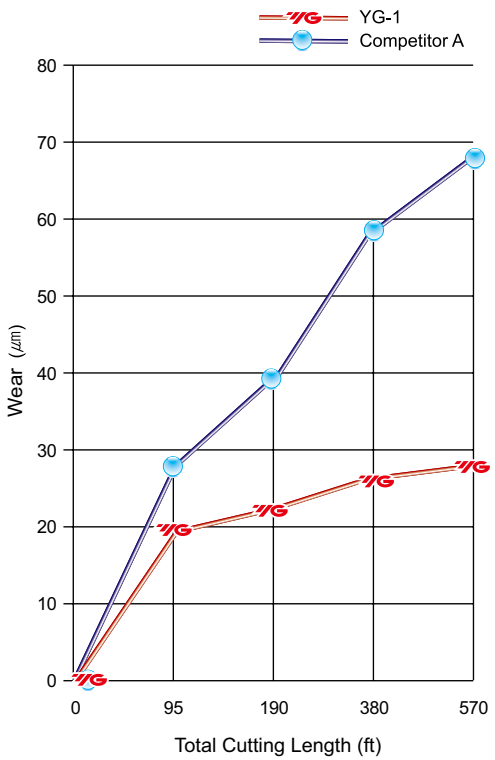

**COMPETITOR A (Total Cutting Length : 984 ft)**



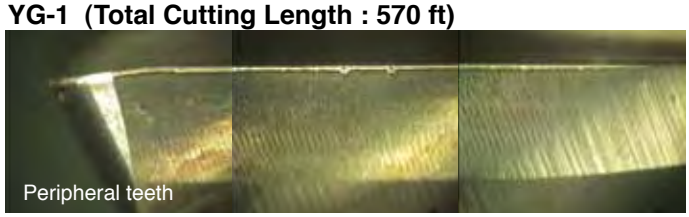

### CUTTING CONDITION

**Tool** : 2Flute, Carbide Ball End Mill
**Size** : Ø6×6×12×90
**Work Material** : KP4M (HRc35 / AISI P20+Ni DIN 1.2738 Improved)
**Cutting Speed** : 426.7 ft/min.
**R.P.M** : 6,900 rev./min.
**Feed** : 32.68 inch/min.
**Feed per tooth** : .0024 inch/tooth
**Milling Method** : Profiling
**Milling Depth** : Axial : .0079″
Radial : .0472″
**Coolant** : Oil Mist
**Overhang** : 1.024″

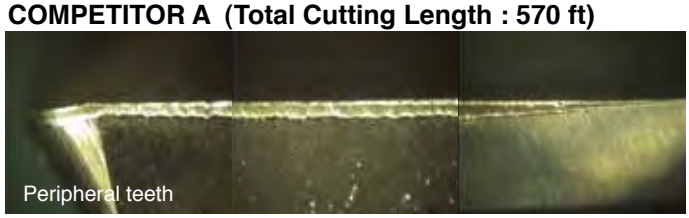
## TEST REPORT (Corner Radius)




**YG-1 (Total Cutting Length : 570 ft)**




**COMPETITOR A (Total Cutting Length : 570 ft)**



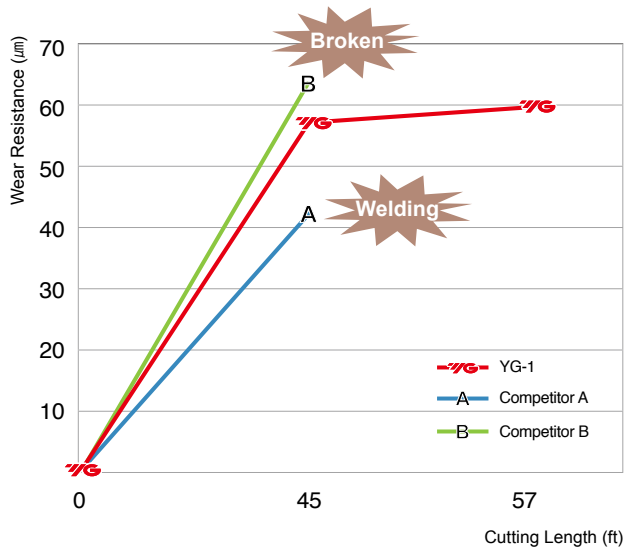

### CUTTING CONDITION

**Tool** : 4Flute, Carbide Corner Radius End Mill
**Size** : Ø10(R0.5)×10×25×100
**Work Material** : KP4M (HRc35 / AISI P20+Ni DIN 1.2738 Improved)
**Cutting Speed** : 169 ft/min.
**R.P.M** : 1,640 rev./min.
**Feed** : 7.09 inch/min.
**Feed per tooth** : .0011 inch/tooth
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : .9842″
Radial : .0197″
**Coolant** : Oil Mist
**Overhang** : 1.614″

# CASE STUDY ◆ TitaNox-POWER END MILLS

(Reference page : p.925 ~ p.946)

## Test Report-1 ◆ Y-Coated Solid Carbide 4 Flutes with Double Core End Mills




**Cutting Edges**

YG
Total Milling Length : 57 ft



COMPETITOR A
Total Milling Length : 53 ft



COMPETITOR B
Total Milling Length : 53 ft

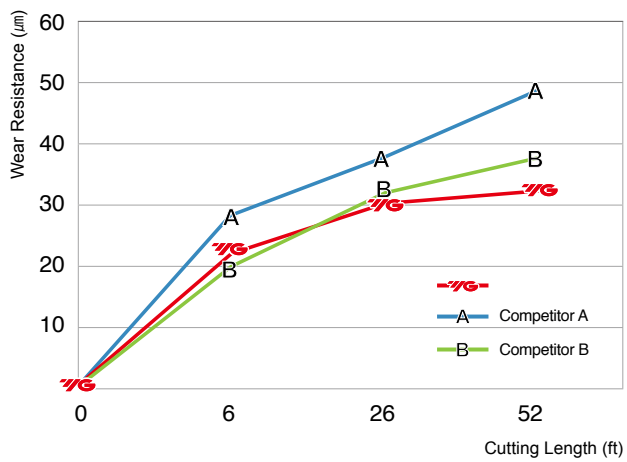


### CUTTING CONDITION

**Size** : Ø12(R1) x Ø12 x 26 x 80
**Work Material** : DIN : TiAV6V4 (Titanium)
**Cutting Depth** : .470" (Axial Depth)
**R.P.M** : 1,591 rev./min.
**Feed** : 10 inch/min.

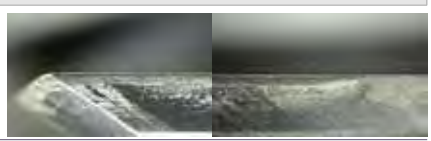
**Milling Method** : Slotting
**Coolant** : Wet Cut
**Overhang** : 1.41"
**Machine** : Machining Center

## Test Report-2 ◆ Y-Coated Solid Carbide 5 Flutes End Mills

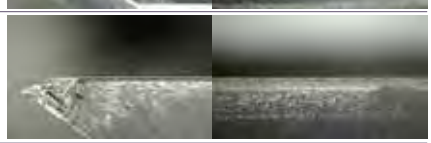



**Cutting Edges**

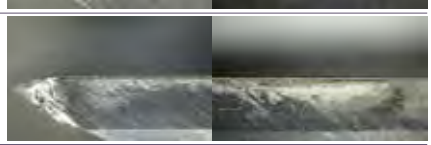
YG



COMPETITOR A



COMPETITOR B



### CUTTING CONDITION

**Size** : Ø12 × Ø12 × 26 × 83
**Work Material** : DIN : TiAV6V4 (Titanium)
**Cutting Depth** : .470" (Axial Depth)
**R.P.M** : 1,591 rev./min.
**Feed** : 15.669 inch/min.

**Milling Method** : Down & Side Cutting
**Axial Depth :** .710"
**Radial Depth** : .141"
**Coolant** : Wet Cut
**Machine** : Machining Center

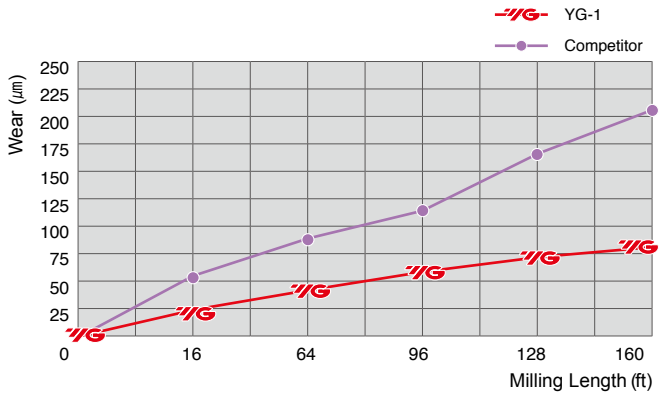
# CASE STUDY ◆ V7 PLUS A END MILLS (Reference page : p.947 ~ p.983)

## TEST I – 4 Flute vs Competitor

### CUTTING CONDITION

**Tools** : 4 Flute, V7 PLUS A
**Wear**(㎛) : V7 PLUS A 83.518
Competitor 203.381
**Milling Length(inch)** : 160
**Size** : Ø10 x Ø10 x 22 x 72
**Work Material** : - AISI : 1045
- JIS : S45C(HRc30)
- DIN : C45

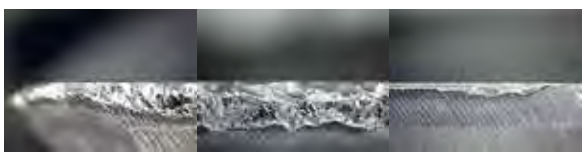
**Cutting Speed** : 754 ft/min.
**R.P.M** : 7,324 rev/min.
**Feed** : 57.64 inch/min.
**Feed per tooth** :.002 inch/tooth
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : .394″
Radial : .118″
**Coolant** : Wet Cut
**Overhang** : 1.339″
**Machine** : Machining Center




V7 PLUS A



COMPETITOR

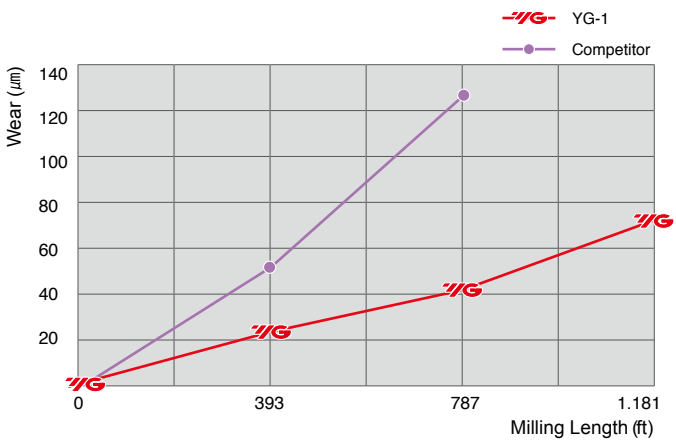


## TEST II – 6 Flute vs Competitor

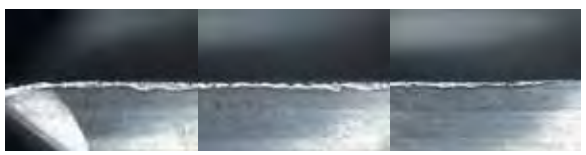
### CUTTING CONDITION

**Tools** : 6 Flute, V7 PLUS A
**Wear**(㎛) : V7 PLUS A 70.855
Competitor 76.498
**Milling Length(inch)** : 1,181
**Size** : Ø12(R1) x Ø2 x 26 x 83
**Work Material** : - AISI : 1045
- JIS : S45C(HRc30)
- DIN : C45

**Cutting Speed** : 914 ft/min.
**R.P.M** : 7,392 rev/min.
**Feed** : 295.08 inch/min.
**Feed per tooth** : .007 inch/tooth
**Milling Method** : Trochoidal Cutting
**Milling Depth** : Axial : .945″
Radial : .024″
**Coolant** : Wet Cut
**Overhang** : 1.417″
**Machine** : Machining Center




V7 PLUS A



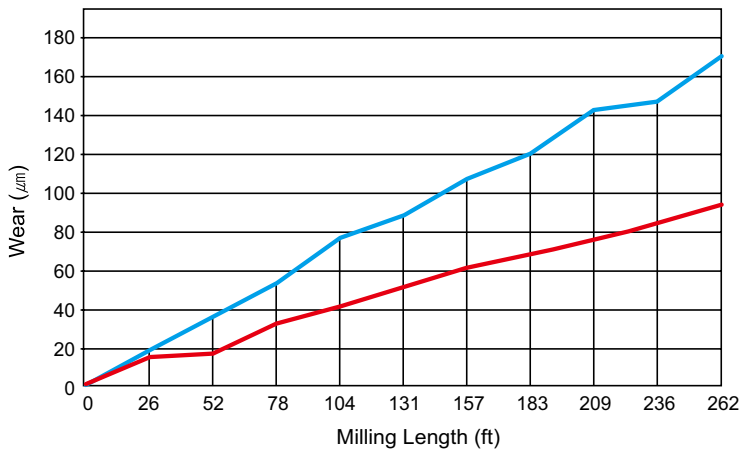
COMPETITOR



# CASE STUDY ◆ D-POWER CFRP END MILLS

(Reference page : p.1063 ~ p.1068)

## TEST Ⅰ - DUAL HELIX



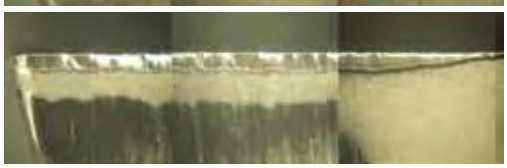

### CUTTING CONDITION

**Tools** : 4 Flute, D-Power Dual Helix
**Size** : Ø6(R0.5)×Ø6×12×65
**Work Material** : CFRP
**R.P.M** : 7,960 rev./min.
**Feed** : 45.87 inch/min.
**Cutting Depth** : Axial : .24″
Radial : .09″
**Coolant** : Dry Cut
**Overhang** : 1.14″
**Milling Method** : Side Cutting
**Machine** : Machining Center

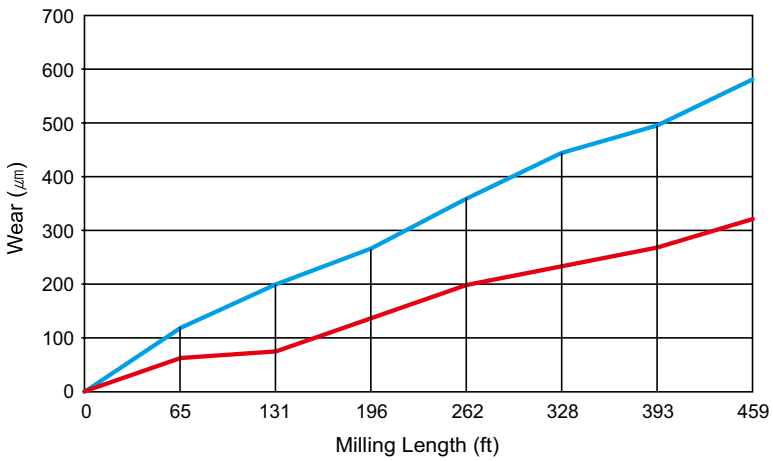
**YG-1**
**(Total Milling Length 262ft)**



**COMPETITOR**
**(Total Milling Length 262ft)**



## TEST Ⅱ - 4 FLUTE, FINISH




### CUTTING CONDITION

**Tools** : 4 Flute, D-Power
**Size** : Ø12×Ø12×36×100
**Work Material** : CFRP
**R.P.M** : 5,310 rev./min.
**Feed** : 50.19 inch/min.
**Cutting Depth** : Axial : .47″
Radial : .05″
**Coolant** : Dry Cut
**Overhang** : 2.20″
**Milling Method** : Down & Side Cutting
**Machine** : Machining Center

**YG-1**
**(Total Milling Length 459ft)**



**COMPETITOR**
**(Total Milling Length 459ft)**



## 4 Flute Square End Mill, S45C

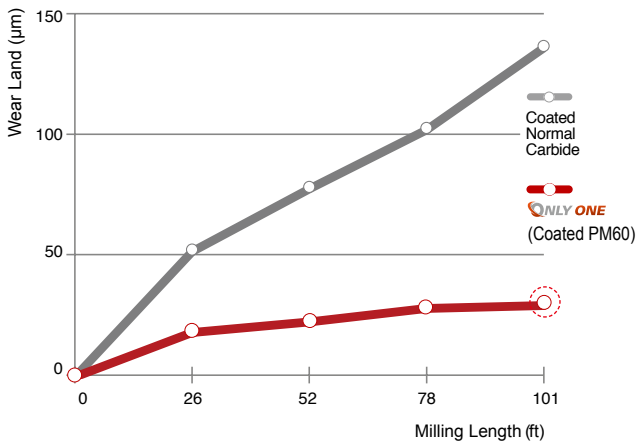
### CUTTING CONDITION

**Tool** : Only One Coated PM60/Coated Normal Carbide
**Size** : Ø10xØ10x22x72/Ø10xØ10x22x70
**Work Material** : - AISI : 1045
- JIS : S45C
- KS : SM45C
- DIN : C45

**R.P.M** : 2,750 rev/min.
**Feed** : 20.47 inch/min.
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : 12″
Radial : .04″
**Coolant** : Wet Cut
**Machine** : Machining Center

**Cutting Edges Condition**




## 4 Flute Square End Mill, S45C

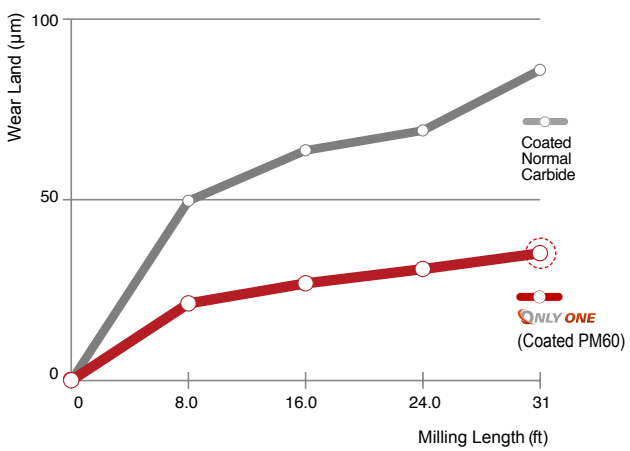
### CUTTING CONDITION

**Tool** : Only One Coated PM60/Coated Normal Carbide
**Size** : Ø10xØ10x22x72/Ø10xØ10x22x70
**Work Material** : - AISI : 1045
- JIS : S45C
- KS : SM45C
- DIN : C45

**R.P.M** : 2,750 rev/min.
**Feed** : 20.47 inch/min.
**Milling Method** : Down & Side Cutting
**Milling Depth** : Axial : .39″
Radial : .04″
**Coolant** : Wet Cut
**Machine** : Machining Center

**Cutting Edges Condition**



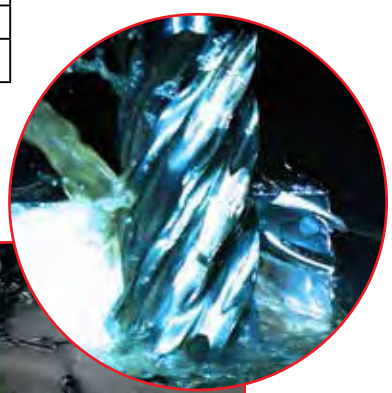
# CASE STUDY ◆ SINE-POWER END MILLS (Reference page : p.1143 ~ p.1147)

## HSS Co 8% 6 FLUTE END MILLS

| SINE-POWER | |
|---|---|
| Material | HSS Co8% |
| Dimension | ø2”(R.125”) x ø2” x 4” x 7-3/4” |
| No. of Flute | 6 |
| Coating | Uncoated |

| CUTTING CONDITIONS | | |
|---|---|---|
| Milling Method | Slotting | Profiling |
| Material | Ti6Al4V (Titanium) | |
| Coolant | Wet Cut | |
| RPM | 100 rev./min. | 100 rev./min. |
| Feed | 2 IPM | 3.15 ~ 4.2 IPM |
| Axial Depth | 1-1/2 inch | 1-1/2 inch |
| Radial Depth | 2 inch | 0.1 ~ 0.2 inch |
| Feed/Tooth | .0018 inch/tooth | .0053 ~ .007 inch/tooth |

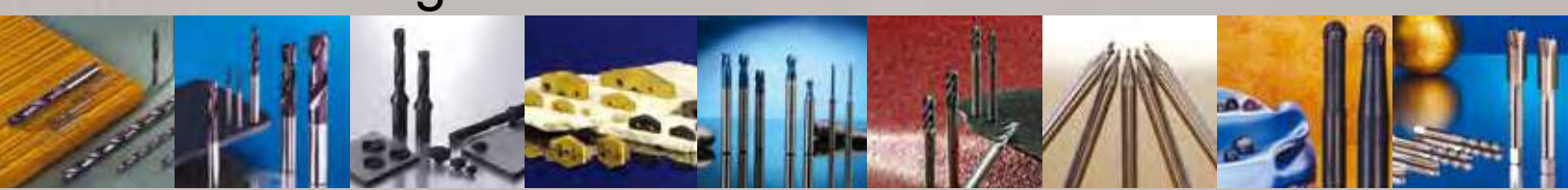
The above cutting conditions achieved 5 hours of machining





**SINE-POWER SPECIFIC GEOMETRY DESIGN HELPS OUR CUSTOMERS TO INCREASE THEIR PRODUCTIVITY BY 15% IN TITANIUM MACHINING.**

Global Cutting Tool Leader **YG-1**



# DRILLING TOOLS


i-DREAM DRILLS, CARBIDE INSERTS

SOLID CARBIDE DREAM DRILLS - GENERAL
(with & without Coolant Holes)

SOLID CARBIDE DREAM DRILLS - HIGH FEED

SOLID CARBIDE DREAM DRILLS - INOX
(with Coolant Holes)

SOLID CARBIDE DREAM DRILLS - ALU
(with Coolant Holes)

SOLID CARBIDE DREAM DRILLS - CFRP

SOLID CARBIDE DREAM DRILLS - MQL TYPE
(with Coolant Holes)

SOLID CARBIDE DREAM DRILLS FOR HIGH HARDENED STEELS

STANDARD CARBIDE DRILLS

HSS-PM MULTI-1 DRILLS

PREMIUM HSS HPD STRAIGHT SHANK DRILLS

HSS GOLD-P DRILLS

HSS STRAIGHT SHANK DRILLS

HSS AIRCRAFT DRILLS

HSS SILVER & DEMING DRILLS

HSS MORSE TAPER SHANK DRILLS

HSS (8% Cobalt) NC SPOTTING DRILLS

HSS COMBINATION DRILL & COUNTER SINK / CENTER DRILL

CARBIDE & HSS-PM SPADE DRILLS

TECHNICAL DATA



YG-1 CO., LTD.

# Contents

## DRILLING TOOLS


CARBIDE INSERT DRILLS

SOLID CARBIDE DRILLS

HSS DRILLS

CARBIDE & HSS-PM SPADE DRILLS

TECHNICAL DATA


YG-1 CO., LTD.

# Contents / DRILLING TOOLS


i-DREAM DRILLS
For General Steels and Stainless Steels — i-DREAM DRILLS

SOLID CARBIDE DREAM DRILLS - GENERAL (with & without Coolant Holes)
For General Purpose HRc30 to HRc50 — DREAM DRILLS -GENERAL

SOLID CARBIDE DREAM DRILLS - HIGH FEED (with Coolant Holes)
For Carbon Steels, Alloy Steels and Cast Iron — DREAM DRILLS -HIGH FEED

SOLID CARBIDE DREAM DRILLS - INOX (with Coolant Holes)
For Tough Materials - Stainless Steels, Nickel Alloys and Titanium up to HRc35 — DREAM DRILLS -INOX

SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)
For Aluminum and Aluminum Alloys — DREAM DRILLS -ALU

SOLID CARBIDE DREAM DRILLS - CFRP
For Composite Matecials including CFRP and GFRP — DREAM DRILLS -CFRP

SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)
Minimum Quantity Lubrication Drilling Deep Holes (10×D ~ 30×D) — DREAM DRILLS -MQL TYPE

SOLID CARBIDE DREAM DRILLS for HIGH HARDENED STEELS
For High Hardened Steels HRc50 to HRc70 — DREAM DRILLS for HIGH HARDENED STEELS

STANDARD CARBIDE DRILLS
For General Purpose, 118° Point — STANDARD CARBIDE DRILLS

HSS-PM MULTI-1 DRILLS
For Multi Purpose Particularly for Stainless Steels and Titanium — MULTI-1 DRILLS

HPD DRILLS
For General Steels and Stainless Steels — HPD DRILLS

HSS GOLD-P DRILLS
Gold-P Coating — GOLD-P DRILLS

HSS STRAIGHT SHANK DRILLS
For General Purpose — STRAIGHT SHANK DRILLS

AIRCRAFT DRILLS
6 and 12 inch Length Drills — AIRCRAFT DRILLS

SILVER & DEMING DRILLS
118° Split Point, 3 Flat Black and Gold — SILVER & DEMING DRILLS

HSS MORSE TAPER SHANK DRILLS
For General Purpose, Standard Length — TAPER SHANK DRILLS

HSS (8% Cobalt) NC SPOTTING DRILLS
Centering and Chamfering of Holes — NC SPOTTING DRILLS

HSS COMBINATION DRILLS & COUNTER SINK / CENTER DRILL
Regular and Long Lengths — COMBINATION DRILLS & COUNTERSINK

CARBIDE & HSS-PM SPADE DRILLS
Carbide for Long Tool Life, and HSS-PM for General Machines and Large Diameters
Higher Productivity than Other Drilling Tools — SPADE DRILLS

TECHNICAL DATA — TECHNICAL DATA

# DRILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|---|
| | | | | MIN | MAX | |
| **i-Dream Drills** | Y03 * |  | Insert for General Purpose | .4724 (#A) | 1.2500 (#J) | **44~49** |
| | YI3 * | | Insert for Stainless Steels | .4724 (#A) | 1.2500 (#J) | **44~49** |
| **Spade Drills** | S01~S08 |  | HSS M4 Insert | .7031 (#1) | 4.5000 (#8) | **242~245** |
| | S06~S08 (SM08) |  | Super Cobalt T15 Insert | .3740 (#Y) | 4.5000 (#8) | **246~252 262~265** |
| | S11~S14 |  | Primium cobalt M48 Insert | .3740 (#Y) | 1.3780 (#2) | **253~255** |
| | S21~S23 |  | Carbide C2, C5, C3 Insert | .3740 (#Y) | 1.8750 (#3) | **256~260** |
| | S26~S28 (SM28) |  | Carbide C5 Insert (P40) | .3740 (#Y) | 1.8750 (#3) | **256~260 266~267** |
| | S16~S18 |  | Carbide C3 Insert (K10) | .3740 (#Y) | 1.3780 (#2) | **256~260** |
| | SF05 SF15 |  | Super Cobalt T15 Flat Bottom | .3750 (#Y) | 1.3750 (#2) | **268** |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys | |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | ○ | |
| ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | |
| | | | | | | | | | | | | ◎ | ◎ | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | |

# DRILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | INCH / METRIC | LENGTH | SIZE | | PAGE |
|---|---|---|---|---|---|---|---|
| | | | | | MIN | MAX | |
| **DREAM DRILLS-GENERAL** | DH414 |  | Inch | Stub(3XD) | D1/8 | D5/8 | **58** |
| | DH722 |  | Inch | Long(5XD) | D13/64 | D1/2 | **59** |
| | DH416<br>DH711 |  | Inch | Short(3XD) | D1/8 | D5/8 | **60** |
| | DH418<br>DH712 |  | Inch | Long(5XD) | D13/64 | D1/2 | **62** |
| | DH404 |  | Metric | Stub(3XD) | D3.0 | D20.0 | **63** |
| | DH423 |  | Metric | Short(3XD) | D3.0 | D20.0 | **65** |
| | DH424 |  | Metric | Long(5XD) | D1.0 | D20.0 | **68** |
| | DH406 |  | Metric | Short(3XD) | D3.0 | D20.0 | **71** |
| | DH408 |  | Metric | Long(5XD) | D1.0 | D20.0 | **74** |
| | DH421 |  | Metric | Extra Long(8XD) | D3.0 | D14.0 | **77** |
| **DREAM DRILLS-HIGH FEED** | DGR493 |  | Inch | Short(3XD) | D.1969 | D.7874 | **86** |
| | DGR495 |  | Inch | Long(5XD) | D.1969 | D.7874 | **89** |
| **DREAM DRILLS-INOX** | DH463<br>DH714 |  | Inch | Stub(3XD) | D1/8 | D5/8 | **96** |
| | DH464<br>DH715 |  | Inch | Long(5XD) | D13/64 | D1/2 | **98** |
| | DH451 |  | Metric | Short(3XD) | D3.0 | D20.0 | **99** |
| | DH452 |  | Metric | Long(5XD) | D1.0 | D20.0 | **102** |
| | DH453 |  | Metric | Extra Long(8XD) | D3.0 | D14.0 | **105** |
| **DREAM DRILLS-ALU** | DGE466<br>DGE718 |  | Inch | Long(5XD) | D13/64 | D1/2 | **112** |
| | DGE433 |  | Metric | Long(5XD) | D3.0 | D20.0 | **113** |
| **DREAM DRILLS-CFRP** | DI473 |  | Inch | - | D.0980 | D.7500 | **120** |
| **DREAM DRILLS-MQL TYPE** | DH510 |  | Metric | Extra Long(10XD) | D3.0 | D14.0 | **126** |
| | DH515 |  | Metric | Extra Long(15XD) | D3.0 | D12.0 | **127** |
| | DH520 |  | Metric | Extra Long(20XD) | D3.0 | D12.0 | **127** |
| | DHM10 |  | Metric | Extra Long(10XD) | D3.0 | D14.0 | **128** |
| | DHM15 |  | Metric | Extra Long(15XD) | D3.0 | D12.0 | **128** |
| | DHM20 |  | Metric | Extra Long(20XD) | D3.0 | D12.0 | **128** |
| | DHM25 |  | Metric | Extra Long(25XD) | D3.0 | D10.0 | **129** |
| | DHM30 |  | Metric | Extra Long(30XD) | D3.0 | D8.0 | **129** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | ○ | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | ○ | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |
| | | | | | | | | ◎ | | | | |
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| | | | | | | | | | | | ◎ | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DRILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | INCH / METRIC | LENGTH | SIZE | | PAGE |
|---|---|---|---|---|---|---|---|
| | | | | | MIN | MAX | |
| **DREAM DRILLS For HIGH HARDENED STEELS** | DH501 |  | Inch | - | D1/8 | D3/4 | **134** |
| | DH500 |  | Metric | - | D1.0 | D14.0 | **136** |
| **STANDARD CARBIDE DRILLS** | D5412 |  | Metric | Jobber | #56 | #1 | **142** |
| | D5413 |  | Inch | Jobber | A | Z | **143** |
| | D5417 |  | Inch | Jobber | D3/64 | D1/2 | **144** |
| **MULTI-1 DRILLS** | CDR405 |  | Inch | - | D3/32 | D1/2 | **150** |
| | CDR406 |  | Inch | - | #45 | #1 | **151** |
| | CDR407 |  | Inch | - | B | Z | **152** |
| **HPD DRILLS** | DJ543 |  | Metric | Stub | D2.0 | D13.0 | **158** |
| | DJ544 |  | Metric | Jobber | D2.0 | D20.0 | **160** |
| **GOLD-P DRILLS** | D1GP182 D8182 |  | Inch | Jobber | D3/64 | D3/4 | **168** |
| | D1GP139 |  | Inch | Jobber | A | Z | **169** |
| | D1GP138 |  | Inch | Jobber | #56 | #1 | **170** |
| | D2GP185 |  | Inch | Jobber | D3/64 | D1/2 | **171** |
| | D2GP186 |  | Inch | Jobber | A | Z | **172** |
| | D2GP187 |  | Inch | Jobber | #56 | #1 | **173** |
| | D2GP511 |  | Inch | Jobber | D5/64 | D1/2 | **174** |
| | DLGP513 |  | Inch | Jobber | A | Z | **175** |
| | DLGP512 |  | Inch | Jobber | #47 | #1 | **176** |
| | DLGP195 |  | Metric | Jobber | D1.0 | D13.0 | **177** |
| | DLGP506 |  | Metric | Jobber | D2.0 | D13.0 | **179** |
| **STRAIGHT SHANK DRILLS** | D1118 |  | Inch | Screw Machine | D3/64 | D1/2 | **188** |
| | D1115 |  | Inch | Screw Machine | A | Z | **189** |
| | D1119 |  | Inch | Screw Machine | #60 | #1 | **190** |
| | D2146 D4146 |  | Inch | Screw Machine | D3/64 | D1/2 | **191** |
| | D2147 D4147 |  | Inch | Screw Machine | A | Z | **192** |
| | D2148 D4148 |  | Inch | Screw Machine | #60 | #1 | **193** |
| | DN514 |  | Inch | Screw Machine | D3/32 | D1/2 | **195** |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | ◎ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | ◎ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | ◎ |
| ◎ | | | | | ◎ | | ○ | ○ | | | ○ |
| ◎ | | | | | ◎ | | ○ | ○ | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
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| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | | ○ | ○ | | | | |

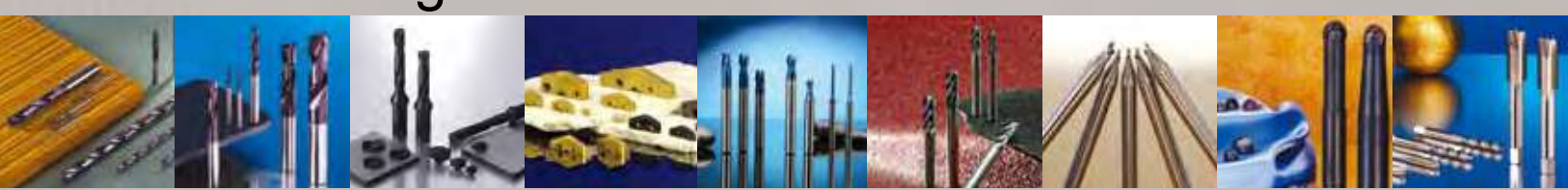
# DRILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | INCH / METRIC | LENGTH | SIZE | | PAGE |
|---|---|---|---|---|---|---|---|
| | | | | | MIN | MAX | |
| **STRAIGHT SHANK DRILLS** | DN516 |  | Inch | Screw Machine | A | Z | **196** |
| | DN515 |  | Inch | Screw Machine | #47 | #1 | **197** |
| | DL517<br>DX517 |  | Inch | Taper Length | D5/64 | D1/2 | **198** |
| | D4107 |  | Metric | Screw Machine | D1.0 | D31.0 | **199** |
| **AIRCRAFT DRILLS** | DL601<br>DL604 |  | Inch | Extension Length | D5/64 | D1/2 | **200** |
| | DL602<br>DL605 |  | Inch | Extension Length | A | Z | **211** |
| | DL603<br>DL606 |  | Inch | Extension Length | #43 | #1 | **212** |
| | D1631<br>D1634 |  | Inch | Extension Length | D5/64 | D1/2 | **213** |
| | D1632<br>D1635 |  | Inch | Extension Length | A | Z | **214** |
| | D1633<br>D1636 |  | Inch | Extension Length | #43 | #1 | **215** |
| **SILVER & DEMING DRILLS** | D1191 |  | Inch | — | D1/2 | D1-1/2 | **220** |
| **MORSE TAPER SHANK DRILLS** | D1211 |  | Inch | — | D1/2 | D2-1/2 | **226** |
| **NC SPOTTING DRILLS** | D2N90(90˚) |  | Inch | — | D1/8 | D1 | **232** |
| | D2N90(120˚) |  | Inch | — | D1/8 | D1 | **232** |
| **COMBINATION DRILL & COUNTER SINK / CENTER DRILL** | D1C90 |  | Inch | — | D3/64 | D7/32 | **238** |

◎ : Excellent ○ : Good

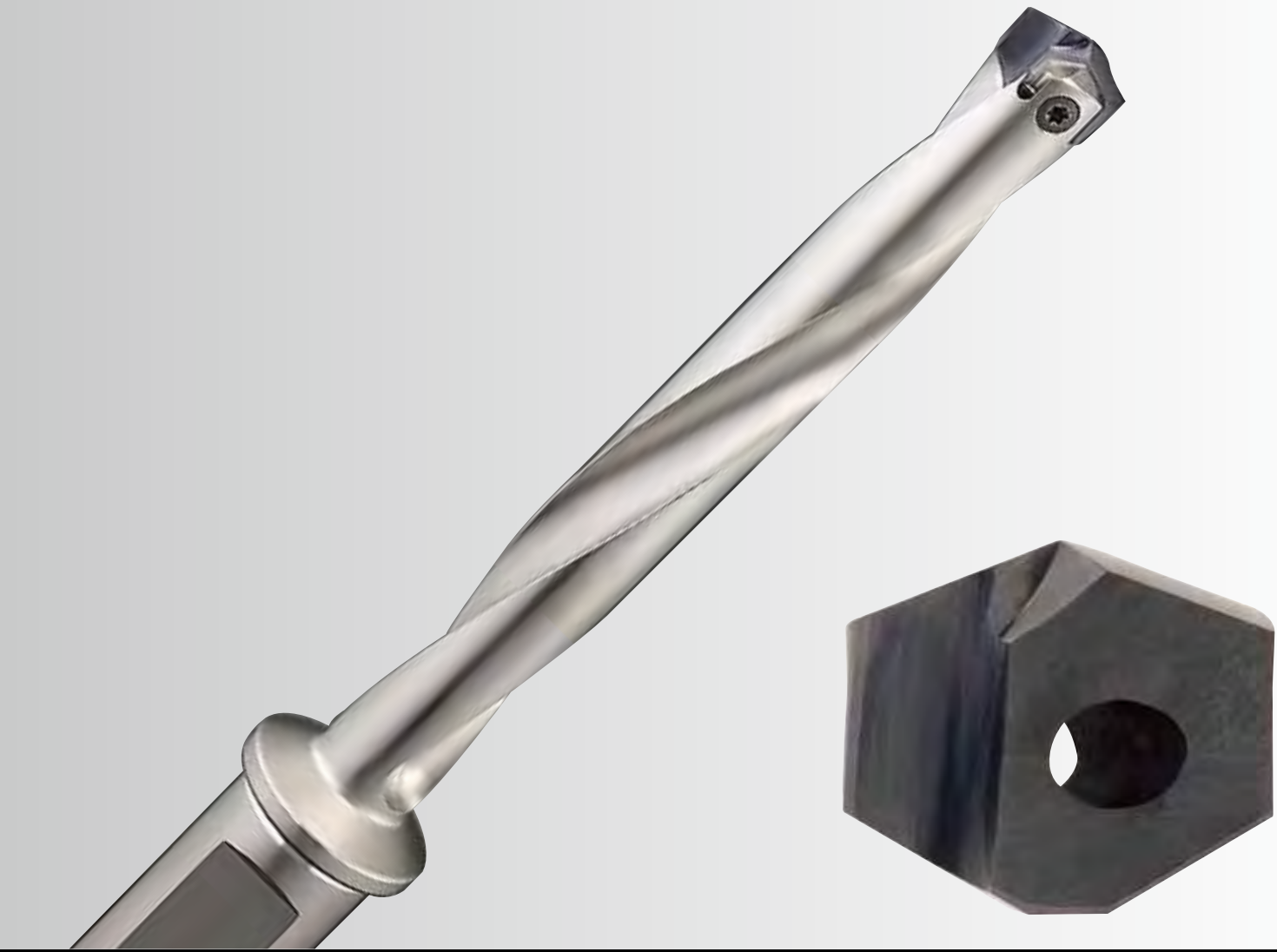
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | ○ | | |
| ◎ | ◎ | | | | ○ | | ○ | | ○ | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | ○ | ○ | | ○ |

Global Cutting Tool Leader **YG-1**



# CARBIDE INSERT

Being the best through innovation



# i-Dream Drills

- For Steels and Stainless Steel Alloys

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | PAGE |
|---|---|---|---|
| Y03A / Y03B |  | *i*-Dream Drills General | 44 |
| YI3A / YI3B | | *i*-Dream Drills INOX | 44 |
| Y03B / Y03C |  | *i*-Dream Drills General | 45 |
| YI3B / YI3C | | *i*-Dream Drills INOX | 45 |
| Y03C / Y03D |  | *i*-Dream Drills General | 46 |
| YI3C / YI3D | | *i*-Dream Drills INOX | 46 |
| Y03E / Y03F |  | *i*-Dream Drills General | 47 |
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| YI3I / YI3J | | *i*-Dream Drills INOX | 49 |
| | | RECOMMENDED CUTTING CONDITIONS | 50 |

## Comparison with Split Point Drill, Spade Drill & Dream Drill



◎ : Excellent ○ : Good

| P | | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys | |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |

# i-Dream Drills

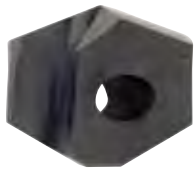
**Y03A / YI3A SERIES**
**Y03B / YI3B SERIES**

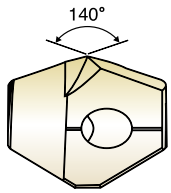
## i-DREAM DRILL INSERTS & HOLDERS

**- Features of *i-Dream Drill* Inserts**
- Secure and accurate seating resulting in accurate repeatability and concentricity.

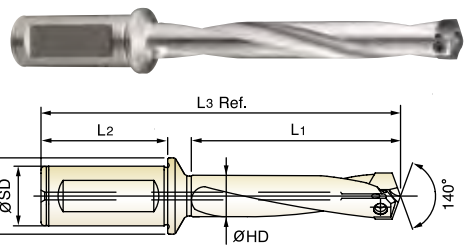
*i-Dream Drill* ***General***
- For most steel materials

*i-Dream Drill* ***INOX***
- For tough, ductile materials and stainless steels
- Light, sharp cutting edge
- Minimize cutting forces
- Reduce built-up edge






**- Features of *i-Dream Drill* Holders**
- Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
- High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| A Ø12.00 to Ø13.99 3.6mm Thick | Y03A01 | YI3A01 | .4724 | 12.00 | 3D<br>5D<br>7D | ZA0301<br>ZA0501<br>ZA0701 | .4528 | 3/4 | 2 | 1 | 1-27/64<br>2-23/64<br>3-5/16 | 4-29/64<br>5-13/32<br>6-11/32 | TA1213 |
| | Y03A02 | YI3A02 | .4764 | 12.10 | | | | | | | | | |
| | Y03A03 | YI3A03 | .4803 | 12.20 | | | | | | | | | |
| | Y03A04 | YI3A04 | .4844 | 31/64 | | | | | | | | | |
| | Y03A05 | YI3A05 | .4921 | 12.50 | 3D<br>5D<br>7D | ZA0302<br>ZA0502<br>ZA0702 | .4724 | 3/4 | 2 | 1 | 1-15/32<br>2-29/64<br>3-7/16 | 4-1/2<br>5-31/64<br>6-15/32 | |
| | Y03A06 | YI3A06 | .4961 | 12.60 | | | | | | | | | |
| | Y03A07 | YI3A07 | .5000 | 1/2 | | | | | | | | | |
| | Y03A08 | YI3A08 | .5039 | 12.80 | | | | | | | | | |
| | Y03A09 | YI3A09 | .5079 | 12.90 | | | | | | | | | |
| | Y03A10 | YI3A10 | .5118 | 13.00 | 3D<br>5D<br>7D | ZA0303<br>ZA0503<br>ZA0703 | .4921 | 3/4 | 2 | 1 | 1-17/32<br>2-9/16<br>3-37/64 | 4-37/64<br>5-19/32<br>6-5/8 | |
| | Y03A11 | YI3A11 | .5156 | 33/64 | | | | | | | | | |
| | Y03A12 | YI3A12 | .5197 | 13.20 | | | | | | | | | |
| | Y03A13 | YI3A13 | .5312 | 17/32 | | | | | | | | | |
| | Y03A14 | YI3A14 | .5315 | 13.50 | 3D<br>5D<br>7D | ZA0304<br>ZA0504<br>ZA0704 | .5118 | 3/4 | 2 | 1 | 1-19/32<br>2-21/32<br>3-23/32 | 4-39/64<br>5-43/64<br>6-47/64 | TA1314 |
| | Y03A15 | YI3A15 | .5354 | 13.60 | | | | | | | | | |
| | Y03A16 | YI3A16 | .5394 | 13.70 | | | | | | | | | |
| | Y03A17 | YI3A17 | .5433 | 13.80 | | | | | | | | | |
| | Y03A18 | YI3A18 | .5469 | 35/64 | | | | | | | | | |
| B Ø14.00 to Ø15.99 4mm Thick | Y03B01 | YI3B01 | .5512 | 14.00 | 3D<br>5D<br>7D | ZB0301<br>ZB0501<br>ZB0701 | .5315 | 3/4 | 2 | 1 | 1-21/32<br>2-3/4<br>3-55/64 | 4-23/32<br>5-13/16<br>6-59/64 | TB1415 |
| | Y03B02 | YI3B02 | .5551 | 14.10 | | | | | | | | | |
| | Y03B03 | YI3B03 | .5591 | 14.20 | | | | | | | | | |
| | Y03B04 | YI3B04 | .5625 | 9/16 | | | | | | | | | |
| | Y03B05 | YI3B05 | .5630 | 14.30 | | | | | | | | | |
| | Y03B06 | YI3B06 | .5669 | 14.40 | | | | | | | | | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ |

YG i-Dream Drills

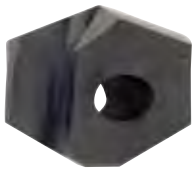
**Y03B / YI3B SERIES**
**Y03C / YI3C SERIES**

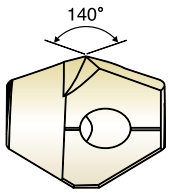
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**- Features of *i*-*Dream Drill* Inserts**
- Secure and accurate seating resulting in accurate repeatability and concentricity.

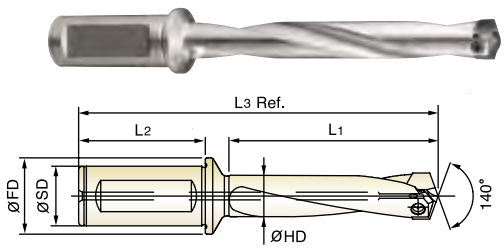
*i-Dream Drill* ***General***
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- For tough, ductile materials and stainless steels
- Light, sharp cutting edge
- Minimize cutting forces
- Reduce built-up edge






**- Features of *i*-*Dream Drill* Holders**
- Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
- High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| B Ø14.00 to Ø15.99 4mm Thick | Y03B07 | YI3B07 | .5709 | 14.50 | 3D | ZB0302 | .5512 | 3/4 | 2 | 1 | 1-23/32 | 4-51/64 | TB1415 |
| | Y03B08 | YI3B08 | .5748 | 14.60 | 5D | ZB0502 | | | | | 2-55/64 | 5-15/16 | |
| | Y03B09 | YI3B09 | .5781 | 37/64 | 7D | ZB0702 | | | | | 4 | 7-5/64 | |
| | Y03B10 | YI3B10 | .5827 | 14.80 | | | | | | | | | |
| | Y03B11 | YI3B11 | .5906 | 15.00 | 3D | ZB0303 | .5709 | 3/4 | 2 | 1 | 1-49/64 | 4-7/8 | TB1516 |
| | Y03B12 | YI3B12 | .5938 | 19/32 | 5D | ZB0503 | | | | | 2-61/64 | 6-3/64 | |
| | Y03B13 | YI3B13 | .5945 | 15.10 | 7D | ZB0703 | | | | | 4-9/64 | 7-15/64 | |
| | Y03B14 | YI3B14 | .5984 | 15.20 | | | | | | | | | |
| | Y03B15 | YI3B15 | .6024 | 15.30 | | | | | | | | | |
| | Y03B16 | YI3B16 | .6094 | 39/64 | | | | | | | | | |
| | Y03B17 | YI3B17 | .6102 | 15.50 | 3D | ZB0304 | .5906 | 3/4 | 2 | 1 | 1-53/64 | 4-29/32 | |
| | Y03B18 | YI3B18 | .6142 | 15.60 | 5D | ZB0504 | | | | | 3-3/64 | 6-1/8 | |
| | Y03B19 | YI3B19 | .6181 | 15.70 | 7D | ZB0704 | | | | | 4-17/64 | 7-11/32 | |
| | Y03B20 | YI3B20 | .6220 | 15.80 | | | | | | | | | |
| | Y03B21 | YI3B21 | .6250 | 5/8 | | | | | | | | | |
| C Ø16.00 to Ø17.99 4.5mm Thick | Y03C01 | YI3C01 | .6299 | 16.00 | 3D | ZC0301 | .6102 | 3/4 | 2 | 1 | 1-57/64 | 4-61/64 | TC1617 |
| | Y03C02 | YI3C02 | .6335 | 16.09 | 5D | ZC0501 | | | | | 3-5/32 | 6-7/32 | |
| | Y03C03 | YI3C03 | .6378 | 16.20 | 7D | ZC0701 | | | | | 4-13/32 | 7-15/32 | |
| | Y03C04 | YI3C04 | .6406 | 41/64 | | | | | | | | | |
| | Y03C05 | YI3C05 | .6417 | 16.30 | | | | | | | | | |
| | Y03C06 | YI3C06 | .6496 | 16.50 | 3D | ZC0302 | .6299 | 3/4 | 2 | 1 | 1-61/64 | 5-1/32 | |
| | Y03C07 | YI3C07 | .6562 | 21/32 | 5D | ZC0502 | | | | | 3-1/4 | 6-21/64 | |
| | Y03C08 | YI3C08 | .6614 | 16.80 | 7D | ZC0702 | | | | | 4-35/64 | 7-5/8 | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys | |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 | |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ | |

# i-Dream Drills

**Y03C / YI3C SERIES**
**Y03D / YI3D SERIES**

## i-DREAM DRILL INSERTS & HOLDERS

**- Features of *i-Dream Drill* Inserts**

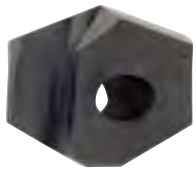
▶ Secure and accurate seating resulting in accurate repeatability and concentricity.

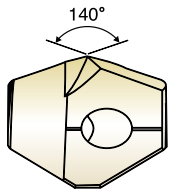
*i-Dream Drill* ***General***

▶ For most steel materials

*i-Dream Drill* ***INOX***

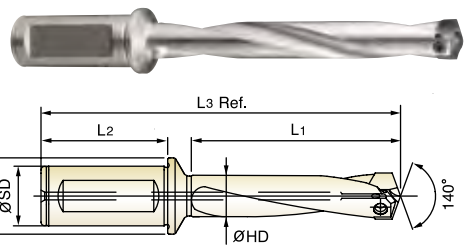
▶ For tough, ductile materials and stainless steels
▶ Light, sharp cutting edge
▶ Minimize cutting forces
▶ Reduce built-up edge






**- Features of *i-Dream Drill* Holders**

▶ Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
▶ Innovative surface treatment that improves wear resistance and reduces corrosion.
▶ High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| C Ø16.00 to Ø17.99 4.5mm Thick | Y03C09 | YI3C09 | .6693 | 17.00 | 3D | ZC0303 | .6496 | 3/4 | 2 | 1 | 2-1/64 | 5-5/64 | TC1718 |
| | Y03C10 | YI3C10 | .6919 | 43/64 | 5D | ZC0503 | | | | | 3-11/32 | 6-13/32 | |
| | Y03C11 | YI3C11 | .6875 | 11/16 | 7D | ZC0703 | | | | | 4-11/16 | 7-3/4 | |
| | Y03C12 | YI3C12 | .6890 | 17.50 | 3D | ZC0304 | .6693 | 3/4 | 2 | 1 | 2-1/16 | 5-5/32 | |
| | Y03C13 | YI3C13 | .7008 | 17.80 | 5D | ZC0504 | | | | | 3-7/16 | 6-17/32 | |
| | Y03C14 | YI3C14 | .7031 | 45/64 | 7D | ZC0704 | | | | | 4-53/64 | 7-29/32 | |
| D Ø18.00 to Ø19.99 5mm Thick | Y03D01 | YI3D01 | .7087 | 18.00 | 3D | ZD0301 | .6890 | 1 | 2-3/16 | 1-1/4 | 2-1/8 | 5-1/2 | TD1819 |
| | Y03D02 | YI3D02 | .7188 | 23/32 | 5D | ZD0501 | | | | | 3-35/64 | 6-59/64 | |
| | | | | | 7D | ZD0701 | | | | | 4-61/64 | 8-11/32 | |
| | Y03D03 | YI3D03 | .7283 | 18.50 | 3D | ZD0302 | .7087 | 1 | 2-3/16 | 1-1/4 | 2-3/16 | 5-35/64 | |
| | Y03D04 | YI3D04 | .7344 | 47/64 | 5D | ZD0502 | | | | | 3-41/64 | 7 | |
| | Y03D05 | YI3D05 | .7402 | 18.80 | 7D | ZD0702 | | | | | 5-3/32 | 8-29/64 | |
| | Y03D06 | YI3D06 | .7480 | 19.00 | 3D | ZD0303 | .7283 | 1 | 2-3/16 | 1-1/4 | 2-1/4 | 5-43/64 | TD1920 |
| | Y03D07 | YI3D07 | .7500 | 3/4 | 5D | ZD0503 | | | | | 3-47/64 | 7-5/32 | |
| | Y03D08 | YI3D08 | .7587 | 19.27 | 7D | ZD0703 | | | | | 5-15/64 | 8-21/32 | |
| | Y03D09 | YI3D09 | .7656 | 49/64 | | | | | | | | | |
| | Y03D10 | YI3D10 | .7677 | 19.50 | 3D | ZD0304 | .7480 | 1 | 2-3/16 | 1-1/4 | 2-19/64 | 5-45/64 | |
| | Y03D11 | YI3D11 | .7795 | 19.80 | 5D | ZD0504 | | | | | 3-27/32 | 7-15/64 | |
| | Y03D12 | YI3D12 | .7812 | 25/32 | 7D | ZD0704 | | | | | 5-3/8 | 8-25/32 | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ |

YG *i*-Dream Drills

**Y03E / YI3E SERIES**
**Y03F / YI3F SERIES**

# i-DREAM DRILL INSERTS & HOLDERS

**- Features of *i*-*Dream Drill* Inserts**

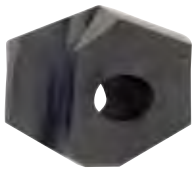
▶ Secure and accurate seating resulting in accurate repeatability and concentricity.

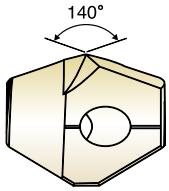
*i-Dream Drill* ***General***

▶ For most steel materials

*i-Dream Drill* ***INOX***

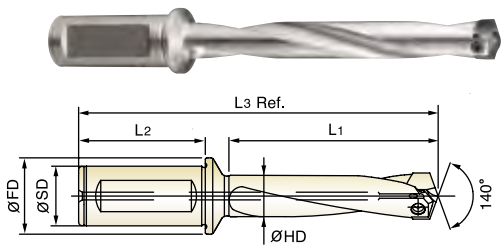
▶ For tough, ductile materials and stainless steels
▶ Light, sharp cutting edge
▶ Minimize cutting forces
▶ Reduce built-up edge






**- Features of *i*-*Dream Drill* Holders**

▶ Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
▶ Innovative surface treatment that improves wear resistance and reduces corrosion.
▶ High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| | Y03E01 | YI3E01 | .7874 | 20.00 | 3D | ZE0301 | | | | | 2-23/64 | 5-23/32 | |
| | | | | | 5D | ZE0501 | .7638 | 1 | 2-3/16 | 1-1/4 | 3-15/16 | 7-9/32 | |
| | Y03E02 | YI3E02 | .7969 | 51/64 | 7D | ZE0701 | | | | | 5-33/64 | 8-55/64 | |
| **E** | Y03E03 | YI3E03 | .8071 | 20.50 | 3D | ZE0302 | | | | | 2-27/64 | 5-51/64 | TE2021 |
| | Y03E04 | YI3E04 | .8125 | 13/16 | 5D | ZE0502 | .7835 | 1 | 2-3/16 | 1-1/4 | 4-1/32 | 7-13/32 | |
| Ø20.00 to Ø21.99 | Y03E05 | YI3E05 | .8150 | 20.70 | 7D | ZE0702 | | | | | 5-21/32 | 9-1/64 | |
| | Y03E06 | YI3E06 | .8268 | 21.00 | 3D | ZE0303 | | | | | 2-31/64 | 5-7/8 | |
| | Y03E07 | YI3E07 | .8281 | 53/64 | 5D | ZE0503 | .8031 | 1 | 2-3/16 | 1-1/4 | 4-9/64 | 7-33/64 | |
| 5.5mm Thick | Y03E08 | YI3E08 | .8438 | 27/32 | 7D | ZE0703 | | | | | 5-25/32 | 9-11/64 | TE2122 |
| | Y03E09 | YI3E09 | .8465 | 21.50 | 3D | ZE0304 | | | | | 2-35/64 | 5-29/32 | |
| | Y03E10 | YI3E10 | .8543 | 21.70 | 5D | ZE0504 | .8228 | 1 | 2-3/16 | 1-1/4 | 4-15/64 | 7-19/32 | |
| | Y03E11 | YI3E11 | .8594 | 55/64 | 7D | ZE0704 | | | | | 5-59/64 | 9-19/64 | |
| | Y03F01 | YI3F01 | .8661 | 22.00 | 3D | ZF0301 | | | | | 2-19/32 | 5-63/64 | |
| | | | | | 5D | ZF0501 | .8425 | 1 | 2-3/16 | 1-1/4 | 4-21/64 | 7-23/32 | |
| | Y03F02 | YI3F02 | .8750 | 7/8 | 7D | ZF0701 | | | | | 6-1/16 | 9-29/64 | TF2223 |
| **F** | Y03F03 | YI3F03 | .8858 | 22.50 | 3D | ZF0302 | | | | | 2-21/32 | 6-1/32 | |
| | Y03F04 | YI3F04 | .8906 | 57/64 | 5D | ZF0502 | .8622 | 1 | 2-3/16 | 1-1/4 | 4-27/64 | 7-51/64 | |
| Ø22.00 to Ø23.99 | Y03F05 | YI3F05 | .8937 | 22.70 | 7D | ZF0702 | | | | | 6-13/64 | 9-9/16 | |
| | Y03F06 | YI3F06 | .9055 | 23.00 | 3D | ZF0303 | | | | | 2-23/32 | 6-7/64 | |
| | Y03F07 | YI3F07 | .9062 | 29/32 | 5D | ZF0503 | .8819 | 1 | 2-3/16 | 1-1/4 | 4-17/32 | 7-29/32 | |
| 6mm Thick | Y03F08 | YI3F08 | .9219 | 59/64 | 7D | ZF0703 | | | | | 6-11/32 | 9-23/32 | TF2324 |
| | Y03F09 | YI3F09 | .9252 | 23.50 | 3D | ZF0304 | | | | | 2-25/32 | 6-3/16 | |
| | Y03F10 | YI3F10 | .9331 | 23.70 | 5D | ZF0504 | .9016 | 1 | 2-3/16 | 1-1/4 | 4-5/8 | 8-1/32 | |
| | Y03F11 | YI3F11 | .9375 | 15/16 | 7D | ZF0704 | | | | | 6-15/32 | 9-7/8 | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ |

# i-Dream Drills

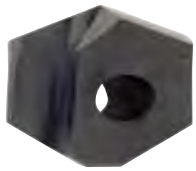
**Y03G / YI3G SERIES**
**Y03H / YI3H SERIES**

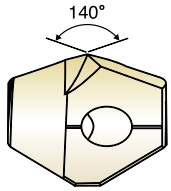
## i-DREAM DRILL INSERTS & HOLDERS

**- Features of *i-Dream Drill* Inserts**
- Secure and accurate seating resulting in accurate repeatability and concentricity.

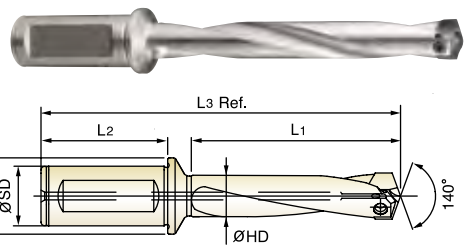
*i-Dream Drill* ***General***
- For most steel materials

*i-Dream Drill* ***INOX***
- For tough, ductile materials and stainless steels
- Light, sharp cutting edge
- Minimize cutting forces
- Reduce built-up edge






**- Features of *i-Dream Drill* Holders**
- Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
- High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| G Ø24.00 to Ø25.99 6.5mm Thick | Y03G01 | YI3G01 | .9449 | 24.00 | 3D | ZG0301 | .9213 | 1-1/4 | 2-3/8 | 1-15/32 | 2-53/64 | 6-1/2 | TG2425 |
| | | | | | 5D | ZG0501 | | | | | 4-23/32 | 8-25/64 | |
| | Y03G02 | YI3G02 | .9531 | 61/64 | 7D | ZG0701 | | | | | 6-39/64 | 10-9/32 | |
| | Y03G03 | YI3G03 | .9646 | 24.50 | 3D | ZG0302 | .9409 | 1-1/4 | 2-3/8 | 1-15/32 | 2-57/64 | 6-17/32 | |
| | Y03G04 | YI3G04 | .9688 | 31/32 | 5D | ZG0502 | | | | | 4-53/64 | 8-15/32 | |
| | Y03G05 | YI3G05 | .9724 | 24.70 | 7D | ZG0702 | | | | | 6-3/4 | 10-25/64 | |
| | Y03G06 | YI3G06 | .9843 | 63/64 | 3D | ZG0303 | .9606 | 1-1/4 | 2-3/8 | 1-15/32 | 2-61/64 | 6-39/64 | TG2526 |
| | Y03G07 | YI3G07 | 1.0000 | 1 | 5D | ZG0503 | | | | | 4-59/64 | 8-37/64 | |
| | | | | | 7D | ZG0703 | | | | | 6-57/64 | 10-35/64 | |
| | Y03G08 | YI3G08 | 1.0039 | 25.50 | 3D | ZG0304 | .9803 | 1-1/4 | 2-3/8 | 1-15/32 | 3-1/64 | 6-47/64 | |
| | Y03G09 | YI3G09 | 1.0106 | 25.67 | 5D | ZG0504 | | | | | 5-1/64 | 8-47/64 | |
| | Y03G10 | YI3G10 | 1.0118 | 25.70 | 7D | ZG0704 | | | | | 7-1/32 | 10-3/4 | |
| | Y03G11 | YI3G11 | 1.0156 | 1-1/64 | | | | | | | | | |
| H Ø26.00 to Ø27.99 7.1mm Thick | Y03H01 | YI3H01 | 1.0236 | 26.00 | 3D | ZH0301 | 1.0000 | 1-1/4 | 2-3/8 | 1-15/32 | 3-5/64 | 6-3/4 | TH2627 |
| | | | | | 5D | ZH0501 | | | | | 5-1/8 | 8-51/64 | |
| | Y03H02 | YI3H02 | 1.0312 | 1-1/32 | 7D | ZH0701 | | | | | 7-11/64 | 10-27/32 | |
| | Y03H03 | YI3H03 | 1.0433 | 26.50 | 3D | ZH0302 | 1.0197 | 1-1/4 | 2-3/8 | 1-15/32 | 3-1/8 | 6-51/64 | |
| | Y03H04 | YI3H04 | 1.0469 | 1-3/64 | 5D | ZH0502 | | | | | 5- 7/32 | 8-7/8 | |
| | Y03H05 | YI3H05 | 1.0625 | 1-1/16 | 7D | ZH0702 | | | | | 7-19/64 | 10-31/32 | |
| | Y03H06 | YI3H06 | 1.0630 | 27.00 | 3D | ZH0303 | 1.0394 | 1-1/4 | 2-3/8 | 1-15/32 | 3-3/16 | 6-7/8 | TH2728 |
| | | | | | 5D | ZH0503 | | | | | 5-5/16 | 9 | |
| | | | | | 7D | ZH0703 | | | | | 7-7/16 | 11-1/8 | |
| | Y03H07 | YI3H07 | 1.0827 | 27.50 | 3D | ZH0304 | 1.0591 | 1-1/4 | 2-3/8 | 1-15/32 | 3-1/4 | 6-29/32 | |
| | Y03H08 | YI3H08 | 1.0938 | 1-3/32 | 5D | ZH0504 | | | | | 5-13/32 | 9-5/64 | |
| | | | | | 7D | ZH0704 | | | | | 7-37/64 | 11-15/64 | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ |

YG i-Dream Drills

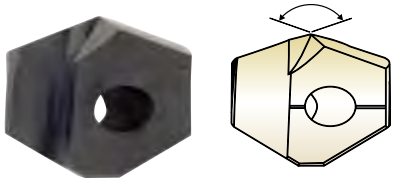
**Y03I / YI3I SERIES**
**Y03J / YI3J SERIES**

# i-DREAM DRILL INSERTS & HOLDERS

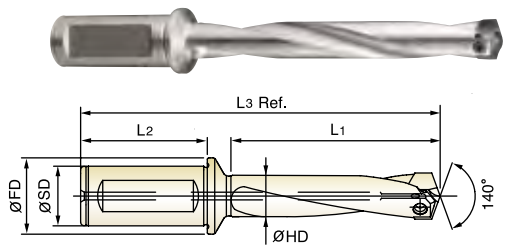
**- Features of *i-Dream Drill* Inserts**
- Secure and accurate seating resulting in accurate repeatability and concentricity.

*i-Dream Drill* ***General***
- For most steel materials

*i-Dream Drill* ***INOX***
- For tough, ductile materials and stainless steels
- Light, sharp cutting edge
- Minimize cutting forces
- Reduce built-up edge




**- Features of *i-Dream Drill* Holders**
- Special Alloy Steels that maintains its hardness and toughness under high temperatures with generous coolant holes for effective coolant flow.
- Innovative surface treatment that improves wear resistance and reduces corrosion.
- High Performance flute design allowing maximum chip evacuation and minimum interference.




cutting conditions : p.50~51

Unit : Inch

| Series Range | Insert EDP No. | | Insert O.D. | | Length | Holder EDP No. | Diameter | Shank Dia. | Shank Length | Flange Dia. | Drilling Depth | Overall Length | Torx Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TiAlN | TiCN | h7 | | | | | | | | | | |
| (mm) | General | INOX | dec. | inch / mm | | | HD | SD | L2 | FD | L1 | L3 Ref. | |
| I Ø28.00 to Ø29.99 7.7mm Thick | Y03I01 | YI3I01 | 1.1024 | 28.00 | 3D | ZI0301 | 1.0748 | 1-1/4 | 2-3/8 | 1-15/32 | 3-5/16 | 7 | TI2829 |
| | | | | | 5D | ZI0501 | | | | | 5-33/64 | 9-15/64 | |
| | Y03I02 | YI3I02 | 1.1094 | 1-7/64 | 7D | ZI0701 | | | | | 7-23/32 | 11-7/16 | |
| | Y03I03 | YI3I03 | 1.1220 | 28.50 | 3D | ZI0302 | 1.0945 | 1-1/4 | 2-3/8 | 1-15/32 | 3-23/64 | 7-1/16 | |
| | | | | | 5D | ZI0502 | | | | | 5-39/64 | 9-5/16 | |
| | Y03I04 | YI3I04 | 1.1250 | 1-1/8 | 7D | ZI0702 | | | | | 7-55/64 | 11-9/16 | |
| | Y03I05 | YI3I05 | 1.1417 | 29.00 | 3D | ZI0303 | 1.1142 | 1-1/4 | 2-3/8 | 1-15/32 | 3-27/64 | 7-3/16 | TI2930 |
| | | | | | 5D | ZI0503 | | | | | 5-45/64 | 9-15/32 | |
| | Y03I06 | YI3I06 | 1.1562 | 1-5/32 | 7D | ZI0703 | | | | | 7-63/64 | 11-3/4 | |
| | Y03I07 | YI3I07 | 1.1614 | 29.50 | 3D | ZI0304 | 1.1339 | 1-1/4 | 2-3/8 | 1-15/32 | 3-31/64 | 7-7/32 | |
| | | | | | 5D | ZI0504 | | | | | 5-13/16 | 9-35/64 | |
| | Y03I08 | YI3I08 | 1.1719 | 1-11/64 | 7D | ZI0704 | | | | | 8-1/8 | 11-7/8 | |
| J Ø30.00 to Ø31.99 8mm Thick | Y03J01 | YI3J01 | 1.1811 | 30.00 | 3D | ZJ0301 | 1.1535 | 1-1/4 | 2-3/8 | 1-15/32 | 3-35/64 | 7-21/64 | TJ2831 |
| | | | | | 5D | ZJ0501 | | | | | 5-29/32 | 9-45/64 | |
| | Y03J02 | YI3J02 | 1.1875 | 1-3/16 | 7D | ZJ0701 | | | | | 8-17/64 | 12-1/16 | |
| | Y03J03 | YI3J03 | 1.2008 | 30.50 | 3D | ZJ0302 | 1.1732 | 1-1/4 | 2-3/8 | 1-15/32 | 3-39/64 | 7-3/8 | |
| | Y03J04 | YI3J04 | 1.2031 | 1-11/64 | 5D | ZJ0502 | | | | | 6 | 9-25/32 | |
| | Y03J05 | YI3J05 | 1.2188 | 1-7/32 | 7D | ZJ0702 | | | | | 8-13/32 | 12-11/64 | |
| | Y03J06 | YI3J06 | 1.2205 | 31.00 | 3D | ZJ0303 | 1.1929 | 1-1/4 | 2-3/8 | 1-15/32 | 3-21/32 | 7-13/32 | TJ3132 |
| | | | | | 5D | ZJ0503 | | | | | 6-7/64 | 9-55/64 | |
| | | | | | 7D | ZJ0703 | | | | | 8-35/64 | 12-19/64 | |
| | Y03J07 | YI3J07 | 1.2402 | 31.50 | 3D | ZJ0304 | 1.2126 | 1-1/4 | 2-3/8 | 1-15/32 | 3-23/32 | 7-17/32 | |
| | | | | | 5D | ZJ0504 | | | | | 6-13/64 | 10-1/64 | |
| | Y03J08 | YI3J08 | 1.2500 | 1-1/4 | 7D | ZJ0704 | | | | | 8-11/16 | 12-31/64 | |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| Y03 * | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | ◎ | ◎ | | |
| YI3 * | ○ | ○ | | ○ | | | | ○ | | ○ | | ◎ | | | ○ | ○ |

# INCH

| ISO | Material | | | Tensile Strength | Hardness | | Cutting Speed | Feed [IPR] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MPa | HB | HRc | Vc [SFM] | Ø31/64 ~Ø37/64 | Ø19/32 ~Ø45/64 | Ø23/32 ~Ø55/64 | Ø7/8 ~Ø1-1/16 | Ø1-3/32 ~Ø1-1/4 |
| P | Non-alloyed steels, Cast steels Free-machining steels | 1213, 13L13, 1215, 12L14, 1118 etc | YG3□ / YI3□ | ~500 | 100~150 | | 312~394 | .006~.011 | .008~.014 | .011~.016 | .013~.020 | .015~.022 |
| | | | | 500~850 | 150~250 | ~24 | 262~344 | .006~.009 | .008~.014 | .011~.016 | .013~.020 | .015~.022 |
| | Low-alloyed steels, Cast steels (<5%) Carbon steels | 1015, 1020, 1140, 1025, 1035, 1050, 1045, 1055 etc | | ~450 | 85~125 | | 295~377 | .006~.010 | .008~.013 | .010~.015 | .012~.019 | .013~.020 |
| | | | | 450~755 | 125~225 | ~19 | 230~295 | .005~.008 | .007~.011 | .009~.013 | .012~.018 | .013~.019 |
| | | | | 755~900 | 225~265 | 19~27 | 197~262 | .005~.008 | .007~.011 | .009~.013 | .012~.018 | .013~.019 |
| | | | | 900~1200 | 265~350 | 27~37 | 180~230 | .004~.006 | .006~.010 | .008~.012 | .010~.015 | .011~.017 |
| | Alloyed steels | 8620, 4130, 4137, 4140, 6150 etc | | ~600 | 125~175 | ~7 | 262~328 | .006~.009 | .007~.011 | .009~.013 | .012~.018 | .013~.020 |
| | | | | 600~800 | 175~235 | 7~22 | 230~295 | .005~.008 | .007~.011 | .009~.013 | .012~.018 | .013~.020 |
| | | | | 800~950 | 235~280 | 22~29 | 197~262 | .005~.008 | .006~.010 | .009~.013 | .012~.018 | .013~.020 |
| | | | | 950~1110 | 280~330 | 29~35 | 180~230 | .004~.006 | .005~.008 | .008~.012 | .010~.015 | .011~.017 |
| | | | | 1110~1230 | 330~360 | 35~39 | 148~197 | .003~.005 | .005~.008 | .008~.012 | .010~.015 | .011~.017 |
| | High-alloyed steels | A355, 9840, 4340 etc | | 600~1020 | 225~300 | 19~32 | 148~197 | .005~.008 | .006~.010 | .008~.012 | .008~.012 | .009~.014 |
| | | | | 1020~1200 | 300~355 | 32~38 | 131~180 | .004~.006 | .004~.007 | .008~.012 | .008~.012 | .009~.014 |
| | | | | 1200~1330 | 355~390 | 38~42 | 131~164 | .003~.005 | .004~.006 | .007~.010 | .007~.011 | .009~.013 |
| | Structural steels | A36, A516, A182 etc | | 350~500 | 100~150 | | 246~312 | .006~.009 | .008~.014 | .011~.015 | .011~.017 | .013~.019 |
| | | | | 500~850 | 150~250 | ~24 | 197~246 | .005~.008 | .008~.013 | .009~.013 | .010~.015 | .011~.017 |
| | | | | 850~1200 | 250~355 | 24~38 | 164~213 | .004~.006 | .007~.011 | .008~.012 | .008~.013 | .010~.015 |
| | Tool steels | H13, H21, A2, S1 etc | | 500~705 | 150~210 | ~16 | 164~213 | .004~.006 | .005~.008 | .007~.010 | .008~.012 | .009~.014 |
| | | | | 705~950 | 210~280 | 16~29 | 131~164 | .004~.006 | .005~.008 | .007~.010 | .008~.012 | .009~.014 |
| M | Stainless steels | Austenitic and Austenitic/ferritic | | 450~610 | 135~185 | ~9 | 145~197 | .004~.006 | .005~.007 | .006~.008 | .006~.011 | .007~.011 |
| | | | | 610~930 | 185~275 | 9~28 | 89~145 | .003~.005 | .004~.006 | .004~.006 | .005~.008 | .006~.009 |
| K | Grey cast iron | Pearlitic, Ferritic | | 500~700 | 150~210 | ~16 | 328~410 | .006~.010 | .008~.015 | .011~.017 | .014~.020 | .016~.022 |
| | | Pearlitic | | 700~850 | 210~250 | 16~24 | 246~312 | .004~.008 | .006~.011 | .008~.012 | .010~.014 | .011~.016 |
| | Cast iron nodular | Ferritic | | 540 | 165 | 4 | 312~394 | .005~.009 | .007~.012 | .008~.013 | .011~.016 | .013~.017 |
| | | Pearlitic | | 850 | 250 | 24 | 246~312 | .004~.008 | .006~.010 | .007~.011 | .010~.014 | .011~.016 |
| | Malleable cast iron | Ferritic | | 450 | 125 | | 328~410 | .005~.009 | .007~.012 | .008~.013 | .011~.016 | .013~.017 |
| | | Pearlitic | | 780 | 230 | 21 | 246~312 | .004~.007 | .006~.010 | .007~.011 | .010~.014 | .011~.016 |
| N | Aluminum alloys (Wrought) | not heat treatable | | | 65 | | 820~1083 | .0118~.0157 | .0138~.0177 | .0157~.0197 | .0177~.0217 | .0197~.0236 |
| | | hardened | | | 150 | | 656~820 | .0118~.0157 | .0138~.0177 | .0157~.0197 | .0177~.0217 | .0197~.0236 |
| | Aluminum alloys (Cast) | ≤12% Si, not heat treatable | | | 75 | | 656~820 | .0098~.0138 | .0118~.0157 | .0138~.0177 | .0157~.0197 | .0177~.0217 |
| | | ≤12% Si, hardened | | | 90 | | 492~722 | .0098~.0138 | .0118~.0157 | .0138~.0177 | .0157~.0197 | .0177~.0217 |
| | | >12% Si, not heat treatable | | | 130 | | 328~656 | .0079~.0118 | .0098~.0138 | .0118~.0157 | .0138~.0177 | .0157~.0197 |
| | Copper alloys | Free machining (Pb>1%) | | | 110 | | 377~476 | .006~.011 | .009~.014 | .011~.014 | .015~.018 | .016~.019 |
| | | Brass | | | 90 | | 476~607 | .007~.011 | .009~.015 | .012~.015 | .015~.018 | .017~.019 |
| | | Electrolitic copper | | | 100 | | 312~394 | .002~.004 | .004~.005 | .004~.005 | .006~.007 | .007~.009 |
| | Non ferrous material | Duroplastics | | | | | | | | | | |
| | | Fiber plastics | | | | | | | | | | |
| | | Hard rubber | | | | | | | | | | |

RPM = revolution per minute (rev/min)
SFM = surface feet per minute (ft/min)
DIA. = diameter of drill (inch)
IPR = feed rate (inch/rev)
IPM = inch per minute penetration rate

*Formulas:

$$SFM = \frac{(RPM) \cdot \pi \cdot (DIA.)}{12}$$

$$IPM = (RPM) \cdot (IPR)$$

$$RPM = \frac{(SFM) \cdot 12}{(\pi) \cdot (DIA.)}$$

▶ The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
▶ Recommend you to reduce the feed rate to 85%, 70% when you use 5xD, 7xD holders.
▶ For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140° point angle to min. 2/3 cutting diameter.
The use of the centering pre-hole improves hole location, roundness and surface finish.

# METRIC

| ISO | Material | | | Tensile Strength | Hardness | | Cutting Speed | Feed [ mm/rev] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | [N/mm²] | HB | HRc | Vc [M/min] | Ø12.00 ~Ø14.99 | Ø15.00 ~Ø17.99 | Ø18.00 ~Ø21.99 | Ø22.00 ~Ø26.99 | Ø27.00 ~Ø31.99 |
| P | Non-alloyed steels, Cast steels Free-machining steels | 9SMn28, 9SMnPb28, 10SPb20 etc | YG03□ / YI3□ | ~500 | 100~150 | | 95~120 | 0.16~0.28 | 0.21~0.35 | 0.27~0.40 | 0.34~0.52 | 0.37~0.55 |
| | | | | 500~850 | 150~250 | ~24 | 80~105 | 0.14~0.24 | 0.21~0.35 | 0.27~0.40 | 0.34~0.52 | 0.37~0.55 |
| | Low-alloyed steels, Cast steels (<5%) Carbon steels | C15, C22, 20Mn5, Ck45, C45 etc | | ~450 | 85~125 | | 90~115 | 0.14~0.25 | 0.20~0.33 | 0.25~0.39 | 0.31~0.47 | 0.34~0.50 |
| | | | | 450~755 | 125~225 | ~19 | 70~90 | 0.12~0.20 | 0.17~0.28 | 0.22~0.32 | 0.30~0.46 | 0.33~0.49 |
| | | | | 755~900 | 225~265 | 19~27 | 60~80 | 0.12~0.20 | 0.17~0.28 | 0.22~0.32 | 0.30~0.46 | 0.33~0.49 |
| | | | | 900~1200 | 265~350 | 27~37 | 55~70 | 0.10~0.16 | 0.15~0.25 | 0.21~0.30 | 0.25~0.38 | 0.29~0.43 |
| | Alloyed steels | 45CrMo4, 42CrMo4, 16MnCr5, Ck75, 35CrMo4, 16MnCr5 etc | | ~600 | 125~175 | ~7 | 80~100 | 0.14~0.24 | 0.17~0.28 | 0.22~0.32 | 0.30~0.46 | 0.34~0.50 |
| | | | | 600~800 | 175~235 | 7~22 | 70~90 | 0.12~0.20 | 0.17~0.28 | 0.22~0.32 | 0.30~0.46 | 0.34~0.50 |
| | | | | 800~950 | 235~280 | 22~29 | 60~80 | 0.12~0.20 | 0.15~0.25 | 0.22~0.32 | 0.30~0.46 | 0.34~0.50 |
| | | | | 950~1110 | 280~330 | 29~35 | 55~70 | 0.10~0.16 | 0.13~0.21 | 0.21~0.30 | 0.25~0.38 | 0.29~0.43 |
| | | | | 1110~1230 | 330~360 | 35~39 | 45~60 | 0.08~0.12 | 0.13~0.21 | 0.21~0.30 | 0.25~0.38 | 0.29~0.43 |
| | High-alloyed steels | 36CrNiMo4, 41CrAlMo7 etc | | 600~1020 | 225~300 | 19~32 | 45~60 | 0.12~0.20 | 0.15~0.25 | 0.21~0.30 | 0.20~0.31 | 0.24~0.35 |
| | | | | 1020~1200 | 300~355 | 32~38 | 40~55 | 0.10~0.16 | 0.11~0.18 | 0.21~0.30 | 0.20~0.31 | 0.24~0.35 |
| | | | | 1200~1330 | 355~390 | 38~42 | 40~50 | 0.08~0.12 | 0.09~0.14 | 0.18~0.26 | 0.19~0.29 | 0.23~0.34 |
| | Structural steels | St33, St37-2, St44-2, St52, St60 etc | | 350~500 | 100~150 | | 75~95 | 0.14~0.24 | 0.21~0.35 | 0.27~0.39 | 0.29~0.44 | 0.32~0.47 |
| | | | | 500~850 | 150~250 | ~24 | 60~75 | 0.12~0.20 | 0.20~0.33 | 0.22~0.32 | 0.25~0.38 | 0.29~0.43 |
| | | | | 850~1200 | 250~355 | 24~38 | 50~65 | 0.10~0.16 | 0.17~0.28 | 0.21~0.30 | 0.21~0.32 | 0.26~0.38 |
| | Tool steels | 102Cr6, 105WCr6, C75W etc | | 500~705 | 150~210 | ~16 | 50~65 | 0.10~0.16 | 0.13~0.21 | 0.18~0.26 | 0.20~0.31 | 0.24~0.35 |
| | | | | 705~950 | 210~280 | 16~29 | 40~50 | 0.10~0.16 | 0.13~0.21 | 0.18~0.26 | 0.20~0.31 | 0.24~0.35 |
| M | Stainless steels | Austenitic and Austenitic/Ferritic | | 450~610 | 135~185 | ~9 | 45~60 | 0.10~0.16 | 0.12~0.18 | 0.14~0.20 | 0.15~0.26 | 0.18~0.28 |
| | | | | 610~930 | 185~275 | 9~28 | 30~45 | 0.08~0.14 | 0.09~0.15 | 0.10~0.16 | 0.12~0.20 | 0.14~0.22 |
| K | Grey cast iron | Pearlitic,Ferritic A48-76, 20B, 25B, 30B etc | | 500~700 | 150~210 | ~16 | 100~125 | 0.15~0.26 | 0.20~0.37 | 0.27~0.42 | 0.36~0.51 | 0.40~0.55 |
| | | Pearlitic A48-35B, 40B, 50B, 60B etc | | 700~850 | 210~250 | 16~24 | 75~95 | 0.11~0.20 | 0.16~0.29 | 0.20~0.30 | 0.25~0.35 | 0.29~0.40 |
| | Cast iron nodular | Ferritic 60-40-18, 80-55-06 etc | | 540 | 165 | 4 | 95~120 | 0.13~0.22 | 0.17~0.31 | 0.21~0.32 | 0.28~0.40 | 0.32~0.44 |
| | | Pearlitic 100-70-03 etc | | 850 | 250 | 24 | 75~95 | 0.11~0.20 | 0.14~0.26 | 0.19~0.29 | 0.25~0.35 | 0.29~0.40 |
| | Malleable cast iron | Ferritic A48-74, A220-76, 32510 etc | | 450 | 125 | | 100~125 | 0.13~0.22 | 0.17~0.31 | 0.21~0.32 | 0.28~0.40 | 0.32~0.44 |
| | | Pearlitic 50005, 70003 etc | | 780 | 230 | 21 | 75~95 | 0.11~0.18 | 0.14~0.26 | 0.19~0.29 | 0.25~0.35 | 0.29~0.40 |
| N | Aluminum alloys (Wrought) | not heat treatable | | | 65 | | 250~330 | 0.30~0.40 | 0.35~0.45 | 0.40~0.50 | 0.45~0.55 | 0.50~0.60 |
| | | hardened | | | 150 | | 200~250 | 0.30~0.40 | 0.35~0.45 | 0.40~0.50 | 0.45~0.55 | 0.50~0.60 |
| | Aluminum alloys (Cast) | ≤12% Si, not heat treatable | | | 75 | | 200~50 | 0.25~0.35 | 0.30~0.40 | 0.35~0.45 | 0.40~0.50 | 0.45~0.55 |
| | | ≤12% Si, hardened | | | 90 | | 150~220 | 0.25~0.35 | 0.30~0.40 | 0.35~0.45 | 0.40~0.50 | 0.45~0.55 |
| | | >12% Si, not heat treatable | | | 130 | | 100~200 | 0.20~0.30 | 0.25~0.35 | 0.30~0.40 | 0.35~0.45 | 0.40~0.50 |
| | Copper alloys | Free machining (Pb>1%) | | | 110 | | 115~145 | 0.16~0.28 | 0.23~0.36 | 0.29~0.36 | 0.37~0.45 | 0.41~0.48 |
| | | Brass | | | 90 | | 145~185 | 0.17~0.29 | 0.24~0.37 | 0.30~0.38 | 0.38~0.46 | 0.42~0.49 |
| | | Electrolitic copper | | | 100 | | 95~120 | 0.06~0.09 | 0.09~0.13 | 0.11~0.13 | 0.15~0.18 | 0.19~0.22 |
| | Non ferrous material | Duroplastics | | | | | | | | | | |
| | | Fiber plastics | | | | | | | | | | |
| | | Hard rubber | | | | | | | | | | |

RPM = revolution per minute (rev/min)
M/min = surface meter per minute (M/min)
DIA. = diameter of drill (mm)
mm/rev = feed rate (mm/rev)

*Formulas :

$$\text{M/min} = \frac{(\text{RPM}) \cdot \pi \cdot (\text{DIA.})}{1000}$$

$$\text{mm/min} = (\text{RPM}) \cdot (\text{mm/rev})$$

$$\text{RPM} = \frac{(\text{M/min}) \cdot 1000}{(\pi) \cdot (\text{DIA.})}$$

- The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.
  Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.
- Recommend you to reduce the feed rate to 85%, 70% when you use 5xD, 7xD holders.
- For use of 7xD holder, we recommend to drill a centering pre-hole with equal to or larger than 140° point angle to min. 2/3 cutting diameter.
  The use of the centering pre-hole improves hole location, roundness and surface finish.

## Assembly of *i*-Dream Drills





Make sure to clean the insert and insert seat.



Slide the drill insert into the slot of the holder and press down the insert to touch the bottom of the slot.



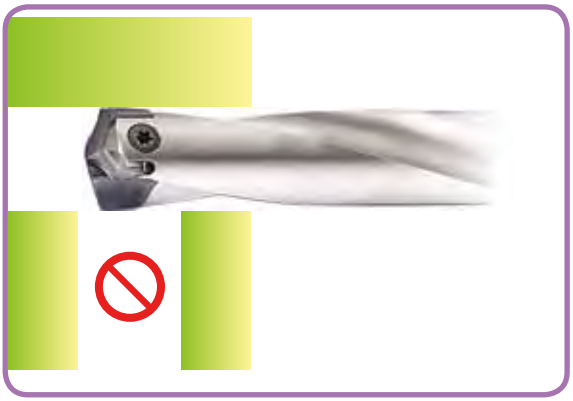
After confirming the insert is pressed down to the bottom of the slot, tighten the screw using anti-seize compound.

| WRENCH TYPE | PRODUCT No. | T-HANDLE No. | SERIES |
|---|---|---|---|
| WING TYPE  | TWWT08 | — | A |
| | | | B |
| | | | C |
| TORX BIT TYPE  | TWBT15 | TWH600  | D |
| | TWBT20 | | E, F, G |
| | TWBT25 | | H, I, J |

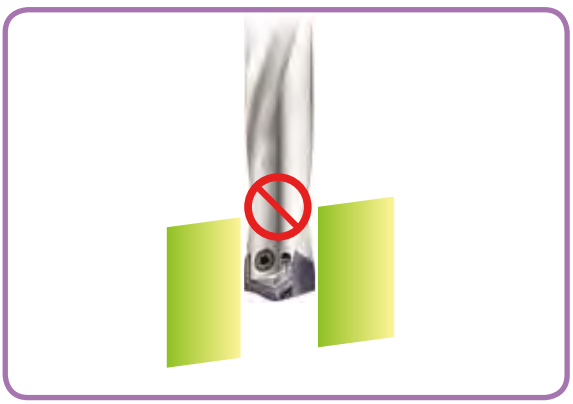
Use the wing type or T-type wrench.

- ▶ Need to use appropriate wrenches and screws as indicated.
- ▶ It's important to tighten up the screw properly.

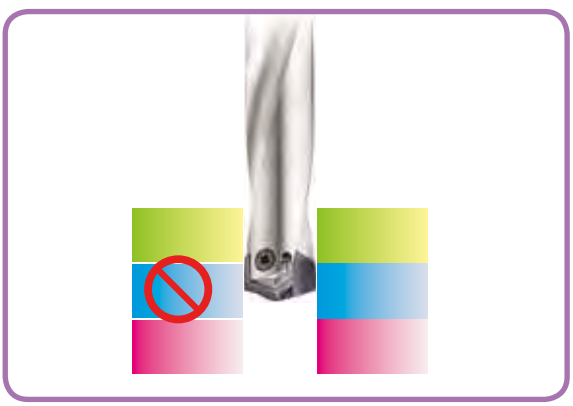
## CAUTION-NOT RECOMMENDABLE APPLICATION



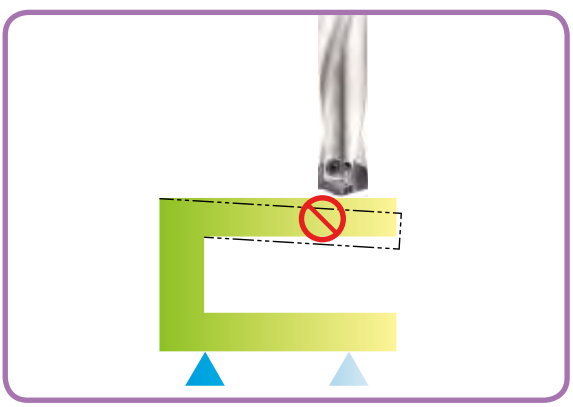
**Intersecting cross hole is bigger than the drill insert's Margin Length.**



**Material with slanting entrance and exit over 7 degree. (If drilling 7 degree or under slanting surface, reduce the feed about 30-50 %)**

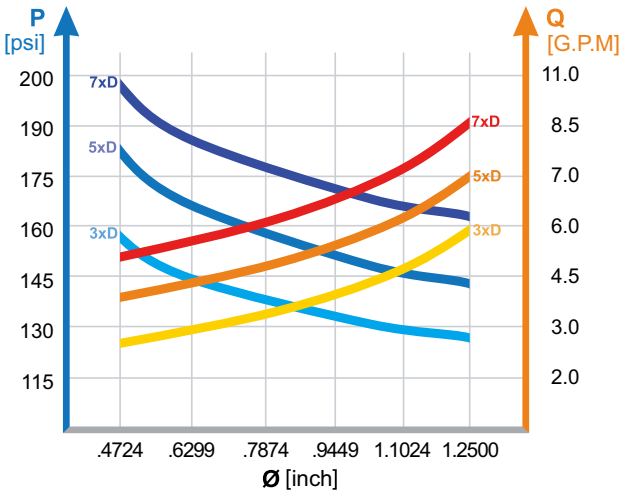


**For drilling stacked plates, minimize the space between the plates.**
**The space stacked plates can cause insert breakage or poor chip control.**



**The material needs to be fixtured securely before drilling.**

## RECOMMENDED COOLANT PRESSURE AND FLOW RATE ON VERTICAL DRILLING




- Recommended emulsion mix is 6% - 8%.
- For Drilling in Stainless and High Strength steels, a mix of 10% is recommended.
- For horizontal drilling, 30% reduction on the coolant pressure and flow rate is possible.
- Dry drilling is possible for 1-2xD drilling. But not recommended.

## TROUBLE SHOOTING



**1) Heavy flank wear / Fast flank wear**
- Reduce cutting speed
- Increase feed



**2) Chipping on cutting edge**
- Reduce feed
- Check the rigidity of spindle and chuck
- Rigid clamping of workpiece



**3) Build up on cutting edge**
- Increase cutting speed
- Use a coated insert



**4) Chipping or break down on outer corner**
- Reduce feed
- Rigid clamping of workpiece



**5) Wear of land margin**
- Rigid clamping of workpiece
- Reduce cutting speed
- Increase coolant flow



**6) Unsatisfactory positioning of the hole**
- Rigid clamping of workpiece
- Reduce feed during entrance or exit



**7) Scratching on holder**
- Rigid clamping of workpiece
- Reduce feed
- Increase coolant flow



**8) Unsatisfactory surface finish**
- Rigid clamping of workpiece
- Increase coolant flow and pressure

# CARBIDE

Being the best through innovation



# DREAM DRILLS -GENERAL

- WITH & WITHOUT COOLANT HOLES
  General Purpose 30Rc to 50Rc Alloys

# SELECTION GUIDE

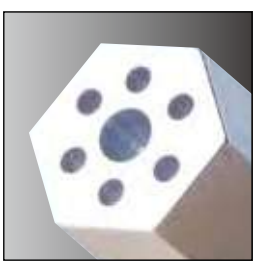
## SOLID CARBIDE DREAM DRILLS-GENERAL (with & without Coolant Holes)

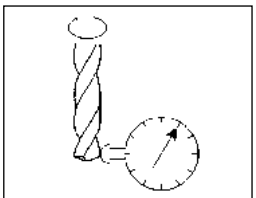
General Purpose HRc30 to HRc50 Alloys

| | MODEL | | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|---|
| **INCH** | | | | | | | |
| 3XD | **DH414** |  | CARBIDE, DREAM DRILLS without COOLANT HOLES | *STUB* | D1/8 | D5/8 | **58** |
| 5XD | **DH722** |  | CARBIDE, DREAM DRILLS without COOLANT HOLES | *LONG* | D13/64 | D1/2 | **59** |
| 3XD | **DH416 DH711** |  | CARBIDE, DREAM DRILLS with COOLANT HOLES | *SHORT* | D1/8 | D5/6 | **60** |
| 5XD | **DH418 DH712** |  | CARBIDE, DREAM DRILLS with COOLANT HOLES | *LONG* | D13/64 | D1/2 | **62** |
| **METRIC** | | | | | | | |
| 3XD | **DH404** |  | CARBIDE, DREAM DRILLS without COOLANT HOLES | *STUB* | D3.0 | D20.0 | **63** |
| 3XD | **DH423** |  | CARBIDE, DREAM DRILLS without COOLANT HOLES | *SHORT* | D3.0 | D20.0 | **65** |
| 5XD | **DH424** |  | CARBIDE, DREAM DRILLS without COOLANT HOLES | *LONG* | D1.0 | D20.0 | **68** |
| 5XD | **DH406** |  | CARBIDE, DREAM DRILLS with COOLANT HOLES | *SHORT* | D3.0 | D20.0 | **71** |
| 5XD | **DH408** |  | CARBIDE, DREAM DRILLS with COOLANT HOLES | *LONG* | D1.0 | D20.0 | **74** |
| 8XD | **DH421** |  | CARBIDE, DREAM DRILLS with COOLANT HOLES | *EXTRA LONG* | D3.0 | D14.0 | **77** |
| | | | RECOMMENDED CUTTING CONDITIONS | | | | **80** |

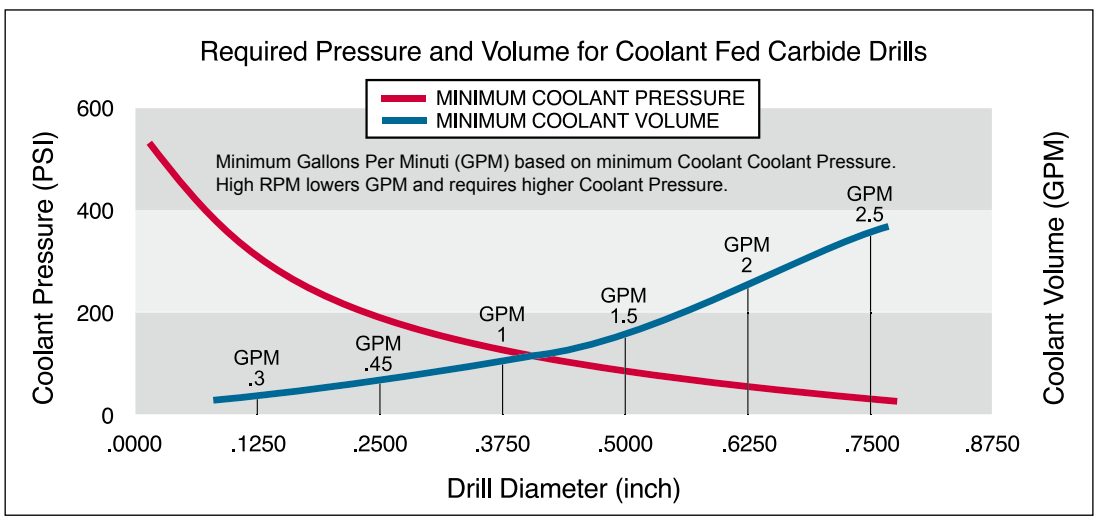
◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |
| ○ | ◎ | ◎ | | | ○ | ○ | | | | | |





• Radial run out at cutting lip must not exceed .001



# DREAM DRILLS -GENERAL

**DH414 SERIES**

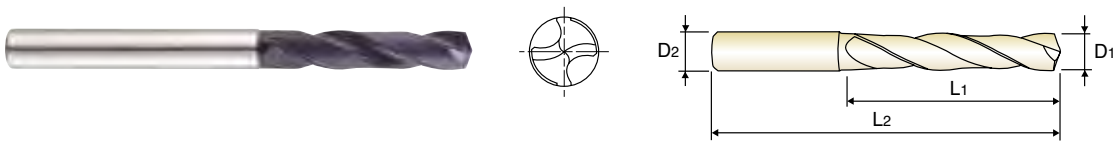
## CARBIDE, DREAM DRILLS without COOLANT HOLES

***STUB***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005




MG | h6 | 140° | P.80

$D_1 = D_2$
3 × D

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length | EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| | Fractional | Decimal | | | | Fractional | Decimal | | |
| TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| **0081ATF** | **1/8** | **.1250** | 45/64 | 1-59/64 | **0221ATF** | **11/32** | **.3438** | 2-3/16 | 3-7/8 |
| **0091ATF** | **9/64** | **.1406** | 25/32 | 2-3/64 | **0231ATF** | **23/64** | **.3594** | 2-9/32 | 4 |
| **0101ATF** | **5/32** | **.1562** | 7/8 | 2-3/16 | **2211ATF** | **U** | **.3680** | 2-9/32 | 4 |
| **0111ATF** | **11/64** | **.1719** | 15/16 | 2-9/32 | **0241ATF** | **3/8** | **.3750** | 2-3/8 | 4-1/8 |
| **0121ATF** | **3/16** | **.1875** | 1 | 2-7/16 | **0251ATF** | **25/64** | **.3906** | 2-3/8 | 4-1/8 |
| **0131ATF** | **13/64** | **.2031** | 1 | 2-7/16 | **0261ATF** | **13/32** | **.4062** | 2-5/8 | 4-13/32 |
| **0141ATF** | **7/32** | **.2188** | 1-1/8 | 2-5/8 | **0271ATF** | **27/64** | **.4219** | 2-11/16 | 4-1/2 |
| **0151ATF** | **15/64** | **.2344** | 1-1/8 | 2-5/8 | **0281ATF** | **7/16** | **.4375** | 2-13/16 | 4-5/8 |
| **0161ATF** | **1/4** | **.2500** | 1-5/8 | 3-3/16 | **0291ATF** | **29/64** | **.4531** | 2-7/8 | 4-3/4 |
| **2061ATF** | **F** | **.2570** | 1-11/16 | 3-17/64 | **0301ATF** | **15/32** | **.4688** | 2-7/8 | 4-3/4 |
| **0171ATF** | **17/64** | **.2656** | 1-11/16 | 3-17/64 | **0311ATF** | **31/64** | **.4844** | 3 | 5-5/16 |
| **2091ATF** | **I** | **.2720** | 1-11/16 | 3-17/64 | **0321ATF** | **1/2** | **.5000** | 3-1/16 | 5-3/8 |
| **0181ATF** | **9/32** | **.2812** | 1-3/4 | 3-7/16 | **0331ATF** | **33/64** | **.5156** | 3-11/32 | 5-11/16 |
| **0191ATF** | **19/64** | **.2969** | 1-7/8 | 3-9/16 | **0341ATF** | **17/32** | **.5312** | 3-11/32 | 5-11/16 |
| **0201ATF** | **5/16** | **.3125** | 1-7/8 | 3-9/16 | **0361ATF** | **9/16** | **.5625** | 3-1/2 | 5-15/16 |
| **0211ATF** | **21/64** | **.3281** | 2-1/16 | 3-3/4 | **0371ATF** | **37/64** | **.5781** | 3-37/64 | 6 |
| **2171ATF** | **Q** | **.3320** | 2-1/16 | 3-3/4 | **0401ATF** | **5/8** | **.6250** | 3-25/3 | 6-19/64 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH722 SERIES**

## CARBIDE, DREAM DRILLS without COOLANT HOLES

***LONG***

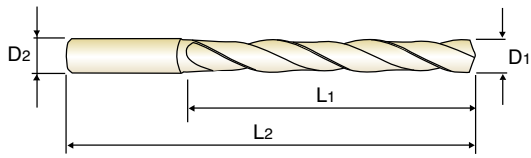
▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








MG | h6 | 140° | P.80

5 × D

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH722013 | 13/64 | .2031 | 1/4 | 1-3/4 | 3-15/16 |
| DH722014 | 7/32 | .2188 | 1/4 | 1-57/64 | 3-15/16 |
| DH722015 | 15/64 | .2344 | 1/4 | 1-57/64 | 3-15/16 |
| DH722016 | 1/4 | .2500 | 1/4 | 2-3/64 | 4-19/64 |
| DH722206 | F | .2570 | 5/16 | 2-13/64 | 4-19/64 |
| DH722017 | 17/64 | .2656 | 5/16 | 2-13/64 | 4-19/64 |
| DH722209 | I | .2720 | 5/16 | 2-13/64 | 4-19/64 |
| DH722018 | 9/32 | .2812 | 5/16 | 2-23/64 | 4-41/64 |
| DH722019 | 19/64 | .2969 | 5/16 | 2-33/64 | 4-41/64 |
| DH722020 | 5/16 | .3125 | 5/16 | 2-33/64 | 4-41/64 |
| DH722021 | 21/64 | .3281 | 3/8 | 2-43/64 | 5 |
| DH722217 | Q | .3320 | 3/8 | 2-43/64 | 5 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decim al | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH722022 | 11/32 | .3438 | 3/8 | 2-27/32 | 5 |
| DH722023 | 23/64 | .3594 | 3/8 | 3 | 5-23/64 |
| DH722221 | U | .3680 | 3/8 | 3 | 5-23/64 |
| DH722024 | 3/8 | .3750 | 3/8 | 3-5/32 | 5-23/64 |
| DH722025 | 25/64 | .3906 | 7/16 | 3-5/32 | 5-23/64 |
| DH722026 | 13/32 | .4062 | 7/16 | 3-5/16 | 5-7/8 |
| DH722027 | 27/64 | .4219 | 7/16 | 3-15/32 | 5-7/8 |
| DH722028 | 7/16 | .4375 | 7/16 | 3-5/8 | 6-7/32 |
| DH722029 | 29/64 | .4531 | 1/2 | 3-25/32 | 6-7/32 |
| DH722030 | 15/32 | .4688 | 1/2 | 3-25/32 | 6-7/32 |
| DH722031 | 31/64 | .4844 | 1/2 | 3-15/16 | 6-37/64 |
| DH722032 | 1/2 | .5000 | 1/2 | 4-3/32 | 6-37/64 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH416, DH711 SERIES**

## CARBIDE, DREAM DRILLS with COOLANT HOLES

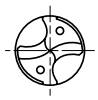
***SHORT***

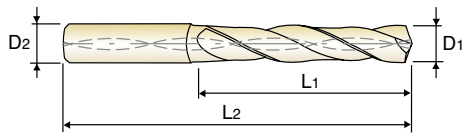
▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic

▶ **Advantage** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ØD1: See page 57, Shank Tolerance ØD2: -.0001 -.0005








MG | h6 | 140° | 20 bar P.80

3 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH711008 | 1/8 | .1250 | 3/16 | 1.102 | 2.992 |
| 0081BTF | 1/8 | .1250 | 15/64 | 1.102 | 2.992 |
| DH711011 | 11/64 | .1719 | 3/16 | 1.417 | 3.386 |
| 0111BTF | 11/64 | .1719 | 15/64 | 1.417 | 3.386 |
| DH711012 | 3/16 | .1875 | 3/16 | 1.575 | 3.543 |
| 0121BTF | 3/16 | .1875 | 15/64 | 1.575 | 3.543 |
| 0131BTF | 13/64 | .2031 | 15/64 | 1.082 | 3.228 |
| DH711013 | 13/64 | .2031 | 1/4 | 1.082 | 3.228 |
| 0141BTF | 7/32 | .2188 | 15/64 | 1.181 | 3.228 |
| DH711014 | 7/32 | .2188 | 1/4 | 1.181 | 3.228 |
| 0151BTF | 15/64 | .2344 | 15/64 | 1.181 | 3.228 |
| DH711015 | 15/64 | .2344 | 1/4 | 1.181 | 3.228 |
| DH711016 | 1/4 | .2500 | 1/4 | 1.279 | 3.465 |
| 0161BTF | 1/4 | .2500 | 17/64 | 1.279 | 3.465 |
| 2061BTF | F | .2570 | 17/64 | 1.279 | 3.465 |
| DH711206 | F | .2570 | 5/16 | 1.279 | 3.465 |
| 0171BTF | 17/64 | .2656 | 17/64 | 1.378 | 3.465 |
| DH711017 | 17/64 | .2656 | 5/16 | 1.378 | 3.465 |
| 2091BTF | I | .2720 | .2720 | 1.378 | 3.465 |
| DH711209 | I | .2720 | 5/16 | 1.378 | 3.465 |
| 0181BTF | 9/32 | .2812 | 5/16 | 1.476 | 3.701 |
| 0191BTF | 19/64 | .2969 | 5/16 | 1.476 | 3.701 |
| 0201BTF | 5/16 | .3125 | 5/16 | 1.575 | 3.701 |
| 0211BTF | 21/64 | .3281 | 11/32 | 1.673 | 3.937 |
| DH711021 | 21/64 | .3281 | 3/8 | 1.673 | 3.937 |
| 2171BTF | Q | .3320 | 11/32 | 1.673 | 3.937 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH711217 | Q | .3320 | 3/8 | 1.673 | 3.937 |
| 0221BTF | 11/32 | .3438 | 11/32 | 1.772 | 3.937 |
| DH711022 | 11/32 | .3438 | 3/8 | 1.772 | 3.937 |
| DH711023 | 23/64 | .3594 | 3/8 | 1.87 | 4.174 |
| 0231BTF | 23/64 | .3594 | 25/64 | 1.870 | 4.174 |
| DH711221 | U | .3680 | 3/8 | 1.87 | 4.174 |
| 2211BTF | U | .3680 | 25/64 | 1.870 | 4.174 |
| DH711024 | 3/8 | .3750 | 3/8 | 1.969 | 4.174 |
| 0241BTF | 3/8 | .3750 | 25/64 | 1.969 | 4.174 |
| 0251BTF | 25/64 | .3906 | 25/64 | 1.969 | 4.174 |
| DH711025 | 25/64 | .3906 | 7/16 | 1.969 | 4.174 |
| 0261BTF | 13/32 | .4062 | 27/64 | 2.067 | 4.567 |
| DH711026 | 13/32 | .4062 | 7/16 | 2.067 | 4.567 |
| 0271BTF | 27/64 | .4219 | 27/64 | 2.165 | 4.567 |
| DH711027 | 27/64 | .4219 | 7/16 | 2.165 | 4.567 |
| DH711028 | 7/16 | .4375 | 7/16 | 2.264 | 4.803 |
| 0281BTF | 7/16 | .4375 | 15/32 | 2.264 | 4.803 |
| 0291BTF | 29/64 | .4531 | 15/32 | 2.264 | 4.803 |
| DH711029 | 29/64 | .4531 | 1/2 | 2.264 | 4.803 |
| 0301BTF | 15/32 | .4688 | 15/32 | 2.362 | 4.803 |
| DH711030 | 15/32 | .4688 | 1/2 | 2.362 | 4.803 |
| 0311BTF | 31/64 | .4844 | 1/2 | 2.461 | 5.039 |
| 0321BTF | 1/2 | .5000 | 1/2 | 2.559 | 5.039 |
| 0331BTF | 33/64 | .5156 | 35/64 | 2.657 | 5.276 |
| DH711033 | 33/64 | .5156 | 9/16 | 2.657 | 5.276 |
| 0341BTF | 17/32 | .5312 | 35/64 | 2.756 | 5.276 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# CARBIDE, DREAM DRILLS with COOLANT HOLES

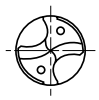
***SHORT***

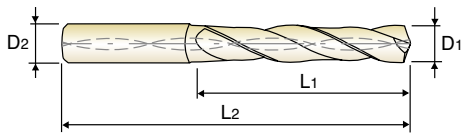
▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic

▶ **Advantage** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling

▶ **Tolerance** : Dia. Tolerance ØD1: See page 57, Shank Tolerance ØD2: -.0001 -.0005











P.80

3 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Fractional | Decimal | | | | | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 | TiAlN | D1 | | D2 | L1 | L2 |
| **DH711034** | **17/32** | **.5312** | 9/16 | 2.756 | 5.276 | **0371BTF** | **37/64** | **.5781** | 37/64 | 2.953 | 5.512 |
| **0351BTF** | **35/64** | **.5469** | 35/64 | 2.756 | 5.276 | **DH711037** | **37/64** | **.5781** | 5/8 | 2.953 | 5.512 |
| **DH711035** | **35/64** | **.5469** | 9/16 | 2.756 | 5.276 | **0381BTF** | **19/32** | **.5937** | 5/8 | 3.051 | 5.709 |
| **DH711036** | **9/16** | **.5625** | 9/16 | 2.854 | 5.512 | **0391BTF** | **39/64** | **.6094** | 5/8 | 3.051 | 5.709 |
| **0361BTF** | **9/16** | **.5625** | 37/64 | 2.854 | 5.512 | **0401BTF** | **5/8** | **.6250** | 5/8 | 3.150 | 5.709 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# YG DREAM DRILLS -GENERAL

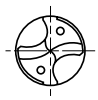
**DH418, DH712 SERIES**

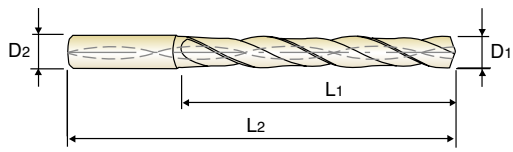
## CARBIDE, DREAM DRILLS with COOLANT HOLES

***LONG***

- **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic
- **Advantage** : Self centering - center drilling is not required
  Excellent positioning - bushing is not necessary
  Special Design - reaming is not required
  - good chip removal
  - powerful drilling
- **Tolerance** : Dia. Tolerance ØD1: See page 57, Shank Tolerance ØD2: -.0001 -.0005








MG | h6 | 140° | 20 bar P.80

5 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| 0131CTF | 13/64 | .2031 | 15/64 | 1-3/4 | 3-15/16 |
| DH712013 | 13/64 | .2031 | 1/4 | 1-3/4 | 3-15/16 |
| 0141CTF | 7/32 | .2188 | 15/64 | 1-57/64 | 3-15/16 |
| DH712014 | 7/32 | .2188 | 1/4 | 1-57/64 | 3-15/16 |
| 0151CTF | 15/64 | .2344 | 15/64 | 1-57/64 | 3-15/16 |
| DH712015 | 15/64 | .2344 | 1/4 | 1-57/64 | 3-15/16 |
| DH712016 | 1/4 | .2500 | 1/4 | 2-3/64 | 4-19/64 |
| 0161CTF | 1/4 | .2500 | 17/64 | 2-3/64 | 4-19/64 |
| 2061CTF | F | .2570 | 17/64 | 2-13/64 | 4-19/64 |
| DH712206 | F | .2570 | 5/16 | 2-13/64 | 4-19/64 |
| 0171CTF | 17/64 | .2656 | 17/64 | 2-13/64 | 4-19/64 |
| DH712017 | 17/64 | .2656 | 5/16 | 2-13/64 | 4-19/64 |
| 2091CTF | I | .2720 | .2720 | 2-13/64 | 4-19/64 |
| DH712209 | I | .2720 | 5/16 | 2-13/64 | 4-19/64 |
| 0181CTF | 9/32 | .2812 | 5/16 | 2-23/64 | 4-41/64 |
| 0191CTF | 19/64 | .2969 | 5/16 | 2-33/64 | 4-41/64 |
| 0201CTF | 5/16 | .3125 | 5/16 | 2-33/64 | 4-41/64 |
| 0211CTF | 21/64 | .3281 | 11/32 | 2-43/64 | 5 |
| DH712021 | 21/64 | .3281 | 3/8 | 2-43/64 | 5 |
| 2171CTF | Q | .3320 | 11/32 | 2-43/64 | 5 |
| DH712217 | Q | .3320 | 3/8 | 2-43/64 | 5 |
| 0221CTF | 11/32 | .3438 | 11/32 | 2-27/32 | 5 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH712022 | 11/32 | .3438 | 3/8 | 2-27/32 | 5 |
| DH712023 | 23/64 | .3594 | 3/8 | 3 | 5-23/64 |
| 0231CTF | 23/64 | .3594 | 25/64 | 3 | 5-23/64 |
| DH712221 | U | .3680 | 3/8 | 3 | 5-23/64 |
| 2211CTF | U | .3680 | 25/64 | 3 | 5-23/64 |
| DH712024 | 3/8 | .3750 | 3/8 | 3-5/32 | 5-23/64 |
| 0241CTF | 3/8 | .3750 | 25/64 | 3-5/32 | 5-23/64 |
| 0251CTF | 25/64 | .3906 | 25/64 | 3-5/32 | 5-23/64 |
| DH712025 | 25/64 | .3906 | 7/16 | 3-5/32 | 5-23/64 |
| 0261CTF | 13/32 | .4062 | 27/64 | 3-5/16 | 5-7/8 |
| DH712026 | 13/32 | .4062 | 7/16 | 3-5/16 | 5-7/8 |
| 0271CTF | 27/64 | .4219 | 27/64 | 3-15/32 | 5-7/8 |
| DH712027 | 27/64 | .4219 | 7/16 | 3-15/32 | 5-7/8 |
| DH712028 | 7/16 | .4375 | 7/16 | 3-5/8 | 6-7/32 |
| 0281CTF | 7/16 | .4375 | 15/32 | 3-5/8 | 6-7/32 |
| 0291CTF | 29/64 | .4531 | 15/32 | 3-25/32 | 6-7/32 |
| DH712029 | 29/64 | .4531 | 1/2 | 3-25/32 | 6-7/32 |
| 0301CTF | 15/32 | .4688 | 15/32 | 3-25/32 | 6-7/32 |
| DH712030 | 15/32 | .4688 | 1/2 | 3-25/32 | 6-7/32 |
| 0311CTF | 31/64 | .4844 | 1/2 | 3-15/16 | 6-37/64 |
| 0321CTF | 1/2 | .5000 | 1/2 | 4-3/32 | 6-37/64 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

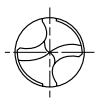
# CARBIDE, DREAM DRILLS without COOLANT HOLES

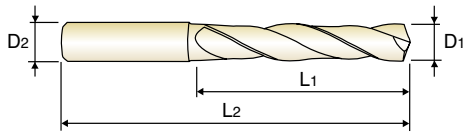
**STUB**

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6539 | MG | h6 | h7 | 140° | P.81

$D_1 = D_2$

3 × D

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Fractional | Decimal | | |
| TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| DH404030 | 3.0 | .1181 | 16 | 46 |
| DH404031 | 3.1 | .1220 | 18 | 49 |
| DH404032 | 3.2 | .1260 | 18 | 49 |
| DH404033 | 3.3 | .1299 | 18 | 49 |
| DH404034 | 3.4 | .1339 | 20 | 52 |
| DH404035 | 3.5 | .1378 | 20 | 52 |
| DH404036 | 3.6 | .1417 | 20 | 52 |
| DH404037 | 3.7 | .1457 | 20 | 52 |
| DH404038 | 3.8 | .1496 | 22 | 55 |
| DH404039 | 3.9 | .1535 | 22 | 55 |
| DH404040 | 4.0 | .1575 | 22 | 55 |
| DH404041 | 4.1 | .1614 | 22 | 55 |
| DH404042 | 4.2 | .1654 | 22 | 55 |
| DH404043 | 4.3 | .1693 | 24 | 58 |
| DH404044 | 4.4 | .1732 | 24 | 58 |
| DH404045 | 4.5 | .1772 | 24 | 58 |
| DH404046 | 4.6 | .1811 | 24 | 58 |
| DH404047 | 4.7 | .1850 | 24 | 58 |
| DH404048 | 4.8 | .1890 | 26 | 62 |
| DH404049 | 4.9 | .1929 | 26 | 62 |
| DH404050 | 5.0 | .1969 | 26 | 62 |
| DH404051 | 5.1 | .2008 | 26 | 62 |
| DH404052 | 5.2 | .2047 | 26 | 62 |
| DH404053 | 5.3 | .2087 | 26 | 62 |
| DH404054 | 5.4 | .2126 | 28 | 66 |
| DH404055 | 5.5 | .2165 | 28 | 66 |
| DH404056 | 5.6 | .2205 | 28 | 66 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| DH404057 | 5.7 | .2244 | 28 | 66 |
| DH404058 | 5.8 | .2283 | 28 | 66 |
| DH404059 | 5.9 | .2323 | 28 | 66 |
| DH404060 | 6.0 | .2362 | 28 | 66 |
| DH404061 | 6.1 | .2402 | 31 | 70 |
| DH404062 | 6.2 | .2441 | 31 | 70 |
| DH404063 | 6.3 | .2480 | 31 | 70 |
| DH404064 | 6.4 | .2520 | 31 | 70 |
| DH404065 | 6.5 | .2559 | 31 | 70 |
| DH404066 | 6.6 | .2598 | 31 | 70 |
| DH404067 | 6.7 | .2638 | 31 | 70 |
| DH404068 | 6.8 | .2677 | 34 | 74 |
| DH404069 | 6.9 | .2717 | 34 | 74 |
| DH404070 | 7.0 | .2756 | 34 | 74 |
| DH404071 | 7.1 | .2795 | 34 | 74 |
| DH404072 | 7.2 | .2835 | 34 | 74 |
| DH404073 | 7.3 | .2874 | 34 | 74 |
| DH404074 | 7.4 | .2913 | 34 | 74 |
| DH404075 | 7.5 | .2953 | 34 | 74 |
| DH404076 | 7.6 | .2992 | 37 | 79 |
| DH404077 | 7.7 | .3031 | 37 | 79 |
| DH404078 | 7.8 | .3071 | 37 | 79 |
| DH404079 | 7.9 | .3110 | 37 | 79 |
| DH404080 | 8.0 | .3150 | 37 | 79 |
| DH404081 | 8.1 | .3189 | 37 | 79 |
| DH404082 | 8.2 | .3228 | 37 | 79 |
| DH404083 | 8.3 | .3268 | 37 | 79 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium | |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# YG DREAM DRILLS -GENERAL

**DH404 SERIES**

## CARBIDE, DREAM DRILLS without COOLANT HOLES

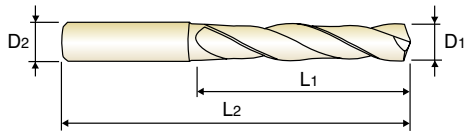
***STUB***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6539 | MG | h6 | h7 | 140° | P.81

$D_1 = D_2$
3 × D

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| DH404084 | 8.4 | .3307 | 37 | 79 |
| DH404085 | 8.5 | .3346 | 37 | 79 |
| DH404086 | 8.6 | .3386 | 40 | 84 |
| DH404087 | 8.7 | .3425 | 40 | 84 |
| DH404088 | 8.8 | .3465 | 40 | 84 |
| DH404089 | 8.9 | .3504 | 40 | 84 |
| DH404090 | 9.0 | .3543 | 40 | 84 |
| DH404091 | 9.1 | .3583 | 40 | 84 |
| DH404092 | 9.2 | .3622 | 40 | 84 |
| DH404093 | 9.3 | .3661 | 40 | 84 |
| DH404094 | 9.4 | .3701 | 40 | 84 |
| DH404095 | 9.5 | .3740 | 40 | 84 |
| DH404096 | 9.6 | .3780 | 43 | 89 |
| DH404097 | 9.7 | .3819 | 43 | 89 |
| DH404098 | 9.8 | .3858 | 43 | 89 |
| DH404099 | 9.9 | .3898 | 43 | 89 |
| DH404100 | 10.0 | .3937 | 43 | 89 |
| DH404102 | 10.2 | .4016 | 43 | 89 |
| DH404105 | 10.5 | .4134 | 43 | 89 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| DH404110 | 11.0 | .4331 | 47 | 95 |
| DH404115 | 11.5 | .4528 | 47 | 95 |
| DH404120 | 12.0 | .4724 | 51 | 102 |
| DH404130 | 13.0 | .5118 | 51 | 102 |
| DH404135 | 13.5 | .5314 | 54 | 107 |
| DH404140 | 14.0 | .5512 | 54 | 107 |
| DH404145 | 14.5 | .5708 | 56 | 111 |
| DH404150 | 15.0 | .5905 | 56 | 111 |
| DH404155 | 15.5 | .6102 | 58 | 115 |
| DH404160 | 16.0 | .6299 | 58 | 115 |
| DH404165 | 16.5 | .6495 | 60 | 119 |
| DH404170 | 17.0 | .6692 | 60 | 119 |
| DH404175 | 17.5 | .6889 | 62 | 123 |
| DH404180 | 18.0 | .7087 | 62 | 123 |
| DH404185 | 18.5 | .7283 | 64 | 127 |
| DH404190 | 19.0 | .7480 | 64 | 127 |
| DH404195 | 19.5 | .7676 | 66 | 131 |
| DH404200 | 20.0 | .7874 | 66 | 131 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH423 SERIES**

## CARBIDE, DREAM DRILLS without COOLANT HOLES

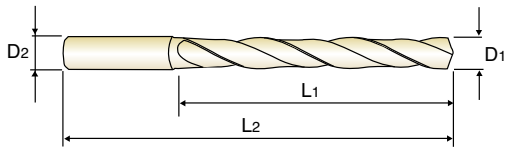
***SHORT***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | P.81

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH423030 | 3.0 | | .1181 | 6 | 20 | 62 |
| DH423031 | 3.1 | | .1220 | 6 | 20 | 62 |
| DH423008F | 3.175 | 1/8 | .1250 | 6 | 20 | 62 |
| DH423032 | 3.2 | | .1260 | 6 | 20 | 62 |
| DH423033 | 3.3 | | .1299 | 6 | 20 | 62 |
| DH423034 | 3.4 | | .1339 | 6 | 20 | 62 |
| DH423035 | 3.5 | | .1378 | 6 | 20 | 62 |
| DH423009F | 3.572 | 9/64 | .1406 | 6 | 20 | 62 |
| DH423036 | 3.6 | | .1417 | 6 | 20 | 62 |
| DH423037 | 3.7 | | .1457 | 6 | 20 | 62 |
| DH423038 | 3.8 | | .1496 | 6 | 24 | 66 |
| DH423039 | 3.9 | | .1535 | 6 | 24 | 66 |
| DH423010F | 3.969 | 5/32 | .1563 | 6 | 24 | 66 |
| DH423040 | 4.0 | | .1575 | 6 | 24 | 66 |
| DH423041 | 4.1 | | .1614 | 6 | 24 | 66 |
| DH423042 | 4.2 | | .1654 | 6 | 24 | 66 |
| DH423043 | 4.3 | | .1693 | 6 | 24 | 66 |
| DH423011F | 4.366 | 11/64 | .1719 | 6 | 24 | 66 |
| DH423044 | 4.4 | | .1732 | 6 | 24 | 66 |
| DH423045 | 4.5 | | .1772 | 6 | 24 | 66 |
| DH423046 | 4.6 | | .1811 | 6 | 24 | 66 |
| DH423047 | 4.7 | | .1850 | 6 | 24 | 66 |
| DH423012F | 4.763 | 3/16 | .1875 | 6 | 24 | 66 |
| DH423048 | 4.8 | | .1890 | 6 | 28 | 66 |
| DH423049 | 4.9 | | .1929 | 6 | 28 | 66 |
| DH423050 | 5.0 | | .1969 | 6 | 28 | 66 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH423051 | 5.1 | | .2008 | 6 | 28 | 66 |
| DH423013F | 5.159 | 13/64 | .2031 | 6 | 28 | 66 |
| DH423052 | 5.2 | | .2047 | 6 | 28 | 66 |
| DH423053 | 5.3 | | .2087 | 6 | 28 | 66 |
| DH423054 | 5.4 | | .2126 | 6 | 28 | 66 |
| DH423055 | 5.5 | | .2165 | 6 | 28 | 66 |
| DH423014F | 5.556 | 7/32 | .2188 | 6 | 28 | 66 |
| DH423056 | 5.6 | | .2205 | 6 | 28 | 66 |
| DH423057 | 5.7 | | .2244 | 6 | 28 | 66 |
| DH423058 | 5.8 | | .2283 | 6 | 28 | 66 |
| DH423059 | 5.9 | | .2323 | 6 | 28 | 66 |
| DH423015F | 5.953 | 15/64 | .2344 | 6 | 28 | 66 |
| DH423060 | 6.0 | | .2362 | 6 | 28 | 66 |
| DH423061 | 6.1 | | .2402 | 8 | 34 | 79 |
| DH423062 | 6.2 | | .2441 | 8 | 34 | 79 |
| DH423063 | 6.3 | | .2480 | 8 | 34 | 79 |
| DH423016F | 6.350 | 1/4 | .2500 | 8 | 34 | 79 |
| DH423064 | 6.4 | | .2520 | 8 | 34 | 79 |
| DH423065 | 6.5 | | .2559 | 8 | 34 | 79 |
| DH423066 | 6.6 | | .2598 | 8 | 34 | 79 |
| DH423067 | 6.7 | | .2638 | 8 | 34 | 79 |
| DH423017F | 6.747 | 17/64 | .2656 | 8 | 34 | 79 |
| DH423068 | 6.8 | | .2677 | 8 | 34 | 79 |
| DH423069 | 6.9 | | .2717 | 8 | 34 | 79 |
| DH423070 | 7.0 | | .2756 | 8 | 34 | 79 |
| DH423071 | 7.1 | | .2795 | 8 | 41 | 79 |

▶ NEXT PAGE

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium | |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# YG DREAM DRILLS -GENERAL

DH423 SERIES

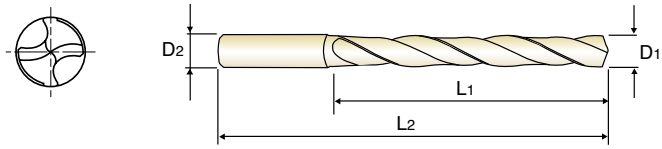
## CARBIDE, DREAM DRILLS without COOLANT HOLES

*SHORT*

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling






DIN 6537 | MG | h6 | m7 | 140° | P.81

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | | | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 | TiAlN | D1 | | | D2 | L1 | L2 |
| DH423018F | 7.144 | 9/32 | .2812 | 8 | 41 | 79 | DH423092 | 9.2 | | .3622 | 10 | 47 | 89 |
| DH423072 | 7.2 | | .2835 | 8 | 41 | 79 | DH423093 | 9.3 | | .3661 | 10 | 47 | 89 |
| DH423073 | 7.3 | | .2874 | 8 | 41 | 79 | DH423094 | 9.4 | | .3701 | 10 | 47 | 89 |
| DH423074 | 7.4 | | .2913 | 8 | 41 | 79 | DH423095 | 9.5 | | .3740 | 10 | 47 | 89 |
| DH423075 | 7.5 | | .2953 | 8 | 41 | 79 | DH423024F | 9.525 | 3/8 | .3750 | 10 | 47 | 89 |
| DH423019F | 7.541 | 19/64 | .2969 | 8 | 41 | 79 | DH423096 | 9.6 | | .3780 | 10 | 47 | 89 |
| DH423076 | 7.6 | | .2992 | 8 | 41 | 79 | DH423097 | 9.7 | | .3819 | 10 | 47 | 89 |
| DH423077 | 7.7 | | .3031 | 8 | 41 | 79 | DH423098 | 9.8 | | .3858 | 10 | 47 | 89 |
| DH423078 | 7.8 | | .3071 | 8 | 41 | 79 | DH423099 | 9.9 | | .3898 | 10 | 47 | 89 |
| DH423079 | 7.9 | | .3110 | 8 | 41 | 79 | DH423025F | 9.922 | 25/64 | .3906 | 10 | 47 | 89 |
| DH423020F | 7.938 | 5/16 | .3125 | 8 | 41 | 79 | DH423100 | 10.0 | | .3937 | 10 | 47 | 89 |
| DH423080 | 8.0 | | .3150 | 8 | 41 | 79 | DH423101 | 10.1 | | .3976 | 12 | 55 | 102 |
| DH423081 | 8.1 | | .3189 | 10 | 47 | 89 | DH423102 | 10.2 | | .4016 | 12 | 55 | 102 |
| DH423082 | 8.2 | | .3228 | 10 | 47 | 89 | DH423103 | 10.3 | | .4055 | 12 | 55 | 102 |
| DH423083 | 8.3 | | .3268 | 10 | 47 | 89 | DH423026F | 10.319 | 13/32 | .4062 | 12 | 55 | 102 |
| DH423021F | 8.334 | 21/64 | .3281 | 10 | 47 | 89 | DH423104 | 10.4 | | .4094 | 12 | 55 | 102 |
| DH423084 | 8.4 | | .3307 | 10 | 47 | 89 | DH423105 | 10.5 | | .4134 | 12 | 55 | 102 |
| DH423085 | 8.5 | | .3346 | 10 | 47 | 89 | DH423106 | 10.6 | | .4173 | 12 | 55 | 102 |
| DH423086 | 8.6 | | .3386 | 10 | 47 | 89 | DH423107 | 10.7 | | .4213 | 12 | 55 | 102 |
| DH423087 | 8.7 | | .3425 | 10 | 47 | 89 | DH423027F | 10.716 | 27/64 | .4219 | 12 | 55 | 102 |
| DH423022F | 8.731 | 11/32 | .3438 | 10 | 47 | 89 | DH423108 | 10.8 | | .4252 | 12 | 55 | 102 |
| DH423088 | 8.8 | | .3465 | 10 | 47 | 89 | DH423109 | 10.9 | | .4291 | 12 | 55 | 102 |
| DH423089 | 8.9 | | .3504 | 10 | 47 | 89 | DH423110 | 11.0 | | .4331 | 12 | 55 | 102 |
| DH423090 | 9.0 | | .3543 | 10 | 47 | 89 | DH423111 | 11.1 | | .4370 | 12 | 55 | 102 |
| DH423091 | 9.1 | | .3583 | 10 | 47 | 89 | DH423028F | 11.113 | 7/16 | .4375 | 12 | 55 | 102 |
| DH423023F | 9.128 | 23/64 | .3594 | 10 | 47 | 89 | DH423112 | 11.2 | | .4409 | 12 | 55 | 102 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium | |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# CARBIDE, DREAM DRILLS without COOLANT HOLES

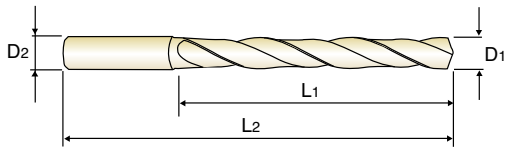
***SHORT***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | P.81

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH423113 | 11.3 | | .4449 | 12 | 55 | 102 |
| DH423114 | 11.4 | | .4488 | 12 | 55 | 102 |
| DH423115 | 11.5 | | .4528 | 12 | 55 | 102 |
| DH423029F | 11.509 | 29/64 | .4531 | 12 | 55 | 102 |
| DH423116 | 11.6 | | .4567 | 12 | 55 | 102 |
| DH423117 | 11.7 | | .4606 | 12 | 55 | 102 |
| DH423118 | 11.8 | | .4646 | 12 | 55 | 102 |
| DH423119 | 11.9 | | .4685 | 12 | 55 | 102 |
| DH423030F | 11.906 | 15/32 | .4688 | 12 | 55 | 102 |
| DH423120 | 12.0 | | .4724 | 12 | 55 | 102 |
| DH423123 | 12.3 | | .4843 | 14 | 60 | 107 |
| DH423031F | 12.303 | 31/64 | .4844 | 14 | 60 | 107 |
| DH423125 | 12.5 | | .4921 | 14 | 60 | 107 |
| DH423032F | 12.7 | 1/2 | .5000 | 14 | 60 | 107 |
| DH423128 | 12.8 | | .5039 | 14 | 60 | 107 |
| DH423130 | 13.0 | | .5118 | 14 | 60 | 107 |
| DH423135 | 13.5 | | .5315 | 14 | 60 | 107 |
| DH423138 | 13.8 | | .5433 | 14 | 60 | 107 |
| DH423140 | 14.0 | | .5512 | 14 | 60 | 107 |
| DH423036F | 14.288 | 9/16 | .5625 | 16 | 65 | 115 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH423145 | 14.5 | | .5708 | 16 | 65 | 115 |
| DH423148 | 14.8 | | .5827 | 16 | 65 | 115 |
| DH423150 | 15.0 | | .5905 | 16 | 65 | 115 |
| DH423155 | 15.5 | | .6102 | 16 | 65 | 115 |
| DH423158 | 15.8 | | .6220 | 16 | 65 | 115 |
| DH423040F | 15.875 | 5/8 | .6250 | 16 | 65 | 115 |
| DH423160 | 16.0 | | .6299 | 16 | 65 | 115 |
| DH423165 | 16.5 | | .6495 | 18 | 73 | 123 |
| DH423168 | 16.8 | | .6614 | 18 | 73 | 123 |
| DH423170 | 17.0 | | .6692 | 18 | 73 | 123 |
| DH423044F | 17.463 | 11/16 | .6875 | 18 | 73 | 123 |
| DH423175 | 17.5 | | .6889 | 18 | 73 | 123 |
| DH423178 | 17.8 | | .7008 | 18 | 73 | 123 |
| DH423180 | 18.0 | | .7087 | 18 | 73 | 123 |
| DH423185 | 18.5 | | .7283 | 20 | 79 | 131 |
| DH423190 | 19.0 | | .7480 | 20 | 79 | 131 |
| DH423048F | 19.05 | 3/4 | .7500 | 20 | 79 | 131 |
| DH423195 | 19.5 | | .7676 | 20 | 79 | 131 |
| DH423198 | 19.8 | | .7795 | 20 | 79 | 131 |
| DH423200 | 20.0 | | .7874 | 20 | 79 | 131 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH424 SERIES**

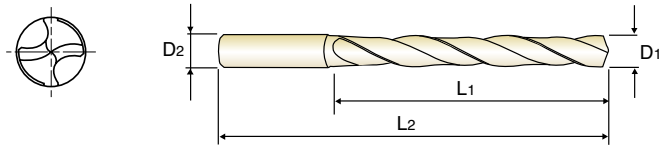
## CARBIDE, DREAM DRILLS without COOLANT HOLES

***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling






DIN 6537 | MG | h6 | m7 | 140° | P.81

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | | | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 | TiAlN | D1 | | | D2 | L1 | L2 |
| DH424010 | 1.0 | | .0394 | 3 | 8 | 55 | DH424033 | 3.3 | | .1299 | 6 | 28 | 66 |
| DH424011 | 1.1 | | .0433 | 3 | 12 | 55 | DH424034 | 3.4 | | .1339 | 6 | 28 | 66 |
| DH424012 | 1.2 | | .0472 | 3 | 12 | 55 | DH424035 | 3.5 | | .1378 | 6 | 28 | 66 |
| DH424013 | 1.3 | | .0512 | 3 | 12 | 55 | DH424009F | 3.572 | 9/64 | .1406 | 6 | 28 | 66 |
| DH424014 | 1.4 | | .0551 | 3 | 12 | 55 | DH424036 | 3.6 | | .1417 | 6 | 28 | 66 |
| DH424015 | 1.5 | | .0591 | 3 | 16 | 55 | DH424037 | 3.7 | | .1457 | 6 | 28 | 66 |
| DH424004F | 1.588 | 1/16 | .0625 | 3 | 16 | 55 | DH424038 | 3.8 | | .1496 | 6 | 36 | 74 |
| DH424016 | 1.6 | | .0630 | 3 | 16 | 55 | DH424039 | 3.9 | | .1535 | 6 | 36 | 74 |
| DH424017 | 1.7 | | .0669 | 3 | 16 | 55 | DH424010F | 3.969 | 5/32 | .1563 | 6 | 36 | 74 |
| DH424018 | 1.8 | | .0709 | 3 | 16 | 55 | DH424040 | 4.0 | | .1575 | 6 | 36 | 74 |
| DH424019 | 1.9 | | .0748 | 3 | 16 | 55 | DH424041 | 4.1 | | .1614 | 6 | 36 | 74 |
| DH424005F | 1.984 | 5/64 | .0781 | 3 | 16 | 55 | DH424042 | 4.2 | | .1654 | 6 | 36 | 74 |
| DH424020 | 2.0 | | .0787 | 4 | 21 | 57 | DH424043 | 4.3 | | .1693 | 6 | 36 | 74 |
| DH424021 | 2.1 | | .0827 | 4 | 21 | 57 | DH424011F | 4.366 | 11/64 | .1719 | 6 | 36 | 74 |
| DH424022 | 2.2 | | .0866 | 4 | 21 | 57 | DH424044 | 4.4 | | .1732 | 6 | 36 | 74 |
| DH424023 | 2.3 | | .0906 | 4 | 21 | 57 | DH424045 | 4.5 | | .1772 | 6 | 36 | 74 |
| DH424006F | 2.381 | 3/32 | .0938 | 4 | 21 | 57 | DH424046 | 4.6 | | .1811 | 6 | 36 | 74 |
| DH424024 | 2.4 | | .0945 | 4 | 21 | 57 | DH424047 | 4.7 | | .1850 | 6 | 36 | 74 |
| DH424025 | 2.5 | | .0984 | 4 | 21 | 57 | DH424012F | 4.763 | 3/16 | .1875 | 6 | 36 | 74 |
| DH424026 | 2.6 | | .1024 | 4 | 21 | 57 | DH424048 | 4.8 | | .1890 | 6 | 44 | 82 |
| DH424027 | 2.7 | | .1063 | 4 | 21 | 57 | DH424049 | 4.9 | | .1929 | 6 | 44 | 82 |
| DH424007F | 2.778 | 7/64 | .1094 | 4 | 21 | 57 | DH424050 | 5.0 | | .1969 | 6 | 44 | 82 |
| DH424028 | 2.8 | | .1102 | 4 | 21 | 57 | DH424051 | 5.1 | | .2008 | 6 | 44 | 82 |
| DH424029 | 2.9 | | .1142 | 4 | 21 | 57 | DH424013F | 5.159 | 13/64 | .2031 | 6 | 44 | 82 |
| DH424030 | 3.0 | | .1181 | 6 | 28 | 66 | DH424052 | 5.2 | | .2047 | 6 | 44 | 82 |
| DH424031 | 3.1 | | .1220 | 6 | 28 | 66 | DH424053 | 5.3 | | .2087 | 6 | 44 | 82 |
| DH424008F | 3.175 | 1/8 | .1250 | 6 | 28 | 66 | DH424054 | 5.4 | | .2126 | 6 | 44 | 82 |
| DH424032 | 3.2 | | .1260 | 6 | 28 | 66 | DH424055 | 5.5 | | .2165 | 6 | 44 | 82 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH424 SERIES**

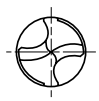
## CARBIDE, DREAM DRILLS without COOLANT HOLES

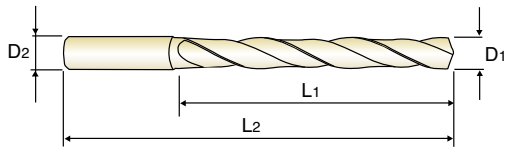
***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | P.81

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH424014F | 5.556 | 7/32 | .2188 | 6 | 44 | 82 |
| DH424056 | 5.6 | | .2205 | 6 | 44 | 82 |
| DH424057 | 5.7 | | .2244 | 6 | 44 | 82 |
| DH424058 | 5.8 | | .2283 | 6 | 44 | 82 |
| DH424059 | 5.9 | | .2323 | 6 | 44 | 82 |
| DH424015F | 5.953 | 15/64 | .2344 | 6 | 44 | 82 |
| DH424060 | 6.0 | | .2362 | 6 | 44 | 82 |
| DH424061 | 6.1 | | .2402 | 8 | 53 | 91 |
| DH424062 | 6.2 | | .2441 | 8 | 53 | 91 |
| DH424063 | 6.3 | | .2480 | 8 | 53 | 91 |
| DH424016F | 6.35 | 1/4 | .2500 | 8 | 53 | 91 |
| DH424064 | 6.4 | | .2520 | 8 | 53 | 91 |
| DH424065 | 6.5 | | .2559 | 8 | 53 | 91 |
| DH424066 | 6.6 | | .2598 | 8 | 53 | 91 |
| DH424067 | 6.7 | | .2638 | 8 | 53 | 91 |
| DH424017F | 6.747 | 17/64 | .2656 | 8 | 53 | 91 |
| DH424068 | 6.8 | | .2677 | 8 | 53 | 91 |
| DH424069 | 6.9 | | .2717 | 8 | 53 | 91 |
| DH424070 | 7.0 | | .2756 | 8 | 53 | 91 |
| DH424071 | 7.1 | | .2795 | 8 | 53 | 91 |
| DH424018F | 7.144 | 9/32 | .2812 | 8 | 53 | 91 |
| DH424072 | 7.2 | | .2835 | 8 | 53 | 91 |
| DH424073 | 7.3 | | .2874 | 8 | 53 | 91 |
| DH424074 | 7.4 | | .2913 | 8 | 53 | 91 |
| DH424075 | 7.5 | | .2953 | 8 | 53 | 91 |
| DH424019F | 7.541 | 19/64 | .2969 | 8 | 53 | 91 |
| DH424076 | 7.6 | | .2992 | 8 | 53 | 91 |
| DH424077 | 7.7 | | .3031 | 8 | 53 | 91 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH424078 | 7.8 | | .3071 | 8 | 53 | 91 |
| DH424079 | 7.9 | | .3110 | 8 | 53 | 91 |
| DH424020F | 7.938 | 5/16 | .3125 | 8 | 53 | 91 |
| DH424080 | 8.0 | | .3150 | 8 | 53 | 91 |
| DH424081 | 8.1 | | .3189 | 10 | 61 | 103 |
| DH424082 | 8.2 | | .3228 | 10 | 61 | 103 |
| DH424083 | 8.3 | | .3268 | 10 | 61 | 103 |
| DH424021F | 8.334 | 21/64 | .3281 | 10 | 61 | 103 |
| DH424084 | 8.4 | | .3307 | 10 | 61 | 103 |
| DH424085 | 8.5 | | .3346 | 10 | 61 | 103 |
| DH424086 | 8.6 | | .3386 | 10 | 61 | 103 |
| DH424087 | 8.7 | | .3425 | 10 | 61 | 103 |
| DH424022F | 8.731 | 11/32 | .3438 | 10 | 61 | 103 |
| DH424088 | 8.8 | | .3465 | 10 | 61 | 103 |
| DH424089 | 8.9 | | .3504 | 10 | 61 | 103 |
| DH424090 | 9.0 | | .3543 | 10 | 61 | 103 |
| DH424091 | 9.1 | | .3583 | 10 | 61 | 103 |
| DH424023F | 9.128 | 23/64 | .3594 | 10 | 61 | 103 |
| DH424092 | 9.2 | | .3622 | 10 | 61 | 103 |
| DH424093 | 9.3 | | .3661 | 10 | 61 | 103 |
| DH424094 | 9.4 | | .3701 | 10 | 61 | 103 |
| DH424095 | 9.5 | | .3740 | 10 | 61 | 103 |
| DH424024F | 9.525 | 3/8 | .3750 | 10 | 61 | 103 |
| DH424096 | 9.6 | | .3780 | 10 | 61 | 103 |
| DH424097 | 9.7 | | .3819 | 10 | 61 | 103 |
| DH424098 | 9.8 | | .3858 | 10 | 61 | 103 |
| DH424099 | 9.9 | | .3898 | 10 | 61 | 103 |
| DH424025F | 9.922 | 25/64 | .3906 | 10 | 61 | 103 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH424 SERIES**

## CARBIDE, DREAM DRILLS without COOLANT HOLES

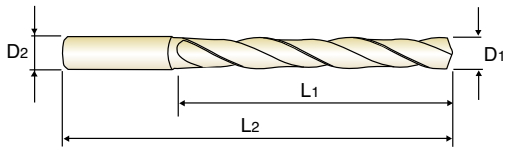
***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | P.81

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH424100 | 10.0 | | .3937 | 10 | 61 | 103 |
| DH424101 | 10.1 | | .3976 | 12 | 71 | 118 |
| DH424102 | 10.2 | | .4016 | 12 | 71 | 118 |
| DH424103 | 10.3 | | .4055 | 12 | 71 | 118 |
| DH424026F | 10.319 | 13/32 | .4062 | 12 | 71 | 118 |
| DH424104 | 10.4 | | .4094 | 12 | 71 | 118 |
| DH424105 | 10.5 | | .4134 | 12 | 71 | 118 |
| DH424106 | 10.6 | | .4173 | 12 | 71 | 118 |
| DH424107 | 10.7 | | .4213 | 12 | 71 | 118 |
| DH424027F | 10.716 | 27/64 | .4219 | 12 | 71 | 118 |
| DH424108 | 10.8 | | .4252 | 12 | 71 | 118 |
| DH424109 | 10.9 | | .4291 | 12 | 71 | 118 |
| DH424110 | 11.0 | | .4331 | 12 | 71 | 118 |
| DH424111 | 11.1 | | .4370 | 12 | 71 | 118 |
| DH424028F | 11.113 | 7/16 | .4375 | 12 | 71 | 118 |
| DH424112 | 11.2 | | .4409 | 12 | 71 | 118 |
| DH424113 | 11.3 | | .4449 | 12 | 71 | 118 |
| DH424114 | 11.4 | | .4488 | 12 | 71 | 118 |
| DH424115 | 11.5 | | .4528 | 12 | 71 | 118 |
| DH424029F | 11.509 | 29/64 | .4531 | 12 | 71 | 118 |
| DH424116 | 11.6 | | .4567 | 12 | 71 | 118 |
| DH424117 | 11.7 | | .4606 | 12 | 71 | 118 |
| DH424118 | 11.8 | | .4646 | 12 | 71 | 118 |
| DH424119 | 11.9 | | .4685 | 12 | 71 | 118 |
| DH424030F | 11.906 | 15/32 | .4688 | 12 | 71 | 118 |
| DH424120 | 12.0 | | .4724 | 12 | 71 | 118 |
| DH424123 | 12.3 | | .4843 | 14 | 77 | 124 |
| DH424031F | 12.303 | 31/64 | .4844 | 14 | 77 | 124 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH424125 | 12.5 | | .4921 | 14 | 77 | 124 |
| DH424032F | 12.7 | 1/2 | .5000 | 14 | 77 | 124 |
| DH424128 | 12. 8 | | .5039 | 14 | 77 | 124 |
| DH424130 | 13.0 | | .5118 | 14 | 77 | 124 |
| DH424135 | 13.5 | | .5315 | 14 | 77 | 124 |
| DH424138 | 13.8 | | .5433 | 14 | 77 | 124 |
| DH424140 | 14.0 | | .5512 | 14 | 77 | 124 |
| DH424036F | 14.288 | 9/16 | .5625 | 16 | 83 | 133 |
| DH424145 | 14.5 | | .5708 | 16 | 83 | 133 |
| DH424148 | 14.8 | | .5827 | 16 | 83 | 133 |
| DH424150 | 15.0 | | .5905 | 16 | 83 | 133 |
| DH424155 | 15.5 | | .6102 | 16 | 83 | 133 |
| DH424158 | 15.8 | | .6220 | 16 | 83 | 133 |
| DH424040F | 15.875 | 5/8 | .6250 | 16 | 83 | 133 |
| DH424160 | 16.0 | | .6299 | 16 | 83 | 133 |
| DH424165 | 16.5 | | .6495 | 18 | 93 | 143 |
| DH424168 | 16.8 | | .6614 | 18 | 93 | 143 |
| DH424170 | 17.0 | | .6692 | 18 | 93 | 143 |
| DH424175 | 17.5 | | .6889 | 18 | 93 | 143 |
| DH424178 | 17.8 | | .7008 | 18 | 93 | 143 |
| DH424180 | 18.0 | | .7087 | 18 | 93 | 143 |
| DH424185 | 18.5 | | .7283 | 20 | 101 | 153 |
| DH424190 | 19.0 | | .7480 | 20 | 101 | 153 |
| DH424048F | 19.05 | 3/4 | .7500 | 20 | 101 | 153 |
| DH424195 | 19.5 | | .7676 | 20 | 101 | 153 |
| DH424198 | 19.8 | | .7795 | 20 | 101 | 153 |
| DH424200 | 20.0 | | .7874 | 20 | 101 | 153 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

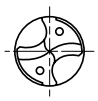
# CARBIDE, DREAM DRILLS with COOLANT HOLES

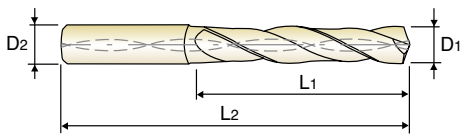
***SHORT***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406030 | 3.0 | | .1181 | 6 | 20 | 62 |
| DH406031 | 3.1 | | .1220 | 6 | 20 | 62 |
| DH406008F | 3.175 | 1/8 | .1250 | 6 | 20 | 62 |
| DH406032 | 3.2 | | .1260 | 6 | 20 | 62 |
| DH406033 | 3.3 | | .1299 | 6 | 20 | 62 |
| DH406034 | 3.4 | | .1339 | 6 | 20 | 62 |
| DH406035 | 3.5 | | .1378 | 6 | 20 | 62 |
| DH406009F | 3.572 | 9/64 | .1406 | 6 | 20 | 62 |
| DH406036 | 3.6 | | .1417 | 6 | 20 | 62 |
| DH406037 | 3.7 | | .1457 | 6 | 20 | 62 |
| DH406038 | 3.8 | | .1496 | 6 | 24 | 66 |
| DH406039 | 3.9 | | .1535 | 6 | 24 | 66 |
| DH406010F | 3.969 | 5/32 | .1563 | 6 | 24 | 66 |
| DH406040 | 4.0 | | .1575 | 6 | 24 | 66 |
| DH406041 | 4.1 | | .1614 | 6 | 24 | 66 |
| DH406042 | 4.2 | | .1654 | 6 | 24 | 66 |
| DH406043 | 4.3 | | .1693 | 6 | 24 | 66 |
| DH406011F | 4.366 | 11/64 | .1719 | 6 | 24 | 66 |
| DH406044 | 4.4 | | .1732 | 6 | 24 | 66 |
| DH406045 | 4.5 | | .1772 | 6 | 24 | 66 |
| DH406046 | 4.6 | | .1811 | 6 | 24 | 66 |
| DH406047 | 4.7 | | .1850 | 6 | 24 | 66 |
| DH406012F | 4.763 | 3/16 | .1875 | 6 | 24 | 66 |
| DH406048 | 4.8 | | .1890 | 6 | 28 | 66 |
| DH406049 | 4.9 | | .1929 | 6 | 28 | 66 |
| DH406050 | 5.0 | | .1969 | 6 | 28 | 66 |
| DH406051 | 5.1 | | .2008 | 6 | 28 | 66 |
| DH406013F | 5.159 | 13/64 | .2031 | 6 | 28 | 66 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406052 | 5.2 | | .2047 | 6 | 28 | 66 |
| DH406053 | 5.3 | | .2087 | 6 | 28 | 66 |
| DH406054 | 5.4 | | .2126 | 6 | 28 | 66 |
| DH406055 | 5.5 | | .2165 | 6 | 28 | 66 |
| DH406014F | 5.556 | 7/32 | .2188 | 6 | 28 | 66 |
| DH406056 | 5.6 | | .2205 | 6 | 28 | 66 |
| DH406057 | 5.7 | | .2244 | 6 | 28 | 66 |
| DH406058 | 5.8 | | .2283 | 6 | 28 | 66 |
| DH406059 | 5.9 | | .2323 | 6 | 28 | 66 |
| DH406015F | 5.953 | 15/64 | .2344 | 6 | 28 | 66 |
| DH406060 | 6.0 | | .2362 | 6 | 28 | 66 |
| DH406061 | 6.1 | | .2402 | 8 | 34 | 79 |
| DH406062 | 6.2 | | .2441 | 8 | 34 | 79 |
| DH406063 | 6.3 | | .2480 | 8 | 34 | 79 |
| DH406016F | 6.35 | 1/4 | .2500 | 8 | 34 | 79 |
| DH406064 | 6.4 | | .2520 | 8 | 34 | 79 |
| DH406065 | 6.5 | | .2559 | 8 | 34 | 79 |
| DH406066 | 6.6 | | .2598 | 8 | 34 | 79 |
| DH406067 | 6.7 | | .2638 | 8 | 34 | 79 |
| DH406017F | 6.747 | 17/64 | .2656 | 8 | 34 | 79 |
| DH406068 | 6.8 | | .2677 | 8 | 34 | 79 |
| DH406069 | 6.9 | | .2717 | 8 | 34 | 79 |
| DH406070 | 7.0 | | .2756 | 8 | 34 | 79 |
| DH406071 | 7.1 | | .2795 | 8 | 41 | 79 |
| DH406018F | 7.144 | 9/32 | .2812 | 8 | 41 | 79 |
| DH406072 | 7.2 | | .2835 | 8 | 41 | 79 |
| DH406073 | 7.3 | | .2874 | 8 | 41 | 79 |
| DH406074 | 7.4 | | .2913 | 8 | 41 | 79 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH406 SERIES**

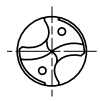
## CARBIDE, DREAM DRILLS with COOLANT HOLES

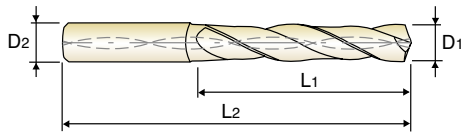
***SHORT***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406075 | 7.5 | | .2953 | 8 | 41 | 79 |
| DH406019F | 7.541 | 19/64 | .2969 | 8 | 41 | 79 |
| DH406076 | 7.6 | | .2992 | 8 | 41 | 79 |
| DH406077 | 7.7 | | .3031 | 8 | 41 | 79 |
| DH406078 | 7.8 | | .3071 | 8 | 41 | 79 |
| DH406079 | 7.9 | | .3110 | 8 | 41 | 79 |
| DH406020F | 7.938 | 5/16 | .3125 | 8 | 41 | 79 |
| DH406080 | 8.0 | | .3150 | 8 | 41 | 79 |
| DH406081 | 8.1 | | .3189 | 10 | 47 | 89 |
| DH406082 | 8.2 | | .3228 | 10 | 47 | 89 |
| DH406083 | 8.3 | | .3268 | 10 | 47 | 89 |
| DH406021F | 8.334 | 21/64 | .3281 | 10 | 47 | 89 |
| DH406084 | 8.4 | | .3307 | 10 | 47 | 89 |
| DH406085 | 8.5 | | .3346 | 10 | 47 | 89 |
| DH406086 | 8.6 | | .3386 | 10 | 47 | 89 |
| DH406087 | 8.7 | | .3425 | 10 | 47 | 89 |
| DH406022F | 8.731 | 11/32 | .3438 | 10 | 47 | 89 |
| DH406088 | 8.8 | | .3465 | 10 | 47 | 89 |
| DH406089 | 8.9 | | .3504 | 10 | 47 | 89 |
| DH406090 | 9.0 | | .3543 | 10 | 47 | 89 |
| DH406091 | 9.1 | | .3583 | 10 | 47 | 89 |
| DH406023F | 9.128 | 23/64 | .3594 | 10 | 47 | 89 |
| DH406092 | 9.2 | | .3622 | 10 | 47 | 89 |
| DH406093 | 9.3 | | .3661 | 10 | 47 | 89 |
| DH406094 | 9.4 | | .3701 | 10 | 47 | 89 |
| DH406095 | 9.5 | | .3740 | 10 | 47 | 89 |
| DH406024F | 9.525 | 3/8 | .3750 | 10 | 47 | 89 |
| DH406096 | 9.6 | | .3780 | 10 | 47 | 89 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406097 | 9.7 | | .3819 | 10 | 47 | 89 |
| DH406098 | 9.8 | | .3858 | 10 | 47 | 89 |
| DH406099 | 9.9 | | .3898 | 10 | 47 | 89 |
| DH406025F | 9.922 | 25/64 | .3906 | 10 | 47 | 89 |
| DH406100 | 10.0 | | .3937 | 10 | 47 | 89 |
| DH406101 | 10.1 | | .3976 | 12 | 55 | 102 |
| DH406102 | 10.2 | | .4016 | 12 | 55 | 102 |
| DH406103 | 10.3 | | .4055 | 12 | 55 | 102 |
| DH406026F | 10.319 | 13/32 | .4062 | 12 | 55 | 102 |
| DH406104 | 10.4 | | .4094 | 12 | 55 | 102 |
| DH406105 | 10.5 | | .4134 | 12 | 55 | 102 |
| DH406106 | 10.6 | | .4173 | 12 | 55 | 102 |
| DH406107 | 10.7 | | .4212 | 12 | 55 | 102 |
| DH406027F | 10.716 | 27/64 | .4219 | 12 | 55 | 102 |
| DH406108 | 10.8 | | .4252 | 12 | 55 | 102 |
| DH406109 | 10.9 | | .4291 | 12 | 55 | 102 |
| DH406110 | 11.0 | | .4330 | 12 | 55 | 102 |
| DH406111 | 11.1 | | .4370 | 12 | 55 | 102 |
| DH406028F | 11.113 | 7/16 | .4375 | 12 | 55 | 102 |
| DH406112 | 11.2 | | .4409 | 12 | 55 | 102 |
| DH406113 | 11.3 | | .4448 | 12 | 55 | 102 |
| DH406114 | 11.4 | | .4488 | 12 | 55 | 102 |
| DH406115 | 11.5 | | .4527 | 12 | 55 | 102 |
| DH406029F | 11.509 | 29/64 | .4531 | 12 | 55 | 102 |
| DH406116 | 11.6 | | .4566 | 12 | 55 | 102 |
| DH406117 | 11.7 | | .4606 | 12 | 55 | 102 |
| DH406118 | 11.8 | | .4645 | 12 | 55 | 102 |
| DH406119 | 11.9 | | .4685 | 12 | 55 | 102 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH406 SERIES**

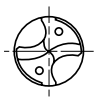
## CARBIDE, DREAM DRILLS with COOLANT HOLES

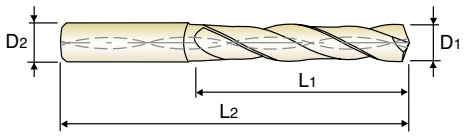
***SHORT***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar | P.82

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406030F | 11.906 | 15/32 | .4688 | 12 | 55 | 102 |
| DH406120 | 12.0 | | .4724 | 12 | 55 | 102 |
| DH406031F | 12.303 | 31/64 | .4844 | 14 | 60 | 107 |
| DH406125 | 12.5 | | .4921 | 14 | 60 | 107 |
| DH406032F | 12.7 | 1/2 | .5000 | 14 | 60 | 107 |
| DH406130 | 13.0 | | .5118 | 14 | 60 | 107 |
| DH406135 | 13.5 | | .5314 | 14 | 60 | 107 |
| DH406140 | 14.0 | | .5512 | 14 | 60 | 107 |
| DH406036F | 14.288 | 9/16 | .5625 | 16 | 65 | 115 |
| DH406145 | 14.5 | | .5708 | 16 | 65 | 115 |
| DH406150 | 15.0 | | .5905 | 16 | 65 | 115 |
| DH406155 | 15.5 | | .6102 | 16 | 65 | 115 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH406040F | 15.875 | 5/8 | .6250 | 16 | 65 | 115 |
| DH406160 | 16.0 | | .6299 | 16 | 65 | 115 |
| DH406165 | 16.5 | | .6495 | 18 | 73 | 123 |
| DH406170 | 17.0 | | .6692 | 18 | 73 | 123 |
| DH406044F | 17.463 | 11/16 | .6875 | 18 | 73 | 123 |
| DH406175 | 17.5 | | .6889 | 18 | 73 | 123 |
| DH406180 | 18.0 | | .7087 | 18 | 73 | 123 |
| DH406185 | 18.5 | | .7283 | 20 | 79 | 131 |
| DH406190 | 19.0 | | .7480 | 20 | 79 | 131 |
| DH406048F | 19.05 | 3/4 | .7500 | 20 | 79 | 131 |
| DH406195 | 19.5 | | .7676 | 20 | 79 | 131 |
| DH406200 | 20.0 | | .7874 | 20 | 79 | 131 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH408 SERIES**

## CARBIDE, DREAM DRILLS with COOLANT HOLES

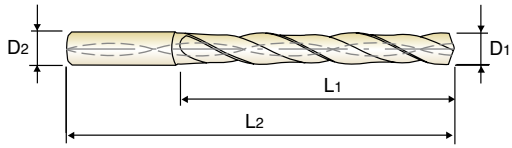
***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | | | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 | TiAlN | D1 | | | D2 | L1 | L2 |
| DH408010 | 1.0 | | .0394 | 3 | 8 | 55 | DH408033 | 3.3 | | .1299 | 6 | 28 | 66 |
| DH408011 | 1.1 | | .0433 | 3 | 12 | 55 | DH408034 | 3.4 | | .1339 | 6 | 28 | 66 |
| DH408012 | 1.2 | | .0472 | 3 | 12 | 55 | DH408035 | 3.5 | | .1378 | 6 | 28 | 66 |
| DH408013 | 1.3 | | .0512 | 3 | 12 | 55 | DH408009F | 3.572 | 9/64 | .1406 | 6 | 28 | 66 |
| DH408014 | 1.4 | | .0551 | 3 | 12 | 55 | DH408036 | 3.6 | | .1417 | 6 | 28 | 66 |
| DH408015 | 1.5 | | .0591 | 3 | 16 | 55 | DH408037 | 3.7 | | .1457 | 6 | 28 | 66 |
| DH408004F | 1.588 | 1/16 | .0625 | 3 | 16 | 55 | DH408038 | 3.8 | | .1496 | 6 | 36 | 74 |
| DH408016 | 1.6 | | .0630 | 3 | 16 | 55 | DH408039 | 3.9 | | .1535 | 6 | 36 | 74 |
| DH408017 | 1.7 | | .0669 | 3 | 16 | 55 | DH408010F | 3.969 | 5/32 | .1563 | 6 | 36 | 74 |
| DH408018 | 1.8 | | .0709 | 3 | 16 | 55 | DH408040 | 4.0 | | .1575 | 6 | 36 | 74 |
| DH408019 | 1.9 | | .0748 | 3 | 16 | 55 | DH408041 | 4.1 | | .1614 | 6 | 36 | 74 |
| DH408005F | 1.984 | 5/64 | .0781 | 3 | 16 | 55 | DH408042 | 4.2 | | .1654 | 6 | 36 | 74 |
| DH408020 | 2.0 | | .0787 | 4 | 21 | 57 | DH408043 | 4.3 | | .1693 | 6 | 36 | 74 |
| DH408021 | 2.1 | | .0827 | 4 | 21 | 57 | DH408011F | 4.366 | 11/64 | .1719 | 6 | 36 | 74 |
| DH408022 | 2.2 | | .0866 | 4 | 21 | 57 | DH408044 | 4.4 | | .1732 | 6 | 36 | 74 |
| DH408023 | 2.3 | | .0906 | 4 | 21 | 57 | DH408045 | 4.5 | | .1772 | 6 | 36 | 74 |
| DH408006F | 2.381 | 3/32 | .0938 | 4 | 21 | 57 | DH408046 | 4.6 | | .1811 | 6 | 36 | 74 |
| DH408024 | 2.4 | | .0945 | 4 | 21 | 57 | DH408047 | 4.7 | | .1850 | 6 | 36 | 74 |
| DH408025 | 2.5 | | .0984 | 4 | 21 | 57 | DH408012F | 4.763 | 3/16 | .1875 | 6 | 36 | 74 |
| DH408026 | 2.6 | | .1024 | 4 | 21 | 57 | DH408048 | 4.8 | | .1890 | 6 | 44 | 82 |
| DH408027 | 2.7 | | .1063 | 4 | 21 | 57 | DH408049 | 4.9 | | .1929 | 6 | 44 | 82 |
| DH408007F | 2.778 | 7/64 | .1094 | 4 | 21 | 57 | DH408050 | 5.0 | | .1969 | 6 | 44 | 82 |
| DH408028 | 2.8 | | .1102 | 4 | 21 | 57 | DH408051 | 5.1 | | .2008 | 6 | 44 | 82 |
| DH408029 | 2.9 | | .1142 | 4 | 21 | 57 | DH408013F | 5.159 | 13/64 | .2031 | 6 | 44 | 82 |
| DH408030 | 3.0 | | .1181 | 6 | 28 | 66 | DH408052 | 5.2 | | .2047 | 6 | 44 | 82 |
| DH408031 | 3.1 | | .1220 | 6 | 28 | 66 | DH408053 | 5.3 | | .2087 | 6 | 44 | 82 |
| DH408008F | 3.175 | 1/8 | .1250 | 6 | 28 | 66 | DH408054 | 5.4 | | .2126 | 6 | 44 | 82 |
| DH408032 | 3.2 | | .1260 | 6 | 28 | 66 | DH408055 | 5.5 | | .2165 | 6 | 44 | 82 |

▶ NEXT PAGE

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# DREAM DRILLS -GENERAL

**DH408 SERIES**

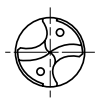
## CARBIDE, DREAM DRILLS with COOLANT HOLES

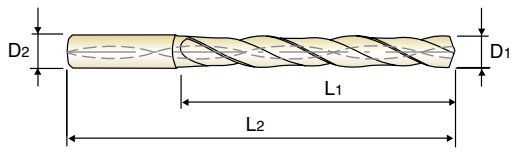
***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | | | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 | TiAlN | D1 | | | D2 | L1 | L2 |
| DH408014F | 5.556 | 7/32 | .2188 | 6 | 44 | 82 | DH408078 | 7.8 | | .3071 | 8 | 53 | 91 |
| DH408056 | 5.6 | | .2205 | 6 | 44 | 82 | DH408079 | 7.9 | | .3110 | 8 | 53 | 91 |
| DH408057 | 5.7 | | .2244 | 6 | 44 | 82 | DH408020F | 7.938 | 5/16 | .3125 | 8 | 53 | 91 |
| DH408058 | 5.8 | | .2283 | 6 | 44 | 82 | DH408080 | 8.0 | | .3150 | 8 | 53 | 91 |
| DH408059 | 5.9 | | .2323 | 6 | 44 | 82 | DH408081 | 8.1 | | .3189 | 10 | 61 | 103 |
| DH408015F | 5.953 | 15/64 | .2344 | 6 | 44 | 82 | DH408082 | 8.2 | | .3228 | 10 | 61 | 103 |
| DH408060 | 6.0 | | .2362 | 6 | 44 | 82 | DH408083 | 8.3 | | .3268 | 10 | 61 | 103 |
| DH408061 | 6.1 | | .2402 | 8 | 53 | 91 | DH408021F | 8.334 | 21/64 | .3281 | 10 | 61 | 103 |
| DH408062 | 6.2 | | .2441 | 8 | 53 | 91 | DH408084 | 8.4 | | .3307 | 10 | 61 | 103 |
| DH408063 | 6.3 | | .2480 | 8 | 53 | 91 | DH408085 | 8.5 | | .3346 | 10 | 61 | 103 |
| DH408016F | 6.35 | 1/4 | .2500 | 8 | 53 | 91 | DH408086 | 8.6 | | .3386 | 10 | 61 | 103 |
| DH408064 | 6.4 | | .2520 | 8 | 53 | 91 | DH408087 | 8.7 | | .3425 | 10 | 61 | 103 |
| DH408065 | 6.5 | | .2559 | 8 | 53 | 91 | DH408022F | 8.731 | 11/32 | .3438 | 10 | 61 | 103 |
| DH408066 | 6.6 | | .2598 | 8 | 53 | 91 | DH408088 | 8.8 | | .3465 | 10 | 61 | 103 |
| DH408067 | 6.7 | | .2638 | 8 | 53 | 91 | DH408089 | 8.9 | | .3504 | 10 | 61 | 103 |
| DH408017F | 6.747 | 17/64 | .2656 | 8 | 53 | 91 | DH408090 | 9.0 | | .3543 | 10 | 61 | 103 |
| DH408068 | 6.8 | | .2677 | 8 | 53 | 91 | DH408091 | 9.1 | | .3583 | 10 | 61 | 103 |
| DH408069 | 6.9 | | .2717 | 8 | 53 | 91 | DH408023F | 9.128 | 23/64 | .3594 | 10 | 61 | 103 |
| DH408070 | 7.0 | | .2756 | 8 | 53 | 91 | DH408092 | 9.2 | | .3622 | 10 | 61 | 103 |
| DH408071 | 7.1 | | .2795 | 8 | 53 | 91 | DH408093 | 9.3 | | .3661 | 10 | 61 | 103 |
| DH408018F | 7.144 | 9/32 | .2812 | 8 | 53 | 91 | DH408094 | 9.4 | | .3701 | 10 | 61 | 103 |
| DH408072 | 7.2 | | .2835 | 8 | 53 | 91 | DH408095 | 9.5 | | .3740 | 10 | 61 | 103 |
| DH408073 | 7.3 | | .2874 | 8 | 53 | 91 | DH408024F | 9.525 | 3/8 | .3750 | 10 | 61 | 103 |
| DH408074 | 7.4 | | .2913 | 8 | 53 | 91 | DH408096 | 9.6 | | .3780 | 10 | 61 | 103 |
| DH408075 | 7.5 | | .2953 | 8 | 53 | 91 | DH408097 | 9.7 | | .3819 | 10 | 61 | 103 |
| DH408019F | 7.541 | 19/64 | .2969 | 8 | 53 | 91 | DH408098 | 9.8 | | .3858 | 10 | 61 | 103 |
| DH408076 | 7.6 | | .2992 | 8 | 53 | 91 | DH408099 | 9.9 | | .3898 | 10 | 61 | 103 |
| DH408077 | 7.7 | | .3031 | 8 | 53 | 91 | DH408025F | 9.922 | 25/64 | .3906 | 10 | 61 | 103 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium | |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# DREAM DRILLS -GENERAL

**DH408 SERIES**

## CARBIDE, DREAM DRILLS with COOLANT HOLES

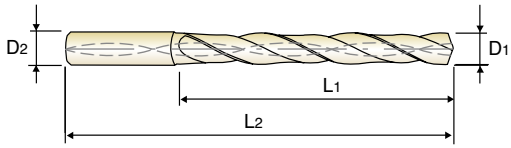
***LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | $D_1$ | | | $D_2$ | $L_1$ | $L_2$ |
| DH408100 | 10.0 | | .3937 | 10 | 61 | 103 |
| DH408101 | 10.1 | | .3976 | 12 | 71 | 118 |
| DH408102 | 10.2 | | .4016 | 12 | 71 | 118 |
| DH408103 | 10.3 | | .4055 | 12 | 71 | 118 |
| DH408026F | 10.319 | 13/32 | .4062 | 12 | 71 | 118 |
| DH408104 | 10.4 | | .4094 | 12 | 71 | 118 |
| DH408105 | 10.5 | | .4134 | 12 | 71 | 118 |
| DH408106 | 10.6 | | .4173 | 12 | 71 | 118 |
| DH408107 | 10.7 | | .4212 | 12 | 71 | 118 |
| DH408027F | 10.716 | 27/64 | .4219 | 12 | 71 | 118 |
| DH408108 | 10.8 | | .4252 | 12 | 71 | 118 |
| DH408109 | 10.9 | | .4291 | 12 | 71 | 118 |
| DH408110 | 11.0 | | .4330 | 12 | 71 | 118 |
| DH408111 | 11.1 | | .4370 | 12 | 71 | 118 |
| DH408028F | 11.113 | 7/16 | .4375 | 12 | 71 | 118 |
| DH408112 | 11.2 | | .4409 | 12 | 71 | 118 |
| DH408113 | 11.3 | | .4448 | 12 | 71 | 118 |
| DH408114 | 11.4 | | .4488 | 12 | 71 | 118 |
| DH408115 | 11.5 | | .4527 | 12 | 71 | 118 |
| DH408029F | 11.509 | 29/64 | .4531 | 12 | 71 | 118 |
| DH408116 | 11.6 | | .4566 | 12 | 71 | 118 |
| DH408117 | 11.7 | | .4606 | 12 | 71 | 118 |
| DH408118 | 11.8 | | .4645 | 12 | 71 | 118 |
| DH408119 | 11.9 | | .4685 | 12 | 71 | 118 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | $D_1$ | | | $D_2$ | $L_1$ | $L_2$ |
| DH408030F | 11.906 | 15/32 | .4688 | 12 | 71 | 118 |
| DH408120 | 12.0 | | .4724 | 12 | 71 | 118 |
| DH408031F | 12.303 | 31/64 | .4844 | 14 | 77 | 124 |
| DH408125 | 12.5 | | .4921 | 14 | 77 | 124 |
| DH408032F | 12.7 | 1/2 | .5000 | 14 | 77 | 124 |
| DH408130 | 13.0 | | .5118 | 14 | 77 | 124 |
| DH408135 | 13.5 | | .5314 | 14 | 77 | 124 |
| DH408140 | 14.0 | | .5512 | 14 | 77 | 124 |
| DH408036F | 14.288 | 9/16 | .5625 | 16 | 83 | 133 |
| DH408145 | 14.5 | | .5708 | 16 | 83 | 133 |
| DH408150 | 15.0 | | .5905 | 16 | 83 | 133 |
| DH408155 | 15.5 | | .6102 | 16 | 83 | 133 |
| DH408040F | 15.875 | 5/8 | .6250 | 16 | 83 | 133 |
| DH408160 | 16.0 | | .6299 | 16 | 83 | 133 |
| DH408165 | 16.5 | | .6495 | 18 | 93 | 143 |
| DH408170 | 17.0 | | .6692 | 18 | 93 | 143 |
| DH408175 | 17.5 | | .6889 | 18 | 93 | 143 |
| DH408180 | 18.0 | | .7087 | 18 | 93 | 143 |
| DH408185 | 18.5 | | .7283 | 20 | 101 | 153 |
| DH408190 | 19.0 | | .7480 | 20 | 101 | 153 |
| DH408048F | 19.05 | 3/4 | .7500 | 20 | 101 | 153 |
| DH408195 | 19.5 | | .7676 | 20 | 101 | 153 |
| DH408200 | 20.0 | | .7874 | 20 | 101 | 153 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH421 SERIES**

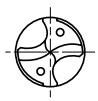
## CARBIDE, DREAM DRILLS with COOLANT HOLES

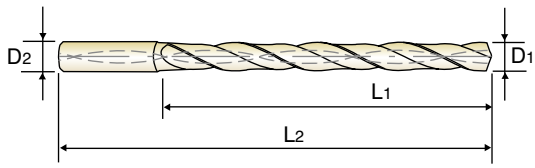
***EXTRA LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar | P.82

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421030 | 3.0 | | .1181 | 6 | 34 | 72 |
| DH421031 | 3.1 | | .1220 | 6 | 34 | 72 |
| DH421008F | 3.175 | 1/8 | .1250 | 6 | 34 | 72 |
| DH421032 | 3.2 | | .1260 | 6 | 34 | 72 |
| DH421033 | 3.3 | | .1299 | 6 | 34 | 72 |
| DH421034 | 3.4 | | .1339 | 6 | 34 | 72 |
| DH421229G | 3.450 | #29 | .1360 | 6 | 34 | 72 |
| DH421035 | 3.5 | | .1378 | 6 | 34 | 72 |
| DH421009F | 3.572 | 9/64 | .1406 | 6 | 34 | 72 |
| DH421036 | 3.6 | | .1417 | 6 | 34 | 72 |
| DH421037 | 3.7 | | .1457 | 6 | 34 | 72 |
| DH421038 | 3.8 | | .1496 | 6 | 43 | 81 |
| DH421039 | 3.9 | | .1535 | 6 | 43 | 81 |
| DH421010F | 3.969 | 5/32 | .1563 | 6 | 43 | 81 |
| DH421040 | 4.0 | | .1575 | 6 | 43 | 81 |
| DH421221G | 4.040 | #21 | .1590 | 6 | 43 | 81 |
| DH421041 | 4.1 | | .1614 | 6 | 43 | 81 |
| DH421042 | 4.2 | | .1654 | 6 | 43 | 81 |
| DH421043 | 4.3 | | .1693 | 6 | 43 | 81 |
| DH421011F | 4.366 | 11/64 | .1719 | 6 | 43 | 81 |
| DH421044 | 4.4 | | .1732 | 6 | 43 | 81 |
| DH421045 | 4.5 | | .1772 | 6 | 43 | 81 |
| DH421046 | 4.6 | | .1811 | 6 | 43 | 81 |
| DH421047 | 4.7 | | .1850 | 6 | 43 | 81 |
| DH421012F | 4.763 | 3/16 | .1875 | 6 | 57 | 95 |
| DH421048 | 4.8 | | .1890 | 6 | 57 | 95 |
| DH421049 | 4.9 | | .1929 | 6 | 57 | 95 |
| DH421050 | 5.0 | | .1969 | 6 | 57 | 95 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421051 | 5.1 | | .2008 | 6 | 57 | 95 |
| DH421013F | 5.159 | 13/64 | .2031 | 6 | 57 | 95 |
| DH421052 | 5.2 | | .2047 | 6 | 57 | 95 |
| DH421053 | 5.3 | | .2087 | 6 | 57 | 95 |
| DH421054 | 5.4 | | .2126 | 6 | 57 | 95 |
| DH421055 | 5.5 | | .2165 | 6 | 57 | 95 |
| DH421014F | 5.556 | 7/32 | .2188 | 6 | 57 | 95 |
| DH421056 | 5.6 | | .2205 | 6 | 57 | 95 |
| DH421057 | 5.7 | | .2244 | 6 | 57 | 95 |
| DH421058 | 5.8 | | .2283 | 6 | 57 | 95 |
| DH421059 | 5.9 | | .2323 | 6 | 57 | 95 |
| DH421015F | 5.953 | 15/64 | .2344 | 6 | 57 | 95 |
| DH421060 | 6.0 | | .2362 | 6 | 57 | 95 |
| DH421061 | 6.1 | | .2402 | 8 | 76 | 114 |
| DH421062 | 6.2 | | .2441 | 8 | 76 | 114 |
| DH421063 | 6.3 | | .2480 | 8 | 76 | 114 |
| DH421016F | 6.350 | 1/4 | .2500 | 8 | 76 | 114 |
| DH421064 | 6.4 | | .2520 | 8 | 76 | 114 |
| DH421065 | 6.5 | | .2559 | 8 | 76 | 114 |
| DH421106L | 6.53 | F | .2570 | 8 | 76 | 114 |
| DH421066 | 6.6 | | .2598 | 8 | 76 | 114 |
| DH421067 | 6.7 | | .2638 | 8 | 76 | 114 |
| DH421017F | 6.747 | 17/64 | .2656 | 8 | 76 | 114 |
| DH421068 | 6.8 | | .2677 | 8 | 76 | 114 |
| DH421069 | 6.9 | | .2717 | 8 | 76 | 114 |
| DH421070 | 7.0 | | .2756 | 8 | 76 | 114 |
| DH421071 | 7.1 | | .2795 | 8 | 76 | 114 |
| DH421018F | 7.144 | 9/32 | .2813 | 8 | 76 | 114 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium | |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | | |

# DREAM DRILLS -GENERAL

**DH421 SERIES**

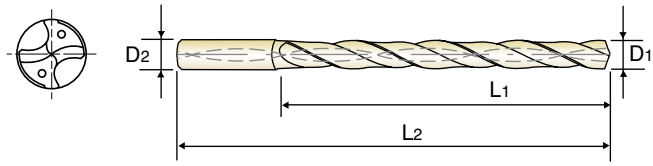
## CARBIDE, DREAM DRILLS with COOLANT HOLES

***EXTRA LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling






DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.82

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421072 | 7.2 | | .2835 | 8 | 76 | 114 |
| DH421073 | 7.3 | | .2874 | 8 | 76 | 114 |
| DH421074 | 7.4 | | .2913 | 8 | 76 | 114 |
| DH421075 | 7.5 | | .2953 | 8 | 76 | 114 |
| DH421019F | 7.541 | 19/64 | .2969 | 8 | 76 | 114 |
| DH421076 | 7.6 | | .2992 | 8 | 76 | 114 |
| DH421077 | 7.7 | | .3031 | 8 | 76 | 114 |
| DH421078 | 7.8 | | .3071 | 8 | 76 | 114 |
| DH421079 | 7.9 | | .3110 | 8 | 76 | 114 |
| DH421020F | 7.938 | 5/16 | .3125 | 8 | 76 | 114 |
| DH421080 | 8.0 | | .3150 | 8 | 76 | 114 |
| DH421081 | 8.1 | | .3189 | 10 | 95 | 142 |
| DH421082 | 8.2 | | .3228 | 10 | 95 | 142 |
| DH421083 | 8.3 | | .3268 | 10 | 95 | 142 |
| DH421021F | 8.334 | 21/64 | .3281 | 10 | 95 | 142 |
| DH421084 | 8.4 | | .3307 | 10 | 95 | 142 |
| DH421117L | 8.430 | Q | .3320 | 10 | 95 | 142 |
| DH421085 | 8.5 | | .3346 | 10 | 95 | 142 |
| DH421086 | 8.6 | | .3386 | 10 | 95 | 142 |
| DH421087 | 8.7 | | .3425 | 10 | 95 | 142 |
| DH421022F | 8.731 | 11/32 | .3438 | 10 | 95 | 142 |
| DH421088 | 8.8 | | .3465 | 10 | 95 | 142 |
| DH421089 | 8.9 | | .3504 | 10 | 95 | 142 |
| DH421090 | 9.0 | | .3543 | 10 | 95 | 142 |
| DH421091 | 9.1 | | .3583 | 10 | 95 | 142 |
| DH421023F | 9.128 | 23/64 | .3594 | 10 | 95 | 142 |
| DH421092 | 9.2 | | .3622 | 10 | 95 | 142 |
| DH421093 | 9.3 | | .3661 | 10 | 95 | 142 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421121L | 9.350 | U | .3680 | 10 | 95 | 142 |
| DH421094 | 9.4 | | .3701 | 10 | 95 | 142 |
| DH421095 | 9.5 | | .3740 | 10 | 95 | 142 |
| DH421024F | 9.525 | 3/8 | .3750 | 10 | 95 | 142 |
| DH421096 | 9.6 | | .3780 | 10 | 95 | 142 |
| DH421097 | 9.7 | | .3819 | 10 | 95 | 142 |
| DH421098 | 9.8 | | .3858 | 10 | 95 | 142 |
| DH421099 | 9.9 | | .3898 | 10 | 95 | 142 |
| DH421025F | 9.922 | 25/64 | .3906 | 10 | 95 | 142 |
| DH421100 | 10.0 | | .3937 | 10 | 95 | 142 |
| DH421101 | 10.1 | | .3976 | 12 | 114 | 162 |
| DH421102 | 10.2 | | .4016 | 12 | 114 | 162 |
| DH421103 | 10.3 | | .4055 | 12 | 114 | 162 |
| DH421026F | 10.319 | 13/32 | .4063 | 12 | 114 | 162 |
| DH421104 | 10.4 | | .4094 | 12 | 114 | 162 |
| DH421105 | 10.5 | | .4134 | 12 | 114 | 162 |
| DH421106 | 10.6 | | .4173 | 12 | 114 | 162 |
| DH421107 | 10.7 | | .4212 | 12 | 114 | 162 |
| DH421027F | 10.716 | 27/64 | .4219 | 12 | 114 | 162 |
| DH421108 | 10.8 | | .4252 | 12 | 114 | 162 |
| DH421109 | 10.9 | | .4291 | 12 | 114 | 162 |
| DH421110 | 11.0 | | .4330 | 12 | 114 | 162 |
| DH421111 | 11.1 | | .4370 | 12 | 114 | 162 |
| DH421028F | 11.113 | 7/16 | .4375 | 12 | 114 | 162 |
| DH421112 | 11.2 | | .4409 | 12 | 114 | 162 |
| DH421113 | 11.3 | | .4448 | 12 | 114 | 162 |
| DH421114 | 11.4 | | .4488 | 12 | 114 | 162 |
| DH421115 | 11.5 | | .4527 | 12 | 114 | 162 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

**DH421 SERIES**

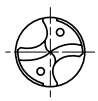
## CARBIDE, DREAM DRILLS with COOLANT HOLES

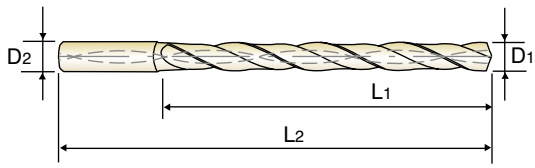
***EXTRA LONG***

▶ **Application** : Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

▶ **Advantages** : Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling








DIN 6537 | MG | h6 | m7 | 140° | 20 bar | P.82

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421116 | 11.6 | | .4566 | 12 | 114 | 162 |
| DH421117 | 11.7 | | .4606 | 12 | 114 | 162 |
| DH421118 | 11.8 | | .4645 | 12 | 114 | 162 |
| DH421119 | 11.9 | | .4685 | 12 | 114 | 162 |
| DH421030F | 11.906 | 15/32 | .4688 | 12 | 114 | 162 |
| DH421120 | 12.0 | | .4724 | 12 | 114 | 162 |
| DH421031F | 12.303 | 31/64 | .4844 | 14 | 133 | 178 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH421125 | 12.5 | | .4921 | 14 | 133 | 178 |
| DH421032F | 12.700 | 1/2 | .5000 | 14 | 133 | 178 |
| DH421130 | 13.0 | | .5118 | 14 | 133 | 178 |
| DH421033F | 13.097 | 33/64 | .5156 | 14 | 133 | 178 |
| DH421135 | 13.5 | | .5314 | 14 | 133 | 178 |
| DH421140 | 14.0 | | .5512 | 14 | 133 | 178 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ○ | ◎ | ◎ | | | | ○ | ○ | | | | | |

# DREAM DRILLS -GENERAL

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, DREAM DRILLS without COOLANT HOLES, TiAlN COATED

### DH414, DH722 SERIES

| WORK MATERIAL | | | | K | | | | P | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CAST IRON | | CAST IRON | | CARBON STEELS | | ALLOY STEELS | |
| STRENGTH | | | | < HRc24 | | > HRc24 | | < HB240, GG25 | | < HB300, GG40 | |
| DRILLING SPEED(SFM) | | | | 400 ~ 650 ft/min | | 280 ~ 430 ft/min | | 250 ~ 400 ft/min | | 210 ~ 350 ft/min | |
| DIAMETER | | | | N | IPR | N | IPR | N | IPR | N | IPR |
| Fractional | | Metric(mm) | | | | | | | | | |
| 1/8 | 3/16 | 3.175 | 4.763 | 13120 | .006 | 8750 | .005 | 7880 | .005 | 7000 | .005 |
| 3/16 | 5/16 | 4.763 | 7.938 | 8200 | .008 | 5470 | .006 | 4920 | .006 | 4370 | .006 |
| 5/16 | 3/8 | 7.938 | 9.525 | 5970 | .011 | 3980 | .009 | 3560 | .009 | 3190 | .009 |
| 3/8 | 1/2 | 9.525 | 12.700 | 4690 | .014 | 3120 | .011 | 2810 | .011 | 2500 | .011 |
| 1/2 | 9/16 | 12.700 | 14.288 | 3860 | .016 | 2570 | .012 | 2310 | .012 | 2060 | .012 |
| 9/16 | 13/16 | 14.288 | 20.638 | 2980 | .018 | 1990 | .014 | 1790 | .014 | 1590 | .014 |

▸ Recommend to reduce the feed rate as following
DH414(3xD) : Feed 100%
DH722(5xD) : Feed 85%

N = R.P.M
IPR = feed rate(inch/rev.)

## CARBIDE, DREAM DRILLS with COOLANT HOLES, TiAlN COATED

### DH416, DH418, DH711, DH712 SERIES

| WORK MATERIAL | | | | K | | | | P | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CAST IRON | | CAST IRON | | CARBON STEELS | | ALLOY STEELS | |
| STRENGTH | | | | < HRc24 | | > HRc24 | | < HB240, GG25 | | < HB300, GG40 | |
| DRILLING SPEED(SFM) | | | | 480 ~ 730 ft/min | | 310 ~ 490 ft/min | | 280 ~ 430 ft/min | | 250 ~ 400 ft/min | |
| DIAMETER | | | | N | IPR | N | IPR | N | IPR | N | IPR |
| Fractional | | Metric(mm) | | | | | | | | | |
| 1/8 | 3/16 | 3.175 | 4.763 | 14870 | .006 | 9620 | .006 | 8750 | .006 | 7880 | .005 |
| 3/16 | 5/16 | 4.763 | 7.938 | 8200 | .008 | 6010 | .008 | 5470 | .008 | 4920 | .006 |
| 5/16 | 3/8 | 7.938 | 9.525 | 6760 | .011 | 4370 | .011 | 3980 | .011 | 3580 | .009 |
| 3/8 | 1/2 | 9.525 | 12.700 | 5310 | .014 | 3440 | .014 | 3120 | .014 | 2810 | .011 |
| 1/2 | 9/16 | 12.700 | 14.288 | 4370 | .016 | 2830 | .016 | 2570 | .016 | 2310 | .012 |
| 9/16 | 13/16 | 14.288 | 20.638 | 3380 | .018 | 2190 | .018 | 1990 | .018 | 1790 | .014 |

▸ Recommend to reduce the feed rate as following
DH416/DH711(3xD) : Feed 100%
DH418/DH712(5xD) : Feed 85%

N = R.P.M
IPR= feed rate (Inch/rev.)

## CARBIDE, DREAM DRILLS without COOLANT HOLES, TiAlN COATED

### DH404, DH423, DH424 SERIES

| WORK MATERIAL | | P | | | | | | K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOY STEELS | | | ALLOY STEELS | | | SOFT GREY CAST IRON | | | HARD GREY CAST IRON | | |
| STRENGTH | | < HRc 20 | | | > HRc 20 | | | < 240 BHN | | | < 300 BHN | | |
| DRILLING SPEED | | 130 ~ 400 ft/min | | | 115 ~ 340 ft/min | | | 220 ~ 650 ft/min | | | 150 ~ 430 ft/min | | |
| DIAMETER | | N | S | IPR | N | S | IPR | N | S | IPR | N | S | IPR |
| Metric(mm) | Decimal | | | | | | | | | | | | |
| 1.0 | .0394 | 13000 | 0.04 | .002 | 11250 | 0.04 | .002 | 21300 | 0.04 | .002 | 14200 | 0.04 | .002 |
| 2.0 | .0787 | 13000 | 0.06 | .002 | 11250 | 0.06 | .002 | 21300 | 0.06 | .002 | 14200 | 0.06 | .002 |
| 3.0 | .1181 | 13000 | 0.13 | .005 | 11000 | 0.13 | .005 | 21000 | 0.13 | .005 | 14000 | 0.13 | .005 |
| 4.0 | .1575 | 9500 | 0.14 | .006 | 8400 | 0.14 | .006 | 16000 | 0.14 | .006 | 10500 | 0.14 | .006 |
| 5.0 | .1969 | 7600 | 0.15 | .006 | 6700 | 0.15 | .006 | 13000 | 0.15 | .006 | 8300 | 0.15 | .006 |
| 6.0 | .2362 | 6400 | 0.17 | .007 | 5600 | 0.17 | .007 | 11000 | 0.17 | .007 | 6900 | 0.17 | .007 |
| 7.0 | .2756 | 5500 | 0.19 | .007 | 4800 | 0.19 | .007 | 9100 | 0.19 | .007 | 5900 | 0.19 | .007 |
| 8.0 | .3150 | 4800 | 0.21 | .008 | 4200 | 0.21 | .008 | 8000 | 0.21 | .008 | 5200 | 0.21 | .008 |
| 9.0 | .3543 | 4200 | 0.23 | .009 | 3700 | 0.23 | .009 | 7100 | 0.23 | .009 | 4600 | 0.23 | .009 |
| 10.0 | .3937 | 3800 | 0.25 | .010 | 3350 | 0.25 | .010 | 6400 | 0.25 | .010 | 4150 | 0.25 | .010 |
| 12.0 | .4724 | 3200 | 0.27 | .011 | 2800 | 0.27 | .011 | 5300 | 0.27 | .011 | 3450 | 0.27 | .011 |
| 14.0 | .5512 | 2750 | 0.29 | .011 | 2400 | 0.29 | .011 | 4550 | 0.29 | .011 | 3000 | 0.29 | .011 |
| 16.0 | .6299 | 2400 | 0.31 | .012 | 2100 | 0.31 | .012 | 4000 | 0.31 | .012 | 2600 | 0.31 | .012 |
| 18.0 | .7087 | 2100 | 0.33 | .013 | 1850 | 0.33 | .013 | 3550 | 0.33 | .013 | 2300 | 0.33 | .013 |
| 20.0 | .7874 | 1900 | 0.35 | .014 | 1650 | 0.35 | .014 | 3200 | 0.35 | .014 | 2100 | 0.35 | .014 |

▶ Recommend to reduce the feed rate as following
DH404(3xD), DH423(3xD) : Feed 100%
DH424(5xD) : Feed 85%

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

# DREAM DRILLS -GENERAL

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, DREAM DRILLS with COOLANT HOLES, TiAlN COATED

### DH406, DH408, DH421 SERIES

| WORK MATERIAL | | P | | | | | | K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOY STEELS | | | ALLOY STEELS | | | SOFT GREY CAST IRON | | | HARD GREY CAST IRON | | |
| STRENGTH | | < HRc 20 | | | > HRc 20 | | | < 240 BHN | | | < 300 BHN | | |
| DRILLING SPEED | | 160 ~ 490 ft/min | | | 150 ~ 440 ft/min | | | 270 ~ 820 ft/min | | | 170 ~ 530 ft/min | | |
| DIAMETER | | N | S | IPR | N | S | IPR | N | S | IPR | N | S | IPR |
| Metric(mm) | Decimal | | | | | | | | | | | | |
| 1.0 | .0394 | 16250 | 0.05 | .002 | 14800 | 0.05 | .002 | 26600 | 0.05 | .002 | 17300 | 0.05 | .002 |
| 2.0 | .0787 | 16250 | 0.07 | .003 | 14800 | 0.07 | .003 | 26600 | 0.07 | .003 | 17300 | 0.07 | .003 |
| 3.0 | .1181 | 16000 | 0.16 | .006 | 14500 | 0.16 | .006 | 26000 | 0.16 | .006 | 17000 | 0.16 | .006 |
| 4.0 | .1575 | 12000 | 0.17 | .007 | 11000 | 0.17 | .007 | 20000 | 0.17 | .007 | 13000 | 0.17 | .007 |
| 5.0 | .1969 | 9550 | 0.18 | .007 | 8600 | 0.18 | .007 | 16000 | 0.18 | .007 | 10000 | 0.18 | .007 |
| 6.0 | .2362 | 8000 | 0.20 | .008 | 7200 | 0.20 | .008 | 13000 | 0.20 | .008 | 8500 | 0.20 | .008 |
| 7.0 | .2756 | 6800 | 0.22 | .009 | 6100 | 0.22 | .009 | 11500 | 0.22 | .009 | 7300 | 0.22 | .009 |
| 8.0 | .3150 | 6000 | 0.24 | .009 | 5400 | 0.24 | .009 | 9900 | 0.24 | .009 | 6400 | 0.24 | .009 |
| 9.0 | .3543 | 5300 | 0.27 | .011 | 4800 | 0.27 | .011 | 8800 | 0.27 | .011 | 5700 | 0.27 | .011 |
| 10.0 | .3937 | 4800 | 0.30 | .012 | 4300 | 0.30 | .012 | 8000 | 0.30 | .012 | 5100 | 0.30 | .012 |
| 12.0 | .4724 | 4000 | 0.33 | .013 | 3600 | 0.33 | .013 | 6600 | 0.33 | .013 | 4250 | 0.33 | .013 |
| 14.0 | .5512 | 3400 | 0.36 | .014 | 3050 | 0.36 | .014 | 5700 | 0.36 | .014 | 3650 | 0.36 | .014 |
| 16.0 | .6299 | 3000 | 0.39 | .015 | 2700 | 0.39 | .015 | 5000 | 0.39 | .015 | 3200 | 0.39 | .015 |
| 18.0 | .7087 | 2650 | 0.42 | .017 | 2400 | 0.42 | .017 | 4400 | 0.42 | .017 | 2850 | 0.42 | .017 |
| 20.0 | .7874 | 2400 | 0.45 | .018 | 2150 | 0.45 | .018 | 4000 | 0.45 | .018 | 2550 | 0.45 | .018 |

▶ Recommend to reduce the feed rate as following
DH406(3xD) : Feed 100%, DH408(5xD) : Feed 85%
DH421(8xD) : Feed 70%

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

# CARBIDE

Being the best through innovation



# DREAM DRILLS - HIGH FEED

**WITH COOLANT HOLES**
**- for Carbon Steels, Alloy Steels (up to HRc35) and Cast Iron**

## SOLID CARBIDE DREAM DRILLS - HIGH FEED (with Coolant Holes)


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| 3XD DGR493 |  | CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES *SHORT* | .1969 | .7874 | **86** |
| 5XD DGR495 |  | CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES *LONG* | .1969 | .7874 | **89** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **92** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | | | | |

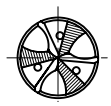
# DREAM DRILLS -HIGH FEED

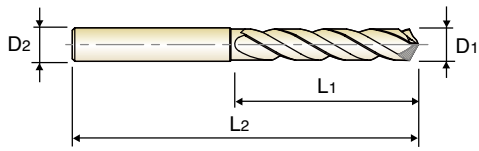
**DGR493 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES — *SHORT*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

3 × D

Unit : mm

| EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | D2 | L1 | L2 | H-Coating | D1 | | D2 | L1 | L2 |
| DGR493050 | .1969 | 5.00 | 6 | 28 | 66 | DGR493069 | .2717 | 6.90 | 8 | 34 | 79 |
| DGR493051 | .2008 | 5.10 | 6 | 28 | 66 | DGR496209 I | .2720 | 6.91 | 5/16 | 34 | 79 |
| DGR496013 13/64 | .2031 | 5.16 | 1/4 | 28 | 66 | DGR493070 | .2756 | 7.00 | 8 | 34 | 79 |
| DGR493052 | .2047 | 5.20 | 6 | 28 | 66 | DGR493071 | .2795 | 7.10 | 8 | 41 | 79 |
| DGR493053 | .2087 | 5.30 | 6 | 28 | 66 | DGR496018 9/32 | .2813 | 7.14 | 5/16 | 41 | 79 |
| DGR493054 | .2126 | 5.40 | 6 | 28 | 66 | DGR493072 | .2835 | 7.20 | 8 | 41 | 79 |
| DGR496103 #3 | .2130 | 5.41 | 1/4 | 28 | 66 | DGR493073 | .2874 | 7.30 | 8 | 41 | 79 |
| DGR493055 | .2165 | 5.50 | 6 | 28 | 66 | DGR493074 | .2913 | 7.40 | 8 | 41 | 79 |
| DGR496014 7/32 | .2188 | 5.56 | 1/4 | 28 | 66 | DGR493075 | .2953 | 7.50 | 8 | 41 | 79 |
| DGR493056 | .2205 | 5.60 | 6 | 28 | 66 | DGR496019 19/64 | .2969 | 7.54 | 5/16 | 41 | 79 |
| DGR496102 #2 | .2210 | 5.61 | 1/4 | 28 | 66 | DGR493076 | .2992 | 7.60 | 8 | 41 | 79 |
| DGR493057 | .2244 | 5.70 | 6 | 28 | 66 | DGR493077 | .3031 | 7.70 | 8 | 41 | 79 |
| DGR496101 #1 | .2280 | 5.79 | 1/4 | 28 | 66 | DGR493078 | .3071 | 7.80 | 8 | 41 | 79 |
| DGR493058 | .2283 | 5.80 | 6 | 28 | 66 | DGR493079 | .3110 | 7.90 | 8 | 41 | 79 |
| DGR493059 | .2323 | 5.90 | 6 | 28 | 66 | DGR496020 5/16 | .3125 | 7.94 | 5/16 | 41 | 79 |
| DGR496015 15/64 | .2344 | 5.95 | 1/4 | 28 | 66 | DGR493080 | .3150 | 8.00 | 8 | 41 | 79 |
| DGR493060 | .2362 | 6.00 | 6 | 28 | 66 | DGR493081 | .3189 | 8.10 | 10 | 47 | 89 |
| DGR493061 | .2402 | 6.10 | 8 | 34 | 79 | DGR493082 P | .3228 | 8.20 | 10 | 47 | 89 |
| DGR493062 | .2441 | 6.20 | 8 | 34 | 79 | DGR493083 | .3268 | 8.30 | 10 | 47 | 89 |
| DGR493063 | .2480 | 6.30 | 8 | 34 | 79 | DGR496021 21/64 | .3281 | 8.33 | 3/8 | 47 | 89 |
| DGR496016 1/4 | .2500 | 6.35 | 1/4 | 34 | 79 | DGR493084 | .3307 | 8.40 | 10 | 47 | 89 |
| DGR493064 | .2520 | 6.40 | 8 | 34 | 79 | DGR496217 Q | .3320 | 8.43 | 3/8 | 47 | 89 |
| DGR493065 | .2559 | 6.50 | 8 | 34 | 79 | DGR493085 | .3346 | 8.50 | 10 | 47 | 89 |
| DGR496206 F | .2570 | 6.53 | 5/16 | 34 | 79 | DGR493086 | .3386 | 8.60 | 10 | 47 | 89 |
| DGR493066 | .2598 | 6.60 | 8 | 34 | 79 | DGR493087 | .3425 | 8.70 | 10 | 47 | 89 |
| DGR493067 | .2638 | 6.70 | 8 | 34 | 79 | DGR496022 11/32 | .3437 | 8.73 | 3/8 | 47 | 89 |
| DGR496017 17/64 | .2656 | 6.75 | 5/16 | 34 | 79 | DGR493088 | .3465 | 8.80 | 10 | 47 | 89 |
| DGR493068 | .2677 | 6.80 | 8 | 34 | 79 | DGR493089 | .3504 | 8.90 | 10 | 47 | 89 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

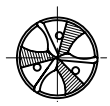
# DREAM DRILLS -HIGH FEED

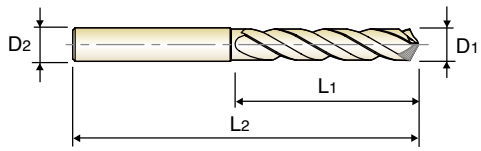
**DGR493 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES — *SHORT*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

3 × D

Unit : mm

| EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | D2 | L1 | L2 | H-Coating | D1 | | D2 | L1 | L2 |
| DGR493090 | | .3543 | 9.00 | 10 | 47 | 89 | DGR496028 | 7/16 | .4375 | 11.11 | 7/16 | 55 | 102 |
| DGR493091 | | .3583 | 9.10 | 10 | 47 | 89 | DGR493112 | | .4409 | 11.20 | 12 | 55 | 102 |
| DGR496023 | 23/64 | .3594 | 9.13 | 3/8 | 47 | 89 | DGR493113 | | .4449 | 11.30 | 12 | 55 | 102 |
| DGR493092 | | .3622 | 9.20 | 10 | 47 | 89 | DGR493114 | | .4488 | 11.40 | 12 | 55 | 102 |
| DGR493093 | | .3661 | 9.30 | 10 | 47 | 89 | DGR493115 | | .4528 | 11.50 | 12 | 55 | 102 |
| DGR496221 | U | .3680 | 9.35 | 3/8 | 47 | 89 | DGR496029 | 29/64 | .4531 | 11.51 | 1/2 | 55 | 102 |
| DGR493094 | | 0.3701 | 9.40 | 10 | 47 | 89 | DGR493116 | | .4567 | 11.60 | 12 | 55 | 102 |
| DGR493095 | | .3740 | 9.50 | 10 | 47 | 89 | DGR493117 | | .4606 | 11.70 | 12 | 55 | 102 |
| DGR496024 | 3/8 | 0.3750 | 9.53 | 3/8 | 47 | 89 | DGR493118 | | .4646 | 11.80 | 12 | 55 | 102 |
| DGR493096 | | .3780 | 9.60 | 10 | 47 | 89 | DGR493119 | | .4685 | 11.90 | 12 | 55 | 102 |
| DGR493097 | | .3819 | 9.70 | 10 | 47 | 89 | DGR496030 | 15/32 | .4688 | 11.91 | 1/2 | 55 | 102 |
| DGR493098 | W | .3858 | 9.80 | 10 | 47 | 89 | DGR493120 | | .4724 | 12.00 | 12 | 55 | 102 |
| DGR493099 | | .3898 | 9.90 | 10 | 47 | 89 | DGR493121 | | .4764 | 12.10 | 14 | 60 | 107 |
| DGR496025 | 25/64 | .3906 | 9.92 | 7/16 | 47 | 89 | DGR493122 | | .4803 | 12.20 | 14 | 60 | 107 |
| DGR493100 | | .3937 | 10.00 | 10 | 47 | 89 | DGR493123 | | .4843 | 12.30 | 14 | 60 | 107 |
| DGR493101 | | .3976 | 10.10 | 12 | 55 | 102 | DGR496031 | 31/64 | .4844 | 12.30 | 1/2 | 60 | 107 |
| DGR493102 | | .4016 | 10.20 | 12 | 55 | 102 | DGR493124 | | .4882 | 12.40 | 14 | 60 | 107 |
| DGR493103 | | .4055 | 10.30 | 12 | 55 | 102 | DGR493125 | | .4921 | 12.50 | 14 | 60 | 107 |
| DGR496026 | 13/32 | .4063 | 10.32 | 7/16 | 55 | 102 | DGR493126 | | .4961 | 12.60 | 14 | 60 | 107 |
| DGR493104 | | .4094 | 10.40 | 12 | 55 | 102 | DGR496032 | 1/2 | .5000 | 12.70 | 1/2 | 60 | 107 |
| DGR493105 | | .4134 | 10.50 | 12 | 55 | 102 | DGR493127 | | .5000 | 12.70 | 14 | 60 | 107 |
| DGR493106 | | .4173 | 10.60 | 12 | 55 | 102 | DGR493128 | | .5039 | 12.80 | 14 | 60 | 107 |
| DGR493107 | | .4213 | 10.70 | 12 | 55 | 102 | DGR493129 | | .5079 | 12.90 | 14 | 60 | 107 |
| DGR496027 | 27/64 | .4219 | 10.72 | 7/16 | 55 | 102 | DGR493130 | | .5118 | 13.00 | 14 | 60 | 107 |
| DGR493108 | | .4252 | 10.80 | 12 | 55 | 102 | DGR493131 | 33/64 | .5156 | 13.10 | 14 | 60 | 107 |
| DGR493109 | | .4291 | 10.90 | 12 | 55 | 102 | DGR493132 | | .5197 | 13.20 | 14 | 60 | 107 |
| DGR493110 | | .4331 | 11.00 | 12 | 55 | 102 | DGR493133 | | .5236 | 13.30 | 14 | 60 | 107 |
| DGR493111 | | .4370 | 11.10 | 12 | 55 | 102 | DGR493134 | | .5276 | 13.40 | 14 | 60 | 107 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

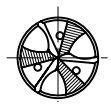
# DREAM DRILLS -HIGH FEED

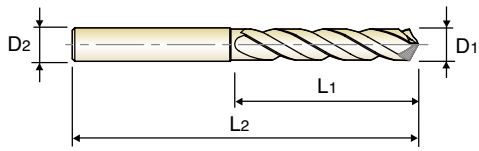
**DGR493 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES — *SHORT*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

3 × D

Unit : mm

| EDP No. | Diameter Inch | | Diameter Metric | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | | | D2 | L1 | L2 |
| DGR496034 | 17/32 | .5312 | 13.49 | | 9/16 | 60 | 107 |
| DGR493135 | | .5315 | 13.50 | | 14 | 60 | 107 |
| DGR493136 | | .5354 | 13.60 | | 14 | 60 | 107 |
| DGR493137 | | .5394 | 13.70 | | 14 | 60 | 107 |
| DGR493138 | | .5433 | 13.80 | | 14 | 60 | 107 |
| DGR496035 | 35/64 | .5469 | 13.89 | | 9/16 | 60 | 107 |
| DGR493139 | | .5472 | 13.90 | | 14 | 60 | 107 |
| DGR493140 | | .5512 | 14.00 | | 14 | 60 | 107 |
| DGR493141 | | .5551 | 14.10 | | 16 | 65 | 115 |
| DGR493142 | | .5591 | 14.20 | | 16 | 65 | 115 |
| DGR496036 | 9/16 | .5625 | 14.29 | | 9/16 | 65 | 115 |
| DGR493143 | | .5630 | 14.30 | | 16 | 65 | 115 |
| DGR493144 | | .5669 | 14.40 | | 16 | 65 | 115 |
| DGR493145 | | .5709 | 14.50 | | 16 | 65 | 115 |
| DGR493146 | | .5748 | 14.60 | | 16 | 65 | 115 |
| DGR496037 | 37/64 | .5781 | 14.68 | | 5/8 | 65 | 115 |
| DGR493147 | | .5787 | 14.70 | | 16 | 65 | 115 |
| DGR493148 | | .5827 | 14.80 | | 16 | 65 | 115 |
| DGR493149 | | .5866 | 14.90 | | 16 | 65 | 115 |
| DGR493150 | | .5906 | 15.00 | | 16 | 65 | 115 |
| DGR496038 | 19/32 | .5938 | 15.08 | | 5/8 | 65 | 115 |
| DGR493151 | | .5945 | 15.10 | | 16 | 65 | 115 |
| DGR493152 | | .5984 | 15.20 | | 16 | 65 | 115 |
| DGR493153 | | .6024 | 15.30 | | 16 | 65 | 115 |
| DGR493154 | | .6063 | 15.40 | | 16 | 65 | 115 |

| EDP No. | Diameter Inch | | Diameter Metric | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | | | D2 | L1 | L2 |
| DGR496039 | 39/64 | .6094 | 15.48 | | 5/8 | 65 | 115 |
| DGR493155 | | .6102 | 15.50 | | 16 | 65 | 115 |
| DGR493156 | | .6142 | 15.60 | | 16 | 65 | 115 |
| DGR493157 | | .6181 | 15.70 | | 16 | 65 | 115 |
| DGR493158 | | .6220 | 15.80 | | 16 | 65 | 115 |
| DGR496040 | 5/8 | .6250 | 15.88 | | 5/8 | 65 | 115 |
| DGR493159 | | .6260 | 15.90 | | 16 | 65 | 115 |
| DGR493160 | | .6299 | 16.00 | | 16 | 65 | 115 |
| DGR493161 | | .6339 | 16.10 | | 18 | 73 | 123 |
| DGR496041 | 41/64 | .6406 | 16.27 | | 11/16 | 73 | 123 |
| DGR493165 | | .6496 | 16.50 | | 18 | 73 | 123 |
| DGR496042 | 21/32 | .6563 | 16.67 | | 11/16 | 73 | 123 |
| DGR493170 | | .6693 | 17.00 | | 18 | 73 | 123 |
| DGR496043 | 43/64 | .6719 | 17.07 | | 11/16 | 73 | 123 |
| DGR496044 | 11/16 | .6875 | 17.46 | | 11/16 | 73 | 123 |
| DGR493175 | | .6890 | 17.50 | | 18 | 73 | 123 |
| DGR496045 | 45/64 | .7031 | 17.86 | | 3/4 | 73 | 123 |
| DGR493180 | | .7087 | 18.00 | | 18 | 73 | 123 |
| DGR496046 | 23/32 | .7188 | 18.26 | | 3/4 | 79 | 131 |
| DGR493185 | | .7283 | 18.50 | | 20 | 79 | 131 |
| DGR496047 | 47/64 | .7344 | 18.65 | | 3/4 | 79 | 131 |
| DGR493190 | | .7480 | 19.00 | | 20 | 79 | 131 |
| DGR496048 | 3/4 | .7500 | 19.05 | | 3/4 | 79 | 131 |
| DGR493195 | | .7677 | 19.50 | | 20 | 79 | 131 |
| DGR493200 | | .7874 | 20.00 | | 20 | 79 | 131 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

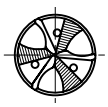
# DREAM DRILLS -HIGH FEED

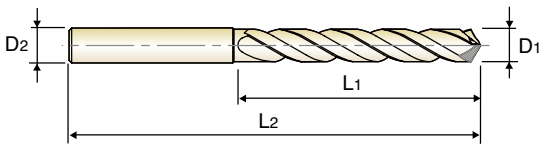
**DGR495 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES *LONG*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

5 × D

Unit : mm

| EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | D2 | L1 | L2 | H-Coating | D1 | | D2 | L1 | L2 |
| DGR495050 | | .1969 | 5.00 | 6 | 44 | 82 | DGR495069 | | .2717 | 6.90 | 8 | 53 | 91 |
| DGR495051 | | .2008 | 5.10 | 6 | 44 | 82 | DGR497209 | I | .2720 | 6.91 | 5/16 | 53 | 91 |
| DGR497013 | 13/64 | .2031 | 5.16 | 1/4 | 44 | 82 | DGR495070 | | .2756 | 7.00 | 8 | 53 | 91 |
| DGR495052 | | .2047 | 5.20 | 6 | 44 | 82 | DGR495071 | | .2795 | 7.10 | 8 | 53 | 91 |
| DGR495053 | | .2087 | 5.30 | 6 | 44 | 82 | DGR497018 | 9/32 | .2813 | 7.14 | 5/16 | 53 | 91 |
| DGR495054 | | .2126 | 5.40 | 6 | 44 | 82 | DGR495072 | | .2835 | 7.20 | 8 | 53 | 91 |
| DGR497103 | #3 | .2130 | 5.41 | 1/4 | 44 | 82 | DGR495073 | | .2874 | 7.30 | 8 | 53 | 91 |
| DGR495055 | | .2165 | 5.50 | 6 | 44 | 82 | DGR495074 | | .2913 | 7.40 | 8 | 53 | 91 |
| DGR497014 | 7/32 | .2188 | 5.56 | 1/4 | 44 | 82 | DGR495075 | | .2953 | 7.50 | 8 | 53 | 91 |
| DGR495056 | | .2205 | 5.60 | 6 | 44 | 82 | DGR497019 | 19/64 | .2969 | 7.54 | 5/16 | 53 | 91 |
| DGR497102 | #2 | .2210 | 5.61 | 1/4 | 44 | 82 | DGR495076 | | .2992 | 7.60 | 8 | 53 | 91 |
| DGR495057 | | .2244 | 5.70 | 6 | 44 | 82 | DGR495077 | | .3031 | 7.70 | 8 | 53 | 91 |
| DGR497101 | #1 | .2280 | 5.79 | 1/4 | 44 | 82 | DGR495078 | | .3071 | 7.80 | 8 | 53 | 91 |
| DGR495058 | | .2283 | 5.80 | 6 | 44 | 82 | DGR495079 | | .3110 | 7.90 | 8 | 53 | 91 |
| DGR495059 | | .2323 | 5.90 | 6 | 44 | 82 | DGR497020 | 5/16 | .3125 | 7.94 | 5/16 | 53 | 91 |
| DGR497015 | 15/64 | .2344 | 5.95 | 1/4 | 44 | 82 | DGR495080 | | .3150 | 8.00 | 8 | 53 | 91 |
| DGR495060 | | .2362 | 6.00 | 6 | 44 | 82 | DGR495081 | | .3189 | 8.10 | 10 | 61 | 103 |
| DGR495061 | | .2402 | 6.10 | 8 | 53 | 91 | DGR495082 | P | .3228 | 8.20 | 10 | 61 | 103 |
| DGR495062 | | .2441 | 6.20 | 8 | 53 | 91 | DGR495083 | | .3268 | 8.30 | 10 | 61 | 103 |
| DGR495063 | | .2480 | 6.30 | 8 | 53 | 91 | DGR497021 | 21/64 | .3281 | 8.33 | 3/8 | 61 | 103 |
| DGR497016 | 1/4 | .2500 | 6.35 | 1/4 | 53 | 91 | DGR495084 | | .3307 | 8.40 | 10 | 61 | 103 |
| DGR495064 | | .2520 | 6.40 | 8 | 53 | 91 | DGR497217 | Q | .3320 | 8.43 | 3/8 | 61 | 103 |
| DGR495065 | | .2559 | 6.50 | 8 | 53 | 91 | DGR495085 | | .3346 | 8.50 | 10 | 61 | 103 |
| DGR497206 | F | .2570 | 6.53 | 5/16 | 53 | 91 | DGR495086 | | .3386 | 8.60 | 10 | 61 | 103 |
| DGR495066 | | .2598 | 6.60 | 8 | 53 | 91 | DGR495087 | | .3425 | 8.70 | 10 | 61 | 103 |
| DGR495067 | | .2638 | 6.70 | 8 | 53 | 91 | DGR497022 | 11/32 | .3437 | 8.73 | 3/8 | 61 | 103 |
| DGR497017 | 17/64 | .2656 | 6.75 | 5/16 | 53 | 91 | DGR495088 | | .3465 | 8.80 | 10 | 61 | 103 |
| DGR495068 | | .2677 | 6.80 | 8 | 53 | 91 | DGR495089 | | .3504 | 8.90 | 10 | 61 | 103 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

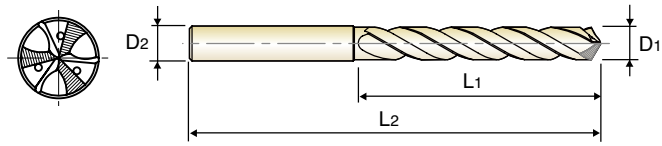
# YG DREAM DRILLS -HIGH FEED

**DGR495 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES — *LONG*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering






DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

5 × D

Unit : mm

| EDP No. | Diameter Inch | | Diameter Metric | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | | | D2 | L1 | L2 |
| DGR495090 | | .3543 | 9.00 | | 10 | 61 | 103 |
| DGR495091 | | .3583 | 9.10 | | 10 | 61 | 103 |
| DGR497023 | 23/64 | .3594 | 9.13 | | 3/8 | 61 | 103 |
| DGR495092 | | .3622 | 9.20 | | 10 | 61 | 103 |
| DGR495093 | | .3661 | 9.30 | | 10 | 61 | 103 |
| DGR497221 | U | .3680 | 9.35 | | 3/8 | 61 | 103 |
| DGR495094 | | .3701 | 9.40 | | 10 | 61 | 103 |
| DGR495095 | | .3740 | 9.50 | | 10 | 61 | 103 |
| DGR497024 | 3/8 | .3750 | 9.53 | | 3/8 | 61 | 103 |
| DGR495096 | | .3780 | 9.60 | | 10 | 61 | 103 |
| DGR495097 | | .3819 | 9.70 | | 10 | 61 | 103 |
| DGR495098 | W | .3858 | 9.80 | | 10 | 61 | 103 |
| DGR495099 | | .3898 | 9.90 | | 10 | 61 | 103 |
| DGR497025 | 25/64 | .3906 | 9.92 | | 7/16 | 61 | 103 |
| DGR495100 | | .3937 | 10.00 | | 10 | 61 | 103 |
| DGR495101 | | .3976 | 10.10 | | 12 | 71 | 118 |
| DGR495102 | | .4016 | 10.20 | | 12 | 71 | 118 |
| DGR495103 | | .4055 | 10.30 | | 12 | 71 | 118 |
| DGR497026 | 13/32 | .4063 | 10.32 | | 7/16 | 71 | 118 |
| DGR495104 | | .4094 | 10.40 | | 12 | 71 | 118 |
| DGR495105 | | .4134 | 10.50 | | 12 | 71 | 118 |
| DGR495106 | | .4173 | 10.60 | | 12 | 71 | 118 |
| DGR495107 | | .4213 | 10.70 | | 12 | 71 | 118 |
| DGR497027 | 27/64 | .4219 | 10.72 | | 7/16 | 71 | 118 |
| DGR495108 | | .4252 | 10.80 | | 12 | 71 | 118 |
| DGR495109 | | .4291 | 10.90 | | 12 | 71 | 118 |
| DGR495110 | | .4331 | 11.00 | | 12 | 71 | 118 |
| DGR495111 | | .4370 | 11.10 | | 12 | 71 | 118 |

| EDP No. | Diameter Inch | | Diameter Metric | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | | | D2 | L1 | L2 |
| DGR497028 | 7/16 | .4375 | 11.11 | | 7/16 | 71 | 118 |
| DGR495112 | | .4409 | 11.20 | | 12 | 71 | 118 |
| DGR495113 | | .4449 | 11.30 | | 12 | 71 | 118 |
| DGR495114 | | .4488 | 11.40 | | 12 | 71 | 118 |
| DGR495115 | | .4528 | 11.50 | | 12 | 71 | 118 |
| DGR497029 | 29/64 | .4531 | 11.51 | | 1/2 | 71 | 118 |
| DGR495116 | | .4567 | 11.60 | | 12 | 71 | 118 |
| DGR495117 | | .4606 | 11.70 | | 12 | 71 | 118 |
| DGR495118 | | .4646 | 11.80 | | 12 | 71 | 118 |
| DGR495119 | | .4685 | 11.90 | | 12 | 71 | 118 |
| DGR497030 | 15/32 | .4688 | 11.91 | | 1/2 | 71 | 118 |
| DGR495120 | | .4724 | 12.00 | | 12 | 71 | 118 |
| DGR495121 | | .4764 | 12.10 | | 14 | 77 | 124 |
| DGR495122 | | .4803 | 12.20 | | 14 | 77 | 124 |
| DGR495123 | | .4843 | 12.30 | | 14 | 77 | 124 |
| DGR497031 | 31/64 | .4844 | 12.30 | | 1/2 | 77 | 124 |
| DGR495124 | | .4882 | 12.40 | | 14 | 77 | 124 |
| DGR495125 | | .4921 | 12.50 | | 14 | 77 | 124 |
| DGR495126 | | .4961 | 12.60 | | 14 | 77 | 124 |
| DGR497032 | 1/2 | .5000 | 12.70 | | 1/2 | 77 | 124 |
| DGR495127 | | .5000 | 12.70 | | 14 | 77 | 124 |
| DGR495128 | | .5039 | 12.80 | | 14 | 77 | 124 |
| DGR495129 | | .5079 | 12.90 | | 14 | 77 | 124 |
| DGR495130 | | .5118 | 13.00 | | 14 | 77 | 124 |
| DGR495131 | 33/64 | .5156 | 13.10 | | 14 | 77 | 124 |
| DGR495132 | | .5197 | 13.20 | | 14 | 77 | 124 |
| DGR495133 | | .5236 | 13.30 | | 14 | 77 | 124 |
| DGR495134 | | .5276 | 13.40 | | 14 | 77 | 124 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

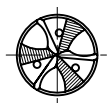
# DREAM DRILLS -HIGH FEED

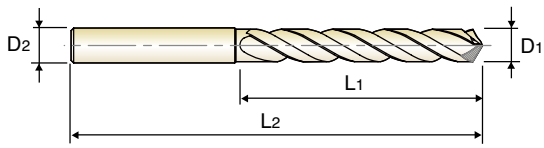
**DGR495 SERIES**

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES — *LONG*

▶ Application : Carbon Steels, Alloy Steels (~ HRc35), Cast Iron
▶ Advantage : – Increases productivity due to 1.5 to 2 times faster feeding speed than 2-flute drill
– Multi-Layer coating delivers much better productivity and reliability.
– Self-Centering








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.92

5 × D

Unit : mm

| EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length | EDP No. | Diameter Inch | Diameter Metric | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H-Coating | D1 | | D2 | L1 | L2 | H-Coating | D1 | | D2 | L1 | L2 |
| DGR497034 | 17/32 | .5312 | 13.49 | 9/16 | 77 | 124 | DGR497039 | 39/64 | .6094 | 15.48 | 5/8 | 83 | 133 |
| DGR495135 | | .5315 | 13.50 | 14 | 77 | 124 | DGR495155 | | .6102 | 15.50 | 16 | 83 | 133 |
| DGR495136 | | .5354 | 13.60 | 14 | 77 | 124 | DGR495156 | | .6142 | 15.60 | 16 | 83 | 133 |
| DGR495137 | | .5394 | 13.70 | 14 | 77 | 124 | DGR495157 | | .6181 | 15.70 | 16 | 83 | 133 |
| DGR495138 | | .5433 | 13.80 | 14 | 77 | 124 | DGR495158 | | .6220 | 15.80 | 16 | 83 | 133 |
| DGR497035 | 35/64 | .5469 | 13.89 | 9/16 | 77 | 124 | DGR497040 | 5/8 | .6250 | 15.88 | 5/8 | 83 | 133 |
| DGR495139 | | .5472 | 13.90 | 14 | 77 | 124 | DGR495159 | | .6260 | 15.90 | 16 | 83 | 133 |
| DGR495140 | | .5512 | 14.00 | 14 | 77 | 124 | DGR495160 | | .6299 | 16.00 | 16 | 83 | 133 |
| DGR495141 | | .5551 | 14.10 | 16 | 83 | 133 | DGR495161 | | .6339 | 16.10 | 18 | 93 | 143 |
| DGR495142 | | .5591 | 14.20 | 16 | 83 | 133 | DGR497041 | 41/64 | .6406 | 16.27 | 11/16 | 93 | 143 |
| DGR497036 | 9/16 | .5625 | 14.29 | 9/16 | 83 | 133 | DGR495165 | | .6496 | 16.50 | 18 | 93 | 143 |
| DGR495143 | | .5630 | 14.30 | 16 | 83 | 133 | DGR497042 | 21/32 | .6563 | 16.67 | 11/16 | 93 | 143 |
| DGR495144 | | .5669 | 14.40 | 16 | 83 | 133 | DGR495170 | | .6693 | 17.00 | 18 | 93 | 143 |
| DGR495145 | | .5709 | 14.50 | 16 | 83 | 133 | DGR497043 | 43/64 | .6719 | 17.07 | 11/16 | 93 | 143 |
| DGR495146 | | .5748 | 14.60 | 16 | 83 | 133 | DGR497044 | 11/16 | .6875 | 17.46 | 11/16 | 93 | 143 |
| DGR497037 | 37/64 | .5781 | 14.68 | 5/8 | 83 | 133 | DGR495175 | | .6890 | 17.50 | 18 | 93 | 143 |
| DGR495147 | | .5787 | 14.70 | 16 | 83 | 133 | DGR497045 | 45/64 | .7031 | 17.86 | 3/4 | 93 | 143 |
| DGR495148 | | .5827 | 14.80 | 16 | 83 | 133 | DGR495180 | | .7087 | 18.00 | 18 | 93 | 143 |
| DGR495149 | | .5866 | 14.90 | 16 | 83 | 133 | DGR497046 | 23/32 | .7188 | 18.26 | 3/4 | 101 | 153 |
| DGR495150 | | .5906 | 15.00 | 16 | 83 | 133 | DGR495185 | | .7283 | 18.50 | 20 | 101 | 153 |
| DGR497038 | 19/32 | .5938 | 15.08 | 5/8 | 83 | 133 | DGR497047 | 47/64 | .7344 | 18.65 | 3/4 | 101 | 153 |
| DGR495151 | | .5945 | 15.10 | 16 | 83 | 133 | DGR495190 | | .7480 | 19.00 | 20 | 101 | 153 |
| DGR495152 | | .5984 | 15.20 | 16 | 83 | 133 | DGR497048 | 3/4 | .7500 | 19.05 | 3/4 | 101 | 153 |
| DGR495153 | | .6024 | 15.30 | 16 | 83 | 133 | DGR495195 | | .7677 | 19.50 | 20 | 101 | 153 |
| DGR495154 | | .6063 | 15.40 | 16 | 83 | 133 | DGR495200 | | .7874 | 20.00 | 20 | 101 | 153 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ◎ | | | | | |

# DREAM DRILLS -HIGH FEED

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, DREAM DRILLS - HIGH FEED with COOLANT HOLES

### DGR493, DGR495 SERIES

| WORK MATERIAL | | P | | | | | | K | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CARBON STEELS ALLOY STEELS | | | ALLOY STEELS | | | CAST IRON | | | DUCTILE CAST IRON | | |
| HARDNESS | | ~ HRc20 | | | HRc20 ~ 35 | | | | | | | | |
| DRILLING SPEED | | 329 ft/min | | | 247 ft/min | | | 329 ft/min | | | 264 ft/min | | |
| DRILLING DIAMETER | | SFM | IPR | | SFM | IPR | | SFM | IPR | | SFM | IPR | |
| | | | Min | Max | | Min | Max | | Min | Max | | Min | Max |
| 5.0 | .1969 | 328 | .0079 | .0098 | 246 | .0079 | .0098 | 328 | .0091 | .0118 | 263 | .0079 | .0098 |
| 6.0 | .2362 | 328 | .0094 | .0118 | 246 | .0094 | .0118 | 328 | .0106 | .0142 | 263 | .0094 | .0118 |
| 7.0 | .2756 | 328 | .0110 | .0138 | 247 | .0110 | .0138 | 328 | .0126 | .0165 | 263 | .0110 | .0138 |
| 8.0 | .3150 | 328 | .0126 | .0157 | 247 | .0126 | .0157 | 328 | .0142 | .0189 | 263 | .0126 | .0157 |
| 9.0 | .3543 | 328 | .0142 | .0177 | 247 | .0142 | .0177 | 328 | .0161 | .0213 | 263 | .0142 | .0177 |
| 10.0 | .3937 | 329 | .0157 | .0197 | 246 | .0157 | .0197 | 329 | .0177 | .0236 | 263 | .0157 | .0197 |
| 11.0 | .4331 | 329 | .0173 | .0217 | 247 | .0173 | .0195 | 329 | .0197 | .0260 | 263 | .0173 | .0217 |
| 12.0 | .4724 | 329 | .0189 | .0236 | 247 | .0189 | .0213 | 329 | .0213 | .0283 | 263 | .0189 | .0236 |
| 13.0 | .5118 | 328 | .0205 | .0256 | 247 | .0205 | .0230 | 328 | .0232 | .0307 | 263 | .0205 | .0256 |
| 14.0 | .5512 | 329 | .0220 | .0276 | 247 | .0220 | .0248 | 329 | .0248 | .0331 | 263 | .0220 | .0276 |
| 16.0 | .6299 | 328 | .0220 | .0283 | 247 | .0220 | .0252 | 328 | .0252 | .0315 | 264 | .0220 | .0283 |

SFM = ft/min
IPR = feed rate (Inch/rev.)

# CARBIDE

Being the best through innovation



# DREAM DRILLS -INOX

- **WITH COOLANT HOLES**
  **Stainless Steels, Nickel Alloys and Titanium up to HRc35**

# SELECTION GUIDE

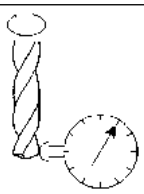
SOLID CARBIDE DREAM DRILLS -INOX (with Coolant Holes)
Stainless Steels, Nickel Alloys and Titanium up to HRc35.

| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **INCH** | | | | | | |
| 3XD **DH463 DH714** |  | CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES | *STUB* | D1/8 | D5/8 | **96** |
| 5XD **DH464 DH715** |  | CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES | *LONG* | D13/64 | D1/2 | **98** |
| **METRIC** | | | | | | |
| 3XD **DH451** |  | CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES | *SHORT* | D3.0 | D20.0 | **99** |
| 5XD **DH452** |  | CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES | *LONG* | D3.0 | D20.0 | **102** |
| 8XD **DH453** |  | CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES | *EXTRA LONG* | D3.0 | D14.0 | **105** |
| | | RECOMMENDED CUTTING CONDITIONS | | | | **108** |

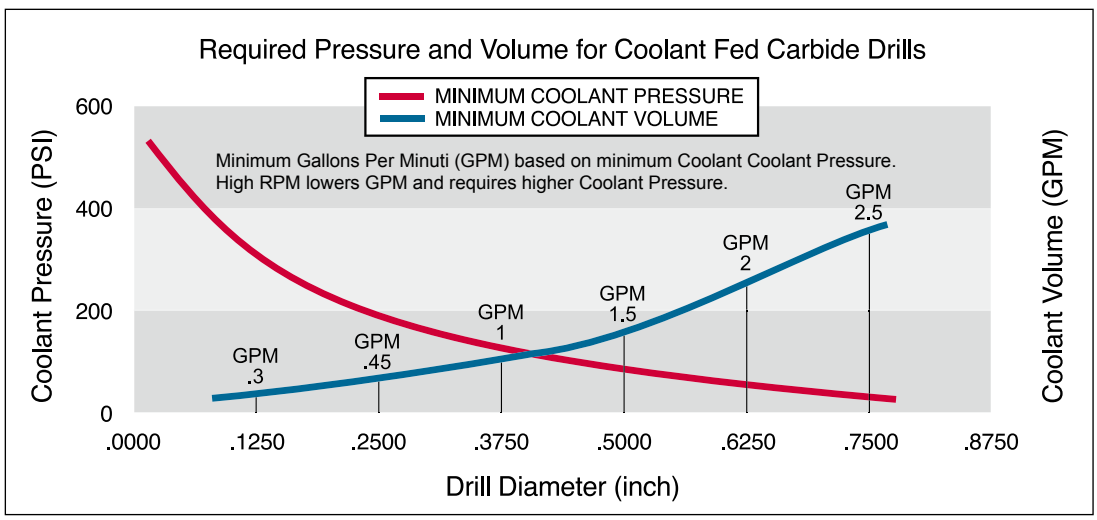
◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |





• Radial run out at cutting lip must not exceed .001



# DREAM DRILLS -INOX

**DH463, DH714 SERIES**

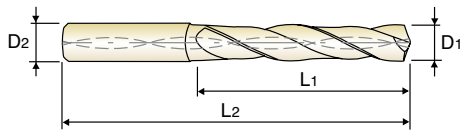
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***STUB***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ØD1: See page 253, Shank Tolerance ØD2: -.0001 -.0005








MG | 140° | 20 bar | P.108

**▶ for stainless steel** 3 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH714008 | 1/8 | .1250 | 3/16 | 1.102 | 2.992 |
| DH463008 | 1/8 | .1250 | 15/64 | 1.102 | 2.992 |
| DH714011 | 11/64 | .1719 | 3/16 | 1.417 | 3.386 |
| DH463011 | 11/64 | .1719 | 15/64 | 1.417 | 3.386 |
| DH714012 | 3/16 | .1875 | 3/16 | 1.575 | 3.543 |
| DH463012 | 3/16 | .1875 | 15/64 | 1.575 | 3.543 |
| DH463013 | 13/64 | .2031 | 15/64 | 1.082 | 3.228 |
| DH714013 | 13/64 | .2031 | 1/4 | 1.082 | 3.228 |
| DH463014 | 7/32 | .2188 | 15/64 | 1.181 | 3.228 |
| DH714014 | 7/32 | .2188 | 1/4 | 1.181 | 3.228 |
| DH463015 | 15/64 | .2344 | 15/64 | 1.181 | 3.228 |
| DH714015 | 15/64 | .2344 | 1/4 | 1.181 | 3.228 |
| DH714016 | 1/4 | .2500 | 1/4 | 1.279 | 3.465 |
| DH463016 | 1/4 | .2500 | 17/64 | 1.279 | 3.465 |
| DH463206 | F | .2570 | 17/64 | 1.279 | 3.465 |
| DH714206 | F | .2570 | 5/16 | 1.279 | 3.465 |
| DH463017 | 17/64 | .2656 | 17/64 | 1.378 | 3.465 |
| DH714017 | 17/64 | .2656 | 5/16 | 1.378 | 3.465 |
| DH463209 | I | .2720 | .2720 | 1.378 | 3.465 |
| DH714209 | I | .2720 | 5/16 | 1.378 | 3.465 |
| DH463018 | 9/32 | .2812 | 5/16 | 1.476 | 3.701 |
| DH463019 | 19/64 | .2969 | 5/16 | 1.476 | 3.701 |
| DH463020 | 5/16 | .3125 | 5/16 | 1.575 | 3.701 |
| DH463021 | 21/64 | .3281 | 11/32 | 1.673 | 3.937 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH714021 | 21/64 | .3281 | 3/8 | 1.673 | 3.937 |
| DH463217 | Q | .3320 | 11/32 | 1.673 | 3.937 |
| DH714217 | Q | .3320 | 3/8 | 1.673 | 3.937 |
| DH463022 | 11/32 | .3438 | 11/32 | 1.772 | 3.937 |
| DH714022 | 11/32 | .3438 | 3/8 | 1.772 | 3.937 |
| DH714023 | 23/64 | .3594 | 3/8 | 1.870 | 4.174 |
| DH463023 | 23/64 | .3594 | 25/64 | 1.870 | 4.174 |
| DH714221 | U | .3680 | 3/8 | 1.870 | 4.174 |
| DH463221 | U | .3680 | 25/64 | 1.870 | 4.174 |
| DH714024 | 3/8 | .3750 | 3/8 | 1.969 | 4.174 |
| DH463024 | 3/8 | .3750 | 25/64 | 1.969 | 4.174 |
| DH463025 | 25/64 | .3906 | 25/64 | 1.969 | 4.174 |
| DH714025 | 25/64 | .3906 | 7/16 | 1.969 | 4.174 |
| DH463026 | 13/32 | .4062 | 27/64 | 2.067 | 4.567 |
| DH714026 | 13/32 | .4062 | 7/16 | 2.067 | 4.567 |
| DH463027 | 27/64 | .4219 | 27/64 | 2.165 | 4.567 |
| DH714027 | 27/64 | .4219 | 7/16 | 2.165 | 4.567 |
| DH714028 | 7/16 | .4375 | 7/16 | 2.264 | 4.803 |
| DH463028 | 7/16 | .4375 | 15/32 | 2.264 | 4.803 |
| DH463029 | 29/64 | .4531 | 15/32 | 2.264 | 4.803 |
| DH714029 | 29/64 | .4531 | 1/2 | 2.264 | 4.803 |
| DH463030 | 15/32 | .4688 | 15/32 | 2.362 | 4.803 |
| DH714030 | 15/32 | .4688 | 1/2 | 2.362 | 4.803 |
| DH463031 | 31/64 | .4844 | 1/2 | 2.461 | 5.039 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

## DH463, DH714 SERIES

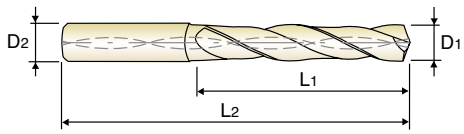
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***STUB***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








MG | 140° | 20 bar | P.108

**▶ for stainless steel** 3 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH463032 | 1/2 | .5000 | 1/2 | 2.559 | 5.039 |
| DH463033 | 33/64 | .5156 | 35/64 | 2.657 | 5.276 |
| DH714033 | 33/64 | .5156 | 9/16 | 2.657 | 5.276 |
| DH463034 | 17/32 | .5312 | 35/64 | 2.756 | 5.276 |
| DH714034 | 17/32 | .5312 | 9/16 | 2.756 | 5.276 |
| DH463035 | 35/64 | .5469 | 35/64 | 2.756 | 5.276 |
| DH714035 | 35/64 | .5469 | 9/16 | 2.756 | 5.276 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH714036 | 9/16 | .5625 | 9/16 | 2.854 | 5.512 |
| DH463036 | 9/16 | .5625 | 37/64 | 2.854 | 5.512 |
| DH463037 | 37/64 | .5781 | 37/64 | 2.953 | 5.512 |
| DH714037 | 37/64 | .5781 | 5/8 | 2.953 | 5.512 |
| DH463038 | 19/32 | .5937 | 5/8 | 3.051 | 5.709 |
| DH463039 | 39/64 | .6094 | 5/8 | 3.051 | 5.709 |
| DH463040 | 5/8 | .6250 | 5/8 | 3.150 | 5.709 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

## DH464, DH715 SERIES

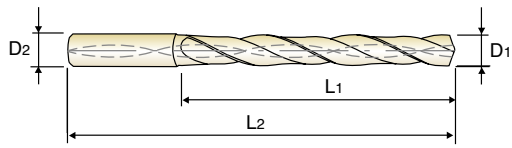
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

*LONG*

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








MG | 140° | 20 bar | P.108

### ▶ for stainless steel

5 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH464013 | 13/64 | .2031 | 15/64 | 1-3/4 | 3-15/16 |
| DH715013 | 13/64 | .2031 | 1/4 | 1-3/4 | 3-15/16 |
| DH464014 | 7/32 | .2188 | 15/64 | 1-57/64 | 3-15/16 |
| DH715014 | 7/32 | .2188 | 1/4 | 1-57/64 | 3-15/16 |
| DH464015 | 15/64 | .2344 | 15/64 | 1-57/64 | 3-15/16 |
| DH715015 | 15/64 | .2344 | 1/4 | 1-57/64 | 3-15/16 |
| DH715016 | 1/4 | .2500 | 1/4 | 2-3/64 | 4-19/64 |
| DH464016 | 1/4 | .2500 | 17/64 | 2-3/64 | 4-19/64 |
| DH464206 | F | .2570 | 17/64 | 2-13/64 | 4-19/64 |
| DH715206 | F | .2570 | 5/16 | 2-13/64 | 4-19/64 |
| DH464017 | 17/64 | .2656 | 17/64 | 2-13/64 | 4-19/64 |
| DH715017 | 17/64 | .2656 | 5/16 | 2-13/64 | 4-19/64 |
| DH464209 | I | .2720 | .2720 | 2-13/64 | 4-19/64 |
| DH715209 | I | .2720 | 5/16 | 2-13/64 | 4-19/64 |
| DH464018 | 9/32 | .2812 | 5/16 | 2-23/64 | 4-41/64 |
| DH464019 | 19/64 | .2969 | 5/16 | 2-33/64 | 4-41/64 |
| DH464020 | 5/16 | .3125 | 5/16 | 2-33/64 | 4-41/64 |
| DH464021 | 21/64 | .3281 | 11/32 | 2-43/64 | 5 |
| DH715021 | 21/64 | .3281 | 3/8 | 2-43/64 | 5 |
| DH464217 | Q | .3320 | 11/32 | 2-43/64 | 5 |
| DH715217 | Q | .3320 | 3/8 | 2-43/64 | 5 |
| DH464022 | 11/32 | .3438 | 11/32 | 2-27/32 | 5 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH715022 | 11/32 | .3438 | 3/8 | 2-27/32 | 5 |
| DH715023 | 23/64 | .3594 | 3/8 | 3 | 5-23/64 |
| DH464023 | 23/64 | .3594 | 25/64 | 3 | 5-23/64 |
| DH715221 | U | .3680 | 3/8 | 3 | 5-23/64 |
| DH464221 | U | .3680 | 25/64 | 3 | 5-23/64 |
| DH715024 | 3/8 | .3750 | 3/8 | 3-5/32 | 5-23/64 |
| DH464024 | 3/8 | .3750 | 25/64 | 3-5/32 | 5-23/64 |
| DH464025 | 25/64 | .3906 | 25/64 | 3-5/32 | 5-23/64 |
| DH715025 | 25/64 | .3906 | 7/16 | 3-5/32 | 5-23/64 |
| DH464026 | 13/32 | .4062 | 27/64 | 3-5/16 | 5-7/8 |
| DH715026 | 13/32 | .4062 | 7/16 | 3-5/16 | 5-7/8 |
| DH464027 | 27/64 | .4219 | 27/64 | 3-15/32 | 5-7/8 |
| DH715027 | 27/64 | .4219 | 7/16 | 3-15/32 | 5-7/8 |
| DH715028 | 7/16 | .4375 | 7/16 | 3-5/8 | 6-7/32 |
| DH464028 | 7/16 | .4375 | 15/32 | 3-5/8 | 6-7/32 |
| DH464029 | 29/64 | .4531 | 15/32 | 3-25/32 | 6-7/32 |
| DH715029 | 29/64 | .4531 | 1/2 | 3-25/32 | 6-7/32 |
| DH464030 | 15/32 | .4688 | 15/32 | 3-25/32 | 6-7/32 |
| DH715030 | 15/32 | .4688 | 1/2 | 3-25/32 | 6-7/32 |
| DH464031 | 31/64 | .4844 | 1/2 | 3-15/16 | 6-37/64 |
| DH464032 | 1/2 | .5000 | 1/2 | 4-3/32 | 6-37/64 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH451 SERIES**

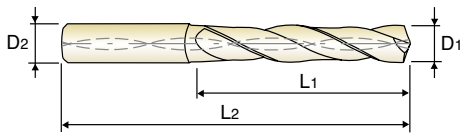
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***SHORT***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

**▶ for stainless steel**

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH451030 | 3.0 | | .1181 | 6 | 20 | 62 |
| DH451031 | 3.1 | | .1220 | 6 | 20 | 62 |
| DH451008F | 3.175 | 1/8 | .1250 | 6 | 20 | 62 |
| DH451032 | 3.2 | | .1260 | 6 | 20 | 62 |
| DH451033 | 3.3 | | .1299 | 6 | 20 | 62 |
| DH451034 | 3.4 | | .1339 | 6 | 20 | 62 |
| DH451035 | 3.5 | | .1378 | 6 | 20 | 62 |
| DH451009F | 3.572 | 9/64 | .1406 | 6 | 20 | 62 |
| DH451036 | 3.6 | | .1417 | 6 | 20 | 62 |
| DH451037 | 3.7 | | .1457 | 6 | 20 | 62 |
| DH451038 | 3.8 | | .1496 | 6 | 24 | 66 |
| DH451039 | 3.9 | | .1535 | 6 | 24 | 66 |
| DH451010F | 3.969 | 5/32 | .1563 | 6 | 24 | 66 |
| DH451040 | 4.0 | | .1575 | 6 | 24 | 66 |
| DH451041 | 4.1 | | .1614 | 6 | 24 | 66 |
| DH451042 | 4.2 | | .1654 | 6 | 24 | 66 |
| DH451043 | 4.3 | | .1693 | 6 | 24 | 66 |
| DH451011F | 4.366 | 11/64 | .1719 | 6 | 24 | 66 |
| DH451044 | 4.4 | | .1732 | 6 | 24 | 66 |
| DH451045 | 4.5 | | .1772 | 6 | 24 | 66 |
| DH451046 | 4.6 | | .1811 | 6 | 24 | 66 |
| DH451047 | 4.7 | | .1850 | 6 | 24 | 66 |
| DH451012F | 4.763 | 3/16 | .1875 | 6 | 24 | 66 |
| DH451048 | 4.8 | | .1890 | 6 | 28 | 66 |
| DH451049 | 4.9 | | .1929 | 6 | 28 | 66 |
| DH451050 | 5.0 | | .1969 | 6 | 28 | 66 |
| DH451051 | 5.1 | | .2008 | 6 | 28 | 66 |
| DH451013F | 5.159 | 13/64 | .2031 | 6 | 28 | 66 |
| DH451052 | 5.2 | | .2047 | 6 | 28 | 66 |
| DH451053 | 5.3 | | .2087 | 6 | 28 | 66 |
| DH451054 | 5.4 | | .2126 | 6 | 28 | 66 |
| DH451055 | 5.5 | | .2165 | 6 | 28 | 66 |
| DH451014F | 5.556 | 7/32 | .2188 | 6 | 28 | 66 |
| DH451056 | 5.6 | | .2205 | 6 | 28 | 66 |
| DH451057 | 5.7 | | .2244 | 6 | 28 | 66 |
| DH451058 | 5.8 | | .2283 | 6 | 28 | 66 |
| DH451059 | 5.9 | | .2323 | 6 | 28 | 66 |
| DH451015F | 5.953 | 15/64 | .2344 | 6 | 28 | 66 |
| DH451060 | 6.0 | | .2362 | 6 | 28 | 66 |
| DH451061 | 6.1 | | .2402 | 8 | 34 | 79 |
| DH451062 | 6.2 | | .2441 | 8 | 34 | 79 |
| DH451063 | 6.3 | | .2480 | 8 | 34 | 79 |
| DH451016F | 6.35 | 1/4 | .2500 | 8 | 34 | 79 |
| DH451064 | 6.4 | | .2520 | 8 | 34 | 79 |
| DH451065 | 6.5 | | .2559 | 8 | 34 | 79 |
| DH451066 | 6.6 | | .2598 | 8 | 34 | 79 |
| DH451067 | 6.7 | | .2638 | 8 | 34 | 79 |
| DH451017F | 6.747 | 17/64 | .2656 | 8 | 34 | 79 |
| DH451068 | 6.8 | | .2677 | 8 | 34 | 79 |
| DH451069 | 6.9 | | .2717 | 8 | 34 | 79 |
| DH451070 | 7.0 | | .2756 | 8 | 34 | 79 |
| DH451071 | 7.1 | | .2795 | 8 | 41 | 79 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH451 SERIES**

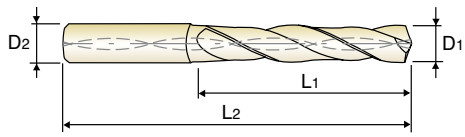
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***SHORT***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

**▶ for stainless steel**

3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH451018F | 7.144 | 9/32 | .2812 | 8 | 41 | 79 |
| DH451072 | 7.2 | | .2835 | 8 | 41 | 79 |
| DH451073 | 7.3 | | .2874 | 8 | 41 | 79 |
| DH451074 | 7.4 | | .2913 | 8 | 41 | 79 |
| DH451075 | 7.5 | | .2953 | 8 | 41 | 79 |
| DH451019F | 7.541 | 19/64 | .2969 | 8 | 41 | 79 |
| DH451076 | 7.6 | | .2992 | 8 | 41 | 79 |
| DH451077 | 7.7 | | .3031 | 8 | 41 | 79 |
| DH451078 | 7.8 | | .3071 | 8 | 41 | 79 |
| DH451079 | 7.9 | | .3110 | 8 | 41 | 79 |
| DH451020F | 7.938 | 5/16 | .3125 | 8 | 41 | 79 |
| DH451080 | 8.0 | | .3150 | 8 | 41 | 79 |
| DH451081 | 8.1 | | .3189 | 10 | 47 | 89 |
| DH451082 | 8.2 | | .3228 | 10 | 47 | 89 |
| DH451083 | 8.3 | | .3268 | 10 | 47 | 89 |
| DH451021F | 8.334 | 21/64 | .3281 | 10 | 47 | 89 |
| DH451084 | 8.4 | | .3307 | 10 | 47 | 89 |
| DH451085 | 8.5 | | .3346 | 10 | 47 | 89 |
| DH451086 | 8.6 | | .3386 | 10 | 47 | 89 |
| DH451087 | 8.7 | | .3425 | 10 | 47 | 89 |
| DH451022F | 8.731 | 11/32 | .3438 | 10 | 47 | 89 |
| DH451088 | 8.8 | | .3465 | 10 | 47 | 89 |
| DH451089 | 8.9 | | .3504 | 10 | 47 | 89 |
| DH451090 | 9.0 | | .3543 | 10 | 47 | 89 |
| DH451091 | 9.1 | | .3583 | 10 | 47 | 89 |
| DH451023F | 9.128 | 23/64 | .3594 | 10 | 47 | 89 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH451092 | 9.2 | | .3622 | 10 | 47 | 89 |
| DH451093 | 9.3 | | .3661 | 10 | 47 | 89 |
| DH451094 | 9.4 | | .3701 | 10 | 47 | 89 |
| DH451095 | 9.5 | | .3740 | 10 | 47 | 89 |
| DH451024F | 9.525 | 3/8 | .3750 | 10 | 47 | 89 |
| DH451096 | 9.6 | | .3780 | 10 | 47 | 89 |
| DH451097 | 9.7 | | .3819 | 10 | 47 | 89 |
| DH451098 | 9.8 | | .3858 | 10 | 47 | 89 |
| DH451099 | 9.9 | | .3898 | 10 | 47 | 89 |
| DH451025F | 9.922 | 25/64 | .3906 | 10 | 47 | 89 |
| DH451100 | 10.0 | | .3937 | 10 | 47 | 89 |
| DH451101 | 10.1 | | .3976 | 12 | 55 | 102 |
| DH451102 | 10.2 | | .4016 | 12 | 55 | 102 |
| DH451103 | 10.3 | | .4055 | 12 | 55 | 102 |
| DH451026F | 10.319 | 13/32 | .4062 | 12 | 55 | 102 |
| DH451104 | 10.4 | | .4094 | 12 | 55 | 102 |
| DH451105 | 10.5 | | .4134 | 12 | 55 | 102 |
| DH451106 | 10.6 | | .4173 | 12 | 55 | 102 |
| DH451107 | 10.7 | | .4212 | 12 | 55 | 102 |
| DH451027F | 10.716 | 27/64 | .4219 | 12 | 55 | 102 |
| DH451108 | 10.8 | | .4252 | 12 | 55 | 102 |
| DH451109 | 10.9 | | .4291 | 12 | 55 | 102 |
| DH451110 | 11.0 | | .4330 | 12 | 55 | 102 |
| DH451111 | 11.1 | | .4370 | 12 | 55 | 102 |
| DH451028F | 11.113 | 7/16 | .4375 | 12 | 55 | 102 |
| DH451112 | 11.2 | | .4409 | 12 | 55 | 102 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

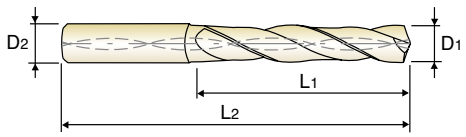
**DH451 SERIES**

## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES — *SHORT*

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar | P.108

**for stainless steel** — 3 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH451113 | 11.3 | | .4448 | 12 | 55 | 102 |
| DH451114 | 11.4 | | .4488 | 12 | 55 | 102 |
| DH451115 | 11.5 | | .4527 | 12 | 55 | 102 |
| DH451029F | 11.509 | 29/64 | .4531 | 12 | 55 | 102 |
| DH451116 | 11.6 | | .4566 | 12 | 55 | 102 |
| DH451117 | 11.7 | | .4606 | 12 | 55 | 102 |
| DH451118 | 11.8 | | .4645 | 12 | 55 | 102 |
| DH451119 | 11.9 | | .4685 | 12 | 55 | 102 |
| DH451030F | 11.906 | 15/32 | .4688 | 12 | 55 | 102 |
| DH451120 | 12.0 | | .4724 | 12 | 55 | 102 |
| DH451031F | 12.303 | 31/64 | .4844 | 14 | 60 | 107 |
| DH451125 | 12.5 | | .4921 | 14 | 60 | 107 |
| DH451032F | 12.7 | 1/2 | .5000 | 14 | 60 | 107 |
| DH451130 | 13.0 | | .5118 | 14 | 60 | 107 |
| DH451135 | 13.5 | | .5314 | 14 | 60 | 107 |
| DH451140 | 14.0 | | .5512 | 14 | 60 | 107 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH451036F | 14.288 | 9/16 | .5625 | 16 | 65 | 115 |
| DH451145 | 14.5 | | .5708 | 16 | 65 | 115 |
| DH451150 | 15.0 | | .5905 | 16 | 65 | 115 |
| DH451155 | 15.5 | | .6102 | 16 | 65 | 115 |
| DH451040F | 15.875 | 5/8 | .6250 | 16 | 65 | 115 |
| DH451160 | 16.0 | | .6299 | 16 | 65 | 115 |
| DH451165 | 16.5 | | .6495 | 18 | 73 | 123 |
| DH451170 | 17.0 | | .6692 | 18 | 73 | 123 |
| DH451044F | 17.463 | 11/16 | .6875 | 18 | 73 | 123 |
| DH451175 | 17.5 | | .6889 | 18 | 73 | 123 |
| DH451180 | 18.0 | | .7087 | 18 | 73 | 123 |
| DH451185 | 18.5 | | .7283 | 20 | 79 | 131 |
| DH451190 | 19.0 | | .7480 | 20 | 79 | 131 |
| DH451048F | 19.05 | 3/4 | .7500 | 20 | 79 | 131 |
| DH451195 | 19.5 | | .7676 | 20 | 79 | 131 |
| DH451200 | 20.0 | | .7874 | 20 | 79 | 131 |

- Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH452 SERIES**

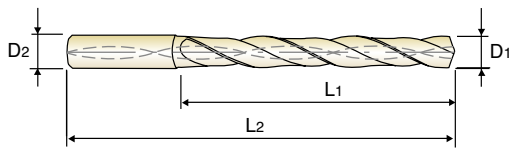
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***LONG***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

▶ **for stainless steel**

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452010 | 1.0 | | .0394 | 3 | 8 | 55 |
| DH452011 | 1.1 | | .0433 | 3 | 12 | 55 |
| DH452012 | 1.2 | | .0472 | 3 | 12 | 55 |
| DH452013 | 1.3 | | .0512 | 3 | 12 | 55 |
| DH452014 | 1.4 | | .0551 | 3 | 12 | 55 |
| DH452015 | 1.5 | | .0591 | 3 | 16 | 55 |
| DH452004F | 1.588 | 1/16 | .0625 | 3 | 16 | 55 |
| DH452016 | 1.6 | | .0630 | 3 | 16 | 55 |
| DH452017 | 1.7 | | .0669 | 3 | 16 | 55 |
| DH452018 | 1.8 | | .0709 | 3 | 16 | 55 |
| DH452019 | 1.9 | | .0748 | 3 | 16 | 55 |
| DH452005F | 1.984 | 5/64 | .0781 | 3 | 16 | 55 |
| DH452020 | 2.0 | | .0787 | 4 | 21 | 57 |
| DH452021 | 2.1 | | .0827 | 4 | 21 | 57 |
| DH452022 | 2.2 | | .0866 | 4 | 21 | 57 |
| DH452023 | 2.3 | | .0906 | 4 | 21 | 57 |
| DH452006F | 2.381 | 3/32 | .0938 | 4 | 21 | 57 |
| DH452024 | 2.4 | | .0945 | 4 | 21 | 57 |
| DH452025 | 2.5 | | .0984 | 4 | 21 | 57 |
| DH452026 | 2.6 | | .1024 | 4 | 21 | 57 |
| DH452027 | 2.7 | | .1063 | 4 | 21 | 57 |
| DH452007F | 2.778 | 7/64 | .1094 | 4 | 21 | 57 |
| DH452028 | 2.8 | | .1102 | 4 | 21 | 57 |
| DH452029 | 2.9 | | .1142 | 4 | 21 | 57 |
| DH452030 | 3.0 | | .1181 | 6 | 28 | 66 |
| DH452031 | 3.1 | | .1220 | 6 | 28 | 66 |
| DH452008F | 3.175 | 1/8 | .1250 | 6 | 28 | 66 |
| DH452032 | 3.2 | | .1260 | 6 | 28 | 66 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452033 | 3.3 | | .1299 | 6 | 28 | 66 |
| DH452034 | 3.4 | | .1339 | 6 | 28 | 66 |
| DH452035 | 3.5 | | .1378 | 6 | 28 | 66 |
| DH452009F | 3.572 | 9/64 | .1406 | 6 | 28 | 66 |
| DH452036 | 3.6 | | .1417 | 6 | 28 | 66 |
| DH452037 | 3.7 | | .1457 | 6 | 28 | 66 |
| DH452038 | 3.8 | | .1496 | 6 | 36 | 74 |
| DH452039 | 3.9 | | .1535 | 6 | 36 | 74 |
| DH452010F | 3.969 | 5/32 | .1563 | 6 | 36 | 74 |
| DH452040 | 4.0 | | .1575 | 6 | 36 | 74 |
| DH452041 | 4.1 | | .1614 | 6 | 36 | 74 |
| DH452042 | 4.2 | | .1654 | 6 | 36 | 74 |
| DH452043 | 4.3 | | .1693 | 6 | 36 | 74 |
| DH452011F | 4.366 | 11/64 | .1719 | 6 | 36 | 74 |
| DH452044 | 4.4 | | .1732 | 6 | 36 | 74 |
| DH452045 | 4.5 | | .1772 | 6 | 36 | 74 |
| DH452046 | 4.6 | | .1811 | 6 | 36 | 74 |
| DH452047 | 4.7 | | .1850 | 6 | 36 | 74 |
| DH452012F | 4.763 | 3/16 | .1875 | 6 | 36 | 74 |
| DH452048 | 4.8 | | .1890 | 6 | 44 | 82 |
| DH452049 | 4.9 | | .1929 | 6 | 44 | 82 |
| DH452050 | 5.0 | | .1969 | 6 | 44 | 82 |
| DH452051 | 5.1 | | .2008 | 6 | 44 | 82 |
| DH452013F | 5.159 | 13/64 | .2031 | 6 | 44 | 82 |
| DH452052 | 5.2 | | .2047 | 6 | 44 | 82 |
| DH452053 | 5.3 | | .2087 | 6 | 44 | 82 |
| DH452054 | 5.4 | | .2126 | 6 | 44 | 82 |
| DH452055 | 5.5 | | .2165 | 6 | 44 | 82 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

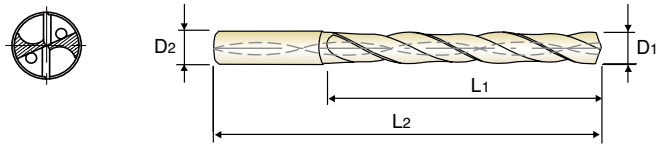
**DH452 SERIES**

## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***LONG***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005






DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

**▶ for stainless steel**

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452014F | 5.556 | 7/32 | .2188 | 6 | 44 | 82 |
| DH452056 | 5.6 | | .2205 | 6 | 44 | 82 |
| DH452057 | 5.7 | | .2244 | 6 | 44 | 82 |
| DH452058 | 5.8 | | .2283 | 6 | 44 | 82 |
| DH452059 | 5.9 | | .2323 | 6 | 44 | 82 |
| DH452015F | 5.953 | 15/64 | .2344 | 6 | 44 | 82 |
| DH452060 | 6.0 | | .2362 | 6 | 44 | 82 |
| DH452061 | 6.1 | | .2402 | 8 | 53 | 91 |
| DH452062 | 6.2 | | .2441 | 8 | 53 | 91 |
| DH452063 | 6.3 | | .2480 | 8 | 53 | 91 |
| DH452016F | 6.35 | 1/4 | .2500 | 8 | 53 | 91 |
| DH452064 | 6.4 | | .2520 | 8 | 53 | 91 |
| DH452065 | 6.5 | | .2559 | 8 | 53 | 91 |
| DH452066 | 6.6 | | .2598 | 8 | 53 | 91 |
| DH452067 | 6.7 | | .2638 | 8 | 53 | 91 |
| DH452017F | 6.747 | 17/64 | .2656 | 8 | 53 | 91 |
| DH452068 | 6.8 | | .2677 | 8 | 53 | 91 |
| DH452069 | 6.9 | | .2717 | 8 | 53 | 91 |
| DH452070 | 7.0 | | .2756 | 8 | 53 | 91 |
| DH452071 | 7.1 | | .2795 | 8 | 53 | 91 |
| DH452018F | 7.144 | 9/32 | .2812 | 8 | 53 | 91 |
| DH452072 | 7.2 | | .2835 | 8 | 53 | 91 |
| DH452073 | 7.3 | | .2874 | 8 | 53 | 91 |
| DH452074 | 7.4 | | .2913 | 8 | 53 | 91 |
| DH452075 | 7.5 | | .2953 | 8 | 53 | 91 |
| DH452019F | 7.541 | 19/64 | .2969 | 8 | 53 | 91 |
| DH452076 | 7.6 | | .2992 | 8 | 53 | 91 |
| DH452077 | 7.7 | | .3031 | 8 | 53 | 91 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452078 | 7.8 | | .3071 | 8 | 53 | 91 |
| DH452079 | 7.9 | | .3110 | 8 | 53 | 91 |
| DH452020F | 7.938 | 5/16 | .3125 | 8 | 53 | 91 |
| DH452080 | 8.0 | | .3150 | 8 | 53 | 91 |
| DH452081 | 8.1 | | .3189 | 10 | 61 | 103 |
| DH452082 | 8.2 | | .3228 | 10 | 61 | 103 |
| DH452083 | 8.3 | | .3268 | 10 | 61 | 103 |
| DH452021F | 8.334 | 21/64 | .3281 | 10 | 61 | 103 |
| DH452084 | 8.4 | | .3307 | 10 | 61 | 103 |
| DH452085 | 8.5 | | .3346 | 10 | 61 | 103 |
| DH452086 | 8.6 | | .3386 | 10 | 61 | 103 |
| DH452087 | 8.7 | | .3425 | 10 | 61 | 103 |
| DH452022F | 8.731 | 11/32 | .3438 | 10 | 61 | 103 |
| DH452088 | 8.8 | | .3465 | 10 | 61 | 103 |
| DH452089 | 8.9 | | .3504 | 10 | 61 | 103 |
| DH452090 | 9.0 | | .3543 | 10 | 61 | 103 |
| DH452091 | 9.1 | | .3583 | 10 | 61 | 103 |
| DH452023F | 9.128 | 23/64 | .3594 | 10 | 61 | 103 |
| DH452092 | 9.2 | | .3622 | 10 | 61 | 103 |
| DH452093 | 9.3 | | .3661 | 10 | 61 | 103 |
| DH452094 | 9.4 | | .3701 | 10 | 61 | 103 |
| DH452095 | 9.5 | | .3740 | 10 | 61 | 103 |
| DH452024F | 9.525 | 3/8 | .3750 | 10 | 61 | 103 |
| DH452096 | 9.6 | | .3780 | 10 | 61 | 103 |
| DH452097 | 9.7 | | .3819 | 10 | 61 | 103 |
| DH452098 | 9.8 | | .3858 | 10 | 61 | 103 |
| DH452099 | 9.9 | | .3898 | 10 | 61 | 103 |
| DH452025F | 9.922 | 25/64 | .3906 | 10 | 61 | 103 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH452 SERIES**

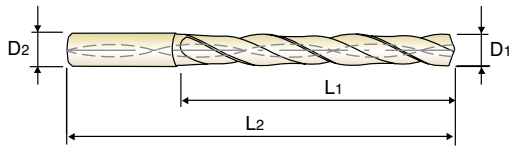
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***LONG***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar P.108

**▶ for stainless steel** 5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452100 | 10.0 | | .3937 | 10 | 61 | 103 |
| DH452101 | 10.1 | | .3976 | 12 | 71 | 118 |
| DH452102 | 10.2 | | .4016 | 12 | 71 | 118 |
| DH452103 | 10.3 | | .4055 | 12 | 71 | 118 |
| DH452026F | 10.319 | 13/32 | .4062 | 12 | 71 | 118 |
| DH452104 | 10.4 | | .4094 | 12 | 71 | 118 |
| DH452105 | 10.5 | | .4134 | 12 | 71 | 118 |
| DH452106 | 10.6 | | .4173 | 12 | 71 | 118 |
| DH452107 | 10.7 | | .4212 | 12 | 71 | 118 |
| DH452027F | 10.716 | 27/64 | .4219 | 12 | 71 | 118 |
| DH452108 | 10.8 | | .4252 | 12 | 71 | 118 |
| DH452109 | 10.9 | | .4291 | 12 | 71 | 118 |
| DH452110 | 11.0 | | .4330 | 12 | 71 | 118 |
| DH452111 | 11.1 | | .4370 | 12 | 71 | 118 |
| DH452028F | 11.113 | 7/16 | .4375 | 12 | 71 | 118 |
| DH452112 | 11.2 | | .4409 | 12 | 71 | 118 |
| DH452113 | 11.3 | | .4448 | 12 | 71 | 118 |
| DH452114 | 11.4 | | .4488 | 12 | 71 | 118 |
| DH452115 | 11.5 | | .4527 | 12 | 71 | 118 |
| DH452029F | 11.509 | 29/64 | .4531 | 12 | 71 | 118 |
| DH452116 | 11.6 | | .4566 | 12 | 71 | 118 |
| DH452117 | 11.7 | | .4606 | 12 | 71 | 118 |
| DH452118 | 11.8 | | .4645 | 12 | 71 | 118 |
| DH452119 | 11.9 | | .4685 | 12 | 71 | 118 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH452030F | 11.906 | 15/32 | .4688 | 12 | 71 | 118 |
| DH452120 | 12.0 | | .4724 | 12 | 71 | 118 |
| DH452031F | 12.303 | 31/64 | .4844 | 14 | 77 | 124 |
| DH452125 | 12.5 | | .4921 | 14 | 77 | 124 |
| DH452032F | 12.7 | 1/2 | .5000 | 14 | 77 | 124 |
| DH452130 | 13.0 | | .5118 | 14 | 77 | 124 |
| DH452135 | 13.5 | | .5314 | 14 | 77 | 124 |
| DH452140 | 14.0 | | .5512 | 14 | 77 | 124 |
| DH452036F | 14.288 | 9/16 | .5625 | 16 | 83 | 133 |
| DH452145 | 14.5 | | .5708 | 16 | 83 | 133 |
| DH452150 | 15.0 | | .5905 | 16 | 83 | 133 |
| DH452155 | 15.5 | | .6102 | 16 | 83 | 133 |
| DH452040F | 15.875 | 5/8 | .6250 | 16 | 83 | 133 |
| DH452160 | 16.0 | | .6299 | 16 | 83 | 133 |
| DH452165 | 16.5 | | .6495 | 18 | 93 | 143 |
| DH452170 | 17.0 | | .6692 | 18 | 93 | 143 |
| DH452175 | 17.5 | | .6889 | 18 | 93 | 143 |
| DH452180 | 18.0 | | .7087 | 18 | 93 | 143 |
| DH452185 | 18.5 | | .7283 | 20 | 101 | 153 |
| DH452190 | 19.0 | | .7480 | 20 | 101 | 153 |
| DH452048F | 19.05 | 3/4 | .7500 | 20 | 101 | 153 |
| DH452195 | 19.5 | | .7676 | 20 | 101 | 153 |
| DH452200 | 20.0 | | .7874 | 20 | 101 | 153 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH453 SERIES**

## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***EXTRA LONG***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005




DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

**▶ for stainless steel**

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453030 | 3.0 | | .1181 | 6 | 34 | 72 |
| DH453031 | 3.1 | | .1220 | 6 | 34 | 72 |
| DH453008F | 3.175 | 1/8 | .1250 | 6 | 34 | 72 |
| DH453032 | 3.2 | | .1260 | 6 | 34 | 72 |
| DH453033 | 3.3 | | .1299 | 6 | 34 | 72 |
| DH453034 | 3.4 | | .1339 | 6 | 34 | 72 |
| DH453229G | 3.454 | #29 | .1360 | 6 | 34 | 72 |
| DH453035 | 3.5 | | .1378 | 6 | 34 | 72 |
| DH453009F | 3.572 | 9/64 | .1406 | 6 | 34 | 72 |
| DH453036 | 3.6 | | .1417 | 6 | 34 | 72 |
| DH453037 | 3.7 | | .1457 | 6 | 34 | 72 |
| DH453038 | 3.8 | | .1496 | 6 | 43 | 81 |
| DH453039 | 3.9 | | .1535 | 6 | 43 | 81 |
| DH453010F | 3.969 | 5/32 | .1563 | 6 | 43 | 81 |
| DH453040 | 4.0 | | .1575 | 6 | 43 | 81 |
| DH453221G | 4.038 | #21 | .1590 | 6 | 43 | 81 |
| DH453041 | 4.1 | | .1614 | 6 | 43 | 81 |
| DH453042 | 4.2 | | .1654 | 6 | 43 | 81 |
| DH453043 | 4.3 | | .1693 | 6 | 43 | 81 |
| DH453011F | 4.366 | 11/64 | .1719 | 6 | 43 | 81 |
| DH453044 | 4.4 | | .1732 | 6 | 43 | 81 |
| DH453045 | 4.5 | | .1772 | 6 | 43 | 81 |
| DH453046 | 4.6 | | .1811 | 6 | 43 | 81 |
| DH453047 | 4.7 | | .1850 | 6 | 43 | 81 |
| DH453012F | 4.763 | 3/16 | .1875 | 6 | 57 | 95 |
| DH453048 | 4.8 | | .1890 | 6 | 57 | 95 |
| DH453049 | 4.9 | | .1929 | 6 | 57 | 95 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453050 | 5.0 | | .1969 | 6 | 57 | 95 |
| DH453051 | 5.1 | | .2008 | 6 | 57 | 95 |
| DH453013F | 5.159 | 13/64 | .2031 | 6 | 57 | 95 |
| DH453052 | 5.2 | | .2047 | 6 | 57 | 95 |
| DH453053 | 5.3 | | .2087 | 6 | 57 | 95 |
| DH453054 | 5.4 | | .2126 | 6 | 57 | 95 |
| DH453055 | 5.5 | | .2165 | 6 | 57 | 95 |
| DH453014F | 5.556 | 7/32 | .2188 | 6 | 57 | 95 |
| DH453056 | 5.6 | | .2205 | 6 | 57 | 95 |
| DH453057 | 5.7 | | .2244 | 6 | 57 | 95 |
| DH453058 | 5.8 | | .2283 | 6 | 57 | 95 |
| DH453059 | 5.9 | | .2323 | 6 | 57 | 95 |
| DH453015F | 5.953 | 15/64 | .2344 | 6 | 57 | 95 |
| DH453060 | 6.0 | | .2362 | 6 | 57 | 95 |
| DH453061 | 6.1 | | .2402 | 8 | 76 | 114 |
| DH453062 | 6.2 | | .2441 | 8 | 76 | 114 |
| DH453063 | 6.3 | | .2480 | 8 | 76 | 114 |
| DH453016F | 6.35 | 1/4 | .2500 | 8 | 76 | 114 |
| DH453064 | 6.4 | | .2520 | 8 | 76 | 114 |
| DH453065 | 6.5 | | .2559 | 8 | 76 | 114 |
| DH453106L | 6.527 | F | .2570 | 8 | 76 | 114 |
| DH453066 | 6.6 | | .2598 | 8 | 76 | 114 |
| DH453067 | 6.7 | | .2638 | 8 | 76 | 114 |
| DH453017F | 6.747 | 17/64 | .2656 | 8 | 76 | 114 |
| DH453068 | 6.8 | | .2677 | 8 | 76 | 114 |
| DH453069 | 6.9 | | .2717 | 8 | 76 | 114 |
| DH453070 | 7.0 | | .2756 | 8 | 76 | 114 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ◎ | | ○ | | | | ○ |

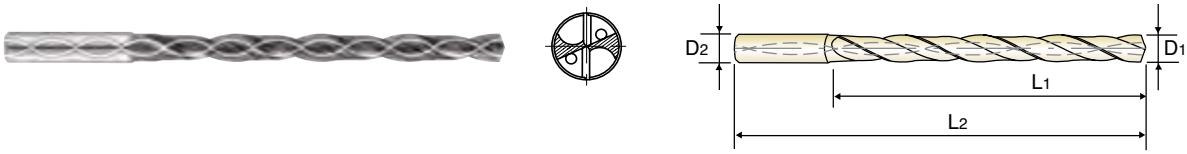
# DREAM DRILLS -INOX

**DH453 SERIES**

## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***EXTRA LONG***

- Special flute shape and geometry suitable for machining stainless steel.
- Excellent chip evacuation from better surface treatment.
- Point R-thinning achieving superior centering and chip curl.
- TiAlN coating for better surface finishes and longer tool life.
- Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005




DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

**▶ for stainless steel**

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453071 | 7.1 | | .2795 | 8 | 76 | 114 |
| DH453018F | 7.144 | 9/32 | .2813 | 8 | 76 | 114 |
| DH453072 | 7.2 | | .2835 | 8 | 76 | 114 |
| DH453073 | 7.3 | | .2874 | 8 | 76 | 114 |
| DH453074 | 7.4 | | .2913 | 8 | 76 | 114 |
| DH453075 | 7.5 | | .2953 | 8 | 76 | 114 |
| DH453019F | 7.541 | 19/64 | .2969 | 8 | 76 | 114 |
| DH453076 | 7.6 | | .2992 | 8 | 76 | 114 |
| DH453077 | 7.7 | | .3031 | 8 | 76 | 114 |
| DH453078 | 7.8 | | .3071 | 8 | 76 | 114 |
| DH453079 | 7.9 | | .3110 | 8 | 76 | 114 |
| DH453020F | 7.938 | 5/16 | .3125 | 8 | 76 | 114 |
| DH453080 | 8.0 | | .3150 | 8 | 76 | 114 |
| DH453081 | 8.1 | | .3189 | 10 | 95 | 142 |
| DH453082 | 8.2 | | .3228 | 10 | 95 | 142 |
| DH453083 | 8.3 | | .3268 | 10 | 95 | 142 |
| DH453021F | 8.334 | 21/64 | .3281 | 10 | 95 | 142 |
| DH453084 | 8.4 | | .3307 | 10 | 95 | 142 |
| DH453117L | 8.432 | Q | .3320 | 10 | 95 | 142 |
| DH453085 | 8.5 | | .3346 | 10 | 95 | 142 |
| DH453086 | 8.6 | | .3386 | 10 | 95 | 142 |
| DH453087 | 8.7 | | .3425 | 10 | 95 | 142 |
| DH453022F | 8.731 | 11/32 | .3438 | 10 | 95 | 142 |
| DH453088 | 8.8 | | .3465 | 10 | 95 | 142 |
| DH453089 | 8.9 | | .3504 | 10 | 95 | 142 |
| DH453090 | 9.0 | | .3543 | 10 | 95 | 142 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453091 | 9.1 | | .3583 | 10 | 95 | 142 |
| DH453023F | 9.128 | 23/64 | .3594 | 10 | 95 | 142 |
| DH453092 | 9.2 | | .3622 | 10 | 95 | 142 |
| DH453093 | 9.3 | | .3661 | 10 | 95 | 142 |
| DH453121L | 9.347 | U | .3680 | 10 | 95 | 142 |
| DH453094 | 9.4 | | .3701 | 10 | 95 | 142 |
| DH453095 | 9.5 | | .3740 | 10 | 95 | 142 |
| DH453024F | 9.525 | 3/8 | .3750 | 10 | 95 | 142 |
| DH453096 | 9.6 | | .3780 | 10 | 95 | 142 |
| DH453097 | 9.7 | | .3819 | 10 | 95 | 142 |
| DH453098 | 9.8 | | .3858 | 10 | 95 | 142 |
| DH453099 | 9.9 | | .3898 | 10 | 95 | 142 |
| DH453025F | 9.922 | 25/64 | .3906 | 10 | 95 | 142 |
| DH453100 | 10.0 | | .3937 | 10 | 95 | 142 |
| DH453101 | 10.1 | | .3976 | 12 | 114 | 162 |
| DH453102 | 10.2 | | .4016 | 12 | 114 | 162 |
| DH453103 | 10.3 | | .4055 | 12 | 114 | 162 |
| DH453026F | 10.319 | 13/32 | .4063 | 12 | 114 | 162 |
| DH453104 | 10.4 | | .4094 | 12 | 114 | 162 |
| DH453105 | 10.5 | | .4134 | 12 | 114 | 162 |
| DH453106 | 10.6 | | .4173 | 12 | 114 | 162 |
| DH453107 | 10.7 | | .4212 | 12 | 114 | 162 |
| DH453027F | 10.716 | 27/64 | .4219 | 12 | 114 | 162 |
| DH453108 | 10.8 | | .4252 | 12 | 114 | 162 |
| DH453109 | 10.9 | | .4291 | 12 | 114 | 162 |
| DH453110 | 11.0 | | .4330 | 12 | 114 | 162 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

**DH453 SERIES**

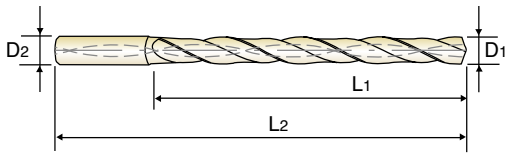
## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES

***EXTRA LONG***

- ▶ Special flute shape and geometry suitable for machining stainless steel.
- ▶ Excellent chip evacuation from better surface treatment.
- ▶ Point R-thinning achieving superior centering and chip curl.
- ▶ TiAlN coating for better surface finishes and longer tool life.
- ▶ Tolerance : Dia. Tolerance ∅D1: See page 253, Shank Tolerance ∅D2: -.0001 -.0005








DIN 6537 | MG | h6 | m7 | 140° | 20 bar

P.108

▶ **for stainless steel**

8 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453111 | 11.1 | | .4370 | 12 | 114 | 162 |
| DH453028F | 11.113 | 7/16 | .4375 | 12 | 114 | 162 |
| DH453112 | 11.2 | | .4409 | 12 | 114 | 162 |
| DH453113 | 11.3 | | .4448 | 12 | 114 | 162 |
| DH453114 | 11.4 | | .4488 | 12 | 114 | 162 |
| DH453115 | 11.5 | | .4527 | 12 | 114 | 162 |
| DH453116 | 11.6 | | .4566 | 12 | 114 | 162 |
| DH453117 | 11.7 | | .4606 | 12 | 114 | 162 |
| DH453118 | 11.8 | | .4645 | 12 | 114 | 162 |
| DH453119 | 11.9 | | .4685 | 12 | 114 | 162 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| TiAlN | D1 | | | D2 | L1 | L2 |
| DH453030F | 11.906 | 15/32 | .4688 | 12 | 114 | 162 |
| DH453120 | 12.0 | | .4724 | 12 | 114 | 162 |
| DH453031F | 12.303 | 31/64 | .4844 | 14 | 133 | 178 |
| DH453125 | 12.5 | | .4921 | 14 | 133 | 178 |
| DH453032F | 12.7 | 1/2 | .5000 | 14 | 133 | 178 |
| DH453130 | 13.0 | | .5118 | 14 | 133 | 178 |
| DH453033F | 13.097 | 33/64 | .5156 | 14 | 133 | 178 |
| DH453135 | 13.5 | | .5314 | 14 | 133 | 178 |
| DH453140 | 14.0 | | .5512 | 14 | 133 | 178 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | | ○ | | | | ○ |

# DREAM DRILLS -INOX

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, DREAM DRILLS - INOX with COOLANT HOLES, TiAlN COATED

### DH451, DH463, DH714, DH452, DH464, DH715, DH453 SERIES

| WORK MATERIAL | | | P | | | M | | | M | | | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARBON STEELS ALLOY STEELS | | | STAINLESS STEELS | | | STAINLESS STEELS | | | ALUMINUM | | |
| STRENGTH | | | | | | < 800 N/mm² | | | > 800 N/mm² | | | < 10% Si | | |
| DRILLING SPEED(SFM) | | | 260 ~ 410 ft/min | | | 120 ~ 230 ft/min | | | 60 ~ 140 ft/min | | | 490 ~ 720 ft/min | | |
| DIAMETER | | | N | S | IPR | N | S | IPR | N | S | IPR | N | S | IPR |
| Metric(mm) | Decimal | Fractional | | | | | | | | | | | | |
| 1.0 | .0394 | | 26000 | 0.02 | .001 | 12000 | 0.02 | .001 | 6200 | 0.02 | .001 | 48000 | 0.04 | .002 |
| 1.5 | .0591 | | 18000 | 0.03 | .001 | 9000 | 0.03 | .001 | 5400 | 0.02 | .001 | 43000 | 0.05 | .002 |
| 2.5 | .0984 | | 10800 | 0.05 | .002 | 7000 | 0.04 | .002 | 4200 | 0.03 | .001 | 25500 | 0.08 | .003 |
| 3.0 | .1181 | 1/8 | 13000 | 0.04 | .002 | 7400 | 0.04 | .002 | 4700 | 0.02 | .001 | 23000 | 0.12 | .005 |
| 4.0 | .1575 | 5/32 | 10000 | 0.05 | .002 | 5600 | 0.05 | .002 | 3600 | 0.03 | .001 | 17500 | 0.18 | .007 |
| 5.0 | .1969 | 13/64 | 8000 | 0.05 | .002 | 4400 | 0.05 | .002 | 2800 | 0.03 | .001 | 14000 | 0.20 | .008 |
| 6.0 | .2362 | 15/64 | 6600 | 0.06 | .002 | 3700 | 0.06 | .002 | 2400 | 0.04 | .002 | 11700 | 0.25 | .010 |
| 8.0 | .3150 | 5/16 | 5000 | 0.08 | .003 | 2800 | 0.08 | .003 | 1800 | 0.06 | .002 | 8800 | 0.30 | .012 |
| 10.0 | .3937 | 25/64 | 4000 | 0.10 | .004 | 2200 | 0.10 | .004 | 1400 | 0.08 | .003 | 7000 | 0.40 | .016 |
| 12.0 | .4724 | 15/32 | 3300 | 0.12 | .005 | 1900 | 0.12 | .005 | 1200 | 0.10 | .004 | 5800 | 0.50 | .020 |
| 14.0 | .5512 | 35/64 | 2800 | 0.15 | .006 | 1600 | 0.15 | .006 | 1000 | 0.12 | .005 | 5000 | 0.60 | .024 |
| 16.0 | .6299 | 5/8 | 2500 | 0.20 | .008 | 1400 | 0.20 | .008 | 900 | 0.15 | .006 | 4380 | 0.80 | .031 |
| 18.0 | .7087 | 45/64 | 2200 | 0.22 | .009 | 1250 | 0.22 | .009 | 800 | 0.17 | .007 | 3900 | 1.00 | .039 |
| 20.0 | .7874 | 25/32 | 2000 | 0.24 | .009 | 1120 | 0.24 | .009 | 720 | 0.19 | .007 | 3500 | 1.20 | .047 |

| WORK MATERIAL | | | N | | | N | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ALUMINUM | | | NON FRERROUS | | | TITANIUM TITANIUM ALLOYS | | |
| STRENGTH | | | < 10% Si | | | | | | | | |
| DRILLING SPEED(SFM) | | | 390 ~ 570 ft/min | | | 390 ~ 490 ft/min | | | 80 ~ 160 ft/min | | |
| DIAMETER | | | N | S | IPR | N | S | IPR | N | S | IPR |
| Metric(mm) | Decimal | Fractional | | | | | | | | | |
| 1.0 | .0394 | | 38000 | 0.03 | .001 | 38000 | 0.02 | .001 | 8100 | 0.01 | .0004 |
| 1.5 | .0591 | | 32000 | 0.04 | .002 | 25500 | 0.03 | .001 | 7500 | 0.01 | .0004 |
| 2.5 | .0984 | | 19500 | 0.06 | .002 | 15500 | 0.05 | .002 | 4500 | 0.02 | .001 |
| 3.0 | .1181 | 1/8 | 18500 | 0.10 | .004 | 16000 | 0.08 | .003 | 5300 | 0.03 | .001 |
| 4.0 | .1575 | 5/32 | 13900 | 0.15 | .006 | 11900 | 0.10 | .004 | 4000 | 0.04 | .002 |
| 5.0 | .1969 | 13/64 | 11000 | 0.18 | .007 | 9500 | 0.12 | .005 | 3200 | 0.05 | .002 |
| 6.0 | .2362 | 15/64 | 9300 | 0.25 | .010 | 8000 | 0.15 | .006 | 2650 | 0.06 | .002 |
| 8.0 | .3150 | 5/16 | 7000 | 0.30 | .012 | 6000 | 0.18 | .007 | 2000 | 0.07 | .003 |
| 10.0 | .3937 | 25/64 | 5600 | 0.35 | .014 | 4800 | 0.22 | .009 | 1600 | 0.08 | .003 |
| 12.0 | .4724 | 15/32 | 4600 | 0.40 | .016 | 4000 | 0.26 | .010 | 1300 | 0.10 | .004 |
| 14.0 | .5512 | 35/64 | 4000 | 0.50 | .020 | 3400 | 0.30 | .012 | 1100 | 0.12 | .005 |
| 16.0 | .6299 | 5/8 | 3500 | 0.60 | .024 | 3000 | 0.40 | .016 | 1000 | 0.14 | .006 |
| 18.0 | .7087 | 45/64 | 3100 | 0.70 | .028 | 2650 | 0.45 | .018 | 900 | 0.16 | .006 |
| 20.0 | .7874 | 25/32 | 2800 | 0.80 | .031 | 2400 | 0.50 | .020 | 800 | 0.18 | .007 |

▶ Recommend to reduce the feed rate as following
DH463/DH714/DH451(3xD), DH464/DH714/DH452(5xD) : Feed 100%
DH453(8xD) : Feed 85%

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

# CARBIDE

Being the best through innovation



# DREAM DRILLS -ALU

- WITH COOLANT HOLES
  for Aluminum & Aluminum Alloys

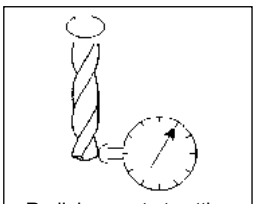
## SOLID CARBIDE DREAM DRILLS - ALU (with Coolant Holes)


| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **INCH** | | | | | | |
| 5XD | DGE466<br>DGE718 |  | CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES | *LONG* | D13/64 | D1/2 | **112** |
| **METRIC** | | | | | | |
| 5XD | DGE433 |  | CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES | *LONG* | D3.0 | D20.0 | **113** |
| | | | RECOMMENDED CUTTING CONDITIONS | | | | **116** |

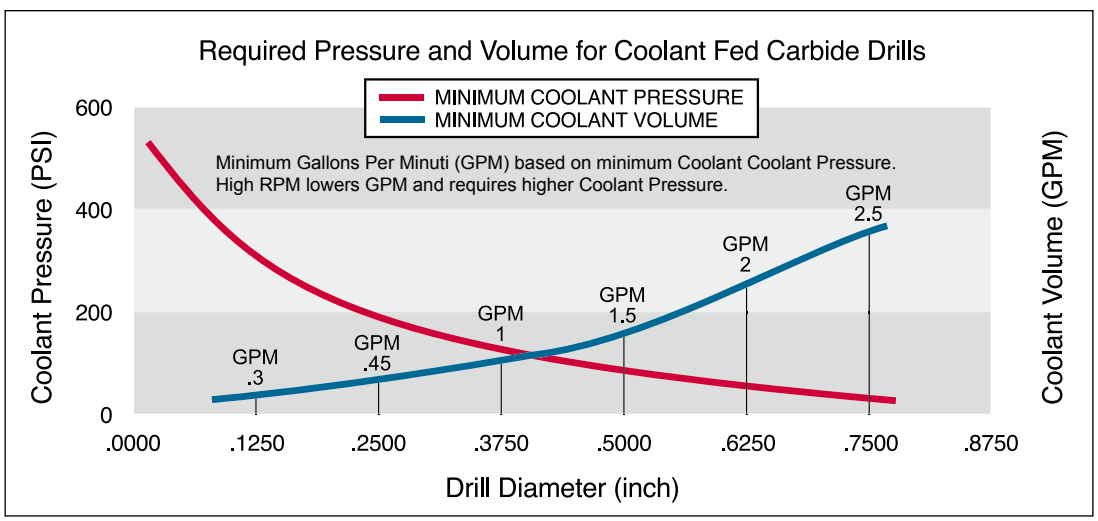
◎ : Excellent ○ : Good

| | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | | | | | ◎ | | | | |
| | | | | | | | ◎ | | | | |





• Radial run out at cutting lip must not exceed .001



# DREAM DRILLS -ALU

**DGE466, DGE718 SERIES**

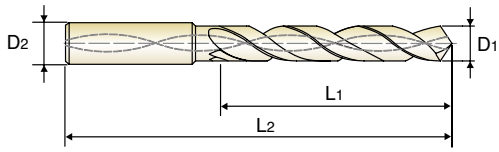
## CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

***LONG***

- Wider and deeper flute gullets for maximum chip removal
- Special geometry and smooth coating reduces built up edge and improves finishes
- Tolerance : Dia. Tolerance ØD1: See page 57, Shank Tolerance ØD2: -.0001 -.0005








MG | h6 | 118° | 20 bar | P.116

▶ **for aluminum**

5 × D

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| DLC | D1 | | D2 | L1 | L2 |
| DGE466013 | 13/64 | .2031 | 15/64 | 1-3/4 | 3-15/16 |
| DGE718013 | 13/64 | .2031 | 1/4 | 1-3/4 | 3-15/16 |
| DGE466014 | 7/32 | .2188 | 15/64 | 1-57/64 | 3-15/16 |
| DGE718014 | 7/32 | .2188 | 1/4 | 1-57/64 | 3-15/16 |
| DGE466015 | 15/64 | .2344 | 15/64 | 1-57/64 | 3-15/16 |
| DGE718015 | 15/64 | .2344 | 1/4 | 1-57/64 | 3-15/16 |
| DGE718016 | 1/4 | .2500 | 1/4 | 2-3/64 | 4-19/64 |
| DGE466016 | 1/4 | .2500 | 17/64 | 2-3/64 | 4-19/64 |
| DGE466206 | F | .2570 | 17/64 | 2-13/64 | 4-19/64 |
| DGE718206 | F | .2570 | 5/16 | 2-13/64 | 4-19/64 |
| DGE466017 | 17/64 | .2656 | 17/64 | 2-13/64 | 4-19/64 |
| DGE718017 | 17/64 | .2656 | 5/16 | 2-13/64 | 4-19/64 |
| DGE466209 | I | .2720 | .272 | 2-13/64 | 4-19/64 |
| DGE718209 | I | .2720 | 5/16 | 2-13/64 | 4-19/64 |
| DGE466018 | 9/32 | .2812 | 5/16 | 2-23/64 | 4-41/64 |
| DGE466019 | 19/64 | .2969 | 5/16 | 2-33/64 | 4-41/64 |
| DGE466020 | 5/16 | .3125 | 5/16 | 2-33/64 | 4-41/64 |
| DGE466021 | 21/64 | .3281 | 11/32 | 2-43/64 | 5 |
| DGE718021 | 21/64 | .3281 | 3/8 | 2-43/64 | 5 |
| DGE466217 | Q | .3320 | 11/32 | 2-43/64 | 5 |
| DGE718217 | Q | .3320 | 3/8 | 2-43/64 | 5 |
| DGE466022 | 11/32 | .3438 | 11/32 | 2-27/32 | 5 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| DLC | D1 | | D2 | L1 | L2 |
| DGE718022 | 11/32 | .3438 | 3/8 | 2-27/32 | 5 |
| DGE718023 | 23/64 | .3594 | 3/8 | 3 | 5-23/64 |
| DGE466023 | 23/64 | .3594 | 25/64 | 3 | 5-23/64 |
| DGE718221 | U | .3680 | 3/8 | 3 | 5-23/64 |
| DGE466221 | U | .3680 | 25/64 | 3 | 5-23/64 |
| DGE718024 | 3/8 | .3750 | 3/8 | 3-5/32 | 5-23/64 |
| DGE466024 | 3/8 | .3750 | 25/64 | 3-5/32 | 5-23/64 |
| DGE466025 | 25/64 | .3906 | 25/64 | 3-5/32 | 5-23/64 |
| DGE718025 | 25/64 | .3906 | 7/16 | 3-5/32 | 5-23/64 |
| DGE466026 | 13/32 | .4062 | 27/64 | 3-5/16 | 5-7/8 |
| DGE718026 | 13/32 | .4062 | 7/16 | 3-5/16 | 5-7/8 |
| DGE466027 | 27/64 | .4219 | 27/64 | 3-15/32 | 5-7/8 |
| DGE718027 | 27/64 | .4219 | 7/16 | 3-15/32 | 5-7/8 |
| DGE718028 | 7/16 | .4375 | 7/16 | 3-5/8 | 6-7/32 |
| DGE466028 | 7/16 | .4375 | 15/32 | 3-5/8 | 6-7/32 |
| DGE466029 | 29/64 | .4531 | 15/32 | 3-25/32 | 6-7/32 |
| DGE718029 | 29/64 | .4531 | 1/2 | 3-25/32 | 6-7/32 |
| DGE466030 | 15/32 | .4688 | 15/32 | 3-25/32 | 6-7/32 |
| DGE718030 | 15/32 | .4688 | 1/2 | 3-25/32 | 6-7/32 |
| DGE466031 | 31/64 | .4844 | 1/2 | 3-15/16 | 6-37/64 |
| DGE466032 | 1/2 | .5000 | 1/2 | 4-3/32 | 6-37/64 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | |
| | | | | | | | | ◎ | | | | |

# DREAM DRILLS -ALU

**DGE433 SERIES**

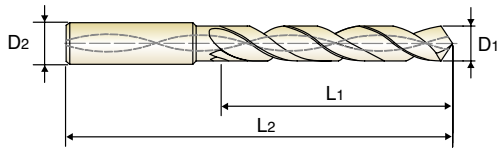
## CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

***LONG***

▶ Wider and deeper flute gullets for maximum chip removal
▶ Special geometry and smooth coating reduces built up edge and improves finishes








DIN 6537 | MG | h6 | m7 | 118° | 20 bar

P.116

▶ **for aluminum**

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433030 | 3.0 | | .1181 | 6 | 28 | 66 |
| DGE433031 | 3.1 | | .1220 | 6 | 28 | 66 |
| DGE433008F | 3.175 | 1/8 | .1250 | 6 | 28 | 66 |
| DGE433032 | 3.2 | | .1260 | 6 | 28 | 66 |
| DGE433033 | 3.3 | | .1299 | 6 | 28 | 66 |
| DGE433034 | 3.4 | | .1339 | 6 | 28 | 66 |
| DGE433035 | 3.5 | | .1378 | 6 | 28 | 66 |
| DGE433009F | 3.572 | 9/64 | .1406 | 6 | 28 | 66 |
| DGE433036 | 3.6 | | .1417 | 6 | 28 | 66 |
| DGE433037 | 3.7 | | .1457 | 6 | 28 | 66 |
| DGE433038 | 3.8 | | .1496 | 6 | 36 | 74 |
| DGE433039 | 3.9 | | .1535 | 6 | 36 | 74 |
| DGE433010F | 3.969 | 5/32 | .1563 | 6 | 36 | 74 |
| DGE433040 | 4.0 | | .1575 | 6 | 36 | 74 |
| DGE433041 | 4.1 | | .1614 | 6 | 36 | 74 |
| DGE433042 | 4.2 | | .1654 | 6 | 36 | 74 |
| DGE433043 | 4.3 | | .1693 | 6 | 36 | 74 |
| DGE433011F | 4.366 | 11/64 | .1719 | 6 | 36 | 74 |
| DGE433044 | 4.4 | | .1732 | 6 | 36 | 74 |
| DGE433045 | 4.5 | | .1772 | 6 | 36 | 74 |
| DGE433046 | 4.6 | | .1811 | 6 | 36 | 74 |
| DGE433047 | 4.7 | | .1850 | 6 | 36 | 74 |
| DGE433012F | 4.763 | 3/16 | .1875 | 6 | 36 | 74 |
| DGE433048 | 4.8 | | .1890 | 6 | 44 | 82 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433049 | 4.9 | | .1929 | 6 | 44 | 82 |
| DGE433050 | 5.0 | | .1969 | 6 | 44 | 82 |
| DGE433051 | 5.1 | | .2008 | 6 | 44 | 82 |
| DGE433013F | 5.159 | 13/64 | .2031 | 6 | 44 | 82 |
| DGE433052 | 5.2 | | .2047 | 6 | 44 | 82 |
| DGE433053 | 5.3 | | .2087 | 6 | 44 | 82 |
| DGE433054 | 5.4 | | .2126 | 6 | 44 | 82 |
| DGE433055 | 5.5 | | .2165 | 6 | 44 | 82 |
| DGE433014F | 5.556 | 7/32 | .2188 | 6 | 44 | 82 |
| DGE433056 | 5.6 | | .2205 | 6 | 44 | 82 |
| DGE433057 | 5.7 | | .2244 | 6 | 44 | 82 |
| DGE433058 | 5.8 | | .2283 | 6 | 44 | 82 |
| DGE433059 | 5.9 | | .2323 | 6 | 44 | 82 |
| DGE433015F | 5.953 | 15/64 | .2344 | 6 | 44 | 82 |
| DGE433060 | 6.0 | | .2362 | 6 | 44 | 82 |
| DGE433061 | 6.1 | | .2402 | 8 | 53 | 91 |
| DGE433062 | 6.2 | | .2441 | 8 | 53 | 91 |
| DGE433063 | 6.3 | | .2480 | 8 | 53 | 91 |
| DGE433016F | 6.35 | 1/4 | .2500 | 8 | 53 | 91 |
| DGE433064 | 6.4 | | .2520 | 8 | 53 | 91 |
| DGE433065 | 6.5 | | .2559 | 8 | 53 | 91 |
| DGE433066 | 6.6 | | .2598 | 8 | 53 | 91 |
| DGE433067 | 6.7 | | .2638 | 8 | 53 | 91 |
| DGE433017F | 6.747 | 17/64 | .2656 | 8 | 53 | 91 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| | | | | | | | | ◎ | | | | |

# DREAM DRILLS -ALU

**DGE433 SERIES**

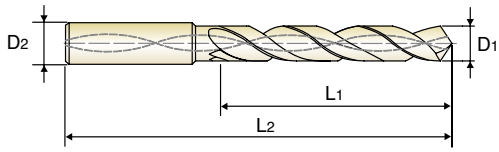
## CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

***LONG***

- Wider and deeper flute gullets for maximum chip removal
- Special geometry and smooth coating reduces built up edge and improves finishes








DIN 6537 | MG | h6 | m7 | 118° | 20 bar

P.116

**▶ for aluminum**

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433068 | 6.8 | | .2677 | 8 | 53 | 91 |
| DGE433069 | 6.9 | | .2717 | 8 | 53 | 91 |
| DGE433070 | 7.0 | | .2756 | 8 | 53 | 91 |
| DGE433071 | 7.1 | | .2795 | 8 | 53 | 91 |
| DGE433018F | 7.144 | 9/32 | .2812 | 8 | 53 | 91 |
| DGE433072 | 7.2 | | .2835 | 8 | 53 | 91 |
| DGE433073 | 7.3 | | .2874 | 8 | 53 | 91 |
| DGE433074 | 7.4 | | .2913 | 8 | 53 | 91 |
| DGE433075 | 7.5 | | .2953 | 8 | 53 | 91 |
| DGE433019F | 7.541 | 19/64 | .2969 | 8 | 53 | 91 |
| DGE433076 | 7.6 | | .2992 | 8 | 53 | 91 |
| DGE433077 | 7.7 | | .3031 | 8 | 53 | 91 |
| DGE433078 | 7.8 | | .3071 | 8 | 53 | 91 |
| DGE433079 | 7.9 | | .3110 | 8 | 53 | 91 |
| DGE433020F | 7.938 | 5/16 | .3125 | 8 | 53 | 91 |
| DGE433080 | 8.0 | | .3150 | 8 | 53 | 91 |
| DGE433081 | 8.1 | | .3189 | 10 | 61 | 103 |
| DGE433082 | 8.2 | | .3228 | 10 | 61 | 103 |
| DGE433083 | 8.3 | | .3268 | 10 | 61 | 103 |
| DGE433021F | 8.334 | 21/64 | .3281 | 10 | 61 | 103 |
| DGE433084 | 8.4 | | .3307 | 10 | 61 | 103 |
| DGE433085 | 8.5 | | .3346 | 10 | 61 | 103 |
| DGE433086 | 8.6 | | .3386 | 10 | 61 | 103 |
| DGE433087 | 8.7 | | .3425 | 10 | 61 | 103 |
| DGE433022F | 8.731 | 11/32 | .3438 | 10 | 61 | 103 |
| DGE433088 | 8.8 | | .3465 | 10 | 61 | 103 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433089 | 8.9 | | .3504 | 10 | 61 | 103 |
| DGE433090 | 9.0 | | .3543 | 10 | 61 | 103 |
| DGE433091 | 9.1 | | .3583 | 10 | 61 | 103 |
| DGE433023F | 9.128 | 23/64 | .3594 | 10 | 61 | 103 |
| DGE433092 | 9.2 | | .3622 | 10 | 61 | 103 |
| DGE433093 | 9.3 | | .3661 | 10 | 61 | 103 |
| DGE433094 | 9.4 | | .3701 | 10 | 61 | 103 |
| DGE433095 | 9.5 | | .3740 | 10 | 61 | 103 |
| DGE433024F | 9.525 | 3/8 | .3750 | 10 | 61 | 103 |
| DGE433096 | 9.6 | | .3780 | 10 | 61 | 103 |
| DGE433097 | 9.7 | | .3819 | 10 | 61 | 103 |
| DGE433098 | 9.8 | | .3858 | 10 | 61 | 103 |
| DGE433099 | 9.9 | | .3898 | 10 | 61 | 103 |
| DGE433025F | 9.922 | 25/64 | .3906 | 10 | 61 | 103 |
| DGE433100 | 10.0 | | .3937 | 10 | 61 | 103 |
| DGE433101 | 10.1 | | .3976 | 12 | 71 | 118 |
| DGE433102 | 10.2 | | .4016 | 12 | 71 | 118 |
| DGE433103 | 10.3 | | .4055 | 12 | 71 | 118 |
| DGE433026F | 10.319 | 13/32 | .4062 | 12 | 71 | 118 |
| DGE433104 | 10.4 | | .4094 | 12 | 71 | 118 |
| DGE433105 | 10.5 | | .4134 | 12 | 71 | 118 |
| DGE433106 | 10.6 | | .4173 | 12 | 71 | 118 |
| DGE433107 | 10.7 | | .4212 | 12 | 71 | 118 |
| DGE433027F | 10.716 | 27/64 | .4219 | 12 | 71 | 118 |
| DGE433108 | 10.8 | | .4252 | 12 | 71 | 118 |
| DGE433109 | 10.9 | | .4291 | 12 | 71 | 118 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | |
| | | | | | | | | ◎ | | | | |

# DREAM DRILLS -ALU

**DGE433 SERIES**

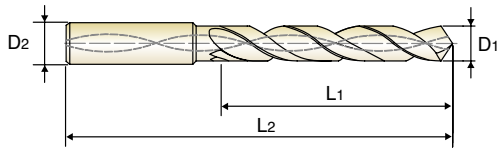
## CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES

***LONG***

▶ Wider and deeper flute gullets for maximum chip removal
▶ Special geometry and smooth coating reduces built up edge and improves finishes








DIN 6537 | MG | h6 | m7 | 118° | 20 bar

P.116

▶ **for aluminum**

5 × D

Unit : mm

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433110 | 11.0 | | .4330 | 12 | 71 | 118 |
| DGE433111 | 11.1 | | .4370 | 12 | 71 | 118 |
| DGE433028F | 11.113 | 7/16 | .4375 | 12 | 71 | 118 |
| DGE433112 | 11.2 | | .4409 | 12 | 71 | 118 |
| DGE433113 | 11.3 | | .4448 | 12 | 71 | 118 |
| DGE433114 | 11.4 | | .4488 | 12 | 71 | 118 |
| DGE433115 | 11.5 | | .4527 | 12 | 71 | 118 |
| DGE433029F | 11.509 | 29/64 | .4531 | 12 | 71 | 118 |
| DGE433116 | 11.6 | | .4566 | 12 | 71 | 118 |
| DGE433117 | 11.7 | | .4606 | 12 | 71 | 118 |
| DGE433118 | 11.8 | | .4645 | 12 | 71 | 118 |
| DGE433119 | 11.9 | | .4685 | 12 | 71 | 118 |
| DGE433030F | 11.906 | 15/32 | .4688 | 12 | 71 | 118 |
| DGE433120 | 12.0 | | .4724 | 12 | 71 | 118 |
| DGE433031F | 12.303 | 31/64 | .4844 | 14 | 77 | 124 |
| DGE433125 | 12.5 | | .4921 | 14 | 77 | 124 |
| DGE433032F | 12.7 | 1/2 | .5000 | 14 | 77 | 124 |
| DGE433130 | 13.0 | | .5118 | 14 | 77 | 124 |

| EDP No. | Diameter | | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|---|
| | Metric | Fractional | Decimal | | | |
| DLC | D1 | | | D2 | L1 | L2 |
| DGE433135 | 13.5 | | .5314 | 14 | 77 | 124 |
| DGE433140 | 14.0 | | .5512 | 14 | 77 | 124 |
| DGE433036F | 14.288 | 9/16 | .5625 | 16 | 83 | 133 |
| DGE433145 | 14.5 | | .5708 | 16 | 83 | 133 |
| DGE433150 | 15.0 | | .5905 | 16 | 83 | 133 |
| DGE433155 | 15.5 | | .6102 | 16 | 83 | 133 |
| DGE433040F | 15.875 | 5/8 | .6250 | 16 | 83 | 133 |
| DGE433160 | 16.0 | | .6299 | 16 | 83 | 133 |
| DGE433165 | 16.5 | | .6495 | 18 | 93 | 143 |
| DGE433170 | 17.0 | | .6692 | 18 | 93 | 143 |
| DGE433175 | 17.5 | | .6889 | 18 | 93 | 143 |
| DGE433180 | 18.0 | | .7087 | 18 | 93 | 143 |
| DGE433185 | 18.5 | | .7283 | 20 | 101 | 153 |
| DGE433190 | 19.0 | | .7480 | 20 | 101 | 153 |
| DGE433048F | 19.05 | 3/4 | .7500 | 20 | 101 | 153 |
| DGE433195 | 19.5 | | .7676 | 20 | 101 | 153 |
| DGE433200 | 20.0 | | .7874 | 20 | 101 | 153 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| | | | | | | | | ◎ | | | | |

# DREAM DRILLS -ALU

**RECOMMENDED CUTTING CONDITIONS**

## CARBIDE, DREAM DRILLS - ALU with COOLANT HOLES, DLC COATED

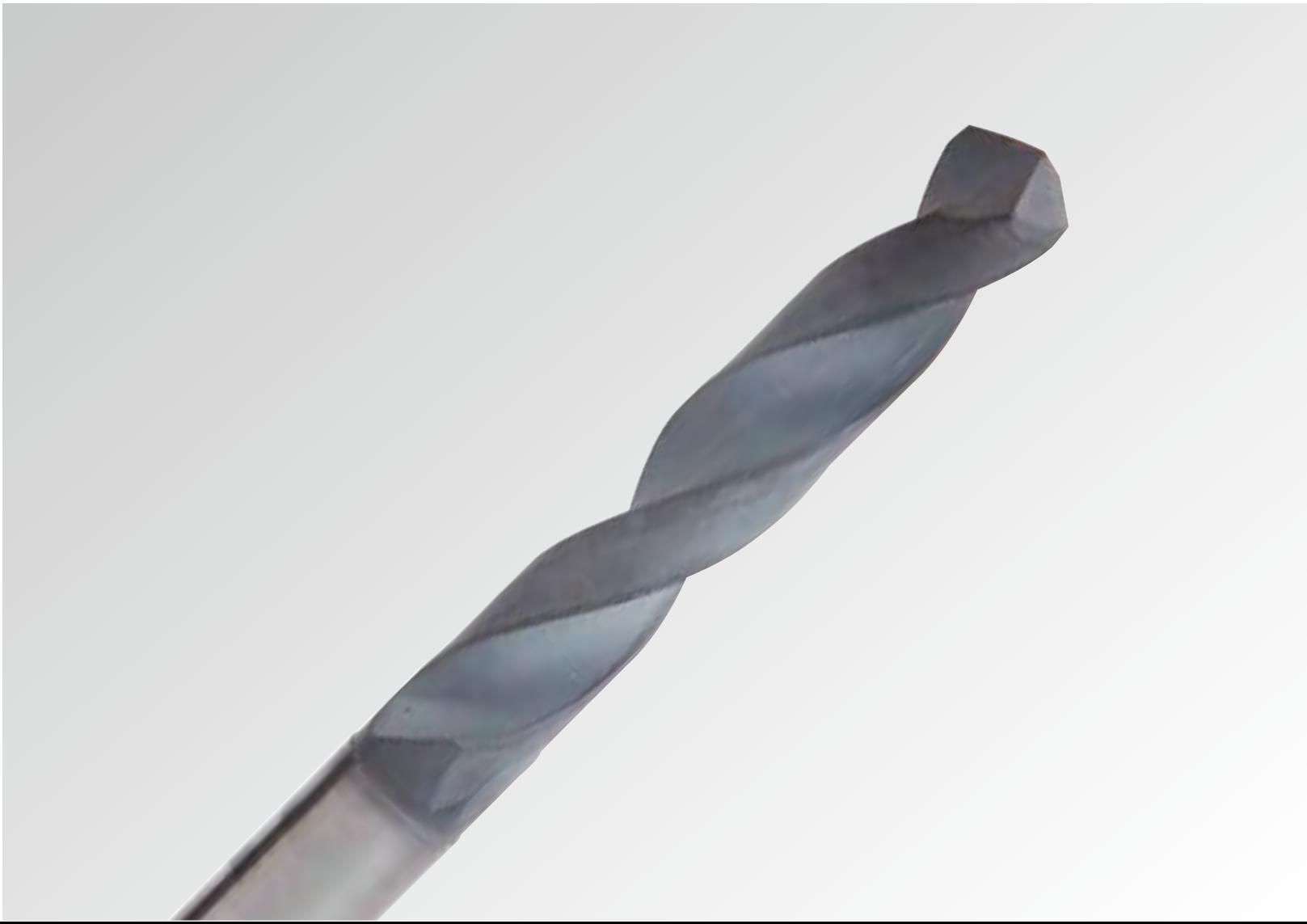
### DGE466, DGE718, DGE433 SERIES

| WORK MATERIAL | | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | ALUMINUM ALLOY CASTING ALUMINUM DIE CASTING | | | | WROUGHT ALUMINUM ALLOY | | | |
| DRILLING SPEED(SFM) | | 240 ~ 650 ft/min | | | | 240 ~ 650 ft/min | | | |
| DIAMETER | | N | S | IPR | | N | S | IPR | |
| Metric(mm) | Decimal | | | | | | | | |
| 3.0~6.0 | .1181 ~ .2362 | 8000 ~ 15000 | 0.2 ~ 0.5 | .008 | .020 | 8000 ~ 15000 | 0.15 ~ 0.3 | .006 | .012 |
| ~10.0 | ~.3937 | 6000 ~ 10500 | 0.3 ~ 1.0 | .012 | .039 | 6000 ~ 10500 | 0.20 ~ 0.4 | .008 | .016 |
| ~14.0 | ~.5512 | 4500 ~ 5800 | 0.3 ~ 1.0 | .012 | .039 | 4500 ~ 5800 | 0.20 ~ 0.4 | .008 | .016 |
| ~20.0 | ~.7874 | 3200 ~ 4600 | 0.3 ~ 1.0 | .012 | .039 | 3200 ~ 4600 | 0.30 ~ 1.0 | .012 | .039 |

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

# CARBIDE

Being the best through innovation



# DREAM DRILLS -CFRP

- For composite materials including CFRP, GFRP

## SOLID CARBIDE DREAM DRILLS - CFRP
For composite materials including CFRP, GFRP


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| DI473 |  | CARBIDE, DREAM DRILLS - CFRP | .0980 | .7500 | 120 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 121 |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | | | | | | | | ◎ | |

# DREAM DRILLS -CFRP

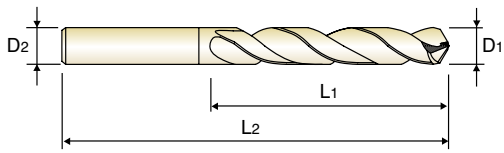
**DI473 SERIES**

## CARBIDE, DREAM DRILLS-CFRP

- Special Point Type to improve hole quality for Composite Materials
  -> Minimized Burr and Delamination at Entry / Exit Hole.
- Outstanding Performance
- Long Tool Life and Increased product by Diamond Coating.








DIN 6537 | MG | h6 | m7 | 118° P.121

Unit : Inch

| EDP No. | Drill Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| DIAMOND COATED | D1 | | D2 | L1 | L2 |
| DI473040G | #40 | .0980 | .2362 | .9449 | 2.5984 |
| DI473008F | 1/8 | .1250 | .2362 | 1.1024 | 2.5984 |
| DI473030G | #30 | .1285 | .2362 | 1.1024 | 2.5984 |
| DI473010F | 5/32 | .1562 | .2362 | 1.4173 | 2.9134 |
| DI473021G | #21 | .1590 | .2362 | 1.4173 | 2.9134 |
| DI473012F | 3/16 | .1875 | .2362 | 1.4173 | 2.9134 |
| DI473012G | #12 | .1890 | .2362 | 1.7323 | 3.2283 |
| DI473011G | #11 | .1910 | .2362 | 1.7323 | 3.2283 |
| DI473007G | #7 | .2010 | .2362 | 1.7323 | 3.2283 |
| DI473013F | 13/64 | .2031 | .2362 | 1.7323 | 3.2283 |
| DI473014F | 7/32 | .2188 | .2362 | 1.7323 | 3.2283 |
| DI473015F | 15/64 | .2344 | .2362 | 1.7323 | 3.2283 |
| DI473016F | 1/4 | .2500 | .3150 | 2.0866 | 3.5827 |
| DI473020F | 5/16 | .3125 | .3150 | 2.0866 | 3.5827 |
| DI473024F | 3/8 | .3750 | .3937 | 2.4016 | 4.0551 |
| DI473028F | 7/16 | .4375 | .4724 | 2.7953 | 4.6457 |
| DI473032F | 1/2 | .5000 | .5512 | 3.0315 | 4.8819 |
| DI473036F | 9/16 | .5625 | .6299 | 3.2677 | 5.2362 |
| DI473040F | 5/8 | .6250 | .6299 | 3.2677 | 5.2362 |
| DI473044F | 11/16 | .6875 | .7087 | 3.6614 | 5.6299 |
| DI473048F | 3/4 | .7500 | .7874 | 3.9764 | 6.0236 |

Unit : mm

| Shank Diameter | Flute Length | Overall Length |
|---|---|---|
| D2 | L1 | L2 |
| 6 | 24 | 66 |
| 6 | 28 | 66 |
| 6 | 28 | 66 |
| 6 | 36 | 74 |
| 6 | 36 | 74 |
| 6 | 36 | 74 |
| 6 | 44 | 82 |
| 6 | 44 | 82 |
| 6 | 44 | 82 |
| 6 | 44 | 82 |
| 6 | 44 | 82 |
| 6 | 44 | 82 |
| 8 | 53 | 91 |
| 8 | 53 | 91 |
| 10 | 61 | 103 |
| 12 | 71 | 118 |
| 14 | 77 | 124 |
| 16 | 83 | 133 |
| 16 | 83 | 133 |
| 18 | 93 | 143 |
| 20 | 101 | 153 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | | | | | | | | ◎ | |

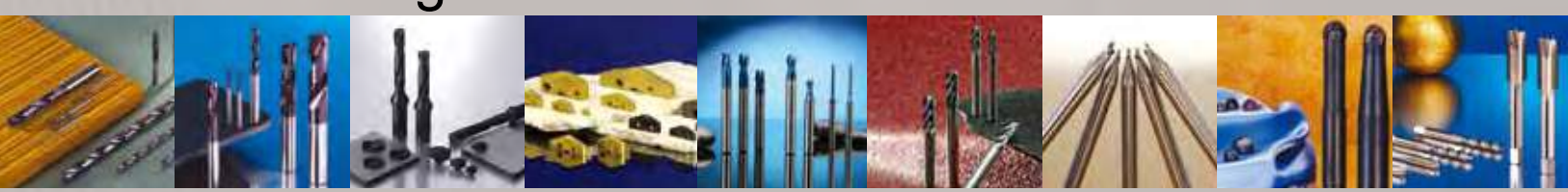
## CARBIDE, DREAM DRILLS - CFRP

### D1473 SERIES

| WORK MATERIAL | N | | |
|---|---|---|---|
| | CFRP | | |
| DRILLING SPEED | 325 ~ 490 ft/min | | |
| DRILLING DIAMETER | SFM | IPR | |
| | | Min | Max |
| 1/8 | 328 ~ 492 | .0012 | .0027 |
| 5/32 | 330 ~ 491 | | |
| 3/16 | 328 ~ 490 | | |
| 1/4 | 328 ~ 495 | | |
| 5/16 | 330 ~ 495 | | |
| 3/8 | 325 ~ 492 | | |
| 1/2 | 330 ~ 484 | | |
| 5/8 | 329 ~ 488 | | |
| 3/4 | 334 ~ 482 | | |

SFM = ft/min
IPR = feed rate (Inch/rev.)

Global Cutting Tool Leader **YG-1**



# CARBIDE

Being the best through innovation



# DREAM DRILLS -MQL TYPE

- WITH COOLANT HOLES
  Minimum Quantity Lubrication. Drilling Deep Holes, 10D, 15D, 20D, 25D & 30D

## SOLID CARBIDE DREAM DRILLS - MQL TYPE (with Coolant Holes)

Minimum Quantity Lubrication. Drilling Deep Holes, 10D, 15D, 20D, 25D & 30D

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **METRIC** | | | | | |
| 10XD | DH510 | CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES *EXTRA LONG* | D3.0 | D14.0 | **126** |
| 15XD | DH515 | CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES *EXTRA LONG* | D3.0 | D12.0 | **127** |
| 20XD | DH520 | CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D12.0 | **127** |
| 10XD | DHM10 | CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D14.0 | **128** |
| 15XD | DHM15 | CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D12.0 | **128** |
| 20XD | DHM20 | CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D12.0 | **128** |
| 25XD | DHM25 | CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D10.0 | **129** |
| 30XD | DHM30 | CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES ◇ *EXTRA LONG* | D3.0 | D8.0 | **129** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **130** |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DREAM DRILLS -MQL TYPE

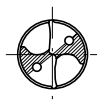
**DH510 SERIES**

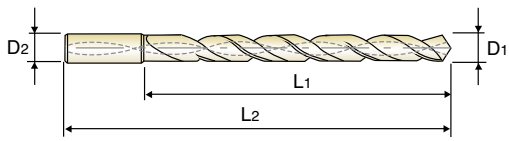
## CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES

***EXTRA LONG***

- Non step drilling up to 10 times of drill diameter
- Available for processing MQL(Minimum Quantity Lubrication)
- Excellent positioning – Bush is not necessary
- Special design – Good chip removal
- Powerful drilling








MG | 30° | h6 | h7 | 140° | 20 bar P.130

10 × D

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH510030 | 3.0 | .1181 | 3 | 39 | 90 |
| DH510033 | 3.3 | .1299 | 4 | 46 | 97 |
| DH510035 | 3.5 | .1378 | 4 | 46 | 97 |
| DH510040 | 4.0 | .1575 | 4 | 52 | 103 |
| DH510042 | 4.2 | .1654 | 5 | 59 | 112 |
| DH510045 | 4.5 | .1772 | 5 | 59 | 112 |
| DH510050 | 5.0 | .1969 | 5 | 65 | 118 |
| DH510055 | 5.5 | .2165 | 6 | 72 | 127 |
| DH510060 | 6.0 | .2362 | 6 | 78 | 133 |
| DH510065 | 6.5 | .2559 | 7 | 85 | 141 |
| DH510068 | 6.8 | .2677 | 7 | 91 | 147 |
| DH510070 | 7.0 | .2756 | 7 | 91 | 147 |
| DH510075 | 7.5 | .2953 | 8 | 98 | 155 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH510080 | 8.0 | .3150 | 8 | 104 | 161 |
| DH510085 | 8.5 | .3346 | 9 | 111 | 169 |
| DH510090 | 9.0 | .3543 | 9 | 117 | 175 |
| DH510095 | 9.5 | .3740 | 10 | 124 | 182 |
| DH510100 | 10.0 | .3937 | 10 | 130 | 188 |
| DH510105 | 10.5 | .4134 | 11 | 137 | 201 |
| DH510110 | 11.0 | .4330 | 11 | 143 | 207 |
| DH510115 | 11.5 | .4527 | 12 | 150 | 215 |
| DH510120 | 12.0 | .4724 | 12 | 156 | 221 |
| DH510125 | 12.5 | .4921 | 13 | 163 | 229 |
| DH510130 | 13.0 | .5118 | 13 | 169 | 235 |
| DH510135 | 13.5 | .5314 | 14 | 176 | 243 |
| DH510140 | 14.0 | .5512 | 14 | 182 | 249 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DREAM DRILLS -MQL TYPE

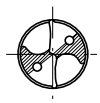
**DH515 SERIES**
**DH520 SERIES**

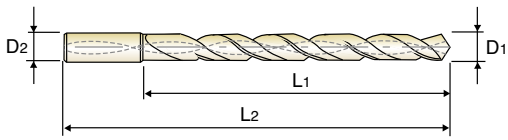
## CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES

***EXTRA LONG***

- Non step drilling up to 15 times (20 times) of drill diameter
- Available for processing MQL(Minimum Quantity Lubrication)
- Excellent positioning – Bush is not necessary
- Special design – Good chip removal
- Powerful drilling








MG | 30° | h6 | h7 | 140° | 45 bar

P.130

15 × D (DH515) | 20 × D (DH520)

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH515030 | 3.0 | .1181 | 3 | 54 | 105 |
| DH515035 | 3.5 | .1378 | 4 | 63 | 114 |
| DH515040 | 4.0 | .1575 | 4 | 72 | 123 |
| DH515045 | 4.5 | .1772 | 5 | 81 | 134 |
| DH515050 | 5.0 | .1969 | 5 | 90 | 143 |
| DH515055 | 5.5 | .2165 | 6 | 99 | 154 |
| DH515060 | 6.0 | .2362 | 6 | 108 | 163 |
| DH515070 | 7.0 | .2756 | 7 | 126 | 182 |
| DH515080 | 8.0 | .3150 | 8 | 144 | 201 |
| DH515090 | 9.0 | .3543 | 9 | 162 | 220 |
| DH515100 | 10.0 | .3937 | 10 | 180 | 238 |
| DH515110 | 11.0 | .4330 | 11 | 198 | 262 |
| DH515120 | 12.0 | .4724 | 12 | 216 | 281 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH520030 | 3.0 | .1181 | 3 | 69 | 120 |
| DH520035 | 3.5 | .1378 | 4 | 81 | 132 |
| DH520040 | 4.0 | .1575 | 4 | 92 | 143 |
| DH520045 | 4.5 | .1772 | 5 | 104 | 157 |
| DH520050 | 5.0 | .1969 | 5 | 115 | 168 |
| DH520055 | 5.5 | .2165 | 6 | 127 | 182 |
| DH520060 | 6.0 | .2362 | 6 | 138 | 193 |
| DH520070 | 7.0 | .2756 | 7 | 161 | 217 |
| DH520080 | 8.0 | .3150 | 8 | 184 | 241 |
| DH520090 | 9.0 | .3543 | 9 | 207 | 265 |
| DH520100 | 10.0 | .3937 | 10 | 230 | 288 |
| DH520120 | 12.0 | .4724 | 12 | 276 | 341 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DREAM DRILLS -MQL TYPE

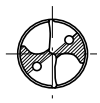
DHM10 SERIES
DHM15 SERIES
DHM20 SERIES

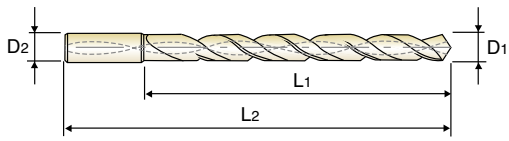
## CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES

***EXTRA LONG***

- Non step drilling up to 10 times (15 times & 20 times) of drill diameter
- Available for processing MQL(Minimum Quantity Lubrication)
- Excellent positioning – Bush is not necessary
- Special design – Good chip removal
- Powerful drilling








DHM10 DHM15 DHM20

◇ Call for Availability

MG | 30° | h6 | h7 | 140° | 20 bar | 45 bar | P.130

10 × D (DHM10) | 15 × D (DHM15) | 20 × D (DHM20)

### 10 × D

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DHM10030 | 3.0 | .1181 | 6 | 40 | 80 |
| DHM10033 | 3.3 | .1299 | 6 | 47 | 87 |
| DHM10035 | 3.5 | .1378 | 6 | 47 | 87 |
| DHM10040 | 4.0 | .1575 | 6 | 53 | 93 |
| DHM10042 | 4.2 | .1654 | 6 | 60 | 100 |
| DHM10045 | 4.5 | .1772 | 6 | 60 | 100 |
| DHM10050 | 5.0 | .1969 | 6 | 66 | 106 |
| DHM10055 | 5.5 | .2165 | 6 | 73 | 113 |
| DHM10060 | 6.0 | .2362 | 6 | 79 | 119 |
| DHM10065 | 6.5 | .2559 | 8 | 86 | 126 |
| DHM10068 | 6.8 | .2677 | 8 | 92 | 132 |
| DHM10070 | 7.0 | .2756 | 8 | 92 | 132 |
| DHM10075 | 7.5 | .2953 | 8 | 99 | 139 |
| DHM10080 | 8.0 | .3150 | 8 | 105 | 145 |
| DHM10085 | 8.5 | .3346 | 10 | 112 | 156 |
| DHM10090 | 9.0 | .3543 | 10 | 118 | 162 |
| DHM10095 | 9.5 | .3740 | 10 | 126 | 170 |
| DHM10100 | 10.0 | .3937 | 10 | 132 | 176 |
| DHM10105 | 10.5 | .4134 | 12 | 139 | 188 |
| DHM10110 | 11.0 | .4330 | 12 | 145 | 194 |
| DHM10115 | 11.5 | .4527 | 12 | 152 | 201 |
| DHM10120 | 12.0 | .4724 | 12 | 158 | 207 |
| DHM10125 | 12.5 | .4921 | 14 | 165 | 214 |
| DHM10130 | 13.0 | .5118 | 14 | 171 | 220 |
| DHM10135 | 13.5 | .5314 | 14 | 178 | 227 |
| DHM10140 | 14.0 | .5512 | 14 | 184 | 233 |

### 15 × D

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DHM15030 | 3.0 | .1181 | 6 | 55 | 95 |
| DHM15035 | 3.5 | .1378 | 6 | 64 | 104 |
| DHM15040 | 4.0 | .1575 | 6 | 73 | 113 |
| DHM15045 | 4.5 | .1772 | 6 | 82 | 122 |
| DHM15050 | 5.0 | .1969 | 6 | 91 | 131 |
| DHM15055 | 5.5 | .2165 | 6 | 100 | 140 |
| DHM15060 | 6.0 | .2362 | 6 | 109 | 149 |
| DHM15070 | 7.0 | .2756 | 8 | 127 | 167 |
| DHM15080 | 8.0 | .3150 | 8 | 145 | 185 |
| DHM15090 | 9.0 | .3543 | 10 | 163 | 207 |
| DHM15100 | 10.0 | .3937 | 10 | 182 | 226 |
| DHM15110 | 11.0 | .4330 | 12 | 200 | 249 |
| DHM15120 | 12.0 | .4724 | 12 | 218 | 267 |

### 20 × D

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DHM20030 | 3.0 | .1181 | 6 | 70 | 110 |
| DHM20035 | 3.5 | .1378 | 6 | 82 | 122 |
| DHM20040 | 4.0 | .1575 | 6 | 93 | 133 |
| DHM20045 | 4.5 | .1772 | 6 | 105 | 145 |
| DHM20050 | 5.0 | .1969 | 6 | 116 | 156 |
| DHM20055 | 5.5 | .2165 | 6 | 128 | 168 |
| DHM20060 | 6.0 | .2362 | 6 | 139 | 179 |
| DHM20070 | 7.0 | .2756 | 8 | 162 | 202 |
| DHM20080 | 8.0 | .3150 | 8 | 185 | 225 |
| DHM20090 | 9.0 | .3543 | 10 | 208 | 252 |
| DHM20100 | 10.0 | .3937 | 10 | 232 | 276 |
| DHM20110 | 11.0 | .4330 | 12 | 255 | 304 |
| DHM20120 | 12.0 | .4724 | 12 | 278 | 327 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DREAM DRILLS -MQL TYPE

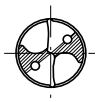
**DHM25 SERIES**
**DHM30 SERIES**

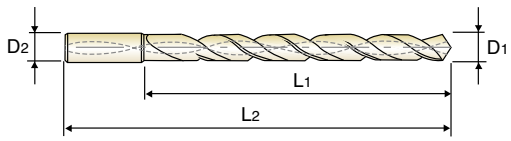
## CARBIDE, DREAM DRILLS MQL TYPE END MILL SHANK with COOLANT HOLES

***EXTRA LONG***

- Non step drilling up to 25 times (30 times) of drill diameter
- Available for processing MQL(Minimum Quantity Lubrication)
- Excellent positioning – Bush is not necessary
- Special design – Good chip removal
- Powerful drilling








◇ Call for Availability

MG | 30° | h6 | h7 | 140° | 45 bar | P.130

25 × D (DHM25) | 30 × D (DHM30)

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DHM25030 | 3.0 | .1181 | 6 | 85 | 125 |
| DHM25035 | 3.5 | .1378 | 6 | 99 | 139 |
| DHM25040 | 4.0 | .1575 | 6 | 113 | 153 |
| DHM25045 | 4.5 | .1772 | 6 | 127 | 167 |
| DHM25050 | 5.0 | .1969 | 6 | 141 | 181 |
| DHM25055 | 5.5 | .2165 | 6 | 155 | 195 |
| DHM25060 | 6.0 | .2362 | 6 | 169 | 209 |
| DHM25070 | 7.0 | .2756 | 8 | 197 | 237 |
| DHM25080 | 8.0 | .3150 | 8 | 225 | 265 |
| DHM25090 | 9.0 | .3543 | 10 | 253 | 297 |
| DHM25100 | 10.0 | .3937 | 10 | 282 | 326 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DHM30030 | 3.0 | .1181 | 6 | 100 | 140 |
| DHM30035 | 3.5 | .1378 | 6 | 117 | 157 |
| DHM30040 | 4.0 | .1575 | 6 | 133 | 173 |
| DHM30045 | 4.5 | .1772 | 6 | 150 | 190 |
| DHM30050 | 5.0 | .1969 | 6 | 166 | 206 |
| DHM30055 | 5.5 | .2165 | 6 | 183 | 223 |
| DHM30060 | 6.0 | .2362 | 6 | 199 | 239 |
| DHM30070 | 7.0 | .2756 | 8 | 232 | 272 |
| DHM30080 | 8.0 | .3150 | 8 | 265 | 305 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | | ○ | | | | | |

# DREAM DRILLS -MQL TYPE

**RECOMMENDED CUTTING CONDITIONS**

## CARBIDE, DREAM DRILLS MQL TYPE with COOLANT HOLES, TiAlN COATED

### DH510, DH515, DH520, DHM10, DHM15, DHM20 SERIES

| WORK MATERIAL | | P | | | | K | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CARBON STEELS | | | | CAST IRON | | | | DUCTILE CAST IRON | | | |
| STRENGTH | | ~ 1060 N/mm² | | | | 250 ~ 350 N/mm² | | | | 400 ~ 500 N/mm² | | | |
| DRILLING SPEED(SFM) | | 230 ~ 290 ft/min | | | | 230 ~ 290 ft/min | | | | 220 ~ 240 ft/min | | | |
| DIAMETER | | N | S | IPR | | N | S | IPR | | N | S | IPR | |
| Metric(mm) | Decimal | | | | | | | | | | | | |
| 3 | .1181 | 7500 | 0.06~0.12 | .0024 | .0047 | 7500 | 0.06~0.12 | .0024 | .0047 | 7500 | 0.06~0.12 | .0024 | .0047 |
| 4 | .1575 | 6400 | 0.08~0.16 | .0031 | .0063 | 6400 | 0.08~0.16 | .0031 | .0063 | 5600 | 0.08~0.16 | .0031 | .0063 |
| 5 | .1969 | 5800 | 0.10~0.20 | .0039 | .0079 | 5800 | 0.10~0.20 | .0039 | .0079 | 4500 | 0.10~0.20 | .0039 | .0079 |
| 6 | .2362 | 4800 | 0.12~0.24 | .0047 | .0094 | 4800 | 0.12~0.24 | .0047 | .0094 | 3800 | 0.12~0.24 | .0047 | .0094 |
| 8 | .3150 | 3600 | 0.16~0.28 | .0063 | .0110 | 3600 | 0.16~0.28 | .0063 | .0110 | 2800 | 0.16~0.28 | .0063 | .0110 |
| 10 | .3937 | 2900 | 0.20~0.35 | .0079 | .0138 | 2900 | 0.20~0.35 | .0079 | .0138 | 2300 | 0.20~0.35 | .0079 | .0138 |
| 12 | .4724 | 2400 | 0.24~0.42 | .0094 | .0165 | 2400 | 0.24~0.42 | .0094 | .0165 | 1900 | 0.24~0.42 | .0094 | .0165 |
| 14 | .5512 | 2050 | 0.28~0.46 | .0110 | .0181 | 2050 | 0.28~0.46 | .0110 | .0181 | 1600 | 0.28~0.46 | .0110 | .0181 |

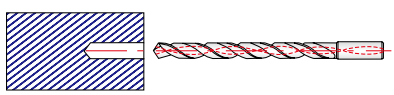
N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

### DHM25, DHM30 SERIES

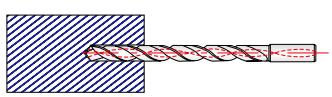
| WORK MATERIAL | | P | | | | K | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CARBON STEELS | | | | CAST IRON | | | | DUCTILE CAST IRON | | | |
| STRENGTH | | ~ 1060 N/mm² | | | | 250 ~ 350 N/mm² | | | | 400 ~ 500 N/mm² | | | |
| DRILLING SPEED(SFM) | | 230 ~ 290 ft/min | | | | 230 ~ 290 ft/min | | | | 220 ~ 240 ft/min | | | |
| DIAMETER | | N | S | IPR | | N | S | IPR | | N | S | IPR | |
| Metric(mm) | Decimal | | | | | | | | | | | | |
| 3 | .1181 | 6400 | 0.06~0.12 | .0024 | .0047 | 6400 | 0.06~0.12 | .0024 | .0047 | 6400 | 0.06~0.12 | .0024 | .0047 |
| 4 | .1575 | 5500 | 0.08~0.16 | .0031 | .0063 | 5500 | 0.08~0.16 | .0031 | .0063 | 4700 | 0.08~0.16 | .0031 | .0063 |
| 5 | .1969 | 4900 | 0.10~0.20 | .0039 | .0079 | 4900 | 0.10~0.20 | .0039 | .0079 | 3800 | 0.10~0.20 | .0039 | .0079 |
| 6 | .2362 | 4200 | 0.12~0.24 | .0047 | .0094 | 4200 | 0.12~0.24 | .0047 | .0094 | 3200 | 0.12~0.24 | .0047 | .0094 |
| 8 | .3150 | 3000 | 0.16~0.28 | .0063 | .0110 | 3000 | 0.16~0.28 | .0063 | .0110 | 2400 | 0.16~0.28 | .0063 | .0110 |
| 10 | .3937 | 2500 | 0.20~0.35 | .0079 | .0138 | 2500 | 0.20~0.35 | .0079 | .0138 | 1900 | 0.20~0.35 | .0079 | .0138 |

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

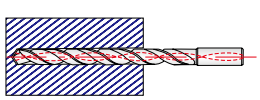
### ▶ Coolant Pressure : 900 PSI



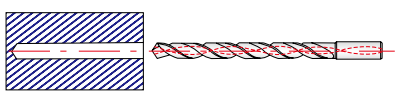
1. Use a YG 3xD Drill to produce a guide hole no larger than .004 over the required drill size. Drill the pilot hole 2xD deep hole.



2. Enter the guide hole at 50 SFM surface and .010 feed rate / per rev.



3. Before hitting the bottom of the guide hole, Increase SFM and feed rate for normal drilling.

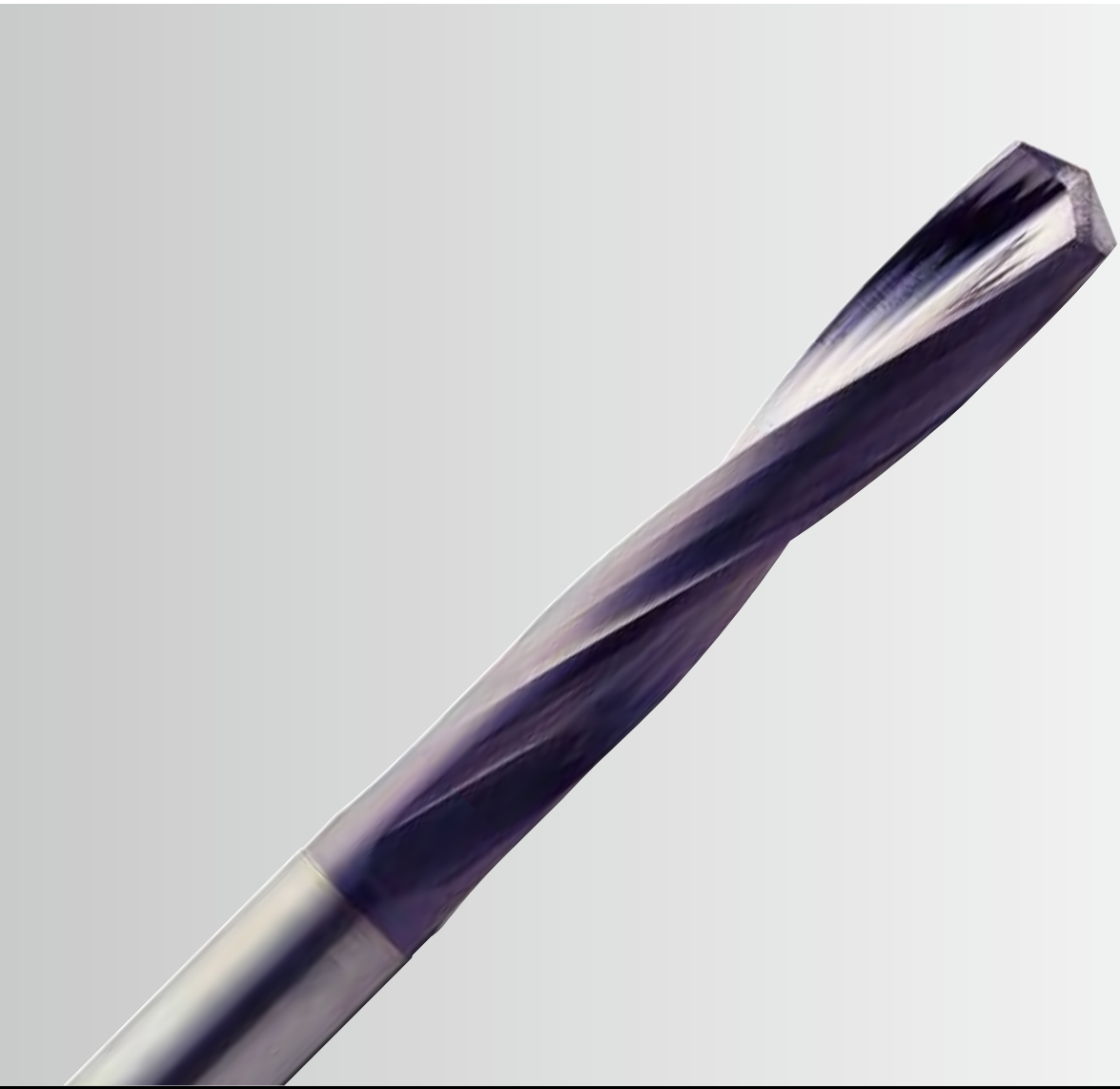


4. After drilling, to withdraw drill, reduce SFM to 50 @ 10 inches per minute.

# CARBIDE

YG

Being the best through innovation



# DREAM DRILLS
## - For HIGH HARDENED STEELS

- HIGH HARDENED STEELS, HRc50~HRc70

## SOLID CARBIDE DREAM DRILLS for HIGH HARDENED STEELS
High Hardened Steels, HRc50~HRc70


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| | **DH501**  | CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~HRc70) | D1/8 | D3/4 | **134** |
| **METRIC** | | | | | |
| | **DH500**  | CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~HRc70) | D1.0 | D14.0 | **136** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **138** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |

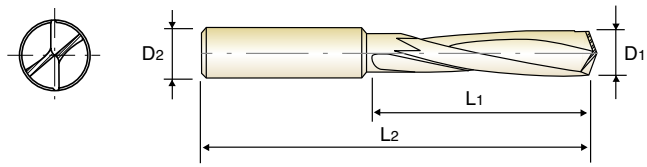
# DREAM DRILLS for HIGH HARDENED STEELS

DH501 SERIES

## CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

▶ **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
▶ **Advantage** : Special Design
Minimum of cutting load through special thinning
Good chip removal
Powerful Drilling
▶ **Tolerance** : Dia. Tolerance ØD1: See page 247, Shank Tolerance ØD2: -.0001 -.0005






MG 15° h6 140°

P.138

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH501001 | 1/8 | .1250 | 1/8 | 21/32 | 2 |
| DH501002 | #30 | .1285 | 3/16 | 23/32 | 2 |
| DH501003 | #29 | .1360 | 3/16 | 13/16 | 2 |
| DH501004 | #28 | .1405 | 3/16 | 13/16 | 2 |
| DH501005 | 9/64 | .1406 | 3/16 | 13/16 | 2 |
| DH501006 | #27 | .1440 | 3/16 | 13/16 | 2 |
| DH501007 | #26 | .1470 | 3/16 | 13/16 | 2 |
| DH501008 | #25 | .1495 | 3/16 | 7/8 | 2-1/16 |
| DH501009 | #24 | .1520 | 3/16 | 7/8 | 2-1/16 |
| DH501010 | #23 | .1540 | 3/16 | 7/8 | 2-1/16 |
| DH501011 | 5/32 | .1562 | 3/16 | 7/8 | 2-1/16 |
| DH501012 | #22 | .1570 | 3/16 | 7/8 | 2-1/16 |
| DH501013 | #21 | .1590 | 3/16 | 7/8 | 2-1/16 |
| DH501014 | #20 | .1610 | 3/16 | 1 | 2-1/2 |
| DH501015 | #19 | .1660 | 3/16 | 1 | 2-1/2 |
| DH501016 | 11/64 | .1719 | 3/16 | 1-1/8 | 2-3/4 |
| DH501017 | #15 | .1800 | 3/16 | 1-1/8 | 2-3/4 |
| DH501018 | #14 | .1820 | 3/16 | 1-1/8 | 2-3/4 |
| DH501019 | 3/16 | .1875 | 3/16 | 1-1/8 | 2-3/4 |
| DH501020 | #10 | .1935 | 1/4 | 1-9/32 | 2-7/8 |
| DH501021 | #9 | .1960 | 1/4 | 1-9/32 | 2-7/8 |
| DH501022 | #8 | .1990 | 1/4 | 1-9/32 | 2-7/8 |
| DH501023 | #7 | .2010 | 1/4 | 1-9/32 | 2-7/8 |
| DH501024 | 13/64 | .2031 | 1/4 | 1-9/32 | 2-7/8 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH501025 | #6 | .2040 | 1/4 | 1-9/32 | 2-7/8 |
| DH501026 | #5 | .2055 | 1/4 | 1-9/32 | 2-7/8 |
| DH501027 | #4 | .2090 | 1/4 | 1-9/32 | 2-7/8 |
| DH501028 | #3 | .2130 | 1/4 | 1-13/32 | 3 |
| DH501029 | 7/32 | .2188 | 1/4 | 1-13/32 | 3 |
| DH501030 | #2 | .2210 | 1/4 | 1-13/32 | 3 |
| DH501031 | #1 | .2280 | 1/4 | 1-13/32 | 3 |
| DH501032 | 15/64 | .2344 | 1/4 | 1-13/32 | 3 |
| DH501033 | B | .2380 | 1/4 | 1-19/32 | 3-1/8 |
| DH501034 | C | .2420 | 1/4 | 1-19/32 | 3-1/8 |
| DH501035 | D | .2460 | 1/4 | 1-19/32 | 3-1/8 |
| DH501036 | 1/4 | .2500 | 1/4 | 1-19/32 | 3-1/8 |
| DH501037 | F | .2570 | 3/8 | 1-19/32 | 3-1/8 |
| DH501038 | G | .2610 | 3/8 | 1-19/32 | 3-1/8 |
| DH501039 | 17/64 | .2656 | 3/8 | 1-19/32 | 3-1/8 |
| DH501040 | I | .2720 | 3/8 | 1-25/32 | 3-3/8 |
| DH501041 | J | .2770 | 3/8 | 1-25/32 | 3-3/8 |
| DH501042 | 9/32 | .2812 | 3/8 | 1-25/32 | 3-3/8 |
| DH501043 | L | .2900 | 3/8 | 1-25/32 | 3-3/8 |
| DH501044 | M | .2950 | 3/8 | 1-25/32 | 3-3/8 |
| DH501045 | 19/64 | .2969 | 3/8 | 1-25/32 | 3-3/8 |
| DH501046 | N | .3020 | 3/8 | 1-31/32 | 3-7/8 |
| DH501047 | 5/16 | .3125 | 3/8 | 1-31/32 | 3-7/8 |
| DH501048 | O | .3160 | 3/8 | 1-31/32 | 3-7/8 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |

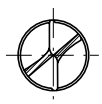
# DREAM DRILLS for HIGH HARDENED STEELS

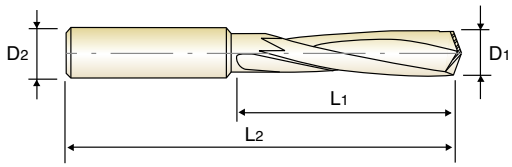
**DH501 SERIES**

## CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

- **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
- **Advantage** : Special Design
  Minimum of cutting load through special thinning
  Good chip removal
  Powerful Drilling
- **Tolerance** : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005








MG | 15° | h6 | 140° P.138

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH501049 | 21/64 | .3281 | 3/8 | 1-31/32 | 3-7/8 |
| DH501050 | Q | .3320 | 3/8 | 1-31/32 | 3-7/8 |
| DH501051 | R | .3390 | 3/8 | 2-1/4 | 4-1/8 |
| DH501052 | 11/32 | .3438 | 3/8 | 2-1/4 | 4-1/8 |
| DH501053 | 23/64 | .3594 | 3/8 | 2-1/4 | 4-1/8 |
| DH501054 | U | .3680 | 3/8 | 2-1/4 | 4-1/8 |
| DH501055 | 3/8 | .3750 | 3/8 | 2-1/4 | 4-1/8 |
| DH501056 | V | .3770 | 1/2 | 2-1/2 | 4-3/8 |
| DH501057 | 25/64 | .3906 | 1/2 | 2-1/2 | 4-3/8 |
| DH501058 | X | .3970 | 1/2 | 2-1/2 | 4-3/8 |
| DH501059 | Y | .4040 | 1/2 | 2-1/2 | 4-3/8 |
| DH501060 | 13/32 | .4062 | 1/2 | 2-1/2 | 4-3/8 |
| DH501061 | Z | .4130 | 1/2 | 2-1/2 | 4-3/8 |
| DH501062 | 27/64 | .4219 | 1/2 | 2-13/16 | 4-5/8 |
| DH501063 | 7/16 | .4375 | 1/2 | 2-13/16 | 4-5/8 |
| DH501064 | 29/64 | .4531 | 1/2 | 2-13/16 | 4-5/8 |
| DH501065 | 15/32 | .4688 | 1/2 | 2-13/16 | 4-5/8 |
| DH501066 | 31/64 | .4844 | 1/2 | 2-13/16 | 4-5/8 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH501067 | 1/2 | .5000 | 1/2 | 3-1/16 | 5 |
| DH501068 | 33/64 | .5156 | 5/8 | 3-1/16 | 5 |
| DH501069 | 17/32 | .5312 | 5/8 | 3-1/16 | 5 |
| DH501070 | 35/64 | .5469 | 5/8 | 3-1/16 | 5 |
| DH501071 | 9/16 | .5625 | 5/8 | 3-1/16 | 5 |
| DH501072 | 37/64 | .5781 | 5/8 | 3-9/32 | 5-1/4 |
| DH501073 | 19/32 | .5937 | 5/8 | 3-9/32 | 5-1/4 |
| DH501074 | 39/64 | .6094 | 5/8 | 3-9/32 | 5-1/4 |
| DH501075 | 5/8 | .6250 | 5/8 | 3-9/32 | 5-1/4 |
| DH501076 | 41/64 | .6406 | 3/4 | 3-9/32 | 5-1/4 |
| DH501077 | 21/32 | .6563 | 3/4 | 3-11/16 | 5-5/8 |
| DH501078 | 43/64 | .6719 | 3/4 | 3-11/16 | 5-5/8 |
| DH501079 | 11/16 | .6875 | 3/4 | 3-11/16 | 5-5/8 |
| DH501080 | 45/64 | .7031 | 3/4 | 3-11/16 | 5-5/8 |
| DH501081 | 23/32 | .7188 | 3/4 | 3-3/4 | 6 |
| DH501082 | 47/64 | .7344 | 3/4 | 3-3/4 | 6 |
| DH501083 | 3/4 | .7500 | 3/4 | 3-3/4 | 6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| | | | ◎ | ◎ | | | | | | | | |

# DREAM DRILLS for HIGH HARDENED STEELS

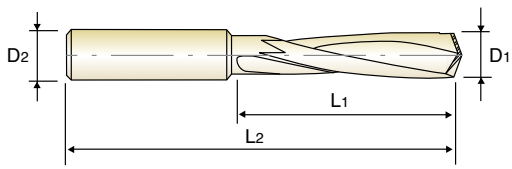
DH500 SERIES

## CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

▶ **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
▶ **Advantage** : Special Design
Minimum of cutting load through special thinning
Good chip removal
Powerful Drilling








MG | 15° | h6 | h7 | 140° P.138

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH500010 | 1.0 | .0394 | 3 | 6 | 40 |
| DH500011 | 1.1 | .0433 | 3 | 6 | 40 |
| DH500012 | 1.2 | .0472 | 3 | 6 | 40 |
| DH500013 | 1.3 | .0512 | 3 | 8 | 40 |
| DH500014 | 1.4 | .0551 | 3 | 8 | 40 |
| DH500015 | 1.5 | .0591 | 3 | 8 | 40 |
| DH500016 | 1.6 | .0630 | 3 | 10 | 40 |
| DH500017 | 1.7 | .0669 | 3 | 10 | 40 |
| DH500018 | 1.8 | .0709 | 3 | 10 | 40 |
| DH500019 | 1.9 | .0748 | 3 | 10 | 40 |
| DH500020 | 2.0 | .0787 | 3 | 12 | 42 |
| DH500025 | 2.5 | .0984 | 3 | 14 | 44 |
| DH500026 | 2.6 | .1024 | 3 | 16 | 44 |
| DH500028 | 2.8 | .1102 | 3 | 16 | 46 |
| DH500030 | 3.0 | .1181 | 3 | 18 | 46 |
| DH500033 | 3.3 | .1299 | 4 | 18 | 48 |
| DH500034 | 3.4 | .1339 | 4 | 20 | 50 |
| DH500035 | 3.5 | .1378 | 4 | 20 | 50 |
| DH500038 | 3.8 | .1496 | 4 | 22 | 52 |
| DH500040 | 4.0 | .1575 | 4 | 22 | 52 |
| DH500041 | 4.1 | .1614 | 6 | 25 | 65 |
| DH500042 | 4.2 | .1654 | 6 | 25 | 65 |
| DH500043 | 4.3 | .1693 | 6 | 28 | 68 |
| DH500044 | 4.4 | .1732 | 6 | 28 | 68 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH500045 | 4.5 | .1772 | 6 | 28 | 68 |
| DH500046 | 4.6 | .1811 | 6 | 28 | 68 |
| DH500048 | 4.8 | .1890 | 6 | 32 | 72 |
| DH500049 | 4.9 | .1929 | 6 | 32 | 72 |
| DH500050 | 5.0 | .1969 | 6 | 32 | 72 |
| DH500051 | 5.1 | .2008 | 6 | 32 | 72 |
| DH500052 | 5.2 | .2047 | 6 | 32 | 72 |
| DH500053 | 5.3 | .2087 | 6 | 32 | 72 |
| DH500055 | 5.5 | .2165 | 6 | 35 | 75 |
| DH500060 | 6.0 | .2362 | 6 | 35 | 75 |
| DH500062 | 6.2 | .2441 | 8 | 40 | 80 |
| DH500065 | 6.5 | .2559 | 8 | 40 | 80 |
| DH500068 | 6.8 | .2677 | 8 | 45 | 85 |
| DH500069 | 6.9 | .2717 | 8 | 45 | 85 |
| DH500070 | 7.0 | .2756 | 8 | 45 | 85 |
| DH500075 | 7.5 | .2953 | 8 | 45 | 85 |
| DH500080 | 8.0 | .3150 | 8 | 50 | 98 |
| DH500085 | 8.5 | .3346 | 10 | 50 | 98 |
| DH500086 | 8.6 | .3386 | 10 | 57 | 105 |
| DH500088 | 8.8 | .3465 | 10 | 57 | 105 |
| DH500090 | 9.0 | .3543 | 10 | 57 | 105 |
| DH500093 | 9.3 | .3661 | 10 | 57 | 105 |
| DH500095 | 9.5 | .3740 | 10 | 57 | 105 |
| DH500100 | 10.0 | .3937 | 10 | 63 | 111 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |

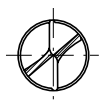
# DREAM DRILLS for HIGH HARDENED STEELS

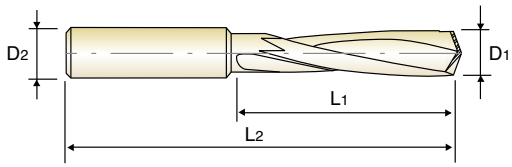
DH500 SERIES

## CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70)

- **Application** : Drilling for High Hardened Steels[Quenched Steels, Tempered Steels (Under HRc 70)]
- **Advantage** : Special Design
  Minimum of cutting load through special thinning
  Good chip removal
  Powerful Drilling
- **Tolerance** : Dia. Tolerance ∅D1: See page 247, Shank Tolerance ∅D2: -.0001 -.0005








MG | 15° | h6 | 140° P.138

Unit : mm

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH500102 | 10.2 | .4016 | 12 | 63 | 111 |
| DH500103 | 10.3 | .4055 | 12 | 63 | 111 |
| DH500105 | 10.5 | .4134 | 12 | 71 | 111 |
| DH500108 | 10.8 | .4252 | 12 | 71 | 119 |
| DH500110 | 11.0 | .4331 | 12 | 71 | 119 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| DH500115 | 11.5 | .4528 | 12 | 71 | 119 |
| DH500120 | 12.0 | .4724 | 12 | 71 | 119 |
| DH500121 | 12.1 | .4764 | 14 | 77 | 125 |
| DH500140 | 14.0 | .5512 | 14 | 77 | 125 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| | | | ◎ | ◎ | | | | | | | |

# DREAM DRILLS for HIGH HARDENED STEELS

**RECOMMENDED CUTTING CONDITIONS**

## CARBIDE, DREAM DRILLS for HIGH HARDENED STEEL (HRc50~70), TiAlN COATED

### DH501 SERIES

| WORK MATERIAL | | | P | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HARDENED STEELS | | | | | | | | |
| | | | HRc 50~55 | | | HRc 55~60 | | | HRc 60~70 | | |
| DRILLING SPEED(SFM) | | | 45 ~ 72 ft/min | | | 32 ~ 52 ft/min | | | 26 ~ 42 ft/min | | |
| DIAMETER | | | N | S | IPR | N | S | IPR | N | S | IPR |
| Fractional | Metric(mm) | Decimal | | | | | | | | | |
| 5/64 | 1.984 | .0781 | 2860 | 0.04 | .0015 | 2000 | 0.04 | .0015 | 1900 | 0.04 | .0015 |
| 1/8 | 3.175 | .1250 | 1900 | 0.04 | .0015 | 1330 | 0.04 | .0015 | 1250 | 0.04 | .0015 |
| 5/32 | 3.969 | .1563 | 1430 | 0.04 | .0015 | 1000 | 0.04 | .0015 | 950 | 0.04 | .0015 |
| 13/64 | 5.159 | .2031 | 1150 | 0.04 | .0015 | 800 | 0.04 | .0015 | 750 | 0.04 | .0015 |
| 15/64 | 5.953 | .2344 | 960 | 0.04 | .0015 | 670 | 0.04 | .0015 | 630 | 0.04 | .0015 |
| 5/16 | 7.938 | .3125 | 720 | 0.04 | .0015 | 500 | 0.04 | .0015 | 480 | 0.04 | .0015 |
| 25/64 | 9.922 | .3906 | 570 | 0.04 | .0015 | 400 | 0.04 | .0015 | 380 | 0.04 | .0015 |
| 15/32 | 11.906 | .4688 | 480 | 0.04 | .0015 | 330 | 0.04 | .0015 | 320 | 0.04 | .0015 |
| 9/16 | 14.288 | .5625 | 435 | 0.04 | .0015 | 280 | 0.04 | .0015 | 270 | 0.04 | .0015 |
| 41/64 | 16.272 | .6406 | 380 | 0.04 | .0015 | 250 | 0.04 | .0015 | 240 | 0.04 | .0015 |
| 11/16 | 17.463 | .6875 | 325 | 0.04 | .0015 | 235 | 0.04 | .0015 | 190 | 0.04 | .0015 |
| 47/64 | 18.653 | .7344 | 310 | 0.04 | .0015 | 220 | 0.04 | .0015 | 180 | 0.04 | .0015 |

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

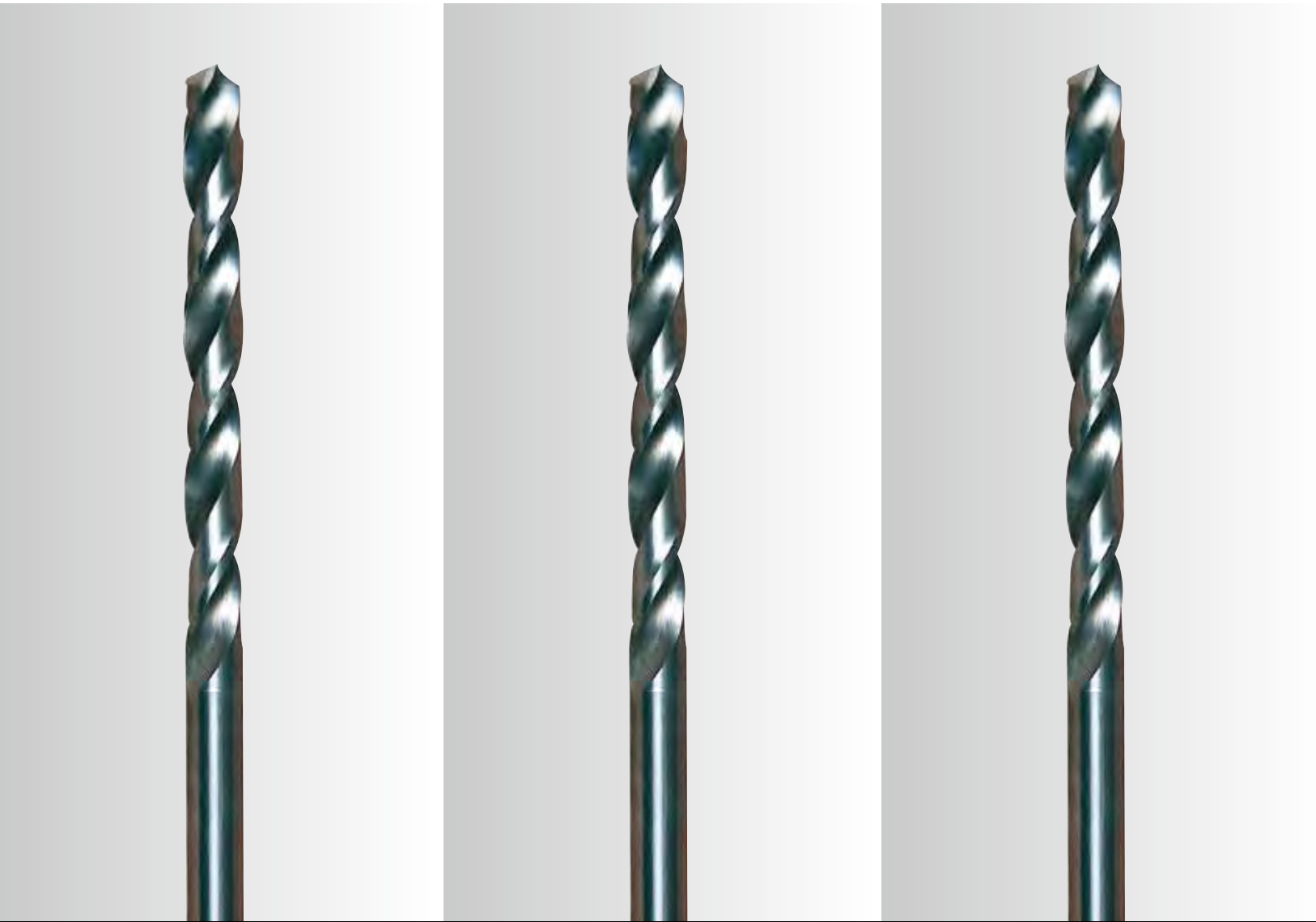
### DH500 SERIES

| WORK MATERIAL | | | P | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HARDENED STEELS | | | | | | | | |
| | | | HRc 50~55 | | | HRc 55~60 | | | HRc 60~70 | | |
| DRILLING SPEED(SFM) | | | 45 ~ 72 ft/min | | | 32 ~ 52 ft/min | | | 26 ~ 42 ft/min | | |
| DIAMETER | | | N | S | IPR | N | S | IPR | N | S | IPR |
| Fractional | Metric(mm) | Decimal | | | | | | | | | |
| 1.0 | | .0394 | 5600 | 0.04 | .0015 | 4000 | 0.04 | .0015 | 3700 | 0.04 | .0015 |
| 2.0 | | .0787 | 2900 | 0.04 | .0015 | 2100 | 0.04 | .0015 | 1900 | 0.04 | .0015 |
| 3.0 | | .1181 | 1900 | 0.04 | .0015 | 1330 | 0.04 | .0015 | 1250 | 0.04 | .0015 |
| 4.0 | | .1575 | 1430 | 0.04 | .0015 | 1000 | 0.04 | .0015 | 950 | 0.04 | .0015 |
| 5.0 | | .1969 | 1150 | 0.04 | .0015 | 800 | 0.04 | .0015 | 750 | 0.04 | .0015 |
| 6.0 | | .2362 | 960 | 0.04 | .0015 | 670 | 0.04 | .0015 | 630 | 0.04 | .0015 |
| 8.0 | | .3150 | 720 | 0.04 | .0015 | 500 | 0.04 | .0015 | 480 | 0.04 | .0015 |
| 10.0 | | .3937 | 570 | 0.04 | .0015 | 400 | 0.04 | .0015 | 380 | 0.04 | .0015 |
| 12 .0 | | .4724 | 480 | 0.04 | .0015 | 330 | 0.04 | .0015 | 320 | 0.04 | .0015 |
| 14.0 | | .5512 | 438 | 0.04 | .0015 | 282 | 0.04 | .0015 | 272 | 0.04 | .0015 |

N = R.P.M
S= feed rate (mm/rev.)
IPR= feed rate (Inch/rev.)

# CARBIDE

Being the best through innovation



# STANDARD CARBIDE DRILLS

- General Purpose
  118° Point

# SELECTION GUIDE

## STANDARD SOLID CARBIDE DRILLS

General Purpose

118° Point

| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **INCH** | | | | | | |
| **D5412 DH412** |  | CARBIDE DRILLS / Wire gauge sizes | *JOBBER* | #56 | #1 | **142** |
| **D5413 DH413** |  | CARBIDE DRILLS / Letter sizes | *JOBBER* | A | Z | **143** |
| **D5417 DH417** |  | CARBIDE DRILLS / Fractional sizes | *JOBBER* | D3/64 | D1/2 | **144** |
| | | RECOMMENDED CUTTING CONDITIONS | | | | **145** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |

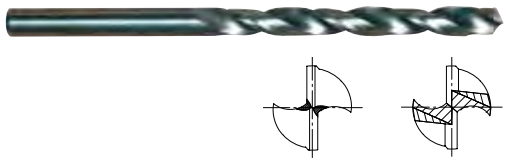
# STANDARD CARBIDE DRILLS

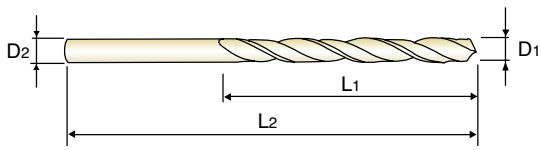
**DH412 SERIES**
**D5412 SERIES**

## CARBIDE DRILLS

***JOBBER***

▶ **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.




MG | N 30° | h6 | h7 | 118° | P.145

$D_1 = D_2$

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length | EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Wire gauge | Decimal | | | | | Wire gauge | Decimal | | |
| Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ | Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| D5412101 | DH412101 | 1 | .2280 | 1-3/4 | 3 | D5412129 | DH412129 | 29 | .1360 | 1-3/8 | 2-1/2 |
| D5412102 | DH412102 | 2 | .2210 | 1-3/4 | 3 | D5412130 | DH412130 | 30 | .1285 | 1-1/4 | 2-1/4 |
| D5412103 | DH412103 | 3 | .2130 | 1-3/4 | 3 | D5412131 | DH412131 | 31 | .1200 | 1-1/4 | 2-1/4 |
| D5412104 | DH412104 | 4 | .2090 | 1-3/4 | 3 | D5412132 | DH412132 | 32 | .1160 | 1-1/4 | 2-1/4 |
| D5412105 | DH412105 | 5 | .2055 | 1-3/4 | 3 | D5412133 | DH412133 | 33 | .1130 | 1-1/4 | 2-1/4 |
| D5412106 | DH412106 | 6 | .2040 | 1-3/4 | 3 | D5412134 | DH412134 | 34 | .1110 | 1-1/4 | 2-1/4 |
| D5412107 | DH412107 | 7 | .2010 | 1-3/4 | 3 | D5412135 | DH412135 | 35 | .1100 | 1-1/4 | 2-1/4 |
| D5412108 | DH412108 | 8 | .1990 | 1-3/4 | 3 | D5412136 | DH412136 | 36 | .1065 | 1-1/4 | 2-1/4 |
| D5412109 | DH412109 | 9 | .1960 | 1- 3/4 | 3 | D5412137 | DH412137 | 37 | .1040 | 1-1/4 | 2-1/4 |
| D5412110 | DH412110 | 10 | .1935 | 1-5/8 | 2-3/4 | D5412138 | DH412138 | 38 | .1015 | 1-1/4 | 2-1/4 |
| D5412111 | DH412111 | 11 | .1910 | 1-5/8 | 2-3/4 | D5412139 | DH412139 | 39 | .0995 | 1-1/4 | 2-1/4 |
| D5412112 | DH412112 | 12 | .1890 | 1-5/8 | 2-3/4 | D5412140 | DH412140 | 40 | .0980 | 1 | 2 |
| D5412113 | DH412113 | 13 | .1850 | 1-5/8 | 2-3/4 | D5412141 | DH412141 | 41 | .0960 | 1 | 2 |
| D5412114 | DH412114 | 14 | .1820 | 1-5/8 | 2-3/4 | D5412142 | DH412142 | 42 | .0935 | 1 | 2 |
| D5412115 | DH412115 | 15 | .1800 | 1-5/8 | 2-3/4 | D5412143 | DH412143 | 43 | .0890 | 1 | 2 |
| D5412116 | DH412116 | 16 | .1770 | 1-5/8 | 2-3/4 | D5412144 | DH412144 | 44 | .0860 | 1 | 2 |
| D5412117 | DH412117 | 17 | .1730 | 1-5/8 | 2-3/4 | D5412145 | DH412145 | 45 | .0820 | 7/8 | 1-3/4 |
| D5412118 | DH412118 | 18 | .1695 | 1-5/8 | 2-3/4 | D5412146 | DH412146 | 46 | .0810 | 7/8 | 1-3/4 |
| D5412119 | DH412119 | 19 | .1660 | 1-5/8 | 2-3/4 | D5412147 | DH412147 | 47 | .0785 | 7/8 | 1-3/4 |
| D5412120 | DH412120 | 20 | .1610 | 1-3/8 | 2-1/2 | D5412148 | DH412148 | 48 | .0760 | 7/8 | 1-3/4 |
| D5412121 | DH412121 | 21 | .1590 | 1-3/8 | 2-1/2 | D5412149 | DH412149 | 49 | .0730 | 7/8 | 1-3/4 |
| D5412122 | DH412122 | 22 | .1570 | 1-3/8 | 2-1/2 | D5412150 | DH412150 | 50 | .0700 | 7/8 | 1-3/4 |
| D5412123 | DH412123 | 23 | .1540 | 1-3/8 | 2-1/2 | D5412151 | DH412151 | 51 | .0670 | 3/4 | 1-1/2 |
| D5412124 | DH412124 | 24 | .1520 | 1-3/8 | 2-1/2 | D5412152 | DH412152 | 52 | .0635 | 3/4 | 1-1/2 |
| D5412125 | DH412125 | 25 | .1495 | 1-3/8 | 2-1/2 | D5412153 | DH412153 | 53 | .0595 | 3/4 | 1-1/2 |
| D5412126 | DH412126 | 26 | .1470 | 1-3/8 | 2-1/2 | D5412154 | DH412154 | 54 | .0550 | 3/4 | 1-1/2 |
| D5412127 | DH412127 | 27 | .1440 | 1-3/8 | 2-1/2 | D5412155 | DH412155 | 55 | .0520 | 3/4 | 1-1/2 |
| D5412128 | DH412128 | 28 | .1405 | 1-3/8 | 2-1/2 | D5412156 | DH412156 | 56 | .0465 | 3/4 | 1-1/2 |

▶ Other coating is available on you request.

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |

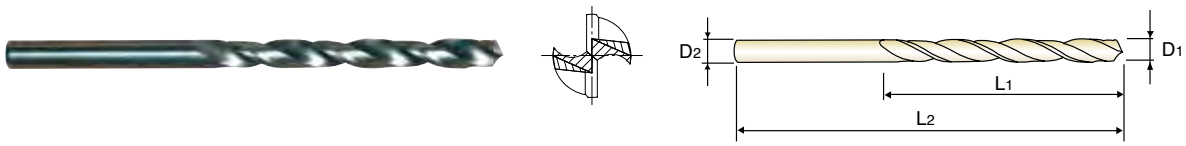
# STANDARD CARBIDE DRILLS

**DH413 SERIES**
**D5413 SERIES**

## CARBIDE DRILLS

***JOBBER***

▶ **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.




MG | N 30° | h6 | h7 | 118° | P.145

$D_1 = D_2$

## ▶ Letter sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length | EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Letter | Decimal | | | | | Letter | Decimal | | |
| Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ | Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| D5413201 | DH413201 | A | .2340 | 2 | 3-1/4 | D5413214 | DH413214 | N | .3020 | 2-3/8 | 3-3/4 |
| D5413202 | DH413202 | B | .2380 | 2 | 3-1/4 | D5413215 | DH413215 | O | .3160 | 2-3/8 | 3-3/4 |
| D5413203 | DH413203 | C | .2420 | 2 | 3-1/4 | D5413216 | DH413216 | P | .3230 | 2-3/8 | 3-3/4 |
| D5413204 | DH413204 | D | .2460 | 2 | 3-1/4 | D5413217 | DH413217 | Q | .3320 | 2-1/2 | 4 |
| D5413205 | DH413205 | E | .2500 | 2 | 3-1/4 | D5413218 | DH413218 | R | .3390 | 2-1/2 | 4 |
| D5413206 | DH413206 | F | .2570 | 2 | 3-1/4 | D5413219 | DH413219 | S | .3480 | 2-1/2 | 4 |
| D5413207 | DH413207 | G | .2610 | 2-1/8 | 3-1/2 | D5413220 | DH413220 | T | .3580 | 2-3/4 | 4-1/4 |
| D5413208 | DH413208 | H | .2660 | 2-1/8 | 3-1/2 | D5413221 | DH413221 | U | .3680 | 2-3/4 | 4-1/4 |
| D5413209 | DH413209 | I | .2720 | 2-1/8 | 3-1/2 | D5413222 | DH413222 | V | .3770 | 2-3/4 | 4-1/4 |
| D5413210 | DH413210 | J | .2770 | 2-1/8 | 3-1/2 | D5413223 | DH413223 | W | .3860 | 2-7/8 | 4-1/2 |
| D5413211 | DH413211 | K | .2810 | 2-1/8 | 3-1/2 | D5413224 | DH413224 | X | .3970 | 2-7/8 | 4-1/2 |
| D5413212 | DH413212 | L | .2900 | 2-1/8 | 3-1/2 | D5413225 | DH413225 | Y | .4040 | 2-7/8 | 4-1/2 |
| D5413213 | DH413213 | M | .2950 | 2-3/8 | 3-3/4 | D5413226 | DH413226 | Z | .4130 | 2-7/8 | 4-1/2 |

▶ Other coating is available on you request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

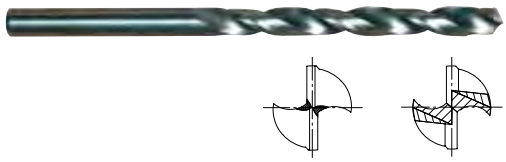
# STANDARD CARBIDE DRILLS

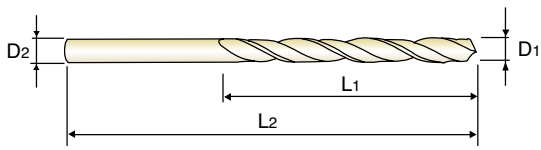
**DH417 SERIES**
**D5417 SERIES**

## CARBIDE DRILLS

***JOBBER***

▶ **Application** : Drilling steels in general, cast steels, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metals, non-ferrous light metals, abrasive plastics.




MG | N 30° | h6 | h7 | 118° | P.145

$D_1 = D_2$

### ▶ Fractional sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Fractional | Decimal | | |
| Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| D5417003 | DH417003 | 3/64 | .0469 | 3/4 | 1-1/2 |
| D5417004 | DH417004 | 1/16 | .0625 | 3/4 | 1-1/2 |
| D5417005 | DH417005 | 5/64 | .0781 | 7/8 | 1-3/4 |
| D5417006 | DH417006 | 3/32 | .0938 | 1 | 2 |
| D5417007 | DH417007 | 7/64 | .1094 | 1-1/4 | 2-1/4 |
| D5417008 | DH417008 | 1/8 | .1250 | 1-1/4 | 2-1/4 |
| D5417009 | DH417009 | 9/64 | .1406 | 1-3/8 | 2-1/2 |
| D5417010 | DH417010 | 5/32 | .1563 | 1-3/8 | 2-1/2 |
| D5417011 | DH417011 | 11/64 | .1719 | 1-5/8 | 2-3/4 |
| D5417012 | DH417012 | 3/16 | .1875 | 1-5/8 | 2-3/4 |
| D5417013 | DH417013 | 13/64 | .2031 | 1-3/4 | 3 |
| D5417014 | DH417014 | 7/32 | .2188 | 1-3/4 | 3 |
| D5417015 | DH417015 | 15/64 | .2344 | 2 | 3-1/4 |
| D5417016 | DH417016 | 1/4 | .2500 | 2 | 3-1/4 |
| D5417017 | DH417017 | 17/64 | .2656 | 2-1/8 | 3-1/2 |

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Fractional | Decimal | | |
| Bright Finish | TiAlN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| D5417018 | DH417018 | 9/32 | .2813 | 2-1/8 | 3-1/2 |
| D5417019 | DH417019 | 19/64 | .2969 | 2-3/8 | 3-3/4 |
| D5417020 | DH417020 | 5/16 | .3125 | 2-3/8 | 3-3/4 |
| D5417021 | DH417021 | 21/64 | .3281 | 2-1/2 | 4 |
| D5417022 | DH417022 | 11/32 | .3438 | 2-1/2 | 4 |
| D5417023 | DH417023 | 23/64 | .3594 | 2-3/4 | 4-1/4 |
| D5417024 | DH417024 | 3/8 | .3750 | 2-3/4 | 4-1/4 |
| D5417025 | DH417025 | 25/64 | .3906 | 2-7/8 | 4-1/2 |
| D5417026 | DH417026 | 13/32 | .4063 | 2-7/8 | 4-1/2 |
| D5417027 | DH417027 | 27/64 | .4219 | 2-7/8 | 4-1/2 |
| D5417028 | DH417028 | 7/16 | .4375 | 2-7/8 | 4-1/2 |
| D5417029 | DH417029 | 29/64 | .4531 | 3 | 4-3/4 |
| D5417030 | DH417030 | 15/32 | .4688 | 3 | 4-3/4 |
| D5417031 | DH417031 | 31/64 | .4844 | 3 | 4-3/4 |
| D5417032 | DH417032 | 1/2 | .5000 | 3 | 4-3/4 |

▶ Other coating is available on you request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

## CARBIDE DRILLS

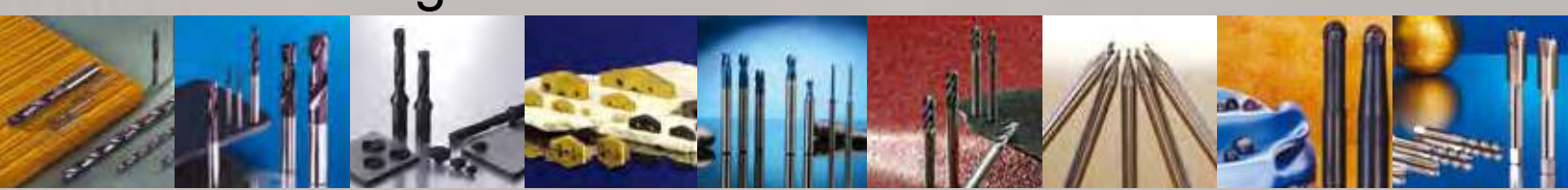
# D5412, DH412, D5413, DH413, D5417, DH417 SERIES

| WORK MATERIAL | P | | | | K | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOY STEELS | | ALLOY STEELS | | SOFT GREY CAST IRON | | HARD GREY CAST IRON | |
| DIAMETER | N | S | N | S | N | S | N | |
| 3/64 | 23000 | .0012 | 17200 | .0012 | 32000 | .0016 | 23000 | .0016 |
| 5/64 | 11500 | .0016 | 8600 | .0016 | 16000 | .0020 | 11500 | .0020 |
| 1/8 | 7800 | .0020 | 5750 | .0020 | 10500 | .0024 | 7600 | .0024 |
| 5/32 | 5800 | .0024 | 4300 | .0024 | 7800 | .0028 | 5700 | .0028 |
| 13/64 | 4700 | .0028 | 3450 | .0028 | 6200 | .0031 | 4550 | .0031 |
| 15/64 | 3900 | .0031 | 2850 | .0031 | 5200 | .0035 | 3800 | .0035 |
| 9/32 | 3350 | .0035 | 2450 | .0035 | 4500 | .0039 | 3250 | .0039 |
| 5/16 | 2900 | .0039 | 2150 | .0039 | 3900 | .0047 | 2850 | .0047 |
| 23/64 | 2600 | .0043 | 1900 | .0043 | 3450 | .0055 | 2550 | .0055 |
| 25/64 | 2350 | .0047 | 1700 | .0047 | 3100 | .0063 | 2300 | .0063 |
| 7/16 | 2150 | .0051 | 1600 | .0051 | 2850 | .0071 | 2100 | .0071 |
| 15/32 | 1950 | .0055 | 1450 | .0055 | 2600 | .0079 | 1900 | .0079 |
| 33/64 | 1800 | .0063 | 1350 | .0063 | 2400 | .0079 | 1750 | .0079 |

| WORK MATERIAL | M | | N | | | | | |
|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS | | Al-Si ALLOY, Si<10% | | Al-Si ALLOY, Si>10% | | Ti, Ni ALLOY STEELS | |
| DIAMETER | N | S | N | S | N | S | N | S |
| 3/64 | 12000 | .0016 | 54000 | .0020 | 42000 | .0020 | 11800 | .0008 |
| 5/64 | 6000 | .0012 | 27000 | .0024 | 21000 | .0024 | 5900 | .0012 |
| 1/8 | 4000 | .0016 | 18000 | .0028 | 14000 | .0028 | 3900 | .0016 |
| 5/32 | 3000 | .0020 | 13000 | .0031 | 10500 | .0031 | 2950 | .0020 |
| 13/64 | 2400 | .0024 | 10500 | .0035 | 8500 | .0035 | 2350 | .0024 |
| 15/64 | 2000 | .0028 | 8800 | .0043 | 7100 | .0043 | 1950 | .0028 |
| 9/32 | 1700 | .0031 | 7600 | .0051 | 6100 | .0051 | 1700 | .0031 |
| 5/16 | 1500 | .0035 | 6600 | .0059 | 5350 | .0059 | 1450 | .0035 |
| 23/64 | 1350 | .0039 | 5900 | .0067 | 4750 | .0067 | 1300 | .0039 |
| 25/64 | 1200 | .0043 | 5300 | .0075 | 4250 | .0075 | 1200 | .0043 |
| 7/16 | 1100 | .0047 | 4850 | .0083 | 3900 | .0083 | 1050 | .0047 |
| 15/32 | 1000 | .0051 | 4450 | .0091 | 3550 | .0091 | 980 | .0051 |
| 33/64 | 950 | .0051 | 4100 | .0098 | 3300 | .0098 | 905 | .0051 |

N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader **YG-1**



# HSS

Being the best through innovation



# MULTI-1 DRILLS

- **HSS-PM MULTI-1 DRILLS**
  **Multi Purpose Drilling. Particularly for Stainless Steels, Titanium**

## PREMIUM HSS-PM MULTI-1 DRILLS

Premium HSS-PM Drills for wide range of applications
- Carbon Steels, Alloy Steels, Stainless steels, Titanium etc.


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **CDRA05** |  | PREMIUM HSS-PM MULTI-1 DRILLS / M15 Fractional sizes | D3/32 | | **150** |
| **CDRA06** |  | PREMIUM HSS-PM MULTI-1 DRILLS / M16 Wire gauge sizes | #45 | | **151** |
| **CDRA07** |  | PREMIUM HSS-PM MULTI-1 DRILLS / M17 Letter sizes | B | | **152** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **153** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | ◎ |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | ◎ |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | ◎ |

# MULTI-1 DRILLS

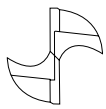
CDRA05 SERIES

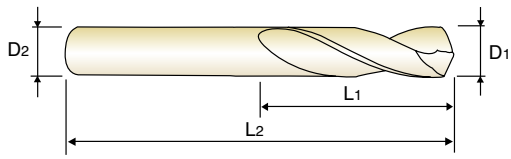
## PREMIUM HSS-PM, MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.








PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.153

### ▶ M15 / Fractional sizes

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M15006 | 3/32 | .0938 | 1/8 | 1/2 | 1-3/4 |
| M15007 | 7/64 | .1094 | 1/8 | 5/8 | 1-7/8 |
| M15008 | 1/8 | .1250 | 1/8 | 3/4 | 2 |
| M15009 | 9/64 | .1406 | 3/16 | 13/16 | 2-1/8 |
| M15010 | 5/32 | .1563 | 3/16 | 13/16 | 2-1/8 |
| M15011 | 11/64 | .1719 | 3/16 | 1 | 2-3/8 |
| M15012 | 3/16 | .1875 | 3/16 | 1 | 2-3/8 |
| M15013 | 13/64 | .2031 | 1/4 | 1-1/8 | 2-7/8 |
| M15014 | 7/32 | .2188 | 1/4 | 1-1/8 | 2-7/8 |
| M15015 | 15/64 | .2344 | 1/4 | 1-1/4 | 3 |
| M15016 | 1/4 | .2500 | 1/4 | 1-1/4 | 3 |
| M15017 | 17/64 | .2656 | 3/8 | 1-3/8 | 3-3/16 |
| M15018 | 9/32 | .2813 | 3/8 | 1-3/8 | 3-3/16 |
| M15019 | 19/64 | .2969 | 3/8 | 1-3/8 | 3-3/16 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Fractional | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M15020 | 5/16 | .3125 | 3/8 | 1-1/2 | 3-3/8 |
| M15021 | 21/64 | .3281 | 3/8 | 1-1/2 | 3-3/8 |
| M15022 | 11/32 | .3438 | 3/8 | 1-5/8 | 3-1/2 |
| M15023 | 23/64 | .3594 | 3/8 | 1-5/8 | 3-1/2 |
| M15024 | 3/8 | .3750 | 3/8 | 1-5/8 | 3-1/2 |
| M15025 | 25/64 | .3906 | 1/2 | 1-11/16 | 3-7/8 |
| M15026 | 13/32 | .4063 | 1/2 | 1-11/16 | 3-7/8 |
| M15027 | 27/64 | .4219 | 1/2 | 1-7/8 | 4-1/8 |
| M15028 | 7/16 | .4375 | 1/2 | 1-7/8 | 4-1/8 |
| M15029 | 29/64 | .4531 | 1/2 | 1-7/8 | 4-1/8 |
| M15030 | 15/32 | .4688 | 1/2 | 2 | 4-1/4 |
| M15031 | 31/64 | .4844 | 1/2 | 2 | 4-1/4 |
| M15032 | 1/2 | .5000 | 1/2 | 2 | 4-1/4 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | ◎ |

# MULTI-1 DRILLS

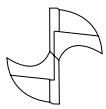
**CDRA06 SERIES**

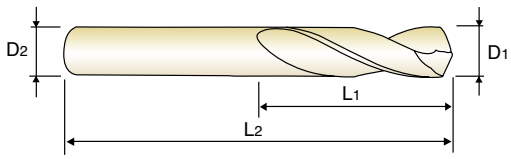
## PREMIUM HSS-PM, MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.








PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.153

### ▶ M16 / Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Wire gauge | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M16045 | 45 | .0820 | 1/8 | 3/4 | 2 |
| M16044 | 44 | .0860 | 1/8 | 3/4 | 2 |
| M16043 | 43 | .0890 | 1/8 | 3/4 | 2 |
| M16042 | 42 | .0935 | 1/8 | 3/4 | 2 |
| M16041 | 41 | .0960 | 1/8 | 13/16 | 2-1/16 |
| M16040 | 40 | .0980 | 1/8 | 13/16 | 2-1/16 |
| M16039 | 39 | .0995 | 1/8 | 13/16 | 2-1/4 |
| M16038 | 38 | .1015 | 1/8 | 13/16 | 2-1/4 |
| M16037 | 37 | .1040 | 1/8 | 13/16 | 2-1/4 |
| M16036 | 36 | .1065 | 1/8 | 13/16 | 2-1/4 |
| M16035 | 35 | .1100 | 1/8 | 7/8 | 2-5/16 |
| M16034 | 34 | .1110 | 1/8 | 7/8 | 2-5/16 |
| M16033 | 33 | .1130 | 1/8 | 7/8 | 2-5/16 |
| M16032 | 32 | .1160 | 1/8 | 7/8 | 2-5/16 |
| M16031 | 31 | .1120 | 1/8 | 7/8 | 2-5/16 |
| M16030 | 30 | .1285 | 3/16 | 15/16 | 2-3/8 |
| M16029 | 29 | .1360 | 3/16 | 15/16 | 2-3/8 |
| M16028 | 28 | .1405 | 3/16 | 15/16 | 2-3/8 |
| M16027 | 27 | .1440 | 3/16 | 1 | 2-7/16 |
| M16026 | 26 | .1470 | 3/16 | 1 | 2-7/16 |
| M16025 | 25 | .1495 | 3/16 | 1 | 2-7/16 |
| M16024 | 24 | .1520 | 3/16 | 1 | 2-7/16 |
| M16023 | 23 | .1540 | 3/16 | 1 | 2-7/16 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Wire gauge | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M16022 | 22 | .1570 | 3/16 | 1-1/16 | 2-1/2 |
| M16021 | 21 | .1590 | 3/16 | 1-1/16 | 2-1/2 |
| M16020 | 20 | .1610 | 3/16 | 1-1/16 | 2-1/2 |
| M16019 | 19 | .1660 | 3/16 | 1-1/16 | 2-1/2 |
| M16018 | 18 | .1695 | 3/16 | 1-1/16 | 2-1/2 |
| M16017 | 17 | .1730 | 3/16 | 1-1/8 | 2-9/16 |
| M16016 | 16 | .1770 | 3/16 | 1-1/8 | 2-9/16 |
| M16015 | 15 | .1800 | 3/16 | 1-1/8 | 2-9/16 |
| M16014 | 14 | .1820 | 3/16 | 1-1/8 | 2-9/16 |
| M16013 | 13 | .1850 | 3/16 | 1-1/8 | 2-9/16 |
| M16012 | 12 | .1890 | 1/4 | 1-3/16 | 3 |
| M16011 | 11 | .1910 | 1/4 | 1-3/16 | 3 |
| M16010 | 10 | .1935 | 1/4 | 1-3/16 | 3 |
| M16009 | 9 | .1960 | 1/4 | 1-3/16 | 3 |
| M16008 | 8 | .1990 | 1/4 | 1-3/16 | 3 |
| M16007 | 7 | .2010 | 1/4 | 1-3/16 | 3 |
| M16006 | 6 | .2040 | 1/4 | 1-1/4 | 3-1/16 |
| M16005 | 5 | .2055 | 1/4 | 1-1/4 | 3-1/16 |
| M16004 | 4 | .2090 | 1/4 | 1-1/4 | 3-1/16 |
| M16003 | 3 | .2130 | 1/4 | 1-1/4 | 3-1/16 |
| M16002 | 2 | .2210 | 1/4 | 1-5/16 | 3-1/8 |
| M16001 | 1 | .2280 | 1/4 | 1-5/16 | 3-1/8 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | ◎ |

# MULTI-1 DRILLS

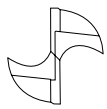
CDRA07 SERIES

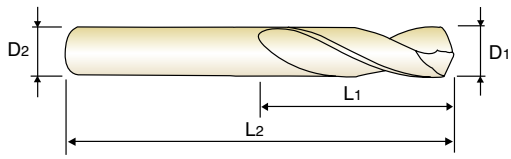
## PREMIUM HSS-PM, MULTI-1 DRILLS

▶ **Features** : Excellent wear resistance by using Premium powder metallurgy materials.
With special point geometry, no centering required.
Minimal drill wandering and improved hole tolerances.
Better tool life with excellent coating.

▶ **Application** : Applicable to various materials including aluminum and stainless steel, as well carbon steel and structural steel.








PREMIUM HSS-PM | N 30° | h6 | h7 | 135° P.153

### ▶ M17 / Letter sizes

Unit : Inch

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Letter | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M1700B | B | .2380 | 1/4 | 1-3/8 | 3-3/16 |
| M1700C | C | .2420 | 1/4 | 1-3/8 | 3-3/16 |
| M1700D | D | .2460 | 1/4 | 1-3/8 | 3-3/16 |
| M1700F | F | .2570 | 3/8 | 1-7/16 | 3-1/4 |
| M1700G | G | .2610 | 3/8 | 1-7/16 | 3-1/4 |
| M1700I | I | .2720 | 3/8 | 1-1/2 | 3-5/16 |
| M1700J | J | .2770 | 3/8 | 1-1/2 | 3-5/16 |
| M1700L | L | .2900 | 3/8 | 1-9/16 | 3-3/8 |
| M1700M | M | .2950 | 3/8 | 1-9/16 | 3-3/8 |

| EDP No. | Diameter | | Shank Diameter | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | Letter | Decimal | | | |
| TiAlN | D1 | | D2 | L1 | L2 |
| M1700N | N | .3020 | 3/8 | 1-5/8 | 3-7/16 |
| M1700O | O | .3160 | 3/8 | 1-11/16 | 3-1/2 |
| M1700Q | Q | .3320 | 3/8 | 1-11/16 | 3-1/2 |
| M1700R | R | .3390 | 3/8 | 1-11/16 | 3-1/2 |
| M1700U | U | .3680 | 3/8 | 1-13/16 | 3-5/8 |
| M1700V | V | .3770 | 1/2 | 1-7/8 | 3-31/32 |
| M1700X | X | .3970 | 1/2 | 1-15/16 | 4-1/32 |
| M1700Y | Y | .4040 | 1/2 | 1-15/16 | 4-1/32 |
| M1700Z | Z | .4130 | 1/2 | 2 | 4-1/32 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | ◎ |

## PREMIUM HSS-PM, MULTI-1 DRILLS

## CDRA05, CDRA06, CDRA07 SERIES

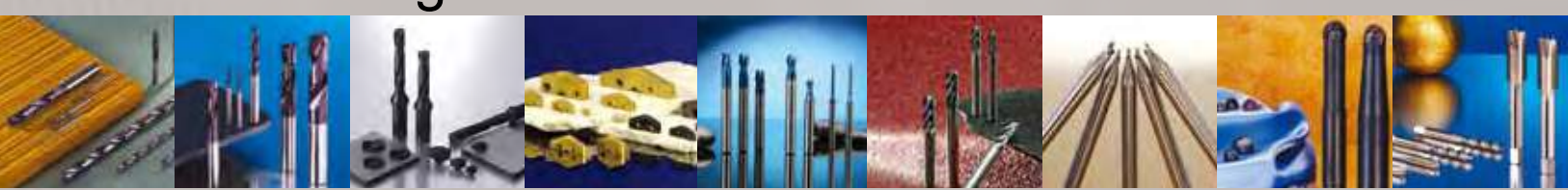
| WORK MATERIAL | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | STRUCTUAL STEEL CARBON STEEL | | | ALLOY STEEL | | | MOLD STEEL | | |
| DIAMETER | RPM | FEED (IPR) | FEED (inch/min) | RPM | FEED (IPR) | FEED (inch/min) | RPM | FEED (IPR) | FEED (inch/min) |
| 3/32 | 5000 | .0030 | 15.00 | 4000 | .0030 | 12.00 | 1800 | .0030 | 5.40 |
| 1/8 | 3800 | .0050 | 19.00 | 3000 | .0040 | 12.00 | 1400 | .0040 | 5.60 |
| 5/32 | 3000 | .0060 | 18.00 | 2400 | .0050 | 12.00 | 1100 | .0040 | 4.40 |
| 3/16 | 2500 | .0070 | 17.50 | 2000 | .0050 | 10.00 | 900 | .0040 | 3.60 |
| 1/4 | 1900 | .0080 | 15.20 | 1500 | .0070 | 10.50 | 700 | .0050 | 3.50 |
| 5/16 | 1500 | .0090 | 13.50 | 1200 | .0080 | 9.60 | 550 | .0070 | 3.85 |
| 3/8 | 1250 | .0100 | 12.50 | 1000 | .0090 | 9.00 | 450 | .0080 | 3.60 |
| 1/2 | 950 | .0110 | 10.45 | 750 | .0100 | 7.50 | 350 | .0090 | 3.15 |

| WORK MATERIAL | M | | | K | | | N | | |
|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEEL | | | CAST IRON | | | ALUMINIUM ALLOY COPPER ALLOY NONFERROUS ALLOY | | |
| DIAMETER | RPM | FEED (IPR) | FEED (inch/min) | RPM | FEED (IPR) | FEED (inch/min) | RPM | FEED (IPR) | FEED (inch/min) |
| 3/32 | 1800 | .0030 | 5.40 | 5700 | .0040 | 22.80 | 8700 | .0040 | 34.80 |
| 1/8 | 1400 | .0040 | 5.60 | 4250 | .0060 | 25.50 | 6500 | .0060 | 39.00 |
| 5/32 | 1100 | .0040 | 4.40 | 3400 | .0070 | 23.80 | 5200 | .0070 | 36.40 |
| 3/16 | 900 | .0040 | 3.60 | 2850 | .0080 | 22.80 | 4300 | .0080 | 34.40 |
| 1/4 | 700 | .0050 | 3.50 | 2100 | .0100 | 21.00 | 3200 | .0090 | 28.80 |
| 5/16 | 550 | .0070 | 3.85 | 1750 | .0120 | 21.00 | 2600 | .0110 | 28.60 |
| 3/8 | 450 | .0080 | 3.60 | 1450 | .0120 | 17.40 | 2200 | .0130 | 28.60 |
| 1/2 | 350 | .0090 | 3.15 | 1100 | .0150 | 16.50 | 1650 | .0150 | 24.75 |

| WORK MATERIAL | S | | |
|---|---|---|---|
| | NICKEL ALLOY TITANIUM ALLOY | | |
| DIAMETER | RPM | FEED (IPR) | FEED (inch/min) |
| 3/32 | 800 | .0010 | 0.80 |
| 1/8 | 600 | .0020 | 1.20 |
| 5/32 | 500 | .0020 | 1.00 |
| 3/16 | 400 | .0020 | 0.80 |
| 1/4 | 300 | .0030 | 0.90 |
| 5/16 | 250 | .0030 | 0.75 |
| 3/8 | 200 | .0040 | 0.80 |
| 1/2 | 150 | .0050 | 0.75 |

N = R.P.M
S = Inch per Revolution(inch/rev.)

Global Cutting Tool Leader **YG-1**



# HSS

Being the best through innovation





# HPD DRILLS

- **HSS-EX HPD STRAIGHT SHANK DRILLS for Stainless Steels**

## HPD - HIGH PERFORMANCE DRILLS

HPD-SUS Drills for High precision drilling in Stainless steels


| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **METRIC** | | | | | | |
| DJ543 |  | HSS-EX, HPD-SUS DRILLS | *STUB* | D2.0 | D13.0 | **158** |
| DJ544 |  | HSS-EX, HPD-SUS DRILLS | *JOBBER* | D2.0 | D20.0 | **160** |
| | | RECOMMENDED CUTTING CONDITIONS | | | | **163** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | | | | | ◎ | | ○ | ○ | | | ○ |
| ◎ | | | | | ◎ | | ○ | ○ | | | ○ |

# HPD DRILLS

**DJ543 SERIES**

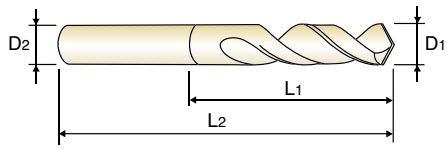
## HSS-EX, HPD-SUS DRILLS

***STUB***

- **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
- **Advantage** : Self centering - center drilling is not required
  Excellent positioning - bush is not necessary
  Special Design - reaming is not required
  - good chip removal
  - powerful drilling
- **Plain Shank** : DIN6535-HA






HSS EX | W 38° | h7 | h8 | 130° | 120° | P.163

$D_1=D_2$

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0201JCN | 2.0 | .0787 | 12 | 44 |
| 0211JCN | 2.1 | .0827 | 12 | 44 |
| 0221JCN | 2.2 | .0866 | 13 | 45 |
| 0231JCN | 2.3 | .0906 | 13 | 45 |
| 0241JCN | 2.4 | .0945 | 14 | 46 |
| 0251JCN | 2.5 | .0984 | 14 | 46 |
| 0261JCN | 2.6 | .1024 | 14 | 46 |
| 0271JCN | 2.7 | .1063 | 16 | 48 |
| 0281JCN | 2.8 | .1102 | 16 | 48 |
| 0291JCN | 2.9 | .1142 | 16 | 48 |
| 0301JCN | 3.0 | .1181 | 16 | 48 |
| 0311JCN | 3.1 | .1220 | 18 | 50 |
| 0321JCN | 3.2 | .1260 | 18 | 50 |
| 0331JCN | 3.3 | .1299 | 18 | 50 |
| 0341JCN | 3.4 | .1339 | 20 | 52 |
| 0351JCN | 3.5 | .1378 | 20 | 52 |
| 0361JCN | 3.6 | .1417 | 20 | 52 |
| 0371JCN | 3.7 | .1457 | 20 | 52 |
| 0381JCN | 3.8 | .1496 | 22 | 54 |
| 0391JCN | 3.9 | .1535 | 22 | 54 |
| 0401JCN | 4.0 | .1575 | 22 | 54 |
| 0411JCN | 4.1 | .1614 | 22 | 66 |
| 0421JCN | 4.2 | .1654 | 22 | 66 |
| 0431JCN | 4.3 | .1693 | 24 | 68 |
| 0441JCN | 4.4 | .1732 | 24 | 68 |
| 0451JCN | 4.5 | .1772 | 24 | 68 |
| 0461JCN | 4.6 | .1811 | 24 | 68 |
| 0471JCN | 4.7 | .1850 | 24 | 68 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0481JCN | 4.8 | .1890 | 26 | 70 |
| 0491JCN | 4.9 | .1929 | 26 | 70 |
| 0501JCN | 5.0 | .1969 | 26 | 70 |
| 0511JCN | 5.1 | .2008 | 26 | 70 |
| 0521JCN | 5.2 | .2047 | 26 | 70 |
| 0531JCN | 5.3 | .2087 | 26 | 70 |
| 0541JCN | 5.4 | .2126 | 28 | 72 |
| 0551JCN | 5.5 | .2165 | 28 | 72 |
| 0561JCN | 5.6 | .2205 | 28 | 72 |
| 0571JCN | 5.7 | .2244 | 28 | 72 |
| 0581JCN | 5.8 | .2283 | 28 | 72 |
| 0591JCN | 5.9 | .2323 | 28 | 72 |
| 0601JCN | 6.0 | .2362 | 28 | 72 |
| 0611JCN | 6.1 | .2402 | 31 | 75 |
| 0621JCN | 6.2 | .2441 | 31 | 75 |
| 0631JCN | 6.3 | .2480 | 31 | 75 |
| 0641JCN | 6.4 | .2520 | 31 | 75 |
| 0651JCN | 6.5 | .2559 | 31 | 75 |
| 0661JCN | 6.6 | .2598 | 31 | 75 |
| 0671JCN | 6.7 | .2638 | 31 | 75 |
| 0681JCN | 6.8 | .2677 | 34 | 78 |
| 0691JCN | 6.9 | .2717 | 34 | 78 |
| 0701JCN | 7.0 | .2756 | 34 | 78 |
| 0711JCN | 7.1 | .2795 | 34 | 78 |
| 0721JCN | 7.2 | .2835 | 34 | 78 |
| 0731JCN | 7.3 | .2874 | 34 | 78 |
| 0741JCN | 7.4 | .2913 | 34 | 78 |
| 0751JCN | 7.5 | .2953 | 34 | 78 |

* Individually packaged

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | | HRc55~ | | | | | | | |
| ◎ | | | | | | ◎ | | ○ | ○ | | | ○ |

# HSS-EX, HPD-SUS DRILLS

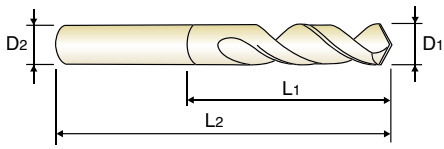
***STUB***

- **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
- **Advantage** : Self centering - center drilling is not required
  Excellent positioning - bush is not necessary
  Special Design - reaming is not required
  - good chip removal
  - powerful drilling
- **Plain Shank** : DIN6535-HA





four facet




HSS EX | W 38° | h7 | h8 | 130° | 120°

P.163

$D_1=D_2$

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0761JCN | 7.6 | .2992 | 37 | 81 |
| 0771JCN | 7.7 | .3031 | 37 | 81 |
| 0781JCN | 7.8 | .3071 | 37 | 81 |
| 0791JCN | 7.9 | .3110 | 37 | 81 |
| 0801JCN | 8.0 | .3150 | 37 | 81 |
| 0811JCN | 8.1 | .3189 | 37 | 87 |
| 0821JCN | 8.2 | .3228 | 37 | 87 |
| 0831JCN | 8.3 | .3268 | 37 | 87 |
| 0841JCN | 8.4 | .3307 | 37 | 87 |
| 0851JCN | 8.5 | .3346 | 37 | 87 |
| 0861JCN | 8.6 | .3386 | 40 | 90 |
| 0871JCN | 8.7 | .3425 | 40 | 90 |
| 0881JCN | 8.8 | .3465 | 40 | 90 |
| 0891JCN | 8.9 | .3504 | 40 | 90 |
| 0901JCN | 9.0 | .3543 | 40 | 90 |
| 0911JCN | 9.1 | .3583 | 40 | 90 |
| 0921JCN | 9.2 | .3622 | 40 | 90 |
| 0931JCN | 9.3 | .3661 | 40 | 90 |
| 0941JCN | 9.4 | .3701 | 40 | 90 |
| 0951JCN | 9.5 | .3740 | 40 | 90 |
| 0961JCN | 9.6 | .3780 | 43 | 93 |
| 0971JCN | 9.7 | .3819 | 43 | 93 |
| 0981JCN | 9.8 | .3858 | 43 | 93 |
| 0991JCN | 9.9 | .3898 | 43 | 93 |
| 1001JCN | 10.0 | .3937 | 43 | 93 |
| 1011JCN | 10.1 | .3976 | 43 | 100 |
| 1021JCN | 10.2 | .4016 | 43 | 100 |
| 1031JCN | 10.3 | .4055 | 43 | 100 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 1041JCN | 10.4 | .4094 | 43 | 100 |
| 1051JCN | 10.5 | .4134 | 43 | 100 |
| 1061JCN | 10.6 | .4173 | 43 | 100 |
| 1071JCN | 10.7 | .4212 | 47 | 104 |
| 1081JCN | 10.8 | .4252 | 47 | 104 |
| 1091JCN | 10.9 | .4291 | 47 | 104 |
| 1101JCN | 11.0 | .4330 | 47 | 104 |
| 1111JCN | 11.1 | .4370 | 47 | 104 |
| 1121JCN | 11.2 | .4409 | 47 | 104 |
| 1131JCN | 11.3 | .4448 | 47 | 104 |
| 1141JCN | 11.4 | .4488 | 47 | 104 |
| 1151JCN | 11.5 | .4527 | 47 | 104 |
| 1161JCN | 11.6 | .4566 | 47 | 104 |
| 1171JCN | 11.7 | .4606 | 47 | 104 |
| 1181JCN | 11.8 | .4645 | 47 | 104 |
| 1191JCN | 11.9 | .4685 | 51 | 108 |
| 1201JCN | 12.0 | .4724 | 51 | 108 |
| 1211JCN | 12.1 | .4764 | 51 | 108 |
| 1221JCN | 12.2 | .4803 | 51 | 108 |
| 1231JCN | 12.3 | .4843 | 51 | 108 |
| 1241JCN | 12.4 | .4882 | 51 | 108 |
| 1251JCN | 12.5 | .4921 | 51 | 108 |
| 1261JCN | 12.6 | .4961 | 51 | 108 |
| 1271JCN | 12.7 | .5000 | 51 | 108 |
| 1281JCN | 12.8 | .5039 | 51 | 108 |
| 1291JCN | 12.9 | .5079 | 51 | 108 |
| 1301JCN | 13.0 | .5118 | 51 | 108 |

* Individually packaged

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | | | | | | ◎ | | ○ | ○ | | | ○ |

# HPD DRILLS

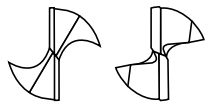
**DJ544 SERIES**

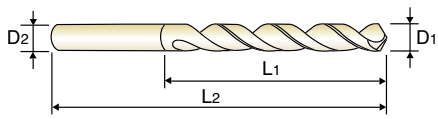
## HSS-EX, HPD-SUS DRILLS

***JOBBER***

▶ **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶ **Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.






HSS EX | W 38° | h7 | h8 | 130° | 120° | P.163

up to 4mm over 4mm

$D_1=D_2$

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0201KCN | 2.0 | .0787 | 24 | 56 |
| 0211KCN | 2.1 | .0827 | 24 | 56 |
| 0221KCN | 2.2 | .0866 | 27 | 59 |
| 0231KCN | 2.3 | .0906 | 27 | 59 |
| 0241KCN | 2.4 | .0945 | 30 | 62 |
| 0251KCN | 2.5 | .0984 | 30 | 62 |
| 0261KCN | 2.6 | .1024 | 30 | 62 |
| 0271KCN | 2.7 | .1063 | 33 | 65 |
| 0281KCN | 2.8 | .1102 | 33 | 65 |
| 0291KCN | 2.9 | .1142 | 33 | 65 |
| 0301KCN | 3.0 | .1181 | 33 | 65 |
| 0311KCN | 3.1 | .1220 | 36 | 68 |
| 0321KCN | 3.2 | .1260 | 36 | 68 |
| 0331KCN | 3.3 | .1299 | 36 | 68 |
| 0341KCN | 3.4 | .1339 | 39 | 71 |
| 0351KCN | 3.5 | .1378 | 39 | 71 |
| 0361KCN | 3.6 | .1417 | 39 | 71 |
| 0371KCN | 3.7 | .1457 | 39 | 71 |
| 0381KCN | 3.8 | .1496 | 43 | 75 |
| 0391KCN | 3.9 | .1535 | 43 | 75 |
| 0401KCN | 4.0 | .1575 | 43 | 75 |
| 0411KCN | 4.1 | .1614 | 43 | 87 |
| 0421KCN | 4.2 | .1654 | 43 | 87 |
| 0431KCN | 4.3 | .1693 | 47 | 91 |
| 0441KCN | 4.4 | .1732 | 47 | 91 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0451KCN | 4.5 | .1772 | 47 | 91 |
| 0461KCN | 4.6 | .1811 | 47 | 91 |
| 0471KCN | 4.7 | .1850 | 47 | 91 |
| 0481KCN | 4.8 | .1890 | 52 | 96 |
| 0491KCN | 4.9 | .1929 | 52 | 96 |
| 0501KCN | 5.0 | .1969 | 52 | 96 |
| 0511KCN | 5.1 | .2008 | 52 | 96 |
| 0521KCN | 5.2 | .2047 | 52 | 96 |
| 0531KCN | 5.3 | .2087 | 52 | 96 |
| 0541KCN | 5.4 | .2126 | 57 | 101 |
| 0551KCN | 5.5 | .2165 | 57 | 101 |
| 0561KCN | 5.6 | .2205 | 57 | 101 |
| 0571KCN | 5.7 | .2244 | 57 | 101 |
| 0581KCN | 5.8 | .2283 | 57 | 101 |
| 0591KCN | 5.9 | .2323 | 57 | 101 |
| 0601KCN | 6.0 | .2362 | 57 | 101 |
| 0611KCN | 6.1 | .2402 | 63 | 107 |
| 0621KCN | 6.2 | .2441 | 63 | 107 |
| 0631KCN | 6.3 | .2480 | 63 | 107 |
| 0641KCN | 6.4 | .2520 | 63 | 107 |
| 0651KCN | 6.5 | .2559 | 63 | 107 |
| 0661KCN | 6.6 | .2598 | 63 | 107 |
| 0671KCN | 6.7 | .2638 | 63 | 107 |
| 0681KCN | 6.8 | .2677 | 69 | 113 |
| 0691KCN | 6.9 | .2717 | 69 | 113 |

* Individually packaged

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | | | | | | ◎ | | ○ | ○ | | | ○ |

# HPD DRILLS

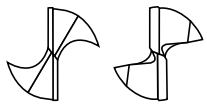
**DJ544 SERIES**

## HSS-EX, HPD-SUS DRILLS

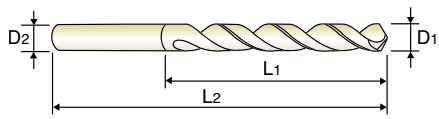
***JOBBER***

▶ **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶ **Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.





up to 13mm over 13mm




HSS EX | W 38° | h7 | h8 | 130° | 120° | up to 4mm

P.163

$D_1 = D_2$

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length | EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| | Metric | Inch | | | | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ | TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 0701KCN | 7.0 | .2756 | 69 | 113 | 0951KCN | 9.5 | .3740 | 81 | 131 |
| 0711KCN | 7.1 | .2795 | 69 | 113 | 0961KCN | 9.6 | .3780 | 87 | 137 |
| 0721KCN | 7.2 | .2835 | 69 | 113 | 0971KCN | 9.7 | .3819 | 87 | 137 |
| 0731KCN | 7.3 | .2874 | 69 | 113 | 0981KCN | 9.8 | .3858 | 87 | 137 |
| 0741KCN | 7.4 | .2913 | 69 | 113 | 0991KCN | 9.9 | .3898 | 87 | 137 |
| 0751KCN | 7.5 | .2953 | 69 | 113 | 1001KCN | 10.0 | .3937 | 87 | 137 |
| 0761KCN | 7.6 | .2992 | 75 | 119 | 1011KCN | 10.1 | .3976 | 87 | 144 |
| 0771KCN | 7.7 | .3031 | 75 | 119 | 1021KCN | 10.2 | .4016 | 87 | 144 |
| 0781KCN | 7.8 | .3071 | 75 | 119 | 1031KCN | 10.3 | .4055 | 87 | 144 |
| 0791KCN | 7.9 | .3110 | 75 | 119 | 1041KCN | 10.4 | .4094 | 87 | 144 |
| 0801KCN | 8.0 | .3150 | 75 | 119 | 1051KCN | 10.5 | .4134 | 87 | 144 |
| 0811KCN | 8.1 | .3189 | 75 | 125 | 1061KCN | 10.6 | .4173 | 87 | 144 |
| 0821KCN | 8.2 | .3228 | 75 | 125 | 1071KCN | 10.7 | .4212 | 94 | 151 |
| 0831KCN | 8.3 | .3268 | 75 | 125 | 1081KCN | 10.8 | .4252 | 94 | 151 |
| 0841KCN | 8.4 | .3307 | 75 | 125 | 1091KCN | 10.9 | .4291 | 94 | 151 |
| 0851KCN | 8.5 | .3346 | 75 | 125 | 1101KCN | 11.0 | .4330 | 94 | 151 |
| 0861KCN | 8.6 | .3386 | 81 | 131 | 1111KCN | 11.1 | .4370 | 94 | 151 |
| 0871KCN | 8.7 | .3425 | 81 | 131 | 1121KCN | 11.2 | .4409 | 94 | 151 |
| 0881KCN | 8.8 | .3465 | 81 | 131 | 1131KCN | 11.3 | .4448 | 94 | 151 |
| 0891KCN | 8.9 | .3504 | 81 | 131 | 1141KCN | 11.4 | .4488 | 94 | 151 |
| 0901KCN | 9.0 | .3543 | 81 | 131 | 1151KCN | 11.5 | .4527 | 94 | 151 |
| 0911KCN | 9.1 | .3583 | 81 | 131 | 1161KCN | 11.6 | .4566 | 94 | 151 |
| 0921KCN | 9.2 | .3622 | 81 | 131 | 1171KCN | 11.7 | .4606 | 94 | 151 |
| 0931KCN | 9.3 | .3661 | 81 | 131 | 1181KCN | 11.8 | .4645 | 94 | 151 |
| 0941KCN | 9.4 | .3701 | 81 | 131 | 1191KCN | 11.9 | .4685 | 101 | 158 |

* Individually packaged

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | | | | | | ◎ | | ○ | ○ | | | ○ |

# HPD DRILLS

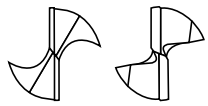
**DJ544 SERIES**

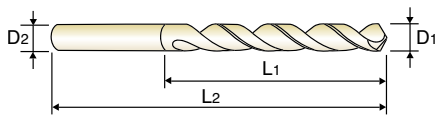
## HSS-EX, HPD-SUS DRILLS

***JOBBER***

▶ **Application** : Designed for drilling in stainless steels, mild steels, aluminum, aluminum alloy, aluminum die cast, copper, copper alloy, etc.
▶ **Advantage** : High helix-sharp cutting edges to avoid built-up and to be suitable for high performance drilling
Wide flute and stub length-increasing chip removal and reducing vibration and deflection.
High vanadium HSS-EX material with superior TiN coating - higher speed and feed, longer service life
High quality-good surface finishes, high productivity.






HSS EX | W 38° | h7 | h8 | 130° | 120° | P.163

up to 4mm over 4mm

$D_1 = D_2$

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 1201KCN | 12.0 | .4724 | 101 | 158 |
| 1211KCN | 12.1 | .4764 | 101 | 158 |
| 1221KCN | 12.2 | .4803 | 101 | 158 |
| 1231KCN | 12.3 | .4843 | 101 | 158 |
| 1241KCN | 12.4 | .4882 | 101 | 158 |
| 1251KCN | 12.5 | .4921 | 101 | 158 |
| 1261KCN | 12.6 | .4961 | 101 | 158 |
| 1271KCN | 12.7 | .5000 | 101 | 158 |
| 1281KCN | 12.8 | .5039 | 101 | 158 |
| 1291KCN | 12.9 | .5079 | 101 | 158 |
| 1301KCN | 13.0 | .5118 | 101 | 158 |
| 1351KCN | 13.5 | .5314 | 106 | 166 |
| 1401KCN | 14.0 | .5512 | 106 | 166 |
| 1411KCN | 14.1 | .5551 | 109 | 169 |
| 1451KCN | 14.5 | .5708 | 109 | 169 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | $D_1 = D_2$ | | $L_1$ | $L_2$ |
| 1501KCN | 15.0 | .5905 | 109 | 169 |
| 1551KCN | 15.5 | .6102 | 112 | 172 |
| 1561KCN | 15.6 | .6141 | 112 | 172 |
| 1601KCN | 16.0 | .6299 | 112 | 172 |
| 1651KCN | 16.5 | .6495 | 115 | 181 |
| 1701KCN | 17.0 | .6692 | 115 | 181 |
| 1751KCN | 17.5 | .6889 | 118 | 184 |
| 1761KCN | 17.6 | .6929 | 118 | 184 |
| 1801KCN | 18.0 | .7087 | 118 | 184 |
| 1851KCN | 18.5 | .7283 | 122 | 188 |
| 1901KCN | 19.0 | .7480 | 122 | 188 |
| 1951KCN | 19.5 | .7676 | 125 | 191 |
| 1961KCN | 19.6 | .7716 | 125 | 191 |
| 2001KCN | 20.0 | .7874 | 125 | 191 |

* Individually packaged

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | | | | | | ◎ | | ○ | ○ | | | ○ |

## HSS-EX, HPD-SUS DRILLS

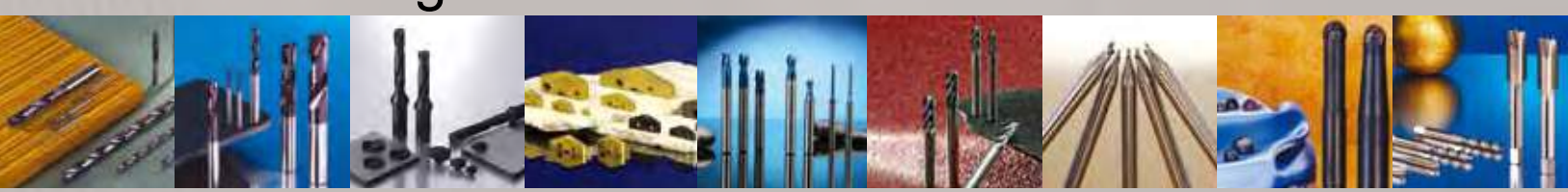
### DJ543, DJ544 SERIES

**Please decrease the feed rate 15% in JOBBERS SERIES.**
**Please decrease the feed and speed 20% for cast surface.**

| WORK MATERIAL | P | | M | | | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | MILD STEELS, LOW CARBON STEELS | | STAINLESS STEELS (SUS304, 200) | | STAINLESS STEELS (SUS420, 440) | | ALUMINUM & ALUMINUM ALLOY | | PLASTICS, COPPER, COPPER ALLOYS | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| 2.0 | 6300 | 0.003 | 2600 | 0.003 | 3100 | 0.003 | 11000 | 0.004 | 5600 | 0.002 |
| 3.0 | 4200 | 0.005 | 1800 | 0.003 | 2100 | 0.003 | 7350 | 0.005 | 3750 | 0.003 |
| 4.0 | 3200 | 0.006 | 1300 | 0.004 | 1600 | 0.004 | 7050 | 0.007 | 2800 | 0.004 |
| 5.0 | 2500 | 0.006 | 1050 | 0.006 | 1250 | 0.006 | 5500 | 0.009 | 2250 | 0.005 |
| 6.0 | 2100 | 0.007 | 900 | 0.007 | 1050 | 0.007 | 4600 | 0.010 | 1850 | 0.006 |
| 8.0 | 1550 | 0.009 | 650 | 0.009 | 800 | 0.009 | 3500 | 0.013 | 1350 | 0.008 |
| 10.0 | 1250 | 0.010 | 550 | 0.010 | 630 | 0.012 | 2800 | 0.016 | 1100 | 0.010 |
| 12.0 | 1050 | 0.013 | 450 | 0.013 | 530 | 0.014 | 2300 | 0.020 | 950 | 0.012 |
| 14.0 | 900 | 0.014 | 400 | 0.014 | 450 | 0.017 | 2050 | 0.022 | 800 | 0.013 |
| 16.0 | 790 | 0.016 | 350 | 0.016 | 390 | 0.019 | 1750 | 0.024 | 700 | 0.014 |
| 18.0 | 700 | 0.018 | 300 | 0.017 | 350 | 0.020 | 1600 | 0.028 | 620 | 0.016 |
| 20.0 | 620 | 0.019 | 260 | 0.018 | 320 | 0.021 | 1450 | 0.030 | 560 | 0.016 |

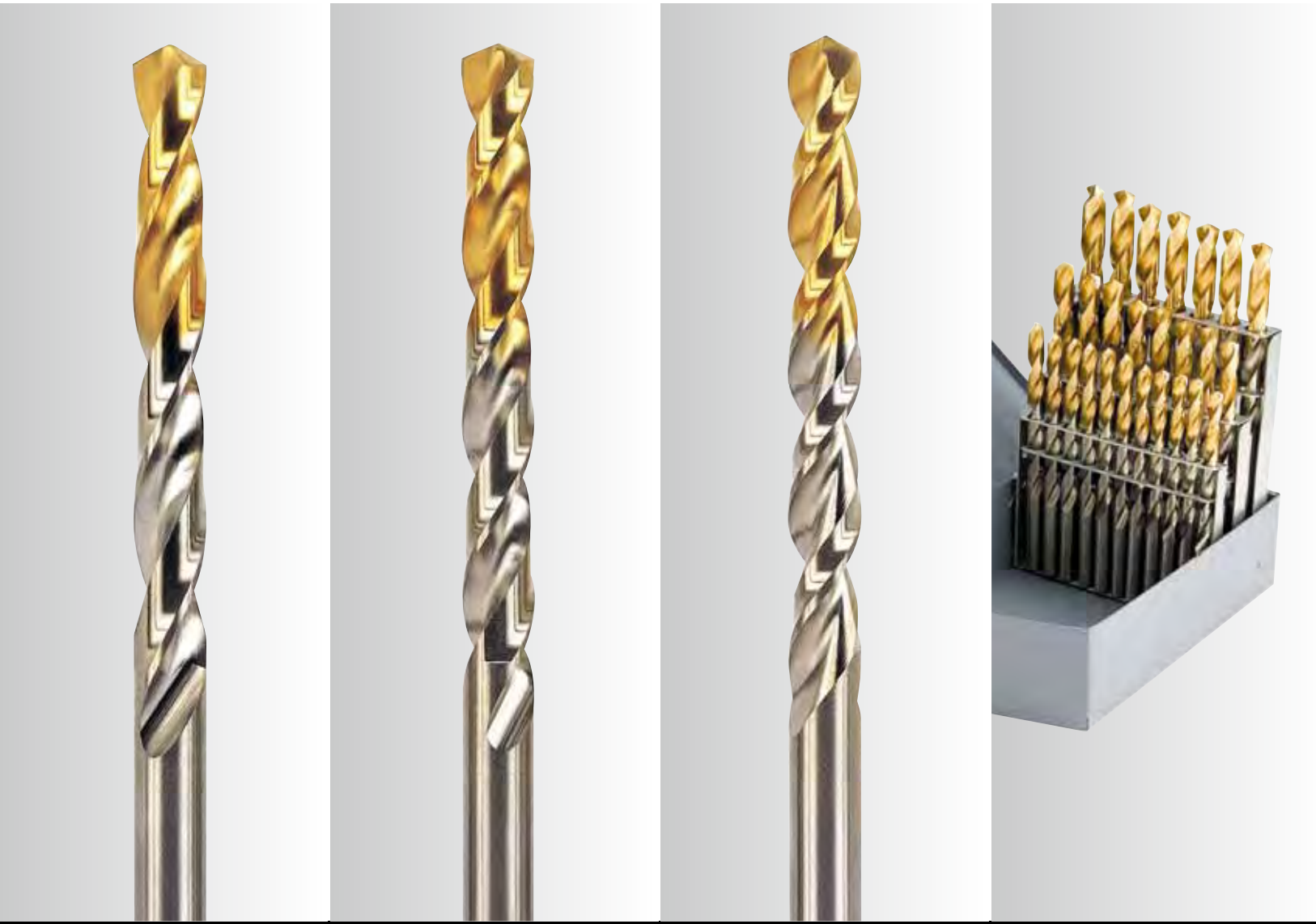
N = R.P.M
S = Inch per Revolution (inch/rev.)

Global Cutting Tool Leader **YG-1**



# HSS

Being the best through innovation



# GOLD-P DRILLS

- GOLD-P COATING

## GOLD-P DRILLS (GOLD-P COATED)

Competitive price and same performance as full TiN coating

| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **INCH** | | | | | | |
| D1GP182 D8182 |  | HSS, STRAIGHT SHANK, GOLD-P COATED / Fractional sizes | *JOBBER* | D3/64 | D3/4 | **168** |
| D1GP139 |  | HSS, STRAIGHT SHANK, GOLD-P COATED / Letter sizes | *JOBBER* | A | Z | **169** |
| D1GP138 |  | HSS, STRAIGHT SHANK, GOLD-P COATED / Wire gauge sizes | *JOBBER* | #56 | #1 | **170** |
| D2GP185 |  | HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Fractional sizes | *JOBBER* | D3/64 | D1/2 | **171** |
| D2GP186 |  | HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Letter sizes | *JOBBER* | A | Z | **172** |
| D2GP187 |  | HSSCo8, STRAIGHT SHANK, GOLD-P COATED / Wire gauge sizes | *JOBBER* | #56 | #1 | **173** |
| DLGP511 |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Fractional sizes | *JOBBER* | D5/64 | D1/2 | **174** |
| DLGP513 |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Letter sizes | *JOBBER* | A | Z | **175** |
| DLGP512 |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED / Wire gauge sizes | *JOBBER* | #47 | #1 | **176** |
| **METRIC** | | | | | | |
| DLGP195 |  | HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED | *JOBBER* | D1.0 | D13.0 | **177** |
| DLGP506 |  | HSSCo5 DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED | *JOBBER* | D2.0 | D13.0 | **179** |
| | | RECOMMENDED CUTTING CONDITIONS | | | | **182** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | | ○ | ○ | | | | |

# GOLD-P DRILLS

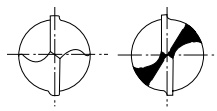
**D1GP182 SERIES**
**D8182 SERIES**

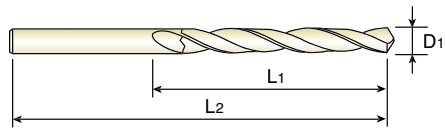
## HSS, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- **Flute Geometry** : Right hand helix, wider flutes
- **Point Angle** : 135˚
  under 1/16 : Normal point
  1/16 & over : Split point
- **Surface treatment** : Bright body TiN coating on working part
  over TiN coating on flute length
- **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI HSS N 30° h8 135° P.182

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1GP113003 | 3/64 | .0469 | 3/4 | 1-3/4 |
| * D1GP182004 | 1/16 | .0625 | 7/8 | 1-7/8 |
| * D1GP182005 | 5/64 | .0781 | 1 | 2 |
| * D1GP182006 | 3/32 | .0938 | 1-1/4 | 2-1/4 |
| * D1GP182007 | 7/64 | .1094 | 1-1/2 | 2-5/8 |
| * D1GP182008 | 1/8 | .1250 | 1-5/8 | 2-3/4 |
| * D1GP182009 | 9/64 | .1406 | 1-3/4 | 2-7/8 |
| * D1GP182010 | 5/32 | .1563 | 2 | 3-1/8 |
| * D1GP182011 | 11/64 | .1719 | 2-1/8 | 3-1/4 |
| * D1GP182012 | 3/16 | .1875 | 2-5/16 | 3-1/2 |
| * D1GP182013 | 13/64 | .2031 | 2-7/16 | 3-5/8 |
| * D1GP182014 | 7/32 | .2188 | 2-1/2 | 3-3/4 |
| * D1GP182015 | 15/64 | .2344 | 2-5/8 | 3-7/8 |
| * D1GP182016 | 1/4 | .2500 | 2-3/4 | 4 |
| * D1GP182017 | 17/64 | .2656 | 2-7/8 | 4-1/8 |
| * D1GP182018 | 9/32 | .2813 | 2-15/16 | 4-1/4 |
| * D1GP182019 | 19/64 | .2969 | 3-1/16 | 4-3/8 |
| * D1GP182020 | 5/16 | .3125 | 3-3/16 | 4-1/2 |
| ** D1GP182021 | 21/64 | .3281 | 3-5/16 | 4-5/8 |
| ** D1GP182022 | 11/32 | .3438 | 3-7/16 | 4-3/4 |
| ** D1GP182023 | 23/64 | .3594 | 3-1/2 | 4-7/8 |
| ** D1GP182024 | 3/8 | .3750 | 3-5/8 | 5 |

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| ** D1GP182025 | 25/64 | .3906 | 3-3/4 | 5-1/8 |
| ** D1GP182026 | 13/32 | .4063 | 3-7/8 | 5-1/4 |
| ** D1GP182027 | 27/64 | .4219 | 3-15/16 | 5-3/8 |
| ** D1GP182028 | 7/16 | .4375 | 4-1/16 | 5-1/2 |
| ** D1GP182029 | 29/64 | .4531 | 4-3/16 | 5-5/8 |
| ** D1GP182030 | 15/32 | .4688 | 4-5/16 | 5-3/4 |
| ** D1GP182031 | 31/64 | .4844 | 4-3/8 | 5-7/8 |
| ** D1GP182032 | 1/2 | .5000 | 4-1/2 | 6 |
| ** D8182033 | 33/64 | .5156 | 4-13/16 | 6-5/8 |
| ** D8182034 | 17/32 | .5312 | 4-13/16 | 6-5/8 |
| ** D8182035 | 35/64 | .5469 | 4-13/16 | 6-5/8 |
| ** D8182036 | 9/16 | .5625 | 4-13/16 | 6-5/8 |
| ** D8182037 | 37/64 | .5781 | 4-13/16 | 6-5/8 |
| ⁂ D8182038 | 19/32 | .5937 | 5-3/16 | 7-1/8 |
| ⁂ D8182039 | 39/64 | .6094 | 5-3/16 | 7-1/8 |
| ⁂ D8182040 | 5/8 | .6250 | 5-3/16 | 7-1/8 |
| ⁂ D8182042 | 21/32 | .6563 | 5-3/16 | 7-1/8 |
| ⁂ D8182044 | 11/16 | .6875 | 5-5/8 | 7-5/8 |
| ⁂ D8182045 | 45/64 | .7031 | 5-5/8 | 9-1/2 |
| ⁂ D8182046 | 23/32 | .7188 | 5-5/8 | 9-1/2 |
| ⁂ D8182047 | 47/64 | .7344 | 5-5/8 | 9-3/4 |
| ⁂ D8182048 | 3/4 | .7500 | 5-7/8 | 9-3/4 |

* 10per package
** 5per package
⁂ 3per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

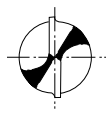
**D1GP139 SERIES**

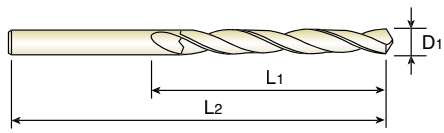
## HSS, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand helix, wider flutes
- ▶ **Point Angle** : 135°:Split point
- ▶ **Surface treatment** : Bright body TiN coating on working part
- ▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron








ANSI | HSS | N ≈30° | h8 | 135° P.182

## ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1GP139101 | A | .2340 | 2-5/8 | 3-7/8 |
| * D1GP139102 | B | .2380 | 2-3/4 | 4 |
| * D1GP139103 | C | .2420 | 2-3/4 | 4 |
| * D1GP139104 | D | .2460 | 2-3/4 | 4 |
| * D1GP139105 | E | .2500 | 2-3/4 | 4 |
| * D1GP139106 | F | .2570 | 2-7/8 | 4-1/8 |
| * D1GP139107 | G | .2610 | 2-7/8 | 4-1/8 |
| * D1GP139108 | H | .2660 | 2-7/8 | 4-1/8 |
| * D1GP139109 | I | .2720 | 2-7/8 | 4-1/8 |
| * D1GP139110 | J | .2770 | 2-7/8 | 4-1/8 |
| * D1GP139111 | K | .2810 | 2-15/16 | 4-1/4 |
| * D1GP139112 | L | .2900 | 2-15/16 | 4-1/4 |
| * D1GP139113 | M | .2950 | 3-1/16 | 4-3/8 |
| * D1GP139114 | N | .3020 | 3-1/16 | 4-3/8 |
| * D1GP139115 | O | .3160 | 3-3/16 | 4-1/2 |
| * D1GP139116 | P | .3230 | 3-5/16 | 4-5/8 |
| ** D1GP139117 | Q | .3320 | 3-7/16 | 4-3/4 |
| ** D1GP139118 | R | .3390 | 3-7/16 | 4-3/4 |
| ** D1GP139119 | S | .3480 | 3-1/2 | 4-7/8 |
| ** D1GP139120 | T | .3580 | 3-1/2 | 4-7/8 |
| ** D1GP139121 | U | .3680 | 3-5/8 | 5 |
| ** D1GP139122 | V | .3770 | 3-5/8 | 5 |
| ** D1GP139123 | W | .3860 | 3-3/4 | 5-1/8 |
| ** D1GP139124 | X | .3970 | 3-3/4 | 5-1/8 |
| ** D1GP139125 | Y | .4040 | 3-7/8 | 5-1/4 |
| ** D1GP139126 | Z | .4130 | 3-7/8 | 5-1/4 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

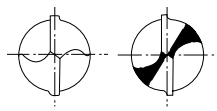
**D1GP138 SERIES**

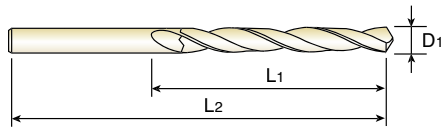
## HSS, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand helix, wider flutes
- ▶ **Point Angle** : 135°, Split point
  Wire gauge size #53~#56 : Normal point
  Wire gauge size #1~#52 : Split point
- ▶ **Surface treatment** : Bright body TiN coating on working part
- ▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS | N ≈30° | h8 | 135° | 118° | P.182

#53~#56 #1~#52

### ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * D1GP138256 | 1 | .2280 | 2-5/8 | 3-7/8 |
| * D1GP138255 | 2 | .2210 | 2-5/8 | 3-7/8 |
| * D1GP138254 | 3 | .2130 | 2-1/2 | 3-3/4 |
| * D1GP138253 | 4 | .2090 | 2-1/2 | 3-3/4 |
| * D1GP138252 | 5 | .2055 | 2-1/2 | 3-3/4 |
| * D1GP138251 | 6 | .2040 | 2-1/2 | 3-3/4 |
| * D1GP138250 | 7 | .2010 | 2-7/16 | 3-5/8 |
| * D1GP138249 | 8 | .1990 | 2-7/16 | 3-5/8 |
| * D1GP138248 | 9 | .1960 | 2-7/16 | 3-5/8 |
| * D1GP138247 | 10 | .1935 | 2-7/16 | 3-5/8 |
| * D1GP138246 | 11 | .1910 | 2-5/16 | 3-1/2 |
| * D1GP138245 | 12 | .1890 | 2-5/16 | 3-1/2 |
| * D1GP138244 | 13 | .1850 | 2-5/16 | 3-1/2 |
| * D1GP138243 | 14 | .1820 | 2-3/16 | 3-3/8 |
| * D1GP138242 | 15 | .1800 | 2-3/16 | 3-3/8 |
| * D1GP138241 | 16 | .1770 | 2-3/16 | 3-3/8 |
| * D1GP138240 | 17 | .1730 | 2-3/16 | 3-3/8 |
| * D1GP138239 | 18 | .1695 | 2-1/8 | 3-1/4 |
| * D1GP138238 | 19 | .1660 | 2-1/8 | 3-1/4 |
| * D1GP138237 | 20 | .1610 | 2-1/8 | 3-1/4 |
| * D1GP138236 | 21 | .1590 | 2-1/8 | 3-1/4 |
| * D1GP138235 | 22 | .1570 | 2 | 3-1/8 |
| * D1GP138234 | 23 | .1540 | 2 | 3-1/8 |
| * D1GP138233 | 24 | .1520 | 2 | 3-1/8 |
| * D1GP138232 | 25 | .1495 | 1-7/8 | 3 |
| * D1GP138231 | 26 | .1470 | 1-7/8 | 3 |
| * D1GP138230 | 27 | .1440 | 1-7/8 | 3 |
| * D1GP138229 | 28 | .1405 | 1-3/4 | 2-7/8 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * D1GP138228 | 29 | .1360 | 1-3/4 | 2-7/8 |
| * D1GP138227 | 30 | .1285 | 1-5/8 | 2-3/4 |
| * D1GP138226 | 31 | .1200 | 1-5/8 | 2-3/4 |
| * D1GP138225 | 32 | .1160 | 1-5/8 | 2-3/4 |
| * D1GP138224 | 33 | .1130 | 1-1/2 | 2-5/8 |
| * D1GP138223 | 34 | .1110 | 1-1/2 | 2-5/8 |
| * D1GP138222 | 35 | .1100 | 1-1/2 | 2-5/8 |
| * D1GP138221 | 36 | .1065 | 1-7/16 | 2-1/2 |
| * D1GP138220 | 37 | .1040 | 1-7/16 | 2-1/2 |
| * D1GP138219 | 38 | .1015 | 1-7/16 | 2-1/2 |
| * D1GP138218 | 39 | .0995 | 1-3/8 | 2-3/8 |
| * D1GP138217 | 40 | .0980 | 1-3/8 | 2-3/8 |
| * D1GP138216 | 41 | .0960 | 1-3/8 | 2-3/8 |
| * D1GP138215 | 42 | .0935 | 1-1/4 | 2-1/4 |
| * D1GP138214 | 43 | .0890 | 1-1/4 | 2-1/4 |
| * D1GP138213 | 44 | .0860 | 1-1/8 | 2-1/8 |
| * D1GP138212 | 45 | .0820 | 1-1/8 | 2-1/8 |
| * D1GP138211 | 46 | .0810 | 1-1/8 | 2-1/8 |
| * D1GP138210 | 47 | .0785 | 1 | 2 |
| * D1GP138209 | 48 | .0760 | 1 | 2 |
| * D1GP138208 | 49 | .0730 | 1 | 2 |
| * D1GP138207 | 50 | .0700 | 1 | 2 |
| * D1GP138206 | 51 | .0670 | 1 | 2 |
| * D1GP138205 | 52 | .0635 | 7/8 | 1-7/8 |
| * D1GP134204 | 53 | .0595 | 7/8 | 1-7/8 |
| * D1GP134203 | 54 | .0550 | 7/8 | 1-7/8 |
| * D1GP134202 | 55 | .0520 | 7/8 | 1-7/8 |
| * D1GP134201 | 56 | .0465 | 3/4 | 1-3/4 |

▶ **Tolerance** : See page 168

* 10per package

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

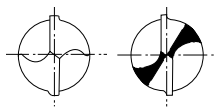
**D2GP185 SERIES**

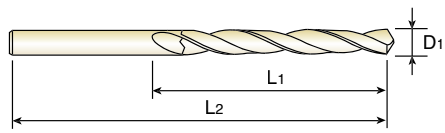
## HSSCo8, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand helix, wider flutes
- ▶ **Point Angle** : 135˚
  under 1/16 : Normal point
  1/16 & over : Split point
- ▶ **Surface treatment** : Bright body TiN coating on working part
- ▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS Co8 | N ≈30° | h8 | 135° P.182

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional D1 | Diameter Decimal D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * D2GP185003 | 3/64 | .0469 | 3/4 | 1-3/4 |
| * D2GP185004 | 1/16 | .0625 | 7/8 | 1-7/8 |
| * D2GP185005 | 5/64 | .0781 | 1 | 2 |
| * D2GP185006 | 3/32 | .0938 | 1-1/4 | 2-1/4 |
| * D2GP185007 | 7/64 | .1094 | 1-1/2 | 2-5/8 |
| * D2GP185008 | 1/8 | .1250 | 1-5/8 | 2-3/4 |
| * D2GP185009 | 9/64 | .1406 | 1-3/4 | 2-7/8 |
| * D2GP185010 | 5/32 | .1563 | 2 | 3-1/8 |
| * D2GP185011 | 11/64 | .1719 | 2-1/8 | 3-1/4 |
| * D2GP185012 | 3/16 | .1875 | 2-5/16 | 3-1/2 |
| * D2GP185013 | 13/64 | .2031 | 2-7/16 | 3-5/8 |
| * D2GP185014 | 7/32 | .2188 | 2-1/2 | 3-3/4 |
| * D2GP185015 | 15/64 | .2344 | 2-5/8 | 3-7/8 |
| * D2GP185016 | 1/4 | .2500 | 2-3/4 | 4 |
| * D2GP185017 | 17/64 | .2656 | 2-7/8 | 4-1/8 |

| EDP No. | Diameter Fractional D1 | Diameter Decimal D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * D2GP185018 | 9/32 | .2813 | 2-15/16 | 4-1/4 |
| * D2GP185019 | 19/64 | .2969 | 3-1/16 | 4-3/8 |
| * D2GP185020 | 5/16 | .3125 | 3-3/16 | 4-1/2 |
| ** D2GP185021 | 21/64 | .3281 | 3-5/16 | 4-5/8 |
| ** D2GP185022 | 11/32 | .3438 | 3-7/16 | 4-3/4 |
| ** D2GP185023 | 23/64 | .3594 | 3-1/2 | 4-7/8 |
| ** D2GP185024 | 3/8 | .3750 | 3-5/8 | 5 |
| ** D2GP185025 | 25/64 | .3906 | 3-3/4 | 5-1/8 |
| ** D2GP185026 | 13/32 | .4063 | 3-7/8 | 5-1/4 |
| ** D2GP185027 | 27/64 | .4219 | 3-15/16 | 5-3/8 |
| ** D2GP185028 | 7/16 | .4375 | 4-1/16 | 5-1/2 |
| ** D2GP185029 | 29/64 | .4531 | 4-3/16 | 5-5/8 |
| ** D2GP185030 | 15/32 | .4688 | 4-5/16 | 5-3/4 |
| ** D2GP185031 | 31/64 | .4844 | 4-3/8 | 5-7/8 |
| ** D2GP185032 | 1/2 | .5000 | 4-1/2 | 6 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

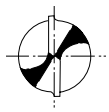
**D2GP186 SERIES**

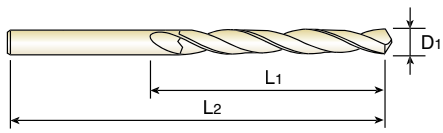
## HSSCo8, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- **Flute Geometry** : Right hand helix, wider flutes
- **Point Angle** : 135° : Split point
- **Surface treatment** : Bright body TiN coating on working part
- **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron








ANSI | HSS Co8 | N ≈ 30° | h8 | 135° P.182

## ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * D2GP186101 | A | .2340 | 2-5/8 | 3-7/8 |
| * D2GP186102 | B | .2380 | 2-3/4 | 4 |
| * D2GP186103 | C | .2420 | 2-3/4 | 4 |
| * D2GP186104 | D | .2460 | 2-3/4 | 4 |
| * D2GP185105 | E | .2500 | 2-3/4 | 4 |
| * D2GP186106 | F | .2570 | 2-7/8 | 4-1/8 |
| * D2GP186107 | G | .2610 | 2-7/8 | 4-1/8 |
| * D2GP186108 | H | .2660 | 2-7/8 | 4-1/8 |
| * D2GP186109 | I | .2720 | 2-7/8 | 4-1/8 |
| * D2GP186110 | J | .2770 | 2-7/8 | 4-1/8 |
| * D2GP186111 | K | .2810 | 2-15/16 | 4-1/4 |
| * D2GP186112 | L | .2900 | 2-15/16 | 4-1/4 |
| * D2GP186113 | M | .2950 | 3-1/16 | 4-3/8 |
| * D2GP186114 | N | .3020 | 3-1/16 | 4-3/8 |
| * D2GP186115 | O | .3160 | 3-3/16 | 4-1/2 |
| * D2GP186116 | P | .3230 | 3-5/16 | 4-5/8 |
| ** D2GP186117 | Q | .3320 | 3-7/16 | 4-3/4 |
| ** D2GP186118 | R | .3390 | 3-7/16 | 4-3/4 |
| ** D2GP186119 | S | .3480 | 3-1/2 | 4-7/8 |
| ** D2GP186120 | T | .3580 | 3-1/2 | 4-7/8 |
| ** D2GP186121 | U | .3680 | 3-5/8 | 5 |
| ** D2GP186122 | V | .3770 | 3-5/8 | 5 |
| ** D2GP186123 | W | .3860 | 3-3/4 | 5-1/8 |
| ** D2GP186124 | X | .3970 | 3-3/4 | 5-1/8 |
| ** D2GP186125 | Y | .4040 | 3-7/8 | 5-1/4 |
| ** D2GP186126 | Z | .4130 | 3-7/8 | 5-1/4 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

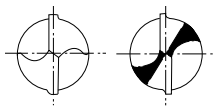
**D2GP187 SERIES**

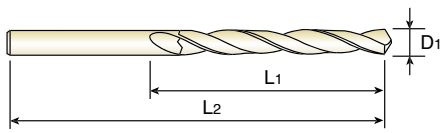
## HSSCo8, STRAIGHT SHANK, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand helix, wider flutes
- ▶ **Point Angle** : 135° : Split point
  Wire gauge size #53~#56 : Normal point
  Wire gauge size #1~#52 : Split point
- ▶ **Surface treatment** : Bright body TiN coating on working part
- ▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS Co8 | N ≈ 30° | h8 | 135° P.182

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * D2GP187256 | 1 | .2280 | 2-5/8 | 3-7/8 |
| * D2GP187255 | 2 | .2210 | 2-5/8 | 3-7/8 |
| * D2GP187254 | 3 | .2130 | 2-1/2 | 3-3/4 |
| * D2GP187253 | 4 | .2090 | 2-1/2 | 3-3/4 |
| * D2GP187252 | 5 | .2055 | 2-1/2 | 3-3/4 |
| * D2GP187251 | 6 | .2040 | 2-1/2 | 3-3/4 |
| * D2GP187250 | 7 | .2010 | 2-7/16 | 3-5/8 |
| * D2GP187249 | 8 | .1990 | 2-7/16 | 3-5/8 |
| * D2GP187248 | 9 | .1960 | 2-7/16 | 3-5/8 |
| * D2GP187247 | 10 | .1935 | 2-7/16 | 3-5/8 |
| * D2GP187246 | 11 | .1910 | 2-5/16 | 3-1/2 |
| * D2GP187245 | 12 | .1890 | 2-5/16 | 3-1/2 |
| * D2GP187244 | 13 | .1850 | 2-5/16 | 3-1/2 |
| * D2GP187243 | 14 | .1820 | 2-3/16 | 3-3/8 |
| * D2GP187242 | 15 | .1800 | 2-3/16 | 3-3/8 |
| * D2GP187241 | 16 | .1770 | 2-3/16 | 3-3/8 |
| * D2GP187240 | 17 | .1730 | 2-3/16 | 3-3/8 |
| * D2GP187239 | 18 | .1695 | 2-1/8 | 3-1/4 |
| * D2GP187238 | 19 | .1660 | 2-1/8 | 3-1/4 |
| * D2GP187237 | 20 | .1610 | 2-1/8 | 3-1/4 |
| * D2GP187236 | 21 | .1590 | 2-1/8 | 3-1/4 |
| * D2GP187235 | 22 | .1570 | 2 | 3-1/8 |
| * D2GP187234 | 23 | .1540 | 2 | 3-1/8 |
| * D2GP187233 | 24 | .1520 | 2 | 3-1/8 |
| * D2GP187232 | 25 | .1495 | 1-7/8 | 3 |
| * D2GP187231 | 26 | .1470 | 1-7/8 | 3 |
| * D2GP187230 | 27 | .1440 | 1-7/8 | 3 |
| * D2GP187229 | 28 | .1405 | 1-3/4 | 2-7/8 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * D2GP187228 | 29 | .1360 | 1-3/4 | 2-7/8 |
| * D2GP187227 | 30 | .1285 | 1-5/8 | 2-3/4 |
| * D2GP187226 | 31 | .1200 | 1-5/8 | 2-3/4 |
| * D2GP187225 | 32 | .1160 | 1-5/8 | 2-3/4 |
| * D2GP187224 | 33 | .1130 | 1-1/2 | 2-5/8 |
| * D2GP187223 | 34 | .1110 | 1-1/2 | 2-5/8 |
| * D2GP187222 | 35 | .1100 | 1-1/2 | 2-5/8 |
| * D2GP187221 | 36 | .1065 | 1-7/16 | 2-1/2 |
| * D2GP187220 | 37 | .1040 | 1-7/16 | 2-1/2 |
| * D2GP187219 | 38 | .1015 | 1-7/16 | 2-1/2 |
| * D2GP187218 | 39 | .0995 | 1-3/8 | 2-3/8 |
| * D2GP187217 | 40 | .0980 | 1-3/8 | 2-3/8 |
| * D2GP187216 | 41 | .0960 | 1-3/8 | 2-3/8 |
| * D2GP187215 | 42 | .0935 | 1-1/4 | 2-1/4 |
| * D2GP187214 | 43 | .0890 | 1-1/4 | 2-1/4 |
| * D2GP187213 | 44 | .0860 | 1-1/8 | 2-1/8 |
| * D2GP187212 | 45 | .0820 | 1-1/8 | 2-1/8 |
| * D2GP187211 | 46 | .0810 | 1-1/8 | 2-1/8 |
| * D2GP187210 | 47 | .0785 | 1 | 2 |
| * D2GP187209 | 48 | .0760 | 1 | 2 |
| * D2GP187208 | 49 | .0730 | 1 | 2 |
| * D2GP187207 | 50 | .0700 | 1 | 2 |
| * D2GP187206 | 51 | .0670 | 1 | 2 |
| * D2GP187205 | 52 | .0635 | 7/8 | 1-7/8 |
| * D2GP187204 | 53 | .0595 | 7/8 | 1-7/8 |
| * D2GP187203 | 54 | .0550 | 7/8 | 1-7/8 |
| * D2GP187202 | 55 | .0520 | 7/8 | 1-7/8 |
| * D2GP187201 | 56 | .0465 | 3/4 | 1-3/4 |

▶ **Tolerance** : See page 168

* 10per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

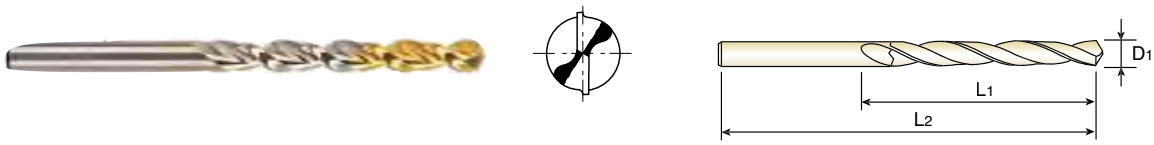
# GOLD-P DRILLS

**DLGP511 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

***JOBBER***

- **Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
- **Point Angle** : 130° : Split point
- **Surface treatment** : Bright body TiN coating on working part
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.




ANSI | HSS Co5 | N ≈ 38° | h8 | 130° | P.183

### ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DLGP511005 | 5/64 | .0781 | 1 | 2 |
| * DLGP511006 | 3/32 | .0938 | 1-1/4 | 2-1/4 |
| * DLGP511007 | 7/64 | .1094 | 1-1/2 | 2-5/8 |
| * DLGP511008 | 1/8 | .1250 | 1-5/8 | 2-3/4 |
| * DLGP511009 | 9/64 | .1406 | 1-3/4 | 2-7/8 |
| * DLGP511010 | 5/32 | .1563 | 2 | 3-1/8 |
| * DLGP511011 | 11/64 | .1719 | 2-1/8 | 3-1/4 |
| * DLGP511012 | 3/16 | .1875 | 2-5/16 | 3-1/2 |
| * DLGP511013 | 13/64 | .2031 | 2-7/16 | 3-5/8 |
| * DLGP511014 | 7/32 | .2188 | 2-1/2 | 3-3/4 |
| * DLGP511015 | 15/64 | .2344 | 2-5/8 | 3-7/8 |
| * DLGP511016 | 1/4 | .2500 | 2-3/4 | 4 |
| * DLGP511017 | 17/64 | .2656 | 2-7/8 | 4-1/8 |
| * DLGP511018 | 9/32 | .2813 | 2-15/16 | 4-1/4 |

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DLGP511019 | 19/64 | .2969 | 3-1/16 | 4-3/8 |
| * DLGP511020 | 5/16 | .3125 | 3-3/16 | 4-1/2 |
| ** DLGP511021 | 21/64 | .3281 | 3-5/16 | 4-5/8 |
| ** DLGP511022 | 11/32 | .3438 | 3-7/16 | 4-3/4 |
| ** DLGP511023 | 23/64 | .3594 | 3-1/2 | 4-7/8 |
| ** DLGP511024 | 3/8 | .3750 | 3-5/8 | 5 |
| ** DLGP511025 | 25/64 | .3906 | 3-3/4 | 5-1/8 |
| ** DLGP511026 | 13/32 | .4063 | 3-7/8 | 5-1/4 |
| ** DLGP511027 | 27/64 | .4219 | 3-15/16 | 5-3/8 |
| ** DLGP511028 | 7/16 | .4375 | 4-1/16 | 5-1/2 |
| ** DLGP511029 | 29/64 | .4531 | 4-3/16 | 5-5/8 |
| ** DLGP511030 | 15/32 | .4688 | 4-5/16 | 5-3/4 |
| ** DLGP511031 | 31/64 | .4844 | 4-3/8 | 5-7/8 |
| ** DLGP511032 | 1/2 | .5000 | 4-1/2 | 6 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | ○ |

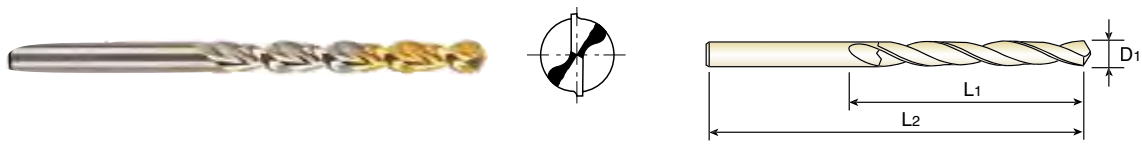
# GOLD-P DRILLS

**DLGP513 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
- ▶ **Point Angle** : 130° : Split point
- ▶ **Surface treatment** : Bright body TiN coating on working part
- ▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.




ANSI | HSS Co5 | N ≈ 38° | h8 | 130° P.183

## ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DLGP513101 | A | .2340 | 2-5/8 | 3-7/8 |
| * DLGP513102 | B | .2380 | 2-3/4 | 4 |
| * DLGP513103 | C | .2420 | 2-3/4 | 4 |
| * DLGP513104 | D | .2460 | 2-3/4 | 4 |
| * DLGP513105 | E | .2500 | 2-3/4 | 4 |
| * DLGP513106 | F | .2570 | 2-7/8 | 4-1/8 |
| * DLGP513107 | G | .2610 | 2-7/8 | 4-1/8 |
| * DLGP513108 | H | .2660 | 2-7/8 | 4-1/8 |
| * DLGP513109 | I | .2720 | 2-7/8 | 4-1/8 |
| * DLGP513110 | J | .2770 | 2-7/8 | 4-1/8 |
| * DLGP513111 | K | .2810 | 2-15/16 | 4-1/4 |
| * DLGP513112 | L | .2900 | 2-15/16 | 4-1/4 |
| * DLGP513113 | M | .2950 | 3-1/16 | 4-3/8 |
| * DLGP513114 | N | .3020 | 3-1/16 | 4-3/8 |
| * DLGP513115 | O | .3160 | 3-3/16 | 4-1/2 |
| * DLGP513116 | P | .3230 | 3-5/16 | 4-5/8 |
| ** DLGP513117 | Q | .3320 | 3-7/16 | 4-3/4 |
| ** DLGP513118 | R | .3390 | 3-7/16 | 4-3/4 |
| ** DLGP513119 | S | .3480 | 3-1/2 | 4-7/8 |
| ** DLGP513120 | T | .3580 | 3-1/2 | 4-7/8 |
| ** DLGP513121 | U | .3680 | 3-5/8 | 5 |
| ** DLGP513122 | V | .3770 | 3-5/8 | 5 |
| ** DLGP513123 | W | .3860 | 3-3/4 | 5-1/8 |
| ** DLGP513124 | X | .3970 | 3-3/4 | 5-1/8 |
| ** DLGP513125 | Y | .4040 | 3-7/8 | 5-1/4 |
| ** DLGP513126 | Z | .4130 | 3-7/8 | 5-1/4 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

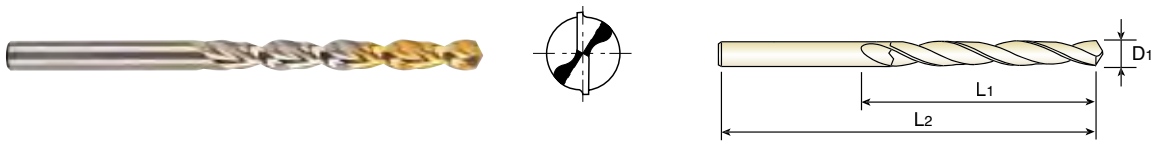
# GOLD-P DRILLS

**DLGP512 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

***JOBBER***

- **Flute Geometry** : Right hand spiral, 38° helix, parabolic flute.
- **Point Angle** : 130° : Split point
- **Surface treatment** : Bright body TiN coating on working part
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.




ANSI | HSS Co5 | N ≈ 38° | h8 | 130° | P.183

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * DLGP512247 | 1 | .2280 | 2-5/8 | 3-7/8 |
| * DLGP512246 | 2 | .2210 | 2-5/8 | 3-7/8 |
| * DLGP512245 | 3 | .2130 | 2-1/2 | 3-3/4 |
| * DLGP512244 | 4 | .2090 | 2-1/2 | 3-3/4 |
| * DLGP512243 | 5 | .2055 | 2-1/2 | 3-3/4 |
| * DLGP512242 | 6 | .2040 | 2-1/2 | 3-3/4 |
| * DLGP512241 | 7 | .2010 | 2-7/16 | 3-5/8 |
| * DLGP512240 | 8 | .1990 | 2-7/16 | 3-5/8 |
| * DLGP512239 | 9 | .1960 | 2-7/16 | 3-5/8 |
| * DLGP512238 | 10 | .1935 | 2-7/16 | 3-5/8 |
| * DLGP512237 | 11 | .1910 | 2-5/16 | 3-1/2 |
| * DLGP512236 | 12 | .1890 | 2-5/16 | 3-1/2 |
| * DLGP512235 | 13 | .1850 | 2-5/16 | 3-1/2 |
| * DLGP512234 | 14 | .1820 | 2-3/16 | 3-3/8 |
| * DLGP512233 | 15 | .1800 | 2-3/16 | 3-3/8 |
| * DLGP512232 | 16 | .1770 | 2-3/16 | 3-3/8 |
| * DLGP512231 | 17 | .1730 | 2-3/16 | 3-3/8 |
| * DLGP512230 | 18 | .1695 | 2-1/8 | 3-1/4 |
| * DLGP512229 | 19 | .1660 | 2-1/8 | 3-1/4 |
| * DLGP512228 | 20 | .1610 | 2-1/8 | 3-1/4 |
| * DLGP512227 | 21 | .1590 | 2-1/8 | 3-1/4 |
| * DLGP512226 | 22 | .1570 | 2 | 3-1/8 |
| * DLGP512225 | 23 | .1540 | 2 | 3-1/8 |
| * DLGP512224 | 24 | .1520 | 2 | 3-1/8 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * DLGP512223 | 25 | .1495 | 1-7/8 | 3 |
| * DLGP512222 | 26 | .1470 | 1-7/8 | 3 |
| * DLGP512221 | 27 | .1440 | 1-7/8 | 3 |
| * DLGP512220 | 28 | .1405 | 1-3/4 | 2-7/8 |
| * DLGP512219 | 29 | .1360 | 1-3/4 | 2-7/8 |
| * DLGP512218 | 30 | .1285 | 1-5/8 | 2-3/4 |
| * DLGP512217 | 31 | .1200 | 1-5/8 | 2-3/4 |
| * DLGP512216 | 32 | .1160 | 1-5/8 | 2-3/4 |
| * DLGP512215 | 33 | .1130 | 1-1/2 | 2-5/8 |
| * DLGP512214 | 34 | .1110 | 1-1/2 | 2-5/8 |
| * DLGP512213 | 35 | .1100 | 1-1/2 | 2-5/8 |
| * DLGP512212 | 36 | .1065 | 1-7/16 | 2-1/2 |
| * DLGP512211 | 37 | .1040 | 1-7/16 | 2-1/2 |
| * DLGP512210 | 38 | .1015 | 1-7/16 | 2-1/2 |
| * DLGP512209 | 39 | .0995 | 1-3/8 | 2-3/8 |
| * DLGP512208 | 40 | .0980 | 1-3/8 | 2-3/8 |
| * DLGP512207 | 41 | .0960 | 1-3/8 | 2-3/8 |
| * DLGP512206 | 42 | .0935 | 1-1/4 | 2-1/4 |
| * DLGP512205 | 43 | .0890 | 1-1/4 | 2-1/4 |
| * DLGP512204 | 44 | .0860 | 1-1/8 | 2-1/8 |
| * DLGP512203 | 45 | .0820 | 1-1/8 | 2-1/8 |
| * DLGP512202 | 46 | .0810 | 1-1/8 | 2-1/8 |
| * DLGP512201 | 47 | .0785 | 1 | 2 |

▶ **Tolerance** : See page 168

* 10per package

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |

# GOLD-P DRILLS

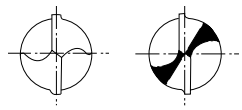
**DLGP195 SERIES**

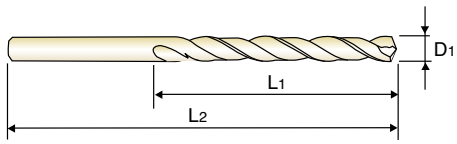
## HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand helix
- ▶ **Point Angle** : 135˚
  under 1.6mm : Normal point
  1.6mm & over : Split point
- ▶ **Surface treatment** : Bright body, TiN coating on working area
- ▶ **Application** : Drilling to steels, cast steels alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






DIN 338 | HSS Co5 | N ≈33° | h8 | 135° P.182

Unit : mm

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP195010 | 1.0 | .0394 | 12 | 34 |
| * DLGP195011 | 1.1 | .0433 | 14 | 36 |
| * DLGP195012 | 1.2 | .0472 | 16 | 38 |
| * DLGP195013 | 1.3 | .0512 | 16 | 38 |
| * DLGP195014 | 1.4 | .0551 | 18 | 40 |
| * DLGP195015 | 1.5 | .0591 | 18 | 40 |
| * DLGP195016 | 1.6 | .0630 | 20 | 43 |
| * DLGP195017 | 1.7 | .0669 | 20 | 43 |
| * DLGP195018 | 1.8 | .0709 | 22 | 46 |
| * DLGP195019 | 1.9 | .0748 | 22 | 46 |
| * DLGP195020 | 2.0 | .0787 | 24 | 49 |
| * DLGP195021 | 2.1 | .0827 | 24 | 49 |
| * DLGP195022 | 2.2 | .0866 | 27 | 53 |
| * DLGP195023 | 2.3 | .0906 | 27 | 53 |
| * DLGP195024 | 2.4 | .0945 | 30 | 57 |
| * DLGP195025 | 2.5 | .0984 | 30 | 57 |
| * DLGP195026 | 2.6 | .1024 | 30 | 57 |
| * DLGP195027 | 2.7 | .1063 | 33 | 61 |
| * DLGP195028 | 2.8 | .1102 | 33 | 61 |
| * DLGP195029 | 2.9 | .1142 | 33 | 61 |
| * DLGP195030 | 3.0 | .1181 | 33 | 61 |
| * DLGP195031 | 3.1 | .1220 | 36 | 65 |
| * DLGP195032 | 3.2 | .1260 | 36 | 65 |
| * DLGP195033 | 3.3 | .1299 | 36 | 65 |
| * DLGP195034 | 3.4 | .1339 | 39 | 70 |
| * DLGP195035 | 3.5 | .1378 | 39 | 70 |
| * DLGP195036 | 3.6 | .1417 | 39 | 70 |
| * DLGP195037 | 3.7 | .1457 | 39 | 70 |
| * DLGP195038 | 3.8 | .1496 | 43 | 75 |
| * DLGP195039 | 3.9 | .1535 | 43 | 75 |
| * DLGP195040 | 4.0 | .1575 | 43 | 75 |
| * DLGP195041 | 4.1 | .1614 | 43 | 75 |

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP195042 | 4.2 | .1654 | 43 | 75 |
| * DLGP195043 | 4.3 | .1693 | 47 | 80 |
| * DLGP195044 | 4.4 | .1732 | 47 | 80 |
| * DLGP195045 | 4.5 | .1772 | 47 | 80 |
| * DLGP195046 | 4.6 | .1811 | 47 | 80 |
| * DLGP195047 | 4.7 | .1850 | 47 | 80 |
| * DLGP195048 | 4.8 | .1890 | 52 | 86 |
| * DLGP195049 | 4.9 | .1929 | 52 | 86 |
| * DLGP195050 | 5.0 | .1969 | 52 | 86 |
| * DLGP195051 | 5.1 | .2008 | 52 | 86 |
| * DLGP195052 | 5.2 | .2047 | 52 | 86 |
| * DLGP195053 | 5.3 | .2087 | 52 | 86 |
| * DLGP195054 | 5.4 | .2126 | 57 | 93 |
| * DLGP195055 | 5.5 | .2165 | 57 | 93 |
| * DLGP195056 | 5.6 | .2205 | 57 | 93 |
| * DLGP195057 | 5.7 | .2244 | 57 | 93 |
| * DLGP195058 | 5.8 | .2283 | 57 | 93 |
| * DLGP195059 | 5.9 | .2323 | 57 | 93 |
| * DLGP195060 | 6.0 | .2362 | 57 | 93 |
| * DLGP195061 | 6.1 | .2402 | 63 | 101 |
| * DLGP195062 | 6.2 | .2441 | 63 | 101 |
| * DLGP195063 | 6.3 | .2480 | 63 | 101 |
| * DLGP195064 | 6.4 | .2520 | 63 | 101 |
| * DLGP195065 | 6.5 | .2559 | 63 | 101 |
| * DLGP195066 | 6.6 | .2598 | 63 | 101 |
| * DLGP195067 | 6.7 | .2638 | 63 | 101 |
| * DLGP195068 | 6.8 | .2677 | 69 | 109 |
| * DLGP195069 | 6.9 | .2717 | 69 | 109 |
| * DLGP195070 | 7.0 | .2756 | 69 | 109 |
| * DLGP195071 | 7.1 | .2795 | 69 | 109 |
| * DLGP195072 | 7.2 | .2835 | 69 | 109 |
| * DLGP195073 | 7.3 | .2874 | 69 | 109 |

* 10per package

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

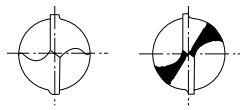
**DLGP195 SERIES**

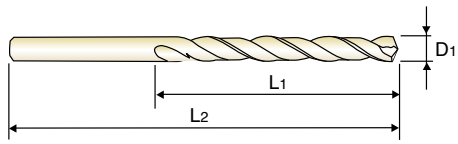
## HSSCo5, STRAIGHT SHANK DRILLS, GOLD-P COATED

***JOBBER***

- **Flute Geometry** : Right hand helix
- **Point Angle** : 135°
  under 1.6mm : Normal point
  1.6mm & over : Split point
- **Surface treatment** : Bright body, TiN coating on working area
- **Application** : Drilling to steels, cast steels alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






DIN 338 | HSS Co5 | N ≈33° | h8 | 135° P.182

Unit : mm

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP195074 | 7.4 | .2913 | 69 | 109 |
| * DLGP195075 | 7.5 | .2953 | 69 | 109 |
| * DLGP195076 | 7.6 | .2992 | 75 | 117 |
| * DLGP195077 | 7.7 | .3031 | 75 | 117 |
| * DLGP195078 | 7.8 | .3071 | 75 | 117 |
| * DLGP195079 | 7.9 | .3110 | 75 | 117 |
| * DLGP195080 | 8.0 | .3150 | 75 | 117 |
| * DLGP195081 | 8.1 | .3189 | 75 | 117 |
| * DLGP195082 | 8.2 | .3228 | 75 | 117 |
| * DLGP195083 | 8.3 | .3268 | 75 | 117 |
| ** DLGP195084 | 8.4 | .3307 | 75 | 117 |
| ** DLGP195085 | 8.5 | .3346 | 75 | 117 |
| ** DLGP195086 | 8.6 | .3386 | 81 | 125 |
| ** DLGP195087 | 8.7 | .3425 | 81 | 125 |
| ** DLGP195088 | 8.8 | .3465 | 81 | 125 |
| ** DLGP195089 | 8.9 | .3504 | 81 | 125 |
| ** DLGP195090 | 9.0 | .3543 | 81 | 125 |
| ** DLGP195091 | 9.1 | .3583 | 81 | 125 |
| ** DLGP195092 | 9.2 | .3622 | 81 | 125 |
| ** DLGP195093 | 9.3 | .3661 | 81 | 125 |
| ** DLGP195094 | 9.4 | .3701 | 81 | 125 |
| ** DLGP195095 | 9.5 | .3740 | 81 | 125 |
| ** DLGP195096 | 9.6 | .3780 | 87 | 133 |
| ** DLGP195097 | 9.7 | .3819 | 87 | 133 |
| ** DLGP195098 | 9.8 | .3858 | 87 | 133 |
| ** DLGP195099 | 9.9 | .3898 | 87 | 133 |
| ** DLGP195100 | 10.0 | .3937 | 87 | 133 |
| ** DLGP195101 | 10.1 | .3976 | 87 | 133 |
| ** DLGP195102 | 10.2 | .4016 | 87 | 133 |

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| ** DLGP195103 | 10.3 | .4055 | 87 | 133 |
| ** DLGP195104 | 10.4 | .4094 | 87 | 133 |
| ** DLGP195105 | 10.5 | .4134 | 87 | 133 |
| ** DLGP195106 | 10.6 | .4173 | 87 | 133 |
| ** DLGP195107 | 10.7 | .4212 | 94 | 142 |
| ** DLGP195108 | 10.8 | .4252 | 94 | 142 |
| ** DLGP195109 | 10.9 | .4291 | 94 | 142 |
| ** DLGP195110 | 11.0 | .4330 | 94 | 142 |
| ** DLGP195111 | 11.1 | .4370 | 94 | 142 |
| ** DLGP195112 | 11.2 | .4409 | 94 | 142 |
| ** DLGP195113 | 11.3 | .4448 | 94 | 142 |
| ** DLGP195114 | 11.4 | .4488 | 94 | 142 |
| ** DLGP195115 | 11.5 | .4527 | 94 | 142 |
| ** DLGP195116 | 11.6 | .4566 | 94 | 142 |
| ** DLGP195117 | 11.7 | .4606 | 94 | 142 |
| ** DLGP195118 | 11.8 | .4645 | 94 | 142 |
| ** DLGP195119 | 11.9 | .4685 | 101 | 151 |
| ** DLGP195120 | 12.0 | .4724 | 101 | 151 |
| ** DLGP195121 | 12.1 | .4764 | 101 | 151 |
| ** DLGP195122 | 12.2 | .4803 | 101 | 151 |
| ** DLGP195123 | 12.3 | .4843 | 101 | 151 |
| ** DLGP195124 | 12.4 | .4882 | 101 | 151 |
| ** DLGP195125 | 12.5 | .4921 | 101 | 151 |
| ** DLGP195126 | 12.6 | .4921 | 101 | 151 |
| ** DLGP195127 | 12.7 | .5000 | 101 | 151 |
| ** DLGP195128 | 12.8 | .5039 | 101 | 151 |
| ** DLGP195129 | 12.9 | .5079 | 101 | 151 |
| ** DLGP195130 | 13.0 | .5118 | 101 | 151 |

* 10per package
** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

# GOLD-P DRILLS

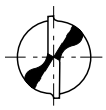
**DLGP506 SERIES**

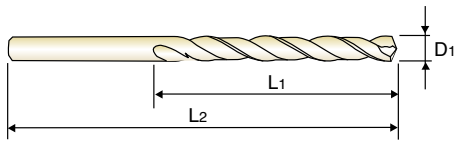
## HSSCo5, DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand, 38° helix, Parabolic flutes
- ▶ **Point Angle** : 130°, Split point giving higher chip removal.
- ▶ **Surface treatment** : Bright body, TiN coating on working area.
- ▶ **Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, Special aluminum or magnesium alloys.








DIN 338 | HSS Co5 | N ≈ 38° | h8 | 130° P.183

Unit : mm

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP506020 | 2.0 | .0787 | 24 | 49 |
| * DLGP506021 | 2.1 | .0827 | 24 | 49 |
| * DLGP506022 | 2.2 | .0866 | 27 | 53 |
| * DLGP506023 | 2.3 | .0906 | 27 | 53 |
| * DLGP506024 | 2.4 | .0945 | 30 | 57 |
| * DLGP506025 | 2.5 | .0984 | 30 | 57 |
| * DLGP506026 | 2.6 | .1024 | 30 | 57 |
| * DLGP506027 | 2.7 | .1063 | 33 | 61 |
| * DLGP506028 | 2.8 | .1102 | 33 | 61 |
| * DLGP506029 | 2.9 | .1142 | 33 | 61 |
| * DLGP506030 | 3.0 | .1181 | 33 | 61 |
| * DLGP506031 | 3.1 | .1220 | 36 | 65 |
| * DLGP506032 | 3.2 | .1260 | 36 | 65 |
| * DLGP506033 | 3.3 | .1299 | 36 | 65 |
| * DLGP506034 | 3.4 | .1339 | 39 | 70 |
| * DLGP506035 | 3.5 | .1378 | 39 | 70 |
| * DLGP506036 | 3.6 | .1417 | 39 | 70 |
| * DLGP506037 | 3.7 | .1457 | 39 | 70 |
| * DLGP506038 | 3.8 | .1496 | 43 | 75 |
| * DLGP506039 | 3.9 | .1535 | 43 | 75 |
| * DLGP506040 | 4.0 | .1575 | 43 | 75 |
| * DLGP506041 | 4.1 | .1614 | 43 | 75 |
| * DLGP506042 | 4.2 | .1654 | 43 | 75 |
| * DLGP506043 | 4.3 | .1693 | 47 | 80 |
| * DLGP506044 | 4.4 | .1732 | 47 | 80 |
| * DLGP506045 | 4.5 | .1772 | 47 | 80 |
| * DLGP506046 | 4.6 | .1811 | 47 | 80 |
| * DLGP506047 | 4.7 | .1850 | 47 | 80 |

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP506048 | 4.8 | .1890 | 52 | 86 |
| * DLGP506049 | 4.9 | .1929 | 52 | 86 |
| * DLGP506050 | 5.0 | .1969 | 52 | 86 |
| * DLGP506051 | 5.1 | .2008 | 52 | 86 |
| * DLGP506052 | 5.2 | .2047 | 52 | 86 |
| * DLGP506053 | 5.3 | .2087 | 52 | 86 |
| * DLGP506054 | 5.4 | .2126 | 57 | 93 |
| * DLGP506055 | 5.5 | .2165 | 57 | 93 |
| * DLGP506056 | 5.6 | .2205 | 57 | 93 |
| * DLGP506057 | 5.7 | .2244 | 57 | 93 |
| * DLGP506058 | 5.8 | .2283 | 57 | 93 |
| * DLGP506059 | 5.9 | .2323 | 57 | 93 |
| * DLGP506060 | 6.0 | .2362 | 57 | 93 |
| * DLGP506061 | 6.1 | .2402 | 63 | 101 |
| * DLGP506062 | 6.2 | .2441 | 63 | 101 |
| * DLGP506063 | 6.3 | .2480 | 63 | 101 |
| * DLGP506064 | 6.4 | .2520 | 63 | 101 |
| * DLGP506065 | 6.5 | .2559 | 63 | 101 |
| * DLGP506066 | 6.6 | .2598 | 63 | 101 |
| * DLGP506067 | 6.7 | .2638 | 63 | 101 |
| * DLGP506068 | 6.8 | .2677 | 69 | 109 |
| * DLGP506069 | 6.9 | .2717 | 69 | 109 |
| * DLGP506070 | 7.0 | .2756 | 69 | 109 |
| * DLGP506071 | 7.1 | .2795 | 69 | 109 |
| * DLGP506072 | 7.2 | .2835 | 69 | 109 |
| * DLGP506073 | 7.3 | .2874 | 69 | 109 |
| * DLGP506074 | 7.4 | .2913 | 69 | 109 |
| * DLGP506075 | 7.5 | .2953 | 69 | 109 |

* 10per package

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

# GOLD-P DRILLS

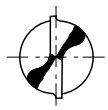
**DLGP506 SERIES**

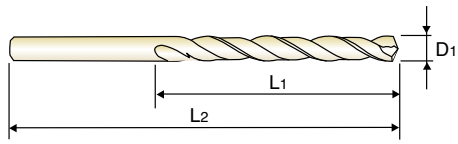
## HSSCo5, DH100 STRAIGHT SHANK DRILLS for DEEP HOLES, GOLD-P COATED

***JOBBER***

- ▶ **Flute Geometry** : Right hand, 38° helix, Parabolic flutes
- ▶ **Point Angle** : 130°, Split point giving higher chip removal.
- ▶ **Surface treatment** : Bright body, TiN coating on working area.
- ▶ **Application** : Drilling deep holes in non alloy steels, alloy steels, grey cast iron, malleable cast iron, Special aluminum or magnesium alloys.








DIN 338 | HSS Co5 | N ≈ 38° | h8 | 130° P.183

Unit : mm

| EDP No. | Diameter Metric D1 | Diameter Inch D1 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| * DLGP506076 | 7.6 | .2992 | 75 | 117 |
| * DLGP506077 | 7.7 | .3031 | 75 | 117 |
| * DLGP506078 | 7.8 | .3071 | 75 | 117 |
| * DLGP506079 | 7.9 | .3110 | 75 | 117 |
| * DLGP506080 | 8.0 | .3150 | 75 | 117 |
| * DLGP506081 | 8.1 | .3189 | 75 | 117 |
| * DLGP506082 | 8.2 | .3228 | 75 | 117 |
| * DLGP506083 | 8.3 | .3268 | 75 | 117 |
| ** DLGP506084 | 8.4 | .3307 | 75 | 117 |
| ** DLGP506085 | 8.5 | .3346 | 75 | 117 |
| ** DLGP506086 | 8.6 | .3386 | 81 | 125 |
| ** DLGP506087 | 8.7 | .3425 | 81 | 125 |
| ** DLGP506088 | 8.8 | .3465 | 81 | 125 |
| ** DLGP506089 | 8.9 | .3504 | 81 | 125 |
| ** DLGP506090 | 9.0 | .3543 | 81 | 125 |
| ** DLGP506091 | 9.1 | .3583 | 81 | 125 |
| ** DLGP506092 | 9.2 | .3622 | 81 | 125 |
| ** DLGP506093 | 9.3 | .3661 | 81 | 125 |
| ** DLGP506094 | 9.4 | .3701 | 81 | 125 |
| ** DLGP506095 | 9.5 | .3740 | 81 | 125 |
| ** DLGP506096 | 9.6 | .3780 | 87 | 133 |
| ** DLGP506097 | 9.7 | .3819 | 87 | 133 |
| ** DLGP506098 | 9.8 | .3858 | 87 | 133 |
| ** DLGP506099 | 9.9 | .3898 | 87 | 133 |
| ** DLGP506100 | 10.0 | .3937 | 87 | 133 |
| ** DLGP506101 | 10.1 | .3976 | 87 | 133 |
| ** DLGP506102 | 10.2 | .4016 | 87 | 133 |
| ** DLGP506103 | 10.3 | .4055 | 87 | 133 |
| ** DLGP506104 | 10.4 | .4094 | 87 | 133 |
| ** DLGP506105 | 10.5 | .4134 | 87 | 133 |
| ** DLGP506106 | 10.6 | .4173 | 87 | 133 |
| ** DLGP506107 | 10.7 | .4212 | 94 | 142 |
| ** DLGP506108 | 10.8 | .4252 | 94 | 142 |
| ** DLGP506109 | 10.9 | .4291 | 94 | 142 |
| ** DLGP506110 | 11.0 | .4330 | 94 | 142 |
| ** DLGP506111 | 11.1 | .4370 | 94 | 142 |
| ** DLGP506112 | 11.2 | .4409 | 94 | 142 |
| ** DLGP506113 | 11.3 | .4448 | 94 | 142 |
| ** DLGP506114 | 11.4 | .4488 | 94 | 142 |
| ** DLGP506115 | 11.5 | .4527 | 94 | 142 |
| ** DLGP506116 | 11.6 | .4566 | 94 | 142 |
| ** DLGP506117 | 11.7 | .4606 | 94 | 142 |
| ** DLGP506118 | 11.8 | .4645 | 94 | 142 |
| ** DLGP506119 | 11.9 | .4685 | 101 | 151 |
| ** DLGP506120 | 12.0 | .4724 | 101 | 151 |
| ** DLGP506121 | 12.1 | .4764 | 101 | 151 |
| ** DLGP506122 | 12.2 | .4803 | 101 | 151 |
| ** DLGP506123 | 12.3 | .4843 | 101 | 151 |
| ** DLGP506124 | 12.4 | .4882 | 101 | 151 |
| ** DLGP506125 | 12.5 | .4921 | 101 | 151 |
| ** DLGP506126 | 12.6 | .4921 | 101 | 151 |
| ** DLGP506127 | 12.7 | .5000 | 101 | 151 |
| ** DLGP506128 | 12.8 | .5039 | 101 | 151 |
| ** DLGP506129 | 12.9 | .5079 | 101 | 151 |
| ** DLGP506130 | 13.0 | .5118 | 101 | 151 |

* 10per package
** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

# GOLD-P DRILLS

## GOLD-P COATED DRILL SETS







| EDP No. | Series No. | Description | SIZE | Q'TY |
|---|---|---|---|---|
| D1GP138 SET | D1GP SET924 | HSS Straight Shank, Split Point (#53 ~ #56 : NORMAL point) | #1~#56(Wire gauge) | 56 pcs |
| D1GP139 SET | D1GP SET925 | HSS Straight Shank, Split Point | A~Z(Letter) | 26 pcs |
| D1GP182 SET | D1GP SET926 | HSS Straight Shank, Split Point | Ø1/16~Ø1/2(Fractional) | 29 pcs |
| D2GP185 SET | D2GP SET927 | HSSCo8 Straight Shank, Split Point | Ø1/16~Ø1/2(Fractional) | 29 pcs |
| D2GP186 SET | D2GP SET928 | HSSCo8 Straight Shank, Split Point | A~Z(Letter) | 26 pcs |
| D2GP187 SET | D2GP SET930 | HSSCo8 Straight Shank, Split Point (#53 ~ #56 : NORMAL point) | #1~#56(Wire gauge) | 56 pcs |
| DLGP511 SET | DLGP SET931 | HSSCo5 Straight Shank, Split Point | Ø5/64~Ø1/2(Fractional) | 28 pcs |
| DLGP512 SET | DLGP SET932 | HSSCo5 Straight Shank, Split Point | #1~#47(Wire gauge) | 47 pcs |
| DLGP513 SET | DLGP SET933 | HSSCo5 Straight Shank, Split Point | A~Z(Letter) | 26 pcs |

# GOLD-P DRILLS

## RECOMMENDED CUTTING CONDITIONS

## HSS & HSSCo5, STRAIGHT SHANK, GOLD-P COATED

### D1GP182, D1GP139, D1GP138, D2GP185, D2GP186, D2GP187, DLGP195, SERIES

| WORK MATERIAL | | | P | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | STAINLESS STEELS | |
| HARDNESS | | | | | ~ HRc23 | | HRc23 ~ 34 | | ~ HRc23 | |
| STRENGTH | | | ~ 570N/mm² | | ~ 830N/mm² | | 830~1110N/mm² | | ~ 830N/mm² | |
| DIAMETER | | | N | S | N | S | N | S | N | S |
| Fractional | Decimal | Metric | | | | | | | | |
| 3/64 | .0469 | 1.0 | 14000 | .0008 | 12500 | .0008 | 7700 | .0008 | 7000 | .0008 |
| #47 | .0785 | 2.0 | 7000 | .0023 | 6100 | .0024 | 3850 | .0024 | 3500 | .0024 |
| #32 | .1160 | 3.0 | 4650 | .0038 | 4100 | .0031 | 2550 | .0031 | 2350 | .0031 |
| #22 | .1570 | 4.0 | 3500 | .0044 | 3050 | .0043 | 1950 | .0039 | 1750 | .0039 |
| #9 | .1960 | 5.0 | 2800 | .0049 | 2450 | .0043 | 1550 | .0039 | 1400 | .0039 |
| B | .2380 | 6.0 | 2350 | .0056 | 2050 | .0051 | 1300 | .0047 | 1150 | .0047 |
| J | .2770 | 7.0 | 2000 | .0064 | 1750 | .0059 | 1100 | .0055 | 1000 | .0055 |
| O | .3160 | 8.0 | 1750 | .0072 | 1550 | .0071 | 960 | .0059 | 875 | .0059 |
| T | .3580 | 9.0 | 1550 | .0077 | 1350 | .0087 | 855 | .0071 | 780 | .0071 |
| X | .3970 | 10.0 | 1400 | .0084 | 1250 | .0087 | 770 | .0071 | 700 | .0071 |
| 7/16 | .4375 | 11.0 | 1250 | .0087 | 1100 | .0087 | 700 | .0071 | 650 | .0071 |
| 15/32 | .4688 | 12.0 | 1150 | .0090 | 1000 | .0087 | 650 | .0079 | 585 | .0079 |
| 1/2 | .5000 | 13.0 | 1050 | .0090 | 950 | .0087 | 595 | .0079 | 540 | .0079 |

| WORK MATERIAL | | | N | | | | S | |
|---|---|---|---|---|---|---|---|---|
| | | | ALUMINUM ALLOYS, ZINC ALLOYS | | MAGNESIUM ALLOYS | | TITANIUM ALLOYS | |
| HARDNESS | | | | | | | | |
| STRENGTH | | | | | | | ~410N/mm² | |
| DIAMETER | | | N | S | N | S | N | S |
| Fractional | Decimal | Metric | | | | | | |
| 3/64 | .0469 | 1.0 | 30000 | .0008 | 11500 | .0012 | 8050 | .0008 |
| #47 | .0785 | 2.0 | 15000 | .0023 | 5800 | .0035 | 4050 | .0024 |
| #32 | .1160 | 3.0 | 9900 | .0038 | 3850 | .0051 | 2700 | .0031 |
| #22 | .1570 | 4.0 | 7450 | .0044 | 2900 | .0059 | 2000 | .0035 |
| #9 | .1960 | 5.0 | 5950 | .0049 | 2300 | .0067 | 1600 | .0039 |
| B | .2380 | 6.0 | 14950 | .0056 | 1950 | .0075 | 1350 | .0047 |
| J | .2770 | 7.0 | 4250 | .0064 | 1650 | .0087 | 1150 | .0055 |
| O | .3160 | 8.0 | 3700 | .0072 | 1450 | .0094 | 1000 | .0059 |
| T | .3580 | 9.0 | 3300 | .0079 | 1280 | .0106 | 895 | .0067 |
| X | .3970 | 10.0 | 3000 | .0090 | 1150 | .0114 | 805 | .0071 |
| 7/16 | .4375 | 11.0 | 2700 | .0090 | 1050 | .0118 | 730 | .0071 |
| 15/32 | .4688 | 12.0 | 2480 | .0090 | 960 | .0122 | 670 | .0079 |
| 1/2 | .5000 | 13.0 | 2300 | .0090 | 890 | .0122 | 620 | .0079 |

N = R.P.M
S = Inch per Revolution (inch/rev.)

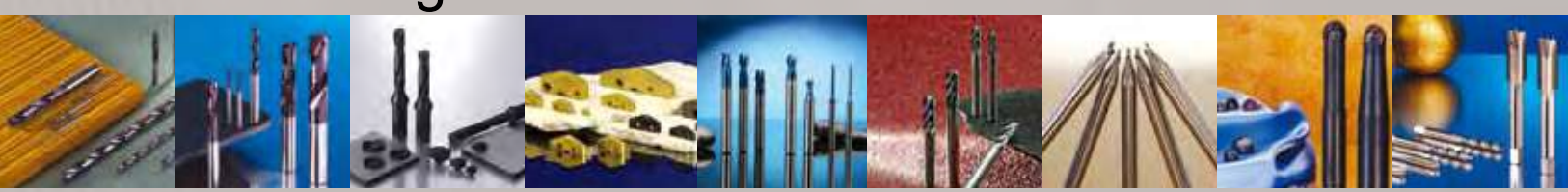
## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE, GOLD-P COATED

# DLGP511, DLGP513, DLGP512, DLGP506 SERIES

| WORK MATERIAL | | | P | | | | K | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | CARBON STEELS ALLOY STEELS | | TOOL STEELS HARDENED STEELS | | SOFT GREY CAST IRON | | HARD GREY CAST IRON | |
| HARDNESS | | | HRc15 ~ 30 | | HRc20 ~ 40 | | | | | |
| STRENGTH | | | 700 ~ 1000N/mm$^2$ | | 800~1200N/mm$^2$ | | | | | |
| DIAMETER | | | N | S | N | S | N | S | N | S |
| Fractional | Decimal | Metric | | | | | | | | |
| 3/64 | .0469 | 1.0 | 8750 | .0008 | 6300 | .0008 | 16000 | .0008 | 9800 | .0008 |
| #47 | .0785 | 2.0 | 4400 | .0022 | 3150 | .0022 | 7900 | .0027 | 4900 | .0027 |
| #32 | .1160 | 3.0 | 2900 | .0032 | 2100 | .0032 | 5250 | .0043 | 3250 | .0043 |
| #22 | .1570 | 4.0 | 2200 | .0036 | 1600 | .0036 | 3950 | .0054 | 2450 | .0054 |
| #9 | .1960 | 5.0 | 1750 | .0041 | 1250 | .0041 | 3150 | .0054 | 1950 | .0054 |
| B | .2380 | 6.0 | 1450 | .0047 | 1050 | .0047 | 2650 | .0069 | 1650 | .0069 |
| J | .2770 | 7.0 | 1250 | .0054 | 900 | .0054 | 2250 | .0078 | 1400 | .0078 |
| O | .3160 | 8.0 | 1100 | .0060 | 790 | .0060 | 1950 | .0087 | 1250 | .0087 |
| T | .3580 | 9.0 | 975 | .0066 | 700 | .0066 | 1750 | .0095 | 1100 | .0095 |
| X | .3970 | 10.0 | 875 | .0071 | 630 | .0071 | 1600 | .0108 | 980 | .0108 |
| 7/16 | .4375 | 11.0 | 800 | .0077 | 575 | .0077 | 1450 | .0108 | 890 | .0108 |
| 15/32 | .4688 | 12.0 | 730 | .0077 | 525 | .0077 | 1300 | .0108 | 815 | .0108 |
| 1/2 | .5000 | 13.0 | 675 | .0077 | 485 | .0077 | 1200 | .0108 | 755 | .0108 |

N = R.P.M
S = Inch per Revolution (inch/rev.)

Global Cutting Tool Leader **YG-1**



# HSS

YG

Being the best through innovation



# STRAIGHT SHANK DRILLS

- General Purpose

## STRAIGHT SHANK TWIST DRILLS

HSS Drills for soft materials & HSS cobalt Drills for tough materials

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **D1118** |  | HSS, STRAIGHT SHANK SCREW MACHINE / Fractional sizes | D3/64 | D1/2 | **188** |
| **D1115** |  | HSS, STRAIGHT SHANK SCREW MACHINE / Letter sizes | A | Z | **189** |
| **D1119** |  | HSS, STRAIGHT SHANK SCREW MACHINE / Wire gauge sizes | #60 | #1 | **190** |
| **D2146 D4146** |  | HSSCo8, STRAIGHT SHANK SCREW MACHINE / Fractional sizes | D3/64 | D1/2 | **191** |
| **D2147 D4147** |  | HSSCo8, STRAIGHT SHANK SCREW MACHINE / Letter sizes | A | Z | **192** |
| **D2148 D4148** |  | HSSCo8, STRAIGHT SHANK SCREW MACHINE / Wire gauge sizes | #60 | #1 | **193** |
| **DN514** |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED / Fractional sizes | D3/32 | D1/2 | **195** |
| **DN516** |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED / Letter sizes | A | Z | **196** |
| **DN515** |  | HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED / Wire gauge sizes | #47 | #1 | **197** |
| **DL517 DX517** |  | HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL / Fractional sizes | D5/64 | D1/2 | **198** |
| **METRIC** | | | | | |
| **D4107** |  | HSSCo5, STRAIGHT SHANK SCREW MACHINE *STUB* | D1.0 | D31.0 | **199** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **202** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | ○ | | ○ | | | | ○ |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |

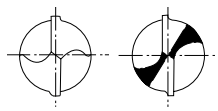
# STRAIGHT SHANK DRILLS

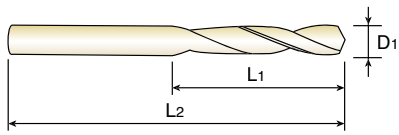
**D1118 SERIES**

## HSS, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135°
under 1/16 : Normal point
1/16 & over : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI HSS N 20~30° ANSI 135° P.202

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1118003 | 3/64 | .0469 | 1/2 | 1-3/8 |
| * D1118004 | 1/16 | .0625 | 5/8 | 1-5/8 |
| * D1118005 | 5/64 | .0781 | 11/16 | 1-11/16 |
| * D1118006 | 3/32 | .0938 | 3/4 | 1-3/4 |
| * D1118007 | 7/64 | .1094 | 13/16 | 1-13/16 |
| * D1118008 | 1/8 | .1250 | 7/8 | 1-7/8 |
| * D1118009 | 9/64 | .1406 | 15/16 | 1-15/16 |
| * D1118010 | 5/32 | .1563 | 1 | 2-1/16 |
| * D1118011 | 11/64 | .1719 | 1-1/16 | 2-1/8 |
| * D1118012 | 3/16 | .1875 | 1-1/8 | 2-3/16 |
| * D1118013 | 13/64 | .2031 | 1-3/16 | 2-1/4 |
| * D1118014 | 7/32 | .2188 | 1-1/4 | 2-3/8 |
| * D1118015 | 15/64 | .2344 | 1-5/16 | 2-7/16 |
| * D1118016 | 1/4 | .2500 | 1-3/8 | 2-1/2 |
| * D1118017 | 17/64 | .2656 | 1-7/16 | 2-5/8 |

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1118018 | 9/32 | .2813 | 1-1/2 | 2-11/16 |
| * D1118019 | 19/64 | .2969 | 1-9/16 | 2-3/4 |
| * D1118020 | 5/16 | .3125 | 1-5/8 | 2-13/16 |
| * D1118021 | 21/64 | .3281 | 1-11/16 | 2-15/16 |
| ** D1118022 | 11/32 | .3438 | 1-11/16 | 3 |
| ** D1118023 | 23/64 | .3594 | 1-3/4 | 3-1/16 |
| ** D1118024 | 3/8 | .3750 | 1-13/16 | 3-1/8 |
| ** D1118025 | 25/64 | .3906 | 1-7/8 | 3-1/4 |
| ** D1118026 | 13/32 | .4063 | 1-15/16 | 3-5/16 |
| ** D1118027 | 27/64 | .4219 | 2 | 3-3/8 |
| ** D1118028 | 7/16 | .4375 | 2-1/16 | 3-7/16 |
| ** D1118029 | 29/64 | .4531 | 2-1/8 | 3-9/16 |
| ** D1118030 | 15/32 | .4688 | 2-1/8 | 3-5/8 |
| ** D1118031 | 31/64 | .4844 | 2-3/16 | 3-11/16 |
| ** D1118032 | 1/2 | .5000 | 2-1/4 | 3-3/4 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

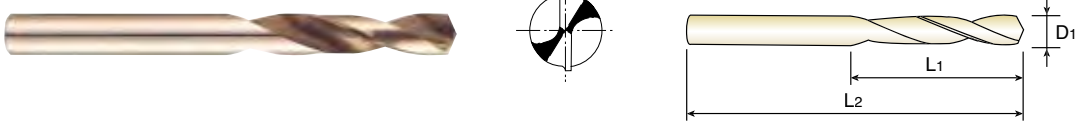
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |

# STRAIGHT SHANK DRILLS

D1115 SERIES

## HSS, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135° : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron




ANSI | HSS | N 20~30° | ANSI | 135° | P.202

### ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1115201 | A | .2340 | 1-5/16 | 2-7/16 |
| * D1115202 | B | .2380 | 1-3/8 | 2-1/2 |
| * D1115203 | C | .2420 | 1-3/8 | 2-1/2 |
| * D1115204 | D | .2460 | 1-3/8 | 2-1/2 |
| * D1115205 | E | .2500 | 1-3/8 | 2-1/2 |
| * D1115206 | F | .2570 | 1-7/16 | 2-5/8 |
| * D1115207 | G | .2610 | 1-7/16 | 2-5/8 |
| * D1115208 | H | .2660 | 1-1/2 | 2-11/16 |
| * D1115209 | I | .2720 | 1-1/2 | 2-11/16 |
| * D1115210 | J | .2770 | 1-1/2 | 2-11/16 |
| * D1115211 | K | .2810 | 1-1/2 | 2-11/16 |
| * D1115212 | L | .2900 | 1-9/16 | 2-3/4 |
| * D1115213 | M | .2950 | 1-9/16 | 2-3/4 |

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1115214 | N | .3020 | 1-5/8 | 2-13/16 |
| * D1115215 | O | .3160 | 1-11/16 | 2-15/16 |
| * D1115216 | P | .3230 | 1-11/16 | 2-15/16 |
| ** D1115217 | Q | .3320 | 1-11/16 | 3 |
| ** D1115218 | R | .3390 | 1-11/16 | 3 |
| ** D1115219 | S | .3480 | 1-3/4 | 3-1/16 |
| ** D1115220 | T | .3580 | 1-3/4 | 3-1/16 |
| ** D1115221 | U | .3680 | 1-13/16 | 3-1/8 |
| ** D1115222 | V | .3770 | 1-7/8 | 3-1/4 |
| ** D1115223 | W | .3860 | 1-7/8 | 3-1/4 |
| ** D1115224 | X | .3970 | 1-15/16 | 3-5/16 |
| ** D1115225 | Y | .4040 | 1-15/16 | 3-5/16 |
| ** D1115226 | Z | .4130 | 2 | 3-3/8 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

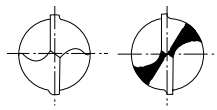
# STRAIGHT SHANK DRILLS

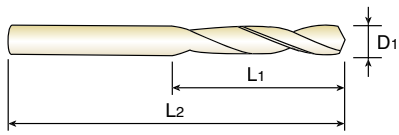
**D1119 SERIES**

## HSS, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135° : Split point
Wire gauge size #53~#60 : Normal point
Wire gauge size #1~#52 : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI HSS N 20~30° ANSI 135° P.202

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | | |
| | D1 | | L1 | L2 |
| * D1119201 | 1 | .2280 | 1-5/16 | 2-7/16 |
| * D1119202 | 2 | .2210 | 1-5/16 | 2-7/16 |
| * D1119203 | 3 | .2130 | 1-1/4 | 2-3/8 |
| * D1119204 | 4 | .2090 | 1-1/4 | 2-3/8 |
| * D1119205 | 5 | .2055 | 1-1/4 | 2-3/8 |
| * D1119206 | 6 | .2040 | 1-1/4 | 2-3/8 |
| * D1119207 | 7 | .2010 | 1-3/16 | 2-1/4 |
| * D1119208 | 8 | .1990 | 1-3/16 | 2-1/4 |
| * D1119209 | 9 | .1960 | 1-3/16 | 2-1/4 |
| * D1119210 | 10 | .1935 | 1-3/16 | 2-1/4 |
| * D1119211 | 11 | .1910 | 1-3/16 | 2-1/4 |
| * D1119212 | 12 | .1890 | 1-3/16 | 2-1/4 |
| * D1119213 | 13 | .1850 | 1-1/8 | 2-3/16 |
| * D1119214 | 14 | .1820 | 1-1/8 | 2-3/16 |
| * D1119215 | 15 | .1800 | 1-1/8 | 2-3/16 |
| * D1119216 | 16 | .1770 | 1-1/8 | 2-3/16 |
| * D1119217 | 17 | .1730 | 1-1/8 | 2-3/16 |
| * D1119218 | 18 | .1695 | 1-1/16 | 2-1/8 |
| * D1119219 | 19 | .1660 | 1-1/16 | 2-1/8 |
| * D1119220 | 20 | .1610 | 1-1/16 | 2-1/8 |
| * D1119221 | 21 | .1590 | 1-1/16 | 2-1/8 |
| * D1119222 | 22 | .1570 | 1-1/16 | 2-1/8 |
| * D1119223 | 23 | .1540 | 1 | 2-1/16 |
| * D1119224 | 24 | .1520 | 1 | 2-1/16 |
| * D1119225 | 25 | .1495 | 1 | 2-1/16 |
| * D1119226 | 26 | .1470 | 1 | 2-1/16 |
| * D1119227 | 27 | .1440 | 1 | 2-1/16 |
| * D1119228 | 28 | .1405 | 15/16 | 1-15/16 |
| * D1119229 | 29 | .1360 | 15/16 | 1-15/16 |
| * D1119230 | 30 | .1285 | 15/16 | 1-15/16 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | | |
| | D1 | | L1 | L2 |
| * D1119231 | 31 | .1200 | 7/8 | 1-7/8 |
| * D1119232 | 32 | .1160 | 7/8 | 1-7/8 |
| * D1119233 | 33 | .1130 | 7/8 | 1-7/8 |
| * D1119234 | 34 | .1110 | 7/8 | 1-7/8 |
| * D1119235 | 35 | .1100 | 7/8 | 1-7/8 |
| * D1119236 | 36 | .1065 | 13/16 | 1-13/16 |
| * D1119237 | 37 | .1040 | 13/16 | 1-13/16 |
| * D1119238 | 38 | .1015 | 13/16 | 1-13/16 |
| * D1119239 | 39 | .0995 | 13/16 | 1-13/16 |
| * D1119240 | 40 | .0980 | 13/16 | 1-13/16 |
| * D1119241 | 41 | .0960 | 13/16 | 1-13/16 |
| * D1119242 | 42 | .0935 | 3/4 | 1-3/4 |
| * D1119243 | 43 | .0890 | 3/4 | 1-3/4 |
| * D1119244 | 44 | .0860 | 3/4 | 1-3/4 |
| * D1119245 | 45 | .0820 | 3/4 | 1-3/4 |
| * D1119246 | 46 | .0810 | 3/4 | 1-3/4 |
| * D1119247 | 47 | .0785 | 11/16 | 1-11/16 |
| * D1119248 | 48 | .0760 | 11/16 | 1-11/16 |
| * D1119249 | 49 | .0730 | 11/16 | 1-11/16 |
| * D1119250 | 50 | .0700 | 11/16 | 1-11/16 |
| * D1119251 | 51 | .0670 | 11/16 | 1-11/16 |
| * D1119252 | 52 | .0635 | 11/16 | 1-11/16 |
| * D1119253 | 53 | .0595 | 5/8 | 1-5/8 |
| * D1119254 | 54 | .0550 | 5/8 | 1-5/8 |
| * D1119255 | 55 | .0520 | 5/8 | 1-5/8 |
| * D1119256 | 56 | .0465 | 1/2 | 1-3/8 |
| * D1119257 | 57 | .0430 | 1/2 | 1-3/8 |
| * D1119258 | 58 | .0420 | 1/2 | 1-3/8 |
| * D1119259 | 59 | .0410 | 1/2 | 1-3/8 |
| * D1119260 | 60 | .0400 | 1/2 | 1-3/8 |

▶ **Tolerance** : See page 188 / * 10per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

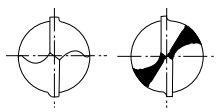
# STRAIGHT SHANK DRILLS

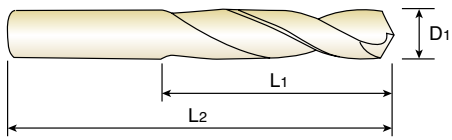
**D2146 SERIES** UN-COATED
**D4146 SERIES** TiN-COATED

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135°
under 1/16 : Normal point
1/16 & over : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS Co8 | N 20~30° | ANSI | 135° | P.202

### ▶ Fractional sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Fractional | Decimal | | |
| UN-COATED | TiN-COATED | D1 | | L1 | L2 |
| * D2146003 | D4146003 | 3/64 | .0469 | 1/2 | 1-3/8 |
| * D2146004 | D4146004 | 1/16 | .0625 | 5/8 | 1-5/8 |
| * D2146005 | D4146005 | 5/64 | .0781 | 11/16 | 1-11/16 |
| * D2146006 | D4146006 | 3/32 | .0938 | 3/4 | 1-3/4 |
| ** D2146007 | D4146007 | 7/64 | .1094 | 13/16 | 1-13/16 |
| ** D2146008 | D4146008 | 1/8 | .1250 | 7/8 | 1-7/8 |
| ** D2146009 | D4146009 | 9/64 | .1406 | 15/16 | 1-15/16 |
| ** D2146010 | D4146010 | 5/32 | .1563 | 1 | 2-1/16 |
| ** D2146011 | D4146011 | 11/64 | .1719 | 1-1/16 | 2-1/8 |
| ** D2146012 | D4146012 | 3/16 | .1875 | 1-1/8 | 2-3/16 |
| ** D2146013 | D4146013 | 13/64 | .2031 | 1-3/16 | 2-1/4 |
| ** D2146014 | D4146014 | 7/32 | .2188 | 1-1/4 | 2-3/8 |
| ** D2146015 | D4146015 | 15/64 | .2344 | 1-5/16 | 2-7/16 |
| ** D2146016 | D4146016 | 1/4 | .2500 | 1-3/8 | 2-1/2 |
| ** D2146017 | D4146017 | 17/64 | .2656 | 1-7/16 | 2-5/8 |
| ** D2146018 | D4146018 | 9/32 | .2813 | 1-1/2 | 2-11/16 |
| ** D2146019 | D4146019 | 19/64 | .2969 | 1-9/16 | 2-3/4 |
| ** D2146020 | D4146020 | 5/16 | .3125 | 1-5/8 | 2-13/16 |
| ** D2146021 | D4146021 | 21/64 | .3281 | 1-11/16 | 2-15/16 |
| ** D2146022 | D4146022 | 11/32 | .3438 | 1-11/16 | 3 |
| ** D2146023 | D4146023 | 23/64 | .3594 | 1-3/4 | 3-1/16 |
| ** D2146024 | D4146024 | 3/8 | .3750 | 1-13/16 | 3-1/8 |
| ** D2146025 | D4146025 | 25/64 | .3906 | 1-7/8 | 3-1/4 |
| ** D2146026 | D4146026 | 13/32 | .4063 | 1-15/16 | 3-5/16 |
| ** D2146027 | D4146027 | 27/64 | .4219 | 2 | 3-3/8 |
| ** D2146028 | D4146028 | 7/16 | .4375 | 2-1/16 | 3-7/16 |
| ** D2146029 | D4146029 | 29/64 | .4531 | 2-1/8 | 3-9/16 |
| ** D2146030 | D4146030 | 15/32 | .4688 | 2-1/8 | 3-5/8 |
| ** D2146031 | D4146031 | 31/64 | .4844 | 2-3/16 | 3-11/16 |
| ** D2146032 | D4146032 | 1/2 | .5000 | 2-1/4 | 3-3/4 |

▶ **Tolerance** : See page 188 / * 10per package ** 5per package

◎ : Excellent ○ : Good

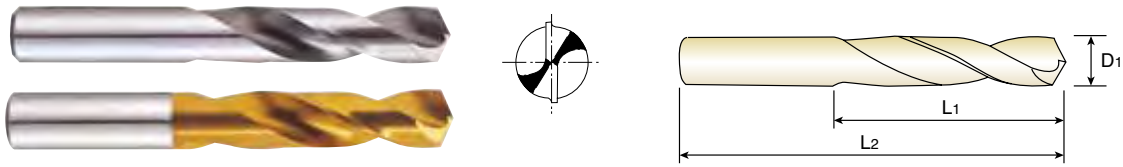
| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

# STRAIGHT SHANK DRILLS

**D2147 SERIES** UN-COATED
**D4147 SERIES** TiN-COATED

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135° : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron




ANSI | HSS Co8 | N 20~30° | ANSI | 135° P.202

## ▶ Letter sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Letter | Decimal | | |
| UN-COATED | TiN-COATED | D1 | | L1 | L2 |
| ** D2147201 | D4147201 | A | .2340 | 1-5/16 | 2-7/16 |
| ** D2147202 | D4147202 | B | .2380 | 1-3/8 | 2-1/2 |
| ** D2147203 | D4147203 | C | .2420 | 1-3/8 | 2-1/2 |
| ** D2147204 | D4147204 | D | .2460 | 1-3/8 | 2-1/2 |
| ** D2147205 | D4147205 | E | .2500 | 1-3/8 | 2-1/2 |
| ** D2147206 | D4147206 | F | .2570 | 1-7/16 | 2-5/8 |
| ** D2147207 | D4147207 | G | .2610 | 1-7/16 | 2-5/8 |
| ** D2147208 | D4147208 | H | .2660 | 1-1/2 | 2-11/16 |
| ** D2147209 | D4147209 | I | .2720 | 1-1/2 | 2-11/16 |
| ** D2147210 | D4147210 | J | .2770 | 1-1/2 | 2-11/16 |
| ** D2147211 | D4147211 | K | .2810 | 1-1/2 | 2-11/16 |
| ** D2147212 | D4147212 | L | .2900 | 1-9/16 | 2-3/4 |
| ** D2147213 | D4147213 | M | .2950 | 1-9/16 | 2-3/4 |
| ** D2147214 | D4147214 | N | .3020 | 1-5/8 | 2-13/16 |
| ** D2147215 | D4147215 | O | .3160 | 1-11/16 | 2-15/16 |
| ** D2147216 | D4147216 | P | .3230 | 1-11/16 | 2-15/16 |
| ** D2147217 | D4147217 | Q | .3320 | 1-11/16 | 3 |
| ** D2147218 | D4147218 | R | .3390 | 1-11/16 | 3 |
| ** D2147219 | D4147219 | S | .3480 | 1-3/4 | 3-1/16 |
| ** D2147220 | D4147220 | T | .3580 | 1-3/4 | 3-1/16 |
| ** D2147221 | D4147221 | U | .3680 | 1-13/16 | 3-1/8 |
| ** D2147222 | D4147222 | V | .3770 | 1-7/8 | 3-1/4 |
| ** D2147223 | D4147223 | W | .3860 | 1-7/8 | 3-1/4 |
| ** D2147224 | D4147224 | X | .3970 | 1-15/16 | 3-5/16 |
| ** D2147225 | D4147225 | Y | .4040 | 1-15/16 | 3-5/16 |
| ** D2147226 | D4147226 | Z | .4130 | 2 | 3-3/8 |

▶ **Tolerance** : See page 188 / ** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

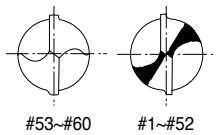
# STRAIGHT SHANK DRILLS

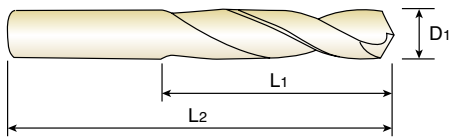
**D2148 SERIES** UN-COATED
**D4148 SERIES** TiN-COATED

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135° : Split point
Wire gauge size #53~#60 : Normal point
Wire gauge size #1~#52 : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS Co8 | N 20~30° | ANSI | 135° | P.202

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Wire gauge | Decimal | | |
| UN-COATED | TiN-COATED | $D_1$ | | $L_1$ | $L_2$ |
| ** D2148101 | D4148101 | 1 | .2280 | 1-5/16 | 2-7/16 |
| ** D2148102 | D4148102 | 2 | .2210 | 1-5/16 | 2-7/16 |
| ** D2148103 | D4148103 | 3 | .2130 | 1-1/4 | 2-3/8 |
| ** D2148104 | D4148104 | 4 | .2090 | 1-1/4 | 2-3/8 |
| ** D2148105 | D4148105 | 5 | .2055 | 1-1/4 | 2-3/8 |
| ** D2148106 | D4148106 | 6 | .2040 | 1-1/4 | 2-3/8 |
| ** D2148107 | D4148107 | 7 | .2010 | 1-3/16 | 2-1/4 |
| ** D2148108 | D4148108 | 8 | .1990 | 1-3/16 | 2-1/4 |
| ** D2148109 | D4148109 | 9 | .1960 | 1-3/16 | 2-1/4 |
| ** D2148110 | D4148110 | 10 | .1935 | 1-3/16 | 2-1/4 |
| ** D2148111 | D4148111 | 11 | .1910 | 1-3/16 | 2-1/4 |
| ** D2148112 | D4148112 | 12 | .1890 | 1-3/16 | 2-1/4 |
| ** D2148113 | D4148113 | 13 | .1850 | 1-1/8 | 2-3/16 |
| ** D2148114 | D4148114 | 14 | .1820 | 1-1/8 | 2-3/16 |
| ** D2148115 | D4148115 | 15 | .1800 | 1-1/8 | 2-3/16 |
| ** D2148116 | D4148116 | 16 | .1770 | 1-1/8 | 2-3/16 |
| ** D2148117 | D4148117 | 17 | .1730 | 1-1/8 | 2-3/16 |
| ** D2148118 | D4148118 | 18 | .1695 | 1-1/16 | 2-1/8 |
| ** D2148119 | D4148119 | 19 | .1660 | 1-1/16 | 2-1/8 |
| ** D2148120 | D4148120 | 20 | .1610 | 1-1/16 | 2-1/8 |
| ** D2148121 | D4148121 | 21 | .1590 | 1-1/16 | 2-1/8 |
| ** D2148122 | D4148122 | 22 | .1570 | 1-1/16 | 2-1/8 |
| ** D2148123 | D4148123 | 23 | .1540 | 1 | 2-1/16 |
| ** D2148124 | D4148124 | 24 | .1520 | 1 | 2-1/16 |
| ** D2148125 | D4148125 | 25 | .1495 | 1 | 2-1/16 |
| ** D2148126 | D4148126 | 26 | .1470 | 1 | 2-1/16 |
| ** D2148127 | D4148127 | 27 | .1440 | 1 | 2-1/16 |
| ** D2148128 | D4148128 | 28 | .1405 | 15/16 | 1-15/16 |
| ** D2148129 | D4148129 | 29 | .1360 | 15/16 | 1-15/16 |
| ** D2148130 | D4148130 | 30 | .1285 | 15/16 | 1-15/16 |

▶ **Tolerance** : See page 188 / ** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

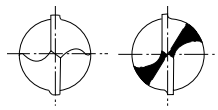
# STRAIGHT SHANK DRILLS

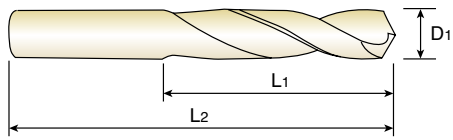
**D2148 SERIES** UN-COATED
**D4148 SERIES** TiN-COATED

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

▶ **Flute Geometry** : Right hand spiral, wider flutes
▶ **Point Angle** : 135° : Split point
Wire gauge size #53~#60 : Normal point
Wire gauge size #1~#52 : Split point
▶ **Application** : Drilling in steel, cast steel alloyed and Non-alloyed, grey cast iron, graphite, malleable cast iron






ANSI | HSS Co8 | N 20~30° | ANSI | 135° | P.202

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Wire gauge | Decimal | | |
| UN-COATED | TiN-COATED | D1 | | L1 | L2 |
| ** D2148131 | D4148131 | 31 | .1200 | 7/8 | 1-7/8 |
| ** D2148132 | D4148132 | 32 | .1160 | 7/8 | 1-7/8 |
| ** D2148133 | D4148133 | 33 | .1130 | 7/8 | 1-7/8 |
| ** D2148134 | D4148134 | 34 | .1110 | 7/8 | 1-7/8 |
| ** D2148135 | D4148135 | 35 | .1100 | 7/8 | 1-7/8 |
| ** D2148136 | D4148136 | 36 | .1065 | 13/16 | 1-13/16 |
| * D2148137 | D4148137 | 37 | .1040 | 13/16 | 1-13/16 |
| * D2148138 | D4148138 | 38 | .1015 | 13/16 | 1-13/16 |
| * D2148139 | D4148139 | 39 | .0995 | 13/16 | 1-13/16 |
| * D2148140 | D4148140 | 40 | .0980 | 13/16 | 1-13/16 |
| * D2148141 | D4148141 | 41 | .0960 | 13/16 | 1-13/16 |
| * D2148142 | D4148142 | 42 | .0935 | 3/4 | 1-3/4 |
| * D2148143 | D4148143 | 43 | .0890 | 3/4 | 1-3/4 |
| * D2148144 | D4148144 | 44 | .0860 | 3/4 | 1-3/4 |
| * D2148145 | D4148145 | 45 | .0820 | 3/4 | 1-3/4 |
| * D2148146 | D4148146 | 46 | .0810 | 3/4 | 1-3/4 |
| * D2148147 | D4148147 | 47 | .0785 | 11/16 | 1-11/16 |
| * D2148148 | D4148148 | 48 | .0760 | 11/16 | 1-11/16 |
| * D2148149 | D4148149 | 49 | .0730 | 11/16 | 1-11/16 |
| * D2148150 | D4148150 | 50 | .0700 | 11/16 | 1-11/16 |
| * D2148151 | D4148151 | 51 | .0670 | 11/16 | 1-11/16 |
| * D2148152 | D4148152 | 52 | .0635 | 11/16 | 1-11/16 |
| * D2148153 | D4148153 | 53 | .0595 | 5/8 | 1-5/8 |
| * D2148154 | D4148154 | 54 | .0550 | 5/8 | 1-5/8 |
| * D2148155 | D4148155 | 55 | .0520 | 5/8 | 1-5/8 |
| * D2148156 | D4148156 | 56 | .0465 | 1/2 | 1-3/8 |
| * D2148157 | D4148157 | 57 | .0430 | 1/2 | 1-3/8 |
| * D2148158 | D4148158 | 58 | .0420 | 1/2 | 1-3/8 |
| * D2148159 | D4148159 | 59 | .0410 | 1/2 | 1-3/8 |
| * D2148160 | D4148160 | 60 | .0400 | 1/2 | 1-3/8 |

▶ **Tolerance** : See page 188 / * 10per package ** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | | ○ | | | | ○ |

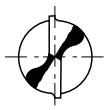
# STRAIGHT SHANK DRILLS

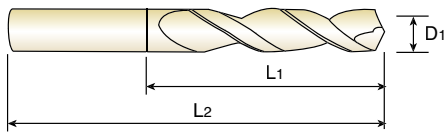
**DN514 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

▶ **Flute Geometry** : Right hand spiral, Parabolic flute
38° helix
▶ **Point Angle** : 130° : Split point
▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.








ANSI HSS-E 38° ANSI 130°

P.203

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Fractional | Decimal | | |
| TiN | D1 | | L1 | L2 |
| * DN514006 | 3/32 | .0938 | 3/4 | 1-3/4 |
| ** DN514007 | 7/64 | .1094 | 13/16 | 1-13/16 |
| ** DN514008 | 1/8 | .1250 | 7/8 | 1-7/8 |
| ** DN514009 | 9/64 | .1406 | 15/16 | 1-15/16 |
| ** DN514010 | 5/32 | .1563 | 1 | 2-1/16 |
| ** DN514011 | 11/64 | .1719 | 1-1/16 | 2-1/8 |
| ** DN514012 | 3/16 | .1875 | 1-1/8 | 2-3/16 |
| ** DN514013 | 13/64 | .2031 | 1-3/16 | 2-1/4 |
| ** DN514014 | 7/32 | .2188 | 1-1/4 | 2-3/8 |
| ** DN514015 | 15/64 | .2344 | 1-5/16 | 2-7/16 |
| ** DN514016 | 1/4 | .2500 | 1-3/8 | 2-1/2 |
| ** DN514017 | 17/64 | .2656 | 1-7/16 | 2-5/8 |
| ** DN514018 | 9/32 | .2813 | 1-1/2 | 2-11/16 |
| ** DN514019 | 19/64 | .2969 | 1-9/16 | 2-3/4 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Fractional | Decimal | | |
| TiN | D1 | | L1 | L2 |
| ** DN514020 | 5/16 | .3125 | 1-5/8 | 2-13/16 |
| ** DN514021 | 21/64 | .3281 | 1-11/16 | 2-15/16 |
| ** DN514022 | 11/32 | .3438 | 1-11/16 | 3 |
| ** DN514023 | 23/64 | .3594 | 1-3/4 | 3-1/16 |
| ** DN514024 | 3/8 | .3750 | 1-13/16 | 3-1/8 |
| ** DN514025 | 25/64 | .3906 | 1-7/8 | 3-1/4 |
| ** DN514026 | 13/32 | .4063 | 1-15/16 | 3-5/16 |
| ** DN514027 | 27/64 | .4219 | 2 | 3-3/8 |
| ** DN514028 | 7/16 | .4375 | 2-1/16 | 3-7/16 |
| ** DN514029 | 29/64 | .4531 | 2-1/8 | 3-9/16 |
| ** DN514030 | 15/32 | .4688 | 2-1/8 | 3-5/8 |
| ** DN514031 | 31/64 | .4844 | 2-3/16 | 3-11/16 |
| ** DN514032 | 1/2 | .5000 | 2-1/4 | 3-3/4 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

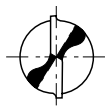
# STRAIGHT SHANK DRILLS

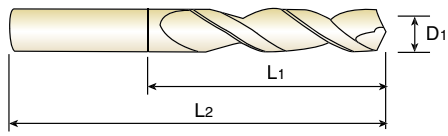
**DN516 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

- **Flute Geometry** : Right hand spiral, Parabolic flute 38° helix
- **Point Angle** : 130° : Split point
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.








ANSI HSS-E 38° ANSI 130° P.203

## ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Letter | Decimal | | |
| TiN | D1 | | L1 | L2 |
| ** DN516101 | A | .2340 | 1-5/16 | 2-7/16 |
| ** DN516102 | B | .2380 | 1-3/8 | 2-1/2 |
| ** DN516103 | C | .2420 | 1-3/8 | 2-1/2 |
| ** DN516104 | D | .2460 | 1-3/8 | 2-1/2 |
| ** DN516105 | E | .2500 | 1-3/8 | 2-1/2 |
| ** DN516106 | F | .2570 | 1-7/16 | 2-5/8 |
| ** DN516107 | G | .2610 | 1-7/16 | 2-5/8 |
| ** DN516108 | H | .2660 | 1-1/2 | 2-11/16 |
| ** DN516109 | I | .2720 | 1-1/2 | 2-11/16 |
| ** DN516110 | J | .2770 | 1-1/2 | 2-11/16 |
| ** DN516111 | K | .2810 | 1-1/2 | 2-11/16 |
| ** DN516112 | L | .2900 | 1-9/16 | 2-3/4 |
| ** DN516113 | M | .2950 | 1-9/16 | 2-3/4 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Letter | Decimal | | |
| TiN | D1 | | L1 | L2 |
| ** DN516114 | N | .3020 | 1-5/8 | 2-13/16 |
| ** DN516115 | O | .3160 | 1-11/16 | 2-15/16 |
| ** DN516116 | P | .3230 | 1-11/16 | 2-15/16 |
| ** DN516117 | Q | .3320 | 1-11/16 | 3 |
| ** DN516118 | R | .3390 | 1-11/16 | 3 |
| ** DN516119 | S | .3480 | 1-3/4 | 3-1/16 |
| ** DN516120 | T | .3580 | 1-3/4 | 3-1/16 |
| ** DN516121 | U | .3680 | 1-13/16 | 3-1/8 |
| ** DN516122 | V | .3770 | 1-7/8 | 3-1/4 |
| ** DN516123 | W | .3860 | 1-7/8 | 3-1/4 |
| ** DN516124 | X | .3970 | 1-15/16 | 3-5/16 |
| ** DN516125 | Y | .4040 | 1-15/16 | 3-5/16 |
| ** DN516126 | Z | .4130 | 2 | 3-3/8 |

** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

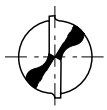
# STRAIGHT SHANK DRILLS

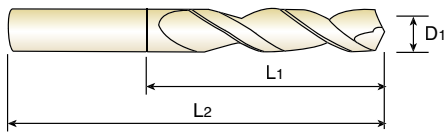
**DN515 SERIES**

## HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

▶ **Flute Geometry** : Right hand spiral, Parabolic flute
38° helix
▶ **Point Angle** : 130° : Split point
▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.








ANSI HSS-E 38° ANSI 130° P.203

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | | |
| TiN | D1 | | L1 | L2 |
| ** DN515201 | 1 | .2280 | 1-5/16 | 2-7/16 |
| ** DN515202 | 2 | .2210 | 1-5/16 | 2-7/16 |
| ** DN515203 | 3 | .2130 | 1-1/4 | 2-3/8 |
| ** DN515204 | 4 | .2090 | 1-1/4 | 2-3/8 |
| ** DN515205 | 5 | .2055 | 1-1/4 | 2-3/8 |
| ** DN515206 | 6 | .2040 | 1-1/4 | 2-3/8 |
| ** DN515207 | 7 | .2010 | 1-3/16 | 2-1/4 |
| ** DN515208 | 8 | .1990 | 1-3/16 | 2-1/4 |
| ** DN515209 | 9 | .1960 | 1-3/16 | 2-1/4 |
| ** DN515210 | 10 | .1935 | 1-3/16 | 2-1/4 |
| ** DN515211 | 11 | .1910 | 1-3/16 | 2-1/4 |
| ** DN515212 | 12 | .1890 | 1-3/16 | 2-1/4 |
| ** DN515213 | 13 | .1850 | 1-1/8 | 2-3/16 |
| ** DN515214 | 14 | .1820 | 1-1/8 | 2-3/16 |
| ** DN515215 | 15 | .1800 | 1-1/8 | 2-3/16 |
| ** DN515216 | 16 | .1770 | 1-1/8 | 2-3/16 |
| ** DN515217 | 17 | .1730 | 1-1/8 | 2-3/16 |
| ** DN515218 | 18 | .1695 | 1-1/16 | 2-1/8 |
| ** DN515219 | 19 | .1660 | 1-1/16 | 2-1/8 |
| ** DN515220 | 20 | .1610 | 1-1/16 | 2-1/8 |
| ** DN515221 | 21 | .1590 | 1-1/16 | 2-1/8 |
| ** DN515222 | 22 | .1570 | 1-1/16 | 2-1/8 |
| ** DN515223 | 23 | .1540 | 1 | 2-1/16 |
| ** DN515224 | 24 | .1520 | 1 | 2-1/16 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | | |
| TiN | D1 | | L1 | L2 |
| ** DN515225 | 25 | .1495 | 1 | 2-1/16 |
| ** DN515226 | 26 | .1470 | 1 | 2-1/16 |
| ** DN515227 | 27 | .1440 | 1 | 2-1/16 |
| ** DN515228 | 28 | .1405 | 15/16 | 1-15/16 |
| ** DN515229 | 29 | .1360 | 15/16 | 1-15/16 |
| ** DN515230 | 30 | .1285 | 15/16 | 1-15/16 |
| ** DN515231 | 31 | .1200 | 7/8 | 1-7/8 |
| ** DN515232 | 32 | .1160 | 7/8 | 1-7/8 |
| ** DN515233 | 33 | .1130 | 7/8 | 1-7/8 |
| ** DN515234 | 34 | .1110 | 7/8 | 1-7/8 |
| ** DN515235 | 35 | .1100 | 7/8 | 1-7/8 |
| ** DN515236 | 36 | .1065 | 13/16 | 1-13/16 |
| * DN515237 | 37 | .1040 | 13/16 | 1-13/16 |
| * DN515238 | 38 | .1015 | 13/16 | 1-13/16 |
| * DN515239 | 39 | .0995 | 13/16 | 1-13/16 |
| * DN515240 | 40 | .0980 | 13/16 | 1-13/16 |
| * DN515241 | 41 | .0960 | 13/16 | 1-13/16 |
| * DN515242 | 42 | .0935 | 3/4 | 1-3/4 |
| * DN515243 | 43 | .0890 | 3/4 | 1-3/4 |
| * DN515244 | 44 | .0860 | 3/4 | 1-3/4 |
| * DN515245 | 45 | .0820 | 3/4 | 1-3/4 |
| * DN515246 | 46 | .0810 | 3/4 | 1-3/4 |
| * DN515247 | 47 | .0785 | 11/16 | 1-11/16 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

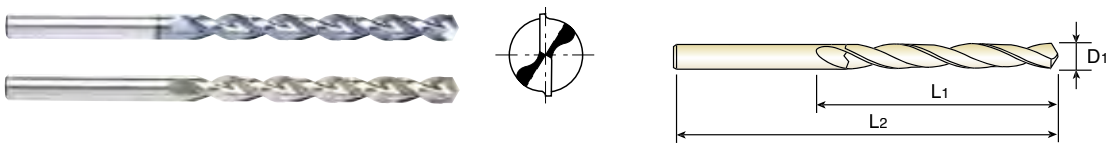
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | | | | |

# STRAIGHT SHANK DRILLS

**DL517 SERIES** UN-COATED
**DX517 SERIES** TiCN-COATED

## HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL

▶ Flute Geometry : Right hand spiral, Parabolic flute
38° helix
▶ Point Angle : 130° : Split point
▶ Application : Improved chip removal in most materials, especially in deep drilling applications.




ANSI HSS-E 38° ANSI 130°
P.204

### ▶ Fractional sizes

Unit : Inch

| EDP No. | | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|---|
| | | Fractional | Decimal | | |
| UN-COATED | TiCN-COATED | D1 | | L1 | L2 |
| * DL517005 | DX517005 | 5/64 | .0781 | 2 | 3-3/4 |
| * DL517006 | DX517006 | 3/32 | .0938 | 2-1/4 | 4-1/4 |
| * DL517007 | DX517007 | 7/64 | .1094 | 2-1/2 | 4-5/8 |
| * DL517008 | DX517008 | 1/8 | .1250 | 2-3/4 | 5-1/8 |
| * DL517009 | DX517009 | 9/64 | .1406 | 3 | 5-3/8 |
| * DL517010 | DX517010 | 5/32 | .1563 | 3 | 5-3/8 |
| * DL517011 | DX517011 | 11/64 | .1719 | 3-3/8 | 5-3/4 |
| * DL517012 | DX517012 | 3/16 | .1875 | 3-3/8 | 5-3/4 |
| * DL517013 | DX517013 | 13/64 | .2031 | 3-5/8 | 6 |
| * DL517014 | DX517014 | 7/32 | .2188 | 3-5/8 | 6 |
| * DL517015 | DX517015 | 15/64 | .2344 | 3-3/4 | 6-1/8 |
| ** DL517016 | DX517016 | 1/4 | .2500 | 3-3/4 | 6-1/8 |
| ** DL517017 | DX517017 | 17/64 | .2656 | 3-7/8 | 6-1/4 |
| ** DL517018 | DX517018 | 9/32 | .2813 | 3-7/8 | 6-1/4 |
| ** DL517019 | DX517019 | 19/64 | .2969 | 4 | 6-3/8 |
| ** DL517020 | DX517020 | 5/16 | .3125 | 4 | 6-3/8 |
| ** DL517021 | DX517021 | 21/64 | .3281 | 4-1/8 | 6-1/2 |
| ** DL517022 | DX517022 | 11/32 | .3438 | 4-1/8 | 6-3/4 |
| ** DL517023 | DX517023 | 23/64 | .3594 | 4-1/4 | 6-3/4 |
| ** DL517024 | DX517024 | 3/8 | .3750 | 4-1/4 | 6-3/4 |
| ** DL517025 | DX517025 | 25/64 | .3906 | 4-3/8 | 7 |
| ** DL517026 | DX517026 | 13/32 | .4063 | 4-3/8 | 7 |
| ** DL517027 | DX517027 | 27/64 | .4219 | 4-5/8 | 7-1/4 |
| ** DL517028 | DX517028 | 7/16 | .4375 | 4-5/8 | 7-1/4 |
| ** DL517029 | DX517029 | 29/64 | .4531 | 4-3/4 | 7-1/2 |
| ** DL517030 | DX517030 | 15/32 | .4688 | 4-3/4 | 7-1/2 |
| ** DL517031 | DX517031 | 31/64 | .4844 | 4-3/4 | 7-3/4 |
| ** DL517032 | DX517032 | 1/2 | .5000 | 4-3/4 | 7-3/4 |

▶ **Tolerance** : See page 197

* 10per package ** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | | ○ | ○ | | | | |

# STRAIGHT SHANK DRILLS

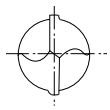
**D4107 SERIES**

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

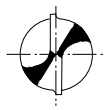
***STUB***

- **Flute Geometry** : Right hand spiral helix
- **Point Angle** : 135˚
  under 1.6mm : Normal point
  1.6mm & over : Split point
- **Surface Treatment** : TiN Coating
- **Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.

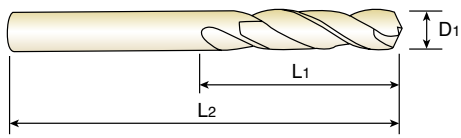




under 1.6mm



1.6mm & over




DIN 1897 | HSS Co8 | N 33˚ | h8 | 135˚

P.205

Unit : mm

| EDP No. | Diameter Metric | Diameter Inch | Flute Length | Overall Length |
|---|---|---|---|---|
| TiN | D1 | | L1 | L2 |
| * D4107010 | 1.0 | .0394 | 6 | 26 |
| * D4107011 | 1.1 | .0433 | 7 | 28 |
| * D4107012 | 1.2 | .0472 | 8 | 30 |
| * D4107912 | 1.25 | .0492 | 8 | 30 |
| * D4107013 | 1.3 | .0512 | 8 | 30 |
| * D4107014 | 1.4 | .0551 | 9 | 32 |
| * D4107015 | 1.5 | .0591 | 9 | 32 |
| * D4107016 | 1.6 | .0630 | 10 | 34 |
| * D4107017 | 1.7 | .0669 | 10 | 34 |
| * D4107917 | 1.75 | .0689 | 11 | 36 |
| * D4107018 | 1.8 | .0709 | 11 | 36 |
| * D4107019 | 1.9 | .0748 | 11 | 36 |
| * D4107020 | 2.0 | .0787 | 12 | 38 |
| * D4107021 | 2.1 | .0827 | 12 | 38 |
| * D4107022 | 2.2 | .0866 | 13 | 40 |
| * D4107925 | 2.25 | 0.886 | 13 | 40 |
| * D4107023 | 2.3 | .0906 | 13 | 40 |
| * D4107024 | 2.4 | .0945 | 14 | 43 |
| * D4107025 | 2.5 | .0984 | 14 | 43 |
| * D4107026 | 2.6 | .1024 | 14 | 43 |
| * D4107027 | 2.7 | .1063 | 16 | 46 |
| ** D4107927 | 2.75 | .1083 | 16 | 46 |
| ** D4107028 | 2.8 | .1102 | 16 | 46 |
| ** D4107029 | 2.9 | .1142 | 16 | 46 |
| ** D4107030 | 3.0 | .1181 | 16 | 46 |
| ** D4107031 | 3.1 | .1220 | 18 | 49 |
| ** D4107032 | 3.2 | .1260 | 18 | 49 |
| ** D4107932 | 3.25 | .1280 | 18 | 49 |
| ** D4107033 | 3.3 | .1299 | 18 | 49 |
| ** D4107034 | 3.4 | .1339 | 20 | 52 |

| EDP No. | Diameter Metric | Diameter Inch | Flute Length | Overall Length |
|---|---|---|---|---|
| TiN | | | L1 | L2 |
| ** D4107035 | 3.5 | .1378 | 20 | 52 |
| ** D4107036 | 3.6 | .1417 | 20 | 52 |
| ** D4107037 | 3.7 | .1457 | 20 | 52 |
| ** D4107937 | 3.75 | .1476 | 20 | 52 |
| ** D4107038 | 3.8 | .1496 | 22 | 55 |
| ** D4107039 | 3.9 | .1535 | 22 | 55 |
| ** D4107040 | 4.0 | .1575 | 22 | 55 |
| ** D4107041 | 4.1 | .1614 | 22 | 55 |
| ** D4107042 | 4.2 | .1654 | 22 | 55 |
| ** D4107942 | 4.25 | .1673 | 22 | 55 |
| ** D4107043 | 4.3 | .1693 | 24 | 58 |
| ** D4107044 | 4.4 | .1732 | 24 | 58 |
| ** D4107045 | 4.5 | .1772 | 24 | 58 |
| ** D4107046 | 4.6 | .1811 | 24 | 58 |
| ** D4107946 | 4.65 | .1831 | 24 | 58 |
| ** D4107047 | 4.7 | .1850 | 24 | 58 |
| ** D4107947 | 4.75 | .1870 | 24 | 58 |
| ** D4107048 | 4.8 | .1890 | 26 | 62 |
| ** D4107049 | 4.9 | .1929 | 26 | 62 |
| ** D4107050 | 5.0 | .1969 | 26 | 62 |
| ** D4107051 | 5.1 | .2008 | 26 | 62 |
| ** D4107052 | 5.2 | .2047 | 26 | 62 |
| ** D4107952 | 5.25 | .2067 | 26 | 62 |
| ** D4107053 | 5.3 | .2087 | 26 | 62 |
| ** D4107054 | 5.4 | .2126 | 28 | 66 |
| ** D4107055 | 5.5 | .2165 | 28 | 66 |
| ** D4107955 | 5.55 | .2185 | 28 | 66 |
| ** D4107056 | 5.6 | .2205 | 28 | 66 |
| ** D4107057 | 5.7 | .2244 | 28 | 66 |
| ** D4107957 | 5.75 | .2264 | 28 | 66 |

- The HSSCo5(DL107) is available when you need.
  The TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

* 10per package ** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

# STRAIGHT SHANK DRILLS

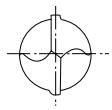
**D4107 SERIES**

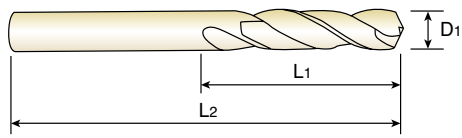
## HSSCo8, STRAIGHT SHANK SCREW MACHINE

***STUB***

▶ **Flute Geometry** : Right hand spiral helix
▶ **Point Angle** : 135˚
under 1.6mm : Normal point
1.6mm & over : Split point
▶ **Surface Treatment** : TiN Coating
▶ **Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.






DIN 1897 | HSS Co8 | N 33° | h8 | 135° P.205

Unit : mm

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | D1 | | L1 | L2 |
| ** D4107058 | 5.8 | .2283 | 28 | 66 |
| ** D4107059 | 5.9 | .2323 | 28 | 66 |
| ** D4107060 | 6.0 | .2362 | 28 | 66 |
| ** D4107061 | 6.1 | .2402 | 31 | 70 |
| ** D4107062 | 6.2 | .2441 | 31 | 70 |
| ** D4107962 | 6.25 | .2461 | 31 | 70 |
| ** D4107063 | 6.3 | .2480 | 31 | 70 |
| ** D4107064 | 6.4 | .2520 | 31 | 70 |
| ** D4107065 | 6.5 | .2559 | 31 | 70 |
| ** D4107066 | 6.6 | .2598 | 31 | 70 |
| ** D4107067 | 6.7 | .2638 | 31 | 70 |
| ** D4107967 | 6.75 | .2657 | 34 | 74 |
| ** D4107068 | 6.8 | .2677 | 34 | 74 |
| ** D4107069 | 6.9 | .2717 | 34 | 74 |
| ** D4107070 | 7.0 | .2756 | 34 | 74 |
| ** D4107071 | 7.1 | .2795 | 34 | 74 |
| ** D4107072 | 7.2 | .2835 | 34 | 74 |
| ** D4107972 | 7.25 | .2854 | 34 | 74 |
| ** D4107073 | 7.3 | .2874 | 34 | 74 |
| ** D4107074 | 7.4 | .2913 | 34 | 74 |
| ** D4107974 | 7.45 | .2933 | 34 | 74 |
| ** D4107075 | 7.5 | .2953 | 34 | 74 |
| ** D4107076 | 7.6 | .2992 | 37 | 79 |
| ** D4107077 | 7.7 | .3031 | 37 | 79 |
| ** D4107977 | 7.75 | .3051 | 37 | 79 |
| ** D4107078 | 7.8 | .3071 | 37 | 79 |
| ** D4107079 | 7.9 | .3110 | 37 | 79 |
| ** D4107080 | 8.0 | .3150 | 37 | 79 |
| ** D4107081 | 8.1 | .3189 | 37 | 79 |
| ** D4107082 | 8.2 | .3228 | 37 | 79 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Metric | Inch | | |
| TiN | D1 | | L1 | L2 |
| ** D4107982 | 8.25 | .3248 | 37 | 79 |
| ** D4107083 | 8.3 | .3268 | 37 | 79 |
| ** D4107084 | 8.4 | .3307 | 37 | 79 |
| ** D4107085 | 8.5 | .3346 | 37 | 79 |
| ** D4107086 | 8.6 | .3386 | 40 | 84 |
| ** D4107087 | 8.7 | .3425 | 40 | 84 |
| ** D4107987 | 8.75 | .3445 | 40 | 84 |
| ** D4107088 | 8.8 | .3465 | 40 | 84 |
| ** D4107089 | 8.9 | .3504 | 40 | 84 |
| ** D4107090 | 9.0 | .3543 | 40 | 84 |
| ** D4107091 | 9.1 | .3583 | 40 | 84 |
| ** D4107092 | 9.2 | .3622 | 40 | 84 |
| ** D4107992 | 9.25 | .3642 | 40 | 84 |
| ** D4107093 | 9.3 | .3661 | 40 | 84 |
| ** D4107993 | 9.35 | .3681 | 40 | 84 |
| ** D4107094 | 9.4 | .3701 | 40 | 84 |
| ** D4107095 | 9.5 | .3740 | 40 | 84 |
| ** D4107096 | 9.6 | .3780 | 43 | 89 |
| ** D4107097 | 9.7 | .3819 | 43 | 89 |
| ** D4107997 | 9.75 | .3839 | 43 | 89 |
| ** D4107098 | 9.8 | .3858 | 43 | 89 |
| ** D4107099 | 9.9 | .3898 | 43 | 89 |
| ** D4107100 | 10.0 | .3937 | 43 | 89 |
| ** D4107102 | 10.2 | .4016 | 43 | 89 |
| ** D4107802 | 10.25 | .4035 | 43 | 89 |
| ** D4107105 | 10.5 | .4134 | 43 | 89 |
| ** D4107807 | 10.75 | .4232 | 47 | 95 |
| ** D4107110 | 11.0 | .4330 | 47 | 95 |
| ** D4107812 | 11.25 | .4429 | 47 | 95 |
| ** D4107115 | 11.5 | .4527 | 47 | 95 |

▶ The HSSCo5(DL107) is available when you need.
The TiN(D4107), TiCN(D7107) and TiAlN(DQ107) are available on your request.

** 5per package

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | ○ |

# STRAIGHT SHANK DRILLS

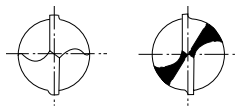
**D4107 SERIES**

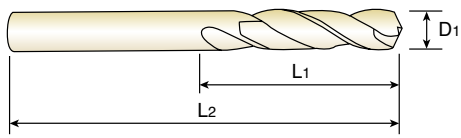
## HSSCo8, STRAIGHT SHANK SCREW MACHINE

***STUB***

- ▶ **Flute Geometry** : Right hand spiral helix
- ▶ **Point Angle** : 135˚
  under 1.6mm : Normal point
  1.6mm & over : Split point
- ▶ **Surface Treatment** : TiN Coating
- ▶ **Application** : Drills suitable for drilling in thin materials with portable drills. Special twist drills for automatic and turret lathes.






DIN 1897 | HSS Co8 | N 33° | h8 | 135° P.205

Unit : mm

| EDP No. | Diameter Metric | Diameter Inch | Flute Length | Overall Length |
|---|---|---|---|---|
| TiN | D1 | | L1 | L2 |
| ** D4107817 | 11.75 | .4626 | 47 | 95 |
| ** D4107118 | 11.8 | .4645 | 47 | 95 |
| ** D4107120 | 12.0 | .4724 | 51 | 102 |
| ** D4107822 | 12.25 | .4823 | 51 | 102 |
| ** D4107125 | 12.5 | .4921 | 51 | 102 |
| ** D4107827 | 12.75 | .5020 | 51 | 102 |
| ** D4107130 | 13.0 | .5118 | 51 | 102 |
| - D4107832 | 13.25 | .5217 | 54 | 107 |
| - D4107135 | 13.5 | .5314 | 54 | 107 |
| - D4107837 | 13.75 | .5413 | 54 | 107 |
| - D4107138 | 13.8 | .5433 | 54 | 107 |
| - D4107140 | 14.0 | .5512 | 54 | 107 |
| - D4107842 | 14.25 | .5610 | 56 | 111 |
| - D4107145 | 14.5 | .5708 | 56 | 111 |
| - D4107847 | 14.75 | .5807 | 56 | 111 |
| - D4107150 | 15.0 | .5905 | 56 | 111 |
| - D4107852 | 15.25 | .6004 | 58 | 115 |
| - D4107155 | 15.5 | .6102 | 58 | 115 |
| - D4107857 | 15.75 | .6201 | 58 | 115 |
| - D4107160 | 16.0 | .6299 | 58 | 115 |
| - D4107862 | 16.25 | .6398 | 60 | 119 |
| - D4107165 | 16.5 | .6495 | 60 | 119 |
| - D4107867 | 16.75 | .6594 | 60 | 119 |
| - D4107170 | 17.0 | .6692 | 60 | 119 |
| - D4107872 | 17.25 | .6791 | 62 | 123 |
| - D4107175 | 17.5 | .6889 | 62 | 123 |

| EDP No. | Diameter Metric | Diameter Inch | Flute Length | Overall Length |
|---|---|---|---|---|
| TiN | D1 | | L1 | L2 |
| - D4107877 | 17.75 | .6907 | 62 | 123 |
| - D4107180 | 18.0 | .7087 | 62 | 123 |
| - D4107882 | 18.25 | .7185 | 64 | 127 |
| - D4107185 | 18.5 | .7283 | 64 | 127 |
| - D4107887 | 18.75 | .7382 | 64 | 127 |
| - D4107190 | 19.0 | .7480 | 64 | 127 |
| - D4107892 | 19.25 | .7579 | 66 | 131 |
| - D4107195 | 19.5 | .7676 | 66 | 131 |
| - D4107897 | 19.75 | .7776 | 66 | 131 |
| - D4107200 | 20.0 | .7874 | 66 | 131 |
| - D4107205 | 20.5 | .8071 | 68 | 136 |
| - D4107210 | 21.0 | .8268 | 68 | 136 |
| - D4107215 | 21.5 | .8465 | 70 | 141 |
| - D4107220 | 22.0 | .8661 | 70 | 141 |
| - D4107225 | 22.5 | .8858 | 72 | 146 |
| - D4107230 | 23.0 | .9055 | 72 | 146 |
| - D4107235 | 23.5 | .9252 | 72 | 146 |
| - D4107240 | 24.0 | .9449 | 75 | 151 |
| - D4107245 | 24.5 | .9646 | 75 | 151 |
| - D4107250 | 25.0 | .9843 | 75 | 151 |
| - D4107260 | 26.0 | 1.0236 | 78 | 156 |
| - D4107270 | 27.0 | 1.0630 | 81 | 162 |
| - D4107280 | 28.0 | 1.1024 | 81 | 162 |
| - D4107290 | 29.0 | 1.1417 | 84 | 168 |
| - D4107300 | 30.0 | 1.1811 | 84 | 168 |
| - D4107310 | 31.0 | 1.2205 | 87 | 174 |

▶ The HSSCo5(DL107) is available when you need.
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** 5per package
- 1per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | | | | | ○ | ○ | ○ | | | | ○ |

# STRAIGHT SHANK DRILLS

**RECOMMENDED CUTTING CONDITIONS**

## HSS & HSSCo8, STRAIGHT SHANK SCREW MACHINE DRILLS

### D1118, D1115, D1119, D2146, D2147, D2148 SERIES

| WORK MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS | |
| HARDNESS | | | ~ HRc23 | | ~ HRc23 ~ 28 | | HRc23 ~ 34 | | HRc34 ~ 38 | |
| STRENGTH | ~ 570 N/mm² | | ~ 830 N/mm² | | 830 ~ 950 N/mm² | | 830 ~ 1110 N/mm² | | 1110 ~ 1260 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| ~ 3/32 | 3380 | .0010 | 2550 | .0010 | 1900 | .0006 | 2380 | .0008 | 1400 | .0006 |
| 3/32 ~ 5/32 | 2700 | .0020 | 2000 | .0020 | 1500 | .0010 | 1880 | .0020 | 1100 | .0008 |
| 11/64 ~ 1/4 | 1700 | .0025 | 1280 | .0025 | 960 | .0015 | 1190 | .0025 | 700 | .0010 |
| 17/64 ~ 23/64 | 1050 | .0051 | 780 | .0051 | 590 | .0030 | 730 | .0051 | 430 | .0015 |
| 3/8 ~ 37/64 | 750 | .0059 | 560 | .0060 | 425 | .0030 | 520 | .0070 | 310 | .0020 |
| 19/32 ~ 1 | 440 | .0090 | 330 | .0090 | 255 | .0051 | 300 | .0090 | 180 | .0020 |
| 1 ~ | 260 | .0110 | 195 | .0110 | 145 | .0070 | 180 | .0070 | 107 | .0030 |

| WORK MATERIAL | P | | M | | K | | N | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TOOL STEELS | | STAINLESS STEELS | | CAST IRON | | ALUMINUM ALLOYS | | MAGNESIUM ALLOYS | |
| HARDNESS | | | HRc23 | | ~ HRc21 | | | | | |
| STRENGTH | ~ 270 N/mm² | | 830 N/mm² | | ~ 800 N/mm² | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| ~ 3/32 | 3180 | .0016 | 2550 | .0010 | 2250 | .0010 | 6400 | .0015 | 8600 | .0015 |
| 3/32 ~ 5/32 | 2500 | .0020 | 2000 | .0020 | 2000 | .0020 | 5000 | .0025 | 6800 | .0025 |
| 11/64 ~ 1/4 | 1590 | .0025 | 1280 | .0025 | 1280 | .0025 | 3200 | .0030 | 4300 | .0030 |
| 17/64 ~ 23/64 | 970 | .0051 | 780 | .0051 | 780 | .0051 | 2000 | .0070 | 2600 | .0070 |
| 3/8 ~ 37/64 | 700 | .0070 | 560 | .0060 | 560 | .0060 | 1400 | .0078 | 1900 | .0078 |
| 19/32 ~ 1 | 440 | .0090 | 330 | .0090 | 330 | .0090 | 820 | .0118 | 1100 | .0118 |
| 1 ~ | 240 | .1180 | 195 | .0110 | 195 | .0110 | 490 | .0150 | 660 | .0150 |

| WORK MATERIAL | N | | N | | S | |
|---|---|---|---|---|---|---|
| | ZINC ALLOYS | | PLASTIC | | TITANIUM ALLOYS | |
| HARDNESS | | | | | | |
| STRENGTH | | | | | 410 N/mm² | |
| DIAMETER | N | S | N | S | N | S |
| ~ 3/32 | 6400 | .0015 | 3380 | .0010 | 1400 | .0008 |
| 3/32 ~ 5/32 | 5000 | .0025 | 2700 | .0020 | 1100 | .0010 |
| 11/64 ~ 1/4 | 3200 | .0030 | 1700 | .0025 | 700 | .0015 |
| 17/64 ~ 23/64 | 2000 | .0070 | 1050 | .0051 | 430 | .0030 |
| 3/8 ~ 37/64 | 1400 | .0078 | 750 | .0060 | 430 | .0030 |
| 19/32 ~ 1 | 820 | .0118 | 440 | .0090 | 180 | .0051 |
| 1 ~ | 490 | .0150 | 260 | .0110 | 107 | .0070 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

# HSSCo5, STRAIGHT SHANK PARABOLIC FLUTE SCREW MACHINE, TiN COATED

## DN514, DN516, DN515 SERIES

| WORK MATERIAL | P | | | | K | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS | | TOOL STEELS HARDENED STEELS | | SOFT GREY CAST IRON | | HARD GREY CAST IRON | |
| HARDNESS | HRc15 ~ 30 | | HRc20 ~ 40 | | | | | |
| STRENGTH | 700 ~ 1000 N/mm$^2$ | | 800 ~ 1200 N/mm$^2$ | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S |
| ~ 5/64 | 2630 | .0012 | 2100 | .0010 | 4200 | .0023 | 1680 | .0500 |
| 3/32 ~ 7/64 | 2100 | .0015 | 1680 | .0012 | 3300 | .0031 | 1310 | .0023 |
| 1/8 ~ 5/32 | 1680 | .0020 | 1310 | .0015 | 2630 | .0039 | 1050 | .0031 |
| 11/64 ~ 3/16 | 1310 | .0023 | 1050 | .0019 | 2100 | .0051 | 840 | .0039 |
| 13/64 ~ 15/64 | 1050 | .0023 | 840 | .0019 | 1680 | .0051 | 660 | .0039 |
| 1/4 ~ 9/32 | 840 | .0031 | 660 | .0023 | 1310 | .0063 | 530 | .0051 |
| 19/64 ~ 11/32 | 660 | .0039 | 530 | .0031 | 1050 | .0078 | 420 | .0067 |
| 23/64 ~ 7/16 | 530 | .0051 | 420 | .0039 | 840 | .0098 | 330 | .0082 |
| 29/64 ~ 9/16 | 420 | .0051 | 330 | .0039 | 660 | .0098 | 260 | .0082 |
| 37/64 ~ 45/64 | 330 | .0059 | 260 | .0051 | 530 | .0118 | 210 | .0098 |
| 23/32 ~ 7/8 | 260 | .0078 | 210 | .0059 | 420 | .0157 | 170 | .0118 |
| 57/64 ~ 1-1/8 | 210 | .0098 | 170 | .0078 | 330 | .0196 | 130 | .0196 |
| 1-9/64 ~ | 170 | .0098 | 130 | .0078 | 260 | .0196 | 110 | .0196 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

# STRAIGHT SHANK DRILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL, TiCN COATED

### DX517 SERIES

| WORK MATERIAL | P | | | | K | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS | | TOOL STEELS HARDENED STEELS | | SOFT GREY CAST IRON | | HARD GREY CAST IRON | |
| HARDNESS | HRc15 ~ 30 | | HRc20 ~ 40 | | | | | |
| STRENGTH | 700 ~ 1000 N/mm$^2$ | | 800 ~ 1200 N/mm$^2$ | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S |
| ~ 5/64 | 4900 | .0023 | 3400 | .0023 | 8500 | .0027 | 5400 | .0027 |
| 3/32 ~ 7/64 | 3000 | .0031 | 2350 | .0031 | 5700 | .0043 | 3500 | .0043 |
| 1/8 ~ 5/32 | 2440 | .0035 | 1800 | .0035 | 4300 | .0055 | 2700 | .0055 |
| 11/64 ~ 15/64 | 1950 | .0039 | 1400 | .0039 | 3450 | .0055 | 2150 | .0055 |
| 1/4 ~ 9/32 | 1400 | .0055 | 1000 | .0055 | 2450 | .0078 | 1550 | .0078 |
| 19/64 ~ 5/16 | 1200 | .0059 | 850 | .0059 | 2100 | .0086 | 1350 | .0086 |
| 21/64 ~ 23/64 | 1100 | .0066 | 800 | .0066 | 1950 | .0094 | 1200 | .0094 |
| 3/8 ~ 25/64 | 950 | .0071 | 660 | .0071 | 1750 | .0110 | 1050 | .0110 |
| 13/32 ~ 7/16 | 900 | .0078 | 630 | .0078 | 1600 | .0110 | 960 | .0110 |
| 29/64 ~ 15/32 | 800 | .0078 | 575 | .0078 | 1450 | .0110 | 900 | .0110 |
| 31/64 ~ 1/2 | 720 | .0078 | 500 | .0078 | 1300 | .0110 | 830 | .0110 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

## HSSCo5, TAPER LENGTH STRAIGHT SHANK DRILL

### DL517 SERIES

| WORK MATERIAL | P | | | | K | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS | | TOOL STEELS HARDENED STEELS | | SOFT GREY CAST IRON | | HARD GREY CAST IRON | |
| HARDNESS | HRc15 ~ 30 | | HRc20 ~ 40 | | | | | |
| STRENGTH | 700 ~ 1000 N/mm$^2$ | | 800 ~ 1200 N/mm$^2$ | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S |
| ~ 5/64 | 3990 | .0023 | 2770 | .0023 | 6920 | .0027 | 4400 | .0027 |
| 3/32 ~ 7/64 | 2440 | .0031 | 1910 | .0031 | 4640 | .0043 | 2850 | .0043 |
| 1/8 ~ 5/32 | 1990 | .0035 | 1470 | .0035 | 3500 | .0055 | 2200 | .0055 |
| 11/64 ~ 15/64 | 1590 | .0039 | 1140 | .0039 | 2810 | .0055 | 1750 | .0055 |
| 1/4 ~ 9/32 | 1140 | .0055 | 810 | .0055 | 1990 | .0078 | 1260 | .0078 |
| 19/64 ~ 5/16 | 980 | .0059 | 690 | .0059 | 1710 | .0086 | 1100 | .0086 |
| 21/64 ~ 23/64 | 900 | .0066 | 650 | .0066 | 1590 | .0094 | 980 | .0094 |
| 3/8 ~ 25/64 | 770 | .0071 | 540 | .0071 | 1420 | .0110 | 850 | .0110 |
| 13/32 ~ 7/16 | 730 | .0078 | 510 | .0078 | 1300 | .0110 | 780 | .0110 |
| 29/64 ~ 15/32 | 650 | .0078 | 470 | .0078 | 1180 | .0110 | 730 | .0110 |
| 31/64 ~ 1/2 | 590 | .0078 | 410 | .0078 | 1060 | .0110 | 680 | .0110 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

## HSSCo8, STRAIGHT SHANK SCREW MACHINE

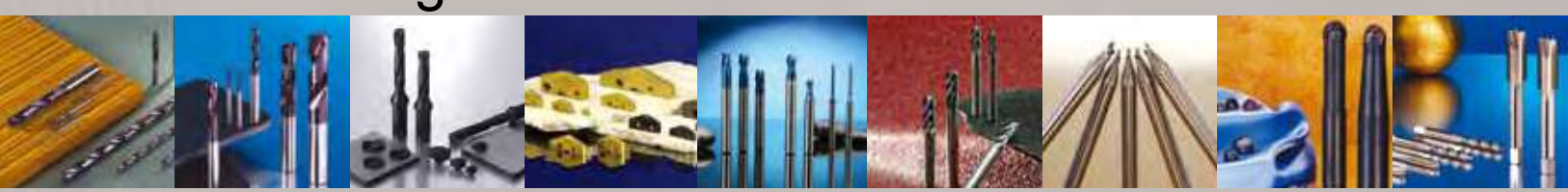
### D4107 SERIES

| WORK MATERIAL | P | | | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc23 | | ~ HRc23 ~ 28 | | HRc23 ~ 34 | | HRc34 ~ 38 | | | | HRc23 | |
| STRENGTH | ~ 570 N/mm² | | ~ 830 N/mm² | | 830 ~ 950 N/mm² | | 830 ~ 1110 N/mm² | | 1110 ~ 1260 N/mm² | | ~ 270 N/mm² | | 830 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S | N | S |
| 2.5 | 4225 | .0010 | 3200 | .0010 | 2500 | .0006 | 2980 | .0008 | 1750 | .0006 | 3975 | .0017 | 3200 | .0010 |
| 3.0 | 3375 | .0020 | 2500 | .0020 | 2000 | .0010 | 2350 | .0020 | 1375 | .0008 | 3125 | .0020 | 2500 | .0020 |
| 5.0 | 2125 | .0025 | 1600 | .0025 | 1280 | .0015 | 1500 | .0025 | 875 | .0010 | 2000 | .0025 | 1600 | .0025 |
| 8.0 | 1310 | .0051 | 975 | .0051 | 785 | .0030 | 910 | .0051 | 535 | .0015 | 1210 | .0051 | 975 | .0051 |
| 11.0 | 935 | .0059 | 700 | .0059 | 565 | .0030 | 650 | .0071 | 385 | .0020 | 875 | .0071 | 700 | .0059 |
| 19.0 | 550 | .0091 | 410 | .0091 | 340 | .0051 | 375 | .0091 | 225 | .0020 | 550 | .0091 | 410 | .0091 |
| 31.0 | 325 | .0110 | 244 | .0110 | 193 | .0071 | 225 | .0071 | 134 | .0030 | 300 | .0118 | 244 | .0110 |

| WORK MATERIAL | K | | N | | | | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | ALUMINUM ALLOYS | | MAGNESIUM ALLOYS | | ZINC ALLOYS | | PLASTIC | | TITANIUM ALLOYS | |
| HARDNESS | ~ HRc21 | | | | | | | | | | | |
| STRENGTH | ~ 800 N/mm² | | | | | | | | | | 410 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S |
| 2.5 | 2800 | .0010 | 7950 | .0015 | 10700 | .0015 | 7950 | .0015 | 4225 | .0010 | 1750 | .0008 |
| 3.0 | 2500 | .0020 | 6200 | .0025 | 8450 | .0025 | 6200 | .0025 | 3350 | .0020 | 1375 | .0010 |
| 5.0 | 1600 | .0025 | 3950 | .0030 | 5350 | .0030 | 3950 | .0030 | 2125 | .0025 | 875 | .0015 |
| 8.0 | 975 | .0051 | 2490 | .0071 | 3240 | .0071 | 2490 | .0071 | 1310 | .0051 | 535 | .0030 |
| 11.0 | 700 | .0059 | 1740 | .0079 | 2365 | .0079 | 1740 | .0079 | 935 | .0059 | 535 | .0030 |
| 19.0 | 410 | .0091 | 1020 | .0118 | 1370 | .0118 | 1020 | .0118 | 550 | .0091 | 225 | .0051 |
| 31.0 | 244 | .0110 | 610 | .0150 | 820 | .0150 | 610 | .0150 | 325 | .0110 | 134 | .0071 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

Global Cutting Tool Leader **YG-1**



# HSS

Being the best through innovation



# AIRCRAFT DRILLS

- 6 and 12 inch Length Drills

# AIRCRAFT DRILLS

6 and 12 inch Length Drills


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| DL601 DL604 |  | HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Fractional sizes | D5/64 | D1/2 | **210** |
| DL602 DL605 |  | HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Letter sizes | A | Z | **211** |
| DL603 DL606 |  | HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING / Wire gauge sizes | #43 | #1 | **212** |
| D1631 D1634 |  | HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Fractional sizes | D5/64 | D1/2 | **213** |
| D1632 D1635 |  | HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Letter sizes | A | Z | **214** |
| D1633 D1636 |  | HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE / Wire gauge sizes | #43 | #1 | **215** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **216** |

◎ : Excellent ○ : Good

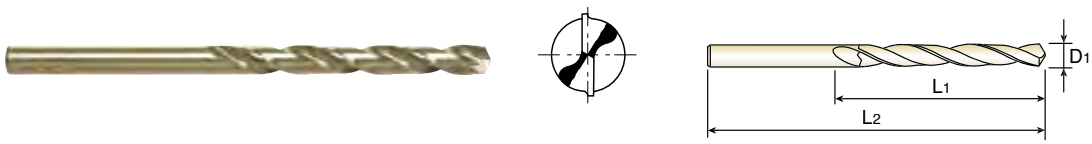
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |

# AIRCRAFT DRILLS

**DL601 SERIES**
**DL604 SERIES**

## HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

- **Flute Geometry** : Right hand spiral, 30° helix
- **Point Angle** : 135° : Split point
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.




HSS Co5 | NAS 907 | N 30° | 135° P.216

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DL601005 | 5/64 | .0781 | 1 | 6 |
| * DL601006 | 3/32 | .0938 | 1-1/4 | 6 |
| * DL601007 | 7/64 | .1094 | 1-1/2 | 6 |
| * DL601008 | 1/8 | .1250 | 1-5/8 | 6 |
| * DL601009 | 9/64 | .1406 | 1-3/4 | 6 |
| * DL601010 | 5/32 | .1563 | 2 | 6 |
| * DL601011 | 11/64 | .1719 | 2-1/8 | 6 |
| * DL601012 | 3/16 | .1875 | 2-5/16 | 6 |
| * DL601013 | 13/64 | .2031 | 2-7/16 | 6 |
| * DL601014 | 7/32 | .2188 | 2-1/2 | 6 |
| * DL601015 | 15/64 | .2344 | 2-5/8 | 6 |
| ** DL601016 | 1/4 | .2500 | 2-3/4 | 6 |
| ** DL601017 | 17/64 | .2656 | 2-7/8 | 6 |
| ** DL601018 | 9/32 | .2813 | 2-15/16 | 6 |
| ** DL601019 | 19/64 | .2969 | 3-1/16 | 6 |
| ** DL601020 | 5/16 | .3125 | 3-3/16 | 6 |
| ** DL601021 | 21/64 | .3281 | 3-5/16 | 6 |
| ** DL601022 | 11/32 | .3438 | 3-7/16 | 6 |
| ** DL601023 | 23/64 | .3594 | 3-1/2 | 6 |
| ** DL601024 | 3/8 | .3750 | 3-5/8 | 6 |
| ** DL601025 | 25/64 | .3906 | 3-3/4 | 6 |
| ** DL601026 | 13/32 | .4063 | 3-7/8 | 6 |
| ** DL601027 | 27/64 | .4219 | 3-15/16 | 6 |
| ** DL601028 | 7/16 | .4375 | 4-1/16 | 6 |

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| ** DL601029 | 29/64 | .4531 | 4-3/16 | 6 |
| ** DL601030 | 15/32 | .4688 | 4-5/16 | 6 |
| ** DL601031 | 31/64 | .4844 | 4-3/8 | 6 |
| ** DL601032 | 1/2 | .5000 | 4-1/2 | 6 |
| ** DL604014 | 7/32 | .2188 | 2-1/2 | 12 |
| ** DL604015 | 15/64 | .2344 | 2-5/8 | 12 |
| ** DL604016 | 1/4 | .2500 | 2-3/4 | 12 |
| ** DL604017 | 17/64 | .2656 | 2-7/8 | 12 |
| ** DL604018 | 9/32 | .2813 | 2-15/16 | 12 |
| ** DL604019 | 19/64 | .2969 | 3-1/16 | 12 |
| ** DL604020 | 5/16 | .3125 | 3-3/16 | 12 |
| ** DL604021 | 21/64 | .3281 | 3-5/16 | 12 |
| ** DL604022 | 11/32 | .3438 | 3-7/16 | 12 |
| ** DL604023 | 23/64 | .3594 | 3-1/2 | 12 |
| ** DL604024 | 3/8 | .3750 | 3-5/8 | 12 |
| ** DL604025 | 25/64 | .3906 | 3-3/4 | 12 |
| ** DL604026 | 13/32 | .4063 | 3-7/8 | 12 |
| ** DL604027 | 27/64 | .4219 | 3-15/16 | 12 |
| ** DL604028 | 7/16 | .4375 | 4-1/16 | 12 |
| ** DL604029 | 29/64 | .4531 | 4-3/16 | 12 |
| ** DL604030 | 15/32 | .4688 | 4-5/16 | 12 |
| ** DL604031 | 31/64 | .4844 | 4-3/8 | 12 |
| ** DL604032 | 1/2 | .5000 | 4-1/2 | 12 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

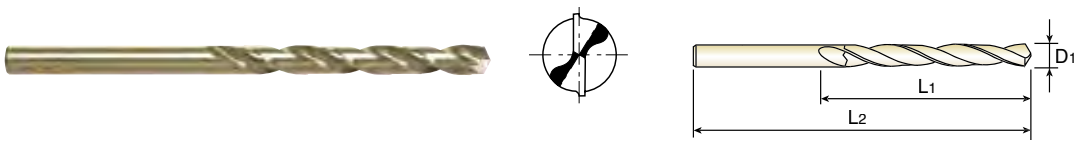
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |

# AIRCRAFT DRILLS

**DL602 SERIES**
**DL605 SERIES**

## HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

▶ **Flute Geometry** : Right hand spiral, 30° helix
▶ **Point Angle** : 135° : Split point
▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.




HSS Co5 | NAS 907 | N 30° | 135° P.216

### ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DL602101 | A | .2340 | 2-5/8 | 6 |
| ** DL602102 | B | ,2380 | 2-3/4 | 6 |
| ** DL602103 | C | .2420 | 2-3/4 | 6 |
| ** DL602104 | D | .2460 | 2-3/4 | 6 |
| ** DL602105 | E | .2500 | 2-3/4 | 6 |
| ** DL602106 | F | .2570 | 2-7/8 | 6 |
| ** DL602107 | G | .2610 | 2-7/8 | 6 |
| ** DL602108 | H | .2660 | 2-7/8 | 6 |
| ** DL602109 | I | .2720 | 2-7/8 | 6 |
| ** DL602110 | J | .2770 | 2-7/8 | 6 |
| ** DL602111 | K | .2810 | 2-15/16 | 6 |
| ** DL602112 | L | .2900 | 2-15/16 | 6 |
| ** DL602113 | M | .2950 | 3-1/16 | 6 |
| ** DL602114 | N | .3020 | 3-1/16 | 6 |
| ** DL602115 | O | .3160 | 3-3/16 | 6 |
| ** DL602116 | P | .3230 | 3-5/16 | 6 |
| ** DL602117 | Q | .3320 | 3-7/16 | 6 |
| ** DL602118 | R | .3390 | 3-7/16 | 6 |
| ** DL602119 | S | .3480 | 3-1/2 | 6 |
| ** DL602120 | T | .3580 | 3-1/2 | 6 |
| ** DL602121 | U | .3680 | 3-5/8 | 6 |
| ** DL602122 | V | .3770 | 3-5/8 | 6 |
| ** DL602123 | W | .3860 | 3-3/4 | 6 |
| ** DL602124 | X | .3970 | 3-3/4 | 6 |
| ** DL602125 | Y | .4040 | 3-7/8 | 6 |
| ** DL602126 | Z | .4130 | 3-7/8 | 6 |

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * DL605101 | A | .2340 | 2-5/8 | 12 |
| ** DL605102 | B | ,2380 | 2-3/4 | 12 |
| ** DL605103 | C | .2420 | 2-3/4 | 12 |
| ** DL605104 | D | .2460 | 2-3/4 | 12 |
| ** DL605105 | E | .2500 | 2-3/4 | 12 |
| ** DL605106 | F | .2570 | 2-7/8 | 12 |
| ** DL605107 | G | .2610 | 2-7/8 | 12 |
| ** DL605108 | H | .2660 | 2-7/8 | 12 |
| ** DL605109 | I | .2720 | 2-7/8 | 12 |
| ** DL605110 | J | .2770 | 2-7/8 | 12 |
| ** DL605111 | K | .2810 | 2-15/16 | 12 |
| ** DL605112 | L | .2900 | 2-15/16 | 12 |
| ** DL605113 | M | .2950 | 3-1/16 | 12 |
| ** DL605114 | N | .3020 | 3-1/16 | 12 |
| ** DL605115 | O | .3160 | 3-3/16 | 12 |
| ** DL605116 | P | .3230 | 3-5/16 | 12 |
| ** DL605117 | Q | .3320 | 3-7/16 | 12 |
| ** DL605118 | R | .3390 | 3-7/16 | 12 |
| ** DL605119 | S | .3480 | 3-1/2 | 12 |
| ** DL605120 | T | .3580 | 3-1/2 | 12 |
| ** DL605121 | U | .3680 | 3-5/8 | 12 |
| ** DL605122 | V | .3770 | 3-5/8 | 12 |
| ** DL605123 | W | .3860 | 3-3/4 | 12 |
| ** DL605124 | X | .3970 | 3-3/4 | 12 |
| ** DL605125 | Y | .4040 | 3-7/8 | 12 |
| ** DL605126 | Z | .4130 | 3-7/8 | 12 |

▶ **Tolerance** : See page 210

* 10per package
** 5per package

◎ : Excellent ○ : Good

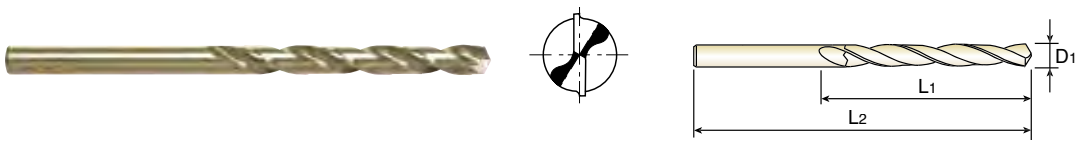
| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ○ | | | | | ○ | ○ | ○ | ○ | ○ | | |

# AIRCRAFT DRILLS

**DL603 SERIES**
**DL606 SERIES**

## HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT COLORING

▶ **Flute Geometry** : Right hand spiral, parabolic fute
30° helix
▶ **Point Angle** : 135° : Split point
▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.




HSS Co5 | NAS 907 | N 30° | 135° | P.216

## ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * DL603256 | 1 | .2280 | 2-5/8 | 6 |
| * DL603255 | 2 | .2210 | 2-5/8 | 6 |
| * DL603254 | 3 | .2130 | 2-1/2 | 6 |
| * DL603253 | 4 | .2090 | 2-1/2 | 6 |
| * DL603252 | 5 | .2055 | 2-1/2 | 6 |
| * DL603251 | 6 | .2040 | 2-1/2 | 6 |
| * DL603250 | 7 | .2010 | 2-7/16 | 6 |
| * DL603249 | 8 | .1990 | 2-7/16 | 6 |
| * DL603248 | 9 | .1960 | 2-7/16 | 6 |
| * DL603247 | 10 | .1935 | 2-7/16 | 6 |
| * DL603246 | 11 | .1910 | 2-5/16 | 6 |
| * DL603245 | 12 | .1890 | 2-5/16 | 6 |
| * DL603244 | 13 | .1850 | 2-5/16 | 6 |
| * DL603243 | 14 | .1820 | 2-3/16 | 6 |
| * DL603242 | 15 | .1800 | 2-3/16 | 6 |
| * DL603241 | 16 | .1770 | 2-3/16 | 6 |
| * DL603240 | 17 | .1730 | 2-3/16 | 6 |
| * DL603239 | 18 | .1695 | 2-1/8 | 6 |
| * DL603238 | 19 | .1660 | 2-1/8 | 6 |
| * DL603237 | 20 | .1610 | 2-1/8 | 6 |
| * DL603236 | 21 | .1590 | 2-1/8 | 6 |
| * DL603235 | 22 | .1570 | 2 | 6 |
| * DL603234 | 23 | .1540 | 2 | 6 |

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * DL603233 | 24 | .1520 | 2 | 6 |
| * DL603232 | 25 | .1495 | 1-7/8 | 6 |
| * DL603231 | 26 | .1470 | 1-7/8 | 6 |
| * DL603230 | 27 | .1440 | 1-7/8 | 6 |
| * DL603229 | 28 | .1405 | 1-3/4 | 6 |
| * DL603228 | 29 | .1360 | 1-3/4 | 6 |
| * DL603227 | 30 | .1280 | 1-5/8 | 6 |
| * DL603226 | 31 | .1200 | 1-5/8 | 6 |
| * DL603225 | 32 | .1160 | 1-5/8 | 6 |
| * DL603224 | 33 | .1130 | 1-1/2 | 6 |
| * DL603223 | 34 | .1110 | 1-1/2 | 6 |
| * DL603222 | 35 | .1100 | 1-1/2 | 6 |
| * DL603221 | 36 | .1065 | 1-7/16 | 6 |
| * DL603220 | 37 | .1040 | 1-7/16 | 6 |
| * DL603219 | 38 | .1015 | 1-7/16 | 6 |
| * DL603218 | 39 | .0995 | 1-3/8 | 6 |
| * DL603217 | 40 | .0980 | 1-3/8 | 6 |
| * DL603216 | 41 | .0960 | 1-3/8 | 6 |
| * DL603215 | 42 | .0935 | 1-1/4 | 6 |
| * DL603214 | 43 | .0890 | 1-1/4 | 6 |
| * DL606256 | 1 | .2280 | 2-5/8 | 12 |
| * DL606254 | 3 | .2130 | 2-1/2 | 12 |

* 10per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | |

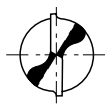
# AIRCRAFT DRILLS

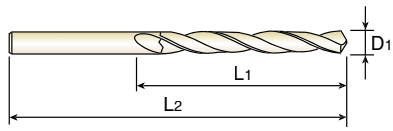
**D1631 SERIES**
**D1634 SERIES**

## HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

▶ **Flute Geometry** : Right hand spiral, 30° helix
▶ **Point Angle** : 135° : Split point
▶ **Application** : Improved chip removal in most materials, especially in deep drilling applications.








HSS | NAS 907 | N 30° | 135° | P.216

## ▶ Fractional sizes

Unit : Inch

| EDP No. | Diameter Fractional | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1631005 | 5/64 | .0781 | 1 | 6 |
| * D1631006 | 3/32 | .0938 | 1-1/4 | 6 |
| * D1631007 | 7/64 | .1094 | 1-1/2 | 6 |
| * D1631008 | 1/8 | .1250 | 1-5/8 | 6 |
| * D1631009 | 9/64 | .1406 | 1-3/4 | 6 |
| * D1631010 | 5/32 | .1563 | 2 | 6 |
| * D1631011 | 11/64 | .1719 | 2-1/8 | 6 |
| * D1631012 | 3/16 | .1875 | 2-5/16 | 6 |
| * D1631013 | 13/64 | .2031 | 2-7/16 | 6 |
| * D1631014 | 7/32 | .2188 | 2-1/2 | 6 |
| * D1631015 | 15/64 | .2344 | 2-5/8 | 6 |
| ** D1631016 | 1/4 | .2500 | 2-3/4 | 6 |
| ** D1631017 | 17/64 | .2656 | 2-7/8 | 6 |
| ** D1631018 | 9/32 | .2813 | 2-15/16 | 6 |
| ** D1631019 | 19/64 | .2969 | 3-1/16 | 6 |
| ** D1631020 | 5/16 | .3125 | 3-3/16 | 6 |
| ** D1631021 | 21/64 | .3281 | 3-5/16 | 6 |
| ** D1631022 | 11/32 | .3438 | 3-7/16 | 6 |
| ** D1631023 | 23/64 | .3594 | 3-1/2 | 6 |
| ** D1631024 | 3/8 | .3750 | 3-5/8 | 6 |
| ** D1631025 | 25/64 | .3906 | 3-3/4 | 6 |
| ** D1631026 | 13/32 | .4063 | 3-7/8 | 6 |
| ** D1631027 | 27/64 | .4219 | 3-15/16 | 6 |
| ** D1631028 | 7/16 | .4375 | 4-1/16 | 6 |
| ** D1631029 | 29/64 | .4531 | 4-3/16 | 6 |
| ** D1631030 | 15/32 | .4688 | 4-5/16 | 6 |
| ** D1631031 | 31/64 | .4844 | 4-3/8 | 6 |
| ** D1631032 | 1/2 | .5000 | 4-1/2 | 6 |
| * D1634014 | 7/32 | .2188 | 2-1/2 | 12 |
| * D1634015 | 15/64 | .2344 | 2-5/8 | 12 |
| ** D1634016 | 1/4 | .2500 | 2-3/4 | 12 |
| ** D1634017 | 17/64 | .2656 | 2-7/8 | 12 |
| ** D1634018 | 9/32 | .2813 | 2-15/16 | 12 |
| ** D1634019 | 19/64 | .2969 | 3-1/16 | 12 |
| ** D1634020 | 5/16 | .3125 | 3-3/16 | 12 |
| ** D1634021 | 21/64 | .3281 | 3-5/16 | 12 |
| ** D1634022 | 11/32 | .3438 | 3-7/16 | 12 |
| ** D1634023 | 23/64 | .3594 | 3-1/2 | 12 |
| ** D1634024 | 3/8 | .3750 | 3-5/8 | 12 |
| ** D1634025 | 25/64 | .3906 | 3-3/4 | 12 |
| ** D1634026 | 13/32 | .4063 | 3-7/8 | 12 |
| ** D1634027 | 27/64 | .4219 | 3-15/16 | 12 |
| ** D1634028 | 7/16 | .4375 | 4-1/16 | 12 |
| ** D1634029 | 29/64 | .4531 | 4-3/16 | 12 |
| ** D1634030 | 15/32 | .4688 | 4-5/16 | 12 |
| ** D1634031 | 31/64 | .4844 | 4-3/8 | 12 |
| ** D1634032 | 1/2 | .5000 | 4-1/2 | 12 |

* 10per package
** 5per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

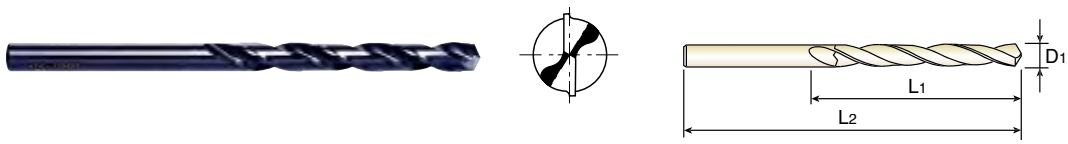
| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | ○ |

# AIRCRAFT DRILLS

**D1632 SERIES**
**D1635 SERIES**

## HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

- **Flute Geometry** : Right hand spiral, 30° helix
- **Point Angle** : 135° : Split point
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.




HSS | NAS 907 | N 30° | 135° P.216

### ▶ Letter sizes

Unit : Inch

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1632101 | A | .2340 | 2-5/8 | 6 |
| ** D1632102 | B | ,2380 | 2-3/4 | 6 |
| ** D1632103 | C | .2420 | 2-3/4 | 6 |
| ** D1632104 | D | .2460 | 2-3/4 | 6 |
| ** D1632105 | E | .2500 | 2-3/4 | 6 |
| ** D1632106 | F | .2570 | 2-7/8 | 6 |
| ** D1632107 | G | .2610 | 2-7/8 | 6 |
| ** D1632108 | H | .2660 | 2-7/8 | 6 |
| ** D1632109 | I | .2720 | 2-7/8 | 6 |
| ** D1632110 | J | .2770 | 2-7/8 | 6 |
| ** D1632111 | K | .2810 | 2-15/16 | 6 |
| ** D1632112 | L | .2900 | 2-15/16 | 6 |
| ** D1632113 | M | .2950 | 3-1/16 | 6 |
| ** D1632114 | N | .3020 | 3-1/16 | 6 |
| ** D1632115 | O | .3160 | 3-3/16 | 6 |
| ** D1632116 | P | .3230 | 3-5/16 | 6 |
| ** D1632117 | Q | .3320 | 3-7/16 | 6 |
| ** D1632118 | R | .3390 | 3-7/16 | 6 |
| ** D1632119 | S | .3480 | 3-1/2 | 6 |
| ** D1632120 | T | .3580 | 3-1/2 | 6 |
| ** D1632121 | U | .3680 | 3-5/8 | 6 |
| ** D1632122 | V | .3770 | 3-5/8 | 6 |
| ** D1632123 | W | .3860 | 3-3/4 | 6 |
| ** D1632124 | X | .3970 | 3-3/4 | 6 |
| ** D1632125 | Y | .4040 | 3-7/8 | 6 |
| ** D1632126 | Z | .4130 | 3-7/8 | 6 |

| EDP No. | Diameter Letter | Diameter Decimal | Flute Length | Overall Length |
|---|---|---|---|---|
| | D1 | | L1 | L2 |
| * D1635101 | A | .2340 | 2-5/8 | 12 |
| ** D1635102 | B | ,2380 | 2-3/4 | 12 |
| ** D1635103 | C | .2420 | 2-3/4 | 12 |
| ** D1635104 | D | .2460 | 2-3/4 | 12 |
| ** D1635105 | E | .2500 | 2-3/4 | 12 |
| ** D1635106 | F | .2570 | 2-7/8 | 12 |
| ** D1635107 | G | .2610 | 2-7/8 | 12 |
| ** D1635108 | H | .2660 | 2-7/8 | 12 |
| ** D1635109 | I | .2720 | 2-7/8 | 12 |
| ** D1635110 | J | .2770 | 2-7/8 | 12 |
| ** D1635111 | K | .2810 | 2-15/16 | 12 |
| ** D1635112 | L | .2900 | 2-15/16 | 12 |
| ** D1635113 | M | .2950 | 3-1/16 | 12 |
| ** D1635114 | N | .3020 | 3-1/16 | 12 |
| ** D1635115 | O | .3160 | 3-3/16 | 12 |
| ** D1635116 | P | .3230 | 3-5/16 | 12 |
| ** D1635117 | Q | .3320 | 3-7/16 | 12 |
| ** D1635118 | R | .3390 | 3-7/16 | 12 |
| ** D1635119 | S | .3480 | 3-1/2 | 12 |
| ** D1635120 | T | .3580 | 3-1/2 | 12 |
| ** D1635121 | U | .3680 | 3-5/8 | 12 |
| ** D1635122 | V | .3770 | 3-5/8 | 12 |
| ** D1635123 | W | .3860 | 3-3/4 | 12 |
| ** D1635124 | X | .3970 | 3-3/4 | 12 |
| ** D1635125 | Y | .4040 | 3-7/8 | 12 |
| ** D1635126 | Z | .4130 | 3-7/8 | 12 |

▶ **Tolerance** : See page 210

* 10per package
** 5per package

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | ○ | ○ | | ○ |

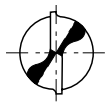
# AIRCRAFT DRILLS

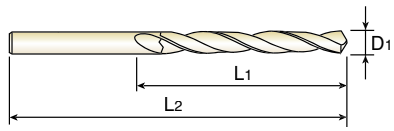
**D1633 SERIES**
**D1636 SERIES**

## HSS, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT STEAM OXIDE

- **Flute Geometry** : Right hand spiral, 30° helix
- **Point Angle** : 135° : Split point
- **Application** : Improved chip removal in most materials, especially in deep drilling applications.








HSS | NAS 907 | N 30° | 135° | P.216

### ▶ Wire gauge sizes

Unit : Inch

| EDP No. | Diameter | | Flute Length | Overall Length |
|---|---|---|---|---|
| | Wire gauge | Decimal | D1 | |
| | | | L1 | L2 |
| * D1633256 | 1 | .2280 | 2-5/8 | 6 |
| * D1633255 | 2 | .2210 | 2-5/8 | 6 |
| * D1633254 | 3 | .2130 | 2-1/2 | 6 |
| * D1633253 | 4 | .2090 | 2-1/2 | 6 |
| * D1633252 | 5 | .2055 | 2-1/2 | 6 |
| * D1633251 | 6 | .2040 | 2-1/2 | 6 |
| * D1633250 | 7 | .2010 | 2-7/16 | 6 |
| * D1633249 | 8 | .1990 | 2-7/16 | 6 |
| * D1633248 | 9 | .1960 | 2-7/16 | 6 |
| * D1633247 | 10 | .1935 | 2-7/16 | 6 |
| * D1633246 | 11 | .1910 | 2-5/16 | 6 |
| * D1633245 | 12 | .1890 | 2-5/16 | 6 |
| * D1633244 | 13 | .1850 | 2-5/16 | 6 |
| * D1633243 | 14 | .1820 | 2-3/16 | 6 |
| * D1633242 | 15 | .1800 | 2-3/16 | 6 |
| * D1633241 | 16 | .1770 | 2-3/16 | 6 |
| * D1633240 | 17 | .1730 | 2-3/16 | 6 |
| * D1633239 | 18 | .1695 | 2-1/8 | 6 |
| * D1633238 | 19 | .1660 | 2-1/8 | 6 |
| * D1633237 | 20 | .1610 | 2-1/8 | 6 |
| * D1633236 | 21 | .1590 | 2-1/8 | 6 |
| * D1633235 | 22 | .1570 | 2 | 6 |
| * D1633234 | 23 | .1540 | 2 | 6 |
| * D1633233 | 24 | .1520 | 2 | 6 |
| * D1633232 | 25 | .1495 | 1-7/8 | 6 |
| * D1633231 | 26 | .1470 | 1-7/8 | 6 |
| * D1633230 | 27 | .1440 | 1-7/8 | 6 |
| * D1633229 | 28 | .1405 | 1-3/4 | 6 |
| * D1633228 | 29 | .1360 | 1-3/4 | 6 |
| * D1633227 | 30 | .1280 | 1-5/8 | 6 |
| * D1633226 | 31 | .1200 | 1-5/8 | 6 |
| * D1633225 | 32 | .1160 | 1-5/8 | 6 |
| * D1633224 | 33 | .1130 | 1-1/2 | 6 |
| * D1633223 | 34 | .1110 | 1-1/2 | 6 |
| * D1633222 | 35 | .1100 | 1-1/2 | 6 |
| * D1633221 | 36 | .1065 | 1-7/16 | 6 |
| * D1633220 | 37 | .1040 | 1-7/16 | 6 |
| * D1633219 | 38 | .1015 | 1-7/16 | 6 |
| * D1633218 | 39 | .0995 | 1-3/8 | 6 |
| * D1633217 | 40 | .0980 | 1-3/8 | 6 |
| * D1633216 | 41 | .0960 | 1-3/8 | 6 |
| * D1633215 | 42 | .0935 | 1-1/4 | 6 |
| * D1633214 | 43 | .0890 | 1-1/4 | 6 |
| * D1636256 | 1 | .2280 | 2-5/8 | 12 |
| * D1636254 | 3 | .2130 | 2-1/2 | 12 |

* 10per package

| Tolerance Diameter (Inch) | |
|---|---|
| up to 1/8(.1250) | 0 ~ −.0005 |
| over 1/8(.1250) up to 1/4(.2500) | 0 ~ −.0007 |
| over 1/4(.2500) up to 1/2(.5000) | 0 ~ −.0010 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | ○ | ○ | | ○ |

# AIRCRAFT DRILLS

## RECOMMENDED CUTTING CONDITIONS

## HSS & HSSCo5, AIRCRAFT EXTENSION DRILL 135° SPLIT POINT

## DL601, DL602, DL603, D1631, D1632, D1633 SERIES

| WORK MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS | |
| HARDNESS | | | ~ HRc23 | | ~ HRc23 ~ 28 | | HRc23 ~ 34 | | HRc34 ~ 38 | |
| STRENGTH | ~ 570 N/mm² | | ~ 830 N/mm² | | 830 ~ 950 N/mm² | | 830 ~ 1110 N/mm² | | 1110 ~ 1260 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| ~ 3/32 | 3380 | .0010 | 2550 | .0010 | 1900 | .0006 | 2380 | .0008 | 1400 | .0006 |
| 3/32 ~ 5/32 | 2700 | .0020 | 2000 | .0020 | 1500 | .0010 | 1880 | .0020 | 1100 | .0008 |
| 11/64 ~ 1/4 | 1700 | .0025 | 1280 | .0025 | 960 | .0015 | 1190 | .0025 | 700 | .0010 |
| 17/64 ~ 23/64 | 1050 | .0051 | 780 | .0051 | 590 | .0030 | 730 | .0051 | 430 | .0015 |
| 3/8 ~ 37/64 | 750 | .0059 | 560 | .0060 | 425 | .0030 | 520 | .0070 | 310 | .0020 |
| 19/32 ~ 1 | 440 | .0090 | 330 | .0090 | 255 | .0051 | 300 | .0090 | 180 | .0020 |
| 1 ~ | 260 | .0110 | 195 | .0110 | 145 | .0070 | 180 | .0070 | 107 | .0030 |

| WORK MATERIAL | P | | M | | K | | N | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TOOL STEELS | | STAINLESS STEELS | | CAST IRON | | ALUMINUM ALLOYS | | MAGNESIUM ALLOYS | |
| HARDNESS | | | HRc23 | | ~ HRc21 | | | | | |
| STRENGTH | ~ 270 N/mm² | | 830 N/mm² | | ~ 800 N/mm² | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| ~ 3/32 | 3180 | .0016 | 2550 | .0010 | 2250 | .0010 | 6400 | .0015 | 8600 | .0015 |
| 3/32 ~ 5/32 | 2500 | .0020 | 2000 | .0020 | 2000 | .0020 | 5000 | .0025 | 6800 | .0025 |
| 11/64 ~ 1/4 | 1590 | .0025 | 1280 | .0025 | 1280 | .0025 | 3200 | .0030 | 4300 | .0030 |
| 17/64 ~ 23/64 | 970 | .0051 | 780 | .0051 | 780 | .0051 | 2000 | .0070 | 2600 | .0070 |
| 3/8 ~ 37/64 | 700 | .0070 | 560 | .0060 | 560 | .0060 | 1400 | .0078 | 1900 | .0078 |
| 19/32 ~ 1 | 440 | .0090 | 330 | .0090 | 330 | .0090 | 820 | .0118 | 1100 | .0118 |
| 1 ~ | 240 | .1180 | 195 | .0110 | 195 | .0110 | 490 | .0150 | 660 | .0150 |

| WORK MATERIAL | N | | N | | S | |
|---|---|---|---|---|---|---|
| | ZINC ALLOYS | | PLASTIC | | TITANIUM ALLOYS | |
| HARDNESS | | | | | | |
| STRENGTH | | | | | 410 N/mm² | |
| DIAMETER | N | S | N | S | N | S |
| ~ 3/32 | 6400 | .0015 | 3380 | .0010 | 1400 | .0008 |
| 3/32 ~ 5/32 | 5000 | .0025 | 2700 | .0020 | 1100 | .0010 |
| 11/64 ~ 1/4 | 3200 | .0030 | 1700 | .0025 | 700 | .0015 |
| 17/64 ~ 23/64 | 2000 | .0070 | 1050 | .0051 | 430 | .0030 |
| 3/8 ~ 37/64 | 1400 | .0078 | 750 | .0060 | 430 | .0030 |
| 19/32 ~ 1 | 820 | .0118 | 440 | .0090 | 180 | .0051 |
| 1 ~ | 490 | .0150 | 260 | .0110 | 107 | .0070 |

N = R.P.M
S =Inch per Revolution (inch/rev.)

HSS

Being the best through innovation



# SILVER & DEMING DRILLS

- 118° Split Point
  3 Flats Black and Gold

# HSS SILVER & DEMING DRILLS

118° Split Point

3 Flat Black and Gold

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **D1191** |  | HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS | D1/2 | D1-1/2 | **220** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **221** |

◎ : Excellent ○ : Good

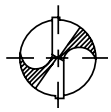
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | |

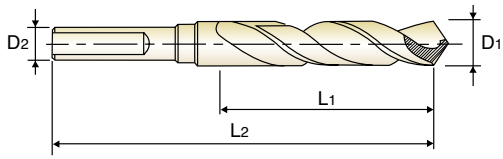
# SILVER & DEMING DRILLS

D1191 SERIES

## HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS








ANSI HSS 30~35° h8 118° P.221

Unit : Inch

| EDP No. | Diameter D1 | Shank Diameter D2 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| D1191032 | 1/2 | 1/2 | 3 | 6 |
| D1191033 | 33/64 | 1/2 | 3 | 6 |
| D1191034 | 17/32 | 1/2 | 3 | 6 |
| D1191035 | 35/64 | 1/2 | 3 | 6 |
| D1191036 | 9/16 | 1/2 | 3 | 6 |
| D1191037 | 37/64 | 1/2 | 3 | 6 |
| D1191038 | 19/32 | 1/2 | 3 | 6 |
| D1191039 | 39/64 | 1/2 | 3 | 6 |
| D1191040 | 5/8 | 1/2 | 3 | 6 |
| D1191041 | 41/64 | 1/2 | 3 | 6 |
| D1191042 | 21/32 | 1/2 | 3 | 6 |
| D1191043 | 43/64 | 1/2 | 3 | 6 |
| D1191044 | 11/16 | 1/2 | 3 | 6 |
| D1191045 | 45/64 | 1/2 | 3 | 6 |
| D1191046 | 23/32 | 1/2 | 3 | 6 |
| D1191047 | 47/64 | 1/2 | 3 | 6 |
| D1191048 | 3/4 | 1/2 | 3 | 6 |
| D1191049 | 49/64 | 1/2 | 3 | 6 |
| D1191050 | 25/32 | 1/2 | 3 | 6 |
| D1191051 | 51/64 | 1/2 | 3 | 6 |
| D1191052 | 13/16 | 1/2 | 3 | 6 |
| D1191053 | 53/64 | 1/2 | 3 | 6 |
| D1191054 | 27/32 | 1/2 | 3 | 6 |
| D1191055 | 55/64 | 1/2 | 3 | 6 |
| D1191056 | 7/8 | 1/2 | 3 | 6 |
| D1191057 | 57/64 | 1/2 | 3 | 6 |
| D1191058 | 29/32 | 1/2 | 3 | 6 |
| D1191059 | 59/64 | 1/2 | 3 | 6 |
| D1191060 | 15/16 | 1/2 | 3 | 6 |

| EDP No. | Diameter D1 | Shank Diameter D2 | Flute Length L1 | Overall Length L2 |
|---|---|---|---|---|
| D1191061 | 61/64 | 1/2 | 3 | 6 |
| D1191062 | 31/32 | 1/2 | 3 | 6 |
| D1191063 | 63/64 | 1/2 | 3 | 6 |
| D1191064 | 1 | 1/2 | 3 | 6 |
| D1191101 | 1-1/64 | 1/2 | 3 | 6 |
| D1191102 | 1-1/32 | 1/2 | 3 | 6 |
| D1191103 | 1-3/64 | 1/2 | 3 | 6 |
| D1191104 | 1-1/16 | 1/2 | 3 | 6 |
| D1191105 | 1-5/64 | 1/2 | 3 | 6 |
| D1191106 | 1-3/32 | 1/2 | 3 | 6 |
| D1191107 | 1-7/64 | 1/2 | 3 | 6 |
| D1191108 | 1-1/8 | 1/2 | 3 | 6 |
| D1191109 | 1-9/64 | 1/2 | 3 | 6 |
| D1191110 | 1-5/32 | 1/2 | 3 | 6 |
| D1191111 | 1-11/64 | 1/2 | 3 | 6 |
| D1191112 | 1-3/16 | 1/2 | 3 | 6 |
| D1191113 | 1-13/64 | 1/2 | 3 | 6 |
| D1191114 | 1-7/32 | 1/2 | 3 | 6 |
| D1191115 | 1-15/64 | 1/2 | 3 | 6 |
| D1191116 | 1-1/4 | 1/2 | 3 | 6 |
| D1191118 | 1-9/32 | 1/2 | 3 | 6 |
| D1191120 | 1-5/16 | 1/2 | 3 | 6 |
| D1191122 | 1-11/32 | 1/2 | 3 | 6 |
| D1191124 | 1-3/8 | 1/2 | 3 | 6 |
| D1191126 | 1-13/32 | 1/2 | 3 | 6 |
| D1191128 | 1-7/16 | 1/2 | 3 | 6 |
| D1191130 | 1-15/32 | 1/2 | 3 | 6 |
| D1191132 | 1-1/2 | 1/2 | 3 | 6 |

* Individually packaged

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | | | | |

# HSS(M2), 118° SPLIT POINT 3FLAT BLACK&GOLD SILVER & DEMING DRILLS

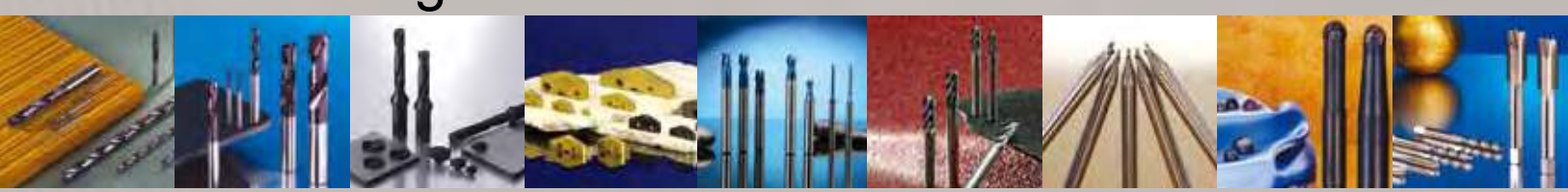
## D1191 SERIES

| WORK MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS | | TOOL STEELS | |
| HARDNESS | | | ~ HRc23 | | ~ HRc23 ~ 28 | | HRc23 ~ 34 | | HRc34 ~ 38 | | | |
| STRENGTH | ~ 570 N/mm² | | ~ 830 N/mm² | | 830 ~ 950 N/mm² | | 830 ~ 1110 N/mm² | | 1110 ~ 1260 N/mm² | | ~ 270 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S |
| 1/2 | 645 | .0067 | 480 | .0067 | 370 | .0035 | 440 | .0067 | 265 | .0020 | 645 | .0067 |
| 3/4 | 440 | .0091 | 330 | .0091 | 255 | .0051 | 300 | .0091 | 180 | .0020 | 440 | .0091 |
| 1 | 325 | .0110 | 245 | .0110 | 185 | .0063 | 220 | .0110 | 133 | .0030 | 325 | .0110 |
| 1-9/32 | 260 | .0110 | 195 | .0110 | 145 | .0071 | 180 | .0110 | 107 | .0030 | 240 | .0118 |
| 1-1/2 | 220 | .0130 | 165 | .0130 | 120 | .0076 | 150 | .0130 | 90 | .0030 | 198 | .0121 |

| WORK MATERIAL | M | | N | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS | | CAST IRON | | ALUMINUM ALLOYS | | MAGNESIUM ALLOYS | | ZINC ALLOYS | | PLASTIC | |
| HARDNESS | HRc23 | | ~ HRc21 | | | | | | | | | |
| STRENGTH | 830 N/mm² | | ~ 800 N/mm² | | | | | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S |
| 1/2 | 480 | .0067 | 480 | .0067 | 1200 | .0100 | 1600 | .0100 | 1200 | .0100 | 645 | .0067 |
| 3/4 | 330 | .0091 | 330 | .0091 | 820 | .0118 | 1100 | .0118 | 820 | .0118 | 440 | .0091 |
| 1 | 245 | .0110 | 245 | .0110 | 605 | .0146 | 810 | .0150 | 605 | .0146 | 325 | .0110 |
| 1-9/32 | 195 | .0110 | 195 | .0110 | 490 | .0150 | 660 | .0150 | 490 | .0150 | 260 | .0110 |
| 1-1/2 | 165 | .0130 | 165 | .0130 | 410 | .0172 | 550 | .0180 | 410 | .0172 | 220 | .0130 |

N = R.P.M
S = Inch per Revolution(inch/rev.)

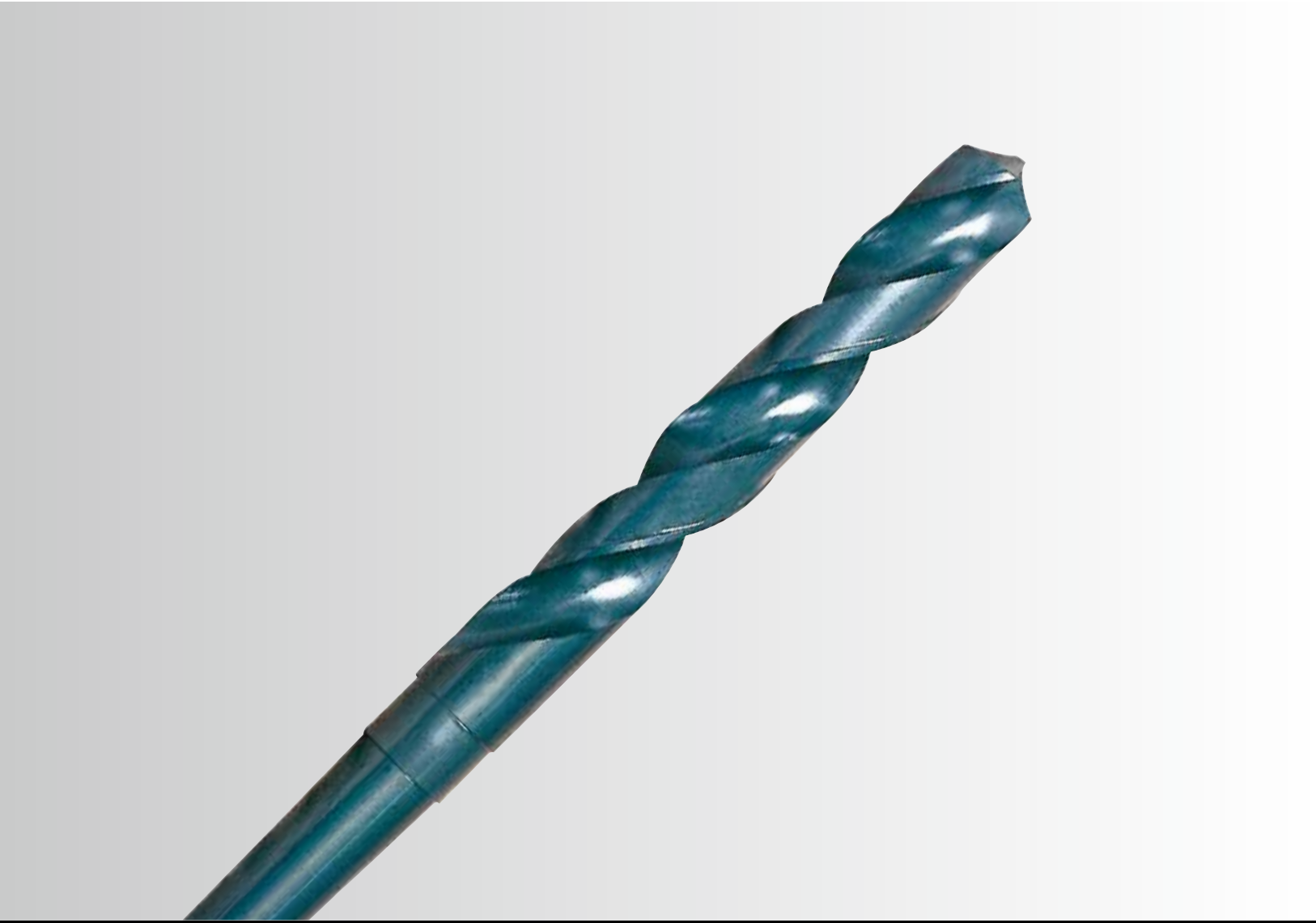
Global Cutting Tool Leader **YG-1**



HSS

YG

Being the best through innovation



# MORSE TAPER SHANK DRILLS

- General Purpose
  Standard Length

# HSS MORSE TAPER SHANK DRILLS

General Purpose

Standard Length

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| D1211 |  | HSS(M2), MORSE TAPER SHANK TWIST DRILL | D1/2 | D2-1/2 | **226** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **228** |

◎ : Excellent ○ : Good

| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | |

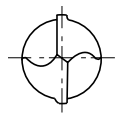
# MORSE TAPER SHANK DRILLS

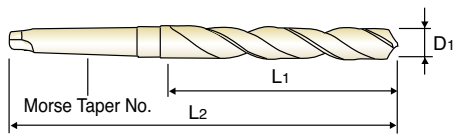
D1211 SERIES

## HSS(M2) MORSE TAPER SHANK TWIST DRILL

▶ **Surface treatment** :Steam Tempered(Black Oxide Finish)
▶ **Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.








ANSI HSS 30~35° 2~5 h8 118° P.228

Unit : Inch

| EDP No. | Diameter D1 | Flute Length L1 | Overall Length L2 | Morse Taper No. |
|---|---|---|---|---|
| D1211032 | 1/2 | 4-3/8 | 8-1/4 | 2 |
| D1211033 | 33/64 | 4-5/8 | 8-1/2 | 2 |
| D1211034 | 17/32 | 4-5/8 | 8-1/2 | 2 |
| D1211035 | 35/64 | 4-7/8 | 8-3/4 | 2 |
| D1211036 | 9/16 | 4-7/8 | 8-3/4 | 2 |
| D1211037 | 37/64 | 4-7/8 | 8-3/4 | 2 |
| D1211038 | 19/32 | 4-7/8 | 8-3/4 | 2 |
| D1211039 | 39/64 | 4-7/8 | 8-3/4 | 2 |
| D1211040 | 5/8 | 4-7/8 | 8-3/4 | 2 |
| D1211041 | 41/64 | 5-1/8 | 9 | 2 |
| D1211042 | 21/32 | 5-1/8 | 9 | 2 |
| D1211043 | 43/64 | 5-3/8 | 9-1/4 | 2 |
| D1211044 | 11/16 | 5-3/8 | 9-1/4 | 2 |
| D1211045 | 45/64 | 5-5/8 | 9-1/2 | 2 |
| D1211046 | 23/32 | 5-5/8 | 9-1/2 | 2 |
| D1211047 | 47/64 | 5-7/8 | 9-3/4 | 2 |
| D1211048 | 3/4 | 5-7/8 | 9-3/4 | 2 |
| D1211049 | 49/64 | 6 | 9-7/8 | 2 |
| D1211050 | 25/32 | 6 | 9-7/8 | 2 |
| D1211051 | 51/64 | 6-1/8 | 10-3/4 | 3 |
| D1211052 | 13/16 | 6-1/8 | 10-3/4 | 3 |
| D1211053 | 53/64 | 6-1/8 | 10-3/4 | 3 |
| D1211054 | 27/32 | 6-1/8 | 10-3/4 | 3 |
| D1211055 | 55/64 | 6-1/8 | 10-3/4 | 3 |
| D1211056 | 7/8 | 6-1/8 | 10-3/4 | 3 |
| D1211057 | 57/64 | 6-1/8 | 10-3/4 | 3 |
| D1211058 | 29/32 | 6-1/8 | 10-3/4 | 3 |
| D1211059 | 59/64 | 6-1/8 | 10-3/4 | 3 |
| D1211060 | 15/16 | 6-1/8 | 10-3/4 | 3 |

| EDP No. | Diameter D1 | Flute Length L1 | Overall Length L2 | Morse Taper No. |
|---|---|---|---|---|
| D1211061 | 61/64 | 6-3/8 | 11 | 3 |
| D1211062 | 31/32 | 6-3/8 | 11 | 3 |
| D1211063 | 63/64 | 6-3/8 | 11 | 3 |
| D1211100 | 1 | 6-3/8 | 11 | 3 |
| D1211101 | 1-1/64 | 6-1/2 | 11-1/8 | 3 |
| D1211102 | 1-1/32 | 6-1/2 | 11-1/8 | 3 |
| D1211103 | 1-3/64 | 6-5/8 | 11-1/4 | 3 |
| D1211104 | 1-1/16 | 6-5/8 | 11-1/4 | 3 |
| D1211105 | 1-5/64 | 6-7/8 | 12-1/2 | 4 |
| D1211106 | 1-3/32 | 6-7/8 | 12-1/2 | 4 |
| D1211107 | 1-7/64 | 7-1/8 | 12-3/4 | 4 |
| D1211108 | 1-1/8 | 7-1/8 | 12-3/4 | 4 |
| D1211109 | 1-9/64 | 7-1/4 | 12-7/8 | 4 |
| D1211110 | 1-5/32 | 7-1/4 | 12-7/8 | 4 |
| D1211111 | 1-11/64 | 7-3/8 | 13 | 4 |
| D1211112 | 1-3/16 | 7-3/8 | 13 | 4 |
| D1211113 | 1-13/64 | 7-1/2 | 13-1/8 | 4 |
| D1211114 | 1-7/32 | 7-1/2 | 13-1/8 | 4 |
| D1211115 | 1-15/64 | 7-7/8 | 13-1/2 | 4 |
| D1211116 | 1-1/4 | 7-7/8 | 13-1/2 | 4 |
| D1211117 | 1-17/64 | 8-1/2 | 14-1/8 | 4 |
| D1211118 | 1-9/32 | 8-1/2 | 14-1/8 | 4 |
| D1211119 | 1-19/64 | 8-5/8 | 14-1/4 | 4 |
| D1211120 | 1-5/16 | 8-5/8 | 14-1/4 | 4 |
| D1211121 | 1-21/64 | 8-3/4 | 14-3/8 | 4 |
| D1211122 | 1-11/32 | 8-3/4 | 14-3/8 | 4 |
| D1211123 | 1-23/64 | 8-7/8 | 14-1/2 | 4 |
| D1211124 | 1-3/8 | 8-7/8 | 14-1/2 | 4 |
| D1211126 | 1-13/32 | 9 | 14-5/8 | 4 |

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | ○ | | | ○ | ○ | ○ | | | | |

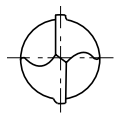
# MORSE TAPER SHANK DRILLS

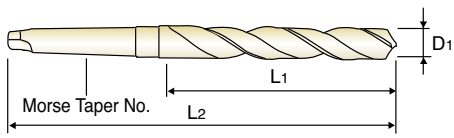
D1211 SERIES

## HSS(M2) MORSE TAPER SHANK TWIST DRILL

▶ **Surface treatment** :Steam Tempered(Black Oxide Finish)
▶ **Application** : Drilling steels, cast steels alloyed and non-alloyed, grey cast iron, malleable cast iron, graphite.








ANSI HSS 30~35° 2~5 h8 118°

P.228

Unit : Inch

| EDP No. | Diameter D1 | Flute Length L1 | Overall Length L2 | Morse Taper No. |
|---|---|---|---|---|
| D1211128 | 1-7/16 | 9-1/8 | 14-3/4 | 4 |
| D1211130 | 1-15/32 | 9-1/4 | 14-7/8 | 4 |
| D1211132 | 1-1/2 | 9-3/8 | 15 | 4 |
| D1211133 | 1-33/64 | 9-3/8 | 16-3/8 | 4 |
| D1211134 | 1-17/32 | 9-3/8 | 16-3/8 | 5 |
| D1211136 | 1-9/16 | 9-5/8 | 16-5/8 | 5 |
| D1211138 | 1-19/32 | 9-7/8 | 16-7/8 | 5 |
| D1211140 | 1-5/8 | 10 | 17 | 5 |
| D1211142 | 1-21/32 | 10-1/8 | 17-1/8 | 5 |
| D1211144 | 1-11/16 | 10-1/8 | 17-1/8 | 5 |
| D1211146 | 1-23/32 | 10-1/8 | 17-1/8 | 5 |
| D1211148 | 1-3/4 | 10-1/8 | 17-1/8 | 5 |
| D1211152 | 1-13/16 | 10-1/8 | 17-1/8 | 5 |
| D1211154 | 1-27/32 | 10-1/8 | 17-1/8 | 5 |
| D1211156 | 1-7/8 | 10-3/8 | 17-3/8 | 5 |

| EDP No. | Diameter D1 | Flute Length L1 | Overall Length L2 | Morse Taper No. |
|---|---|---|---|---|
| D1211160 | 1-15/16 | 10-3/8 | 17-3/8 | 5 |
| D1211162 | 1-31/32 | 10-3/8 | 17-3/8 | 5 |
| D1211200 | 2 | 10-3/8 | 17-3/8 | 5 |
| D1211202 | 2-1/32 | 10-3/8 | 17-3/8 | 5 |
| D1211204 | 2-1/16 | 10-1/4 | 17-3/8 | 5 |
| D1211206 | 2-3/32 | 10-1/4 | 17-3/8 | 5 |
| D1211208 | 2-1/8 | 10-1/4 | 17-3/8 | 5 |
| D1211210 | 2-5/32 | 10-1/4 | 17-3/8 | 5 |
| D1211212 | 2-3/16 | 10-1/4 | 17-3/8 | 5 |
| D1211214 | 2-7/32 | 10-1/8 | 17-3/8 | 5 |
| D1211216 | 2-1/4 | 10-1/8 | 17-3/8 | 5 |
| D1211220 | 2-5/16 | 10-1/8 | 17-3/8 | 5 |
| D1211224 | 2-3/8 | 10-1/8 | 17-3/8 | 5 |
| D1211228 | 2-7/16 | 11-1/4 | 18-3/4 | 5 |
| D1211232 | 2-1/2 | 11-1/4 | 18-3/4 | 5 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | ○ | | | | |

# MORSE TAPER SHANK DRILLS

**RECOMMENDED CUTTING CONDITIONS**

## HSS(M2) MORSE TAPER SHANK TWIST DRILL

### D1211 SERIES

| WORK MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | CARBON STEELS | | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS | | TOOL STEELS | |
| HARDNESS | | | ~ HRc23 | | ~ HRc23 ~ 28 | | HRc23 ~ 34 | | HRc34 ~ 38 | | | |
| STRENGTH | ~ 570 N/mm² | | ~ 830 N/mm² | | 830 ~ 950 N/mm² | | 830 ~ 1110 N/mm² | | 1110 ~ 1260 N/mm² | | ~ 270 N/mm² | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S |
| 1/2 | 645 | .0067 | 480 | .0067 | 370 | .0035 | 440 | .0067 | 265 | .0020 | 645 | .0067 |
| 3/4 | 440 | .0091 | 330 | .0091 | 255 | .0051 | 300 | .0091 | 180 | .0020 | 440 | .0091 |
| 1 | 325 | .0110 | 245 | .0110 | 185 | .0063 | 220 | .0110 | 133 | .0030 | 325 | .0110 |
| 1-17/64 | 260 | .0110 | 195 | .0110 | 145 | .0071 | 180 | .0110 | 107 | .0030 | 240 | .0118 |
| 1-1/2 | 220 | .0130 | 165 | .0130 | 120 | .0076 | 150 | .0130 | 90 | .0030 | 198 | .0121 |
| 1-31/32 | 165 | .0130 | 125 | .0130 | 93 | .0079 | 115 | .0130 | 68 | .0030 | 150 | .0169 |
| 2-3/8 | 140 | .0157 | 105 | .0157 | 78 | .0091 | 95 | .0157 | 57 | .0039 | 125 | .0188 |

| WORK MATERIAL | M | | K | | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS | | CAST IRON | | ALUMINUM ALLOYS | | MAGNESIUM ALLOYS | | ZINC ALLOYS | | PLASTIC | |
| HARDNESS | HRc23 | | ~ HRc21 | | | | | | | | | |
| STRENGTH | 830 N/mm² | | ~ 800 N/mm² | | | | | | | | | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S | N | S |
| 1/2 | 480 | .0067 | 480 | .0067 | 1200 | .0100 | 1600 | .0100 | 1200 | .0100 | 645 | .0067 |
| 3/4 | 330 | .0091 | 330 | .0091 | 820 | .0118 | 1100 | .0118 | 820 | .0118 | 440 | .0091 |
| 1 | 245 | .0110 | 245 | .0110 | 605 | .0146 | 810 | .0150 | 605 | .0146 | 325 | .0110 |
| 1-17/64 | 195 | .0110 | 195 | .0110 | 490 | .0150 | 660 | .0150 | 490 | .0150 | 260 | .0110 |
| 1-1/2 | 165 | .0130 | 165 | .0130 | 410 | .0172 | 550 | .0180 | 410 | .0172 | 220 | .0130 |
| 1-31/32 | 125 | .0130 | 125 | .0130 | 310 | .0181 | 415 | .0181 | 310 | .0181 | 165 | .0130 |
| 2-3/8 | 105 | .0157 | 105 | .0157 | 260 | .0196 | 345 | .0196 | 260 | .0196 | 140 | .0157 |

N = R.P.M
S = Inch per Revolution (inch/rev.)

# HSS

Being the best through innovation





# NC SPOTTING DRILLS

- HSS(8% COBALT)
  Centering and Chamfering of Holes

## HSS(8% Cobalt) NC SPOTTING DRILLS
Centering and Chamfering of Holes

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **D2N90** |  | HSSCo8, NC SPOTTING DRILLS 90° | D1/8 | D1 | **232** |
| |  | HSSCo8, NC SPOTTING DRILLS 120° | D1/8 | D1 | **232** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **233** |

◎ : Excellent ○ : Good

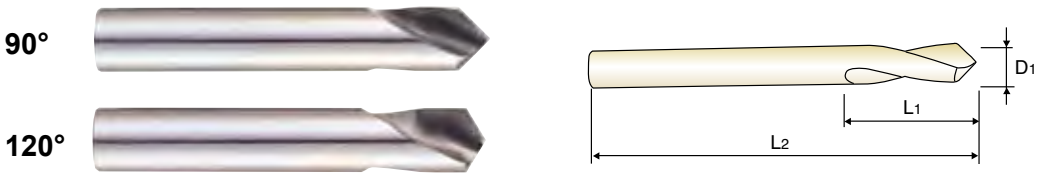
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | ○ | | |
| ◎ | ◎ | | | | ○ | | ○ | | ○ | | |

# NC SPOTTING DRILLS

**D2N90 SERIES**

## HSSCo8, NC SPOTTING DRILLS

▶ **Application** : For more precise centering work on NC/CNC machine. A larger diameter in respect to the subsequent drilling tool permit to obtain the centering and chamfering simultaneously.




NC | HSS Co8 | h6 | h6 | 90° | 120° | P.233

### NC Spotting drills 90°

Unit : Inch

| EDP No. | Diameter | Flute Length | Overall Length |
|---|---|---|---|
| | D1 | L1 | L2 |
| 0081L | 1/8 | .472 | 1.93 |
| 0121L | 3/16 | .590 | 2.44 |
| 0161L | 1/4 | .669 | 2.76 |
| 0201L | 5/16 | .984 | 3.11 |
| 0241L | 3/8 | .827 | 3.50 |
| 0321L | 1/2 | .984 | 4.02 |
| 0401L | 5/8 | 1.575 | 4.53 |
| 0481L | 3/4 | 1.968 | 5.16 |
| 0641L | 1 | 1.968 | 6.14 |

### NC Spotting drills 120°

| EDP No. | Diameter | Flute Length | Overall Length |
|---|---|---|---|
| | D1 | L1 | L2 |
| 2081L | 1/8 | .472 | 1.93 |
| 2121L | 3/16 | .590 | 2.44 |
| 2161L | 1/4 | .669 | 2.76 |
| 2201L | 5/16 | .984 | 3.11 |
| 2241L | 3/8 | .827 | 3.50 |
| 2321L | 1/2 | .984 | 4.02 |
| 2401L | 5/8 | 1.575 | 4.53 |
| 2481L | 3/4 | 1.968 | 5.16 |
| 2641L | 1 | 1.968 | 6.14 |

* Individually packaged

◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | | ○ | | ○ | | |

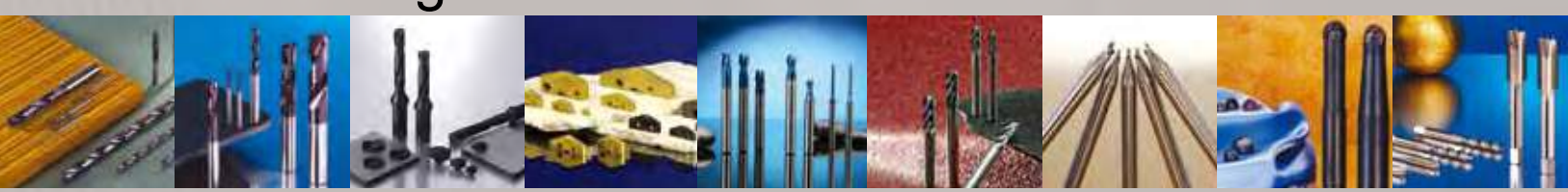
## HSSCo8, NC SPOTTING DRILLS

### D2N90 SERIES

| WORK MATERIAL | P | | | | | | M | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | ALLOY STEELS, TOOL STEELS, HARDENED STEELS | | STAINLESS STEELS | | ALUMINUM, ALUMINUM ALLOYS | |
| DIAMETER | N | S | N | S | N | S | N | S | N | S |
| 1/8 ~ 5/32 | 2460 | .002 | 2110 | .002 | 1080 | .002 | 940 | .002 | 7040 | .005 |
| 11/64 ~ 3/16 | 1850 | .002 | 1580 | .002 | 800 | .002 | 700 | .002 | 5280 | .006 |
| 13/64 ~ 15/64 | 1510 | .003 | 1300 | .003 | 670 | .003 | 580 | .003 | 4400 | .006 |
| 1/4 ~ 5/16 | 1170 | .003 | 1030 | .003 | 540 | .003 | 460 | .003 | 3520 | .007 |
| 21/64 ~ 25/64 | 880 | .004 | 790 | .004 | 400 | .004 | 350 | .004 | 2640 | .008 |
| 13/32 ~ 15/32 | 700 | .004 | 630 | .004 | 320 | .004 | 290 | .004 | 2110 | .009 |
| 31/64 ~ 5/8 | 590 | .005 | 530 | .005 | 260 | .005 | 240 | .005 | 1760 | .011 |
| 41/64 ~ 47/64 | 460 | .007 | 400 | .007 | 200 | .007 | 180 | .007 | 1320 | .012 |
| 3/4 ~ 1 | 350 | .009 | 320 | .009 | 150 | .009 | 140 | .009 | 1060 | .017 |

N = R.P.M
S = Inch per Revolution (inch/rev.)

Global Cutting Tool Leader **YG-1**



HSS

Being the best through innovation



# COMBINATION DRILL & COUNTER SINK / CENTER DRILL

- Regular and Long Length

## HSS COMBINATION DRILL & COUNTER SINK / CENTER DRILL
Regular and Long Length


| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| D1C90 |  | HSS(M2), COMBINATION DRILL & COUNTER SINK / CENTER DRILL | D3/64 | D7/32 | **238** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **238** |

◎ : Excellent ○ : Good

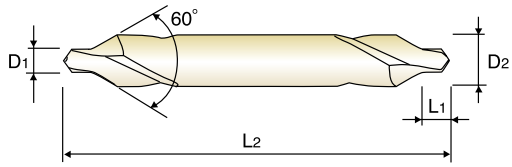
| P | | | | H | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | ○ | ○ | | ○ |

# COMBINATION DRILL & COUNTER SINK

D1C90 SERIES

## HSS(M2), COMBINATION DRILL & COUNTER SINK / CENTER DRILL






HSS | h8 | k12 | 120° P.238

### 60°

| EDP No. | Size | Diameter | Shank Diameter | Drill Length | Overall Length |
|---|---|---|---|---|---|
| | | D1 | D2 | L1 | L2 |
| * D1C90079 | 1 | 3/64 | 1/8 | 1/16 | 1-1/2 |
| * D1C90080 | 2 | 1/16 | 3/16 | 5/64 | 1-3/4 |
| * D1C90081 | 3 | 3/32 | 1/4 | 1/8 | 2 |
| * D1C90082 | 4 | 1/8 | 5/16 | 5/32 | 2-1/4 |
| * D1C90083 | 5 | 3/16 | 7/16 | 1/4 | 2-1/2 |
| ★ D1C90084 | 6 | 7/32 | 1/2 | 7/32 | 3 |

* 10per package
★ Individually package

### 60°

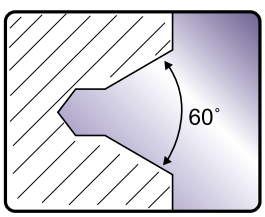
| EDP No. | Size | Diameter | Shank Diameter | Drill Length | Overall Length |
|---|---|---|---|---|---|
| | | D1 | D2 | L1 | L2 |
| * D1C90141 | 1 | 3/64 | 1/8 | 3/64 | 1-1/4 |
| * D1C90142 | 2 | 5/64 | 3/16 | 5/64 | 1-7/8 |
| * D1C90143 | 3 | 7/64 | 1/4 | 7/64 | 2 |
| * D1C90144 | 4 | 1/8 | 5/16 | 1/8 | 2-1/8 |
| * D1C90145 | 5 | 3/16 | 7/16 | 3/16 | 2-3/4 |

* 10per package

### LONG LENGTH (60°)

Unit : Inch

| EDP No. | Size | Diameter | Shank Diameter | Drill Length | Overall Length |
|---|---|---|---|---|---|
| | | D1 | D2 | L1 | L2 |
| D1C90085 | 1 | 3/64 | 1/8 | 3/64 | 3 |
| D1C90086 | 1 | 3/64 | 1/8 | 3/64 | 4 |
| D1C90087 | 1 | 3/64 | 1/8 | 3/64 | 5 |
| D1C90088 | 1 | 3/64 | 1/8 | 3/64 | 6 |
| D1C90089 | 2 | 5/64 | 3/16 | 5/64 | 3 |
| D1C90090 | 2 | 5/64 | 3/16 | 5/64 | 4 |
| D1C90091 | 2 | 5/64 | 3/16 | 5/64 | 5 |
| D1C90092 | 2 | 5/64 | 3/16 | 5/64 | 6 |
| D1C90093 | 3 | 7/64 | 1/4 | 7/64 | 4 |
| D1C90094 | 3 | 7/64 | 1/4 | 7/64 | 5 |
| D1C90095 | 3 | 7/64 | 1/4 | 7/64 | 6 |
| D1C90096 | 4 | 1/8 | 5/16 | 1/8 | 4 |
| D1C90097 | 4 | 1/8 | 5/16 | 1/8 | 5 |
| D1C90098 | 4 | 1/8 | 5/16 | 1/8 | 6 |
| D1C90099 | 5 | 3/16 | 7/16 | 3/16 | 4 |
| D1C90100 | 5 | 3/16 | 7/16 | 3/16 | 5 |
| D1C90101 | 5 | 3/16 | 7/16 | 3/16 | 6 |
| D1C90102 | 6 | 7/32 | 1/2 | 7/32 | 4 |
| D1C90103 | 6 | 7/32 | 1/2 | 7/32 | 5 |
| D1C90104 | 6 | 7/32 | 1/2 | 7/32 | 6 |




◎ : Excellent ○ : Good

| P | | | H | | M | K | N | | | | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | Stainless Steels | Cast Iron | Aluminum | Copper | Bronze | CFRP | Titanium |
| ~HB225 | HB225~325 | HRc30~45 | HRc45~55 | HRc55~ | | | | | | | |
| ◎ | ◎ | | | | ○ | ○ | ○ | ○ | ○ | | ○ |

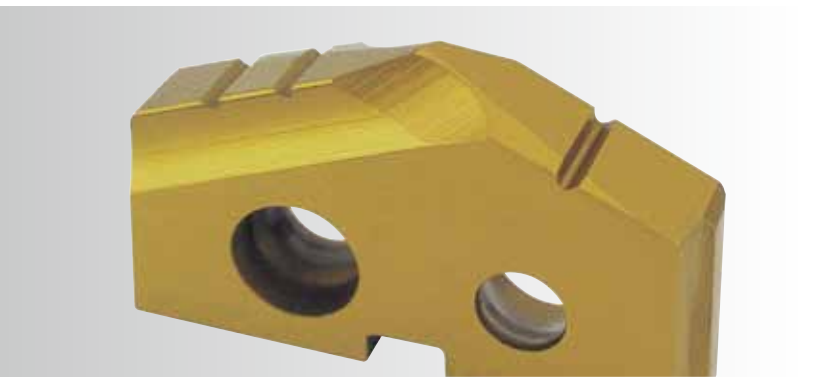
YG

Being the best through innovation

## INSERTS & HOLDERS









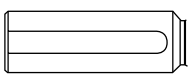
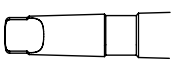
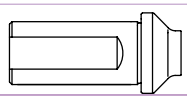




# SPADE DRILLS

- **Carbide for Long Tool Life, and HSS-PM for General Machines and Large Diameters Higher Productivity than Other Drilling Tools**

## SPADE DRILL INSERTS & HOLDER

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| SERIES 1~8 |  | SPADE DRILL INSERTS - HSS M4 | .7031 (#1) | 4.5000 (#8) | 242 |
| SERIES Y,Z,0,1~8 |  | SPADE DRILL INSERTS - SUPER HSS T15 | .3740 (#Y) | 4.5000 (#8) | 246 |
| SERIES Y,Z,0,1,2 |  | SPADE DRILL INSERTS - PREMIUM HSS M48 | .3740 (#Y) | 1.3780 (#2) | 253 |
| SERIES Y,Z,0,1~3 |  | CARBIDE BLADE INSERTS-C2(K20) | .3740 (#Y) | 1.8750 (#3) | 256 |
| SERIES Y,Z,0,1~3 |  | CARBIDE BLADE INSERTS-C5(P40) | .3740 (#Y) | 1.8750 (#3) | 256 |
| SERIES Y,Z,0,1~2 |  | CARBIDE BLADE INSERTS-C3(K10) | .3740 (#Y) | 1.3780 (#2) | 256 |
| SERIES Y,Z,0,1~8 |  | SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15) | .3740 (#Y) | 4.5000 (#8) | 262 |
| SERIES Y,Z,0,1~3 |  | SM-POINT SPADE DRILL INSERTS - CARBIDE(C5) | .3740 (#Y) | 1.8750 (#3) | 266 |
| SERIES Y,Z,0,1,2 |  | SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15 | .3750 (#Y) | 1.3750 (#2) | 268 |
| STRAIGHT SHANK |  | SPADE DRILL HOLDER - STRAIGHT SHANK | | | 269 |
| TAPER SHANK |  | SPADE DRILL HOLDER - TAPER SHANK | | | 273 |
| FLANGED SHANK |  | SPADE DRILL HOLDER - FLANGED SHANK | | | 275 |
| | | HOLDER ACCESSORIES | | | 277 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 278 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | ○ |
| ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| | | | | | | | | | | | | ◎ | ◎ | | |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 1,2

## SPADE DRILL INSERTS - HSS M4

- General purpose insert for most materials
- Not recommended for tool steels and high temp alloys
- High toughness for loose or manual machines

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | HSS (M4) TiN | HSS (M4) TiAlN | HSS (M4) Hardslick |
| **1** .690 (17.53) to .960 (24.38) | 45/64 | 17.86 | .7031 | 5/32 (4.0) | S01101 | S03101 | S04101 |
| | | 18.00 | .7087 | | S01102 | S03102 | S04102 |
| | 23/32 | 18.26 | .7188 | | S01103 | S03103 | S04103 |
| | | 18.50 | .7283 | | S01104 | S03104 | S04104 |
| | 47/64 | 18.65 | .7344 | | S01105 | S03105 | S04105 |
| | | 19.00 | .7480 | | S01106 | S03106 | S04106 |
| | 3/4 | 19.05 | .7500 | | S01107 | S03107 | S04107 |
| | 49/64 | 19.45 | .7656 | | S01108 | S03108 | S04108 |
| | | 19.50 | .7677 | | S01109 | S03109 | S04109 |
| | 25/32 | 19.84 | .7813 | | S01110 | S03110 | S04110 |
| | | 20.00 | .7874 | | S01111 | S03111 | S04111 |
| | 51/64 | 20.24 | .7969 | | S01160 | S03160 | S04160 |
| | | 20.50 | .8071 | | S01112 | S03112 | S04112 |
| | 13/16 | 20.64 | .8125 | | S01113 | S03113 | S04113 |
| | | 21.00 | .8268 | | S01114 | S03114 | S04114 |
| | 27/32 | 21.43 | .8438 | | S01115 | S03115 | S04115 |
| | 55/64 | 21.83 | .8594 | | S01161 | S03161 | S04161 |
| | | 22.00 | .8661 | | S01116 | S03116 | S04116 |
| | 7/8 | 22.23 | .8750 | | S01117 | S03117 | S04117 |
| | 57/64 | 22.62 | .8906 | | S01162 | S03162 | S04162 |
| | | 23.00 | .9055 | | S01118 | S03118 | S04118 |
| | 29/32 | 23.02 | .9063 | | S01119 | S03119 | S04119 |
| | 59/64 | 23.42 | .9219 | | S01120 | S03120 | S04120 |
| | 15/16 | 23.81 | .9375 | | S01121 | S03121 | S04121 |
| | | 24.00 | .9449 | | S01122 | S03122 | S04122 |
| **2** .961 (24.41) to 1.380 (35.05) | 31/32 | 24.61 | .9688 | 3/16 (4.8) | S01201 | S03201 | S04201 |
| | 63/64 | 25.00 | .9843 | | S01202 | S03202 | S04202 |
| | 1 | 25.40 | 1.0000 | | S01203 | S03203 | S04203 |
| | 1-1/64 | 25.80 | 1.0156 | | S01204 | S03204 | S04204 |
| | | 26.00 | 1.0236 | | S01205 | S03205 | S04205 |
| | 1-1/32 | 26.19 | 1.0313 | | S01206 | S03206 | S04206 |
| | 1-3/64 | 26.59 | 1.0469 | | S01260 | S03260 | S04260 |
| | 1-1/16 | 26.99 | 1.0625 | | S01207 | S03207 | S04207 |
| | | 27.00 | 1.0630 | | S01208 | S03208 | S04208 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ |

# SPADE DRILLS

SERIES 2,3

## SPADE DRILL INSERTS - HSS M4

- General purpose insert for most materials
- Not recommended for tool steels and high temp alloys
- High toughness for loose or manual machines

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | | | | | HSS (M4) | | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | Hardslick |
| **2** .961 (24.41) to 1.380 (35.05) | 1-3/32 | 27.78 | 1.0938 | 3/16 (4.8) | SO1209 | SO3209 | SO4209 |
| | | 28.00 | 1.1024 | | SO1210 | SO3210 | SO4210 |
| | 1-7/64 | 28.18 | 1.1094 | | SO1261 | SO3261 | SO4261 |
| | 1-1/8 | 28.58 | 1.1250 | | SO1211 | SO3211 | SO4211 |
| | | 29.00 | 1.1417 | | SO1212 | SO3212 | SO4212 |
| | 1-5/32 | 29.37 | 1.1563 | | SO1213 | SO3213 | SO4213 |
| | | 30.00 | 1.1811 | | SO1214 | SO3214 | SO4214 |
| | 1-3/16 | 30.16 | 1.1875 | | SO1215 | SO3215 | SO4215 |
| | 1-7/32 | 30.96 | 1.2188 | | SO1216 | SO3216 | SO4216 |
| | | 31.00 | 1.2205 | | SO1217 | SO3217 | SO4217 |
| | 1-1/4 | 31.75 | 1.2500 | | SO1218 | SO3218 | SO4218 |
| | | 32.00 | 1.2598 | | SO1219 | SO3219 | SO4219 |
| | 1-9/32 | 32.54 | 1.2813 | | SO1220 | SO3220 | SO4220 |
| | | 33.00 | 1.2992 | | SO1221 | SO3221 | SO4221 |
| | 1-5/16 | 33.34 | 1.3125 | | SO1222 | SO3222 | SO4222 |
| | | 34.00 | 1.3386 | | SO1223 | SO3223 | SO4223 |
| | 1-11/32 | 34.13 | 1.3438 | | SO1224 | SO3224 | SO4224 |
| | 1-3/8 | 34.93 | 1.3750 | | SO1225 | SO3225 | SO4225 |
| | | 35.00 | 1.3780 | | SO1226 | SO3226 | SO4226 |
| **3** 1.353 (34.37) to 1.882 (47.80) | 1-13/32 | 35.72 | 1.4063 | 1/4 (6.4) | SO1301 | SO3301 | SO4301 |
| | | 36.00 | 1.4173 | | SO1302 | SO3302 | SO4302 |
| | 1-7/16 | 36.51 | 1.4375 | | SO1303 | SO3303 | SO4303 |
| | | 37.00 | 1.4567 | | SO1304 | SO3304 | SO4304 |
| | 1-15/32 | 37.31 | 1.4688 | | SO1305 | SO3305 | SO4305 |
| | | 38.00 | 1.4961 | | SO1306 | SO3306 | SO4306 |
| | 1-1/2 | 38.10 | 1.5000 | | SO1307 | SO3307 | SO4307 |
| | 1-17/32 | 38.89 | 1.5313 | | SO1308 | SO3308 | SO4308 |
| | | 39.00 | 1.5354 | | SO1309 | SO3309 | SO4309 |
| | 1-9/16 | 39.69 | 1.5625 | | SO1310 | SO3310 | SO4310 |
| | | 40.00 | 1.5748 | | SO1311 | SO3311 | SO4311 |
| | 1-19/32 | 40.48 | 1.5938 | | SO1312 | SO3312 | SO4312 |
| | | 41.00 | 1.6142 | | SO1313 | SO3313 | SO4313 |
| | 1-5/8 | 41.28 | 1.6250 | | SO1314 | SO3314 | SO4314 |
| | | 42.00 | 1.6535 | | SO1315 | SO3315 | SO4315 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ |

# SPADE DRILLS

SERIES 3,4

## SPADE DRILL INSERTS - HSS M4

- General purpose insert for most materials
- Not recommended for tool steels and high temp alloys
- High toughness for loose or manual machines

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | HSS (M4) TiN | HSS (M4) TiAlN | HSS (M4) Hardslick |
| **3** 1.353 (34.37) to 1.882 (47.80) | 1-21/32 | 42.07 | 1.6563 | 1/4 (6.4) | SO1316 | SO3316 | SO4316 |
| | 1-11/16 | 42.86 | 1.6875 | | SO1317 | SO3317 | SO4317 |
| | | 43.00 | 1.6929 | | SO1318 | SO3318 | SO4318 |
| | 1-23/32 | 43.66 | 1.7188 | | SO1319 | SO3319 | SO4319 |
| | | 44.00 | 1.7323 | | SO1320 | SO3320 | SO4320 |
| | 1-3/4 | 44.45 | 1.7500 | | SO1321 | SO3321 | SO4321 |
| | | 45.00 | 1.7717 | | SO1322 | SO3322 | SO4322 |
| | 1-25/32 | 45.24 | 1.7813 | | SO1323 | SO3323 | SO4323 |
| | | 46.00 | 1.8110 | | SO1324 | SO3324 | SO4324 |
| | 1-13/16 | 46.04 | 1.8125 | | SO1325 | SO3325 | SO4325 |
| | 1-27/32 | 46.83 | 1.8438 | | SO1326 | SO3326 | SO4326 |
| | | 47.00 | 1.8504 | | SO1327 | SO3327 | SO4327 |
| | 1-7/8 | 47.63 | 1.8750 | | SO1328 | SO3328 | SO4328 |
| **4** 1.850 (46.99) to 2.570 (65.28) | 1-29/32 | 48.42 | 1.9063 | 5/16 (7.9) | SO1402 | SO3402 | SO4402 |
| | 1-15/16 | 49.21 | 1.9375 | | SO1404 | SO3404 | SO4404 |
| | 1-31/32 | 50.01 | 1.9688 | | SO1406 | SO3406 | SO4406 |
| | 2 | 50.80 | 2.0000 | | SO1407 | SO3407 | SO4407 |
| | 2-1/32 | 51.59 | 2.0313 | | SO1409 | SO3409 | SO4409 |
| | 2-3/64 | 52.00 | 2.0472 | | SO1410 | SO3410 | SO4410 |
| | 2-1/16 | 52.39 | 2.0625 | | SO1411 | SO3411 | SO4411 |
| | 2-3/32 | 53.18 | 2.0938 | | SO1413 | SO3413 | SO4413 |
| | 2-1/8 | 53.98 | 2.1250 | | SO1414 | SO3414 | SO4414 |
| | 2-5/32 | 54.77 | 2.1563 | | SO1416 | SO3416 | SO4416 |
| | 2-3/16 | 55.56 | 2.1875 | | SO1418 | SO3418 | SO4418 |
| | 2-7/32 | 56.36 | 2.2188 | | SO1420 | SO3420 | SO4420 |
| | 2-1/4 | 57.15 | 2.2500 | | SO1422 | SO3422 | SO4422 |
| | 2-9/32 | 57.94 | 2.2813 | | SO1423 | SO3423 | SO4423 |
| | 2-5/16 | 58.74 | 2.3125 | | SO1425 | SO3425 | SO4425 |
| | 2-11/32 | 59.53 | 2.3438 | | SO1427 | SO3427 | SO4427 |
| | 2-3/8 | 60.33 | 2.3750 | | SO1429 | SO3429 | SO4429 |
| | 2-13/32 | 61.12 | 2.4063 | | SO1431 | SO3431 | SO4431 |
| | 2-7/16 | 61.91 | 2.4375 | | SO1432 | SO3432 | SO4432 |
| | 2-15/32 | 62.71 | 2.4688 | | SO1434 | SO3434 | SO4434 |
| | 2-1/2 | 63.50 | 2.5000 | | SO1436 | SO3436 | SO4436 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ |

# SPADE DRILLS

SERIES 4,5,6,7,8

## SPADE DRILL INSERTS - HSS M4

- General purpose insert for most materials
- Not recommended for tool steels and high temp alloys
- High toughness for loose or manual machines

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | HSS (M4) TiN | HSS (M4) TiAlN | HSS (M4) Hardslick |
| **4** | 2-17/32 | 64.29 | 2.5313 | 5/16 (7.9) | SO1438 | SO3438 | SO4438 |
| | 2-9/16 | 65.09 | 2.5625 | | SO1440 | SO3440 | SO4440 |
| **5** 2.456 (62.38) to 3.000 (76.20) | 2-1/2 | 63.50 | 2.5000 | 7/16 (11.1) | SO1501 | SO3501 | SO4501 |
| | 2-5/8 | 66.68 | 2.6250 | | SO1507 | SO3507 | SO4507 |
| | 2-3/4 | 69.85 | 2.7500 | | SO1512 | SO3512 | SO4512 |
| | 2-25/32 | 70.64 | 2.7813 | | SO1514 | SO3514 | SO4514 |
| | 2-13/16 | 71.44 | 2.8125 | | SO1515 | SO3515 | SO4515 |
| | 2-27/32 | 72.23 | 2.8438 | | SO1517 | SO3517 | SO4517 |
| | 2-7/8 | 73.03 | 2.8750 | | SO1518 | SO3518 | SO4518 |
| | 2-29/32 | 73.82 | 2.9063 | | SO1519 | SO3519 | SO4519 |
| | 2-15/16 | 74.61 | 2.9375 | | SO1521 | SO3521 | SO4521 |
| | 2-31/32 | 75.41 | 2.9688 | | SO1522 | SO3522 | SO4522 |
| | 3 | 76.20 | 3.0000 | | SO1524 | SO3524 | SO4524 |
| **6** 3.001(76.23) to 3.507(89.08) | 3-1/16 | 77.79 | 3.0625 | 7/16 (11.1) | SO1602 | SO3602 | SO4602 |
| | 3-1/8 | 79.38 | 3.1250 | | SO1605 | SO3605 | SO4605 |
| | 3-1/4 | 82.55 | 3.2500 | | SO1611 | SO3611 | SO4611 |
| | 3-3/8 | 85.73 | 3.3750 | | SO1616 | SO3616 | SO4616 |
| | 3-7/16 | 87.31 | 3.4375 | | SO1619 | SO3619 | SO4619 |
| | 3-1/2 | 88.90 | 3.5000 | | SO1622 | SO3622 | SO4622 |
| **7** 3.455 (87.76) to 4.000 (101.60) | 3-9/16 | 90.49 | 3.5625 | 7/16 (11.1) | SO1703 | SO3703 | SO4703 |
| | 3-5/8 | 92.08 | 3.6250 | | SO1706 | SO3706 | SO4706 |
| | 3-3/4 | 95.25 | 3.7500 | | SO1711 | SO3711 | SO4711 |
| | 3-7/8 | 98.43 | 3.8750 | | SO1717 | SO3717 | SO4717 |
| | 4 | 101.60 | 4.0000 | | SO1722 | SO3722 | SO4722 |
| **8** 4.001 (101.63) to 4.507 (114.48) | 4-1/8 | 104.78 | 4.1250 | 7/16 (11.1) | SO1804 | SO3804 | SO4804 |
| | 4-1/4 | 107.95 | 4.2500 | | SO1807 | SO3807 | SO4807 |
| | 4-3/8 | 111.13 | 4.3750 | | SO1811 | SO3811 | SO4811 |
| | 4-1/2 | 114.30 | 4.5000 | | SO1815 | SO3815 | SO4815 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ○ | ○ | ○ | ○ | | ○ | | ○ | ○ | | | ◎ | ◎ | ○ | ◎ | ◎ |

# SPADE DRILLS

SERIES Y,Z,0

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | SUPER COBALT(T15) TiAlN | SUPER COBALT(T15) Hardslick |
| **Y** .374 (9.50) to .436 (11.07) | | 9.50 | .3740 | 3/32 (2.4) | * S06Y01 | * S08Y01 | * S09Y01 |
| | 3/8 | 9.53 | .3750 | | * S06Y02 | * S08Y02 | * S09Y02 |
| | | 9.80 | .3860 | | * S06Y03 | * S08Y03 | * S09Y03 |
| | 25/64 | 9.92 | .3906 | | * S06Y04 | * S08Y04 | * S09Y04 |
| | | 10.00 | .3937 | | * S06Y05 | * S08Y05 | * S09Y05 |
| | | 10.20 | .4016 | | * S06Y06 | * S08Y06 | * S09Y06 |
| | 13/32 | 10.32 | .4063 | | * S06Y07 | * S08Y07 | * S09Y07 |
| | | 10.50 | .4134 | | * S06Y08 | * S08Y08 | * S09Y08 |
| | 27/64 | 10.72 | .4219 | | * S06Y09 | * S08Y09 | * S09Y09 |
| | | 10.80 | .4252 | | * S06Y10 | * S08Y10 | * S09Y10 |
| | | 11.00 | .4331 | | * S06Y11 | * S08Y11 | * S09Y11 |
| **Z** .437 (11.11) to .510 (12.95) | 7/16 | 11.11 | .4375 | 3/32 (2.4) | * S06Z01 | * S08Z01 | * S09Z01 |
| | | 11.50 | .4528 | | * S06Z02 | * S08Z02 | * S09Z02 |
| | 29/64 | 11.51 | .4531 | | * S06Z03 | * S08Z03 | * S09Z03 |
| | 15/32 | 11.91 | .4688 | | * S06Z04 | * S08Z04 | * S09Z04 |
| | | 12.00 | .4724 | | * S06Z05 | * S08Z05 | * S09Z05 |
| | 31/64 | 12.30 | .4844 | | * S06Z06 | * S08Z06 | * S09Z06 |
| | | 12.50 | .4921 | | * S06Z07 | * S08Z07 | * S09Z07 |
| | 1/2 | 12.70 | .5000 | | * S06Z08 | * S08Z08 | * S09Z08 |
| **0** .511 (12.98) to .695 (17.65) | | 13.00 | .5118 | 1/8 (3.2) | * S06001 | * S08001 | * S09001 |
| | 33/64 | 13.10 | .5156 | | * S06002 | * S08002 | * S09002 |
| | 17/32 | 13.49 | .5313 | | * S06003 | * S08003 | * S09003 |
| | | 13.50 | .5315 | | * S06004 | * S08004 | * S09004 |
| | 35/64 | 13.89 | .5469 | | * S06060 | * S08060 | * S09060 |
| | | 14.00 | .5512 | | * S06005 | * S08005 | * S09005 |
| | 9/16 | 14.29 | .5625 | | * S06006 | * S08006 | * S09006 |
| | | 14.50 | .5709 | | * S06007 | * S08007 | * S09007 |
| | 37/64 | 14.68 | .5781 | | * S06008 | * S08008 | * S09008 |
| | | 15.00 | .5906 | | * S06009 | * S08009 | * S09009 |
| | 19/32 | 15.08 | .5938 | | * S06010 | * S08010 | * S09010 |
| | 39/64 | 15.48 | .6094 | | * S06061 | * S08061 | * S09061 |
| | | 15.50 | .6102 | | * S06011 | * S08011 | * S09011 |
| | 5/8 | 15.88 | .6250 | | * S06012 | * S08012 | * S09012 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 0,1

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | TiAlN | Hardslick |
| **0** .511 (12.98) to .695 (17.65) | | 16.00 | .6299 | 1/8 (3.2) | * SO6013 | * SO8013 | * SO9013 |
| | 41/64 | 16.27 | .6406 | | * SO6062 | * SO8062 | * SO9062 |
| | | 16.50 | .6496 | | * SO6014 | * SO8014 | * SO9014 |
| | 21/32 | 16.67 | .6563 | | * SO6015 | * SO8015 | * SO9015 |
| | | 17.00 | .6693 | | * SO6016 | * SO8016 | * SO9016 |
| | 43/64 | 17.07 | .6719 | | * SO6063 | * SO8063 | * SO9063 |
| | 11/16 | 17.46 | .6875 | | * SO6017 | * SO8017 | * SO9017 |
| | | 17.50 | .6890 | | * SO6018 | * SO8018 | * SO9018 |
| **1** .690 (17.53) to .960 (24.38) | 45/64 | 17.86 | .7031 | 5/32 (4.0) | SO6101 | SO8101 | SO9101 |
| | | 18.00 | .7087 | | SO6102 | SO8102 | SO9102 |
| | 23/32 | 18.26 | .7188 | | SO6103 | SO8103 | SO9103 |
| | | 18.50 | .7283 | | SO6104 | SO8104 | SO9104 |
| | 47/64 | 18.65 | .7344 | | SO6105 | SO8105 | SO9105 |
| | | 19.00 | .7480 | | SO6106 | SO8106 | SO9106 |
| | 3/4 | 19.05 | .7500 | | SO6107 | SO8107 | SO9107 |
| | 49/64 | 19.45 | .7656 | | SO6108 | SO8108 | SO9108 |
| | | 19.50 | .7677 | | SO6109 | SO8109 | SO9109 |
| | 25/32 | 19.84 | .7813 | | SO6110 | SO8110 | SO9110 |
| | | 20.00 | .7874 | | SO6111 | SO8111 | SO9111 |
| | 51/64 | 20.24 | .7969 | | SO6160 | SO8160 | SO9160 |
| | | 20.50 | .8071 | | SO6112 | SO8112 | SO9112 |
| | 13/16 | 20.64 | .8125 | | SO6113 | SO8113 | SO9113 |
| | | 21.00 | .8268 | | SO6114 | SO8114 | SO9114 |
| | 27/32 | 21.43 | .8438 | | SO6115 | SO8115 | SO9115 |
| | 55/64 | 21.83 | .8594 | | SO6161 | SO8161 | SO9161 |
| | | 22.00 | .8661 | | SO6116 | SO8116 | SO9116 |
| | 7/8 | 22.23 | .8750 | | SO6117 | SO8117 | SO9117 |
| | 57/64 | 22.62 | .8906 | | SO6162 | SO8162 | SO9162 |
| | | 23.00 | .9055 | | SO6118 | SO8118 | SO9118 |
| | 29/32 | 23.02 | .9063 | | SO6119 | SO8119 | SO9119 |
| | 59/64 | 23.42 | .9219 | | SO6120 | SO8120 | SO9120 |
| | 15/16 | 23.81 | .9375 | | SO6121 | SO8121 | SO9121 |
| | | 24.00 | .9449 | | SO6122 | SO8122 | SO9122 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 2,3

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | SUPER COBALT(T15) TiAlN | SUPER COBALT(T15) Hardslick |
| **2** .961 (24.41) to 1.380 (35.05) | 31/32 | 24.61 | .9688 | 3/16 (4.8) | S06201 | S08201 | S09201 |
| | 63/64 | 25.00 | .9843 | | S06202 | S08202 | S09202 |
| | 1 | 25.40 | 1.0000 | | S06203 | S08203 | S09203 |
| | 1-1/64 | 25.80 | 1.0156 | | S06204 | S08204 | S09204 |
| | | 26.00 | 1.0236 | | S06205 | S08205 | S09205 |
| | 1-1/32 | 26.19 | 1.0313 | | S06206 | S08206 | S09206 |
| | 1-3/64 | 26.59 | 1.0469 | | S06260 | S08260 | S09260 |
| | 1-1/16 | 26.99 | 1.0625 | | S06207 | S08207 | S09207 |
| | | 27.00 | 1.0630 | | S06208 | S08208 | S09208 |
| | 1-3/32 | 27.78 | 1.0938 | | S06209 | S08209 | S09209 |
| | | 28.00 | 1.1024 | | S06210 | S08210 | S09210 |
| | 1-7/64 | 28.18 | 1.1094 | | S06261 | S08261 | S09261 |
| | 1-1/8 | 28.58 | 1.1250 | | S06211 | S08211 | S09211 |
| | | 29.00 | 1.1417 | | S06212 | S08212 | S09212 |
| | 1-5/32 | 29.37 | 1.1563 | | S06213 | S08213 | S09213 |
| | | 30.00 | 1.1811 | | S06214 | S08214 | S09214 |
| | 1-3/16 | 30.16 | 1.1875 | | S06215 | S08215 | S09215 |
| | 1-7/32 | 30.96 | 1.2188 | | S06216 | S08216 | S09216 |
| | | 31.00 | 1.2205 | | S06217 | S08217 | S09217 |
| | 1-1/4 | 31.75 | 1.2500 | | S06218 | S08218 | S09218 |
| | | 32.00 | 1.2598 | | S06219 | S08219 | S09219 |
| | 1-9/32 | 32.54 | 1.2813 | | S06220 | S08220 | S09220 |
| | | 33.00 | 1.2992 | | S06221 | S08221 | S09221 |
| | 1-5/16 | 33.34 | 1.3125 | | S06222 | S08222 | S09222 |
| | | 34.00 | 1.3386 | | S06223 | S08223 | S09223 |
| | 1-11/32 | 34.13 | 1.3438 | | S06224 | S08224 | S09224 |
| | 1-3/8 | 34.93 | 1.3750 | | S06225 | S08225 | S09225 |
| | | 35.00 | 1.3780 | | S06226 | S08226 | S09226 |
| **3** | 1-13/32 | 35.72 | 1.4063 | 1/4 (6.4) | S06301 | S08301 | S09301 |
| | | 36.00 | 1.4173 | | S06302 | S08302 | S09302 |
| | 1-7/16 | 36.51 | 1.4375 | | S06303 | S08303 | S09303 |
| | | 37.00 | 1.4567 | | S06304 | S08304 | S09304 |
| | 1-15/32 | 37.31 | 1.4688 | | S06305 | S08305 | S09305 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 3,4

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | | | | | SUPER COBALT(T15) | | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | Hardslick |
| **3** **1.353 (34.37) to 1.882 (47.80)** | | 38.00 | 1.4961 | 1/4 (6.4) | S06306 | S08306 | S09306 |
| | 1-1/2 | 38.10 | 1.5000 | | S06307 | S08307 | S09307 |
| | 1-17/32 | 38.89 | 1.5313 | | S06308 | S08308 | S09308 |
| | | 39.00 | 1.5354 | | S06309 | S08309 | S09309 |
| | 1-9/16 | 39.69 | 1.5625 | | S06310 | S08310 | S09310 |
| | | 40.00 | 1.5748 | | S06311 | S08311 | S09311 |
| | 1-19/32 | 40.48 | 1.5938 | | S06312 | S08312 | S09312 |
| | | 41.00 | 1.6142 | | S06313 | S08313 | S09313 |
| | 1-5/8 | 41.28 | 1.6250 | | S06314 | S08314 | S09314 |
| | | 42.00 | 1.6535 | | S06315 | S08315 | S09315 |
| | 1-21/32 | 42.07 | 1.6563 | | S06316 | S08316 | S09316 |
| | 1-11/16 | 42.86 | 1.6875 | | S06317 | S08317 | S09317 |
| | | 43.00 | 1.6929 | | S06318 | S08318 | S09318 |
| | 1-23/32 | 43.66 | 1.7188 | | S06319 | S08319 | S09319 |
| | | 44.00 | 1.7323 | | S06320 | S08320 | S09320 |
| | 1-3/4 | 44.45 | 1.7500 | | S06321 | S08321 | S09321 |
| | | 45.00 | 1.7717 | | S06322 | S08322 | S09322 |
| | 1-25/32 | 45.24 | 1.7813 | | S06323 | S08323 | S09323 |
| | | 46.00 | 1.8110 | | S06324 | S08324 | S09324 |
| | 1-13/16 | 46.04 | 1.8125 | | S06325 | S08325 | S09325 |
| | 1-27/32 | 46.83 | 1.8438 | | S06326 | S08326 | S09326 |
| | | 47.00 | 1.8504 | | S06327 | S08327 | S09327 |
| | 1-7/8 | 47.63 | 1.8750 | | S06328 | S08328 | S09328 |
| **4** **1.850 (46.99) to 2.570 (65.28)** | 1-29/32 | 48.42 | 1.9062 | 5/16 (7.9) | S06402 | S08402 | S09402 |
| | 1-15/16 | 49.21 | 1.9375 | | S06404 | S08404 | S09404 |
| | 1-31/32 | 50.01 | 1.9688 | | S06406 | S08406 | S09406 |
| | 2 | 50.80 | 2.0000 | | S06407 | S08407 | S09407 |
| | 2-1/32 | 51.59 | 2.0312 | | S06409 | S08409 | S09409 |
| | 2-3/64 | 52.00 | 2.0472 | | S06410 | S08410 | S09410 |
| | 2-1/16 | 52.39 | 2.0625 | | S06411 | S08411 | S09411 |
| | 2-3/32 | 53.18 | 2.0938 | | S06413 | S08413 | S09413 |
| | 2-1/8 | 53.98 | 2.1250 | | S06414 | S08414 | S09414 |
| | 2-5/32 | 54.77 | 2.1562 | | S06416 | S08416 | S09416 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 4,5

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | SUPER COBALT(T15) TiAlN | SUPER COBALT(T15) Hardslick |
| **4** 1.850 (46.99) to 2.570 (65.28) | 2-3/16 | 55.56 | 2.1875 | 5/16 (7.9) | S06418 | S08418 | S09418 |
| | 2-7/32 | 56.36 | 2.2188 | | S06420 | S08420 | S09420 |
| | 2-1/4 | 57.15 | 2.2500 | | S06422 | S08422 | S09422 |
| | 2-9/32 | 57.94 | 2.2812 | | S06423 | S08423 | S09423 |
| | 2-5/16 | 58.74 | 2.3125 | | S06425 | S08425 | S09425 |
| | 2-11/32 | 59.53 | 2.3438 | | S06427 | S08427 | S09427 |
| | 2-3/8 | 60.33 | 2.3750 | | S06429 | S08429 | S09429 |
| | 2-13/32 | 61.12 | 2.4062 | | S06431 | S08431 | S09431 |
| | 2-7/16 | 61.91 | 2.4375 | | S06432 | S08432 | S09432 |
| | 2-15/32 | 62.71 | 2.4688 | | S06434 | S08434 | S09434 |
| | 2-1/2 | 63.50 | 2.5000 | | S06436 | S08436 | S09436 |
| | 2-17/32 | 64.29 | 2.5312 | | S06438 | S08438 | S09438 |
| | 2-9/16 | 65.09 | 2.5625 | | S06440 | S08440 | S09440 |
| **5** 2.456 (62.38) to 3.000 (76.20) | 2-1/2 | 63.50 | 2.5000 | 7/16 (11.1) | — | — | S09501 |
| | | 64.00 | 2.5197 | | — | — | S09502 |
| | 2-17/32 | 64.29 | 2.5312 | | — | — | S09503 |
| | 2-9/16 | 65.09 | 2.5625 | | — | — | S09504 |
| | 2-19/32 | 65.88 | 2.5938 | | — | — | S09505 |
| | | 66.00 | 2.5984 | | — | — | S09506 |
| | 2-5/8 | 66.68 | 2.6250 | | — | — | S09507 |
| | 2-21/32 | 67.47 | 2.6562 | | — | — | S09508 |
| | | 68.00 | 2.6772 | | — | — | S09509 |
| | 2-11/16 | 68.26 | 2.6875 | | — | — | S09510 |
| | 2-23/32 | 69.09 | 2.7188 | | — | — | S09511 |
| | 2-3/4 | 69.85 | 2.7500 | | — | — | S09512 |
| | | 70.00 | 2.7559 | | — | — | S09513 |
| | 2-25/32 | 70.64 | 2.7812 | | — | — | S09514 |
| | 2-13/16 | 71.44 | 2.8125 | | — | — | S09515 |
| | | 72.00 | 2.8346 | | — | — | S09516 |
| | 2-27/32 | 72.23 | 2.8438 | | — | — | S09517 |
| | 2-7/8 | 73.03 | 2.8750 | | — | — | S09518 |
| | 2-29/32 | 73.82 | 2.9062 | | — | — | S09519 |
| | | 74.00 | 2.9134 | | — | — | S09520 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 5,6,7

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | TiAlN | Hardslick |
| **5** | 2-15/16 | 74.61 | 2.9375 | 7/16 (11.1) | — | — | S09521 |
| | 2-31/32 | 75.41 | 2.8688 | | — | — | S09522 |
| | | 76.00 | 2.9921 | | — | — | S09523 |
| | 3 | 76.20 | 3.0000 | | — | — | S09524 |
| **6** 3.001 (76.23) to 3.507 (89.08) | 3-1/32 | 76.99 | 3.0312 | 7/16 (11.1) | — | — | S09601 |
| | 3-1/16 | 77.79 | 3.0625 | | — | — | S09602 |
| | | 78.00 | 3.0709 | | — | — | S09603 |
| | 3-3/32 | 78.58 | 3.0938 | | — | — | S09604 |
| | 3-1/8 | 79.38 | 3.1250 | | — | — | S09605 |
| | | 80.00 | 3.1496 | | — | — | S09606 |
| | 3-5/32 | 80.17 | 3.1562 | | — | — | S09607 |
| | 3-3/16 | 80.96 | 3.1875 | | — | — | S09608 |
| | 3-7/32 | 81.76 | 3.2188 | | — | — | S09609 |
| | | 82.00 | 3.2283 | | — | — | S09610 |
| | 3-1/4 | 82.55 | 3.2500 | | — | — | S09611 |
| | 3-9/32 | 83.34 | 3.2812 | | — | — | S09612 |
| | | 84.00 | 3.3071 | | — | — | S09613 |
| | 3-5/16 | 84.14 | 3.3125 | | — | — | S09614 |
| | 3-11/32 | 84.93 | 3.3438 | | — | — | S09615 |
| | 3-3/8 | 85.73 | 3.3750 | | — | — | S09616 |
| | | 86.00 | 3.3858 | | — | — | S09617 |
| | 3-13/32 | 86.52 | 3.3062 | | — | — | S09618 |
| | 3-7/16 | 87.31 | 3.4375 | | — | — | S09619 |
| | | 88.00 | 3.4646 | | — | — | S09620 |
| | 3-15/32 | 88.11 | 3.4688 | | — | — | S09621 |
| | 3-1/2 | 88.90 | 3.5000 | | — | — | S09622 |
| **7** 3.455(87.76) to 4.000(101.60) | 3-17/32 | 89.69 | 3.5312 | 7/16 (11.1) | — | — | S09701 |
| | | 90.00 | 3.5433 | | — | — | S09702 |
| | 3-9/16 | 90.49 | 3.5625 | | — | — | S09703 |
| | 3-19/32 | 91.28 | 3.5938 | | — | — | S09704 |
| | | 92.00 | 3.6221 | | — | — | S09705 |
| | 3-5/8 | 92.08 | 3.6250 | | — | — | S09706 |
| | 3-21/32 | 92.87 | 3.6563 | | — | — | S09707 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 7,8

## SPADE DRILL INSERTS - SUPER COBALT(T15)

- Increase wear resistance over M4
- For use in medium carbon steel to high temperature alloys over 280 Brinell
- Performs best in rigid setups

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | SUPER COBALT(T15) TiN | SUPER COBALT(T15) TiAlN | SUPER COBALT(T15) Hardslick |
| **7** 3.455 (87.76) to 4.000 (101.60) | 3-11/16 | 93.66 | 3.6875 | 7/16 (11.1) | — | — | S09708 |
| | | 94.00 | 3.7008 | | — | — | S09709 |
| | 3-23/32 | 94.46 | 3.7188 | | — | — | S09710 |
| | 3-3/4 | 95.25 | 3.7500 | | — | — | S09711 |
| | | 96.00 | 3.7795 | | — | — | S09712 |
| | 3-25/32 | 96.04 | 3.7812 | | — | — | S09713 |
| | 3-13/16 | 96.84 | 3.8125 | | — | — | S09714 |
| | 3-27/32 | 97.63 | 3.8438 | | — | — | S09715 |
| | | 98.00 | 3.8583 | | — | — | S09716 |
| | 3-7/8 | 98.43 | 3.8750 | | — | — | S09717 |
| | 3-29/32 | 99.22 | 3.9062 | | — | — | S09718 |
| | | 100.00 | 3.9370 | | — | — | S09719 |
| | 3-15/16 | 100.01 | 3.9375 | | — | — | S09720 |
| | 3-31/32 | 100.81 | 3.9688 | | — | — | S09721 |
| | 4 | 101.60 | 4.0000 | | — | — | S09722 |
| **8** 4.001 (101.63) to 4.507 (114.48) | 4-1/64 | 102.00 | 4.0156 | 7/16 (11.1) | — | — | S09801 |
| | 4-1/16 | 103.19 | 4.0625 | | — | — | S09802 |
| | 4-3/32 | 104.00 | 4.0945 | | — | — | S09803 |
| | 4-1/8 | 104.78 | 4.1250 | | — | — | S09804 |
| | | 106.00 | 4.1732 | | — | — | S09805 |
| | 4-3/16 | 106.36 | 4.1875 | | — | — | S09806 |
| | 4-1/4 | 107.95 | 4.2500 | | — | — | S09807 |
| | | 108.00 | 4.2520 | | — | — | S09808 |
| | 4-5/16 | 109.54 | 4.3125 | | — | — | S09809 |
| | | 110.00 | 4.3307 | | — | — | S09810 |
| | 4-3/8 | 111.13 | 4.3750 | | — | — | S09811 |
| | | 112.00 | 4.4094 | | — | — | S09812 |
| | 4-7/16 | 112.71 | 4.4375 | | — | — | S09813 |
| | | 114.00 | 4.4882 | | — | — | S09814 |
| | 4-1/2 | 114.30 | 4.5000 | | — | — | S09815 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES Y,Z,0

## SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- Rigid set up needed

**POINT ANGLE : 132 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | PREMIUM COBALT(M48) TiN | TiAlN | Hardslick |
| **Y** .374 (9.50) to .436 (11.07) | | 9.50 | .3740 | 3/32 (2.4) | * S11Y01 | * S13Y01 | * S14Y01 |
| | 3/8 | 9.53 | .3750 | | * S11Y02 | * S13Y02 | * S14Y02 |
| | | 9.80 | .3860 | | * S11Y03 | * S13Y03 | * S14Y03 |
| | 25/64 | 9.92 | .3906 | | * S11Y04 | * S13Y04 | * S14Y04 |
| | | 10.00 | .3937 | | * S11Y05 | * S13Y05 | * S14Y05 |
| | | 10.20 | .4016 | | * S11Y06 | * S13Y06 | * S14Y06 |
| | 13/32 | 10.32 | .4063 | | * S11Y07 | * S13Y07 | * S14Y07 |
| | | 10.50 | .4134 | | * S11Y08 | * S13Y08 | * S14Y08 |
| | 27/64 | 10.72 | .4219 | | * S11Y09 | * S13Y09 | * S14Y09 |
| | | 10.80 | .4252 | | * S11Y10 | * S13Y10 | * S14Y10 |
| | | 11.00 | .4331 | | * S11Y11 | * S13Y11 | * S14Y11 |
| **Z** .437 (11.11) to .510 (12.95) | 7/16 | 11.11 | .4375 | 3/32 (2.4) | * S11Z01 | * S13Z01 | * S14Z01 |
| | | 11.50 | .4528 | | * S11Z02 | * S13Z02 | * S14Z02 |
| | 29/64 | 11.51 | .4531 | | * S11Z03 | * S13Z03 | * S14Z03 |
| | 15/32 | 11.91 | .4688 | | * S11Z04 | * S13Z04 | * S14Z04 |
| | | 12.00 | .4724 | | * S11Z05 | * S13Z05 | * S14Z05 |
| | 31/64 | 12.30 | .4844 | | * S11Z06 | * S13Z06 | * S14Z06 |
| | | 12.50 | .4921 | | * S11Z07 | * S13Z07 | * S14Z07 |
| | 1/2 | 12.70 | .5000 | | * S11Z08 | * S13Z08 | * S14Z08 |
| **0** .511 (12.98) to .695 (17.65) | | 13.00 | .5118 | 1/8 (3.2) | * S11001 | * S13001 | * S14001 |
| | 33/64 | | .5156 | | * S11002 | * S13002 | * S14002 |
| | 17/32 | | .5313 | | * S11003 | * S13003 | * S14003 |
| | | 13.50 | .5315 | | * S11004 | * S13004 | * S14004 |
| | 35/64 | | .5469 | | * S11060 | * S13060 | * S14060 |
| | | 14.00 | .5512 | | * S11005 | * S13005 | * S14005 |
| | 9/16 | | .5625 | | * S11006 | * S13006 | * S14006 |
| | | 14.50 | .5709 | | * S11007 | * S13007 | * S14007 |
| | 37/64 | | .5781 | | * S11008 | * S13008 | * S14008 |
| | | 15.00 | .5906 | | * S11009 | * S13009 | * S14009 |
| | 19/32 | | .5938 | | * S11010 | * S13010 | * S14010 |
| | 39/64 | | .6094 | | * S11061 | * S13061 | * S14061 |
| | | 15.50 | .6102 | | * S11011 | * S13011 | * S14011 |
| | 5/8 | | .6250 | | * S11012 | * S13012 | * S14012 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 0,1

## SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- Rigid set up needed

**POINT ANGLE : 132 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | PREMIUM COBALT(M48) TiN | TiAlN | Hardslick |
| **0** .511 (12.98) to .695 (17.65) | | 16.00 | .6299 | 1/8 (3.2) | * S11013 | * S13013 | * S14013 |
| | 41/64 | | .6406 | | * S11062 | * S13062 | * S14062 |
| | | 16.50 | .6496 | | * S11014 | * S13014 | * S14014 |
| | 21/32 | | .6563 | | * S11015 | * S13015 | * S14015 |
| | | 17.00 | .6693 | | * S11016 | * S13016 | * S14016 |
| | 43/64 | | .6719 | | * S11063 | * S13063 | * S14063 |
| | 11/16 | | .6875 | | * S11017 | * S13017 | * S14017 |
| | | 17.50 | .6890 | | * S11018 | * S13018 | * S14018 |
| **1** .690 (17.53) to .960 (24.38) | 45/64 | 17.86 | .7031 | 5/32 (4.0) | S11101 | S13101 | S14101 |
| | | 18.00 | .7087 | | S11102 | S13102 | S14102 |
| | 23/32 | 18.26 | .7188 | | S11103 | S13103 | S14103 |
| | | 18.50 | .7283 | | S11104 | S13104 | S14104 |
| | 47/64 | 18.65 | .7344 | | S11105 | S13105 | S14105 |
| | | 19.00 | .7480 | | S11106 | S13106 | S14106 |
| | 3/4 | 19.05 | .7500 | | S11107 | S13107 | S14107 |
| | 49/64 | 19.45 | .7656 | | S11108 | S13108 | S14108 |
| | | 19.50 | .7677 | | S11109 | S13109 | S14109 |
| | 25/32 | 19.84 | .7812 | | S11110 | S13110 | S14110 |
| | | 20.00 | .7874 | | S11111 | S13111 | S14111 |
| | 51/64 | 20.24 | .7969 | | S11160 | S13160 | S14160 |
| | | 20.50 | .8071 | | S11112 | S13112 | S14112 |
| | 13/16 | 20.64 | .8125 | | S11113 | S13113 | S14113 |
| | | 21.00 | .8268 | | S11114 | S13114 | S14114 |
| | 27/32 | 21.43 | .8438 | | S11115 | S13115 | S14115 |
| | 55/64 | 21.83 | .8594 | | S11161 | S13161 | S14161 |
| | | 22.00 | .8661 | | S11116 | S13116 | S14116 |
| | 7/8 | 22.23 | .8750 | | S11117 | S13117 | S14117 |
| | 57/64 | 22.62 | .8906 | | S11162 | S13162 | S14162 |
| | | 23.00 | .9055 | | S11118 | S13118 | S14118 |
| | 29/32 | 23.02 | .9062 | | S11119 | S13119 | S14119 |
| | 59/64 | 23.42 | .9219 | | S11120 | S13120 | S14120 |
| | 15/16 | 23.81 | .9375 | | S11121 | S13121 | S14121 |
| | | 24.00 | .9449 | | S11122 | S13122 | S14122 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 2

## SPADE DRILL INSERTS - PREMIUM COBALT(M48)

- Increased tool life over T15
- For use in high temperature alloys and materials including medium carbon, Alloy and tool steels with 350~500 Brinell
- Rigid set up needed

**POINT ANGLE : 132 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | PREMIUM COBALT(M48) TiN | PREMIUM COBALT(M48) TiAlN | PREMIUM COBALT(M48) Hardslick |
| **2** .961 (24.41) to 1.380 (35.05) | 31/32 | 24.61 | .9688 | 3/16 (4.8) | S11201 | S13201 | S14201 |
| | 63/64 | 25.00 | .9843 | | S11202 | S13202 | S14202 |
| | 1 | 25.40 | 1.0000 | | S11203 | S13203 | S14203 |
| | 1-1/64 | 25.80 | 1.0156 | | S11204 | S13204 | S14204 |
| | | 26.00 | 1.0236 | | S11205 | S13205 | S14205 |
| | 1-1/32 | 26.19 | 1.0312 | | S11206 | S13206 | S14206 |
| | 1-3/64 | 26.59 | 1.0469 | | S11260 | S13260 | S14260 |
| | 1-1/16 | 26.99 | 1.0625 | | S11207 | S13207 | S14207 |
| | | 27.00 | 1.0630 | | S11208 | S13208 | S14208 |
| | 1-3/32 | 27.78 | 1.0938 | | S11209 | S13209 | S14209 |
| | | 28.00 | 1.1024 | | S11210 | S13210 | S14210 |
| | 1-7/64 | 28.18 | 1.1094 | | S11261 | S13261 | S14261 |
| | 1-1/8 | 28.58 | 1.1250 | | S11211 | S13211 | S14211 |
| | | 29.00 | 1.1417 | | S11212 | S13212 | S14212 |
| | 1-5/32 | 29.37 | 1.1562 | | S11213 | S13213 | S14213 |
| | | 30.00 | 1.1811 | | S11214 | S13214 | S14214 |
| | 1-3/16 | 30.16 | 1.1875 | | S11215 | S13215 | S14215 |
| | 1-7/32 | 30.96 | 1.2188 | | S11216 | S13216 | S14216 |
| | | 31.00 | 1.2205 | | S11217 | S13217 | S14217 |
| | 1-1/4 | 31.75 | 1.2500 | | S11218 | S13218 | S14218 |
| | | 32.00 | 1.2598 | | S11219 | S13219 | S14219 |
| | 1-9/32 | 32.54 | 1.2812 | | S11220 | S13220 | S14220 |
| | | 33.00 | 1.2992 | | S11221 | S13221 | S14221 |
| | 1-5/16 | 33.34 | 1.3125 | | S11222 | S13222 | S14222 |
| | | 34.00 | 1.3386 | | S11223 | S13223 | S14223 |
| | 1-11/32 | 34.13 | 1.3438 | | S11224 | S13224 | S14224 |
| | 1-3/8 | 34.93 | 1.3750 | | S11225 | S13225 | S14225 |
| | | 35.00 | 1.3780 | | S11226 | S13226 | S14226 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES Y,Z

## CARBIDE BLADE INSERTS(C2,C5,C3)

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Multi purpose Geometry | | | | Cast Iron Geometry | |
| | | | | | C2(K20) | | C5(P40) | | C3(K10) | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAIN | TiN | TiAIN | TiN | TiAIN |
| **Y** .374 (9.50) to .436 (11.07) | | 9.50 | .3740 | 3/32 (2.4) | * S21Y01 | * S23Y01 | * S26Y01 | * S28Y01 | * S16Y01 | * S18Y01 |
| | 3/8 | 9.53 | .3750 | | * S21Y02 | * S23Y02 | * S26Y02 | * S28Y02 | * S16Y02 | * S18Y02 |
| | | 9.80 | .3860 | | * S21Y03 | * S23Y03 | * S26Y03 | * S28Y03 | * S16Y03 | * S18Y03 |
| | 25/64 | 9.92 | .3906 | | * S21Y04 | * S23Y04 | * S26Y04 | * S28Y04 | * S16Y04 | * S18Y04 |
| | | 10.00 | .3937 | | * S21Y05 | * S23Y05 | * S26Y05 | * S28Y05 | * S16Y05 | * S18Y05 |
| | | 10.20 | .4016 | | * S21Y06 | * S23Y06 | * S26Y06 | * S28Y06 | * S16Y06 | * S18Y06 |
| | 13/32 | 10.32 | .4063 | | * S21Y07 | * S23Y07 | * S26Y07 | * S28Y07 | * S16Y07 | * S18Y07 |
| | | 10.50 | .4134 | | * S21Y08 | * S23Y08 | * S26Y08 | * S28Y08 | * S16Y08 | * S18Y08 |
| | 27/64 | 10.72 | .4219 | | * S21Y09 | * S23Y09 | * S26Y09 | * S28Y09 | * S16Y09 | * S18Y09 |
| | | 10.80 | .4252 | | * S21Y10 | * S23Y10 | * S26Y10 | * S28Y10 | * S16Y10 | * S18Y10 |
| | | 11.00 | .4331 | | * S21Y11 | * S23Y11 | * S26Y11 | * S28Y11 | * S16Y11 | * S18Y11 |
| **Z** .437 (11.11) to .510 (12.95) | 7/16 | 11.11 | .4375 | 3/32 (2.4) | * S21Z01 | * S23Z01 | * S26Z01 | * S28Z01 | * S16Z01 | * S18Z01 |
| | | 11.50 | .4528 | | * S21Z02 | * S23Z02 | * S26Z02 | * S28Z02 | * S16Z02 | * S18Z02 |
| | 29/64 | 11.51 | .4531 | | * S21Z03 | * S23Z03 | * S26Z03 | * S28Z03 | * S16Z03 | * S18Z03 |
| | 15/32 | 11.91 | .4688 | | * S21Z04 | * S23Z04 | * S26Z04 | * S28Z04 | * S16Z04 | * S18Z04 |
| | | 12.00 | .4724 | | * S21Z05 | * S23Z05 | * S26Z05 | * S28Z05 | * S16Z05 | * S18Z05 |
| | 31/64 | 12.30 | .4844 | | * S21Z06 | * S23Z06 | * S26Z06 | * S28Z06 | * S16Z06 | * S18Z06 |
| | | 12.50 | .4921 | | * S21Z07 | * S23Z07 | * S26Z07 | * S28Z07 | * S16Z07 | * S18Z07 |
| | 1/2 | 12.70 | .5000 | | * S21Z08 | * S23Z08 | * S26Z08 | * S28Z08 | * S16Z08 | * S18Z08 |

* 2pcs per package

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| C2 | ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ |
| C5 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| C3 | | | | | | | | | | | | | ◎ | ◎ | | |

# SPADE DRILLS

SERIES 0

## CARBIDE BLADE INSERTS(C2,C5,C3)

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Multi purpose Geometry | | | | Cast Iron Geometry | |
| | | | | | C2(K20) | | C5(P40) | | C3(K10) | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | TiN | TiAlN | TiN | TiAlN |
| 0 .511 (12.98) to .695 (17.65) | | 13.00 | .5118 | 1/8 (3.2) | * S21001 | * S23001 | * S26001 | * S28001 | * S16001 | * S18001 |
| | 33/64 | 13.10 | .5156 | | * S21002 | * S23002 | * S26002 | * S28002 | * S16002 | * S18002 |
| | 17/32 | 13.49 | .5313 | | * S21003 | * S23003 | * S26003 | * S28003 | * S16003 | * S18003 |
| | | 13.50 | .5315 | | * S21004 | * S23004 | * S26004 | * S28004 | * S16004 | * S18004 |
| | 35/64 | 13.89 | .5469 | | * S21060 | * S23060 | * S26060 | * S28060 | * S16060 | * S18060 |
| | | 14.00 | .5512 | | * S21005 | * S23005 | * S26005 | * S28005 | * S16005 | * S18005 |
| | 9/16 | 14.29 | .5625 | | * S21006 | * S23006 | * S26006 | * S28006 | * S16006 | * S18006 |
| | | 14.50 | .5709 | | * S21007 | * S23007 | * S26007 | * S28007 | * S16007 | * S18007 |
| | 37/64 | 14.68 | .5781 | | * S21008 | * S23008 | * S26008 | * S28008 | * S16008 | * S18008 |
| | | 15.00 | .5906 | | * S21009 | * S23009 | * S26009 | * S28009 | * S16009 | * S18009 |
| | 19/32 | 15.08 | .5938 | | * S21010 | * S23010 | * S26010 | * S28010 | * S16010 | * S18010 |
| | 39/64 | 15.48 | .6094 | | * S21061 | * S23061 | * S26061 | * S28061 | * S16061 | * S18061 |
| | | 15.50 | .6102 | | * S21011 | * S23011 | * S26011 | * S28011 | * S16011 | * S18011 |
| | | 15.70 | .6181 | | * S21064 | * S23064 | * S26064 | * S28064 | * S16064 | * S18064 |
| | 5/8 | 15.88 | .6250 | | * S21012 | * S23012 | * S26012 | * S28012 | * S16012 | * S18012 |
| | | 16.00 | .6299 | | * S21013 | * S23013 | * S26013 | * S28013 | * S16013 | * S18013 |
| | 41/64 | 16.27 | .6406 | | * S21062 | * S23062 | * S26062 | * S28062 | * S16062 | * S18062 |
| | | 16.50 | .6496 | | * S21014 | * S23014 | * S26014 | * S28014 | * S16014 | * S18014 |
| | 21/32 | 16.67 | .6563 | | * S21015 | * S23015 | * S26015 | * S28015 | * S16015 | * S18015 |
| | | 17.00 | .6693 | | * S21016 | * S23016 | * S26016 | * S28016 | * S16016 | * S18016 |
| | 43/64 | 17.07 | .6719 | | * S21063 | * S23063 | * S26063 | * S28063 | * S16063 | * S18063 |
| | 11/16 | 17.46 | .6875 | | * S21017 | * S23017 | * S26017 | * S28017 | * S16017 | * S18017 |
| | | 17.50 | .6890 | | * S21018 | * S23018 | * S26018 | * S28018 | * S16018 | * S18018 |

* 2pcs per package

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | | ~HRc8 (~HB180) | ~HB110 |
| C2 | ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | | ◎ | ◎ |
| C5 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | | ○ | ○ |
| C3 | | | | | | | | | | | | | ◎ | ◎ | | | |

# SPADE DRILLS

SERIES 1

## CARBIDE BLADE INSERTS(C2,C5,C3)

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Multi purpose Geometry | | | | Cast Iron Geometry | |
| | | | | | C2(K20) | | C5(P40) | | C3(K10) | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | TiN | TiAlN | TiN | TiAlN |
| 1<br>.690 (17.53) to .960 (24.38) | 45/64 | 17.86 | .7031 | 5/32 (4.0) | S21101 | S23101 | S26101 | S28101 | S16101 | S18101 |
| | | 18.00 | .7087 | | S21102 | S23102 | S26102 | S28102 | S16102 | S18102 |
| | 23/32 | 18.26 | .7188 | | S21103 | S23103 | S26103 | S28103 | S16103 | S18103 |
| | | 18.50 | .7283 | | S21104 | S23104 | S26104 | S28104 | S16104 | S18104 |
| | 47/64 | 18.65 | .7344 | | S21105 | S23105 | S26105 | S28105 | S16105 | S18105 |
| | | 19.00 | .7480 | | S21106 | S23106 | S26106 | S28106 | S16106 | S18106 |
| | 3/4 | 19.05 | .7500 | | S21107 | S23107 | S26107 | S28107 | S16107 | S18107 |
| | 49/64 | 19.45 | .7656 | | S21108 | S23108 | S26108 | S28108 | S16108 | S18108 |
| | | 19.50 | .7677 | | S21109 | S23109 | S26109 | S28109 | S16109 | S18109 |
| | 25/32 | 19.84 | .7813 | | S21110 | S23110 | S26110 | S28110 | S16110 | S18110 |
| | | 20.00 | .7874 | | S21111 | S23111 | S26111 | S28111 | S16111 | S18111 |
| | 51/64 | 20.24 | .7969 | | S21160 | S23160 | S26160 | S28160 | S16160 | S18160 |
| | | 20.50 | .8071 | | S21112 | S23112 | S26112 | S28112 | S16112 | S18112 |
| | 13/16 | 20.64 | .8125 | | S21113 | S23113 | S26113 | S28113 | S16113 | S18113 |
| | | 21.00 | .8268 | | S21114 | S23114 | S26114 | S28114 | S16114 | S18114 |
| | 27/32 | 21.43 | .8438 | | S21115 | S23115 | S26115 | S28115 | S16115 | S18115 |
| | 55/64 | 21.83 | .8594 | | S21161 | S23161 | S26161 | S28161 | S16161 | S18161 |
| | | 22.00 | .8661 | | S21116 | S23116 | S26116 | S28116 | S16116 | S18116 |
| | 7/8 | 22.23 | .8750 | | S21117 | S23117 | S26117 | S28117 | S16117 | S18117 |
| | 57/64 | 22.62 | .8906 | | S21162 | S23162 | S26162 | S28162 | S16162 | S18162 |
| | | 23.00 | .9055 | | S21118 | S23118 | S26118 | S28118 | S16118 | S18118 |
| | 29/32 | 23.02 | .9063 | | S21119 | S23119 | S26119 | S28119 | S16119 | S18119 |
| | 59/64 | 23.42 | .9219 | | S21120 | S23120 | S26120 | S28120 | S16120 | S18120 |
| | 15/16 | 23.81 | .9375 | | S21121 | S23121 | S26121 | S28121 | S16121 | S18121 |
| | | 24.00 | .9449 | | S21122 | S23122 | S26122 | S28122 | S16122 | S18122 |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| C2 | ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ |
| C5 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| C3 | | | | | | | | | | | | | ◎ | ◎ | | |

# SPADE DRILLS

SERIES 2

## CARBIDE BLADE INSERTS(C2,C5,C3)

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Multi purpose Geometry | | | | Cast Iron Geometry | |
| | | | | | C2(K20) | | C5(P40) | | C3(K10) | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | TiN | TiAlN | TiN | TiAlN |
| 2<br>.961 (24.41) to 1.380 (35.05) | 31/32 | 24.61 | .9688 | 3/16 (4.8) | S21201 | S23201 | S26201 | S28201 | S16201 | S18201 |
| | 63/64 | 25.00 | .9843 | | S21202 | S23202 | S26202 | S28202 | S16202 | S18202 |
| | 1 | 25.40 | 1.0000 | | S21203 | S23203 | S26203 | S28203 | S16203 | S18203 |
| | 1-1/64 | 25.80 | 1.0156 | | S21204 | S23204 | S26204 | S28204 | S16204 | S18204 |
| | | 26.00 | 1.0236 | | S21205 | S23205 | S26205 | S28205 | S16205 | S18205 |
| | 1-1/32 | 26.19 | 1.0313 | | S21206 | S23206 | S26206 | S28206 | S16206 | S18206 |
| | 1-3/64 | 26.59 | 1.0469 | | S21260 | S23260 | S26260 | S28260 | S16260 | S18260 |
| | 1-1/16 | 26.99 | 1.0625 | | S21207 | S23207 | S26207 | S28207 | S16207 | S18207 |
| | | 27.00 | 1.0630 | | S21208 | S23208 | S26208 | S28208 | S16208 | S18208 |
| | 1-3/32 | 27.78 | 1.0938 | | S21209 | S23209 | S26209 | S28209 | S16209 | S18209 |
| | | 28.00 | 1.1024 | | S21210 | S23210 | S26210 | S28210 | S16210 | S18210 |
| | 1-7/64 | 28.18 | 1.1094 | | S21261 | S23261 | S26261 | S28261 | S16261 | S18261 |
| | 1-1/8 | 28.58 | 1.1250 | | S21211 | S23211 | S26211 | S28211 | S16211 | S18211 |
| | | 29.00 | 1.1417 | | S21212 | S23212 | S26212 | S28212 | S16212 | S18212 |
| | 1-5/32 | 29.37 | 1.1563 | | S21213 | S23213 | S26213 | S28213 | S16213 | S18213 |
| | | 30.00 | 1.1811 | | S21214 | S23214 | S26214 | S28214 | S16214 | S18214 |
| | 1-3/16 | 30.16 | 1.1875 | | S21215 | S23215 | S26215 | S28215 | S16215 | S18215 |
| | 1-7/32 | 30.96 | 1.2188 | | S21216 | S23216 | S26216 | S28216 | S16216 | S18216 |
| | | 31.00 | 1.2205 | | S21217 | S23217 | S26217 | S28217 | S16217 | S18217 |
| | 1-1/4 | 31.75 | 1.2500 | | S21218 | S23218 | S26218 | S28218 | S16218 | S18218 |
| | | 32.00 | 1.2598 | | S21219 | S23219 | S26219 | S28219 | S16219 | S18219 |
| | 1-9/32 | 32.54 | 1.2813 | | S21220 | S23220 | S26220 | S28220 | S16220 | S18220 |
| | | 33.00 | 1.2992 | | S21221 | S23221 | S26221 | S28221 | S16221 | S18221 |
| | 1-5/16 | 33.34 | 1.3125 | | S21222 | S23222 | S26222 | S28222 | S16222 | S18222 |
| | | 34.00 | 1.3386 | | S21223 | S23223 | S26223 | S28223 | S16223 | S18223 |
| | 1-11/32 | 34.13 | 1.3438 | | S21224 | S23224 | S26224 | S28224 | S16224 | S18224 |
| | 1-3/8 | 34.93 | 1.3750 | | S21225 | S23225 | S26225 | S28225 | S16225 | S18225 |
| | | 35.00 | 1.3780 | | S21226 | S23226 | S26226 | S28226 | S16226 | S18226 |

◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| C2 | ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ |
| C5 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| C3 | | | | | | | | | | | | | ◎ | ◎ | | |

# SPADE DRILLS

SERIES 3

## CARBIDE BLADE INSERTS(C2,C5,C3)

- High performance on Gray cast iron over 220 Brinell, malleable cast iron with short chips, silicon aluminum and copper alloys. (C3)
- For general use in carbon steels and alloys steels. (C5)
- For use in Gray cast iron up to 220 Brinell, nonferrous metals,copper, brass and aluminum. (C2)

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | Thick | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Multi purpose Geometry | | | | Cast Iron Geometry | |
| | | | | | C2(K20) | | C5(P40) | | C3(K10) | |
| | Fractional (inch) | Metric (mm) | Decimal (inch) | Metric (inch/mm) | TiN | TiAlN | TiN | TiAlN | TiN | TiAlN |
| 3<br>1.353 (34.37) to 1.882 (47.80) | 1-13/32 | 35.72 | 1.4063 | 1/4 (6.4) | S21301 | S23301 | S26301 | S28301 | Special or non-standard inserts available on request | |
| | | 36.00 | 1.4173 | | S21302 | S23302 | S26302 | S28302 | | |
| | 1-7/16 | 36.51 | 1.4375 | | S21303 | S23303 | S26303 | S28303 | | |
| | | 37.00 | 1.4567 | | S21304 | S23304 | S26304 | S28304 | | |
| | 1-15/32 | 37.31 | 1.4688 | | S21305 | S23305 | S26305 | S28305 | | |
| | | 38.00 | 1.4961 | | S21306 | S23306 | S26306 | S28306 | | |
| | 1-1/2 | 38.10 | 1.5000 | | S21307 | S23307 | S26307 | S28307 | | |
| | 1-17/32 | 38.89 | 1.5313 | | S21308 | S23308 | S26308 | S28308 | | |
| | | 39.00 | 1.5354 | | S21309 | S23309 | S26309 | S28309 | | |
| | 1-9/16 | 39.69 | 1.5625 | | S21310 | S23310 | S26310 | S28310 | | |
| | | 40.00 | 1.5748 | | S21311 | S23311 | S26311 | S28311 | | |
| | 1-19/32 | 40.48 | 1.5938 | | S21312 | S23312 | S26312 | S28312 | | |
| | | 41.00 | 1.6142 | | S21313 | S23313 | S26313 | S28313 | | |
| | 1-5/8 | 41.28 | 1.6250 | | S21314 | S23314 | S26314 | S28314 | | |
| | | 42.00 | 1.6535 | | S21315 | S23315 | S26315 | S28315 | | |
| | 1-21/32 | 42.07 | 1.6563 | | S21316 | S23316 | S26316 | S28316 | | |
| | 1-11/16 | 42.86 | 1.6875 | | S21317 | S23317 | S26317 | S28317 | | |
| | | 43.00 | 1.6929 | | S21318 | S23318 | S26318 | S28318 | | |
| | 1-23/32 | 43.66 | 1.7188 | | S21319 | S23319 | S26319 | S28319 | | |
| | | 44.00 | 1.7323 | | S21320 | S23320 | S26320 | S28320 | | |
| | 1-3/4 | 44.45 | 1.7500 | | S21321 | S23321 | S26321 | S28321 | | |
| | | 45.00 | 1.7717 | | S21322 | S23322 | S26322 | S28322 | | |
| | 1-25/32 | 45.24 | 1.7813 | | S21323 | S23323 | S26323 | S28323 | | |
| | | 46.00 | 1.8110 | | S21324 | S23324 | S26324 | S28324 | | |
| | 1-13/16 | 46.04 | 1.8125 | | S21325 | S23325 | S26325 | S28325 | | |
| | 1-27/32 | 46.83 | 1.8438 | | S21326 | S23326 | S26326 | S28326 | | |
| | | 47.00 | 1.8504 | | S21327 | S23327 | S26327 | S28327 | | |
| | 1-7/8 | 47.63 | 1.8750 | | S21328 | S23328 | S26328 | S28328 | | |

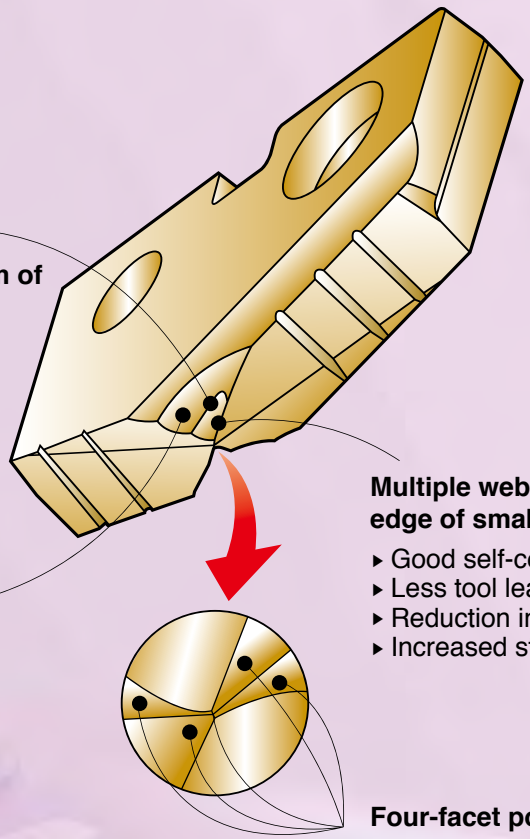
◎ : Excellent ○ : Good

| | P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| | ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| C2 | ○ | ○ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ | ◎ | ◎ |
| C5 | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |
| C3 | | | | | | | | | | | | | ◎ | ◎ | | |

# Special features of SM-Point Spade Drill

**This new “Hybrid Point” combines the strength of the standard point with additional “Web Thinning”.**

**This new point increases stability, reduces thrust, improves centering and allows increased speeds and feeds.**



**Multiple thinning form at the bottom of the large thinning.**

- The optimum thinning for the difference from the cutting speed, the cutting quantity and the cutting load according to the distance from the drill point to the cutting edge.

**Multiple web thinning with the cutting edge of small web thinning.**

- Good self-centering
- Less tool lead off
- Reduction in bell mouthing, thrust
- Increased stability

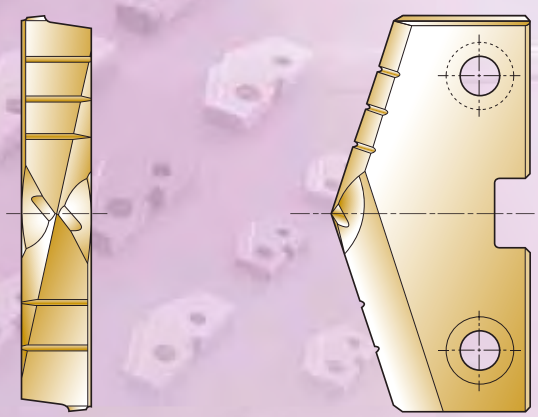
**Radius back face**

- Wide chip space



**Four-facet point**

- Self-centering
- Less thrust force



# SPADE DRILLS

SERIES Y,Z,0,1

## SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

**POINT ANGLE : 132 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **Y** .374 (9.50) to .436 (11.07) Thick 3/32 (2.4) | | 9.50 | .3740 | * SM08Y01 |
| | 3/8 | 9.53 | .3750 | * SM08Y02 |
| | | 9.80 | .3858 | * SM08Y03 |
| | 25/64 | 9.92 | .3906 | * SM08Y04 |
| | | 10.00 | .3937 | * SM08Y05 |
| | | 10.20 | .4016 | * SM08Y06 |
| | 13/32 | 10.32 | .4062 | * SM08Y07 |
| | | 10.50 | .4134 | * SM08Y08 |
| | 27/64 | 10.72 | .4219 | * SM08Y09 |
| | | 10.80 | .4252 | * SM08Y10 |
| | | 11.00 | .4331 | * SM08Y11 |
| **Z** .437 (11.11) to .510 (12.95) 3/32(2.4) | 7/16 | 11.11 | .4375 | * SM08Z01 |
| | | 11.50 | .4528 | * SM08Z02 |
| | 29/64 | 11.51 | .4531 | * SM08Z03 |
| | 15/32 | 11.91 | .4688 | * SM08Z04 |
| | | 12.00 | .4724 | * SM08Z05 |
| | 31/64 | 12.30 | .4844 | * SM08Z06 |
| | | 12.50 | .4921 | * SM08Z07 |
| | 1/2 | 12.70 | .5000 | * SM08Z08 |
| **0** .511 (12.98) to .695 (17.65) Thick 1/8 (3.2) | | 13.00 | .5118 | * SM08001 |
| | 33/64 | 13.10 | .5156 | * SM08002 |
| | 17/32 | 13.49 | .5312 | * SM08003 |
| | | 13.50 | .5315 | * SM08004 |
| | 35/64 | 13.89 | .5469 | * SM08060 |
| | | 14.00 | .5512 | * SM08005 |
| | 9/16 | 14.29 | .5625 | * SM08006 |
| | | 14.50 | .5709 | * SM08007 |
| | 37/64 | 14.68 | .5781 | * SM08008 |
| | | 15.00 | .5906 | * SM08009 |
| | 19/32 | 15.08 | .5938 | * SM08010 |
| | 39/64 | 15.48 | .6094 | * SM08061 |
| | | 15.50 | .6102 | * SM08011 |
| | 5/8 | 15.88 | .6250 | * SM08012 |

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **0** .511 (12.98) to .695 (17.65) | | 16.00 | .6299 | * SM08013 |
| | 41/64 | 16.27 | .6406 | * SM08062 |
| | | 16.50 | .6496 | * SM08014 |
| | 21/32 | 16.67 | .6562 | * SM08015 |
| | | 17.00 | .6693 | * SM08016 |
| | 43/64 | 17.07 | .6719 | * SM08063 |
| | 11/16 | 17.46 | .6875 | * SM08017 |
| | | 17.50 | .6890 | * SM08018 |
| **1** .690 (17.53) to .960 (24.38) Thick 5/32 (4.0) | 45/64 | 17.86 | .7031 | SM08101 |
| | | 18.00 | .7087 | SM08102 |
| | 23/32 | 18.26 | .7188 | SM08103 |
| | | 18.50 | .7283 | SM08104 |
| | 47/64 | 18.65 | .7344 | SM08105 |
| | | 19.00 | .7480 | SM08106 |
| | 3/4 | 19.05 | .7500 | SM08107 |
| | 49/64 | 19.45 | .7656 | SM08108 |
| | | 19.50 | .7677 | SM08109 |
| | 25/32 | 19.84 | .7812 | SM08110 |
| | | 20.00 | .7874 | SM08111 |
| | 51/64 | 20.24 | .7969 | SM08160 |
| | | 20.50 | .8071 | SM08112 |
| | 13/16 | 20.64 | .8125 | SM08113 |
| | | 21.00 | .8268 | SM08114 |
| | 27/32 | 21.43 | .8438 | SM08115 |
| | 55/64 | 21.83 | .8594 | SM08161 |
| | | 22.00 | .8661 | SM08116 |
| | 7/8 | 22.23 | .8750 | SM08117 |
| | 57/64 | 22.62 | .8906 | SM08162 |
| | | 23.00 | .9055 | SM08118 |
| | 29/32 | 23.02 | .9062 | SM08119 |
| | 59/64 | 23.42 | .9219 | SM08120 |
| | 15/16 | 23.81 | .9375 | SM08121 |
| | | 24.00 | .9449 | SM08122 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 2,3

## SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

**POINT ANGLE : 132 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **2** .961 (24.41) to 1.380 (35.05) Thick 3/16 (4.8) | 31/32 | 24.61 | .9688 | SM08201 |
| | 63/64 | 25.00 | .9843 | SM08202 |
| | 1 | 25.40 | 1.0000 | SM08203 |
| | 1-1/64 | 25.80 | 1.0156 | SM08204 |
| | | 26.00 | 1.0236 | SM08205 |
| | 1-1/32 | 26.19 | 1.0312 | SM08206 |
| | 1-3/64 | 26.59 | 1.0469 | SM08260 |
| | 1-1/16 | 26.99 | 1.0625 | SM08207 |
| | | 27.00 | 1.0630 | SM08208 |
| | 1-3/32 | 27.78 | 1.0938 | SM08209 |
| | | 28.00 | 1.1024 | SM08210 |
| | 1-7/64 | 28.18 | 1.1094 | SM08261 |
| | 1-1/8 | 28.58 | 1.1250 | SM08211 |
| | | 29.00 | 1.1417 | SM08212 |
| | 1-5/32 | 29.37 | 1.1562 | SM08213 |
| | | 30.00 | 1.1811 | SM08214 |
| | 1-3/16 | 30.16 | 1.1875 | SM08215 |
| | 1-7/32 | 30.96 | 1.2188 | SM08216 |
| | | 31.00 | 1.2205 | SM08217 |
| | 1-1/4 | 31.75 | 1.2500 | SM08218 |
| | | 32.00 | 1.2598 | SM08219 |
| | 1-9/32 | 32.54 | 1.2812 | SM08220 |
| | | 33.00 | 1.2992 | SM08221 |
| | 1-5/16 | 33.34 | 1.3125 | SM08222 |
| | | 34.00 | 1.3386 | SM08223 |
| | 1-11/32 | 34.13 | 1.3438 | SM08224 |
| | 1-3/8 | 34.93 | 1.3750 | SM08225 |
| | | 35.00 | 1.3780 | SM08226 |

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **3** 1.353 (34.37) to 1.882 (47.80) Thick 1/4 (6.4) | 1-13/32 | 35.72 | 1.4062 | SM08301 |
| | | 36.00 | 1.4173 | SM08302 |
| | 1-7/16 | 36.51 | 1.4375 | SM08303 |
| | | 37.00 | 1.4567 | SM08304 |
| | 1-15/32 | 37.31 | 1.4688 | SM08305 |
| | | 38.00 | 1.4961 | SM08306 |
| | 1-1/2 | 38.10 | 1.5000 | SM08307 |
| | 1-17/32 | 38.89 | 1.5312 | SM08308 |
| | | 39.00 | 1.5354 | SM08309 |
| | 1-9/16 | 39.69 | 1.5625 | SM08310 |
| | | 40.00 | 1.5748 | SM08311 |
| | 1-19/32 | 40.48 | 1.5938 | SM08312 |
| | | 41.00 | 1.6142 | SM08313 |
| | 1-5/8 | 41.28 | 1.6250 | SM08314 |
| | | 42.00 | 1.6535 | SM08315 |
| | 1-21/32 | 42.07 | 1.6562 | SM08316 |
| | 1-11/16 | 42.86 | 1.6875 | SM08317 |
| | | 43.00 | 1.6929 | SM08318 |
| | 1-23/32 | 43.66 | 1.7188 | SM08319 |
| | | 44.00 | 1.7323 | SM08320 |
| | 1-3/4 | 44.45 | 1.7500 | SM08321 |
| | | 45.00 | 1.7717 | SM08322 |
| | 1-25/32 | 45.24 | 1.7812 | SM08323 |
| | | 46.00 | 1.8110 | SM08324 |
| | 1-13/16 | 46.04 | 1.8125 | SM08325 |
| | 1-27/32 | 46.83 | 1.8438 | SM08326 |
| | | 47.00 | 1.8504 | SM08327 |
| | 1-7/8 | 47.63 | 1.8750 | SM08328 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 4,5

## SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

**POINT ANGLE** **- under 2-1/2 : 132 degree**
**- over 2-1/2 : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **4** **1.850 (46.99) to 2.570 (65.28)** **Thick** 5/16 (7.9) | | 48.00 | 1.8898 | SM08401 |
| | 1-29/32 | 48.42 | 1.9062 | SM08402 |
| | | 49.00 | 1.9291 | SM08403 |
| | 1-15/16 | 49.21 | 1.9375 | SM08404 |
| | | 50.00 | 1.9685 | SM08405 |
| | 1-31/32 | 50.01 | 1.9688 | SM08406 |
| | 2 | 50.80 | 2.0000 | SM08407 |
| | | 51.00 | 2.0079 | SM08408 |
| | 2-1/32 | 51.59 | 2.0312 | SM08409 |
| | 2-3/64 | 52.00 | 2.0472 | SM08410 |
| | 2-1/16 | 52.39 | 2.0625 | SM08411 |
| | | 53.00 | 2.0866 | SM08412 |
| | 2-3/32 | 53.18 | 2.0938 | SM08413 |
| | 2-1/8 | 53.98 | 2.1250 | SM08414 |
| | | 54.00 | 2.1260 | SM08415 |
| | 2-5/32 | 54.77 | 2.1562 | SM08416 |
| | | 55.00 | 2.1654 | SM08417 |
| | 2-3/16 | 55.56 | 2.1875 | SM08418 |
| | | 56.00 | 2.2047 | SM08419 |
| | 2-7/32 | 56.36 | 2.2188 | SM08420 |
| | | 57.00 | 2.2441 | SM08421 |
| | 2-1/4 | 57.15 | 2.2500 | SM08422 |
| | 2-9/32 | 57.94 | 2.2812 | SM08423 |
| | | 58.00 | 2.2835 | SM08424 |
| | 2-5/16 | 58.74 | 2.3125 | SM08425 |
| | | 59.00 | 2.3228 | SM08426 |
| | 2-11/32 | 59.53 | 2.3438 | SM08427 |
| | | 60.00 | 2.3622 | SM08428 |
| | 2-3/8 | 60.33 | 2.3750 | SM08429 |
| | | 61.00 | 2.4016 | SM08430 |
| | 2-13/32 | 61.12 | 2.4062 | SM08431 |
| | 2-7/16 | 61.91 | 2.4375 | SM08432 |

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **4** **1.850 (46.99) to 2.570 (65.28)** | | 62.00 | 2.4409 | SM08433 |
| | 2-15/32 | 62.71 | 2.4688 | SM08434 |
| | | 63.00 | 2.4803 | SM08435 |
| | 2-1/2 | 63.50 | 2.5000 | SM08436 |
| | | 64.00 | 2.5197 | SM08437 |
| | 2-17/32 | 64.29 | 2.5312 | SM08438 |
| | | 65.00 | 2.5591 | SM08439 |
| | 2-9/16 | 65.09 | 2.5625 | SM08440 |
| **5** **2.456 (62.38) to 3.000 (76.20)** **Thick** 7/16 (11.1) | 2-1/2 | 63.50 | 2.5000 | SM08501 |
| | | 64.00 | 2.5197 | SM08502 |
| | 2-17/32 | 64.29 | 2.5312 | SM08503 |
| | 2-9/16 | 65.09 | 2.5625 | SM08504 |
| | 2-19/32 | 65.88 | 2.5938 | SM08505 |
| | | 66.00 | 2.5984 | SM08506 |
| | 2-5/8 | 66.68 | 2.6250 | SM08507 |
| | 2-21/32 | 67.47 | 2.6562 | SM08508 |
| | | 68.00 | 2.6772 | SM08509 |
| | 2-11/16 | 68.26 | 2.6875 | SM08510 |
| | 2-23/32 | 69.05 | 2.7188 | SM08511 |
| | 2-3/4 | 69.85 | 2.7500 | SM08512 |
| | | 70.00 | 2.7559 | SM08513 |
| | 2-25/32 | 70.64 | 2.7812 | SM08514 |
| | 2-13/16 | 71.44 | 2.8125 | SM08515 |
| | | 72.00 | 2.8346 | SM08516 |
| | 2-27/32 | 72.23 | 2.8438 | SM08517 |
| | 2-7/8 | 73.03 | 2.8750 | SM08518 |
| | 2-29/32 | 73.82 | 2.9062 | SM08519 |
| | | 74.00 | 2.9134 | SM08520 |
| | 2-15/16 | 74.61 | 2.9375 | SM08521 |
| | 2-31/32 | 75.41 | 2.9688 | SM08522 |
| | | 76.00 | 2.9921 | SM08523 |
| | 3 | 76.20 | 3.0000 | SM08524 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES 6,7,8

## SM-POINT SPADE DRILL INSERTS - SUPER COBALT(T15)

- Improved stability and hole straightness by newly developed thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.

**POINT ANGLE : 144 degree**



cutting conditions : p.278

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **6** 3.001 (76.23) to 3.507 (89.08) Thick 7/16 (11.1) | 3-1/32 | 76.99 | 3.0312 | SM08601 |
| | 3-1/16 | 77.79 | 3.0625 | SM08602 |
| | | 78.00 | 3.0709 | SM08603 |
| | 3-3/32 | 78.58 | 3.0938 | SM08604 |
| | 3-1/8 | 79.38 | 3.1250 | SM08605 |
| | | 80.00 | 3.1496 | SM08606 |
| | 3-5/32 | 80.17 | 3.1562 | SM08607 |
| | 3-3/16 | 80.96 | 3.1875 | SM08608 |
| | 3-7/32 | 81.76 | 3.2188 | SM08609 |
| | | 82.00 | 3.2283 | SM08610 |
| | 3-1/4 | 82.55 | 3.2500 | SM08611 |
| | 3-9/32 | 83.34 | 3.2812 | SM08612 |
| | | 84.00 | 3.3071 | SM08613 |
| | 3-5/16 | 84.14 | 3.3125 | SM08614 |
| | 3-11/32 | 84.93 | 3.3438 | SM08615 |
| | 3-3/8 | 85.73 | 3.3750 | SM08616 |
| | | 86.00 | 3.3858 | SM08617 |
| | 3-13/32 | 86.52 | 3.4063 | SM08618 |
| | 3-7/16 | 87.31 | 3.4375 | SM08619 |
| | | 88.00 | 3.4646 | SM08620 |
| | 3-15/32 | 88.11 | 3.4688 | SM08621 |
| | 3-1/2 | 88.90 | 3.5000 | SM08622 |
| **7** 3.455 (87.76) to 4.000 (101.60) | 3-17/32 | 89.69 | 3.5312 | SM08701 |
| | | 90.00 | 3.5433 | SM08702 |
| | 3-9/16 | 90.49 | 3.5625 | SM08703 |
| | 3-19/32 | 91.28 | 3.5938 | SM08704 |
| | | 92.00 | 3.6221 | SM08705 |
| | 3-5/8 | 92.08 | 3.6250 | SM08706 |
| | 3-21/32 | 92.87 | 3.6562 | SM08707 |
| | 3-11/16 | 93.66 | 3.6875 | SM08708 |

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **7** 3.455 (87.76) to 4.000 (101.60) Thick 7/16 (11.1) | | 94.00 | 3.7008 | SM08709 |
| | 3-23/32 | 94.46 | 3.7188 | SM08710 |
| | 3-3/4 | 95.25 | 3.7500 | SM08711 |
| | | 96.00 | 3.7795 | SM08712 |
| | 3-25/32 | 96.04 | 3.7812 | SM08713 |
| | 3-13/16 | 96.84 | 3.8125 | SM08714 |
| | 3-27/32 | 97.63 | 3.8438 | SM08715 |
| | | 98.00 | 3.8583 | SM08716 |
| | 3-7/8 | 98.43 | 3.8750 | SM08717 |
| | 3-29/32 | 99.22 | 3.9062 | SM08718 |
| | | 100.00 | 3.9370 | SM08719 |
| | 3-15/16 | 100.01 | 3.9375 | SM08720 |
| | 3-31/32 | 100.81 | 3.9688 | SM08721 |
| | 4 | 101.60 | 4.0000 | SM08722 |
| **8** 4.001 (101.63) to 4.507 (114.48) Thick 7/16 (11.1) | 4-1/64 | 102.00 | 4.0156 | SM08801 |
| | 4-1/16 | 103.19 | 4.0625 | SM08802 |
| | 4-3/32 | 104.00 | 4.0945 | SM08803 |
| | 4-1/8 | 104.78 | 4.1250 | SM08804 |
| | | 106.00 | 4.1732 | SM08805 |
| | 4-3/16 | 106.36 | 4.1875 | SM08806 |
| | 4-1/4 | 107.95 | 4.2500 | SM08807 |
| | | 108.00 | 4.2520 | SM08808 |
| | 4-5/16 | 109.54 | 4.3125 | SM08809 |
| | | 110.00 | 4.3307 | SM08810 |
| | 4-3/8 | 111.13 | 4.3750 | SM08811 |
| | | 112.00 | 4.4094 | SM08812 |
| | 4-7/16 | 112.71 | 4.4375 | SM08813 |
| | | 114.00 | 4.4882 | SM08814 |
| | 4-1/2 | 114.30 | 4.5000 | SM08815 |
| | | | | |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

# SPADE DRILLS

SERIES Y,Z,0,1

## SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- Improved stability and hole straightness by newly developed chip thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Increased speeds & feeds

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **Y** .374 (9.50) to .436 (11.07) Thick 3/32 (2.4) | | 9.50 | .3740 | * SM28Y01 |
| | 3/8 | 9.53 | .3750 | * SM28Y02 |
| | | 9.80 | .3858 | * SM28Y03 |
| | 25/64 | 9.92 | .3906 | * SM28Y04 |
| | | 10.00 | .3937 | * SM28Y05 |
| | | 10.20 | .4016 | * SM28Y06 |
| | 13/32 | 10.32 | .4062 | * SM28Y07 |
| | | 10.50 | .4134 | * SM28Y08 |
| | 27/64 | 10.72 | .4219 | * SM28Y09 |
| | | 10.80 | .4252 | * SM28Y10 |
| | | 11.00 | .4331 | * SM28Y11 |
| **Z** .437 (11.11) to .510 (12.95) 3/32(2.4) | 7/16 | 11.11 | .4375 | * SM28Z01 |
| | | 11.50 | .4528 | * SM28Z02 |
| | 29/64 | 11.51 | .4531 | * SM28Z03 |
| | 15/32 | 11.91 | .4688 | * SM28Z04 |
| | | 12.00 | .4724 | * SM28Z05 |
| | 31/64 | 12.30 | .4844 | * SM28Z06 |
| | | 12.50 | .4921 | * SM28Z07 |
| | 1/2 | 12.70 | .5000 | * SM28Z08 |
| **0** .511 (12.98) to .695 (17.65) Thick 1/8 (3.2) | | 13.00 | .5118 | * SM28001 |
| | 33/64 | 13.10 | .5156 | * SM28002 |
| | 17/32 | 13.49 | .5312 | * SM28003 |
| | | 13.50 | .5315 | * SM28004 |
| | 35/64 | 13.89 | .5469 | * SM28060 |
| | | 14.00 | .5512 | * SM28005 |
| | 9/16 | 14.29 | .5625 | * SM28006 |
| | | 14.50 | .5709 | * SM28007 |
| | 37/64 | 14.68 | .5781 | * SM28008 |
| | | 15.00 | .5906 | * SM28009 |
| | 19/32 | 15.08 | .5938 | * SM28010 |
| | 39/64 | 15.48 | .6094 | * SM28061 |
| | | 15.50 | .6102 | * SM28011 |
| | 5/8 | 15.88 | .6250 | * SM28012 |

| Series Min. to Max. (inch/mm) | Diameter Fractional (inch) | Diameter Metric (mm) | Diameter Decimal (inch) | EDP No. TiAlN |
|---|---|---|---|---|
| **0** .511 (12.98) to .695 (17.65) | | 16.00 | .6299 | * SM28013 |
| | 41/64 | 16.27 | .6406 | * SM28062 |
| | | 16.50 | .6496 | * SM28014 |
| | 21/32 | 16.67 | .6562 | * SM28015 |
| | | 17.00 | .6693 | * SM28016 |
| | 43/64 | 17.07 | .6719 | * SM28063 |
| | 11/16 | 17.46 | .6875 | * SM28017 |
| | | 17.50 | .6890 | * SM28018 |
| **1** .690 (17.53) to .960 (24.38) Thick 5/32 (4.0) | 45/64 | 17.86 | .7031 | SM28101 |
| | | 18.00 | .7087 | SM28102 |
| | 23/32 | 18.26 | .7188 | SM28103 |
| | | 18.50 | .7283 | SM28104 |
| | 47/64 | 18.65 | .7344 | SM28105 |
| | | 19.00 | .7480 | SM28106 |
| | 3/4 | 19.05 | .7500 | SM28107 |
| | 49/64 | 19.45 | .7656 | SM28108 |
| | | 19.50 | .7677 | SM28109 |
| | 25/32 | 19.84 | .7812 | SM28110 |
| | | 20.00 | .7874 | SM28111 |
| | 51/64 | 20.24 | .7969 | SM28160 |
| | | 20.50 | .8071 | SM28112 |
| | 13/16 | 20.64 | .8125 | SM28113 |
| | | 21.00 | .8268 | SM28114 |
| | 27/32 | 21.43 | .8438 | SM28115 |
| | 55/64 | 21.83 | .8594 | SM28161 |
| | | 22.00 | .8661 | SM28116 |
| | 7/8 | 22.23 | .8750 | SM28117 |
| | 57/64 | 22.62 | .8906 | SM28162 |
| | | 23.00 | .9055 | SM28118 |
| | 29/32 | 23.02 | .9062 | SM28119 |
| | 59/64 | 23.42 | .9219 | SM28120 |
| | 15/16 | 23.81 | .9375 | SM28121 |
| | | 24.00 | .9449 | SM28122 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |

# SPADE DRILLS

SERIES 2,3

## SM-POINT SPADE DRILL INSERTS - CARBIDE(C5)

- Improved stability and hole straightness by newly developed chip thinning design.
- Less thrust force and excellent self-centering.
- Any non-standard size available.
- Increased speeds & feeds

**POINT ANGLE : 132 degree**



cutting conditions : p.279

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **2** **.961 (24.41) to 1.380 (35.05)** **Thick** 3/16 (4.8) | 31/32 | 24.61 | .9688 | SM28201 |
| | 63/64 | 25.00 | .9843 | SM28202 |
| | 1 | 25.40 | 1.0000 | SM28203 |
| | 1-1/64 | 25.80 | 1.0156 | SM28204 |
| | | 26.00 | 1.0236 | SM28205 |
| | 1-1/32 | 26.19 | 1.0312 | SM28206 |
| | 1-3/64 | 26.59 | 1.0469 | SM28260 |
| | 1-1/16 | 26.99 | 1.0625 | SM28207 |
| | | 27.00 | 1.0630 | SM28208 |
| | 1-3/32 | 27.78 | 1.0938 | SM28209 |
| | | 28.00 | 1.1024 | SM28210 |
| | 1-7/64 | 28.18 | 1.1094 | SM28261 |
| | 1-1/8 | 28.58 | 1.1250 | SM28211 |
| | | 29.00 | 1.1417 | SM28212 |
| | 1-5/32 | 29.37 | 1.1562 | SM28213 |
| | | 30.00 | 1.1811 | SM28214 |
| | 1-3/16 | 30.16 | 1.1875 | SM28215 |
| | 1-7/32 | 30.96 | 1.2188 | SM28216 |
| | | 31.00 | 1.2205 | SM28217 |
| | 1-1/4 | 31.75 | 1.2500 | SM28218 |
| | | 32.00 | 1.2598 | SM28219 |
| | 1-9/32 | 32.54 | 1.2812 | SM28220 |
| | | 33.00 | 1.2992 | SM28221 |
| | 1-5/16 | 33.34 | 1.3125 | SM28222 |
| | | 34.00 | 1.3386 | SM28223 |
| | 1-11/32 | 34.13 | 1.3438 | SM28224 |
| | 1-3/8 | 34.93 | 1.3750 | SM28225 |
| | | 35.00 | 1.3780 | SM28226 |

| Series Min. to Max. (inch/mm) | Diameter | | | EDP No. |
|---|---|---|---|---|
| | Fractional (inch) | Metric (mm) | Decimal (inch) | TiAlN |
| **3** **1.353 (34.37) to 1.882 (47.80)** **Thick** 1/4 (6.4) | 1-13/32 | 35.72 | 1.4062 | SM28301 |
| | | 36.00 | 1.4173 | SM28302 |
| | 1-7/16 | 36.51 | 1.4375 | SM28303 |
| | | 37.00 | 1.4567 | SM28304 |
| | 1-15/32 | 37.31 | 1.4688 | SM28305 |
| | | 38.00 | 1.4961 | SM28306 |
| | 1-1/2 | 38.10 | 1.5000 | SM28307 |
| | 1-17/32 | 38.89 | 1.5312 | SM28308 |
| | | 39.00 | 1.5354 | SM28309 |
| | 1-9/16 | 39.69 | 1.5625 | SM28310 |
| | | 40.00 | 1.5748 | SM28311 |
| | 1-19/32 | 40.48 | 1.5938 | SM28312 |
| | | 41.00 | 1.6142 | SM28313 |
| | 1-5/8 | 41.28 | 1.6250 | SM28314 |
| | | 42.00 | 1.6535 | SM28315 |
| | 1-21/32 | 42.07 | 1.6562 | SM28316 |
| | 1-11/16 | 42.86 | 1.6875 | SM28317 |
| | | 43.00 | 1.6929 | SM28318 |
| | 1-23/32 | 43.66 | 1.7188 | SM28319 |
| | | 44.00 | 1.7323 | SM28320 |
| | 1-3/4 | 44.45 | 1.7500 | SM28321 |
| | | 45.00 | 1.7717 | SM28322 |
| | 1-25/32 | 45.24 | 1.7812 | SM28323 |
| | | 46.00 | 1.8110 | SM28324 |
| | 1-13/16 | 46.04 | 1.8125 | SM28325 |
| | 1-27/32 | 46.83 | 1.8438 | SM28326 |
| | | 47.00 | 1.8504 | SM28327 |
| | 1-7/8 | 47.63 | 1.8750 | SM28328 |

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | ○ |

# SPADE DRILLS

SERIES Y,Z,0,1,2

## SPADE DRILL FLAT BOTTOM INSERTS - SUPER COBALT T15

**POINT ANGLE : 180 degree**



cutting conditions : p.280

| Series | Diameter | | EDP No. | |
|---|---|---|---|---|
| | Fractional (inch) | Decimal (inch) | TiN | TiAlN |
| Y | 3/8 | .3750 | * SF05024 | * SF15024 |
| | 13/32 | .4063 | * SF05026 | * SF15026 |
| Z | 7/16 | .4375 | * SF05028 | * SF15028 |
| | 15/32 | .4688 | * SF05030 | * SF15030 |
| | 1/2 | .5000 | * SF05032 | * SF15032 |
| 0 | 17/32 | .5313 | * SF05034 | * SF15034 |
| | 9/16 | .5625 | * SF05036 | * SF15036 |
| | 19/32 | .5938 | * SF05038 | * SF15038 |
| | 5/8 | .6250 | * SF05040 | * SF15040 |
| | 21/32 | .6563 | * SF05042 | * SF15042 |
| | 11/16 | .6875 | * SF05044 | * SF15044 |
| 1 | 23/32 | .7188 | SF05046 | SF15046 |
| | 3/4 | .7500 | SF05048 | SF15048 |
| | 25/32 | .7813 | SF05050 | SF15050 |
| | 13/16 | .8125 | SF05052 | SF15052 |
| | 27/32 | .8438 | SF05054 | SF15054 |
| | 7/8 | .8750 | SF05056 | SF15056 |
| | 29/32 | .9063 | SF05058 | SF15058 |
| | 15/16 | .9375 | SF05060 | SF15060 |

| Series | Diameter | | EDP No. | |
|---|---|---|---|---|
| | Fractional (inch) | Decimal (inch) | TiN | TiAlN |
| 2 | 31/32 | .9688 | SF05062 | SF15062 |
| | 1 | 1.0000 | SF05100 | SF15100 |
| | 1-1/32 | 1.0313 | SF05102 | SF15102 |
| | 1-1/16 | 1.0625 | SF05104 | SF15104 |
| | 1-3/32 | 1.0938 | SF05106 | SF15106 |
| | 1-1/8 | 1.1250 | SF05108 | SF15108 |
| | 1-5/32 | 1.1563 | SF05110 | SF15110 |
| | 1-3/16 | 1.1875 | SF05112 | SF15112 |
| | 1-7/32 | 1.2188 | SF05114 | SF15114 |
| | 1-1/4 | 1.2500 | SF05116 | SF15116 |
| | 1-9/32 | 1.2813 | SF05118 | SF15118 |
| | 1-5/16 | 1.3125 | SF05120 | SF15120 |
| | 1-11/32 | 1.3438 | SF05122 | SF15122 |
| | 1-3/8 | 1.3750 | SF05124 | SF15124 |

* 2pcs per package

◎ : Excellent ○ : Good

| P | | | | | | | | | | | M | K | | N | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-alloyed Steels, Free Machining Steels | Carbon Steels | | Alloy Steels | | High Alloyed steels | | Structural Steels | | Tool Steels | | Stainless Steels | Cast Iron | | Aluminum | Copper Alloys |
| ~HRc24 (~HB250) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc28 (~HB275) | HRc28~ (HB275~) | ~HRc37 (~HB350) | HRc37~ (HB350~) | ~HRc24 (~HB250) | HRc24~ (HB250~) | ~HRc13 (~HB200) | HRc13~ (HB200~) | ~HRc28 (~HB275) | ~HRc19 (~HB220) | HRc19~ (HB220~) | ~HRc8 (~HB180) | ~HB110 |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ◎ | ◎ | ○ | ○ | ○ | ○ | ◎ | ○ | ○ |

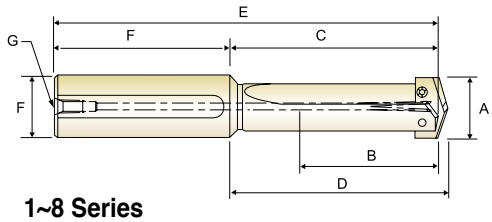
# SPADE DRILLS

P13 SERIES
P14 SERIES

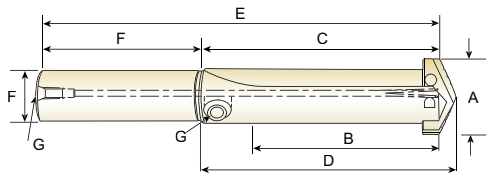
## STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



Y~0.5 Series




1~8 Series

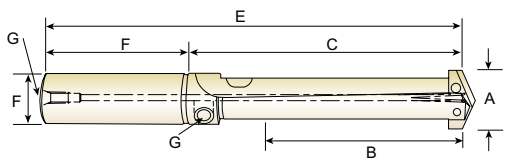



### SHORT LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P13Y01 | 3/8 – 27/64 | 1-1/4 | 2-1/32 | 2-1/8 | 4-13/32 | 3/4 | 2-3/8 | 1/8 |
| Z | P13Z01 | 7/16 – 1/2 | 1-1/4 | 2-1/32 | 2-1/8 | 4-13/32 | 3/4 | 2-3/8 | 1/8 |
| 0 | P13001 | 33/64 – 11/16 | 1-3/8 | 2-3/16 | 2-19/64 | 4-9/16 | 3/4 | 2-3/8 | 1/8 |
| 0.5 | P13051 | 39/64 – 11/16 | 1-3/8 | 2-3/16 | 2-19/64 | 4-9/16 | 3/4 | 2-3/8 | 1/8 |
| 1 | P13101 | 45/64 – 15/16 | 2-5/8 | 3-7/8 | 4-1/64 | 6-7/8 | 3/4 | 3 | 1/8 |
| | P13102 | 45/64 – 15/16 | 2-5/8 | 3-7/8 | 4-1/64 | 6-7/8 | 1 | 3 | 1/8 |
| 1.5 | P13151 | 55/64 – 15/16 | 2-5/8 | 3-7/8 | 4-1/64 | 6-7/8 | 3/4 | 3 | 1/8 |
| | P13152 | 55/64 – 15/16 | 2-5/8 | 3-7/8 | 4-1/64 | 6-7/8 | 1 | 3 | 1/8 |
| 2 | P13202 | 31/32 – 1-3/8 | 3-3/8 | 4-1/2 | 4-41/64 | 8 | 1 | 3-1/2 | 1/8 |
| | P13203 | 31/32 – 1-3/8 | 3-3/8 | 4-1/2 | 4-41/64 | 8 | 1-1/4 | 3-1/2 | 1/8 |
| 2.5 | P13252 | 1-3/16 – 1-3/8 | 3-3/8 | 4-1/2 | 4-41/64 | 8 | 1 | 3-1/2 | 1/8 |
| | P13253 | 1-3/16 – 1-3/8 | 3-3/8 | 4-1/2 | 4-41/64 | 8 | 1-1/4 | 3-1/2 | 1/8 |
| 3 | P13303 | 1-13/32 – 1-7/8 | 4-3/4 | 6 | 6-3/16 | 10 | 1-1/4 | 4 | 1/4 |
| | P13304 | 1-13/32 – 1-7/8 | 4-3/4 | 6 | 6-3/16 | 10 | 1-1/2 | 4 | 1/4 |
| 4 | P13404 | 1-29/32 – 2-9/16 | 5-1/8 | 6-1/2 | 6-11/16 | 10-1/2 | 1-1/2 | 4 | 1/4 |
| | P13405 | 1-29/32 – 2-9/16 | 5-1/8 | 6-1/2 | 6-11/16 | 10-1/2 | 1-3/4 | 4 | 1/4 |
| 5-6 | P13506 | 2-1/2 – 3-1/2 | 6-3/4 | 8-1/2 | 8-3/4 | 12-1/2 | 2 | 4 | 1/2 |
| 7-8 | P13708 | 3-17/32 – 4-1/2 | 6-3/4 | 8-7/8 | 9-1/8 | 13-7/8 | 3 | 5 | 1/2 |






### INTERMEDIATE LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| 1 | P14102 | 45/64 – 15/16 | 4-5/8 | 5-7/8 | 6-1/64 | 8-7/8 | 1 | 3 | 1/8 |
| 1.5 | P14152 | 55/64 – 15/16 | 4-5/8 | 5-7/8 | 6-1/64 | 8-7/8 | 1 | 3 | 1/8 |
| 2 | P14203 | 31/32 – 1-3/8 | 5-3/8 | 6-1/2 | 6-41/64 | 10 | 1-1/4 | 3-1/2 | 1/8 |
| 2.5 | P14253 | 1-3/16 – 1-3/8 | 5-3/8 | 6-1/2 | 6-41/64 | 10 | 1-1/4 | 3-1/2 | 1/8 |
| 3 | P14304 | 1-13/32 – 1-7/8 | 6-1/2 | 7-3/4 | 7-15/16 | 11-3/4 | 1-1/2 | 4 | 1/4 |

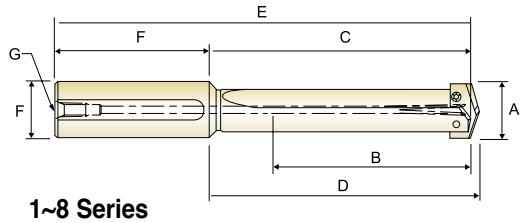
# SPADE DRILLS

P15 SERIES

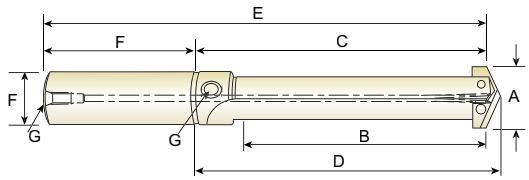
## STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



Y~0.5 Series




1~8 Series




## STANDARD LENGTH

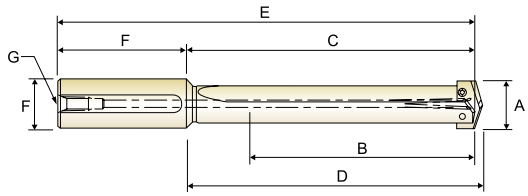
Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P15Y01 | 3/8 – 27/64 | 2-3/8 | 3-5/32 | 3-1/4 | 5-17/32 | 3/4 | 2-3/8 | 1/8 |
| Z | P15Z01 | 7/16 – 1/2 | 2-3/8 | 3-5/32 | 3-1/4 | 5-17/32 | 3/4 | 2-3/8 | 1/8 |
| 0 | P15001 | 33/64 – 11/16 | 2-1/2 | 3-5/16 | 3-27/64 | 5-11/16 | 3/4 | 2-3/8 | 1/8 |
| 0.5 | P15051 | 39/64 – 11/16 | 2-1/2 | 3-5/16 | 3-27/64 | 5-11/16 | 3/4 | 2-3/8 | 1/8 |
| 1 | P15101 | 45/64 – 15/16 | 6-5/8 | 7-7/8 | 8-1/64 | 10-7/8 | 3/4 | 3 | 1/8 |
| | P15102 | 45/64 – 15/16 | 6-5/8 | 7-7/8 | 8-1/64 | 10-7/8 | 1 | 3 | 1/8 |
| 1.5 | P15151 | 55/64 – 15/16 | 6-5/8 | 7-7/8 | 8-1/64 | 10-7/8 | 3/4 | 3 | 1/8 |
| | P15152 | 55/64 – 15/16 | 6-5/8 | 7-7/8 | 8-1/64 | 10-7/8 | 1 | 3 | 1/8 |
| 2 | P15202 | 31/32 – 1-3/8 | 7-3/8 | 8-1/2 | 8-41/64 | 12 | 1 | 3-1/2 | 1/8 |
| | P15203 | 31/32 – 1-3/8 | 7-3/8 | 8-1/2 | 8-41/64 | 12 | 1-1/4 | 3-1/2 | 1/8 |
| 2.5 | P15252 | 1-3/16 – 1-3/8 | 7-3/8 | 8-1/2 | 8-41/64 | 12 | 1 | 3-1/2 | 1/8 |
| | P15253 | 1-3/16 – 1-3/8 | 7-3/8 | 8-1/2 | 8-41/64 | 12 | 1-1/4 | 3-1/2 | 1/8 |
| 3 | P15303 | 1-13/32 – 1-7/8 | 8-1/4 | 9-1/2 | 9-11/16 | 13-1/2 | 1-1/4 | 4 | 1/4 |
| | P15304 | 1-13/32 – 1-7/8 | 8-1/4 | 9-1/2 | 9-11/16 | 13-1/2 | 1-1/2 | 4 | 1/4 |
| 4 | P15404 | 1-29/32 – 2-9/16 | 9-1/8 | 10-1/2 | 10-11/16 | 14-1/2 | 1-1/2 | 4 | 1/4 |
| | P15405 | 1-29/32 – 2-9/16 | 9-1/8 | 10-1/2 | 10-11/16 | 14-1/2 | 1-3/4 | 4 | 1/4 |
| 5-6 | P15506 | 2-1/2 – 3-1/2 | 10-3/4 | 12-1/2 | 12-3/4 | 16-1/2 | 2 | 4 | 1/2 |
| 7-8 | P15708 | 3-17/32 – 4-1/2 | 10-3/4 | 12-7/8 | 13-1/8 | 17-7/8 | 3 | 5 | 1/2 |

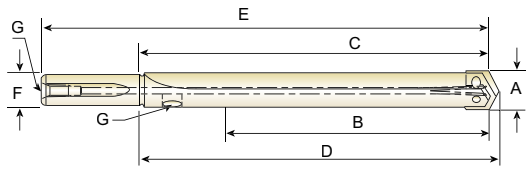
# STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



Y~0.5 Series




1~8 Series




## EXTENDED LENGTH

Unit : Inch

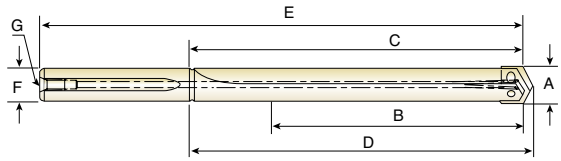
| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P16Y01 | 3/8 – 27/64 | 4-3/8 | 5-5/32 | 5-1/4 | 7-17/32 | 3/4 | 2-3/8 | 1/8 |
| Z | P16Z01 | 7/16 – 1/2 | 4-3/8 | 5-5/32 | 5-1/4 | 7-17/32 | 3/4 | 2-3/8 | 1/8 |
| 0 | P16001 | 33/64 – 11/16 | 4-1/2 | 5-5/16 | 5-27/64 | 7-11/16 | 3/4 | 2-3/8 | 1/8 |
| 0.5 | P16051 | 39/64 – 11/16 | 4-1/2 | 5-5/16 | 5-27/64 | 7-11/16 | 3/4 | 2-3/8 | 1/8 |
| 1 | P16102 | 45/64 – 15/16 | 10-5/8 | 11-7/8 | 12-1/64 | 14-7/8 | 1 | 3 | 1/8 |
| 1.5 | P16152 | 55/64 – 15/16 | 10-5/8 | 11-7/8 | 12-1/64 | 14-7/8 | 1 | 3 | 1/8 |
| 2 | P16203 | 31/32 – 1-3/8 | 11-3/8 | 12-1/2 | 12-41/64 | 16 | 1-1/4 | 3-1/2 | 1/8 |
| 2.5 | P16253 | 1-3/16 – 1-3/8 | 11-3/8 | 12-1/2 | 12-41/64 | 16 | 1-1/4 | 3-1/2 | 1/8 |
| 3 | P16303 | 1-13/32 – 1-7/8 | 13-3/4 | 15 | 15-3/16 | 19 | 1-1/4 | 4 | 1/4 |
| 4 | P16404 | 1-29/32 – 2-9/16 | 16-5/8 | 18 | 18-3/16 | 22 | 1-1/2 | 4 | 1/4 |
| 5-6 | P16506 | 2-1/2 – 3-1/2 | 18-1/4 | 20 | 20-1/4 | 24 | 2 | 4 | 1/2 |
| 7-8 | P16708 | 3-17/32 – 4-1/2 | 21-7/8 | 24 | 24-1/4 | 29 | 3 | 5 | 1/2 |

# SPADE DRILLS

P17 SERIES

## STRAIGHT SHANK HOLDER, STRAIGHT FLUTE



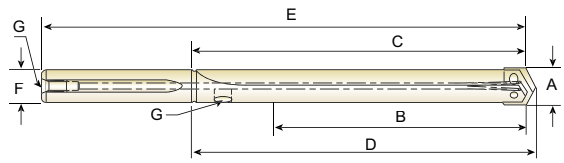



### LONG LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| 0 | P17001 | 33/64 – 11/16 | 7 | 7-13/16 | 7-59/64 | 10-3/16 | 3/4 | 2-3/8 | 1/8 |
| 0.5 | P17051 | 39/64 – 11/16 | 7 | 7-13/16 | 7-59/64 | 10-3/16 | 3/4 | 2-3/8 | 1/8 |






### EXTRA LONG LENGTH

Unit : Inch

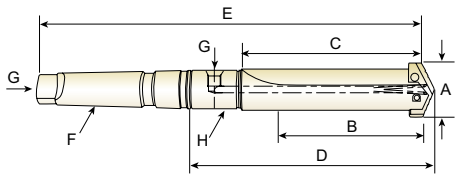
| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| 1 | P17101 | 45/64 – 15/16 | 18 | 19-1/4 | 19-25/64 | 22-1/4 | 1 | 3 | 1/8 |
| 2 | P17202 | 31/32 – 1-3/8 | 20-1/8 | 21-1/4 | 21-25/64 | 24-3/4 | 1-1/4 | 3-1/2 | 1/8 |
| 3 | P17303 | 1-13/32 – 1-7/8 | 22 | 23-1/4 | 23-7/16 | 27-1/4 | 1-1/2 | 4 | 1/4 |
| 4 | P17404 | 1-29/32 – 2-9/16 | 24-5/8 | 26 | 26-3/16 | 30 | 1-1/2 | 4 | 1/4 |
| 5 | P17506 | 2-1/2 – 3-1/2 | 26 | 27-3/4 | 28 | 31-3/4 | 2 | 4 | 1/2 |
| 7 | P17708 | 3-17/32 – 4-1/2 | 27 | 29-1/8 | 29-3/8 | 34-1/8 | 3 | 5 | 1/2 |

# SPADE DRILLS

**P01 SERIES**
**P08 SERIES**

## TAPER SHANK HOLDER, STRAIGHT FLUTE / HELICAL FLUTE





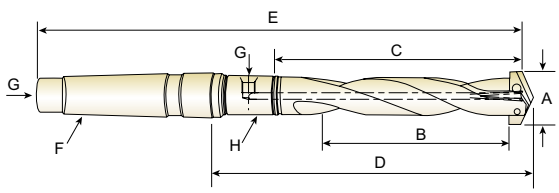

### SHORT LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | MT | Pipe Tap | RCI |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| Y | P01Y02 | 3/8 – 27/64 | 1-1/4 | 2-1/32 | 3-15/32 | 6-5/16 | #2 | 1/16 | PR1030 |
| Z | P01Z02 | 7/16 – 1/2 | 1-1/4 | 2-1/32 | 3-15/32 | 6-5/16 | #2 | 1/16 | PR1030 |
| 0 | P01002 | 33/64 – 11/16 | 1-3/8 | 2-3/16 | 3-41/64 | 6-15/32 | #2 | 1/16 | PR1030 |
| 0.5 | P01052 | 39/64 – 11/16 | 1-3/8 | 2-3/16 | 3-41/64 | 6-15/32 | #2 | 1/16 | PR1030 |
| 1 | P01103 | 45/64 – 15/16 | 2-3/4 | 3-7/8 | 5-39/64 | 9-5/32 | #3 | 1/8 | PR1031 |
| | P01104 | 45/64 – 15/16 | 2-3/4 | 3-7/8 | 5-43/64 | 10-5/32 | #4 | 1/8 | PR1031 |
| 1.5 | P01153 | 55/64 – 15/16 | 2-3/4 | 3-7/8 | 5-39/64 | 9-5/32 | #3 | 1/8 | PR1031 |
| | P01154 | 55/64 – 15/16 | 2-3/4 | 3-7/8 | 5-43/64 | 10-5/32 | #4 | 1/8 | PR1031 |
| 2 | P01203 | 31/32 – 1-3/8 | 3-3/8 | 4-1/2 | 6-15/64 | 9-25/32 | #3 | 1/8 | PR1031 |
| | P01204 | 31/32 – 1-3/8 | 3-3/8 | 4-1/2 | 6-19/64 | 10-25/32 | #4 | 1/8 | PR1031 |
| 2.5 | P01253 | 1-3/16 – 1-3/8 | 3-3/8 | 4-1/2 | 6-15/64 | 9-25/32 | #3 | 1/8 | PR1031 |
| | P01254 | 1-3/16 – 1-3/8 | 3-3/8 | 4-1/2 | 6-37/64 | 11-1/16 | #4 | 1/4 | PR1042 |
| 3 | P01304 | 1-13/32 – 1-7/8 | 4-3/4 | 6 | 8-1/8 | 12-9/16 | #4 | 1/4 | PR1042 |
| | P01305 | 1-13/32 – 1-7/8 | 4-3/4 | 6 | 8-1/8 | 13-13/16 | #5 | 1/4 | PR1043 |
| 4 | P01404 | 1-29/32 – 2-9/16 | 5-1/8 | 6-1/2 | 8-5/8 | 13-1/16 | #4 | 1/4 | PR1042 |
| | P01405 | 1-29/32 – 2-9/16 | 5-1/8 | 6-1/2 | 8-5/8 | 14-5/16 | #5 | 1/4 | PR1043 |
| 5-6 | P01505 | 2-1/2 – 3-1/2 | 6-3/4 | 8-1/2 | 11-5/16 | 16-15/16 | #5 | 1/2 | PR1054 |
| 7-8 | P01705 | 3-17/32 – 4-1/2 | 6-3/4 | 8-7/8 | 11-11/16 | 17-5/16 | #5 | 1/2 | PR1054 |

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)






### INTERMEDIATE LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | MT | Pipe Tap | RCI |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| 1 | P08103 | 45/64 – 15/16 | 4-3/4 | 5-7/8 | 7-39/64 | 11-5/32 | #3 | 1/8 | PR1031 |
| 1.5 | P08153 | 55/64 – 15/16 | 4-3/4 | 5-7/8 | 7-39/64 | 11-5/32 | #3 | 1/8 | PR1031 |
| 2 | P08204 | 31/32 – 1-3/8 | 5-3/8 | 6-1/2 | 8-19/64 | 12-25/32 | #4 | 1/8 | PR1031 |
| 2.5 | P08254 | 1-3/16 – 1-3/8 | 5-3/8 | 6-1/2 | 8-37/64 | 13–1/16 | #4 | 1/4 | PR1042 |

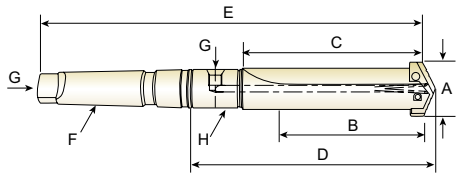
▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)

# SPADE DRILLS

P03 SERIES

## TAPER SHANK HOLDER, STRAIGHT FLUTE





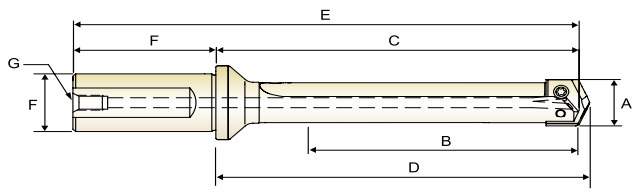

## STANDARD LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | MT | Pipe Tap | RCI |
|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | D | E | F | G | H |
| Y | P03Y02 | 3/8 – 27/64 | 2-3/8 | 3-5/32 | 4-19/32 | 7-7/16 | #2 | 1/16 | PR1030 |
| Z | P03Z02 | 7/16 – 1/2 | 2-3/8 | 3-5/32 | 4-19/32 | 7-7/16 | #2 | 1/16 | PR1030 |
| 0 | P03002 | 33/64 – 11/16 | 2-1/2 | 3-5/16 | 4-49/64 | 7-19/32 | #2 | 1/16 | PR1030 |
| 0.5 | P03052 | 39/64 – 11/16 | 2-1/2 | 3-5/16 | 4-49/64 | 7-19/32 | #2 | 1/16 | PR1030 |
| 1 | P03103 | 45/64 – 15/16 | 6-3/4 | 7-7/8 | 9-39/64 | 13-5/32 | #3 | 1/8 | PR1031 |
| | P03104 | 45/64 – 15/16 | 6-3/4 | 7-7/8 | 9-43/64 | 14-5/32 | #4 | 1/8 | PR1031 |
| 1.5 | P03153 | 55/64 – 15/16 | 6-3/4 | 7-7/8 | 9-39/64 | 13-5/32 | #3 | 1/8 | PR1031 |
| | P03154 | 55/64 – 15/16 | 6-3/4 | 7-7/8 | 9-43/64 | 14-5/32 | #4 | 1/8 | PR1031 |
| 2 | P03203 | 31/32 – 1-3/8 | 7-3/8 | 8-1/2 | 10-15/64 | 13-25/32 | #3 | 1/8 | PR1031 |
| | P03204 | 31/32 – 1-3/8 | 7-3/8 | 8-1/2 | 10-19/64 | 14-25/32 | #4 | 1/8 | PR1031 |
| 2.5 | P03253 | 1-3/16 – 1-3/8 | 7-3/8 | 8-1/2 | 10-15/64 | 13-25/32 | #3 | 1/8 | PR1031 |
| | P03254 | 1-3/16 – 1-3/8 | 7-3/8 | 8-1/2 | 10-37/64 | 15-1/16 | #4 | 1/4 | PR1042 |
| 3 | P03304 | 1-13/32 – 1-7/8 | 8-1/4 | 9-1/2 | 11-5/8 | 16-1/16 | #4 | 1/4 | PR1042 |
| | P03305 | 1-13/32 – 1-7/8 | 8-1/4 | 9-1/2 | 11-5/8 | 17-5/16 | #5 | 1/4 | PR1043 |
| 4 | P03404 | 1-29/32 – 2-9/16 | 9-1/8 | 10-1/2 | 12-5/8 | 17-1/16 | #4 | 1/4 | PR1042 |
| | P03405 | 1-29/32 – 2-9/16 | 9-1/8 | 10-1/2 | 12-5/8 | 18-5/16 | #5 | 1/4 | PR1043 |
| 5-6 | P03505 | 2-1/2 – 3-1/2 | 10-3/4 | 12-1/2 | 15-5/16 | 20-15/16 | #5 | 1/2 | PR1054 |
| 7-8 | P03705 | 3-17/32 – 4-1/2 | 10-3/4 | 12-7/8 | 15-11/16 | 21-5/16 | #5 | 1/2 | PR1054 |

▶ You can also apply **RCI**(**R**otary **C**oolant **I**nducer) for internal cooling. (See page 277)

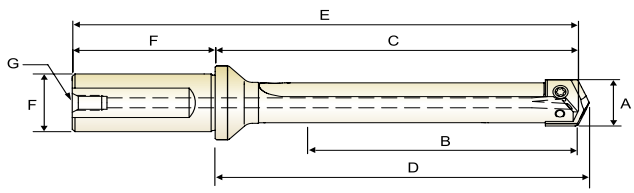
# FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUGTE




## SHORT LENGTH SPADE DRILL HOLDER

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P25Y01 | 3/8 – 27/64 | 1-1/4 | 2-13/32 | 2-1/2 | 4-7/16 | 3/4 | 2-1/32 | 1/8 |
| Z | P25Y01 | 7/16 – 1/2 | 1-1/4 | 2-13/32 | 2-1/2 | 4-7/16 | 3/4 | 2-1/32 | 1/8 |
| 0 | P25001 | 33/64 – 11/16 | 1-3/8 | 2-1/2 | 2-39/64 | 4-17/32 | 3/4 | 2-1/32 | 1/8 |
| 0.5 | P25051 | 39/64 – 11/16 | 1-3/8 | 2-1/2 | 2-39/64 | 4-17/32 | 3/4 | 2-1/32 | 1/8 |
| 1 | P25102 | 45/64 – 15/16 | 2-5/8 | 4-7/32 | 4-23/64 | 6-1/2 | 1 | 2-9/32 | 1/8 |
| 1.5 | P25152 | 55/64 – 15/16 | 2-5/8 | 4-7/32 | 4-23/64 | 6-1/2 | 1 | 2-9/32 | 1/8 |
| 2 | P25203 | 31/32 – 1-3/8 | 3-3/8 | 5-1/16 | 5-13/64 | 7-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 2.5 | P25253 | 1-3/16 – 1-3/8 | 3-3/8 | 5-1/16 | 5-13/64 | 7-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 3 | P25303 | 1-13/32 – 1-7/8 | 4-3/4 | 6-13/16 | 7 | 9-1/2 | 1-1/2 | 2-11/16 | 1/4 |
| 4 | P25404 | 1-29/32 – 2-9/16 | 5-1/8 | 7-1/16 | 7-1/4 | 9-3/4 | 1-1/2 | 2-11/16 | 1/4 |




## INTERMEDIATED LENGTH

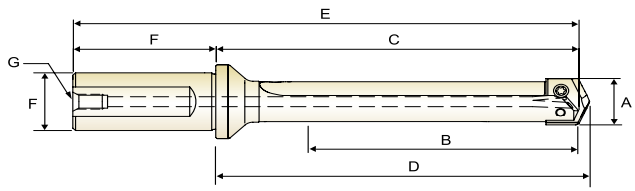
Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| 1 | P26102 | 45/64 ~ 15/16 | 4-5/8 | 6-3/32 | 6-15/64 | 8-3/8 | 1 | 2-9/32 | 1/8 |
| 1.5 | P26152 | 55/64 ~ 15/16 | 4-5/8 | 6-3/32 | 6-15/64 | 8-3/8 | 1 | 2-9/32 | 1/8 |
| 2 | P26203 | 31/32 ~ 1-3/8 | 5-3/8 | 7-1/16 | 7-13/64 | 9-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 2.5 | P26253 | 1-3/16 ~ 1-3/8 | 5-3/8 | 7-1/16 | 7-13/64 | 9-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 3 | P26304 | 1-13/32 ~ 1-7/8 | 6-1/2 | 8-9/16 | 8-3/4 | 11-1/4 | 1-1/2 | 2-11/32 | 1/4 |

# SPADE DRILLS

P27 SERIES
P28 SERIES

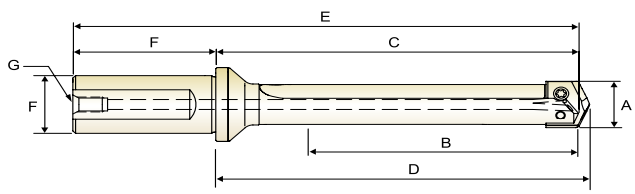
## FLANGED STRAIGHT SHANK HOLDER, STRAIGHT FLUGTE




## STANDARD LENGTH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P27Y01 | 3/8 ~ 27/64 | 2-3/8 | 3-17/32 | 3-5/8 | 5-9/16 | 3/4 | 2-1/32 | 1/8 |
| Z | P27Z01 | 7/16 ~ 1/2 | 2-3/8 | 3-17/32 | 3-5/8 | 5-9/16 | 3/4 | 2-1/32 | 1/8 |
| 0 | P27001 | 33/64 ~ 11/16 | 2-1/2 | 3-5/8 | 3-47/64 | 5-21/32 | 3/4 | 2-1/32 | 1/8 |
| 0.5 | P27051 | 39/64 ~ 11/16 | 2-1/2 | 3-5/8 | 3-47/64 | 5-21/32 | 3/4 | 2-1/32 | 1/8 |
| 1 | P27102 | 45/64 ~ 15/16 | 6-5/8 | 8-3/32 | 8-15/64 | 10-3/8 | 1 | 2-9/32 | 1/8 |
| 1.5 | P27152 | 55/64 ~ 15/16 | 6-5/8 | 8-3/32 | 8-15/64 | 10-3/8 | 1 | 2-9/32 | 1/8 |
| 2 | P27203 | 31/32 ~ 1-3/8 | 7-3/8 | 9-1/16 | 9-13/64 | 11-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 2.5 | P27253 | 1-3/16 ~ 1-3/8 | 7-3/8 | 9-1/16 | 9-13/64 | 11-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 3 | P27303 | 1-13/32 ~ 1-7/8 | 8-1/4 | 10-5/16 | 10-1/2 | 13 | 1-1/2 | 2-11/16 | 1/4 |
| 4 | P27404 | 1-29/32 ~ 2-9/16 | 9-1/8 | 11-1/16 | 11-1/4 | 13-3/4 | 1-1/2 | 2-11/16 | 1/4 |




## EXTENDED LENGTGH

Unit : Inch

| Series | EDP No. | Drill Insert Range | Max. Drill Depth | Flute Length | Ref. Length | Overall Length | Shank | | Pipe Tap |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Dia. | Length | |
| | | A | B | C | D | E | F | | G |
| Y | P28Y01 | 3/8 ~ 27/64 | 4-3/8 | 5-17/32 | 5-5/8 | 7-9/16 | 3/4 | 2-1/32 | 1/8 |
| Z | P28Y01 | 7/16 ~ 1/2 | 4-3/8 | 5-17/32 | 5-5/8 | 7-9/16 | 3/4 | 2-1/32 | 1/8 |
| 0 | P28001 | 33/64 ~ 11/16 | 4-1/2 | 5-5/8 | 5-47/64 | 7-21/32 | 3/4 | 2-1/32 | 1/8 |
| 0.5 | P28051 | 39/64 ~ 11/16 | 4-1/2 | 5-5/8 | 5-47/64 | 7-21/32 | 3/4 | 2-1/32 | 1/8 |
| 1 | P28102 | 45/64 ~ 15/16 | 10-5/8 | 12-3/32 | 12-15/64 | 14-3/8 | 1 | 2-9/32 | 1/8 |
| 1.5 | P28152 | 55/64 ~ 15/16 | 10-5/8 | 12-3/32 | 12-15/64 | 14-3/8 | 1 | 2-9/32 | 1/8 |
| 2 | P28203 | 31/32 ~ 1-3/8 | 11-3/8 | 13-1/16 | 13-13/64 | 15-11/32 | 1-1/4 | 2-9/32 | 1/4 |
| 2.5 | P28253 | 1-3/32 ~ 1-3/8 | 11-3/8 | 13-1/16 | 13-13/64 | 15-11/32 | 1-1/4 | 2-9/32 | 1/4 |

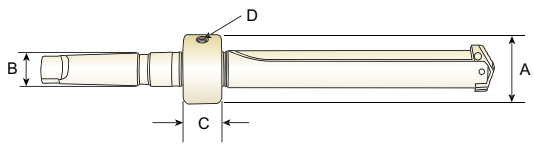
# HOLDER ACCESSORIES

## TORX SCREWS AND PREMIUM TORX HAND DRIVERS

| Series | Torx Screws | | Torx Screws (Nylon Locking) | | Premium Torx Drivers | Drill Range | | Torque in Lbs. 5.5 |
|---|---|---|---|---|---|---|---|---|
| | Item | PKG EDP No. (10 Screws) | Item | PKG EDP No. (10 Screws) | EDP No. | Fractional inch | Metric mm | |
| Y | 2XT7 | J7Y001 | 2XT7N | J7Y006 | J5Y007 | 3/8 – 27/64 | 9.5 – 11.0 | 5.5 |
| Z | 2LXT7 | J7Z011 | 2LXT7N | J7Z016 | J5Y007 | 7/16 – 1/2 | 11.5 – 12.5 | 5.5 |
| 0 | 2.5XT8 | J80021 | 2.5XT8N | J80026 | J50008 | 33/64 – 11/16 | 13.0 – 17.5 | 11.0 |
| 0.5 | 2.5LXT8 | J80531 | 2.5LXT8N | J80536 | J50008 | 39/64 – 11/16 | 15.5 – 17.5 | 11.0 |
| 1 | 3XT9 | J91041 | 3XT9N | J91046 | J51009 | 45/64 – 15/16 | 18.0 – 24.0 | 20.0 |
| 1.5 | 3LXT9 | J91551 | 3LXT9N | J91556 | J51009 | 55/64 – 15/16 | 22.0 – 24.0 | 20.0 |
| 2 | 4XT15 | JB2061 | 4XT15N | JB2066 | J52015 | 31/32 – 1-3/8 | 25.0 – 35.0 | 45.0 |
| 2.5 | 4XT15 | JB2061 | 4XT15N | JB2066 | J52015 | 31/32 – 1-3/8 | 30.0 – 35.0 | 45.0 |
| 3-4 | 5XT20 | JC3081 | 5XT20N | JC3086 | J53020 | 1-13/32 – 2-9/16 | 36.0 – 65.0 | 90.0 |
| 5-8 | 6XT25 | JD5091 | 6XT25N | JD5096 | J55025 | 2-1/2 – 4-1/2 | 64.0 – 114.0 | 155.0 |

**NOTE** : Replacement screws sold in packages (10 screws per package)






## ROTARY COOLANT INDUCER (RCI) AND ACCESSORIES



Complete with O'Rings, Flat Washers and Locking Clips.

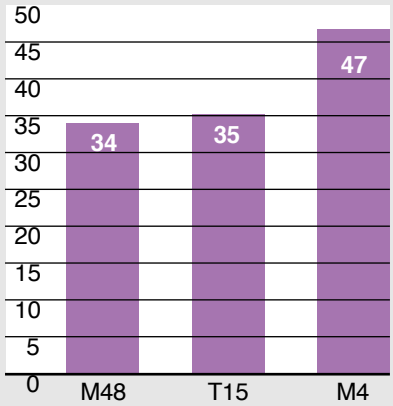
| EDP No. | I.D. A | Pipe O.D. B | Length C | Tap D | Thread for Driving Rod |
|---|---|---|---|---|---|
| PR1030 | 1-3/4 | 3/4 | 7/8 | 1/8 | 5/16 – NC |
| PR1031 | 2-1/8 | 1 | 1-1/8 | 1/8 | 5/16 – NC |
| PR1042 | 2-1/2 | 1-1/4 | 1-3/8 | 1/4 | 3/8 – NC |
| PR1043 | 3 | 1-3/4 | 1-3/8 | 1/4 | 3/8 – NC |
| PR1054 | 3-3/4 | 2-1/4 | 1-3/4 | 1/2 | 1/2 – NC |

# SPADE DRILLS

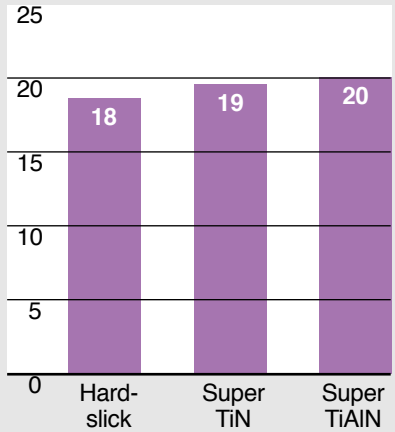
## RECOMMENDED CUTTING CONDITIONS

## SPADE BLADE INSERTS SELECTION & APPLICATIONS HSS

**Toughness Values**




**Wear Values**




- **WHEN TO USE M4**
  - Loose or Manual Machines
  - If T15 Breaks
- **WHEN TO USE T15**
  - When M4 Life needs to be Extended
  - If M48 Breaks
- **WHEN TO USE M48**
  - Extend Life T15
- **WHEN TO USE SM POINT**
  - Reduce Thrust
  - Smoother Entry
  - Improve Hole Quality
  - Higher Speeds and Feeds

## SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT)

STANDARD GEOMETRY
SM POINT

| Material | Material Hardness (BHN) | SFM Surface Footage | | Feed (IPR) 3/8 ~ 1/2 | | 33/64 ~ 11/16 | | 45/64 ~ 15/16 | | 31/32~ 1-3/8 | | 1-13/32 ~ 1-7/8 | | 1-29/32 ~ 2-9/16 | | 2-19/32 ~ 4-1/2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Free Machining Steel 1118, 1215, 12L14 | 100 - 150 | 280 | 330 | .007 | .008 | .010 | .012 | .013 | .016 | .016 | .019 | .020 | .020 | .023 | .023 | .028 | .028 |
| | 150 - 200 | 260 | 305 | .007 | .007 | .010 | .011 | .013 | .015 | .016 | .017 | .020 | .020 | .023 | .023 | .028 | .028 |
| | 200 - 250 | 240 | 285 | .007 | .006 | .010 | .010 | .013 | .014 | .016 | .016 | .020 | .020 | .023 | .023 | .028 | .028 |
| Low & Medium Carbon Steel 1018, 1040, 1140 | | 240 | 280 | .006 | .007 | .009 | .010 | .012 | .014 | .015 | .017 | .019 | .019 | .023 | .023 | .027 | .027 |
| | | 225 | 265 | .005 | .006 | .008 | .009 | .010 | .013 | .014 | .016 | .018 | .018 | .021 | .021 | .024 | .024 |
| | | 210 | 245 | .005 | .006 | .008 | .009 | .010 | .013 | .014 | .016 | .018 | .018 | .021 | .021 | .024 | .024 |
| | | 195 | 230 | .004 | .005 | .007 | .008 | .009 | .012 | .012 | .015 | .016 | .016 | .019 | .019 | .022 | .022 |
| Alloy Steel 4140, 5140, 8640 | 125 - 175 | 210 | 245 | .006 | .007 | .008 | .010 | .010 | .014 | .014 | .017 | .017 | .017 | .019 | .019 | .022 | .022 |
| | 175 - 225 | 195 | 230 | .005 | .006 | .008 | .009 | .010 | .013 | .014 | .016 | .017 | .017 | .019 | .019 | .022 | .022 |
| | 225 - 275 | 180 | 215 | .005 | .006 | .007 | .009 | .010 | .013 | .014 | .016 | .017 | .017 | .019 | .019 | .022 | .022 |
| | 275 - 325 | 170 | 200 | .004 | .005 | .006 | .008 | .009 | .012 | .012 | .015 | .015 | .015 | .017 | .017 | .020 | .020 |
| | 325 - 375 | 155 | 185 | .003 | .004 | .006 | .007 | .009 | .011 | .012 | .014 | .015 | .015 | .017 | .017 | .020 | .020 |
| High Strength Alloy Stee 4340, 4330V, 300M | | 110 | 130 | .005 | .006 | .007 | .009 | .009 | .011 | .010 | .013 | .014 | .014 | .017 | .017 | .020 | .020 |
| | | 85 | 105 | .004 | .005 | .007 | .008 | .009 | .010 | .010 | .012 | .014 | .014 | .017 | .017 | .020 | .020 |
| | | 70 | 85 | .003 | .004 | .006 | .007 | .008 | .009 | .009 | .011 | .012 | .012 | .015 | .015 | .018 | .018 |
| Structural Steel A36, A285, A516 | 100 - 150 | 200 | 240 | .006 | .008 | .010 | .011 | .012 | .015 | .014 | .017 | .018 | .018 | .021 | .021 | .026 | .026 |
| | 150 - 250 | 170 | 195 | .005 | .006 | .009 | .010 | .010 | .013 | .012 | .015 | .016 | .016 | .019 | .019 | .024 | .024 |
| | 250 - 350 | 140 | 165 | .004 | .005 | .008 | .009 | .009 | .012 | .010 | .013 | .014 | .014 | .017 | .017 | .020 | .020 |
| High Temp, Alloy Hastelloy B, Inconel 600 | | 40 | 50 | .003 | .004 | .006 | .007 | .007 | .009 | .008 | .011 | .010 | .012 | .012 | .015 | .015 | .017 |
| | | 35 | 45 | .003 | .004 | .006 | .006 | .007 | .008 | .008 | .010 | .010 | .010 | .012 | .012 | .015 | .014 |
| Stainless Steel 303, 416, 420, 17-4 PH | 135 - 185 | 105 | 125 | .006 | .007 | .008 | .009 | .009 | .012 | .011 | .014 | .014 | .014 | .016 | .016 | .020 | .020 |
| | 185 - 275 | 90 | 110 | .005 | .006 | .007 | .008 | .008 | .011 | .010 | .012 | .012 | .012 | .014 | .014 | .018 | .018 |
| Tool Steel H-13, H021, A04, O-2, S-3 | | 110 | 130 | .004 | .004 | .006 | .007 | .008 | .010 | .010 | .012 | .012 | .012 | .015 | .015 | .017 | .017 |
| | | 90 | 110 | .004 | .004 | .006 | .007 | .008 | .010 | .010 | .012 | .012 | .012 | .015 | .015 | .017 | .017 |
| Aluminum | 30 | 850 | - | .008 | - | .013 | - | .016 | - | .020 | - | .022 | .022 | .025 | .025 | .025 | .025 |
| | 180 | 450 | - | .008 | - | .013 | - | .016 | - | .018 | - | .022 | .022 | .025 | .025 | .025 | .025 |
| Cast Iron Gray, Ductile, Nodular | | 250 | 295 | .007 | .008 | .012 | .012 | .016 | .016 | .020 | .020 | .024 | .024 | .027 | .027 | .030 | .030 |
| | | 225 | 265 | .006 | .007 | .011 | .011 | .014 | .015 | .018 | .019 | .022 | .022 | .025 | .025 | .028 | .028 |
| | | 195 | 230 | .006 | .006 | .009 | .009 | .012 | .013 | .016 | .017 | .018 | .018 | .021 | .021 | .024 | .024 |
| | | 165 | 195 | .005 | .005 | .007 | .008 | .009 | .011 | .012 | .014 | .014 | .014 | .017 | .017 | .020 | .020 |
| | | 135 | 160 | .004 | .005 | .006 | .007 | .007 | .010 | .009 | .011 | .012 | .012 | .014 | .014 | .016 | .016 |

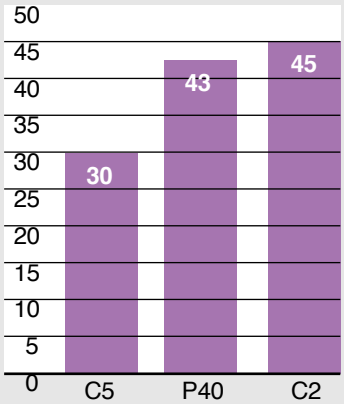
The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

# SPADE DRILLS

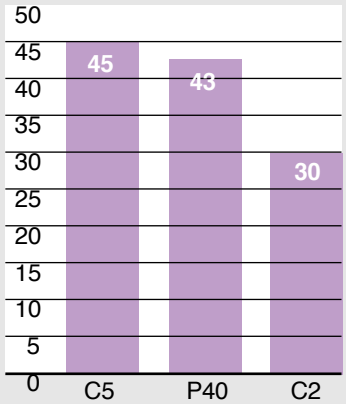
## RECOMMENDED CUTTING CONDITIONS

## SPADE BLADE INSERTS SELECTION & APPLICATIONS CARBIDE

**Toughness Values**




**Wear Values**




**If C5 chips try C2 at 10% – 20% lower S.F.M. than C5 rating**

| Grade | Geometry and Application | Stocked Coatings |
|---|---|---|
| P40 & C5 | Steel Cutting | Super TiN TiAlN |
| C3 | Cast Iron | Super TiN TiAlN |
| P40 & C2 | Ductile Iron<br>Stainless Steel<br>Aluminum<br>Exotic Alloys | Super TiN TiAlNE |

**Note :** Carbide has a lower transverse rupture strength than HSS and is prone to chipping and breakage.

Recutting of chips or lack of rigidity can cause breakage.

Check Coolant Recommendations Chart on Page 461 for flow rates.

## SPEEDS – FEED RECOMMENDATIONS (STD POINT-SM POINT)

STANDARD GEOMETRY
SM POINT

| Material | Material Hardness (BHN) | SFM Surface Footage | | Feed (IPR) 3/8 ~ 1/2 | | 33/64 ~ 11/16 | | 45/64 ~ 15/16 | | 31/32 ~ 1-3/8 | | 1-13/32 ~ 1-7/8 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Free Machining Steel<br>1118, 1215, 12L14 | 100 - 150<br>150 - 200<br>200 - 250 | 420<br>360<br>340 | 485<br>420<br>395 | .006<br>.006<br>.005 | .008<br>.007<br>.006 | .009<br>.008<br>.008 | .012<br>.011<br>.010 | .012<br>.011<br>.010 | .016<br>.015<br>.014 | .015<br>.013<br>.012 | .019<br>.017<br>.016 | .019<br>.017<br>.015 | -<br>-<br>- |
| Low & Medium Carbon Steel<br>1018, 1040, 1140 | 125 - 175<br>175 - 225<br>225 - 275<br>275 - 325 | 340<br>310<br>270<br>230 | 395<br>360<br>315<br>270 | .005<br>.005<br>.004<br>.004 | .007<br>.006<br>.006<br>.005 | .008<br>.007<br>.007<br>.006 | .010<br>.009<br>.009<br>.008 | .010<br>.008<br>.008<br>.006 | .014<br>.013<br>.013<br>.012 | .014<br>.012<br>.012<br>.010 | .017<br>.016<br>.016<br>.015 | .017<br>.016<br>.015<br>.014 | -<br>-<br>-<br>- |
| Alloy Steel<br>4140, 5140, 8640 | 125 - 175<br>175 - 225<br>225 - 275<br>275 - 325<br>325 - 375 | 325<br>300<br>270<br>250<br>220 | 380<br>350<br>315<br>290<br>260 | .005<br>.005<br>.004<br>.004<br>.003 | .007<br>.006<br>.006<br>.005<br>.004 | .008<br>.007<br>.007<br>.006<br>.005 | .010<br>.009<br>.009<br>.008<br>.007 | .010<br>.009<br>.009<br>.008<br>.008 | .014<br>.013<br>.013<br>.012<br>.011 | .013<br>.012<br>.012<br>.011<br>.010 | .017<br>.016<br>.016<br>.015<br>.014 | .016<br>.015<br>.015<br>.014<br>.013 | -<br>-<br>-<br>-<br>- |
| High Strength Alloy Stee<br>4340, 4330V, 300M | 225 - 300<br>300 - 350<br>350 - 400 | 200<br>180<br>160 | 235<br>210<br>190 | .005<br>.004<br>.003 | .006<br>.005<br>.004 | .007<br>.006<br>.005 | .009<br>.008<br>.007 | .008<br>.007<br>.006 | .011<br>.010<br>.009 | .010<br>.009<br>.008 | .013<br>.012<br>.011 | .014<br>.012<br>.010 | -<br>-<br>- |
| Structural Steel<br>A36, A285, A516 | 100 - 150<br>150 - 250<br>250 - 350 | 310<br>250<br>230 | 360<br>290<br>270 | .006<br>.005<br>.004 | .008<br>.006<br>.005 | .010<br>.008<br>.007 | .011<br>.010<br>.009 | .011<br>.009<br>.008 | .015<br>.013<br>.012 | .012<br>.011<br>.009 | .017<br>.015<br>.013 | .016<br>.015<br>.013 | -<br>-<br>- |
| High Temp, Alloy<br>Hastelloy B, Inconel 600 | 140 - 220<br>220 - 310 | 80<br>60 | 125<br>100 | .003<br>.003 | .004<br>.004 | .006<br>.005 | .007<br>.006 | .007<br>.006 | .009<br>.008 | .009<br>.008 | .011<br>.010 | .011<br>.010 | -<br>- |
| Stainless Steel<br>303, 416, 420, 17-4 PH | 135 - 185<br>185 - 275 | 210<br>160 | 245<br>190 | .006<br>.005 | .007<br>.006 | .008<br>.007 | .009<br>.008 | .009<br>.008 | .012<br>.011 | .011<br>.010 | .014<br>.012 | .013<br>.011 | -<br>- |
| Tool Steel<br>H-13, H021, A04, O-2, S-3 | 150 - 200<br>200 - 250 | 220<br>170 | 260<br>200 | .003<br>.003 | .004<br>.004 | .005<br>.005 | .007<br>.007 | .007<br>.007 | .010<br>.010 | .009<br>.009 | .012<br>.012 | .011<br>.011 | -<br>- |
| Aluminum | 30<br>180 | 1500<br>1000 | -<br>- | .008<br>.007 | -<br>- | .013<br>.011 | -<br>- | .016<br>.014 | -<br>- | .020<br>.018 | -<br>- | .022<br>.020 | -<br>- |
| Cast Iron<br>Gray, Ductile, Nodular | 120 - 150<br>150 - 200<br>200 - 220<br>220 - 260<br>260 - 320 | 460<br>400<br>360<br>310<br>270 | 505<br>485<br>435<br>375<br>340 | .006<br>.005<br>.005<br>.004<br>.004 | .008<br>.007<br>.006<br>.005<br>.005 | .009<br>.008<br>.007<br>.006<br>.005 | .012<br>.011<br>.009<br>.008<br>.007 | .011<br>.010<br>.008<br>.007<br>.006 | .015<br>.013<br>.012<br>.011<br>.010 | .015<br>.014<br>.012<br>.010<br>.008 | .019<br>.017<br>.015<br>.013<br>.011 | .020<br>.018<br>.015<br>.013<br>.011 | -<br>-<br>-<br>-<br>- |

The recommendations for speed, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reduction (20% reduction in speed and 10% reduction in feed) are recommended.

# SPADE DRILLS

## RECOMMENDED CUTTING CONDITIONS

## SUPER COBALT T15 FLAT BOTTOM

| Material | Material Hardness (BHN) | Speed (SFM) | | Feed | | | |
|---|---|---|---|---|---|---|---|
| | | TiN | TiAlN | 3/8 ~ 1/2 | 33/64 ~ 11/16 | 45/64 ~ 15/16 | 31/32 ~ 1-3/8 |
| **Free machining Steel**<br>**1213, 12L13, 1215**<br>**12L14, 1118** | 100 - 150<br>150 - 200<br>200 - 250 | 165<br>150<br>135 | 220<br>215<br>190 | 0.005<br>0.005<br>0.004 | 0.007<br>0.007<br>0.007 | 0.010<br>0.010<br>0.010 | 0.013<br>0.013<br>0.012 |
| **Low Carbon Steel**<br>**1015, 1020, 1140,**<br>**1025** | 85 - 125<br>125 - 175<br>175 - 225<br>225 - 275 | 140<br>135<br>125<br>115 | 195<br>190<br>180<br>175 | 0.005<br>0.005<br>0.004<br>0.004 | 0.007<br>0.007<br>0.006<br>0.006 | 0.009<br>0.009<br>0.008<br>0.008 | 0.012<br>0.012<br>0.011<br>0.011 |
| **Medium Carbon Steel**<br>**1035, 1050, 1045**<br>**1055, 1140** | 125 - 175<br>175 - 225<br>225 - 275<br>275 - 325 | 135<br>125<br>115<br>105 | 195<br>180<br>165<br>150 | 0.004<br>0.004<br>0.004<br>0.003 | 0.007<br>0.006<br>0.006<br>0.005 | 0.009<br>0.007<br>0.007<br>0.007 | 0.011<br>0.011<br>0.011<br>0.009 |
| **Structural Steel**<br>**A36, A516, A182** | 100 - 150<br>150 - 250<br>250 - 350 | 115<br>100<br>80 | 165<br>140<br>115 | 0.004<br>0.004<br>0.003 | 0.007<br>0.007<br>0.006 | 0.009<br>0.008<br>0.007 | 0.011<br>0.009<br>0.008 |
| **Cast Iron / S,G Iron**<br>**A48-76 GR30/GR45**<br>**A536-72 60-40-18**<br>**A220-76 GR40010** | 120 - 150<br>150 - 200<br>200 - 220<br>220 - 260<br>260 - 320 | 145<br>130<br>110<br>95<br>80 | 215<br>190<br>165<br>150<br>120 | 0.005<br>0.005<br>0.005<br>0.004<br>0.004 | 0.010<br>0.008<br>0.008<br>0.006<br>0.005 | 0.014<br>0.011<br>0.010<br>0.008<br>0.006 | 0.016<br>0.016<br>0.014<br>0.010<br>0.008 |
| **Alloy Steel**<br>**8620, 4130, 4137**<br>**4140, 6150** | 125 - 175<br>175 - 225<br>225 - 275<br>275 - 325<br>325 - 375 | 125<br>115<br>105<br>100<br>90 | 165<br>150<br>145<br>140<br>120 | 0.005<br>0.004<br>0.004<br>0.003<br>0.003 | 0.006<br>0.006<br>0.005<br>0.005<br>0.005 | 0.008<br>0.008<br>0.007<br>0.007<br>0.007 | 0.011<br>0.011<br>0.011<br>0.009<br>0.009 |
| **Tool Steel**<br>**H13, H21, A2, S1** | 150 - 200<br>200 - 250 | 65<br>45 | 90<br>75 | 0.003<br>0.003 | 0.005<br>0.005 | 0.006<br>0.006 | 0.008<br>0.008 |
| **High Temp. Alloy**<br>**Hastelloy B,Inconel** | 140 - 220<br>220 - 310<br>225 - 300 | 20<br>15<br>65 | 30<br>25<br>90 | 0.003<br>0.003<br>0.004 | 0.005<br>0.004<br>0.006 | 0.006<br>0.006<br>0.007 | 0.008<br>0.006<br>0.008 |
| **High Strength Alloy**<br>**9840, 4340, 4330V** | 300 - 350<br>350 - 400 | 45<br>40 | 70<br>60 | 0.003<br>0.003 | 0.006<br>0.005 | 0.007<br>0.006 | 0.008<br>0.007 |
| **Aluminium**<br>**2014, 6061, 7075** | 30<br>180 | 520<br>255 | 700<br>390 | 0.007<br>0.007 | 0.011<br>0.011 | 0.014<br>0.014 | 0.017<br>0.016 |
| **Stainless Steel**<br>**310, 316, 410, 330** | 135 - 185<br>185 - 275 | 60<br>50 | 90<br>80 | 0.005<br>0.004 | 0.007<br>0.006 | 0.008<br>0.007 | 0.009<br>0.009 |

**RPM** = revolution per minute (rev/min)
**SFM** = surface feet per minute (ft/min)
**DIA** = diameter of drill (inch)
**IPR** = feed rate (in/rev)
**IPM** = inch per minute penetration rate

*** Formulas :**

$SFM = (RPM) \cdot (.262) \cdot (DIA.)$

$IPM = (RPM) \cdot (IPR)$

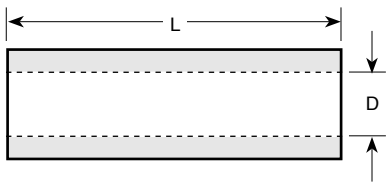
$$RPM = \frac{(SFM) \cdot (3.82)}{(DIA.)}$$

The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points. Speed and feed reductions (20% reduction in speed and 10% reduction in feed) are recommended.

## SPADE BLADE INSERTS HORSEPOWER CONSUMPTION RATE

**Metal Removal Rates (MRR)**
Example : 1.50 Dia. Drill @ 6.412 I.P.M.

**Volume of Cylinder Method : $D^2$x.785xL**
D = Hole Diameter
L = Length in I.P.M.
.785 is Constant




Material Drilled 4140 250 BHN :
Cutting Data : 180 S.F.M. (458 R.P.M.) x .014 Feed per Rev.

458 R.P.M. x .014 = 6.412 I.P.M. (L)

$D^2$ $(1.5)^2$ x .785 x L (6.412) = 11.3 C.U.In./ Min (MRR)

**MRR of 11.3 x 1.4 Energy Value = 15.8HP.**

## metal removal rates (mrR)

- Cubic inches of metal removal per unit of horsepower.
- Unit horsepower ($HP_u$) is the amount of power to remove a volume of metal in a period of time.
  - $HP_u$ = power to cut 1 cubic inch per minute – found in tables

**Average Unit Horsepower Values of Energy Per Unit Volume**

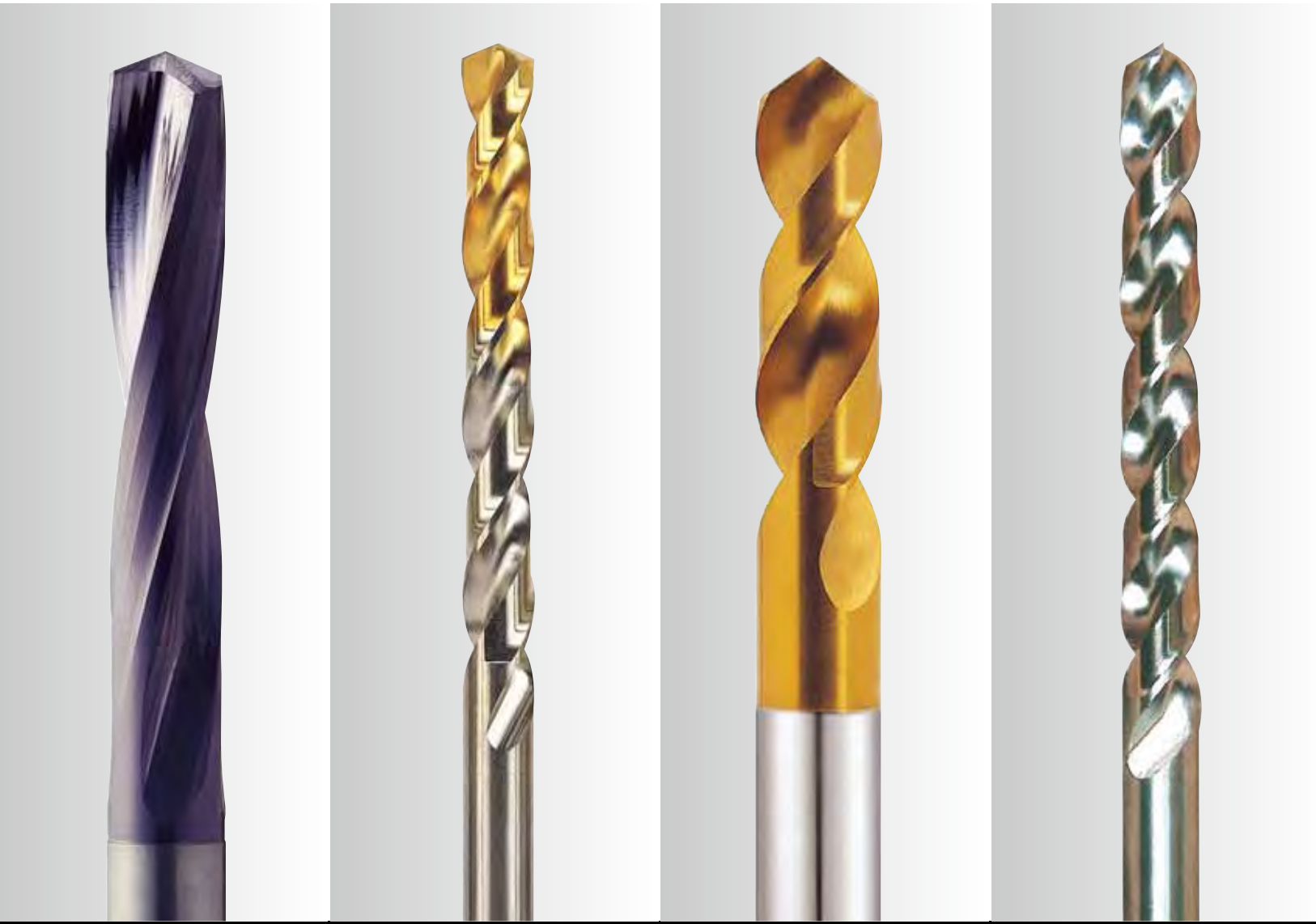
| Material | BHN | $HP_u$ (HP/($in^3$/min.)) |
|---|---|---|
| **Carbon Steels** | 150-200 | 1.0 |
| | 200-250 | 1.4 |
| | 250-350 | 1.6 |
| **Leaded Steels** | 150-175 | 0.7 |
| **Cast Irons** | 125-190 | 0.5 |
| | 190-250 | 1.6 |
| **Stainless Steels** | 135-275 | 1.5 |
| **Aluminum Alloys** | 50-100 | 0.3 |
| **Magnesium Alloys** | 40-90 | 0.2 |
| **Copper** | 125-140 | 0.7 |
| **Copper Alloys** | 100-150 | 0.7 |

# COOLANT RECOMMENDATIONS (SPADE BLADE)

| Material | Material Hardness (BHN) | Coolant Pressure (PSi) / Coolant Volumetric Flowrate (GPM) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 3/8 ~ 1/2 | 33/64 ~ 11/16 | 23/32 ~ 1 | 1 ~ 1-1/4 | 1-1/4 ~ 2 | 2 ~ 3 | 3 ~ 4 |
| **Free Machining Steel**<br>**1118, 1215, 12L14, etc.** | 100 – 250 | 175-185<br>2.5-2.6 | 100-120<br>2.8-3.0 | 105-140<br>4.4-5.2 | 80-115<br>7-8 | 75-100<br>12-14 | 40-50<br>30-33 | 65-90<br>38-44 |
| **Low Carbon Steel**<br>**1010, 1020, 1025, 1522, etc.** | 85 – 275 | 165-170<br>2.4-2.5 | 75-90<br>2.4-2.6 | 75-95<br>3.7-4.2 | 60-80<br>6-7 | 55-75<br>11-12 | 30-40<br>26-30 | 50-65<br>33-38 |
| **Medium Carbon Steel**<br>**1030,1040,1050,1527,1140,1151,etc.** | 125 – 325 | 160-165<br>2.3-2.4 | 70-85<br>2.3-2.6 | 70-90<br>3.6-4.1 | 55-75<br>5-6 | 50-70<br>10-12 | 30-40<br>26-30 | 50-65<br>33-38 |
| **Alloy Steel**<br>**4140, 5140, 8640, etc.** | 125 – 375 | 160-165<br>2.3-2.4 | 66-75<br>2.2-2.4 | 65-80<br>3.5-3.9 | 50-70<br>5-6 | 45-60<br>10-11 | 30-35<br>26-28 | 40-50<br>30-33 |
| **High Strength Alloy**<br>**4340, 4330V, 300M, etc.** | 225 – 400 | 150-155<br>2.3-2.4 | 55-60<br>2.1-2.2 | 45-50<br>2.9-3.1 | 25-30<br>4-5 | 25-30<br>7-8 | 20-25<br>21-23 | 25-30<br>23-26 |
| **Structural Steel**<br>**A36, A285, A516, etc.** | 100 – 350 | 160-165<br>2.3-2.4 | 75-85<br>2.4-2.6 | 65-80<br>3.5-3.9 | 40-55<br>5-6 | 40-50<br>9-10 | 25-30<br>23-26 | 40-50<br>30-33 |
| **High Temp. Alloy**<br>**Hastelloy B, Inconel 600, etc.** | 140 – 310 | 150-155<br>2.3-2.4 | 60-65<br>2.2-2.3 | 50-55<br>3.1-3.2 | 30-35<br>4-5 | 25-30<br>7-8 | 25-30<br>23-26 | -<br>- |
| **Stainless Steel**<br>**301, 316, 330, 17-4PH, etc.** | 135 – 275 | 165-170<br>2.4-2.5 | 70-85<br>2.3-2.6 | 65-75<br>3.5-3.7 | 40-55<br>5-6 | 40-50<br>9-10 | 25-30<br>23-26 | 35-45<br>28-31 |
| **Tool Steel**<br>**H-13, H-21, A-4, O-2, S-3, etc.** | 150 – 250 | 150-155<br>2.3-2.4 | 55-60<br>2.1-2.2 | 45-50<br>2.9-3.1 | 25-30<br>4-5 | 25-30<br>7-8 | 20-25<br>21-23 | 25-30<br>23-26 |
| **Aluminum** | 30 – 180 | 190-210<br>2.6-2.7 | 140-180<br>3.3-3.7 | 150-200<br>5.3-6.1 | 115-160<br>8-9 | 90-125<br>14-16 | 40-50<br>30-33 | 60-80<br>36-42 |
| **Cast Iron** | 120 – 320 | 155-160<br>2.3-2.4 | 60-65<br>2.2-2.3 | 50-60<br>3.1-3.3 | 30-40<br>4-5 | 30-35<br>8-9 | 25-30<br>23-26 | 30-35<br>26-28 |

# DRILLS

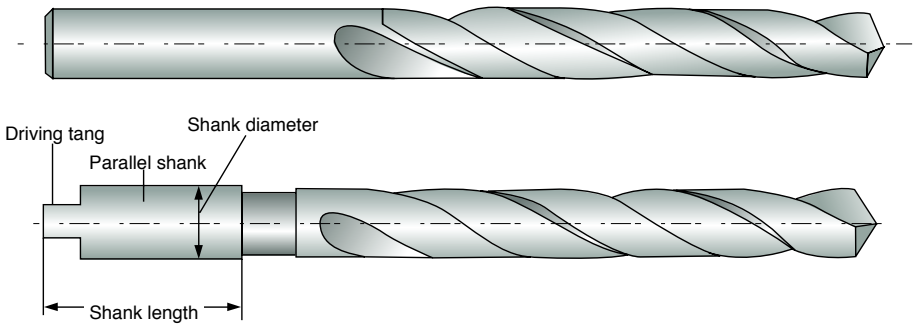
Being the best through innovation



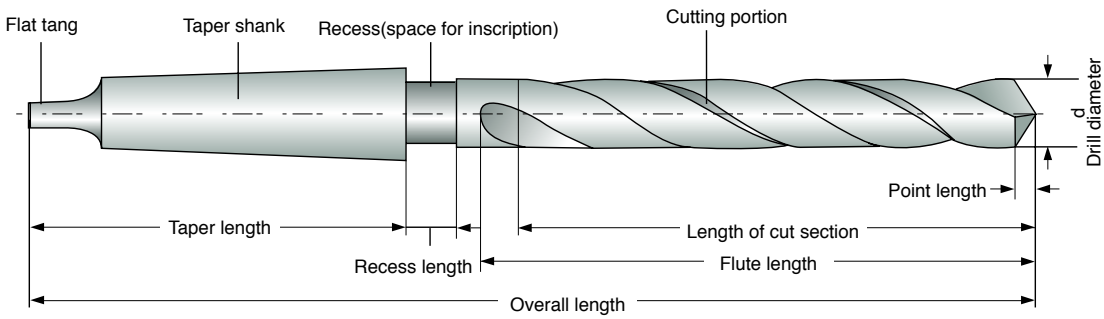
# TECHNICAL DATA

# TECHNICAL DATA

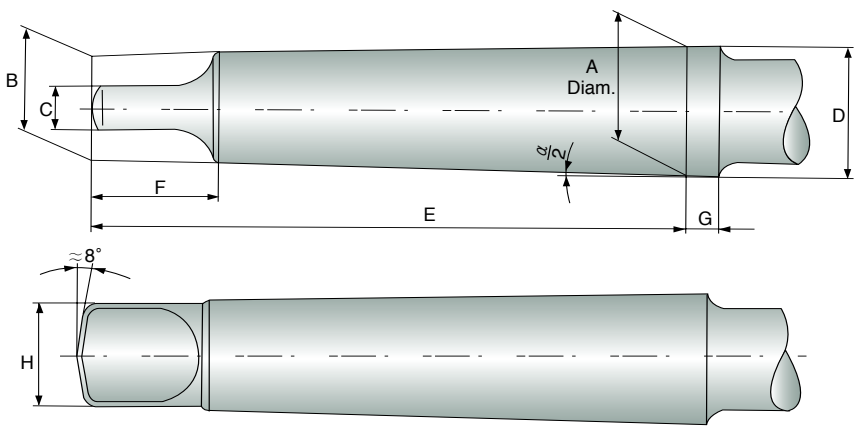
## 1 Twist Drill with parallel shank




## 2 Twist Drill with taper shank

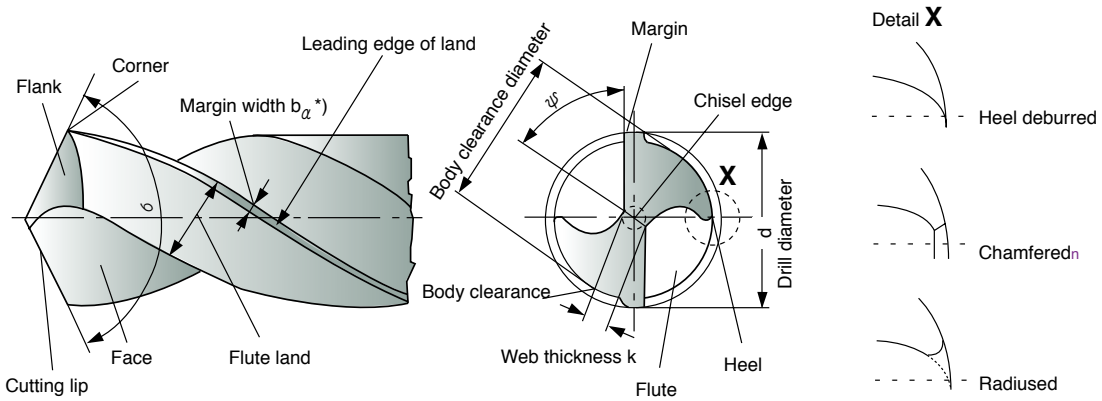



## 3 General dimensions of morse taper shanks




| Morse Taper Shank | A mm | B mm | C(h13) mm | D mm | E mm | F(max.) mm | G mm | H(max.) mm | α/2 |
|---|---|---|---|---|---|---|---|---|---|
| **No.1** | 12.065 | 9 | 5.2 | 12.2 | 62 | 13.5 | 3.5 | 8.7 | 1° 25′ 43″ |
| **No.2** | 17.780 | 14 | 6.3 | 18.0 | 75 | 16 | 5 | 13.5 | 1° 25′ 50″ |
| **No.3** | 23.825 | 19.1 | 7.9 | 24.1 | 94 | 20 | 5 | 18.5 | 1° 26′ 16″ |
| **No.4** | 31.267 | 25.2 | 11.9 | 31.6 | 117.5 | 24 | 6.5 | 24.5 | 1° 29′ 15″ |
| **No.5** | 44.399 | 36.5 | 15.9 | 44.7 | 149.5 | 29 | 6.5 | 35.7 | 1° 30′ 26″ |
| **No.6** | 63.348 | 52.4 | 19 | 63.8 | 210 | 40 | 8 | 51 | 1° 29′ 36″ |

## 4 Cutting portion



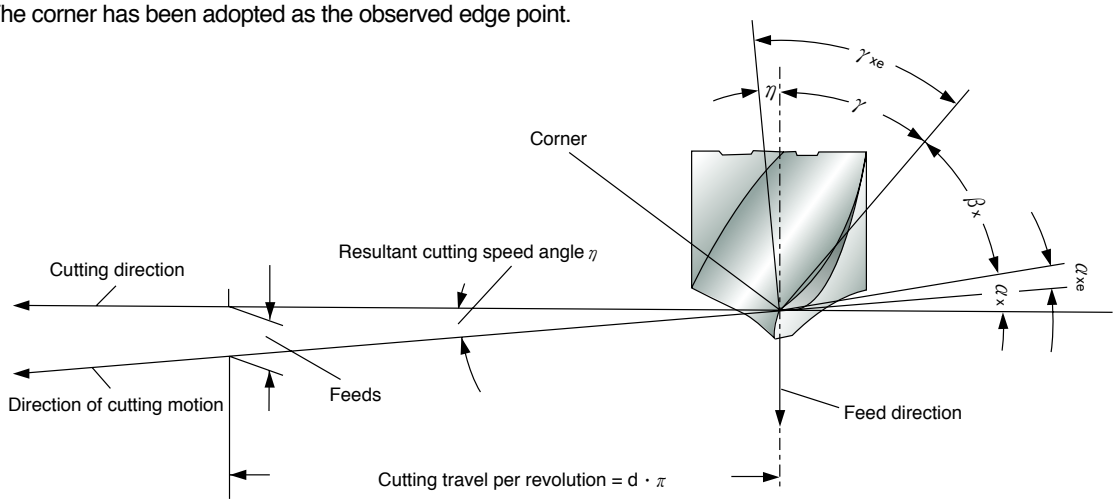

$\sigma$ = Point angle (sigma)

$\psi$ = Chisel edge angle (psi)

* In the context of cutting technology, land width $b_\alpha$ is the body clearance land width which is to be by $b_{f\alpha n}$, see DIN 6581.

## 5 Angle at the cutting edges

The corner has been adopted as the observed edge point.




$\alpha_x$ = Side clearance angle (alpha)

$\alpha_{xe}$ = Effective side clearance angle

$\beta_x$ = Side wedge angle (beta)

$\gamma_x$ = Front rake angle (gamma)

$\gamma_{xe}$ = Working front rake angle

$\eta$ = Resultant cutting speed angle (eta)

Clearance angle $\alpha$, wedge angle $\beta$ and rake angle $\gamma$ are measured in the tool orthogonal plane. For details, see DIN 6581, definitions of metal-cutting technology; geometry at the tool edge.

i-DREAM DRILLS
DREAM DRILLS -GENERAL
DREAM DRILLS -HIGH FEED
DREAM DRILLS -INOX
DREAM DRILLS -ALU
DREAM DRILLS -CFRP
DREAM DRILLS -MQL TYPE
DREAM DRILLS for HIGH HARDENED STEELS
STANDARD CARBIDE DRILLS
MULTI-1 DRILLS
HPD DRILLS
GOLD-P DRILLS
STRAIGHT SHANK DRILLS
AIRCRAFT DRILLS
SILVER & DEMING DRILLS
TAPER SHANK DRILLS
NC SPOTTING DRILLS
COMBINATION DRILLS & COUNTERSINK
SPADE DRILLS
TECHNICAL DATA

## 6 Web thickness k

**Test values :** The web thickness according to Fig. 1 shall not be less than the minimum value $k_{min}$ indicated in Fig. 2.
**Test point :** At the point of the drill.
**Testing equipment :** Slide gauge with measuring points.

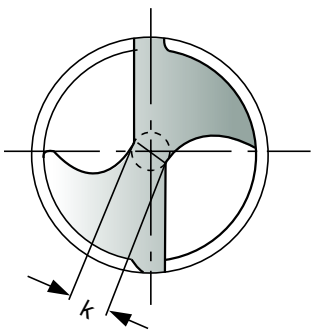



**Figure 1. Web thickness k**

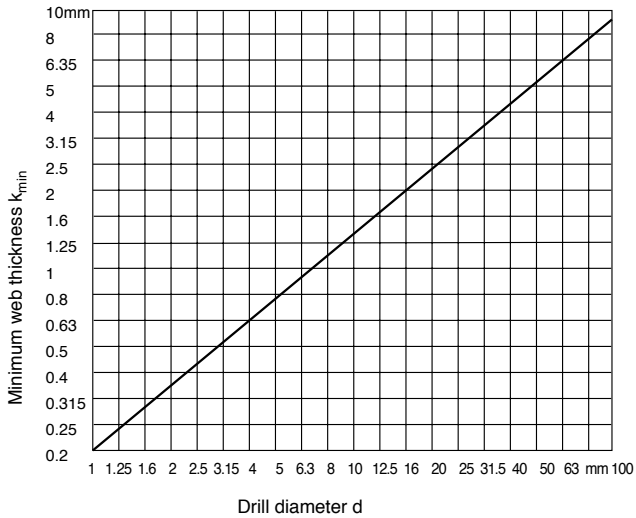



**Figure 2. Web thickness $k_{min}$**

## 7 Margin width $b_\alpha$

**Test values :** The land width as in Fig. 3 shall lie within the limited values indicated in Fig. 4.
**Test point :** 5mm behind the corner
**Testing equipment :** Slide gauge

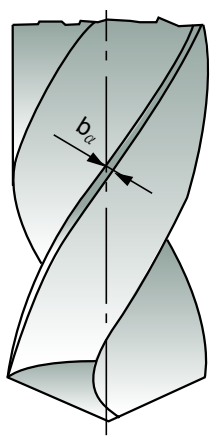



**Figure 3. Margin width $b_\alpha$**

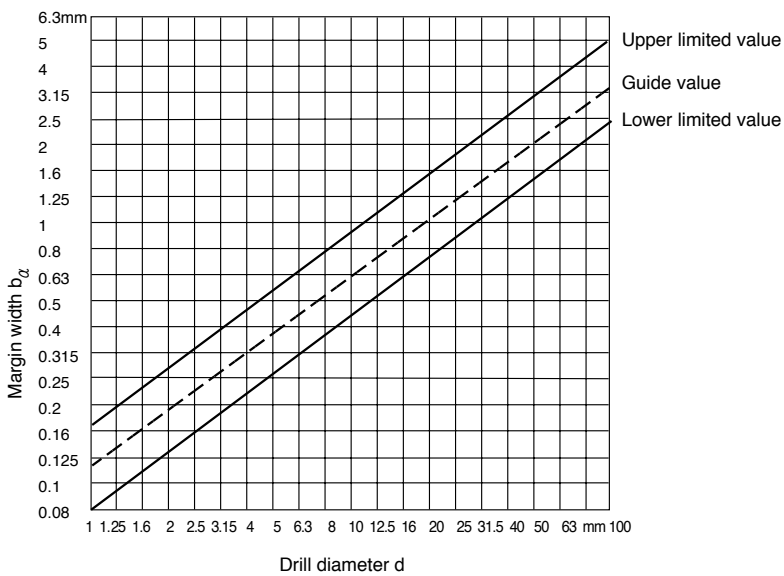



**Figure 4. Margin width $b_\alpha$**

## Angle on Twist Drills

### (1) Side rake angle $\gamma_f$ (Helix angle)

**Recommended test value :** Recommended ranges depending on the tool types N,H and W according to DIN 1836 and the diameter of the drill included in Fig. 5.

**Test point :** At the corner, see Fig. 6.

**Testing equipment :** According to VDI Guideline 3331 Part 1, Section Margin width $b_\alpha$

**Note :** The side rake angle $\gamma_f$ is measured in place of the orthogonal rake angle $\gamma_O$ found in the wedge measuring plane (see DIN 6581), as this changes along the cutting edge (becoming smaller towards the point of the drill).

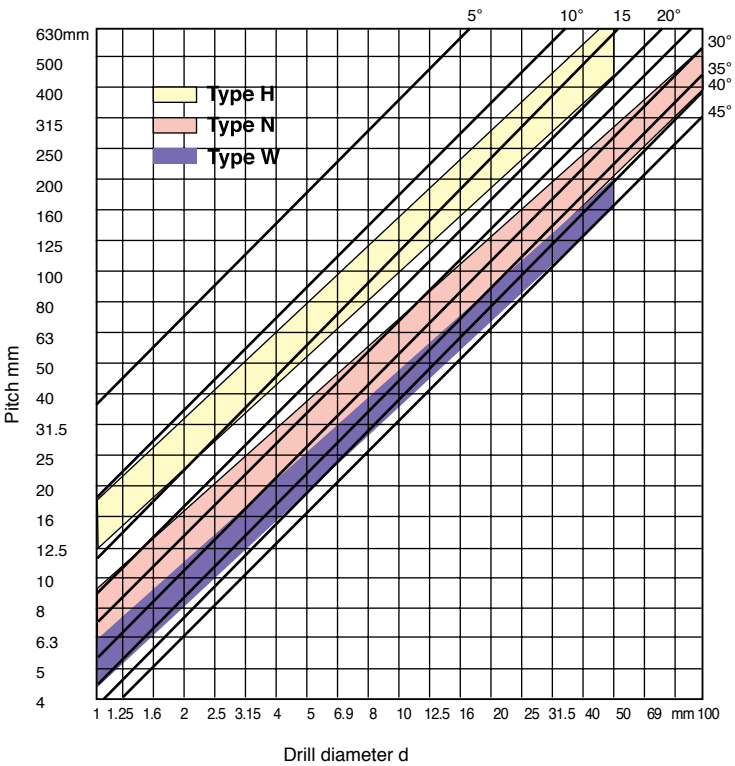



Figure 6. Side rake angle $\gamma_f$

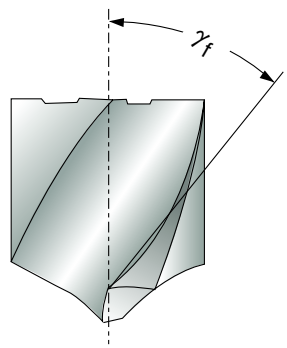



Figure 5. Side rake angle $\gamma_f$

### (2) Point angle $\sigma$

**Test value :** Usual executin for tool types N and H : $\sigma$=118°, for tool type W : $\sigma$=130°

**Test point :** At the cutting, see Fig. 7.

**Testing equipment :** According to VDI Guideline 3331 Part 1, Section Margin width $b_\alpha$

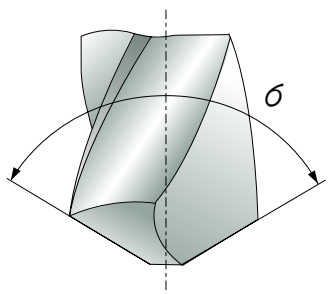



Figure 7. Point angle $\sigma$

## 9 Resharpening Twist Drills

**(1) Drills are worn off irregularly. It should be sharpened prior to developing into excessive wear.**

**(2) Resharpening**

① Grind the correct point angle to suit your application. (figure 8)
② Check that both cutting lips have the same angle. On a 130° point, each lip should be 65° toward the axis. The point must be on center, i.e., the chisel edge must produce cutting lips of equal length. (figure 8)
③ Grind Primary relief and Secondary clearance. (figure 9)
④ Grind web thinning. (figure 10)

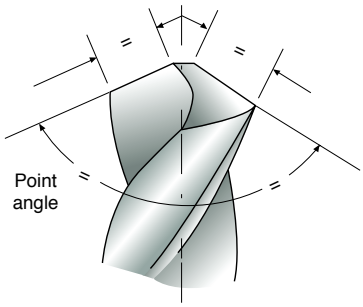


Figure 8

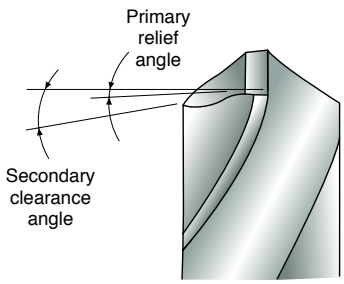


Figure 9

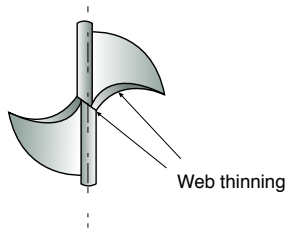
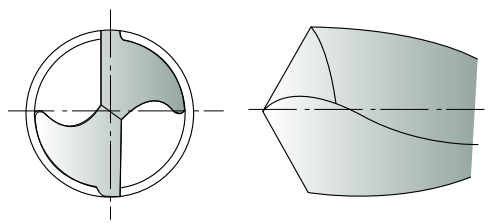


Figure 10

## 10 Web thinning

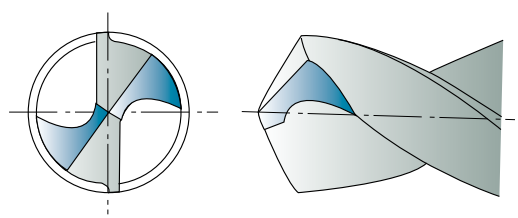
**(1) Without thinning**

Suitable for drill of general purpose.
Thanks to thin web thickness, web thinning is not needed.
This without web thinning type is applied to design of drills for mild steels, alloy steels, cast iron, stainless steels, titanium, inconel, etc. and conventional cutting conditons.



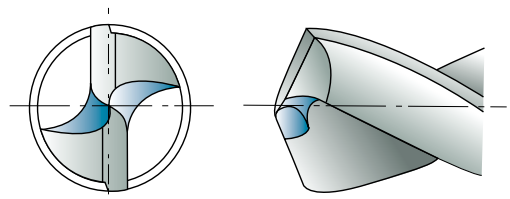
**(2) Type C thinning (DIN1412 FORM C, SPLIT POINT)**

Because Split point enables good centering when drilling and breaks the chips, chip removals are easy.
Suitable for drill design in high hardened tough materials, i.e, heat treated steels, titanium alloys, stainless steels, incoroy inconel, nimonic, etc.



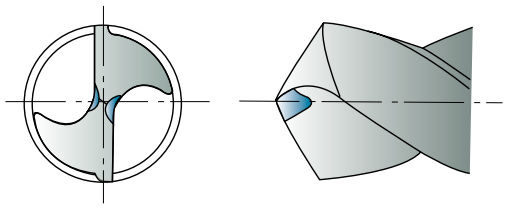
**(3) Type R thinning (HELICAL THINNING)**

Helical thinning ensures to frequent chip breaking and removal. The different direction force of cutting edges and helical thinning parts enable that chips curl, break and remove through the flutes. In addition, helical thinning makes the chip room up to center, remove the chisel and enables good centering



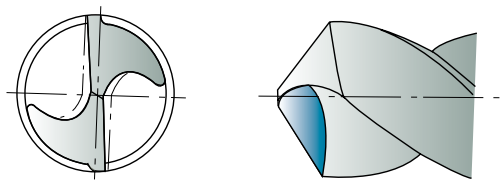
### (4) Type A thinning (DIN1412 FORM A)

A type thinnings makes thin chisel, good chip removal and favorable centering.
This type is the easiest type to grind the thinning. In narrow web and wide fluted drills, keeping of the rigidity and smooth chip removal are possible.



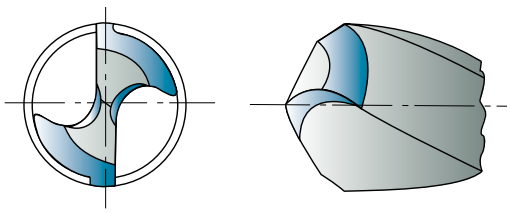
### (5) Type B thinning (DIN1412 FORM B)

In case of work materials with low cutting resistance and good chip removal, i.e., cast iron, aluminum, plastic etc., B type thinning is suitable.
Especially when drills for high hardened steels are designed, this type is applied to decrease rake angle and avoid chipping of cutting lips.



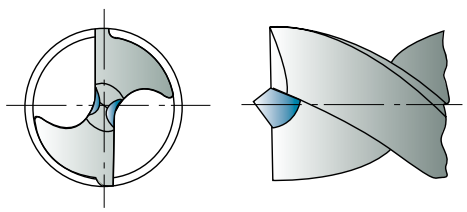
### (6) Type D thinning (DIN1412 FORM D)

Grey cast iron thinning; bevelling of external edges strengthens the cutting edge.
Used for medium to high grey cast iron hardness and for abrasives.



### (7) Type E thinning (DIN1412 FORM E)

Center drill bit thinning; ensures optimal center drilling and does not leave burs in through holes.
As the bit and cutting edges are delicate, this bit should be used for drilling thin sheet metal.



## Surface Finishes for high speed steels Twist Drills

### (1) Bright Finish

Drills with a bright finish are without surface treatment and ground condition.
Especially bright finished drills are used in machining of non ferrous materials.

### (2) Coloring (Gold color)

The coloring is a thin oxide layer formed on the tool surfaces.
This is often applied to cobalt high speed steels twist drills.

### (3) Steam Tempered (black oxide finish)

This is a black oxide layer 1-2㎛ formed on the tool surfaces.
Steam Tempered treated drill is the result of a steam tempering operation. Because the oxide layer retains some coolant on the tool surface, and aids chip flow, helps to dissipate heat, steam homo treated drills are recommended for ferrous applications.

# TECHNICAL DATA

## 12 Coating

The use of coated cutting tools reduce production costs.
For example

- Avoidance of machine downtime due to premature tool wear.
- Higher cutting capabilities to reduce actual machining times.
- Reproducible tool life.
- Improvement of component surface quality.

### (1) TiN (Titanium Nitride) coating

Titanium Nitride gives the tool a higher performance in comparison to traditional non-coated drills.
TiN coating, with good all-around properties, is recommended for the general application, i.e., attack by abrasive, adhesive and chemical wear in equal proportions.

### (2) TiCN (Titanium Carbon Nitride) coating

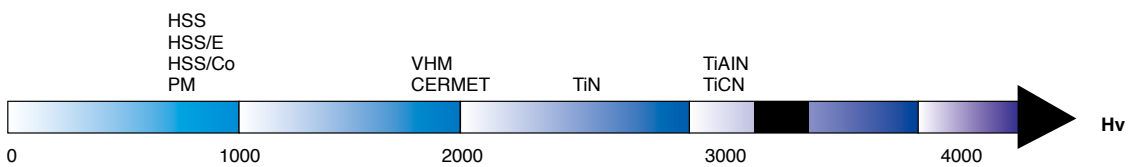
TiCN coating should be employed when severe thermodynamic stress is expected, for example when drilling in high hardened steels or in mild steels with high speed and feed.

### (3) TiAlN (Titanium Alumium Nitride) coating

The addition of Aluminum to the Titanium Nitride produces an increase in hardness and an exceptional increase in resistance to oxidation at high temperature.
TiAlN coating is applied to drilling with severe thermal stress on cutting edges when continuous non-step feed, dry cutting or high speed cutting.

### (4) Properties of coating

| Properties | TiN | TiCN | TiAlN |
|---|---|---|---|
| Coating color | gold - yellow | blue - grey | violet - grey |
| Hardness (Hv 0.05) | 2300 | 3000 | 3000 |
| Coating thickness(㎛) | 1~4 | 1~4 | 1~5 |
| Max. working temperature (°C) | 600 | 400 | 800 |
| Coefficient of friction against steels(dry) | 0.4 | 0.4 | 0.4 |




### (5) Selection of coating

| Work-material | HSS TWIST DRILLS | CARBIDE DRILLS |
|---|---|---|
| Unalloyed steels | TiCN, TiAlN | TiCN, TiAlN |
| Steels < 1000 N/mm² | TiCN, TiAlN | TiCN, TiAlN |
| Steels > 1000 N/mm² | TiCN, TiAlN | TiCN, TiAlN |
| Stainless steels | TiCN, TiAlN | TiCN, TiAlN |
| Cast iron | TiCN, TiAlN | TiAlN |
| Al-wrought alloys | TiN | TiN |
| Al-cast alloys | TiCN | TiCN |
| Copper (pure) | CrN | CrN |
| Brass | TiCN | TiCN |
| Bronze | TiCN | TiCN |

## Drill sizes before Tapping

### (1) Metric - ISO threads coarse pitch

| Nominal diameter | Drill diameter | Nominal diameter | Drill diameter | Nominal diameter | Drill diameter | Nominal diameter | Drill diameter |
|---|---|---|---|---|---|---|---|
| | | M3 | 2.5 | M11 | 9.5 | M30 | 26.5 |
| M1 | 0.75 | M3.5 | 2.9 | M12 | 10.2 | M33 | 29.5 |
| M1.2 | 0.95 | M4 | 3.3 | M14 | 12.0 | M36 | 32.0 |
| M1.4 | 1.1 | M5 | 4.2 | M16 | 14.0 | M39 | 35.0 |
| M1.6 | 1.25 | M6 | 5.0 | M18 | 15.5 | M42 | 37.5 |
| M1.8 | 1.45 | M7 | 6.0 | M20 | 17.5 | M45 | 40.5 |
| M2 | 1.6 | M8 | 6.8 | M22 | 19.5 | M48 | 43.0 |
| M2.2 | 1.75 | M9 | 7.8 | M24 | 21.0 | M52 | 47.0 |
| M2.5 | 2.05 | M10 | 8.5 | M27 | 24.0 | M56 | 50.5 |

### (2) Metric ISO threads fine pitch

| Nominal diameter | Tap Pitch | Drill diameter | Nominal diameter | Tap Pitch | Drill diameter | Nominal diameter | Tap Pitch | |
|---|---|---|---|---|---|---|---|---|
| 2.5 | 0.35 | 2.15 | 17 | 1.5 | 15.5 | 33 | 1.5 | 31.5 |
| 3 | 0.35 | 2.65 | 18 | 1 | 17 | 33 | 2 | 31 |
| 3.5 | 0.35 | 3.15 | 18 | 1.5 | 16.5 | 33 | 3 | 30 |
| 4 | 0.5 | 3.5 | 18 | 2 | 16 | 35 | 1.5 | 33.5 |
| 4.5 | 0.5 | 4 | 20 | 1 | 19 | 36 | 1.5 | 34.5 |
| 5 | 0.5 | 4.5 | 20 | 1.5 | 18.5 | 36 | 2 | 34 |
| 5.5 | 0.5 | 5 | 20 | 2 | 18 | 36 | 3 | 33 |
| 6 | 0.75 | 5.2 | 22 | 1 | 21 | 38 | 1.5 | 36.5 |
| 7 | 0.75 | 6.2 | 22 | 1.5 | 20.5 | 39 | 1.5 | 37.5 |
| 8 | 0.75 | 7.2 | 22 | 2 | 20 | 39 | 2 | 37 |
| 8 | 1 | 7 | 24 | 1 | 23 | 39 | 3 | 36 |
| 9 | 0.75 | 8.2 | 24 | 1.5 | 22.5 | 40 | 1.5 | 38.5 |
| 9 | 1 | 8 | 24 | 2 | 22 | 40 | 2 | 38 |
| 10 | 0.75 | 9.2 | 25 | 1 | 24 | 40 | 3 | 37 |
| 10 | 1 | 9 | 25 | 1.5 | 23.5 | 42 | 1.5 | 40.5 |
| 10 | 1.25 | 8.8 | 25 | 2 | 23 | 42 | 2 | 40 |
| 11 | 0.75 | 10.2 | 26 | 1.5 | 24.5 | 42 | 3 | 39 |
| 11 | 1 | 10 | 27 | 1 | 26 | 45 | 1.5 | 43.5 |
| 12 | 1 | 11 | 27 | 1.5 | 25.5 | 45 | 2 | 43 |
| 12 | 1.25 | 10.8 | 27 | 2 | 25 | 45 | 3 | 42 |
| 12 | 1.5 | 10.5 | 28 | 1 | 27 | 48 | 1.5 | 46.5 |
| 14 | 1 | 13 | 28 | 1.5 | 26.5 | 48 | 2 | 46 |
| 14 | 1.25 | 12.8 | 28 | 2 | 26 | 48 | 3 | 45 |
| 14 | 1.5 | 12.5 | 30 | 1 | 29 | 50 | 1.5 | 48.5 |
| 15 | 1 | 14 | 30 | 1.5 | 28.5 | 50 | 2 | 48 |
| 15 | 1.5 | 13.5 | 30 | 2 | 28 | 50 | 3 | 47 |
| 16 | 1 | 15 | 30 | 3 | 27 | 52 | 1.5 | 50.5 |
| 16 | 1.5 | 14.5 | 32 | 1.5 | 30.5 | 52 | 2 | 50 |
| 17 | 1 | 16 | 32 | 2 | 30 | 52 | 3 | 49 |

# TECHNICAL DATA

### (3) WITHWORTH pipe threads (BSP)

| Nominal size | Drill diameter | Nominal size | Drill diameter |
|---|---|---|---|
| inches | mm | inches | mm |
| G1/8 | 8.8 | G1∗1/4 | 39.5 |
| G1/4 | 11.8 | G1∗3/8 | 42.0 |
| G3/8 | 15.25 | G1∗1/2 | 45.0 |
| G1/2 | 19.0 | G1∗3/4 | 51.0 |
| G5/8 | 21.0 | G2 | 57.0 |
| G3/4 | 24.5 | G2∗1/4 | 63.0 |
| G7/8 | 28.25 | G2∗1/2 | 73.0 |
| G1 | 30.75 | G2∗3/4 | 79.0 |
| G11/8 | 35.5 | G3 | 85.0 |

### (4) American unified coarse threads

| UNC | Drill diameter | | UNC | Drill diameter | |
|---|---|---|---|---|---|
| | inches | mm | | inches | mm |
| **No. 1** | 53 | 1.51 | **7/16** | U | 9.35 |
| **No. 2** | 50 | 1.78 | **1/2** | 27/64 | 10.71 |
| **No. 3** | 47 | 1.99 | **9/16** | 31/64 | 12.30 |
| **No. 4** | 43 | 2.26 | **5/8** | 17/32 | 13.49 |
| **No. 5** | 38 | 2.58 | **3/4** | 21/32 | 16.67 |
| **No. 6** | 36 | 2.71 | **7/8** | 49/64 | 19.44 |
| **No. 8** | 29 | 3.45 | **1** | 7/8 | 22.22 |
| **No. 10** | 25 | 3.8 | **1∗1/8** | 63/64 | 25.00 |
| **No. 12** | 16 | 4.5 | **1∗1/4** | 1∗7/64 | 28.18 |
| **1/4** | 7 | 5.11 | **1∗3/8** | 1∗7/32 | 30.95 |
| **5/16** | F | 6.53 | **1∗1/2** | 1∗11/32 | 34.13 |
| **3/8** | 5/16 | 7.94 | | | |

### (5) American unified fine threads

| NF | Drill diameter | | NF | Drill diameter | |
|---|---|---|---|---|---|
| | inches | mm | | inches | mm |
| **No. 0** | 3/64 | 1.19 | **3/8** | Q | 8.43 |
| **No. 1** | 53 | 1.51 | **7/16** | 25/64 | 9.92 |
| **No. 2** | 50 | 1.78 | **1/2** | 29/64 | 11.51 |
| **No. 3** | 45 | 2.08 | **9/16** | 33/64 | 13.10 |
| **No. 4** | 42 | 2.37 | **5/8** | 37/64 | 14.86 |
| **No. 5** | 37 | 2.64 | **3/4** | 11/16 | 17.46 |
| **No. 6** | 33 | 2.87 | **7/8** | 13/16 | 20.64 |
| **No. 8** | 29 | 3.45 | **1** | 59/64 | 23.42 |
| **No. 10** | 21 | 4.04 | **1∗1/8** | 1∗ 3/64 | 26.59 |
| **No. 12** | 14 | 4.62 | **1∗1/4** | 1∗11/32 | 29.76 |
| **1/4** | 3 | 5.41 | **1∗3/8** | 1∗19/32 | 32.94 |
| **5/16** | 1 | 6.91 | **1∗1/2** | 1∗27/64 | 36.11 |

## ISO Tolerance

### Drill Diameter Tolerance Inch

| up to .118 | over .118 up to .236 | over .236 up to .394 | over .394 up to .709 |
|---|---|---|---|
| +0<br>-.00055 | +0<br>-.00071 | +0<br>-.00087 | +0<br>-.00106 |

### Drill Diameter Tolerance Metric

| Diameter (mm) | 1 - 3<br>from to | 3 - 6<br>over to | 6 - 10<br>over to | 10 - 18<br>over to | 18 - 30<br>over to |
|---|---|---|---|---|---|
| h6 | 0<br>–.00024 | 0<br>–.00032 | 0<br>–.00036 | 0<br>–.00044 | 0<br>–.00052 |
| h7 | 0<br>–.0004 | 0<br>–.00048 | 0<br>–.00059 | 0<br>–.00071 | 0<br>–.00083 |
| h8 | 0<br>–.00056 | 0<br>–.00071 | 0<br>–.00087 | 0<br>–.00107 | 0<br>–.00130 |
| m7 | +.00048<br>+.00007 | +.00063<br>+.00015 | +.00083<br>+.00023 | +.00099<br>+.00027 | +.00114<br>+.00031 |

## Trouble Shooting in Drilling

| Occurrence of trouble | Cause of trouble | Countermeasures |
|---|---|---|
| **Drill will not enter work** | 1. Drill is dull.<br>2. Lip relief too small.<br>3. Too thick a web. | 1. Grind lip relief sufficiently.<br>2. Grind web thinning.<br>3. Choose a drill with narrow web. |
| **Margin chipping** | 1.Oversized jig bushing. | 1. Choose the suitable jig bushing for drill diameter |
| **Cutting lip breaks** | 1. Lip relief too much.<br>2. Feed too heavy. | 1. Grind lip relief sufficiently.<br>2. Decrease feed rate. |
| **Tang breaks Bruch der** | 1. Imperfect fit between taper shank and socket.<br>2. Burred or Badly worn sockets. | 1. Clean the dirt or chips in sockets.<br>2. Change the worn sockets to new ones. |
| **Drill breaks in brass** | 1. Unsuitable drill<br>2. Flutes clogged with chips | 1. Choose the suitable drill for work material. |
| **Chipping of drill center** | 1. Lip relief too much.<br>2. Feed too heavy. | 1. Grind lip relief sufficiently.<br>2. Decrease feed rate. |
| **Hole oversize** | 1. Unequal angle or length of cutting edges.<br>2. Loosen spindle. | 1. Resharpening point, choose correct drills.<br>2. Tighten spindle sufficiently. |
| **Outer corners broken down** | 1. Cutting speed too high.<br>2. Hard spots in work material.<br>3. Flutes clogged with chips.<br>4. Too wear of drills. | 1. Grind point to suit work material.<br>2. Decrease the feed rates.<br>3. Resharpening early beforce too wear. |
| **Large chip of one flute and small chip of other flute** | 1. Improperly ground point.<br>2. Only one lip doing all the cutting | 1. Properly grind point.<br>2. Grind point with same point angle and length of lip<br>3. Grind with small lip height. |
| **Hole rough** | 1. Improperly ground point.<br>2. Unenough coolant supply<br>3. Too much feed.<br>4. Fixture not rigid. | 1. Properly grind point.<br>2. Supply coolant enough.<br>3. Decrease the feed rate.<br>4. Tighten the fixture or replace. |

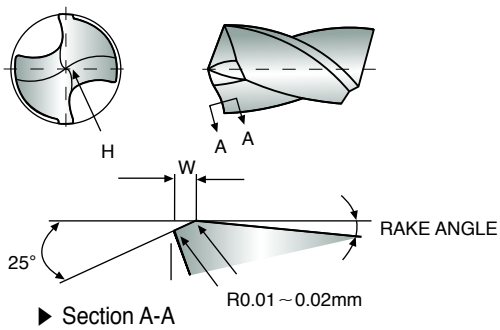
## Characteristic of DREAM DRILLS

- YG-1's Dream Drill Series are suitable for high speed and accurate drilling operations by special design and high quality.
- Good performance for Steels, Cast Irons, Tool steels, Alloy steels and Stainless steels.
- Rapid chip evacuation and excellent chip breaking can be achieved by special designed cutting edges on point and chip breakers on leading edges.
- High accuracy and stability.
- Longer tool life with TiAlN coating.
- Self-centering

# TECHNICAL DATA

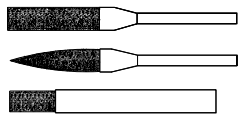
## 17 Honing Guide of DREAM DRILLS

■ **Dimension of Honing**




▶ Section A-A

■ **Scraper**



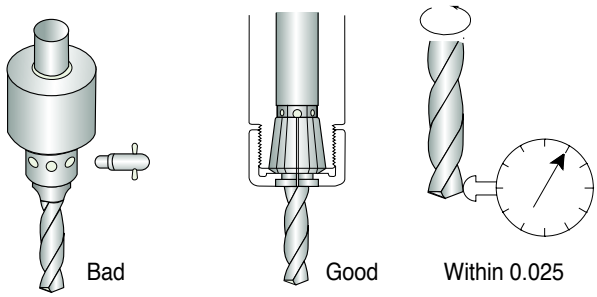
for Roughing (#140)

for Finishing (#230～#400)

| Work Material | Alloy Steels | Mild Steels | Cast Iron |
|---|---|---|---|
| W(mm) | 0.15～0.2 | 0.1～0.15 | 0.03 |

▶ The dimension W of stocked products is 0.1～0.15.

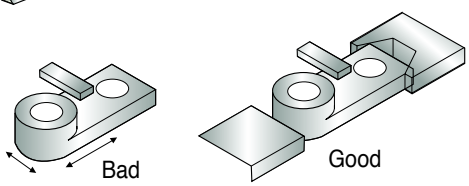
## 18 Use of DREAM DRILLS

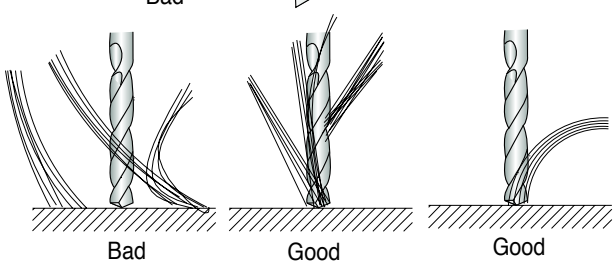



▶ Chucking with spring collet correctly.

▶ Radial run out at cutting lip must not exceed 0.025 mm.

▶ Tighten clamp of work piece.

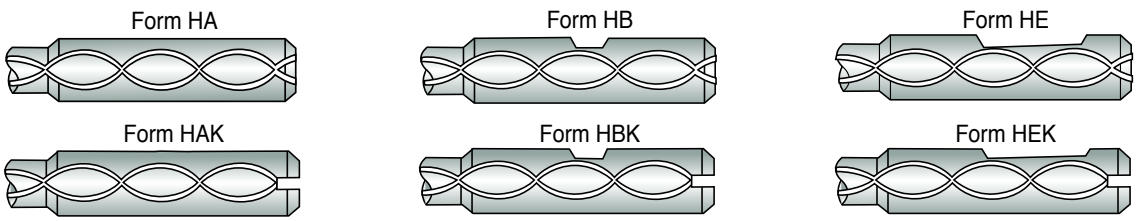



▶ Supply coolant enough to the entrance of hole.

▶ When using Dream Drills with Coolant holes, Supply high pressure coolant.

## 19 Shank Type DREAM DRILLS with Coolant Holes




▶ Shank Type of stocked products is Form HA.

▶ If you need other Shank Type, we can supply them.

# THREADING TOOLS

SOLID CARBIDE THREAD MILLS

COMBO TAPS(Spiral Point & Spiral Flute)

SPIRAL FLUTE TAPS

SPIRAL POINT TAPS

STRAIGHT FLUTE TAPS

FORMING TAPS

SCREW THREAD INSERT TAPS

PIPE TAPS

TECHNICAL DATA

YG-1 CO., LTD.

# Contents

## THREADING TOOLS

CARBIDE THREAD MILLS

CARBIDE & HSS TAPS

TECHNICAL DATA

YG-1 CO., LTD.

# Contents / THREADING TOOLS


SOLID CARBIDE THREAD MILLS
For blind holes and through holes with one single tool / Higher cutting speed and feed than taps
THREAD MILLS

COMBO TAPS
Multi Purpose tapping / YG-1's Patent / Super HSS & HSS-E for Prevention of Oversized Threads
COMBO TAPS

SPIRAL FLUTE TAPS
Tapping Blind Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS
SPIRAL FLUTE TAPS

SPIRAL POINT TAPS
Tapping Through Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS
SPIRAL POINT TAPS

STRAIGHT FLUTE TAPS
Tapping Through & Blind Holes / Carbide, Super HSS & HSS
STRAIGHT FLUTE TAPS

FORMING TAPS
Tapping by Forming Soft Mateials (NO Chips)
FORMING TAPS

SCREW THREAD INSERT TAPS
Tapping STI Threads of Soft Materials (HSS-E)
SCREW THREAD INSERT TAPS

PIPE TAPS
Tapping NPT, NPTF, NPS & NPSF threads
PIPE TAPS

TECHNICAL DATA
TECHNICAL DATA







## SOLID CARBIDE THREAD MILL

**INCH**

| EDP No. | MODEL | Description | Page |
|---|---|---|---|
| **TE** |  | Solid Carbide Thread mill<br>for Unified Internal Threads - ANSI B 1.1 | **327** |
| **TD** |  | Solid Carbide Thread mill<br>for Metric Internal Threads - DIN 13 | **328** |
| **TF**<br>**TG** |  | Solid Carbide Thread mill for Unified Internal Threads<br>- ANSI B 1.20.1(NPT) / ANSI B1.20.3(NPTF) | **329** |

## Application Program Available

### Programming of Thread Milling

☞ Internal Thread Milling in Machining Center

☞ Fanuc

English

INCH

Thread Milling

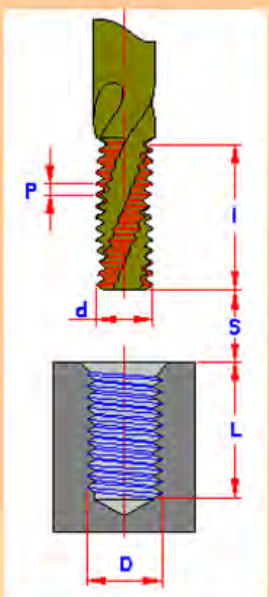
UN - Unified

| | |
|---|---|
| D = thread diameter (Inch) | 0.375 |
| P = pitch (TPI) | 16 |
| L = thread length (Inch) | 0.750 |
| S = safety distance (Inch) | 0.250 |

Steel, High Alloy, < 1200 N/mm2

NC0285C0750 16TPI L121E480

| | | |
|---|---|---|
| Number of passes, axial | 1 | |
| Number of passes, radial (max 2) | 1 | |
| d = cutter diameter (Inch) | 0.285 | |
| l = length of cutting edge (Inch) | 0.750 | |
| z = number of flutes | 4 | |
| V = cutting speed (SFM) | 262 | |
| Fz = feed/tooth (inch/tooth) | 0.0010 | |
| Fdr = drilling feed(inch/rev.) | | |
| N = spindle speed (rpm) | 3,511 | |
| FD = feed at thread diameter (inch/min) | 14 | |
| Fd = feed in center of mill (inch/min) | 3.4 | |
| T = time to mill the thread (seconds) | 9 | |




**CNC program for Fanuc**

```
G90 G00 G57 X0. Y0.
G43 H10 Z0.250 M3 S3511
G91 G00 Z-1.0156
G41 D10 X0. Y-0.1563 F3.4
G03 X0.1906 Y0.1563 Z0.0156 R0.1594
G03 X0. Y0. Z0.0625 I-0.1906 J0.
G03 X-0.1906 Y0.1563 Z0.0156 R0.1594
G00 G40 X0. Y-0.1563
G00 Z0.9219
G90 G49 G00 Z8. M5
M30
```

# COMBO TAPS

## INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| T2<br>T2-S<br>T2-C |  | HSS-EX | UNC/UNF | MU | USCTI 302A | H2~H6 | 2 ~ 3P | 2.5D | Bright<br>Steam Oxide<br>TiCN | 335 |
| T5<br>T5-S<br>T5-C |  | HSS-EX | M | MU | USCTI 302A | D3~D8 | 2 ~ 3P | | Bright<br>Steam Oxide<br>TiCN | 337 |
| T6<br>T6-N | with Internal Coolant<br>  | HSS-EX | UNC/UNF | MU | USCTI 302A | H4~H6 | 2 ~ 3P | | Bright<br>TiN | 338 |
| T8<br>T8-N | with Internal Coolant<br>  | HSS-EX | M | MU | USCTI 302A | D5~D7 | 2 ~ 3P | | Bright<br>TiN | 339 |
| T7<br>T7-C | Short Chamfer<br>  | HSS-EX | UNC/UNF | MU | USCTI 302A | H2~H6 | 1 ~ 2P | | Bright<br>TiCN | 340 |
| T9<br>T9-C | Short Chamfer<br>  | HSS-EX | M | MU | USCTI 302A | D3~D8 | 1 ~ 2P | | Bright<br>TiCN | 342 |
| T1-S<br>T1-C |  | HSS-EX | UNC/UNF | MU | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Steam Oxide<br>TiCN | 343 |
| TA-S<br>TA-C |  | HSS-EX | M | MU | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide<br>TiCN | 344 |
| TCA-S/C<br>TCB-S/C |  | Super HSS<br>HSS-EX | UNC/UNF | VA | USCTI 302A | H2~H6 | 2 ~ 3P | | Steam Oxide<br>TiCN | 345 |
| TCC-S/C<br>TCD-S/C |  | Super HSS<br>HSS-EX | M | VA | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide<br>TiCN | 347 |
| T4<br>T4-S<br>T4-C |  | HSS-EX | UNC/UNF | MU | USCTI 302A | H2~H6 | 4 ~ 5P | 3.0D | Bright<br>Steam Oxide<br>TiCN | 348 |
| T3<br>T3-S<br>T3-C |  | HSS-EX | M | MU | USCTI 302A | D3~D8 | 4 ~ 5P | | Bright<br>Steam Oxide<br>TiCN | 350 |
| TB<br>TB-N | with Internal Coolant<br>  | HSS-EX | UNC/UNF | MU | USCTI 302A | H4~H6 | 4 ~ 5P | | Bright<br>TiN | 351 |
| TH<br>TH-N | with Internal Coolant<br>  | HSS-EX | M | MU | USCTI 302A | D5~D7 | 4 ~ 5P | | Bright<br>TiN | 352 |
| TC-S<br>TC-C |  | HSS-EX | UNC/UNF | MU | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Steam Oxide<br>TiCN | 353 |
| TK-S<br>TK-C |  | HSS-EX | M | MU | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide<br>TiCN | 354 |
| TCE-S/C<br>TCF-S/C |  | Super HSS<br>HSS-EX | UNC/UNF | VA | USCTI 302A | H2~H6 | 4P | | Steam Oxide<br>TiCN | 355 |
| TCG-S/C<br>TCH-S/C |  | Super HSS<br>HSS-EX | M | VA | USCTI 302A | D3~D7 | 4P | | Steam Oxide<br>TiCN | 357 |

## SPIRAL FLUTE TAPS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **BB/BI** |  | Super HSS | UNC/UNF | **VG** | USCTI 302A | H2~H6 | 2 ~ 3P | 2.5D | Steam Oxide Hardslick | **362** |
| **BH/BM** |  | Super HSS | M/MF | **VG** | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | **364** |
| **BF/BK** |  | Super HSS | UNC/UNF | **VG** | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Steam Oxide Hardslick | **365** |
| **BD/BO** |  | Super HSS | M/MF | **VG** | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | **366** |
| **H5/H7/H8** |  | P-HSS | UNC/UNF | **HR** | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | **367** |
| **TQ858/ TK858/TR858** |  | P-HSS | M/MF | **HR** | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | **368** |
| **B3/B5/D6** |  | P-HSS | UNC/UNF | **Ti Ni** | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | **369** |
| **G9/H0** |  | P-HSS | UNC/UNF | **VA** | DIN-ANSI Shank | H2~H3 | 2 ~ 3P | | Hardslick | **371** |
| **H2/H4** |  | P-HSS | UNC/UNF | **VA** | DIN-ANSI Shank | H3 | 4 ~ 5P | 3.0D | TiN Hardslick | **372** |
| **BG/BG-GB** |  | HSSE-V3 | UNC/UN8 | **VG** | DIN-ANSI Shank | 2B | 2 ~ 3P | 2.5D | Hardslick Gold & Black | **373** |
| **B1/B0/B2/D2** |  | HSSE-V3 | UNC/UNF | **VA** | USCTI 302A | H2~H7 | 2 ~ 3P | | Bright Steam Oxide TiN/Hardslick | **374** |
| **BS/BT** |  | HSSE-V3 | M/MF | **VA** | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | **377** |
| **E6/E8/E9** |  | HSSE-V3 | M/MF | **VA** | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | **378** |
| **D3/E0** |  | HSSE-V3 | UNC/UNF | **VG** | USCTI 302A | H2~H11 | 2 ~ 3P | | Hardslick Steam Oxide | **379** |
| **BU/BV** |  | HSSE-V3 | M/MF | **VG** | USCTI 302A | D3~D11 | 2 ~ 3P | | Steam Oxide Hardslick | **382** |
| **E2/E4/E5** |  | HSSE-V3 | M/MF | **VG** | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | **384** |
| **C0/D8** |  | HSSE-V3 | UNC/UNF | **AI** | USCTI 302A | H2~H5 | 2 ~ 3P | | Bright Hardslick | **385** |
| **BW/BX** |  | HSSE-V3 | M/MF | **AI** | USCTI 302A | D3~D6 | 2 ~ 3P | | Bright Hardslick | **386** |

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **C2/C3/C4/D9** |  | HSSE-V3 | UNC/UNF | **GS** | USCTI 302 | H2~H6 | 1.5 ~ 2P | 2.5D | Steam Oxide Bright/TiN Hardslick | **387** |
| **F4/F8/F6** |  | HSS-V | UNC/UNF | **GS** | USCTI 302A | H2~H6 | 1.5 ~ 2P | | Steam Oxide TiN Hardslick | **388** |
| **G4/G5/G6** |  | HSS-V | M/MF | **GS** | USCTI 302A | D3~D6 | 1.5 ~ 2P | | Bright TiCN Hardslick | **390** |
| **G0/G1/G2** |  | HSS-V | UNC/UNF | **GS** | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Bright TiN Hardslick | **391** |
| **T7A96/T6A96/ T8A96 T7295/T6295/ T8295** |  | HSS | UNC/UNF | **GS** | USCTI 302 | H2~H5 | 4 ~ 5P 1.5 ~ 2P | | Bright Steam Oxide TiN | **393** |
| **T7A86/T6A86/ T8A86 T7A85/T6A85/ T8A85** |  | HSS | M/MF | **GS** | USCTI 302 | D3~D6 | 4 ~ 5P 1.5 ~ 2P | | Bright Steam Oxide TiN | **394** |
| **T7D01/T8D01 T7D02/T8D02** |  | HSS | UNC/UNF | **GS** | USCTI Long Shank | H3 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN | **395** |

## SPIRAL POINT TAPS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| M9/O1 |  | Super HSS | UNC/UNF | VG | USCTI 302A | H2~H6 | 4 ~ 5P | 3.0D | Steam Oxide Hardslick | 400 |
| N7/N8 |  | Super HSS | M/MF | VG | USCTI 302A | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 402 |
| N4/O5 |  | Super HSS | UNC/UNF | VG | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Steam Oxide Hardslick | 403 |
| N3/O3 |  | Super HSS | M/MF | VG | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 404 |
| M4/M6/M7 |  | P-HSS | UNC/UNF | HR | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 405 |
| TQ808/ TK808/TR808 |  | P-HSS | M/MF | HR | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 406 |
| I3/I5/J6 |  | P-HSS | UNC/UNF | Ti Ni | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 407 |
| M2/M3 |  | P-HSS | UNC/UNF | VA | USCTI Long Shank | H2~H3 | 4 ~ 5P | | Hardslick | 409 |
| I0/I2/J2 |  | HSSE-V3 | UNC/UNF | VA | USCTI 302A | H2~H7 | 4 ~ 5P | | Steam Oxide TiN Hardslick | 410 |
| O9/IA |  | HSSE-V3 | M/MF | VA | USCTI 302A | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 413 |
| K3/K5/K6 |  | HSSE-V3 | M/MF | VA | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 414 |
| J3/J8 |  | HSSE-V3 | UNC/UNF | VG | USCTI 302A | H2~H11 | 4 ~ 5P | | Steam Oxide Hardslick | 415 |
| IB/IC |  | HSSE-V3 | M/MF | VG | USCTI 302A | D3~D11 | 4 ~ 5P | | Steam Oxide Hardslick | 419 |
| J9/K7/K2 |  | HSSE-V3 | M/MF | VG | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 421 |
| T2496 |  | HSSE-V3 | UNC/UNF | Al | USCTI 302A | H2~H5 | 4 ~ 5P | | Bright | 422 |
| T2K01 |  | HSSE-V3 | M/MF | Al | USCTI 302A | D3~D6 | 4 ~ 5P | | Bright | 423 |
| I9/J0/J1/J7 |  | HSSE-V3 | UNC/UNF | GS | USCTI | H2~H6 | 4 ~ 5P | | Steam Oxide Bright/TiN Hardslick | 424 |
| K9/L0/L1 |  | HSS-V | UNC/UNF | GS | USCTI 302A | H2~H6 | 4 ~ 5P | | Bright TiN Hardslick | 425 |

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **L7/L8/L9** |  | HSS-V | M/MF | **GS** | USCTI 302A | D3~D6 | 4 ~ 5P | 3.0D | Bright TiCN Hardslick | **426** |
| **L3/L4/L5** |  | HSS-V | UNC/UNF | **GS** | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Bright TiN Hardslick | **427** |
| **T7216/T6216/ T8216 T7C16/ T6C16/T8C16** |  | HSS | UNC/UNF | **GS** | USCTI 302 | H1~H7 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | **428** |
| **T7256/T6256** |  | HSS | UNC/UNF | **GS** | USCTI 302 | H1~H7 | 1.5 ~ 2P | | Bright Finish Steam Oxide | **432** |
| **T7217/T6217/ T8217** |  | HSS | M/MF | **GS** | USCTI 302 | D3~D7 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | **434** |
| **T7226/T6226/ T8226** |  | HSS | UNC/UNF | **GS** | USCTI 302 | +.005" oversize | 4 ~ 5P | | Bright Finish Steam Oxide TiN | **435** |
| **T7B17/ T6B17/T8B17** |  | HSS | M/MF | **GS** | USCTI 302 | +.127mm oversize | 4 ~ 5P | | Bright Finish Steam Oxide TiN | **436** |
| **T7236/T6236/ T8236 T7G36/ T6G36/ T8G36** |  | HSS | UNC/UNF | **GS** | USCTI Long Shank | H3 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | **437** |

## STRAIGHT FLUTE TAPS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **T0C01** |  | Carbide | UNC/UNF | **GG** | USCTI 302A | 2B | 1.5 ~ 2P | 2.0D | Bright | **441** |
| **TR** |  | Super HSS | UNC/UNF | **GG** | USCTI 302A | H3~H5 | 2 ~ 3P | | TiAlN | **442** |
| | | | M | **GG** | | D4~D6 | 2 ~ 3P | | | |
| **TR-A, TR-R** |  | Super HSS | UNC/UNF | **GG** | USCTI 302A | H3~H5 | 2 ~ 3P | | TiAlN | **444** |
| | | | M | **GG** | | D4~D6 | 2 ~ 3P | | | |
| **T7316/T6316/ T8316/T7A16 T7B16** |  | HSS | UNC/ UNF/ UNS | **GS** | USCTI 302 | H1~H7 | 9P/5P/2P | | Bright Steam Oxide TiN | **446** |
| **T7315/T6315/ T8315** |  | HSS | M/MF | **GS** | USCTI 302 | D3~D9 | 9P/5P/2P | | Bright Steam Oxide TiN | **452** |
| **T7326** |  | HSS | UNC/UNF | **GS** | USCTI 302 | +.005" oversize | 5P/2P | | Bright | **453** |
| **T7B15** |  | HSS | M/MF | **GS** | USCTI 302 | +.127mm oversize | 5P/2P | | Bright | **454** |
| **T7336** |  | HSS | UNC/UNF | **GS** | USCTI 302 (Left Hand) | H2~H4 | 5P/2P | | Bright | **455** |
| **T7A15** |  | HSS | UNC/UNF | **GS** | USCTI 302 (Left Hand) | D4~D8 | 5P/2P | | Bright | **456** |
| **T7616/T6616/ T8616** |  | HSS | UNC/UNF | **GS** | USCTI Long Shank | H3 | 4 ~ 5P | | Bright Steam Oxide TiN | **457** |

## FORMING TAPS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **TKR03** |  | Super HSS | UNC/UNF | **GV** | USCTI 302A | H3~H7 | 2 ~ 3P | 3.0D | TiCN | **461** |
| **ZF** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302 | H2~H5 | 2 ~ 3P | | Bright | **462** |
| **Z0/Z1/Z2/Z3** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302A | H2~H12 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN | **463** |
| **Z4/Z5/Z6/Z7** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302A | H3~H12 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN | **465** |
| **Z8/ZA/ZC Z9/ZB/ZD** |  | HSSE-V3 | M/MF | **GV** | USCTI 302A | D3~D11 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN / TiCN | **467** |
| **T7R01/T8R01/ THR01 T7R02/T8R02/ THR02** |  | HSS | UNC/UNF | **GV** | USCTI 302A | H2~H5 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN / TiCN | **468** |

# SCREW THREAD INSERT TAPS

## INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| ST/SI |  | HSSE-V3 | UNC/UNF | GS | USCTI 322 | 2B | 1.5 ~ 2P | 2.5D | Hardslick | 471 |
| T7406 |  | HSS | UNC/UNF | GS | USCTI 322 | H2~H4 | 1.5 ~ 2P | | Bright | 472 |
| T7425 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 1.5 ~ 2P | | Bright | 473 |
| ST/SI |  | HSSE-V3 | UNC/UNF | GS | USCTI 322 | 2B | 4 ~ 5P | 3.0D | Hardslick | 474 |
| T7436 |  | HSS | UNC/UNF | GS | USCTI 322 | H1~H4 | 4 ~ 5P | | Bright | 475 |
| T7415 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 4 ~ 5P | | Bright | 476 |
| T7426 |  | HSS | UNC/UNF | GS | USCTI 322 | H1~H4 | 4 ~ 5P<br>1.5 ~ 2P | 2.0D | Bright | 477 |
| T7405 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 4 ~ 5P<br>1.5 ~ 2P | | Bright | 478 |

# PIPE TAPS

## INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|
| Q1/Q0/Q6 |  | HSSE-V3 | NPTF | VA | USCTI 311 | 2 ~ 3P | 2.5D | Bright<br>Steam Oxide<br>Hardslick | 481 |
| Q9/R0/R1 |  | HSSE-V3 | NPTF | GG | USCTI 311 | 2 ~ 3P | | Bright<br>TiN<br>Hardslick | 482 |
| R7/R8/R9/S0 |  | HSSE-V3 | NPTF | GG | USCTI 311 | 2 ~ 3P | 2.0D | Bright<br>TiN<br>Hardslick<br>Nitrided-Steam Oxide | 483 |
| S1/S2 |  | HSSE-V3 | NPTF | GG | USCTI 311 | 2 ~ 3P | | Bright<br>TiCN | 484 |
| T7L36/T6L36<br>T7536/T6536 |  | HSS | NPS/NPSF | GS | USCTI 311 | 4 ~ 5P | | Bright<br>Steam Oxide | 485 |
| T7505/T6505/<br>TH505 |  | HSS | NPT | GS | USCTI 311 | 2 ~ 3P | | Bright<br>Steam Oxide<br>TiCN | 486 |
| T7546/T8546 |  | HSS | NPTF | GS | USCTI 311 | 2 ~ 3P | | Bright<br>TiN | 487 |

# HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| SERIES | | | MU | | | MU | | | MU |
|---|---|---|---|---|---|---|---|---|---|
| | | | T2 | T2 -S | T2 -C | T5 | T5 -S | T5 -C | T6 T6-N |
| DESCRIPTION | | | USCTI 302A | | | USCTI 302A | | | USCTI 302A |
| PAGE | | | 335 | | | 337 | | | 338 |
| THREADS | | | UNC/UNF | | | M | | | UNC/UNF |
| TAP MATERIALS | | | HSS-EX | | | HSS-EX | | | HSS-EX |
| CHAMFER LENGTH | | | 2-3P | | | 2-3P | | | 2-3P |
| SURFACE TREATMENT | | | Bright | Steam Oxide | TiCN | Bright | Steam Oxide | TiCN | Bright TiN |
| SPIRAL FLUTE ANGLE | | | R40° | | | R40° | | | R40° |
| THREAD DEPTH | | | 2.5D | | | 2.5D | | | 2.5D |
| HOLE TYPE | | | Blind | | | Blind | | | Blind |

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Magnesium | | N | - | - | - | 45 - 100 | T | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | | | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| MU | MU | MU | MU | | MU | | VA | VA | MU | | | MU | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T8<br>T8-N | T7<br>T7-C | T9<br>T9-C | T1-S | T1-C | TA-S | TA-C | TCA-S/C<br>TCB-S/C | TCC-S/C<br>TCD-S/C | T4 | T4<br>-S | T4<br>-C | T3 | T3<br>-S | T3<br>-C |
| USCTI 302A | USCTI 302A | USCTI 302A | DIN-ANSI Shank | | DIN-ANSI Shank | | USCTI 302A | USCTI 302A | USCTI 302A | | | USCTI 302A | | |
| 339 | 340 | 342 | 343 | | 344 | | 345 | 347 | 348 | | | 350 | | |
| M | UNC/UNF | M | UNC/UNF | | M | | UNC/UNF | M | UNC/UNF | | | M | | |
| HSS-EX | HSS-EX | HSS-EX | HSS-EX | | HSS-EX | | Super HSS<br>HSS-EX | Super HSS<br>HSS-EX | HSS-EX | | | HSS-EX | | |
| 2-3P | 1-2P | 1-2P | 2-3P | | 2-3P | | 2-3P | 2-3P | 4-5P | | | 4-5P | | |
| Bright<br>TiN | Bright<br>TiCN | Bright<br>TiCN | Steam Oxide | TiCN | Steam Oxide | TiCN | Steam Oxide<br>TiCN | Steam Oxide<br>TiCN | Bright | Steam Oxide | TiCN | Bright | Steam Oxide | TiCN |
| R40° | R40° | R40° | R40° | | R40° | | R45° | R45° | - | | | - | | |
| 2.5D | 2.5D | 2.5D | 2.5D | | 2.5D | | 2.5D | 2.5D | 3.0D | | | 3.0D | | |
| Blind | Blind | Blind | Blind | | Blind | | Blind | Blind | Through | | | Through | | |
|  |  |  |  | |  | |  |  |  | | |  | | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | | ◎ | | ◎ | | | ◎ | | ◎ | ◎ | | ◎ |
| ◎ | ◎ | ◎ | | ◎ | | ◎ | | | ◎ | | ◎ | ◎ | | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | ○ |
| | | | | | | | | | | | | | | |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ | ○ | ○ | ○ | ○ | ○ |

## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | MU | MU | MU | |
|---|---|---|---|---|---|---|
| | | SERIES | TB<br>TB-N | TH<br>TH-N | TC-S | TC-C |
| | | DESCRIPTION | USCTI 302A | USCTI 302A | DIN-ANSI Shank | |
| | | PAGE | 351 | 352 | 353 | |
| | | THREADS | UNC/UNF | M | UNC/UNF | |
| | | TAP MATERIALS | HSS-EX | HSS-EX | HSS-EX | |
| | | CHAMFER LENGTH | 4-5P | 4-5P | 4-5P | |
| | | SURFACE TREATMENT | Bright TiN | Bright TiN | Steam Oxide | TiCN |
| | | SPIRAL FLUTE ANGLE | - | - | - | |
| | | THREAD DEPTH | 3.0D | 3.0D | 3.0D | |
| | | HOLE TYPE | Through | Through | Through | |

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | ◎ | ◎ | ◎ | ◎ |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | ◎ | ◎ | ◎ | ◎ |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | ◎ | ◎ | ◎ | ◎ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | ◎ | ◎ | ◎ | ◎ |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | ◎ | ◎ | ◎ | ◎ |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | ◎ | ◎ | ◎ | ◎ |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | ◎ | ◎ | ◎ | ◎ |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | ◎ | ◎ | ◎ | ◎ |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | ◎ | ◎ | ◎ | ◎ |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | ◎ | ◎ | ◎ | ◎ |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ◎ | ◎ | | ◎ |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ◎ | ◎ | | ◎ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | ◎ | ◎ | ◎ | ◎ |
| Magnesium | | N | - | - | - | 45 - 100 | T | ◎ | ◎ | ◎ | ◎ |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | ○ | ○ | ○ | ○ |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | ○ | ○ | ○ | ○ |

| MU | | VA | VA | VG | VG | VG | VG | HR | HR |
|---|---|---|---|---|---|---|---|---|---|
| TK-S | TK-C | TCE-S/C TCF-S/C | TCG-S/C TCH-S/C | BB/BI | BH/BM | BF/BK | BD/BO | H5/H7/H8 | TQ858/ TK858/ TR858 |
| DIN-ANSI Shank | | USCTI 302A | USCTI 302A | USCTI 302A | USCTI 302A | DIN-ANSI Shank | DIN-ANSI Shank | USCTI 302A | USCTI 302A |
| 354 | | 355 | 357 | 362 | 364 | 365 | 366 | 367 | 368 |
| M | | UNC/UNF | M | UNC/UNF | M/MF | UNC/UNF | M/MF | UNC/UNF | M/MF |
| HSS-EX | | Super HSS HSS-EX | Super HSS HSS-EX | Super HSS | Super HSS | Super HSS | Super HSS | P-HSS | P-HSS |
| 4-5P | | 4P | 4P | 2-3P | 2-3P | 2-3P | 2-3P | 2-3P | 2-3P |
| Steam Oxide | TiCN | Steam Oxide TiCN | Steam Oxide TiCN | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick | Steam Oxide TiCN Hardslick |
| - | | - | - | R40° | R40° | R40° | R40° | R15° | R15° |
| 3.0D | | 3.0D | 3.0D | 2.5D | 2.5D | 2.5D | 2.5D | 2.5D | 2.5D |
| Through | | Through | Through | Blind | Blind | Blind | Blind | Blind | Blind |
|  | |  |  |  |  |  |  |  |  |
| ◎ | ◎ | ○ | ○ | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | | |
| ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ○ | ○ |
| ◎ | ◎ | | | | | | | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | | |
| ◎ | ◎ | | | ◎ | ◎ | ◎ | ◎ | ○ | ○ |
| ◎ | ◎ | | | | | | | ◎ | ◎ |
| ◎ | ◎ | | | | | | | | |
| ◎ | ◎ | | | | | | | | |
| ◎ | ◎ | | | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | | | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | | | | | | | ◎ | ◎ |
| | ◎ | | | ○ | ○ | ○ | ○ | | |
| | ◎ | | | | | | | | |
| ◎ | ◎ | | | ○ | ○ | ○ | ○ | | |
| ◎ | ◎ | | | ○ | ○ | ○ | ○ | | |
| ○ | ○ | | | | | | | ○ | ○ |
| | | | | | | | | ○ | ○ |
| ○ | ○ | | | | | | | ○ | ○ |

## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

| | | Ti / Ni | VA | VA |
|---|---|---|---|---|
| SERIES | | B3/B5/D6 | G9/H0 | H2/H4 |
| DESCRIPTION | | USCTI 302A | USCTI Long Shank | USCTI Long Shank |
| PAGE | | 369 | 371 | 372 |
| THREADS | | UNC/UNF | UNC/UNF | UNC/UNF |
| TAP MATERIALS | | P-HSS | P-HSS | P-HSS |
| CHAMFER LENGTH | | 2-3P | 2-3P | 4-5P |
| SURFACE TREATMENT | | Steam Oxide TiCN Hardslick | Hardslick | TiN Hardslick |
| SPIRAL FLUTE ANGLE | | R15° | R45° | L15° |
| THREAD DEPTH | | 2.5D | 2.5D | 3.0D |
| HOLE TYPE | | Blind | Blind | Through |

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | | ○ | ○ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | | ◎ | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | | |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | | ◎ | ◎ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | | |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | | |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | | |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | ○ | ○ |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | ○ | ○ |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | S | - | - | 50 - 65 | - | T | | ○ | ○ |
| | Aluminum alloy castings | S | - | - | 40 - 65 | 45 - 90 | T | | | |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | ○ | ○ |
| Magnesium | | N | - | - | - | 45 - 100 | T | | ○ | ○ |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | ◎ | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | ◎ | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | ◎ | | |

| VG | VA | VA | VA | VG | VG | VG | Al |
|---|---|---|---|---|---|---|---|
| **BG/BG-GB** | **B1/B0/B2/D2** | **BS/BT** | **E6/E8/E9** | **D3/E0** | **BU/BV** | **E2/E4/E5** | **C0/D8** |
| DIN-ANSI Shank | USCTI 302A | USCTI 302A | DIN-ANSI Shank | USCTI 302A | USCTI 302A | DIN-ANSI Shank | USCTI 302A |
| 373 | 374 | 377 | 378 | 379 | 382 | 384 | 385 |
| UNC/UN8 | UNC/UNF | M/MF | M/MF | UNC/UNF | M/MF | M/MF | UNC/UNF |
| HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 |
| 2-3P | 2-3P | 2-3P | 2-3P | 2-3P | 2-3P | 2-3P | 2-3P |
| Hardslick Gold & Black | Bright Steam Oxide TiN Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick | Bright Hardslick |
| R40° | R45° | R45° | R45° | R45° | R45° | R45° | R50° |
| 2.5D | 2.5D | 2.5D | 2.5D | 2.5D | 2.5D | 2.5D | 2.5D |
| Blind | Blind | Blind | Blind | Blind | Blind | Blind | Blind |
|  |  |  |  |  |  |  |  |
| | ○ | ○ | ○ | | | | |
| ○ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | |
| ◎ | | | | ◎ | ◎ | ◎ | |
| | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ | |
| ◎ | | | | ○ | ○ | ○ | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | ○ | ○ | ○ | | | | |
| | ○ | ○ | ○ | | | | |
| | | | | ○ | ○ | ○ | |
| | ○ | ○ | ○ | | | | ◎ |
| ◎ | | | | | | | ◎ |
| | ○ | ○ | ○ | | | | |
| | ○ | ○ | ○ | | | | |
| | | | | ○ | ○ | ○ | |
| | | | | | | | |
| | | | | | | | |

# HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | AI | GS | GS |
|---|---|---|---|---|---|
| | | SERIES | BW/BX | C2/C3/C4/ D9 | F4/F8/F6 |
| | | DESCRIPTION | USCTI 302A | USCTI 302 | USCTI 302A |
| | | PAGE | 386 | 387 | 388 |
| | | THREADS | M/MF | UNC/UNF | UNC/UNF |
| | | TAP MATERIALS | HSSE-V3 | HSSE-V3 | HSS-V |
| | | CHAMFER LENGTH | 2-3P | 1.5-2P | 1.5-2P |
| | | SURFACE TREATMENT | Bright Hardslick | Steam Oxide Bright/TiN Hardslick | Steam Oxide TiN Hardslick |
| | | SPIRAL FLUTE ANGLE | R50° | R45° | R50° |
| | | THREAD DEPTH | 2.5D | 2.5D | 2.5D |
| | | HOLE TYPE | Blind | Blind | Blind |
| | | |  |  |  |

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | | ◎ | ◎ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | | ◎ | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | ○ | ○ |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | | ○ | ○ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | ○ | ○ |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | | |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | ○ | ○ |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | | |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ◎ | | |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ◎ | ○ | ○ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | | |
| Magnesium | | N | - | - | - | 45 - 100 | T | | | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | | |

| GS | GS | GS | GS | GS | VG | VG |
|---|---|---|---|---|---|---|
| **G4/G5/G6** | **G0/G1/G2** | **T7A96/T6A96/T8A96 T7295/T6295/T8295** | **T7A86/T6A86/T8A86 T7A85/T6A85/T8A85** | **T7D01/T8D01 T7D02/T8D02** | **M9/O1** | **N7/N8** |
| USCTI 302A | DIN-ANSI Shank | USCTI 302 | USCTI 302 | USCTI Long Shank | USCTI 302A | USCTI 302A |
| 390 | 391 | 393 | 394 | 395 | 400 | 402 |
| M/MF | UNC/UNF | UNC/UNF | M/MF | UNC/UNF | UNC/UNF | M/MF |
| HSS-V | HSS-V | HSS | HSS | HSS | Super HSS | Super HSS |
| 1.5-2P | 2-3P | 4-5P 1.5-2P | 4-5P 1.5-2P | 4-5P 1.5-2P | 4-5P | 4-5P |
| Bright TiCN Hardslick | Bright TiN Hardslick | Bright Steam Oxide TiN | Bright Steam Oxide TiN | Bright TiN | Steam Oxide Hardslick | Steam Oxide Hardslick |
| R50° | R45° | R50° | R50° | R50° | - | - |
| 2.5D | 2.5D | 2.5D | 2.5D | 2.5D | 3.0D | 3.0D |
| Blind | Blind | Blind | Blind | Blind | Through | Through |
|  |  |  |  |  |  |  |
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ○ | ○ | ○ | ○ | ○ | ◎ | ◎ |
| | | | | | | |
| ○ | ○ | ○ | ○ | ○ | ◎ | ◎ |
| ○ | ○ | ○ | ○ | ○ | ◎ | ◎ |
| | | | | | | |
| | | | | | | |
| ○ | ○ | ○ | ○ | ○ | | |
| | | | | | ○ | ○ |
| | | | | | ○ | ○ |
| | | | | | | |
| | | | | | ○ | ○ |
| ○ | ○ | ○ | ○ | ○ | | |
| | | | | | ○ | ○ |
| | | | | | ○ | ○ |
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## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| SERIES | | | VG N4/O5 | VG N3/O3 | HR M4/M6/M7 |
|---|---|---|---|---|---|
| DESCRIPTION | | | DIN-ANSI Shank | DIN-ANSI Shank | USCTI 302A |
| PAGE | | | 403 | 404 | 405 |
| THREADS | | | UNC/UNF | M/MF | UNC/UNF |
| TAP MATERIALS | | | Super HSS | Super HSS | P-HSS |
| CHAMFER LENGTH | | | 4-5P | 4-5P | 4-5P |
| SURFACE TREATMENT | | | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick |
| SPIRAL FLUTE ANGLE | | | - | - | - |
| THREAD DEPTH | | | 3.0D | 3.0D | 3.0D |
| HOLE TYPE | | | Through | Through | Through |
| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT |  |  |  |
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ○ | ○ | |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | ◎ | ◎ | ○ |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | ◎ |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | ◎ | ◎ | |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | ◎ | ◎ | ○ |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | ◎ |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | | |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | | |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | ○ | ○ | |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | ○ | ○ | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | ◎ |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ○ | ○ | |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | | | |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | ○ | ○ | |
| Magnesium | | N | - | - | - | 45 - 100 | T | ○ | ○ | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | | ○ |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | ○ |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | | ○ |

| HR | Ti / Ni | VA | VA | VA | VA | VG | VG | VG |
|---|---|---|---|---|---|---|---|---|
| **TQ808/ TK808/ TR808** | **I3/I5/J6** | **M2/M3** | **I0/I2/J2** | **O9/IA** | **K3/K5/K6** | **J3/J8** | **IB/IC** | **J9/K7/K2** |
| USCTI 302A | USCTI 302A | USCTI Long Shank | USCTI 302A | USCTI 302A | DIN-ANSI Shank | USCTI 302A | USCTI 302A | DIN-ANSI Shank |
| 406 | 407 | 409 | 410 | 413 | 414 | 415 | 419 | 421 |
| M/MF | UNC/UNF | UNC/UNF | UNC/UNF | M/MF | M/MF | UNC/UNF | M/MF | M/MF |
| P-HSS | P-HSS | P-HSS | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 |
| 4-5P | 4-5P | 4-5P | 4-5P | 4-5P | 4-5P | 4-5P | 4-5P | 4-5P |
| Steam Oxide TiCN Hardslick | Steam Oxide TiCN Hardslick | Hardslick | Steam Oxide TiN Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick | Steam Oxide Hardslick | Steam Oxide Hardslick | Steam Oxide TiCN Hardslick |
| | - | - | - | - | - | - | - | - |
| 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D |
| Through | Through | Through | Through | Through | Through | Through | Through | Through |
|  |  |  |  |  |  |  |  |  |
| | | ○ | ○ | ○ | ○ | | | |
| | | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ○ | | | | | | ◎ | ◎ | ◎ |
| ◎ | | | | | | | | |
| | | ◎ | ◎ | ◎ | ◎ | ○ | ○ | ○ |
| ○ | | | | | | ○ | ○ | ○ |
| ◎ | | | | | | | | |
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| | | ○ | ○ | ○ | ○ | | | |
| | | ○ | ○ | ○ | ○ | | | |
| ◎ | | | | | | | | |
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| | | ○ | ○ | ○ | ○ | | | |
| | | ○ | ○ | ○ | ○ | | | |
| ○ | ◎ | | | | | ○ | ○ | ○ |
| ○ | ◎ | | | | | | | |
| ○ | ◎ | | | | | | | |

## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | AI | AI | GS |
|---|---|---|---|---|---|
| | | SERIES | T2496 | T2K01 | I9/J0/J1/J7 |
| | | DESCRIPTION | USCTI 302A | USCTI 302A | USCTI |
| | | PAGE | 422 | 423 | 424 |
| | | THREADS | UNC/UNF | M/MF | UNC/UNF |
| | | TAP MATERIALS | HSSE-V3 | HSSE-V3 | HSSE-V3 |
| | | CHAMFER LENGTH | 4-5P | 4-5P | 4-5P |
| | | SURFACE TREATMENT | Bright | Bright | Steam Oxide Bright/TiN Hardslick |
| | | SPIRAL FLUTE ANGLE | - | - | - |
| | | THREAD DEPTH | 3.0D | 3.0D | 3.0D |
| | | HOLE TYPE | Through | Through | Through |
| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT |  |  |  |
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | | | ◎ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | | | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | | ○ |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | | | ○ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | | ○ |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | | |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | | ○ |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | | |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ◎ | ◎ | |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ◎ | ◎ | ○ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | | |
| Magnesium | | N | - | - | - | 45 - 100 | T | | | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | | |

| GS | GS | GS | GS | GS | GS | GS | GS |
|---|---|---|---|---|---|---|---|
| **K9/L0/L1** | **L7/L8/L9** | **L3/L4/L5** | **T7216/T6216/T8216 T7C16/T6C16/T8C16** | **T7256 /T6256** | **T7217/T6217/ T8217** | **T7226/T6226/ T8226** | **T7B17/T6B17/ T8B17** |
| USCTI 302A | USCTI 302A | DIN-ANSI Shank | USCTI 302 | USCTI 302 | USCTI 302 | USCTI Oversize | USCTI Oversize |
| 425 | 426 | 427 | 428 | 432 | 434 | 435 | 436 |
| UNC/UNF | M/MF | UNC/UNF | UNC/UNF | UNC/UNF | M/MF | UNC/UNF | M/MF |
| HSS-V | HSS-V | HSS-V | HSS | HSS | HSS | HSS | HSS |
| 4-5P | 4-5P | 4-5P | 4-5P | 1.5-2P | 4-5P | 4-5P | 4-5P |
| Bright TiN Hardslick | Bright TiCN Hardslick | Bright TiN Hardslick | Bright Steam Oxide TiN | Bright Steam Oxide | Bright Steam Oxide TiN | Bright Steam Oxide TiN | Bright Steam Oxide TiN |
| - | - | - | - | - | - | - | - |
| 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D |
| Through | Through | Through | Through | Through | Through | Through | Through |
|  |  |  |  |  |  |  |  |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | | | | | | | |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
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| ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
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## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | GS | GG |
|---|---|---|---|
| SERIES | | T7236/T6236/T8236 T7G36/T6G36/T8G36 | T0C01 |
| DESCRIPTION | | USCTI Long Shank | USCTI 302A |
| PAGE | | 437 | 441 |
| THREADS | | UNC/UNF | UNC/UNF |
| TAP MATERIALS | | HSS | Carbide |
| CHAMFER LENGTH | | 4-5P | 1.5-2P |
| SURFACE TREATMENT | | Bright<br>Steam Oxide<br>TiN | Bright |
| SPIRAL FLUTE ANGLE | | - | - |
| THREAD DEPTH | | 3.0D | 2.0D |
| HOLE TYPE | | Through | Blind<br>Through |
| | |  |  |

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT | | |
|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ◎ | |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ◎ | |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | ○ | |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | ○ | |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | ○ | |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | ◎ |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | ○ | ◎ |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | ◎ |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | | |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ○ | ◎ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | |
| Magnesium | | N | - | - | - | 45 - 100 | T | | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | |

| GG | GG | GG | GG | GS | GS | GS | GS |
|---|---|---|---|---|---|---|---|
| TR | | TR-A, TR-R | | T7316/T6316/T8316 T7A16/T7B16 | T7315/T6315/ T8315 | T7326 | T7B15 |
| USCTI 302A | USCTI 302A | USCTI 302A | USCTI 302A | USCTI 302 | USCTI 302 | USCTI Oversize | USCTI Oversize |
| 442 | | 444 | | 446 | 452 | 453 | 454 |
| UNC/UNF | M | UNC/UNF | M | UNC/UNF/UNS | M/MF | UNC/UNF | UNC/UNF |
| Super HSS | Super HSS | Super HSS | Super HSS | HSS | HSS | HSS | HSS |
| 2P~3P | 2P~3P | 2P~3P | 2P~3P | 9P / 5P / 2P | 9P / 5P / 2P | 5P / 2P | 5P / 2P |
| TiAlN | TiAlN | TiAlN | TiAlN | Bright Steam Oxide TiN | Bright Steam Oxide TiN | Bright | Bright |
| - | - | - | - | - | - | - | - |
| 2.0D | 2.0D | 2.0D | 2.0D | 2.0D | 2.0D | 2.0D | 2.0D |
| Blind Through | Blind Through | Blind Through | Blind Through | Blind Through | Blind Through | Blind Through | Blind Through |
|  | |  | |  | |  |  |
| | | | | ◎ | ◎ | ◎ | ◎ |
| | | | | ◎ | ◎ | ◎ | ◎ |
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| | | | | ◎ | ◎ | ◎ | ◎ |
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| ◎ | ◎ | ◎ | ◎ | | | | |
| | | | | | | | |
| | | | | ◎ | ◎ | ◎ | ◎ |
| | | | | ◎ | ◎ | ◎ | ◎ |
| | | | | | | | |
| | | | | ◎ | ◎ | ◎ | ◎ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |
| | | | | ◎ | ◎ | ◎ | ◎ |
| | | | | ◎ | ◎ | ◎ | ◎ |
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## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | | | | | | GS | GS | GS |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SERIES | T7336 (LH) | T7A15 (LH) | T7616/ T6616/ T8616 |
| | | | | | | | DESCRIPTION | USCTI 302 (Left Hand) | USCTI 302 (Left Hand) | USCTI Long Shank |
| | | | | | | | PAGE | 455 | 456 | 457 |
| | | | | | | | THREADS | UNC/UNF | UNC/UNF | UNC/UNF |
| | | | | | | | TAP MATERIALS | HSS | HSS | HSS |
| | | | | | | | CHAMFER LENGTH | 5P / 2P | 5P / 2P | 4-5P |
| | | | | | | | SURFACE TREATMENT | Bright | Bright | Bright Steam Oxide TiN |
| | | | | | | | SPIRAL FLUTE ANGLE | - | - | - |
| | | | | | | | THREAD DEPTH | 2.0D | 2.0D | 2.0D |
| | | | | | | | HOLE TYPE | Blind Through | Blind Through | Blind Through |
| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT |  |  |  |
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ◎ | ◎ | ◎ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | | |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | ◎ | ◎ | ◎ |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | | |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | | | |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | | |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | ◎ | ◎ | ◎ |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | ◎ | ◎ | ◎ |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ◎ | ◎ | ◎ |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ◎ | ◎ | ◎ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | ◎ | ◎ | ◎ |
| Magnesium | | N | - | - | - | 45 - 100 | T | ◎ | ◎ | ◎ |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | | |

| GV | GV | GV | GV | GV | GV | GS | GS |
|---|---|---|---|---|---|---|---|
| **TKR03** | **ZF** | **Z0/Z1/Z2/Z3** | **Z4/Z5/Z6/Z7** | **Z8/ZA/ZC Z9/ZB/ZD** | **T7R01/T8R01/THR01 T7R02/T8R02/THR02** | **ST/SI** | **T7406** |
| USCTI 302A | USCTI 302 | USCTI 302A | USCTI 302A | USCTI 302A | USCTI 302A | USCTI 322 | USCTI 322 |
| 461 | 462 | 463 | 465 | 467 | 468 | 471 | 472 |
| UNC/UNF | UNC/UNF | UNC/UNF | UNC/UNF | M/MF | UNC/UNF | UNC/UNF | UNC/UNF |
| Super HSS | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSS | HSSE-V3 | HSS |
| 2-3P | 2-3P | 4-5P<br>1.5-2P | 4-5P<br>1.5-2P | 4-5P<br>1.5-2P | 4-5P<br>1.5-2P | 1.5-2P | 1.5-2P |
| TiCN | Bright | Bright<br>TiN | Bright<br>TiN | Bright<br>TiN<br>TiCN | Bright<br>TiN<br>TiCN | Hardslick | Bright |
| - | - | - | - | - | - | R40° | R50° |
| 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 3.0D | 2.5D | 2.5D |
| Blind<br>Through | Blind<br>Through | Blind<br>Through | Blind<br>Through | Blind<br>Through | Blind<br>Through | Blind | Blind |
|  |  |  |  |  |  |  |  |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| ◎ | | ◎ | ◎ | ◎ | ◎ | ◎ | ○ |
| | | | | | | ○ | |
| | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | |
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| | | | | | | | |
| | | | | | | ○ | ○ |
| | | | | | | | |
| ◎ | | ◎ | ◎ | ◎ | ○ | | |
| ◎ | | ◎ | ◎ | ◎ | ○ | | |
| | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | ○ |
| ◎ | | ◎ | ◎ | ◎ | ○ | | |
| ◎ | | ◎ | ◎ | ◎ | ○ | | |
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## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | GS | GS | GS |
|---|---|---|---|---|---|
| | | SERIES | T7425 | STI TAP (ST/SI) | T7436 |
| | | DESCRIPTION | USCTI 322A | USCTI 322 | USCTI 322 |
| | | PAGE | 473 | 474 | 475 |
| | | THREADS | M/MF | UNC/UNF | UNC/UNF |
| | | TAP MATERIALS | HSS | HSSE-V3 | HSS |
| | | CHAMFER LENGTH | 1.5-2P | 4-5P | 4-5P |
| | | SURFACE TREATMENT | Bright | Hardslick | Bright |
| | | SPIRAL FLUTE ANGLE | R50° | - | - |
| | | THREAD DEPTH | 2.5D | 3.0D | 3.0D |
| | | HOLE TYPE | Blind | Through | Through |

| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ○ | ◎ | ○ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ○ | ◎ | ○ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | ○ | |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | | | |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | | |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | ○ | ○ | ○ |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | | |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | | |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ○ | ○ | ○ |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ○ | ○ | ○ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | | |
| Magnesium | | N | - | - | - | 45 - 100 | T | | | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | | |

| GS | GS | GS | VA | GG | GG | GG | GS |
|---|---|---|---|---|---|---|---|
| **T7415** | **T7426** | **T7405** | **Q1/Q0/Q6** | **Q9/R0/R1** | **R7/R8/R9/S0** | **S1/S2 (INTERRUPTED)** | **T7L36/T6L36 T7536/T6536** |
| USCTI 322A | USCTI 322 | USCTI 322A | USCTI 311 | USCTI 311 | USCTI 311 | USCTI 311 | USCTI 311 |
| 476 | 477 | 478 | 481 | 482 | 483 | 484 | 485 |
| M/MF | UNC/UNF | M/MF | NPTF | NPTF | NPTF | NPTF | NPS/NPSF |
| HSS | HSS | HSS | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSSE-V3 | HSS |
| 4-5P | 4-5P<br>1.5-2P | 4-5P<br>1.5-2P | 2-3P | 2-3P | 2-3P | 2-3P | 4-5P |
| Bright | Bright | Bright | Bright<br>Steam Oxide<br>Hardslick | Bright<br>TiN<br>Hardslick | Bright<br>TiN<br>Hardslick<br>Nitrided-Steam Oxide | Bright<br>TiCN | Bright<br>Steam Oxide |
| - | - | - | R15° | R15° | - | - | - |
| 3.0D | 2.0D | 2.0D | 2.5D | 2.5D | 2.0D | 2.0D | 2.0D |
| Through | Blind<br>Through | Blind<br>Through | Blind | Blind<br>Through | Blind<br>Through | Blind<br>Through | Blind<br>Through |
|  |  |  |  |  |  |  |  |
| ○ | ○ | ○ | ○ | ◎ | ◎ | ◎ | ○ |
| ○ | ○ | ○ | ◎ | ◎ | ◎ | ◎ | ○ |
| | | | ○ | ○ | ○ | ○ | |
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| | | | ◎ | | | | |
| | | | ○ | | | | |
| | | | | | | | |
| ○ | ○ | ○ | | ◎ | ◎ | ◎ | ○ |
| | | | ○ | ◎ | ◎ | ◎ | |
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| | | | | | | | |
| ○ | ○ | ○ | | | | | ○ |
| ○ | ○ | ○ | ○ | | | | ○ |
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## HIGH PERFORMANCE TAPS RECOMMENDATION TABLE

Super HSS : Premium HSS Metallurgy
P-HSS : Powdered Metallurgy
HSSE-V3 : 3% Vanadium Alloy HSS-EX
HSS-V : Vanadium Alloy HSS

◎= RECOMMENDED
○= SUITABLE

COOLANT
A = Cutting Oil
T = Oil Emulsion
X = Cutting Oil/Oil Emulsion

| | | | | | | | | GS | GS |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SERIES | T7505/T6505/ TH505 (INTERRUPTED) | T7546/T8546 |
| | | | | | | | DESCRIPTION | USCTI 311 | USCTI 311 |
| | | | | | | | PAGE | 486 | 487 |
| | | | | | | | THREADS | NPT | NPTF |
| | | | | | | | TAP MATERIALS | HSS | HSS |
| | | | | | | | CHAMFER LENGTH | 2-3P | 2-3P |
| | | | | | | | SURFACE TREATMENT | Bright Steam Oxide TiCN | Bright TiN |
| | | | | | | | SPIRAL FLUTE ANGLE | - | - |
| | | | | | | | THREAD DEPTH | 2.0D | 2.0D |
| | | | | | | | HOLE TYPE | Blind Through | Blind Through |
| Material Group | Material Sub-Group | ISO | Hardness (HRc) | Hardness (BHN) | Cutting Speed (SFM) Uncoated | Cutting Speed (SFM) Coated | COOLANT |  |  |
| Steel | Low carbon steels<br>Free machining carbon steels | P | < 15 | < 180 | 25 - 50 | 50 - 80 | T | ○ | ○ |
| | Medium to high carbon steels<br>Low alloyed steels | P | < 23 | < 240 | 25 - 50 | 50 - 80 | T | ○ | ○ |
| | Steel castings & forgings<br>Heat-treatable alloy steels | P | > 24<br>≤ 38 | > 250<br>≤ 350 | 6 - 30 | 10 - 35 | X | | |
| | Alloyed tool steels<br>Mold steels | P | > 38<br>≤ 44 | > 350<br>≤ 420 | 6 - 12 | - | A | | |
| Stainless Steel | Free machining stainless steels | M | < 23 | < 240 | 12 - 35 | 20 - 50 | A | | |
| | Heat-and corrosion-resistant stainless steels<br>Valve stainless steels | M | > 24<br>≤ 38 | > 250<br>≤ 350 | 12 - 15 | 12 - 15 | A | | |
| | Stainless steel castings<br>Precipitation hardening stainless steels | M | > 38<br>≤ 44 | > 350<br>≤ 420 | 12 - 15 | - | A | | |
| Cast Iron | Grey cast iron | K | - | ≤ 220 | 35 - 50 | 50 - 65 | T | ○ | ○ |
| | Nodular cast iron / Chilled cast iron<br>Meehanite iron / Ductile iron | K | - | ≥ 250 | 12 - 45 | 25 - 55 | X | | |
| Copper | Pure and alloyed copper | N | - | - | 50 - 60 | 65 - 100 | T | | |
| Brass | Free machining brass<br>Alloyed brass | N | - | - | 30 - 65 | - | T | | |
| Bronze | | N | 44 | < 420 | 12 - 20 | 35 - 80 | T | | |
| Aluminum | Pure Aluminum<br>Aluminum alloys | N | - | - | 50 - 65 | - | T | ○ | ○ |
| | Aluminum alloy castings | N | - | - | 40 - 65 | 45 - 90 | T | ○ | ○ |
| Zinc | | N | - | - | 25 - 65 | 50 - 80 | T | | |
| Magnesium | | N | - | - | - | 45 - 100 | T | | |
| Nickel Alloys | 718 & 625 INCOn / Waspaloy<br>Hastelloyn / Invar<br>Moneln / Incoloy | S | ≤ 38 | ≤ 350 | 10 - 15 | - | A | | |
| | 718 Inconel<br>A286 | S | > 38<br>≤ 44 | > 350<br>≤ 420 | 10 - 12 | - | A | | |
| Titanium | | S | ≤ 38 | ≤ 350 | 3 - 15 | - | A | | |

CARBIDE

YG

Being the best through innovation





# SOLID CARBIDE THREAD MILL

# SELECTION GUIDE

- For blind holes and through holes with one single tool.
- Higher cutting speed and feed than taps.

## INCH

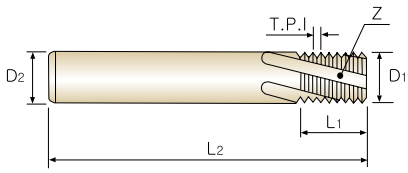
| EDP No. | MODEL | Description | Page |
|---|---|---|---|
| TE |  | Solid Carbide Thread mill<br>for Unified Internal Threads - ANSI B 1.1 | 327 |
| TD |  | Solid Carbide Thread mill<br>for Metric Internal Threads - DIN 13 | 328 |
| TF<br>TG |  | Solid Carbide Thread mill for Unified Internal Threads<br>- ANSI B 1.20.1(NPT) / ANSI B1.20.3(NPTF) | 329 |

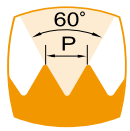
# SOLID CARBIDE THREAD MILLS

TE SERIES

## SOLID CARBIDE THREAD MILL FOR UNIFIED INTERNAL THREADS - ANSI B 1.1






▶ Material : Solid Carbide
▶ Shank : Plain Straight
▶ Spiral Angle : 15°

Unit : Inch

| SIZE | Pitch | Cutter Diameter | Shank Diameter | Thread Length | Overall Length | No. of Flute | EDP No. |
|---|---|---|---|---|---|---|---|
| | TPI | $D_1$ | $D_2$ | $L_1$ | $L_2$ | Z | TiAlN |
| #2 | 56 | **.065** | .125 | .125 | 2.000 | 3 | **TE080** |
| #3 | 48 | **.075** | .125 | .167 | 2.000 | 3 | **TE120** |
| #5 | 44 | **.095** | .125 | .228 | 2.000 | 3 | **TE220** |
| #4 | 40 | **.085** | .125 | .175 | 2.000 | 3 | **TE160** |
| #8 | 36 | **.115** | .125 | .250 | 2.000 | 3 | **TE300** |
| #6 | 32 | **.100** | .125 | .218 | 2.000 | 3 | **TE240** |
| #8 | 32 | **.115** | .125 | .250 | 2.000 | 3 | **TE280** |
| #10 | 32 | **.120** | .125 | .312 | 2.000 | 3 | **TE340** |
| 1/2 | 32 | **.370** | .375 | 1.000 | 3.500 | 4 | **TEF90** |
| #10 | 28 | **.120** | .125 | .312 | 2.000 | 3 | **TEK90** |
| 1/4 | 28 | **.180** | .187 | .500 | 2.500 | 3 | **TE420** |
| 1/2 | 28 | **.370** | .375 | 1.000 | 3.500 | 4 | **TE590** |
| #10 | 24 | **.120** | .125 | .312 | 2.000 | 3 | **TE320** |
| 5/16 | 24 | **.235** | .250 | .625 | 2.500 | 3 | **TE460** |
| 3/8 | 24 | **.285** | .312 | .750 | 3.000 | 4 | **TE500** |
| 1/2 | 24 | **.370** | .375 | 1.000 | 3.500 | 4 | **TE570** |
| 1/4 | 20 | **.180** | .187 | .500 | 2.500 | 3 | **TE400** |
| 7/16 | 20 | **.335** | .375 | .875 | 3.500 | 4 | **TE540** |
| 1/2 | 20 | **.370** | .375 | 1.000 | 3.500 | 4 | **TE580** |
| 5/16 | 18 | **.235** | .250 | .625 | 2.500 | 3 | **TE440** |
| 9/16 | 18 | **.370** | .375 | .875 | 3.500 | 4 | **TE620** |
| 3/8 | 16 | **.285** | .312 | .750 | 3.000 | 4 | **TE480** |
| 3/4 | 16 | **.490** | .500 | 1.250 | 3.500 | 4 | **TE720** |
| 7/16 | 14 | **.305** | .312 | .750 | 3.000 | 4 | **TE520** |
| 7/8 | 14 | **.490** | .500 | 1.250 | 3.500 | 4 | **TE760** |
| 1/2 | 13 | **.350** | .375 | .875 | 3.500 | 4 | **TE560** |
| 9/16 | 12 | **.370** | .375 | .875 | 3.500 | 4 | **TE600** |
| 3/4 | 12 | **.495** | .500 | 1.250 | 3.500 | 4 | **TE710** |
| 5/8 | 11 | **.470** | .500 | 1.250 | 3.500 | 4 | **TE640** |
| 3/4 | 10 | **.495** | .500 | 1.250 | 3.500 | 4 | **TE700** |
| 7/8 | 9 | **.620** | .625 | 1.375 | 4.000 | 4 | **TE740** |
| 1 | 8 | **.620** | .625 | 1.375 | 4.000 | 4 | **TE780** |
| 1 | 12 | **.745** | .750 | 1.500 | 4.000 | 5 | **TE800** |
| 1-1/8 & 1-1/4 | 7 | **.745** | .750 | 1.572 | 4.500 | 5 | **TE820** |

◎ : Excellent ○: Good

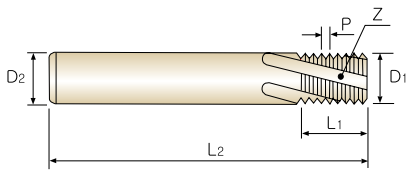
| P | | | M | K | N | S | |
|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Heat Treated Steels | Stainless Steels | Cast Iron | Non Ferrous Materials | Titanium Alloy | Chrome-Nickel Alloy |
| ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ○ |

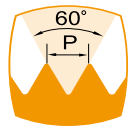
# SOLID CARBIDE THREAD MILLS

TD SERIES

## SOLID CARBIDE THREAD MILL FOR METRIC INTERNAL THREADS - DIN 13






▶ Material : Solid Carbide
▶ Shank : Plain Straight
▶ Spiral Angle : 15°

Unit : Inch

| SIZE | Pitch (mm) | Cutter Diameter | Shank Diameter | Thread Length | Overall Length | No. of Flute | EDP No. |
|---|---|---|---|---|---|---|---|
| | P | $D_1$ | $D_2$ | $L_1$ | $L_2$ | Z | TiAlN |
| M3 | 0.50 | **.085** | .125 | .178 | 2.000 | 3 | **TD200** |
| M4 | 0.70 | **.115** | .125 | .276 | 2.000 | 3 | **TD240** |
| M4.5 | 0.75 | **.120** | .125 | .250 | 2.000 | 3 | **TD260** |
| M8 | 0.75 | **.235** | .250 | .625 | 2.500 | 3 | **TD380** |
| M5 | 0.80 | **.120** | .125 | .312 | 2.000 | 3 | **TD280** |
| M6 | 1.00 | **.170** | .187 | .500 | 2.500 | 3 | **TD310** |
| M12 | 1.00 | **.360** | .375 | .875 | 3.500 | 4 | **TD530** |
| M8 | 1.25 | **.235** | .250 | .625 | 2.500 | 3 | **TD360** |
| M10 | 1.50 | **.300** | .312 | .750 | 3.000 | 4 | **TD420** |
| M14 | 1.50 | **.370** | .375 | .875 | 3.500 | 4 | **TD550** |
| M18 | 1.50 | **.490** | .500 | 1.250 | 3.500 | 4 | **TD670** |
| M12 | 1.75 | **.360** | .375 | .875 | 3.500 | 4 | **TD500** |
| M16 | 2.00 | **.470** | .500 | 1.250 | 3.500 | 4 | **TD600** |
| M20 | 2.50 | **.495** | .500 | 1.250 | 3.500 | 4 | **TD700** |
| M24 | 3.00 | **.620** | .625 | 1.375 | 4.000 | 4 | **TD780** |

◎ : Excellent ○: Good

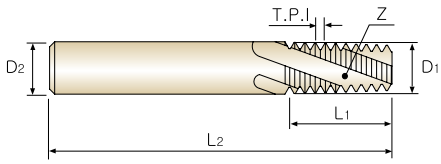
| P | | | M | K | N | S | |
|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Heat Treated Steels | Stainless Steels | Cast Iron | Non Ferrous Materials | Titanium Alloy | Chrome-Nickel Alloy |
| ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ○ |

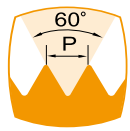
# SOLID CARBIDE THREAD MILLS

TF/TG SERIES

## SOLID CARBIDE THREAD MILL FOR UNIFIED INTERNAL THREADS - ANSI B 1.20.1(NPT) / ANSI B1.20.3(NPTF)






- ▶Material : Solid Carbide
- ▶Shank : Plain Straight
- ▶Spiral Angle : 15°

### TF Series (NPT)

Unit : Inch

| SIZE | Pitch | Cutter Diameter | Shank Diameter | Thread Length | Overall Length | No. of Flute | EDP No. |
|---|---|---|---|---|---|---|---|
| | T.P.I | $D_1$ | $D_2$ | $L_1$ | $L_2$ | Z | TiAlN |
| 1/16 & 1/8 | 27 | **.245** | .250 | .437 | 2.500 | 3 | **TF020** |
| 1/4 & 3/8 | 18 | **.305** | .312 | .625 | 3.000 | 4 | **TF400** |
| 1/4 & 3/8 | 18 | **.363** | .375 | .680 | 3.500 | 4 | **TF480** |
| 1/2 & 3/4 | 14 | **.495** | .500 | .875 | 3.500 | 4 | **TF560** |
| 1" - 2" | 11.5 | **.620** | .625 | 1.125 | 4.000 | 4 | **TF780** |
| 2-1/2" - 6" | 8 | **.745** | .750 | 1.500 | 5.000 | 4 | **TFF40** |

### TG Series (NPTF)

Unit : Inch

| SIZE | Pitch | Cutter Diameter | Shank Diameter | Thread Length | Overall Length | No. of Flute | EDP No. |
|---|---|---|---|---|---|---|---|
| | T.P.I | $D_1$ | $D_2$ | $L_1$ | $L_2$ | Z | TiAlN |
| 1/16 & 1/8 | 27 | **.245** | .250 | .437 | 2.500 | 3 | **TG020** |
| 1/4 & 3/8 | 18 | **.305** | .312 | .625 | 3.000 | 4 | **TG400** |
| 1/2 & 3/4 | 14 | **.495** | .500 | .875 | 3.500 | 4 | **TG560** |
| 1" - 2" | 11.5 | **.620** | .625 | 1.125 | 4.000 | 4 | **TG780** |
| 2-1/2" - 6" | 8 | **.745** | .750 | 1.500 | 5.000 | 4 | **TGF40** |

◎ : Excellent ○: Good

| P | | | M | K | N | S | |
|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Heat Treated Steels | Stainless Steels | Cast Iron | Non Ferrous Materials | Titanium Alloy | Chrome-Nickel Alloy |
| ◎ | ◎ | ◎ | ○ | ◎ | ◎ | ○ | ○ |

# SOLID CARBIDE THREAD MILLS

## RECOMMENDED CUTTING SPEED

Application Program Available

Unit : Inch

| Material | Cutting Speed (SFM) | Feed per Tooth (fz) | |
|---|---|---|---|
| | | Cutter Diameter < 5/16 | Cutter Diameter > 5/16 |
| **Low Carbon Steels Medium Carbon Steels** | 250 - 400 | .0008 - .0016 | .0016 - .0040 |
| **High Carbon Steels** | 250 - 350 | .0008 - .0016 | .0016 - .0040 |
| **Alloy Steels** | 250 - 300 | .0008 - .0016 | .0016 - .0040 |
| **Heat Treated Steels** | 200 - 300 | .0008 - .0016 | .0016 - .0040 |
| **Stainless Steels** | 150 - 250 | .0004 - .0008 | .0008 - .0024 |
| **Cast Iron** | 200 - 350 | .0008 - .0016 | .0016 - .0040 |
| **Chrome-Nickel Alloys Titanium Alloys** | 70 - 200 | .0004 - .0008 | .0008 - .0024 |
| **Non Ferrous Material** | 350 - 1000 | .0012 - .0020 | .0020 - .0040 |

## RECOMMENDED CUTTING SPEED

### Calculate R.P.M of cutter

$$N = \frac{12 \times SFM}{d \times \pi}$$

### Calculate Feed per Revolution

$$F_1 = fz \times Z \times N$$

### Calculate Feed at Tool Center Line

$$F_2 = \frac{F_1 \times (D - d)}{D}$$

**N** : R.P.M
**SFM** : Recommended Cutting Speed
**d** : Diameter of Cutter
**fz** : Recommended Feed per Tooth
**Z** : Number of Teeth
**$F_1$** : Feed at Cutting Edge
**$F_2$** : Feed at Center Line of Cutting
**D** : Major Diameter of Component

# SOLID CARBIDE THREAD MILLS

## RECOMMENDED CUTTING SPEED

Application Program Available

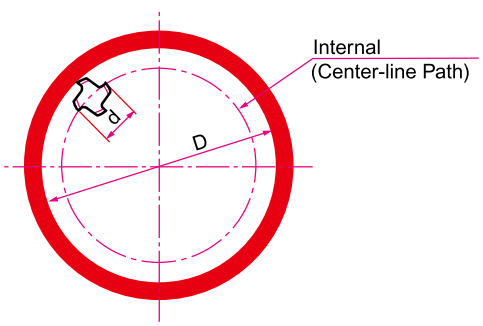
### Program Data

#### G Codes for Thread Milling

| | | | |
|---|---|---|---|
| **G00** | Fast Feed Linear | **G90** | Absolute Command |
| **G01** | Linear Movement | **G91** | Incremental Command |
| **G02** | Circular/Helical Interpolation C.W. | **M03** | Clockwise Rotation of Spindle |
| **G03** | Circular/Helical Interpolation A.C.W. | **M05** | Spindle Stop |
| **G17** | X, Y Plane (Vertical Machining) | **M08** | Coolant On |
| **G18** | Z, X Plane (Horizontal Machining) | **X** | Horizontal Co-ordinate |
| **G19** | Y, Z Plane (Using 90° Head) | **Y** | Horizontal Co-ordinate |
| **G40** | Cutter Radius Compensation Cancel | **Z** | Vertical Co-ordinate |
| **G41** | Cutter Radius Compensation Left | **I** | X Co-ordinate to Center of Arc Travel |
| **G42** | Cutter Radius Compensation Right | **J** | Y Co-ordinate to Center of Arc Travel |
| **G43** | Tool Length Compensation Plus | **S** | Spindle Speed R.P.M. |
| **G49** | Tool Length Compensation Cancel | **F** | Feed inch/min |

### CNC Internal Thread Milling

| | | | | | | |
|---|---|---|---|---|---|---|
| N10 | G54 | G90 | G00 | X… | Y… | |
| N20 | G43 | H10 | Z0.250 | M0.3 | S… | |
| N30 | G91 | G00 | Z-…(A3+0.250) | | | |
| N40 | G41 | G01 | D26 | X…(A6) | Y…(A5) | F… |
| N50 | G03 | X-…(A6) | Y…(A6) | Z…(A4) | I-…(A6) | J0 |
| N60 | G03 | X0 | Y0 | Z…(A2) | I0 | J-…(A1) |
| N70 | G03 | X-…(A6) | Y-…(A6) | Z…(A4) | I0 | J-…(A6) |
| N80 | G00 | G40 | X…(A6) | Y-…(A5) | | |
| N90 | G00 | Z…(A7) | | | | |
| N100 | G90 | G49 | G00 | Z8.0 | M5 | |
| N110 | M30 | | | | | |




**<Explanation of Parameters>**

**A1** : 1/2 Nominal Thread Diameter (D/2)

**A2** : Thread Pitch(P)

**A3** : Thread Depth

**A4** : P/4(for climb milling and right-hand thread)

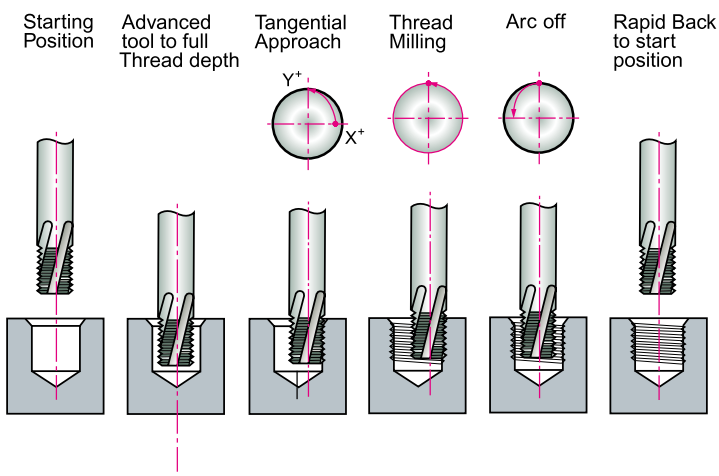
**A5** : Beginning of Contour in Y (P/2)

**A6** : Arc Off (A1 - A5)

**A7** : A3 + 0.250 - P/2

**H10** : Tool length compensation number

**D26** : Tool radius compensation number



# HARDslick

## ULTIMATE TAP PERFORMANCE

### Application Range

SOFT 70 BHN — HARD 340 BHN

**STEEL • STAINLESS STEEL**
**NICKEL ALLOYS**
**ALUMINUM**

- Reduces Galling & Seizing
- Extends Life with Minimal Coolant
- Reduces Tap Inventory



# HSS

Being the best through innovation





# COMBO TAPS

**- Spiral Point and Spiral Flute Taps**

Multi Purpose tapping / YG-1's Patent / Super HSS & HSS-E for Prevention of Oversized Threads

## Spiral Point and Spiral Flute Taps

Multi Purpose tapping / YG-1's Patent / Super HSS & HSS-E for Prevention of Oversized Threads

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **T2<br>T2-S<br>T2-C** |  | HSS-EX | UNC/UNF | **MU** | USCTI 302A | H2~H6 | 2 ~ 3P | 2.5D | Bright<br>Steam Oxide<br>TiCN | **335** |
| **T5<br>T5-S<br>T5-C** |  | HSS-EX | M | **MU** | USCTI 302A | D3~D8 | 2 ~ 3P | | Bright<br>Steam Oxide<br>TiCN | **337** |
| **T6<br>T6-N** | with Internal Coolant<br>  | HSS-EX | UNC/UNF | **MU** | USCTI 302A | H4~H6 | 2 ~ 3P | | Bright<br>TiN | **338** |
| **T8<br>T8-N** | with Internal Coolant<br>  | HSS-EX | M | **MU** | USCTI 302A | D5~D7 | 2 ~ 3P | | Bright<br>TiN | **339** |
| **T7<br>T7-C** | Short Chamfer<br>  | HSS-EX | UNC/UNF | **MU** | USCTI 302A | H2~H6 | 1 ~ 2P | | Bright<br>TiCN | **340** |
| **T9<br>T9-C** | Short Chamfer<br>  | HSS-EX | M | **MU** | USCTI 302A | D3~D8 | 1 ~ 2P | | Bright<br>TiCN | **342** |
| **T1-S<br>T1-C** |  | HSS-EX | UNC/UNF | **MU** | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Steam Oxide<br>TiCN | **343** |
| **TA-S<br>TA-C** |  | HSS-EX | M | **MU** | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide<br>TiCN | **344** |
| **TCA-S/C<br>TCB-S/C** |  | Super HSS<br>HSS-EX | UNC/UNF | **VA** | USCTI 302A | H2~H6 | 2 ~ 3P | | Steam Oxide<br>TiCN | **345** |
| **TCC-S/C<br>TCD-S/C** |  | Super HSS<br>HSS-EX | M | **VA** | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide<br>TiCN | **347** |
| **T4<br>T4-S<br>T4-C** |  | HSS-EX | UNC/UNF | **MU** | USCTI 302A | H2~H6 | 4 ~ 5P | 3.0D | Bright<br>Steam Oxide<br>TiCN | **348** |
| **T3<br>T3-S<br>T3-C** |  | HSS-EX | M | **MU** | USCTI 302A | D3~D8 | 4 ~ 5P | | Bright<br>Steam Oxide<br>TiCN | **350** |
| **TB<br>TB-N** | with Internal Coolant<br>  | HSS-EX | UNC/UNF | **MU** | USCTI 302A | H4~H6 | 4 ~ 5P | | Bright<br>TiN | **351** |
| **TH<br>TH-N** | with Internal Coolant<br>  | HSS-EX | M | **MU** | USCTI 302A | D5~D7 | 4 ~ 5P | | Bright<br>TiN | **352** |
| **TC-S<br>TC-C** |  | HSS-EX | UNC/UNF | **MU** | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Steam Oxide<br>TiCN | **353** |
| **TK-S<br>TK-C** |  | HSS-EX | M | **MU** | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide<br>TiCN | **354** |
| **TCE-S/C<br>TCF-S/C** |  | Super HSS<br>HSS-EX | UNC/UNF | **VA** | USCTI 302A | H2~H6 | 4P | | Steam Oxide<br>TiCN | **355** |
| **TCG-S/C<br>TCH-S/C** |  | Super HSS<br>HSS-EX | M | **VA** | USCTI 302A | D3~D7 | 4P | | Steam Oxide<br>TiCN | **357** |

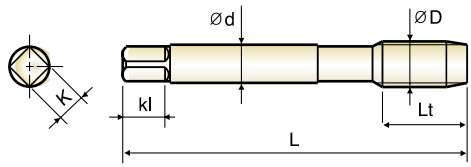
# COMBO TAPS

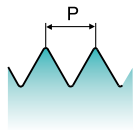
Combo TAP

T2/T2-S/T2-C SERIES

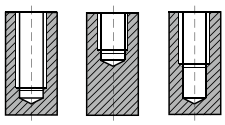
## SPIRAL FLUTE TAPS for Multi-Purpose






**Hole type**
2.5×D



MU | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Bright | Steam Oxide | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| #4 - 40 UNC | H2 | 1.88 | .236 | .141 | .110 | .188 | 2 | T2162 | T2162S | T2162C |
| #4 - 48 UNF | H2 | 1.88 | .236 | .141 | .110 | .188 | 2 | T2182 | T2182S | T2182C |
| #5 - 40 UNC | H2 | 1.94 | .236 | .141 | .110 | .188 | 3 | T2202 | T2202S | T2202C |
| #5 - 44 UNF | H2 | 1.94 | .236 | .141 | .110 | .188 | 3 | T2222 | T2222S | T2222C |
| #6 - 32 UNC | H3 | 2.00 | .276 | .141 | .110 | .188 | 3 | T2243 | T2243S | T2243C |
| #6 - 40 UNF | H2 | 2.00 | .276 | .141 | .110 | .188 | 3 | T2262 | T2262S | T2262C |
| #8 - 32 UNC | H3 | 2.13 | .276 | .168 | .131 | .250 | 3 | T2283 | T2283S | T2283C |
| #8 - 36 UNF | H2 | 2.13 | .276 | .168 | .131 | .250 | 3 | T2302 | T2302S | T2302C |
| #10 - 24 UNC | H3 | 2.38 | .354 | .194 | .152 | .250 | 3 | T2323 | T2323S | T2323C |
| #10 - 32 UNF | H3 | 2.38 | .276 | .194 | .152 | .250 | 3 | T2343 | T2343S | T2343C |
| #12 - 24 UNC | H3 | 2.38 | .354 | .220 | .165 | .281 | 3 | T2363 | T2363S | T2363C |
| #12 - 28 UNF | H3 | 2.38 | .276 | .220 | .165 | .281 | 3 | T2383 | T2383S | T2383C |
| 1/4 - 20 UNC | H3 | 2.50 | .433 | .255 | .191 | .312 | 3 | T2403 | T2403S | T2403C |
| 1/4 - 20 UNC | H5 | 2.50 | .433 | .255 | .191 | .312 | 3 | T2405 | T2405S | T2405C |
| 1/4 - 28 UNF | H3 | 2.50 | .354 | .255 | .191 | .312 | 3 | T2423 | T2423S | T2423C |
| 1/4 - 28 UNF | H4 | 2.50 | .354 | .255 | .191 | .312 | 3 | T2424 | T2424S | T2424C |
| 5/16 - 18 UNC | H3 | 2.72 | .472 | .318 | .238 | .375 | 3 | T2443 | T2443S | T2443C |
| 5/16 - 18 UNC | H5 | 2.72 | .472 | .318 | .238 | .375 | 3 | T2445 | T2445S | T2445C |
| 5/16 - 24 UNF | H3 | 2.72 | .394 | .318 | .238 | .375 | 3 | T2463 | T2463S | T2463C |
| 5/16 - 24 UNF | H5 | 2.72 | .394 | .318 | .238 | .375 | 3 | T2465 | T2465S | T2465C |

▶ Coating(TiN, TiAlN or Hardslick) is available on your request.
▶ Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)

▶ NEXT PAGE

▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

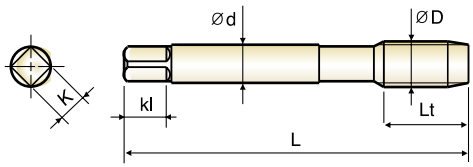
# COMBO TAPS

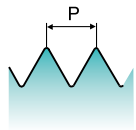
Combo TAP

T2/T2-S/T2-C SERIES

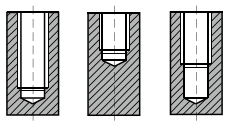
## SPIRAL FLUTE TAPS for Multi-Purpose






**Hole type**
2.5×D



MU | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Bright | Steam Oxide | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| 3/8 - 16 UNC | H3 | 2.94 | .551 | .381 | .286 | .438 | 3 | T2483 | T2483S | T2483C |
| 3/8 - 16 UNC | H5 | 2.94 | .551 | .381 | .286 | .438 | 3 | T2485 | T2485S | T2485C |
| 3/8 - 24 UNF | H3 | 2.94 | .394 | .381 | .286 | .438 | 3 | T2503 | T2503S | T2503C |
| 3/8 - 24 UNF | H4 | 2.94 | .394 | .381 | .286 | .438 | 3 | T2504 | T2504S | T2504C |
| 7/16 - 14 UNC | H3 | 3.16 | .591 | .323 | .242 | .406 | 3 | T2523 | T2523S | T2523C |
| 7/16 - 14 UNC | H5 | 3.16 | .591 | .323 | .242 | .406 | 3 | T2525 | T2525S | T2525C |
| 7/16 - 20 UNF | H3 | 3.16 | .472 | .323 | .242 | .406 | 3 | T2543 | T2543S | T2543C |
| 7/16 - 20 UNF | H5 | 3.16 | .472 | .323 | .242 | .406 | 3 | T2545 | T2545S | T2545C |
| 1/2 - 13 UNC | H5 | 3.38 | .630 | .367 | .275 | .438 | 3 | T2565 | T2565S | T2565C |
| 1/2 - 20 UNF | H5 | 3.38 | .472 | .367 | .275 | .438 | 3 | T2585 | T2585S | T2585C |
| 9/16 - 12 UNC | H5 | 3.59 | .709 | .429 | .322 | .500 | 3 | T2605 | T2605S | T2605C |
| 9/16 - 18 UNF | H5 | 3.59 | .512 | .429 | .322 | .500 | 3 | T2625 | T2625S | T2625C |
| 5/8 - 11 UNC | H5 | 3.81 | .748 | .480 | .360 | .562 | 4 | T2645 | T2645S | T2645C |
| 5/8 - 18 UNF | H5 | 3.81 | .512 | .480 | .360 | .562 | 4 | T2665 | T2665S | T2665C |
| 3/4 - 10 UNC | H5 | 4.25 | .827 | .590 | .442 | .688 | 4 | T2705 | T2705S | T2705C |
| 3/4 - 16 UNF | H5 | 4.25 | .591 | .590 | .442 | .688 | 4 | T2725 | T2725S | T2725C |
| 7/8 - 9 UNC | H6 | 4.69 | .827 | .697 | .523 | .750 | 4 | T2746 | T2746S | T2746C |
| 7/8 - 14 UNF | H6 | 4.69 | .709 | .697 | .523 | .750 | 4 | T2766 | T2766S | T2766C |
| 1 - 8 UNC | H6 | 5.13 | .984 | .800 | .600 | .812 | 4 | T2786 | T2786S | T2786C |
| 1 - 12 UNF | H6 | 5.13 | .709 | .800 | .600 | .812 | 4 | T2806 | T2806S | T2806C |

▶ Coating(TiN, TiAlN or Hardslick) is available on your request.
▶ Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)

▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

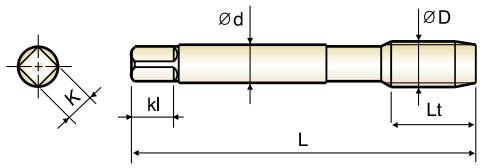
# COMBO TAPS

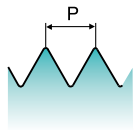
Combo TAP

T5/T5-S/T5-C SERIES

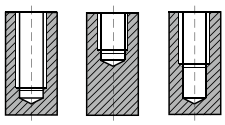
## SPIRAL FLUTE TAPS for Multi-Purpose






**Hole type**
2.5×D



MU | HSS-EX | M | USCTI 302A | D3~D8 | 60° | 2P~3P | Bright | Steam Oxide | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| M3 x 0.5 | D3 | 1.94 | .197 | .141 | .110 | .188 | 3 | T5203 | T5203S | T5203C |
| M3.5 x 0.6 | D4 | 2.00 | .276 | .141 | .110 | .188 | 3 | T5224 | T5224S | T5224C |
| M4 x 0.7 | D4 | 2.13 | .276 | .168 | .131 | .250 | 3 | T5244 | T5244S | T5244C |
| M5 x 0.8 | D4 | 2.38 | .354 | .194 | .152 | .250 | 3 | T5284 | T5284S | T5284C |
| M6 x 1.0 | D5 | 2.50 | .433 | .255 | .191 | .312 | 3 | T5315 | T5315S | T5315C |
| M7 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | T5345 | T5345S | T5345C |
| M8 x 1.25 | D5 | 2.72 | .472 | .318 | .238 | .375 | 3 | T5365 | T5365S | T5365C |
| M8 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | T5375 | T5375S | T5375C |
| M10 x 1.5 | D6 | 2.94 | .512 | .381 | .286 | .438 | 3 | T5426 | T5426S | T5426C |
| M10 x 1.25 | D5 | 2.94 | .472 | .381 | .286 | .438 | 3 | T5435 | T5435S | T5435C |
| M12 x 1.75 | D6 | 3.38 | .591 | .367 | .275 | .438 | 3 | T5506 | T5506S | T5506C |
| M12 x 1.25 | D5 | 3.38 | .551 | .367 | .275 | .438 | 3 | T5525 | T5525S | T5525C |
| M14 x 2.0 | D7 | 3.59 | .709 | .429 | .322 | .500 | 3 | T5547 | T5547S | T5547C |
| M14 x 1.5 | D6 | 3.59 | .551 | .429 | .322 | .500 | 3 | T5556 | T5556S | T5556C |
| M16 x 2.0 | D7 | 3.81 | .709 | .480 | .360 | .562 | 3 | T5607 | T5607S | T5607C |
| M16 x 1.5 | D6 | 3.81 | .551 | .480 | .360 | .562 | 3 | T5616 | T5616S | T5616C |
| M18 x .5 | D7 | 4.03 | .787 | .542 | .406 | .625 | 4 | T5657 | T5657S | T5657C |
| M18 x 1.5 | D6 | 4.03 | .551 | .542 | .406 | .625 | 4 | T5676 | T5676S | T5676C |
| M20 x 2.5 | D7 | 4.47 | .787 | .652 | .489 | .688 | 4 | T5707 | T5707S | T5707C |
| M20 x 1.5 | D6 | 4.47 | .551 | .652 | .489 | .688 | 4 | T5726 | T5726S | T5726C |
| M22 x 2.5 | D7 | 4.69 | .787 | .697 | .523 | .750 | 4 | T5747 | T5747S | T5747C |
| M22 x 1.5 | D6 | 4.69 | .551 | .697 | .523 | .750 | 4 | T5766 | T5766S | T5766C |
| M24 x 3.0 | D8 | 4.91 | .945 | .760 | .570 | .750 | 4 | T5788 | T5788S | T5788C |

▶ Coating(TiN, TiAlN or Hardslick) is available on your request.
▶ Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)
▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

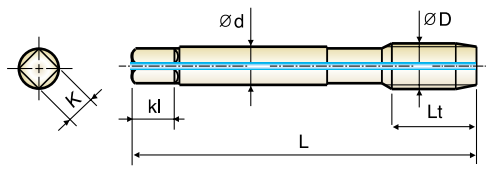
Combo TAP

T6/T6-N SERIES

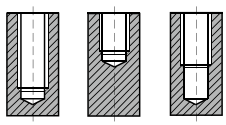
## SPIRAL FLUTE TAPS for Multi-Purpose

with Internal Coolant






Hole type
2.5×D



MU | HSS-EX | UNC UNF | USCTI 302A | H4~H6 | 60° | 2P~3P | Bright | TiN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiN |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 - 20 UNC | H5 | 2.50 | .433 | .255 | .191 | .312 | 3 | T6405 | T6405N |
| 1/4 - 28 UNF | H4 | 2.50 | .354 | .255 | .191 | .312 | 3 | T6424 | T6424N |
| 5/16 - 18 UNC | H5 | 2.72 | .472 | .318 | .238 | .375 | 3 | T6445 | T6445N |
| 5/16 - 24 UNF | H4 | 2.72 | .394 | .318 | .238 | .375 | 3 | T6464 | T6464N |
| 3/8 - 16 UNC | H5 | 2.94 | .551 | .381 | .286 | .438 | 3 | T6485 | T6485N |
| 3/8 - 24 UNF | H4 | 2.94 | .394 | .381 | .286 | .438 | 3 | T6504 | T6504N |
| 7/16 - 14 UNC | H5 | 3.16 | .591 | .323 | .242 | .406 | 3 | T6525 | T6525N |
| 7/16 - 20 UNF | H5 | 3.16 | .472 | .323 | .242 | .406 | 3 | T6545 | T6545N |
| 1/2 - 13 UNC | H5 | 3.38 | .630 | .367 | .275 | .438 | 3 | T6565 | T6565N |
| 1/2 - 20 UNF | H5 | 3.38 | .472 | .367 | .275 | .438 | 3 | T6585 | T6585N |
| 9/16 - 12 UNC | H5 | 3.59 | .709 | .429 | .322 | .500 | 3 | T6605 | T6605N |
| 9/16 - 18 UNF | H5 | 3.59 | .512 | .429 | .322 | .500 | 3 | T6625 | T6625N |
| 5/8 - 11 UNC | H5 | 3.81 | .748 | .480 | .360 | .562 | 4 | T6645 | T6645N |
| 5/8 - 18 UNF | H5 | 3.81 | .512 | .480 | .360 | .562 | 4 | T6665 | T6665N |
| 3/4 - 10 UNC | H5 | 4.25 | .827 | .590 | .442 | .688 | 4 | T6705 | T6705N |
| 3/4 - 16 UNF | H5 | 4.25 | .591 | .590 | .442 | .688 | 4 | T6725 | T6725N |
| 7/8 - 9 UNC | H6 | 4.69 | .827 | .697 | .523 | .750 | 4 | T6746 | T6746N |
| 7/8 - 14 UNF | H6 | 4.69 | .709 | .697 | .523 | .750 | 4 | T6766 | T6766N |
| 1 - 8 UNC | H6 | 5.13 | .984 | .800 | .600 | .812 | 4 | T6786 | T6786N |
| 1 - 12 UNF | H6 | 5.13 | .709 | .800 | .600 | .812 | 4 | T6806 | T6806N |

▶Coating(TiCN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + C(TiCN), F(TiAlN), H(Hardslick), S(Steam Oxide)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

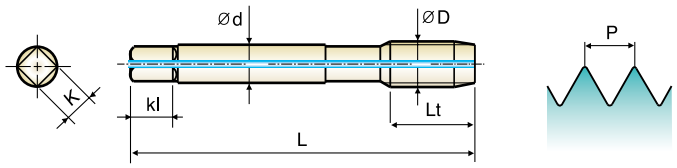
Combo TAP

T8/T8-N SERIES

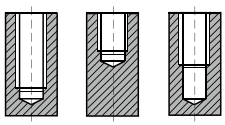
## SPIRAL FLUTE TAPS for Multi-Purpose

**with Internal Coolant**






**Hole type**
2.5×D



MU | HSS-EX | M | USCTI 302A | D5~D7 | 60° | 2P~3P | Bright | TiN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | TiN |
| M6 x 1.0 | D5 | 2.50 | .433 | .255 | .191 | .312 | 3 | **T8315** | **T8315N** |
| M8 x 1.25 | D5 | 2.72 | .472 | .318 | .238 | .375 | 3 | **T8365** | **T8365N** |
| M10 x 1.5 | D6 | 2.94 | .512 | .381 | .286 | .438 | 3 | **T8426** | **T8426N** |
| M12 x 1.75 | D6 | 3.38 | .591 | .367 | .275 | .438 | 3 | **T8506** | **T8506N** |
| M14 x 2.0 | D7 | 3.59 | .709 | .429 | .322 | .500 | 3 | **T8547** | **T8547N** |
| M16 x 2.0 | D7 | 3.81 | .709 | .480 | .360 | .562 | 3 | **T8607** | **T8607N** |
| M18 x 2.5 | D7 | 4.03 | .787 | .542 | .406 | .625 | 4 | **T8657** | **T8657N** |
| M20 x 2.5 | D7 | 4.47 | .787 | .652 | .489 | .688 | 4 | **T8707** | **T8707N** |

▶ Coating(TiCN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + C(TiCN), F(TiAlN), H(Hardslick), S(Steam Oxide)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

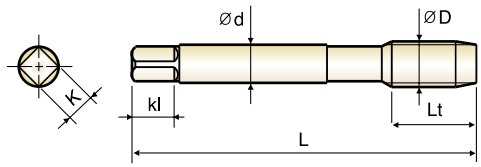
Combo TAP

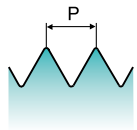
T7/T7-C SERIES

## SPIRAL FLUTE TAPS for Multi-Purpose

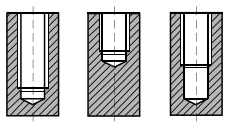


**Short Chamfer**




**Hole type**
2.5×D



MU | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 1P~2P | Bright | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| #4 - 40 UNC | H2 | 1.88 | .236 | .141 | .110 | .188 | 2 | T7162 | T7162C |
| #4 - 48 UNF | H2 | 1.88 | .236 | .141 | .110 | .188 | 2 | T7182 | T7182C |
| #5 - 40 UNC | H2 | 1.94 | .236 | .141 | .110 | .188 | 3 | T7202 | T7202C |
| #5 - 44 UNF | H2 | 1.94 | .236 | .141 | .110 | .188 | 3 | T7222 | T7222C |
| #6 - 32 UNC | H3 | 2.00 | .276 | .141 | .110 | .188 | 3 | T7243 | T7243C |
| #6 - 40 UNF | H2 | 2.00 | .276 | .141 | .110 | .188 | 3 | T7262 | T7262C |
| #8 - 32 UNC | H3 | 2.13 | .276 | .168 | .131 | .250 | 3 | T7283 | T7283C |
| #8 - 36 UNF | H2 | 2.13 | .276 | .168 | .131 | .250 | 3 | T7302 | T7302C |
| #10 - 24 UNC | H3 | 2.38 | .354 | .194 | .152 | .250 | 3 | T7323 | T7323C |
| #10 - 32 UNF | H3 | 2.38 | .276 | .194 | .152 | .250 | 3 | T7343 | T7343C |
| #12 - 24 UNC | H3 | 2.38 | .354 | .220 | .165 | .281 | 3 | T7363 | T7363C |
| #12 - 28 UNF | H3 | 2.38 | .276 | .220 | .165 | .281 | 3 | T7383 | T7383C |
| 1/4 - 20 UNC | H5 | 2.50 | .433 | .255 | .191 | .312 | 3 | T7405 | T7405C |
| 1/4 - 28 UNF | H4 | 2.50 | .354 | .255 | .191 | .312 | 3 | T7424 | T7424C |
| 5/16 - 18 UNC | H5 | 2.72 | .472 | .318 | .238 | .375 | 3 | T7445 | T7445C |
| 5/16 - 24 UNF | H4 | 2.72 | .394 | .318 | .238 | .375 | 3 | T7464 | T7464C |
| 3/8 - 16 UNC | H5 | 2.94 | .551 | .381 | .286 | .438 | 3 | T7485 | T7485C |
| 3/8 - 24 UNF | H4 | 2.94 | .394 | .381 | .286 | .438 | 3 | T7504 | T7504C |
| 7/16 - 14 UNC | H5 | 3.16 | .591 | .323 | .242 | .406 | 3 | T7525 | T7525C |
| 7/16 - 20 UNF | H5 | 3.16 | .472 | .323 | .242 | .406 | 3 | T7545 | T7545C |
| 1/2 - 13 UNC | H5 | 3.38 | .630 | .367 | .275 | .438 | 3 | T7565 | T7565C |
| 1/2 - 20 UNF | H5 | 3.38 | .472 | .367 | .275 | .438 | 3 | T7585 | T7585C |

▶ Coating(TiN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick), S(Steam Oxide)

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

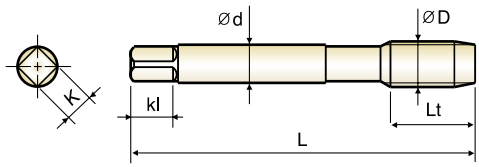
Combo TAP

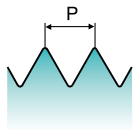
T7/T7-C SERIES

## SPIRAL FLUTE TAPS for Multi-Purpose

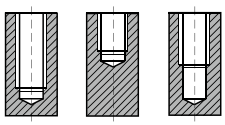


**Short Chamfer**




**Hole type**
2.5×D



MU | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 1P~2P | Bright | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| 9/16 - 12 UNC | H5 | 3.59 | .709 | .429 | .322 | .500 | 3 | **T7605** | **T7605C** |
| 9/16 - 18 UNF | H5 | 3.59 | .512 | .429 | .322 | .500 | 3 | **T7625** | **T7625C** |
| 5/8 - 11 UNC | H5 | 3.81 | .748 | .480 | .360 | .562 | 4 | **T7645** | **T7645C** |
| 5/8 - 18 UNF | H5 | 3.81 | .512 | .480 | .360 | .562 | 4 | **T7665** | **T7665C** |
| 3/4 - 10 UNC | H5 | 4.25 | .827 | .590 | .442 | .688 | 4 | **T7705** | **T7705C** |
| 3/4 - 16 UNF | H5 | 4.25 | .591 | .590 | .442 | .688 | 4 | **T7725** | **T7725C** |
| 7/8 - 9 UNC | H6 | 4.69 | .827 | .697 | .523 | .750 | 4 | **T7746** | **T7746C** |
| 7/8 - 14 UNF | H6 | 4.69 | .709 | .697 | .523 | .750 | 4 | **T7766** | **T7766C** |
| 1 - 8 UNC | H6 | 5.13 | .984 | .800 | .600 | .812 | 4 | **T7786** | **T7786C** |
| 1 - 12 UNF | H6 | 5.13 | .709 | .800 | .600 | .812 | 4 | **T7806** | **T7806C** |

▶Coating(TiN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick), S(Steam Oxide)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

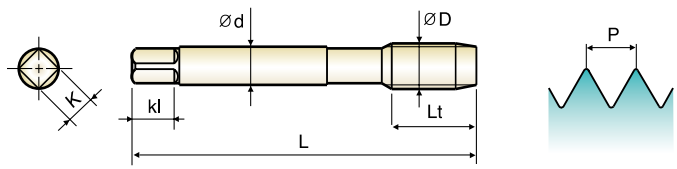
Combo TAP

T9 / T9-C SERIES

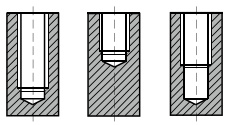
## SPIRAL FLUTE TAPS for Multi-Purpose



**Short Chamfer**




**Hole type**
2.5×D



MU | HSS-EX | M | USCTI 302A | D3~D8 | 60° | 1P~2P | Bright | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| M3 x 0.5 | D3 | 1.94 | .197 | .141 | .110 | .188 | 3 | T9203 | T9203C |
| M3.5 x 0.6 | D4 | 2.00 | .276 | .141 | .110 | .188 | 3 | T9224 | T9224C |
| M4 x 0.7 | D4 | 2.13 | .276 | .168 | .131 | .250 | 3 | T9244 | T9244C |
| M5 x 0.8 | D4 | 2.38 | .354 | .194 | .152 | .250 | 3 | T9284 | T9284C |
| M6 x 1.0 | D5 | 2.50 | .433 | .255 | .191 | .312 | 3 | T9315 | T9315C |
| M7 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | T9345 | T9345C |
| M8 x 1.2 | D5 | 2.72 | .472 | .318 | .238 | .375 | 3 | T9365 | T9365C |
| M8 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | T9375 | T9375C |
| M10 x 1.5 | D6 | 2.94 | .512 | .381 | .286 | .438 | 3 | T9426 | T9426C |
| M10 x 1.25 | D5 | 2.94 | .472 | .381 | .286 | .438 | 3 | T9435 | T9435C |
| M12 x 1.75 | D6 | 3.38 | .591 | .367 | .275 | .438 | 3 | T9506 | T9506C |
| M12 x 1.25 | D5 | 3.38 | .551 | .367 | .275 | .438 | 3 | T9525 | T9525C |
| M14 x 2.0 | D7 | 3.59 | .709 | .429 | .322 | .500 | 3 | T9547 | T9547C |
| M14 x 1.5 | D6 | 3.59 | .551 | .429 | .322 | .500 | 3 | T9556 | T9556C |
| M16 x 2.0 | D7 | 3.81 | .709 | .480 | .360 | .562 | 3 | T9607 | T9607C |
| M16 x 1.5 | D6 | 3.81 | .551 | .480 | .360 | .562 | 3 | T9616 | T9616C |
| M18 x 2.5 | D7 | 4.03 | .787 | .542 | .406 | .625 | 4 | T9657 | T9657C |
| M18 x 1.5 | D6 | 4.03 | .551 | .542 | .406 | .625 | 4 | T9676 | T9676C |
| M20 x 2.5 | D7 | 4.47 | .787 | .652 | .489 | .688 | 4 | T9707 | T9707C |
| M20 x 1.5 | D6 | 4.47 | .551 | .652 | .489 | .688 | 4 | T9726 | T9726C |
| M22 x 2.5 | D7 | 4.69 | .787 | .697 | .523 | .750 | 4 | T9747 | T9747C |
| M22 x 1.5 | D6 | 4.69 | .551 | .697 | .523 | .750 | 4 | T9766 | T9766C |
| M24 x 3.0 | D8 | 4.91 | .945 | .760 | .570 | .750 | 4 | T9788 | T9788C |

▶ Coating(TiN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick), S(Steam Oxide)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

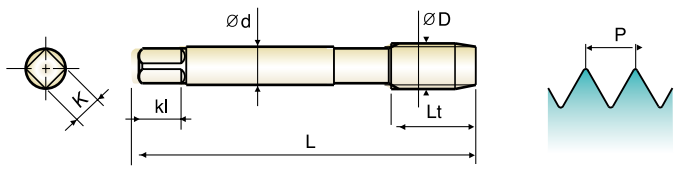
Combo TAP

T1-S / T1-C SERIES

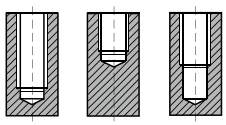
## SPIRAL FLUTE TAPS for Multi-Purpose

DIN-ANSI Shank






Hole type
2.5×D



MU | HSS-EX | UNC UNF | H2~H6 | 60° | 2P~3P | Steam Oxide | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| #4 - 40 UNC | H2 | 2.21 | .236 | .141 | .110 | .188 | 2 | T1162S | T1162C |
| #5 - 40 UNC | H2 | 2.21 | .236 | .141 | .110 | .188 | 3 | T1202S | T1202C |
| #6 - 32 UNC | H3 | 2.21 | .276 | .141 | .110 | .188 | 3 | T1243S | T1243C |
| #8 - 32 UNC | H3 | 2.48 | .276 | .168 | .131 | .250 | 3 | T1283S | T1283C |
| #10 - 24 UNC | H3 | 2.76 | .354 | .194 | .152 | .250 | 3 | T1323S | T1323C |
| #10 - 32 UNF | H3 | 2.76 | .276 | .194 | .152 | .250 | 3 | T1343S | T1343C |
| #12 - 24 UNC | H3 | 3.15 | .354 | .220 | .165 | .281 | 3 | T1363S | T1363C |
| #12 - 28 UNF | H3 | 3.15 | .276 | .220 | .165 | .281 | 3 | T1383S | T1383C |
| 1/4 - 20 UNC | H5 | 3.15 | .433 | .255 | .191 | .312 | 3 | T1405S | T1405C |
| 1/4 - 28 UNF | H4 | 3.15 | .354 | .255 | .191 | .312 | 3 | T1424S | T1424C |
| 5/16 - 18 UNC | H5 | 3.54 | .472 | .318 | .238 | .375 | 3 | T1445S | T1445C |
| 5/16 - 24 UNF | H4 | 3.54 | .394 | .318 | .238 | .375 | 3 | T1464S | T1464C |
| 3/8 - 16 UNC | H5 | 3.94 | .551 | .381 | .286 | .438 | 3 | T1485S | T1485C |
| 3/8 - 24 UNF | H4 | 3.94 | .394 | .381 | .286 | .438 | 3 | T1504S | T1504C |
| 7/16 - 14 UNC | H5 | 3.94 | .591 | .323 | .242 | .406 | 3 | T1525S | T1525C |
| 7/16 - 20 UNF | H5 | 3.94 | .472 | .323 | .242 | .406 | 3 | T1545S | T1545C |
| 1/2 - 13 UNC | H5 | 4.33 | .630 | .367 | .275 | .438 | 3 | T1565S | T1565C |
| 1/2 - 20 UNF | H5 | 3.94 | .472 | .367 | .275 | .438 | 3 | T1585S | T1585C |
| 9/16 - 12 UNC | H5 | 4.33 | .709 | .429 | .322 | .500 | 3 | T1605S | T1605C |
| 9/16 - 18 UNF | H5 | 3.94 | .512 | .429 | .322 | .500 | 3 | T1625S | T1625C |
| 5/8 - 11 UNC | H5 | 4.33 | .748 | .480 | .360 | .562 | 4 | T1645S | T1645C |
| 5/8 - 18 UNF | H5 | 3.94 | .512 | .480 | .360 | .562 | 4 | T1665S | T1665C |
| 3/4 - 10 UNC | H5 | 4.92 | .827 | .590 | .442 | .688 | 4 | T1705S | T1705C |
| 3/4 - 16 UNF | H5 | 4.33 | .591 | .590 | .442 | .688 | 4 | T1725S | T1725C |
| 7/8 - 9 UNC | H6 | 5.51 | .827 | .697 | .523 | .750 | 4 | T1746S | T1746C |
| 7/8 - 14 UNF | H6 | 4.92 | .709 | .697 | .523 | .750 | 4 | T1766S | T1766C |
| 1" - 8 UNC | H6 | 6.30 | .984 | .800 | .600 | .812 | 4 | T1786S | T1786C |
| 1" - 12 UNF | H6 | 5.51 | .709 | .800 | .600 | .812 | 4 | T1806S | T1806C |

▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

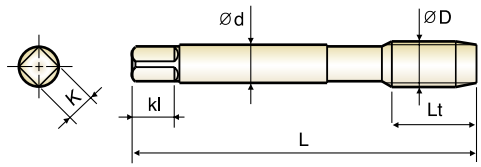
Combo TAP

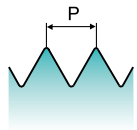
TA-S / TA-C SERIES

## SPIRAL FLUTE TAPS for Multi-Purpose

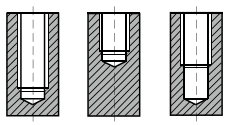
DIN-ANSI Shank






Hole type
2.5×D



MU | HSS-EX | M | D3~D7 | 60° | 2P~3P | Steam Oxide | TiCN | R40

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| M3 x 0.5 | D3 | 2.21 | .197 | .141 | .110 | .188 | 3 | TA203S | TA203C |
| M3.5 x 0.6 | D4 | 2.21 | .276 | .141 | .110 | .188 | 3 | TA224S | TA224C |
| M4 x 0.7 | D4 | 2.48 | .276 | .168 | .131 | .250 | 3 | TA244S | TA244C |
| M5 x 0.8 | D4 | 2.76 | .354 | .194 | .152 | .250 | 3 | TA284S | TA284C |
| M6 x 1.0 | D5 | 3.15 | .433 | .255 | .191 | .312 | 3 | TA315S | TA315C |
| M8 x 1.25 | D5 | 3.54 | .472 | .318 | .238 | .375 | 3 | TA365S | TA365C |
| M10 x 1.5 | D6 | 3.94 | .512 | .381 | .286 | .438 | 3 | TA426S | TA426C |
| M10 x 1.25 | D5 | 3.94 | .472 | .381 | .286 | .438 | 3 | TA435S | TA435C |
| M12 x 1.75 | D6 | 4.33 | .591 | .367 | .275 | .438 | 3 | TA506S | TA506C |
| M12 x 1.25 | D5 | 3.94 | .551 | .367 | .275 | .438 | 3 | TA525S | TA525C |
| M14 x 2.0 | D7 | 4.33 | .709 | .429 | .322 | .500 | 3 | TA547S | TA547C |
| M14 x 1.5 | D6 | 3.94 | .551 | .429 | .322 | .500 | 3 | TA556S | TA556C |
| M16 x 2.0 | D7 | 4.33 | .709 | .480 | .360 | .562 | 3 | TA607S | TA607C |
| M16 x 1.5 | D6 | 3.94 | .551 | .480 | .360 | .562 | 3 | TA616S | TA616C |
| M18 x 2.5 | D7 | 4.92 | .787 | .542 | .406 | .625 | 4 | TA657S | TA657C |
| M18 x 1.5 | D6 | 4.33 | .551 | .542 | .406 | .625 | 4 | TA676S | TA676C |

▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

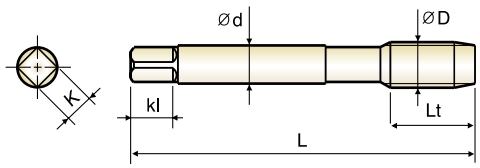
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

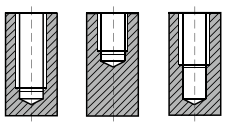
Combo TAP — TCA-S/TCB-S/TCA-C/TCB-C SERIES

## SPIRAL FLUTE TAPS for Stainless Steels






Hole type
2.5×D



VA | Super HSS | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Steam Oxide | TiCN | R45

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| #5 - 40 UNC | H2 | 1.94 | .236 | .141 | .110 | .188 | 3 | TCA202S | TCA202C |
| #6 - 32 UNC | H3 | 2.00 | .276 | .141 | .110 | .188 | 3 | TCA243S | TCA243C |
| #8 - 32 UNC | H3 | 2.13 | .276 | .141 | .131 | .250 | 3 | TCA283S | TCA283C |
| #10 - 24 UNC | H3 | 2.38 | .354 | .141 | .152 | .250 | 3 | TCA323S | TCA323C |
| #10 - 32 UNF | H3 | 2.38 | .276 | .141 | .152 | .250 | 3 | TCA343S | TCA343C |
| 1/4 - 20 UNC | H3 | 2.50 | .433 | .141 | .191 | .312 | 3 | TCA403S | TCA403C |
| 1/4 - 20 UNC | H5 | 2.50 | .433 | .168 | .191 | .312 | 3 | TCA405S | TCA405C |
| 1/4 - 28 UNF | H3 | 2.50 | .354 | .168 | .191 | .312 | 3 | TCA423S | TCA423C |
| 5/16 - 18 UNC | H3 | 2.72 | .472 | .194 | .238 | .375 | 3 | TCA443S | TCA443C |
| 5/16 - 18 UNC | H5 | 2.72 | .472 | .194 | .238 | .375 | 3 | TCA445S | TCA445C |
| 5/16 - 24 UNF | H3 | 2.72 | .394 | .220 | .238 | .375 | 3 | TCA463S | TCA463C |
| 3/8 - 16 UNC | H3 | 2.94 | .551 | .220 | .286 | .438 | 3 | TCA483S | TCA483C |
| 3/8 - 16 UNC | H5 | 2.94 | .551 | .255 | .286 | .438 | 3 | TCA485S | TCA485C |
| 3/8 - 24 UNF | H3 | 2.94 | .394 | .255 | .286 | .438 | 3 | TCA503S | TCA503C |
| 7/16 - 14 UNC | H3 | 3.16 | .591 | .255 | .242 | .406 | 3 | TCA523S | TCA523C |
| 7/16 - 14 UNC | H5 | 3.16 | .591 | .255 | .242 | .406 | 3 | TCA525S | TCA525C |
| 7/16 - 20 UNF | H3 | 3.16 | .472 | .318 | .242 | .406 | 3 | TCA543S | TCA543C |
| 7/16 - 20 UNF | H5 | 3.16 | .472 | .318 | .242 | .406 | 3 | TCA545S | TCA545C |
| 1/2 - 13 UNC | H3 | 3.38 | .630 | .318 | .275 | .438 | 3 | TCA563S | TCA563C |
| 1/2 - 13 UNC | H5 | 3.38 | .630 | .318 | .275 | .438 | 3 | TCA565S | TCA565C |
| 1/2 - 20 UNF | H3 | 3.38 | .472 | .381 | .275 | .438 | 3 | TCA583S | TCA583C |
| 9/16 - 12 UNC | H3 | 3.59 | .709 | .381 | .322 | .500 | 3 | TCB603S | TCB603C |
| 9/16 - 18 UNF | H3 | 3.59 | .512 | .381 | .322 | .500 | 3 | TCB623S | TCB623C |

▶ Super HSS(#5~1/2) and HSS-EX(9/16~1")

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

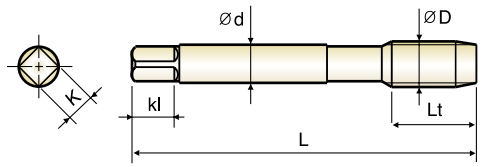
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

# COMBO TAPS

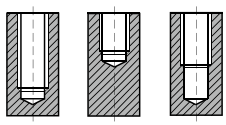
Combo TAP TCA-S/TCB-S/TCA-C/TCB-C SERIES

## SPIRAL FLUTE TAPS for Stainless Steels






**Hole type**
2.5×D



VA | Super HSS | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Steam Oxide | TiCN | R45

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| 9/16 - 18 UNF | H5 | 3.59 | .512 | .381 | .322 | .500 | 3 | **TCB625S** | **TCB625C** |
| 5/8 - 11UNC | H3 | 3.81 | .748 | .323 | .360 | .562 | 4 | **TCB643S** | **TCB643C** |
| 5/8 - 11 UNC | H5 | 3.81 | .748 | .323 | .360 | .562 | 4 | **TCB645S** | **TCB645C** |
| 5/8 - 18 UNF | H3 | 3.81 | .512 | .323 | .360 | .562 | 4 | **TCB663S** | **TCB663C** |
| 5/8 - 18 UNF | H5 | 3.81 | .512 | .323 | .360 | .562 | 4 | **TCB665S** | **TCB665C** |
| 3/4 - 10 UNC | H3 | 4.25 | .827 | .367 | .442 | .688 | 4 | **TCB703S** | **TCB703C** |
| 3/4 - 10 UNC | H5 | 4.25 | .827 | .367 | .442 | .688 | 4 | **TCB705S** | **TCB705C** |
| 3/4 - 16 UNF | H3 | 4.25 | .591 | .429 | .442 | .688 | 4 | **TCB723S** | **TCB723C** |
| 3/4 - 16 UNF | H5 | 4.25 | .591 | .429 | .442 | .688 | 4 | **TCB725S** | **TCB725C** |
| 7/8 - 9 UNC | H4 | 4.69 | .827 | .480 | .523 | .750 | 4 | **TCB744S** | **TCB744C** |
| 7/8 - 9 UNC | H6 | 4.69 | .827 | .480 | .523 | .750 | 4 | **TCB746S** | **TCB746C** |
| 7/8 - 14 UNF | H4 | 4.69 | .709 | .590 | .523 | .750 | 4 | **TCB764S** | **TCB764C** |
| 7/8 - 14 UNF | H6 | 4.69 | .709 | .590 | .523 | .750 | 4 | **TCB766S** | **TCB766C** |
| 1 - 8 UNC | H4 | 5.13 | .984 | .697 | .600 | .812 | 4 | **TCB784S** | **TCB784C** |
| 1 - 8 UNC | H6 | 5.13 | .984 | .697 | .600 | .812 | 4 | **TCB786S** | **TCB786C** |
| 1 - 12 UNF | H4 | 5.13 | .709 | .800 | .600 | .812 | 4 | **TCB804S** | **TCB804C** |
| 1 - 12 UNF | H6 | 5.13 | .709 | .800 | .600 | .812 | 4 | **TCB806S** | **TCB806C** |

▶Super HSS(#5~1/2) and HSS-EX(9/16~1")

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

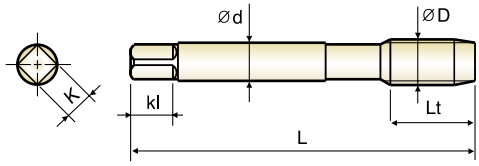
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

# COMBO TAPS

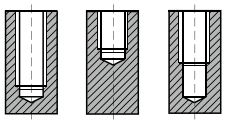
Combo TAP TCC-S/TCD-S/TCC-C/TCD-C SERIES

## SPIRAL FLUTE TAPS for Stainless Steels






**Hole type**
2.5×D



VA | Super HSS | HSS-EX | M | USCTI 302A | D3~D7 | 60° | 2P~3P | Steam Oxide | TiCN | R45

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| M3 x 0.5 | D3 | 1.94 | .197 | .141 | .110 | .188 | 3 | TCC203S | TCC203C |
| M3.5 x 0.6 | D4 | 2.00 | .276 | .141 | .110 | .188 | 3 | TCC224S | TCC224C |
| M4 x 0.7 | D4 | 2.13 | .276 | .168 | .131 | .250 | 3 | TCC244S | TCC244C |
| M5 x 0.8 | D4 | 2.38 | .354 | .194 | .152 | .250 | 3 | TCC284S | TCC284C |
| M6 x 1.0 | D5 | 2.50 | .433 | .255 | .191 | .312 | 3 | TCC315S | TCC315C |
| M7 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | TCC345S | TCC345C |
| M8 x 1.25 | D5 | 2.72 | .472 | .318 | .238 | .375 | 3 | TCC365S | TCC365C |
| M8 x 1.0 | D5 | 2.72 | .433 | .318 | .238 | .375 | 3 | TCC375S | TCC375C |
| M10 x 1.5 | D6 | 2.94 | .512 | .381 | .286 | .438 | 3 | TCC426S | TCC426C |
| M10 x 1.25 | D5 | 2.94 | .472 | .381 | .286 | .438 | 3 | TCC435S | TCC435C |
| M12 x 1.75 | D6 | 3.38 | .591 | .367 | .275 | .438 | 3 | TCC506S | TCC506C |
| M12 x 1.25 | D5 | 3.38 | .551 | .367 | .275 | .438 | 3 | TCC525S | TCC525C |
| M14 x 2.0 | D7 | 3.59 | .709 | .429 | .322 | .500 | 3 | TCD547S | TCD547C |
| M14 x 1.5 | D6 | 3.59 | .551 | .429 | .322 | .500 | 3 | TCD556S | TCD556C |
| M16 x 2.0 | D7 | 3.81 | .709 | .480 | .360 | .562 | 3 | TCD607S | TCD607C |
| M16 x 1.5 | D6 | 3.81 | .551 | .480 | .360 | .562 | 3 | TCD616S | TCD616C |
| M18 x 2.5 | D7 | 4.03 | .787 | .542 | .406 | .625 | 4 | TCD657S | TCD657C |
| M18 x 1.5 | D6 | 4.03 | .551 | .542 | .406 | .625 | 4 | TCD676S | TCD676C |

▶ Super HSS(M3~M12) and HSS-EX(M14~M18)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

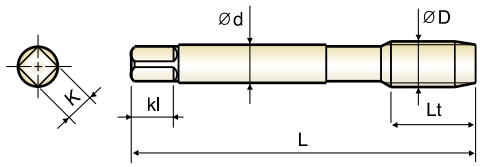
# COMBO TAPS

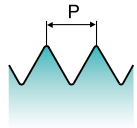
Combo TAP

T4/T4-S/T4-C SERIES

## SPIRAL POINT TAPS for Multi-Purpose

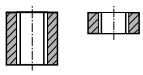





**Hole type**

3.0×D



**MU** | **HSS-EX** | **UNC UNF** | **USCTI 302A** | **H2~H6** | **60°** | **4P~5P** | **Bright** | **Steam Oxide** | **TiCN**

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| #4 - 40 UNC | H2 | 1.88 | .335 | .141 | .110 | .188 | 2 | T4162 | T4162S | T4162C |
| #4 - 48 UNF | H2 | 1.88 | .335 | .141 | .110 | .188 | 2 | T4182 | T4182S | T4182C |
| #5 - 40 UNC | H2 | 1.94 | .374 | .141 | .110 | .188 | 3 | T4202 | T4202S | T4202C |
| #5 - 44 UNF | H2 | 1.94 | .374 | .141 | .110 | .188 | 3 | T4222 | T4222S | T4222C |
| #6 - 32 UNC | H3 | 2.00 | .413 | .141 | .110 | .188 | 3 | T4243 | T4243S | T4243C |
| #6 - 40 UNF | H2 | 2.00 | .413 | .141 | .110 | .188 | 3 | T4262 | T4262S | T4262C |
| #8 - 32 UNC | H3 | 2.13 | .453 | .168 | .131 | .250 | 3 | T4283 | T4283S | T4283C |
| #8 - 36 UNF | H2 | 2.13 | .453 | .168 | .131 | .250 | 3 | T4302 | T4302S | T4302C |
| #10 - 24 UNC | H3 | 2.38 | .531 | .194 | .152 | .250 | 3 | T4323 | T4323S | T4323C |
| #10 - 32 UNF | H3 | 2.38 | .531 | .194 | .152 | .250 | 3 | T4343 | T4343S | T4343C |
| #12 - 24 UNC | H3 | 2.38 | .571 | .220 | .165 | .281 | 3 | T4363 | T4363S | T4363C |
| #12 - 28 UNF | H3 | 2.38 | .571 | .220 | .165 | .281 | 3 | T4383 | T4383S | T4383C |
| 1/4 - 20 UNC | H3 | 2.50 | .591 | .255 | .191 | .312 | 3 | T4403 | T4403S | T4403C |
| 1/4 - 20 UNC | H5 | 2.50 | .591 | .255 | .191 | .312 | 3 | T4405 | T4405S | T4405C |
| 1/4 - 28 UNF | H3 | 2.50 | .591 | .255 | .191 | .312 | 3 | T4423 | T4423S | T4423C |
| 1/4 - 28 UNF | H4 | 2.50 | .591 | .255 | .191 | .312 | 3 | T4424 | T4424S | T4424C |
| 5/16 - 18 UNC | H3 | 2.72 | .669 | .318 | .238 | .375 | 3 | T4443 | T4443S | T4443C |
| 5/16 - 18 UNC | H5 | 2.72 | .669 | .318 | .238 | .375 | 3 | T4445 | T4445S | T4445C |
| 5/16 - 24 UNF | H3 | 2.72 | .669 | .318 | .238 | .375 | 3 | T4463 | T4463S | T4463C |
| 5/16 - 24 UNF | H5 | 2.72 | .669 | .318 | .238 | .375 | 3 | T4465 | T4465S | T4465C |
| 3/8 - 16 UNC | H3 | 2.94 | .748 | .381 | .286 | .438 | 3 | T4483 | T4483S | T4483C |
| 3/8 - 16 UNC | H5 | 2.94 | .748 | .381 | .286 | .438 | 3 | T4485 | T4485S | T4485C |

▶ Coating(TiN, TiAlN or Hardslick) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)

▶ NEXT PAGE

▶ Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

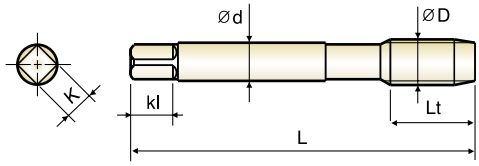
# COMBO TAPS

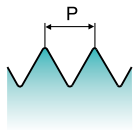
Combo TAP

T4/T4-S/T4-C SERIES

## SPIRAL POINT TAPS for Multi-Purpose

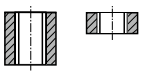





**Hole type**

3.0×D



**MU** | **HSS-EX** | **UNC UNF** | **USCTI 302A** | **H2~H6** | **60°** | **4P~5P** | **Bright** | **Steam Oxide** | **TiCN**

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| 3/8 - 24 UNF | H3 | 2.94 | .748 | .381 | .286 | .438 | 3 | T4503 | T4503S | T4503C |
| 3/8 - 24 UNF | H4 | 2.94 | .748 | .381 | .286 | .438 | 3 | T4504 | T4504S | T4504C |
| 7/16 - 14 UNC | H3 | 3.16 | .866 | .323 | .242 | .406 | 3 | T4523 | T4523S | T4523C |
| 7/16 - 14 UNC | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | T4525 | T4525S | T4525C |
| 7/16 - 20 UNF | H3 | 3.16 | .866 | .323 | .242 | .406 | 3 | T4543 | T4543S | T4543C |
| 7/16 - 20 UNF | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | T4545 | T4545S | T4545C |
| 1/2 - 13 UNC | H5 | 3.38 | .984 | .367 | .275 | .438 | 3 | T4565 | T4565S | T4565C |
| 1/2 - 20 UNF | H5 | 3.38 | .984 | .367 | .275 | .438 | 3 | T4585 | T4585S | T4585C |
| 9/16 - 12 UNC | H5 | 3.59 | .984 | .429 | .322 | .500 | 3 | T4605 | T4605S | T4605C |
| 9/16 - 18 UNF | H5 | 3.59 | .984 | .429 | .322 | .500 | 3 | T4625 | T4625S | T4625C |
| 5/8 - 11 UNC | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | T4645 | T4645S | T4645C |
| 5/8 - 18 UNF | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | T4665 | T4665S | T4665C |
| 3/4 - 10 UNC | H5 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | T4705 | T4705S | T4705C |
| 3/4 - 16 UNF | H5 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | T4725 | T4725S | T4725C |
| 7/8 - 9 UNC | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | T4746 | T4746S | T4746C |
| 7/8 - 14 UNF | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | T4766 | T4766S | T4766C |
| 1 - 8 UNC | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | T4786 | T4786S | T4786C |
| 1 - 12 UNF | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | T4806 | T4806S | T4806C |

▶Coating(TiN, TiAlN or Hardslick) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)

▶Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

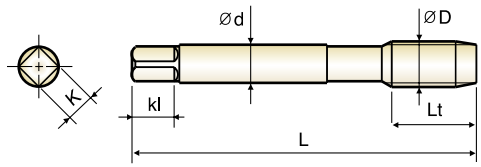
# YG COMBO TAPS

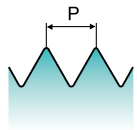
Combo TAP

**T3 / T3-S / T3-C SERIES**

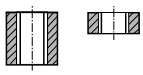
## SPIRAL POINT TAPS for Multi-Purpose






**Hole type**
3.0×D



**MU** | **HSS-EX** | **M** | **USCTI 302A** | **D3~D8** | **60°** | **4P~5P** | **Bright** | **Steam Oxide** | **TiCN**

Unit : Inch

| SIZE & TPI | Limit | Overall Length | Thread Length | Shank Diameter | Square Size | Square Length | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L | Lt | D | K | kl | | Bright | Steam Oxide | TiCN |
| M3 x 0.5 | D3 | 1.94 | .374 | .141 | .110 | .188 | 3 | T3203 | T3203S | T3203C |
| M3.5x 0.6 | D4 | 2.00 | .413 | .141 | .110 | .188 | 3 | T3224 | T3224S | T3224C |
| M4 x 0.7 | D4 | 2.13 | .453 | .168 | .131 | .250 | 3 | T3244 | T3244S | T3244C |
| M5 x 0.8 | D4 | 2.38 | .531 | .194 | .152 | .250 | 3 | T3284 | T3284S | T3284C |
| M6 x 1.0 | D5 | 2.50 | .591 | .255 | .191 | .312 | 3 | T3315 | T3315S | T3315C |
| M7 x 1.0 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | T3345 | T3345S | T3345C |
| M8 x 1.25 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | T3365 | T3365S | T3365C |
| M8 x 1.0 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | T3375 | T3375S | T3375C |
| M10 x 1.5 | D6 | 2.94 | .748 | .381 | .286 | .438 | 3 | T3426 | T3426S | T3426C |
| M10 x 1.25 | D5 | 2.94 | .748 | .381 | .286 | .438 | 3 | T3435 | T3435S | T3435C |
| M12 x 1.75 | D6 | 3.38 | .984 | .367 | .275 | .438 | 3 | T3506 | T3506S | T3506C |
| M12 x 1.25 | D5 | 3.38 | .984 | .367 | .275 | .438 | 3 | T3525 | T3525S | T3525C |
| M14 x 2.0 | D7 | 3.59 | .984 | .429 | .322 | .500 | 3 | T3547 | T3547S | T3547C |
| M14 x 1.5 | D6 | 3.59 | .984 | .429 | .322 | .500 | 3 | T3556 | T3556S | T3556C |
| M16 x 2.0 | D7 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | T3607 | T3607S | T3607C |
| M16 x 1.5 | D6 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | T3616 | T3616S | T3616C |
| M18 x 2.5 | D7 | 4.03 | 1.083 | .542 | .406 | .625 | 3 | T3657 | T3657S | T3657C |
| M18 x 1.5 | D6 | 4.03 | 1.083 | .542 | .406 | .625 | 3 | T3676 | T3676S | T3676C |
| M20 x 2.5 | D7 | 4.47 | 1.201 | .652 | .489 | .688 | 3 | T3707 | T3707S | T3707C |
| M20 x 1.5 | D6 | 4.47 | 1.201 | .652 | .489 | .688 | 3 | T3726 | T3726S | T3726C |
| M22 x 2.5 | D7 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | T3747 | T3747S | T3747C |
| M22 x 1.5 | D6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | T3766 | T3766S | T3766C |
| M24 x 3.0 | D8 | 4.91 | 1.339 | .760 | .570 | .750 | 3 | T3788 | T3788S | T3788C |

▶Coating(TiN, TiAlN or Hardslick) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + N(TiN), F(TiAlN), H(Hardslick)

▶Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

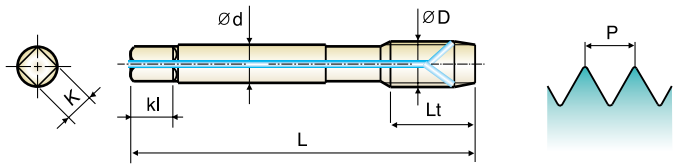
Combo TAP

TB / TB-N SERIES

## SPIRAL POINT TAPS for Multi-Purpose

with Internal Coolant






Hole type
3.0×D

MU | HSS-EX | UNC UNF | USCTI 302A | H4~H6 | 60° | 4P~5P | Bright | TiN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiN |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 - 20 UNC | H5 | 2.50 | .591 | .255 | .191 | .312 | 2 | **TB405** | **TB405N** |
| 1/4 - 28 UNF | H4 | 2.50 | .591 | .255 | .191 | .312 | 2 | **TB424** | **TB424N** |
| 5/16- 18 UNC | H5 | 2.72 | .669 | .318 | .238 | .375 | 3 | **TB445** | **TB445N** |
| 5/16- 24 UNF | H4 | 2.72 | .669 | .318 | .238 | .375 | 3 | **TB464** | **TB464N** |
| 3/8 - 16 UNC | H5 | 2.94 | .748 | .381 | .286 | .438 | 3 | **TB485** | **TB485N** |
| 3/8 - 24 UNF | H4 | 2.94 | .748 | .381 | .286 | .438 | 3 | **TB504** | **TB504N** |
| 7/16- 14 UNC | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | **TB525** | **TB525N** |
| 7/16- 20 UNF | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | **TB545** | **TB545N** |
| 1/2 - 13 UNC | H5 | 3.38 | .984 | .367 | .275 | .438 | 3 | **TB565** | **TB565N** |
| 1/2 - 20 UNF | H5 | 3.38 | .984 | .367 | .275 | .438 | 3 | **TB585** | **TB585N** |
| 9/16- 12 UNC | H5 | 3.59 | .984 | .429 | .322 | .500 | 3 | **TB605** | **TB605N** |
| 9/16- 18 UNF | H5 | 3.59 | .984 | .429 | .322 | .500 | 3 | **TB625** | **TB625N** |
| 5/8 - 11 UNC | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | **TB645** | **TB645N** |
| 5/8 - 18 UNF | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | **TB665** | **TB665N** |
| 3/4 - 10 UNC | H5 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | **TB705** | **TB705N** |
| 3/4 - 16 UNF | H5 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | **TB725** | **TB725N** |
| 7/8 - 9 UNC | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | **TB746** | **TB746N** |
| 7/8 - 14 UNF | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | **TB766** | **TB766N** |
| 1 - 8 UNC | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | **TB786** | **TB786N** |
| 1 - 12 UNF | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | **TB806** | **TB806N** |

▶Coating(TiCN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

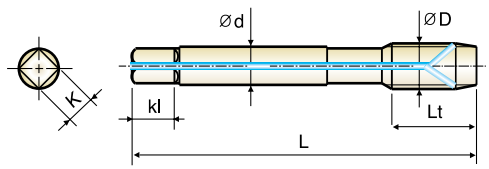
Combo TAP

TH / TH-N SERIES

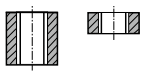
## SPIRAL POINT TAPS for Multi-Purpose



with Internal Coolant




Hole type
3.0×D



MU | HSS-EX | M | USCTI 302A | D5~D7 | 60° | 4P~5P | Bright | TiN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Bright | EDP No. TiN |
|---|---|---|---|---|---|---|---|---|---|
| M6 x 1.0 | D5 | 2.50 | .591 | .255 | .191 | .312 | 3 | TH315 | TH315N |
| M8 x 1.25 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | TH365 | TH365N |
| M10 x 1.5 | D6 | 2.94 | .748 | .381 | .286 | .438 | 3 | TH426 | TH426N |
| M12 x 1.75 | D6 | 3.38 | .984 | .367 | .275 | .438 | 3 | TH506 | TH506N |
| M14 x 2.0 | D7 | 3.59 | .984 | .429 | .322 | .500 | 3 | TH547 | TH547N |
| M16 x 2.0 | D7 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | TH607 | TH607N |
| M18 x 2.5 | D7 | 4.03 | 1.083 | .542 | .406 | .625 | 3 | TH657 | TH657N |
| M20 x 2.5 | D7 | 4.47 | 1.201 | .652 | .489 | .688 | 3 | TH707 | TH707N |

▶ Coating(TiCN, TiAlN or Hardslick) or Surface Treatment(Steam Oxide) is available on your request.
Coating Codes for Combo Tap
Bright Finish No. + C(TiCN), F(TiAlN), H(Hardslick), S(Steam Oxide)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

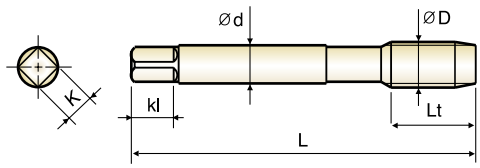
Combo TAP

TC-S / TC-C SERIES

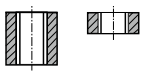
## SPIRAL POINT TAPS for Multi-Purpose

DIN-ANSI Shank






Hole type
3.0×D



MU | HSS-EX | UNC UNF | H2~H6 | 60° | 4P~5P | Steam Oxide | TiCN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| #4 - 40 UNC | H2 | 2.21 | .335 | .141 | .110 | .188 | 2 | TC162S | TC162C |
| #5 - 40 UNC | H2 | 2.21 | .374 | .141 | .110 | .188 | 3 | TC202S | TC202C |
| #6 - 32 UNC | H3 | 2.21 | .413 | .141 | .110 | .188 | 3 | TC243S | TC243C |
| #8 - 32 UNC | H3 | 2.48 | .453 | .168 | .131 | .250 | 3 | TC283S | TC283C |
| #10 - 24 UNC | H3 | 2.76 | .531 | .194 | .152 | .250 | 3 | TC323S | TC323C |
| #10 - 32 UNF | H3 | 2.76 | .531 | .194 | .152 | .250 | 3 | TC343S | TC343C |
| #12 - 24 UNC | H3 | 3.15 | .571 | .220 | .165 | .281 | 3 | TC363S | TC363C |
| #12 - 28 UNF | H3 | 3.15 | .571 | .220 | .165 | .281 | 3 | TC383S | TC383C |
| 1/4 - 20 UNC | H5 | 3.15 | .591 | .255 | .191 | .312 | 3 | TC405S | TC405C |
| 1/4 - 28 UNF | H4 | 3.15 | .591 | .255 | .191 | .312 | 3 | TC424S | TC424C |
| 5/16 - 18 UNC | H5 | 3.54 | .669 | .318 | .238 | .375 | 3 | TC445S | TC445C |
| 5/16 - 24 UNF | H4 | 3.54 | .669 | .318 | .238 | .375 | 3 | TC464S | TC464C |
| 3/8 - 16 UNC | H5 | 3.94 | .748 | .381 | .286 | .438 | 3 | TC485S | TC485C |
| 3/8 - 24 UNF | H4 | 3.94 | .748 | .381 | .286 | .438 | 3 | TC504S | TC504C |
| 7/16 - 14 UNC | H5 | 3.94 | .866 | .323 | .242 | .406 | 3 | TC525S | TC525C |
| 7/16 - 20 UNF | H5 | 3.94 | .866 | .323 | .242 | .406 | 3 | TC545S | TC545C |
| 1/2 - 13 UNC | H5 | 4.33 | .984 | .367 | .275 | .438 | 3 | TC565S | TC565C |
| 1/2 - 20 UNF | H5 | 3.94 | .984 | .367 | .275 | .438 | 3 | TC585S | TC585C |
| 9/16 - 12 UNC | H5 | 4.33 | .984 | .429 | .322 | .500 | 3 | TC605S | TC605C |
| 9/16 - 18 UNF | H5 | 3.94 | .984 | .429 | .322 | .500 | 3 | TC625S | TC625C |
| 5/8 - 11 UNC | H5 | 4.33 | 1.083 | .480 | .360 | .562 | 3 | TC645S | TC645C |
| 5/8 - 18 UNF | H5 | 3.94 | 1.083 | .480 | .360 | .562 | 3 | TC665S | TC665C |
| 3/4 - 10 UNC | H5 | 4.92 | 1.201 | .590 | .442 | .688 | 3 | TC705S | TC705C |
| 3/4 - 16 UNF | H5 | 4.33 | 1.201 | .590 | .442 | .688 | 3 | TC725S | TC725C |
| 7/8 - 9 UNC | H6 | 5.51 | 1.339 | .697 | .523 | .750 | 3 | TC746S | TC746C |
| 7/8 - 14 UNF | H6 | 4.92 | 1.339 | .697 | .523 | .750 | 3 | TC766S | TC766C |
| 1 - 8 UNC | H6 | 6.30 | 1.496 | .800 | .600 | .812 | 3 | TC786S | TC786C |
| 1 - 12 UNF | H6 | 5.51 | 1.496 | .800 | .600 | .812 | 3 | TC806S | TC806C |

▶Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

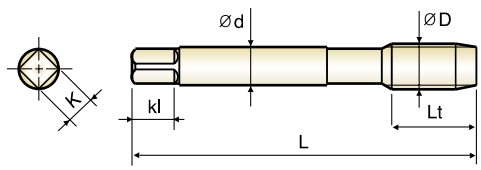
Combo TAP

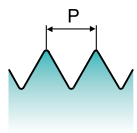
TK-S / TK-C SERIES

## SPIRAL POINT TAPS for Multi-Purpose

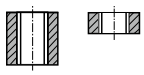
DIN-ANSI Shank






Hole type
3.0×D



MU | HSS-EX | M | D3~D7 | 60° | 4P~5P | Steam Oxide | TiCN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| M3 x 0.5 | D3 | .374 | .374 | .141 | .110 | .188 | 3 | TK203S | TK203C |
| M3.5x 0.6 | D4 | .413 | .413 | .141 | .110 | .188 | 3 | TK224S | TK224C |
| M4 x 0.7 | D4 | .453 | .453 | .168 | .131 | .250 | 3 | TK244S | TK244C |
| M5 x 0.8 | D4 | .531 | .531 | .194 | .152 | .250 | 3 | TK284S | TK284C |
| M6 x 1.0 | D5 | .591 | .591 | .255 | .191 | .312 | 3 | TK315S | TK315C |
| M8 x 1.25 | D5 | .669 | .669 | .318 | .238 | .375 | 3 | TK365S | TK365C |
| M10 x 1.5 | D6 | .748 | .748 | .381 | .286 | .438 | 3 | TK426S | TK426C |
| M10 x 1.25 | D5 | .748 | .748 | .381 | .286 | .438 | 3 | TK435S | TK435C |
| M12 x 1.75 | D6 | .984 | .984 | .367 | .275 | .438 | 3 | TK506S | TK506C |
| M12 x 1.25 | D5 | .984 | .984 | .367 | .275 | .438 | 3 | TK525S | TK525C |
| M14 x 2.0 | D7 | .984 | .984 | .429 | .322 | .500 | 3 | TK547S | TK547C |
| M14 x 1.5 | D6 | .984 | .984 | .429 | .322 | .500 | 3 | TK556S | TK556C |
| M16 x 2.0 | D7 | 1.083 | 1.083 | .480 | .360 | .562 | 3 | TK607S | TK607C |
| M16 x 1.5 | D6 | 1.083 | 1.083 | .480 | .360 | .562 | 3 | TK616S | TK616C |
| M18 x 2.5 | D7 | 1.083 | 1.083 | .542 | .406 | .625 | 3 | TK657S | TK657C |
| M18 x 1.5 | D6 | 1.083 | 1.083 | .542 | .406 | .625 | 3 | TK676S | TK676C |

▶Steam Oxide is not recommended for Aluminum and Aluminum alloys.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ |

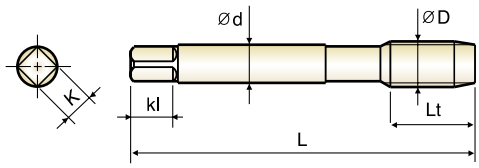
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ◎ | ○ | | ○ |

# COMBO TAPS

Combo TAP TCE-S/TCF-S/TCE-C/TCF-C SERIES

## SPIRAL POINT TAPS for Stainless Steels






Hole type
3.0 ×D

VA | Super HSS | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 4P | Steam Oxide | TiCN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| #5 - 40 UNC | H2 | 1.94 | .374 | .141 | .110 | .188 | 3 | TCE202S | TCE202C |
| #5 - 40 UNC | H3 | 1.94 | .374 | .141 | .110 | .188 | 3 | TCE203S | TCE203C |
| #6 - 32 UNC | H3 | 2.00 | .413 | .141 | .110 | .188 | 3 | TCE243S | TCE243C |
| #8 - 32 UNC | H3 | 2.13 | .453 | .168 | .131 | .250 | 3 | TCE283S | TCE283C |
| #10 - 24 UNC | H3 | 2.38 | .531 | .194 | .152 | .250 | 3 | TCE323S | TCE323C |
| #10 - 32 UNF | H3 | 2.38 | .531 | .194 | .152 | .250 | 3 | TCE343S | TCE343C |
| 1/4 - 20 UNC | H3 | 2.50 | .591 | .255 | .191 | .312 | 3 | TCE403S | TCE403C |
| 1/4 - 20 UNC | H5 | 2.50 | .591 | .255 | .191 | .312 | 3 | TCE405S | TCE405C |
| 1/4 - 28 UNF | H3 | 2.50 | .591 | .255 | .191 | .312 | 3 | TCE423S | TCE423C |
| 5/16 - 18 UNC | H3 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCE443S | TCE443C |
| 5/16 - 18 UNC | H5 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCE445S | TCE445C |
| 5/16 - 24 UNF | H3 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCE463S | TCE463C |
| 3/8 - 16 UNC | H3 | 2.94 | .748 | .381 | .286 | .438 | 3 | TCE483S | TCE483C |
| 3/8 - 16 UNC | H5 | 2.94 | .748 | .381 | .286 | .438 | 3 | TCE485S | TCE485C |
| 3/8 - 24 UNF | H3 | 2.94 | .748 | .381 | .286 | .438 | 3 | TCE503S | TCE503C |
| 7/16 - 14 UNC | H3 | 3.16 | .866 | .323 | .242 | .406 | 3 | TCE523S | TCE523C |
| 7/16 - 14 UNC | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | TCE525S | TCE525C |
| 7/16 - 20 UNF | H3 | 3.16 | .866 | .323 | .242 | .406 | 3 | TCE543S | TCE543C |
| 7/16 - 20 UNF | H5 | 3.16 | .866 | .323 | .242 | .406 | 3 | TCE545S | TCE545C |
| 1/2 - 13 UNC | H3 | 3.38 | .984 | .367 | .275 | .438 | 3 | TCE563S | TCE563C |
| 1/2 - 13 UNC | H5 | 3.38 | .984 | .367 | .275 | .438 | 3 | TCE565S | TCE565C |
| 1/2 - 20 UNF | H3 | 3.38 | .984 | .367 | .275 | .438 | 3 | TCE583S | TCE583C |

▶Super HSS(#5~1/2) and HSS-EX(9/16~1")

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

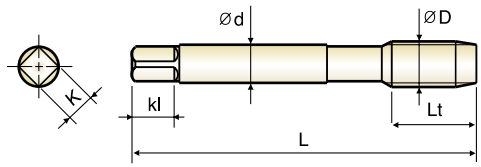
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

# COMBO TAPS

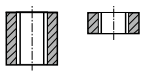
Combo TAP — TCE-S/TCF-S/TCE-C/TCF-C SERIES

## SPIRAL POINT TAPS for Stainless Steels






**Hole type**
3.0×D



VA | Super HSS | HSS-EX | UNC UNF | USCTI 302A | H2~H6 | 60° | 4P | Steam Oxide | TiCN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| 9/16 - 12 UNC | H3 | 3.59 | .984 | .429 | .322 | .500 | 3 | **TCF603S** | **TCF603C** |
| 9/16 - 18 UNF | H3 | 3.59 | .984 | .429 | .322 | .500 | 3 | **TCF623S** | **TCF623C** |
| 5/8 - 11 UNC | H3 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | **TCF643S** | **TCF643C** |
| 5/8 - 11 UNC | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | **TCF645S** | **TCF645C** |
| 5/8 - 18 UNF | H5 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | **TCF665S** | **TCF665C** |
| 3/4 - 10 UNC | H3 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | **TCF703S** | **TCF703C** |
| 3/4 - 10 UNC | H5 | 4.25 | 1.201 | .590 | .442 | .688 | 3 | **TCF705S** | **TCF705C** |
| 7/8 - 9 UNC | H4 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | **TCF744S** | **TCF744C** |
| 7/8 - 9 UNC | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | **TCF746S** | **TCF746C** |
| 7/8 - 14 UNF | H6 | 4.69 | 1.339 | .697 | .523 | .750 | 3 | **TCF766S** | **TCF766C** |
| 1 - 8 UNC | H4 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | **TCF784S** | **TCF784C** |
| 1 - 8 UNC | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | **TCF786S** | **TCF786C** |
| 1 - 12 UNF | H6 | 5.13 | 1.496 | .800 | .600 | .812 | 3 | **TCF806S** | **TCF806C** |

▶ Super HSS(#5~1/2) and HSS-EX(9/16~1")

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

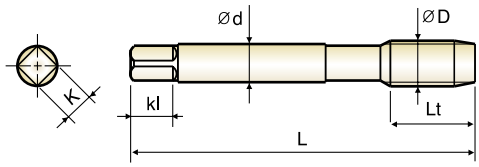
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

# COMBO TAPS

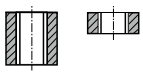
Combo TAP TCG-S/TCH-S/TCG-C/TCH-C SERIES

## SPIRAL POINT TAPS for Stainless Steels






Hole type
3.0×D



VA | Super HSS | HSS-EX | M | USCTI 302A | D3~D7 | 60° | 4P | Steam Oxide | TiCN

Unit : Inch

| SIZE & TPI | Limit | Overall Length L | Thread Length Lt | Shank Diameter D | Square Size K | Square Length kl | No. of Flute | EDP No. Steam Oxide | EDP No. TiCN |
|---|---|---|---|---|---|---|---|---|---|
| M3 x 0.5 | D3 | 1.94 | .374 | .141 | .110 | .188 | 3 | TCG203S | TCG203C |
| M3.5x 0.6 | D4 | 2.00 | .413 | .141 | .110 | .188 | 3 | TCG224S | TCG224C |
| M4 x 0.7 | D4 | 2.13 | .453 | .168 | .131 | .250 | 3 | TCG244S | TCG244C |
| M5 x 0.8 | D4 | 2.38 | .531 | .194 | .152 | .250 | 3 | TCG284S | TCG284C |
| M6 x 1.0 | D5 | 2.50 | .591 | .255 | .191 | .312 | 3 | TCG315S | TCG315C |
| M7 x 1.0 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCG345S | TCG345C |
| M8 x 1.25 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCG365S | TCG365C |
| M8 x 1.0 | D5 | 2.72 | .669 | .318 | .238 | .375 | 3 | TCG375S | TCG375C |
| M10 x 1.5 | D6 | 2.94 | .748 | .381 | .286 | .438 | 3 | TCG426S | TCG426C |
| M10 x 1.25 | D5 | 2.94 | .748 | .381 | .286 | .438 | 3 | TCG435S | TCG435C |
| M12 x 1.75 | D6 | 3.38 | .984 | .367 | .275 | .438 | 3 | TCG506S | TCG506C |
| M12 x 1.25 | D5 | 3.38 | .984 | .367 | .275 | .438 | 3 | TCG525S | TCG525C |
| M14 x 2.0 | D7 | 3.59 | .984 | .429 | .322 | .500 | 3 | TCH547S | TCH547C |
| M14 x 1.5 | D6 | 3.59 | .984 | .429 | .322 | .500 | 3 | TCH556S | TCH556C |
| M16 x 2.0 | D7 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | TCH607S | TCH607C |
| M16 x 1.5 | D6 | 3.81 | 1.083 | .480 | .360 | .562 | 3 | TCH616S | TCH616C |
| M18 x 2.5 | D7 | 4.03 | 1.083 | .542 | .406 | .625 | 3 | TCH657S | TCH657C |
| M18 x 1.5 | D6 | 4.03 | 1.083 | .542 | .406 | .625 | 3 | TCH676S | TCH676C |

▶ Super HSS(M3~M12) and HSS-EX(M14~M18)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | | | |

# COMBO TAPS

Combo TAP

## SPIRAL FLUTE COMBO TAP SETS



TAP SETS **SPIRAL FLUTE COMBO**

| Series | Series | Standard | Surface Treatment | Size | Q'ty |
|---|---|---|---|---|---|
| **T2836SET8** | T2 | UNC/F | Bright | 1/4-20, 1/4-28, 5/16-18, 5-16-24, 3/8-16, 3/8-24, 7/16 -14, 7/16 -20 | 8 pcs |
| **TG836SET8** | T2-C | UNC/F | TiCN | 1/4-20, 1/4-28, 5/16-18, 5-16-24, 3/8-16, 3/8-24, 7/16 -14, 7/16 -20 | 8 pcs |
| **T2836SET8 -1** | T2 | UNC/F | Bright | 1/4-20, 1/4-28, 5/16-18, 5-16-24, 3/8-16, 3/8-24, 1/2-13, 1/2-20 | 8 pcs |
| **TG836SET8 -1** | T2-C | UNC/F | TiCN | 1/4-20, 1/4-28, 5/16-18, 5-16-24, 3/8-16, 3/8-24, 1/2-13, 1/2-20 | 8 pcs |
| **T2805SET7** | T5 | M | Bright | M3, M4, M5, M6, M8, M10, M12 | 7 pcs |
| **TG805SET7** | T5-C | M | TiCN | M3, M4, M5, M6, M8, M10, M12 | 7 pcs |

*Hardslick Coated Set available upon request

# HSS

Being the best through innovation



# SPIRAL FLUTE TAPS

**- Tapping Blind Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS**

## SPIRAL FLUTE TAPS

Tapping Blind Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| BB/BI |  | Super HSS | UNC/UNF | VG | USCTI 302A | H2~H6 | 2 ~ 3P | 2.5D | Steam Oxide Hardslick | 362 |
| BH/BM |  | Super HSS | M/MF | VG | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | 364 |
| BF/BK |  | Super HSS | UNC/UNF | VG | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Steam Oxide Hardslick | 365 |
| BD/BO |  | Super HSS | M/MF | VG | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | 366 |
| H5/H7/H8 |  | P-HSS | UNC/UNF | HR | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | 367 |
| TQ858/ TK858/TR858 |  | P-HSS | M/MF | HR | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | 368 |
| B3/B5/D6 |  | P-HSS | UNC/UNF | Ti Ni | USCTI 302A | H2~H5 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | 369 |
| G9/H0 |  | P-HSS | UNC/UNF | VA | USCTI Long Shank | H2~H3 | 2 ~ 3P | | Hardslick | 371 |
| H2/H4 |  | P-HSS | UNC/UNF | VA | USCTI Long Shank | H3 | 4 ~ 5P | 3.0D | TiN Hardslick | 372 |
| BG/BG-GB |  | HSSE-V3 | UNC/UN8 | VG | DIN-ANSI Shank | 2B | 2 ~ 3P | 2.5D | Hardslick Gold & Black | 373 |
| B1/B0/B2/D2 |  | HSSE-V3 | UNC/UNF | VA | USCTI 302A | H2~H7 | 2 ~ 3P | | Bright Steam Oxide TiN/Hardslick | 374 |
| BS/BT |  | HSSE-V3 | M/MF | VA | USCTI 302A | D3~D7 | 2 ~ 3P | | Steam Oxide Hardslick | 377 |
| E6/E8/E9 |  | HSSE-V3 | M/MF | VA | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | 378 |
| D3/E0 |  | HSSE-V3 | UNC/UNF | VG | USCTI 302A | H2~H11 | 2 ~ 3P | | Hardslick Steam Oxide | 379 |
| BU/BV |  | HSSE-V3 | M/MF | VG | USCTI 302A | D3~D11 | 2 ~ 3P | | Steam Oxide Hardslick | 382 |
| E2/E4/E5 |  | HSSE-V3 | M/MF | VG | DIN-ANSI Shank | D3~D7 | 2 ~ 3P | | Steam Oxide TiCN Hardslick | 384 |
| C0/D8 |  | HSSE-V3 | UNC/UNF | Al | USCTI 302A | H2~H5 | 2 ~ 3P | | Bright Hardslick | 385 |
| BW/BX |  | HSSE-V3 | M/MF | Al | USCTI 302A | D3~D6 | 2 ~ 3P | | Bright Hardslick | 386 |

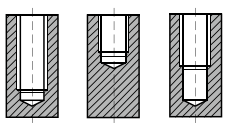
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| C2/C3/C4/D9 |  | HSSE-V3 | UNC/UNF | GS | USCTI 302 | H2~H6 | 1.5 ~ 2P | 2.5D | Steam Oxide Bright/TiN Hardslick | 387 |
| F4/F8/F6 |  | HSS-V | UNC/UNF | GS | USCTI 302A | H2~H6 | 1.5 ~ 2P | | Steam Oxide TiN Hardslick | 388 |
| G4/G5/G6 |  | HSS-V | M/MF | GS | USCTI 302A | D3~D6 | 1.5 ~ 2P | | Bright TiCN Hardslick | 390 |
| G0/G1/G2 |  | HSS-V | UNC/UNF | GS | DIN-ANSI Shank | H2~H6 | 2 ~ 3P | | Bright TiN Hardslick | 391 |
| T7A96/T6A96/ T8A96 T7295/T6295/ T8295 |  | HSS | UNC/UNF | GS | USCTI 302 | H2~H5 | 4 ~ 5P 1.5 ~ 2P | | Bright Steam Oxide TiN | 393 |
| T7A86/T6A86/ T8A86 T7A85/T6A85/ T8A85 |  | HSS | M/MF | GS | USCTI 302 | D3~D6 | 4 ~ 5P 1.5 ~ 2P | | Bright Steam Oxide TiN | 394 |
| T7D01/T8D01 T7D02/T8D02 |  | HSS | UNC/UNF | GS | USCTI Long Shank | H3 | 4 ~ 5P 1.5 ~ 2P | | Bright TiN | 395 |

# SPIRAL FLUTE TAPS

BB/BI SERIES

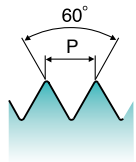
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Steels & Stainless Steels up to 35HRc

Hole type 2.5×D





USCTI




VG | Super HSS | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Steam Oxide | Hardslick | R40

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| #2 | 56 | — | H2 | 2 | **BB082** | **BI082** |
| #4 | 40 | — | H2 | 2 | **BB162** | **BI162** |
| #4 | 40 | — | H3 | 2 | **BB163** | **BI163** |
| #4 | 40 | — | H4 | 2 | **BB164** | **BI164** |
| #5 | 40 | — | H2 | 3 | **BB202** | **BI202** |
| #6 | 32 | — | H2 | 3 | **BB242** | **BI242** |
| #6 | 32 | — | H3 | 3 | **BB243** | **BI243** |
| #6 | 32 | — | H4 | 3 | **BB244** | **BI244** |
| #6 | 32 | — | H5 | 3 | **BB245** | **BI245** |
| #8 | 32 | — | H2 | 3 | **BB282** | **BI282** |
| #8 | 32 | — | H3 | 3 | **BB283** | **BI283** |
| #8 | 32 | — | H4 | 3 | **BB284** | **BI284** |
| #8 | 32 | — | H5 | 3 | **BB285** | **BI285** |
| #8 | 32 | — | H6 | 3 | **BB286** | **BI286** |
| #10 | 24 | — | H3 | 3 | **BB323** | **BI323** |
| #10 | 24 | — | H5 | 3 | **BB325** | **BI325** |
| #10 | — | 32 | H2 | 3 | **BB342** | **BI342** |
| #10 | — | 32 | H3 | 3 | **BB343** | **BI343** |
| #10 | — | 32 | H4 | 3 | **BB344** | **BI344** |
| #10 | — | 32 | H5 | 3 | **BB345** | **BI345** |
| #10 | — | 32 | H6 | 3 | **BB346** | **BI346** |
| 1/4 | 20 | — | H3 | 3 | **BB403** | **BI403** |
| 1/4 | 20 | — | H5 | 3 | **BB405** | **BI405** |
| 1/4 | — | 28 | H3 | 3 | **BB423** | **BI423** |
| 1/4 | — | 28 | H4 | 3 | **BB424** | **BI424** |
| 1/4 | — | 28 | H5 | 3 | **BB425** | **BI425** |
| 1/4 | — | 28 | H6 | 3 | **BB426** | **BI426** |
| 5/16 | 18 | — | H3 | 3 | **BB443** | **BI443** |
| 5/16 | 18 | — | H5 | 3 | **BB445** | **BI445** |
| 5/16 | — | 24 | H3 | 3 | **BB463** | **BI463** |
| 5/16 | — | 24 | H4 | 3 | **BB464** | **BI464** |
| 5/16 | — | 24 | H5 | 3 | **BB465** | **BI465** |
| 5/16 | — | 24 | H6 | 3 | **BB466** | **BI466** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

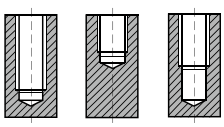
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

BB/BI SERIES

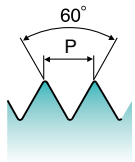
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Steels & Stainless Steels up to 35HRc

Hole type 2.5×D





USCTI




VG | Super HSS | UNC UNF | USCTI 302A | H2~H6 | 60° | 2P~3P | Steam Oxide | Hardslick | R40

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| 3/8 | 16 | — | H3 | 3 | **BB483** | **BI483** |
| 3/8 | 16 | — | H5 | 3 | **BB485** | **BI485** |
| 3/8 | — | 24 | H3 | 3 | **BB503** | **BI503** |
| 3/8 | — | 24 | H4 | 3 | **BB504** | **BI504** |
| 3/8 | — | 24 | H5 | 3 | **BB505** | **BI505** |
| 3/8 | — | 24 | H6 | 3 | **BB506** | **BI506** |
| 7/16 | 14 | — | H3 | 3 | **BB523** | **BI523** |
| 7/16 | 14 | — | H5 | 3 | **BB525** | **BI525** |
| 7/16 | — | 20 | H3 | 3 | **BB543** | **BI543** |
| 7/16 | — | 20 | H5 | 3 | **BB545** | **BI545** |
| 1/2 | 13 | — | H3 | 3 | **BB563** | **BI563** |
| 1/2 | 13 | — | H5 | 3 | **BB565** | **BI565** |
| 1/2 | — | 20 | H3 | 3 | **BB583** | **BI583** |
| 1/2 | — | 20 | H5 | 3 | **BB585** | **BI585** |
| 9/16 | 12 | — | H5 | 3 | **BB605** | **BI605** |
| 9/16 | — | 18 | H5 | 3 | **BB625** | **BI625** |
| 5/8 | 11 | — | H3 | 4 | **BB643** | **BI643** |
| 5/8 | 11 | — | H5 | 4 | **BB645** | **BI645** |
| 5/8 | — | 18 | H3 | 4 | **BB663** | **BI663** |
| 5/8 | — | 18 | H5 | 4 | **BB665** | **BI665** |
| 3/4 | 10 | — | H3 | 4 | **BB703** | **BI703** |
| 3/4 | 10 | — | H5 | 4 | **BB705** | **BI705** |
| 3/4 | — | 16 | H3 | 4 | **BB723** | **BI723** |
| 3/4 | — | 16 | H5 | 4 | **BB725** | **BI725** |
| 7/8 | 9 | — | H6 | 4 | **BB746** | **BI746** |
| 7/8 | — | 14 | H6 | 4 | **BB766** | **BI766** |
| 1 | 8 | — | H6 | 4 | **BB786** | **BI786** |
| 1 | — | 12 | H6 | 4 | **BB806** | **BI806** |
| 1-1/8 | 8 | — | H6 | 4 | **BB836** | **BI836** |
| 1-1/4 | 8 | — | H6 | 4 | **BB876** | **BI876** |
| 1-3/8 | 8 | — | H6 | 4 | **BB916** | **BI916** |
| 1-1/2 | 8 | — | H6 | 4 | **BB956** | **BI956** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

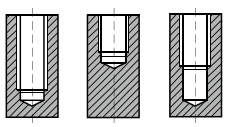
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

BH / BM SERIES

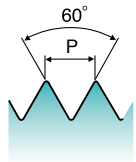
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Steels & Stainless Steels up to 35HRc

Hole type 2.5×D





USCTI




VG | Super HSS | M MF | USCTI 302A | D3~D7 | 60° | 2P~3P | Steam Oxide | Hardslick | R40

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **BH203** | **BM203** |
| M3.5 | 0.6 | D4 | 3 | **BH224** | **BM224** |
| M4 | 0.7 | D4 | 3 | **BH244** | **BM244** |
| M5 | 0.8 | D4 | 3 | **BH284** | **BM284** |
| M6 | 1.0 | D5 | 3 | **BH315** | **BM315** |
| M7 | 1.0 | D5 | 3 | **BH345** | **BM345** |
| M8 | 1.25 | D5 | 3 | **BH365** | **BM365** |
| M8 | 1.0 | D5 | 3 | **BH375** | **BM375** |
| M10 | 1.5 | D6 | 3 | **BH426** | **BM426** |
| M10 | 1.25 | D5 | 3 | **BH435** | **BM435** |
| M12 | 1.75 | D6 | 3 | **BH506** | **BM506** |
| M12 | 1.25 | D5 | 3 | **BH525** | **BM525** |
| M14 | 2.0 | D7 | 3 | **BH547** | **BM547** |
| M14 | 1.5 | D6 | 3 | **BH556** | **BM556** |
| M16 | 2.0 | D7 | 3 | **BH607** | **BM607** |
| M16 | 1.5 | D6 | 3 | **BH616** | **BM616** |
| M18 | 2.5 | D7 | 4 | **BH657** | **BM657** |
| M18 | 1.5 | D6 | 4 | **BH676** | **BM676** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

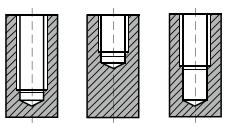
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

BF / BK SERIES

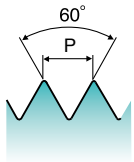
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Steels & Stainless Steels up to 35HRc

Hole type 2.5×D





DIN-ANSI Shank




VG | Super HSS | UNC UNF | H2~H6 | 60° | 2P~3P | Steam Oxide | Hardslick | R40

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| #2 | 56 | — | H2 | 2 | **BF082** | **BK082** |
| #4 | 40 | — | H2 | 2 | **BF162** | **BK162** |
| #5 | 40 | — | H2 | 3 | **BF202** | **BK202** |
| #6 | 32 | — | H3 | 3 | **BF243** | **BK243** |
| #8 | 32 | — | H3 | 3 | **BF283** | **BK283** |
| #10 | 24 | — | H3 | 3 | **BF323** | **BK323** |
| #10 | — | 32 | H3 | 3 | **BF343** | **BK343** |
| 1/4 | 20 | — | H3 | 3 | **BF403** | **BK403** |
| 1/4 | 20 | — | H5 | 3 | **BF405** | **BK405** |
| 1/4 | — | 28 | H3 | 3 | **BF423** | **BK423** |
| 1/4 | — | 28 | H4 | 3 | **BF424** | **BK424** |
| 5/16 | 18 | — | H5 | 3 | **BF445** | **BK445** |
| 5/16 | — | 24 | H4 | 3 | **BF464** | **BK464** |
| 3/8 | 16 | — | H5 | 3 | **BF485** | **BK485** |
| 3/8 | — | 24 | H4 | 3 | **BF504** | **BK504** |
| 7/16 | 14 | — | H5 | 3 | **BF525** | **BK525** |
| 7/16 | — | 20 | H5 | 3 | **BF545** | **BK545** |
| 1/2 | 13 | — | H5 | 3 | **BF565** | **BK565** |
| 1/2 | — | 20 | H5 | 3 | **BF585** | **BK585** |
| 9/16 | 12 | — | H5 | 3 | **BF605** | **BK605** |
| 9/16 | — | 18 | H5 | 3 | **BF625** | **BK625** |
| 5/8 | 11 | — | H5 | 4 | **BF645** | **BK645** |
| 5/8 | — | 18 | H5 | 4 | **BF665** | **BK665** |
| 3/4 | 10 | — | H5 | 4 | **BF705** | **BK705** |
| 3/4 | — | 16 | H5 | 4 | **BF725** | **BK725** |
| 7/8 | 9 | — | H6 | 4 | **BF746** | **BK746** |
| 7/8 | — | 14 | H6 | 4 | **BF766** | **BK766** |
| 1 | 8 | — | H6 | 4 | **BF786** | **BK786** |
| 1 | — | 12 | H6 | 4 | **BF806** | **BK806** |
| 1-1/8 | 8 | — | H6 | 4 | **BF836** | **BK836** |
| 1-1/4 | 8 | — | H6 | 4 | **BF876** | **BK876** |
| 1-3/8 | 8 | — | H6 | 4 | **BF916** | **BK916** |
| 1-1/2 | 8 | — | H6 | 4 | **BF956** | **BK956** |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

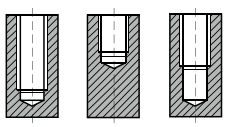
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

BD / BO SERIES

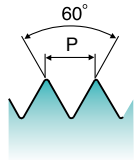
## METRIC SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Steels & Stainless Steels up to 35HRc

Hole type 2.5×D





DIN-ANSI Shank




VG | Super HSS | M MF | D3~D7 | 60° | 2P~3P | Steam Oxide | Hardslick | R40

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | BD203 | B0203 |
| M3.5 | 0.6 | D4 | 3 | BD224 | B0224 |
| M4 | 0.7 | D4 | 3 | BD244 | B0244 |
| M5 | 0.8 | D4 | 3 | BD284 | B0284 |
| M6 | 1.0 | D5 | 3 | BD315 | B0315 |
| M7 | 1.0 | D5 | 3 | BD345 | B0345 |
| M8 | 1.25 | D5 | 3 | BD365 | B0365 |
| M8 | 1.0 | D5 | 3 | BD375 | B0375 |
| M10 | 1.5 | D6 | 3 | BD426 | B0426 |
| M10 | 1.25 | D5 | 3 | BD435 | B0435 |
| M12 | 1.75 | D6 | 3 | BD506 | B0506 |
| M12 | 1.25 | D5 | 3 | BD525 | B0525 |
| M14 | 2.0 | D7 | 3 | BD547 | B0547 |
| M14 | 1.5 | D6 | 3 | BD556 | B0556 |
| M16 | 2.0 | D7 | 3 | BD607 | B0607 |
| M16 | 1.5 | D6 | 3 | BD616 | B0616 |
| M18 | 2.5 | D7 | 4 | BD657 | B0657 |
| M18 | 1.5 | D6 | 4 | BD676 | B0676 |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

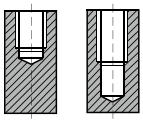
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

**H5 / H7 / H8** SERIES

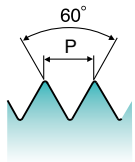
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 45HRc

**Hole type** 2.5×D





USCTI




HR | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R15

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| #2 | 56 | — | H2 | 3 | **H5082** | **H7082** | **H8082** |
| #4 | 40 | — | H2 | 3 | **H5162** | **H7162** | **H8162** |
| #5 | 40 | — | H2 | 3 | **H5202** | **H7202** | **H8202** |
| #6 | 32 | — | H3 | 3 | **H5243** | **H7243** | **H8243** |
| #8 | 32 | — | H3 | 3 | **H5283** | **H7283** | **H8283** |
| #10 | 24 | — | H3 | 3 | **H5323** | **H7323** | **H8323** |
| #10 | — | 32 | H3 | 3 | **H5343** | **H7343** | **H8343** |
| 1/4 | 20 | — | H5 | 3 | **H5405** | **H7405** | **H8405** |
| 1/4 | — | 28 | H4 | 3 | **H5424** | **H7424** | **H8424** |
| 5/16 | 18 | — | H5 | 3 | **H5445** | **H7445** | **H8445** |
| 5/16 | — | 24 | H4 | 3 | **H5464** | **H7464** | **H8464** |
| 3/8 | 16 | — | H5 | 3 | **H5485** | **H7485** | **H8485** |
| 3/8 | — | 24 | H4 | 3 | **H5504** | **H7504** | **H8504** |
| 7/16 | 14 | — | H5 | 3 | **H5525** | **H7525** | **H8525** |
| 7/16 | — | 20 | H5 | 3 | **H5545** | **H7545** | **H8545** |
| 1/2 | 13 | — | H5 | 3 | **H5565** | **H7565** | **H8565** |
| 1/2 | — | 20 | H5 | 3 | **H5585** | **H7585** | **H8585** |
| 5/8 | 11 | — | H5 | 4 | **H5645** | **H7645** | **H8645** |
| 5/8 | — | 18 | H5 | 4 | **H5665** | **H7665** | **H8665** |
| 3/4 | 10 | — | H5 | 4 | **H5705** | **H7705** | **H8705** |
| 3/4 | — | 16 | H5 | 4 | **H5725** | **H7725** | **H8725** |

▶Bright Finish Available: H6 Series

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | ○ | ◎ | | ○ | ◎ | |

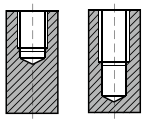
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | ◎ | | | | | ○ | ○ | ○ |

# SPIRAL FLUTE TAPS

**TQ858 / TK858 / TR858** SERIES

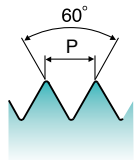
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 45HRc

**Hole type** 2.5×D





USCTI




◇Call for Availability

HR | P-HSS | M MF | USCTI 302A | H2~H5 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R15

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.50 | D3 | 3 | TQ858203 | TK858203 | TR858203HAR |
| M4 | 0.50 | D3 | 3 | TQ858253 | TK858253 | TR858253HAR |
| M4 | 0.70 | D4 | 3 | TQ858244 | TK858244 | TR858244HAR |
| M5 | 0.50 | D3 | 3 | TQ858293 | TK858293 | TR858293HAR |
| M5 | 0.80 | D4 | 3 | TQ858284 | TK858284 | TR858284HAR |
| M6 | 0.50 | D3 | 3 | TQ858333 | TK858333 | TR858333HAR |
| M6 | 0.75 | D4 | 3 | TQ858324 | TK858324 | TR858324HAR |
| M6 | 1.00 | D5 | 3 | TQ858315 | TK858315 | TR858315HAR |
| M8 | 1.00 | D5 | 3 | TQ858375 | TK858375 | TR858375HAR |
| M8 | 1.25 | D5 | 3 | TQ858365 | TK858365 | TR858365HAR |
| M10 | 1.00 | D5 | 3 | TQ858445 | TK858445 | TR858445HAR |
| M10 | 1.25 | D5 | 3 | TQ858435 | TK858435 | TR858435HAR |
| M10 | 1.50 | D6 | 3 | TQ858426 | TK858426 | TR858426HAR |
| M12 | 1.00 | D5 | 3 | TQ858535 | TK858535 | TR858535HAR |
| M12 | 1.25 | D6 | 3 | TQ858526 | TK858526 | TR858526HAR |
| M12 | 1.50 | D6 | 3 | TQ858516 | TK858516 | TR858516HAR |
| M12 | 1.75 | D6 | 3 | TQ858506 | TK858506 | TR858506HAR |
| M14 | 1.50 | D6 | 3 | TQ858556 | TK858556 | TR858556HAR |
| M14 | 2.00 | D7 | 3 | TQ858547 | TK858547 | TR858547HAR |
| M16 | 1.5 | D6 | 4 | TQ858616 | TK858616 | TR858616HAR |
| M16 | 2.0 | D7 | 4 | TQ858607 | TK858607 | TR858607HAR |
| M18 | 1.5 | D6 | 4 | TQ858676 | TK858676 | TR858676HAR |
| M18 | 2.5 | D7 | 4 | TQ858657 | TK858657 | TR858657HAR |
| M20 | 1.5 | D6 | 4 | TQ858726 | TK858726 | TR858726HAR |
| M20 | 2.5 | D7 | 4 | TQ858707 | TK858707 | TR858707HAR |
| M22 | 1.5 | D6 | 4 | TQ858766 | TK858766 | TR858766HAR |
| M22 | 2.5 | D7 | 4 | TQ858747 | TK858747 | TR858747HAR |
| M24 | 1.5 | D6 | 4 | TQ858806 | TK858806 | TR858806HAR |
| M24 | 3.0 | D8 | 4 | TQ858788 | TK858788 | TR858788HAR |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | ○ | ◎ | | ○ | ◎ | |

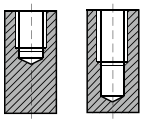
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | ◎ | | | | | ○ | ○ | ○ |

# SPIRAL FLUTE TAPS

B3/B5/D6 SERIES

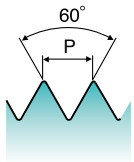
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Titanium Alloys & Nickel Base Alloys up to 44HRc

Hole type 2.5×D





USCTI




Ti Ni | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R15

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| #2 | 56 | — | H2 | 3 | **B3082** | **B5082** | **D6082** |
| #4 | 40 | — | H2 | 3 | **B3162** | **B5162** | **D6162** |
| #5 | 40 | — | H2 | 3 | **B3202** | **B5202** | **D6202** |
| #6 | 32 | — | H3 | 3 | **B3243** | **B5243** | **D6243** |
| #8 | 32 | — | H3 | 3 | **B3283** | **B5283** | **D6283** |
| #10 | 24 | — | H3 | 3 | **B3323** | **B5323** | **D6323** |
| #10 | — | 32 | H3 | 3 | **B3343** | **B5343** | **D6343** |
| 1/4 | 20 | — | H3 | 3 | **B3403** | **B5403** | **D6403** |
| 1/4 | 20 | — | H5 | 3 | **B3405** | **B5405** | **D6405** |
| 1/4 | — | 28 | H3 | 3 | **B3423** | **B5423** | **D6423** |
| 1/4 | — | 28 | H4 | 3 | **B3424** | **B5424** | **D6424** |
| 5/16 | 18 | — | H3 | 3 | **B3443** | **B5443** | **D6443** |
| 5/16 | 18 | — | H5 | 3 | **B3445** | **B5445** | **D6445** |
| 5/16 | — | 24 | H3 | 3 | **B3463** | **B5463** | **D6463** |
| 3/8 | 16 | — | H3 | 3 | **B3483** | **B5483** | **D6483** |
| 3/8 | 16 | — | H5 | 3 | **B3485** | **B5485** | **D6485** |
| 3/8 | — | 24 | H3 | 3 | **B3503** | **B5503** | **D6503** |
| 3/8 | — | 24 | H4 | 3 | **B3504** | **B5504** | **D6504** |
| 7/16 | 14 | — | H3 | 3 | **B3523** | **B5523** | **D6523** |
| 7/16 | 14 | — | H5 | 3 | **B3525** | **B5525** | **D6525** |
| 7/16 | — | 20 | H3 | 3 | **B3543** | **B5543** | **D6543** |
| 7/16 | — | 20 | H5 | 3 | **B3545** | **B5545** | **D6545** |
| 1/2 | 13 | — | H3 | 3 | **B3563** | **B5563** | **D6563** |
| 1/2 | 13 | — | H5 | 3 | **B3565** | **B5565** | **D6565** |
| 1/2 | — | 20 | H3 | 3 | **B3583** | **B5583** | **D6583** |
| 1/2 | — | 20 | H5 | 3 | **B3585** | **B5585** | **D6585** |

▶TiN Coated Available: H9 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

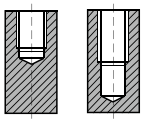
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ◎ | ◎ | ◎ |

# SPIRAL FLUTE TAPS

B3 / B5 / D6 SERIES

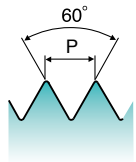
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Titanium Alloys & Nickel Base Alloys up to 44HRc

Hole type 2.5×D





USCTI




Ti Ni | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R15

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| 9/16 | 12 | — | H3 | 3 | **B3603** | **B5603** | **D6603** |
| 9/16 | 12 | — | H5 | 3 | **B3605** | **B5605** | **D6605** |
| 9/16 | — | 18 | H3 | 3 | **B3623** | **B5623** | **D6623** |
| 9/16 | — | 18 | H5 | 3 | **B3625** | **B5625** | **D6625** |
| 5/8 | 11 | — | H3 | 4 | **B3643** | **B5643** | **D6643** |
| 5/8 | 11 | — | H5 | 4 | **B3645** | **B5645** | **D6645** |
| 5/8 | — | 18 | H3 | 4 | **B3663** | **B5663** | **D6663** |
| 5/8 | — | 18 | H5 | 4 | **B3665** | **B5665** | **D6665** |
| 3/4 | 10 | — | H3 | 4 | **B3703** | **B5703** | **D6703** |
| 3/4 | 10 | — | H5 | 4 | **B3705** | **B5705** | **D6705** |
| 3/4 | — | 16 | H3 | 4 | **B3723** | **B5723** | **D6723** |
| 3/4 | — | 16 | H5 | 4 | **B3725** | **B5725** | **D6725** |

▶TiN Coated Available: H9 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ◎ | ◎ | ◎ |

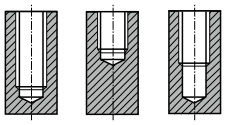
# SPIRAL FLUTE TAPS

G9 / H0 SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

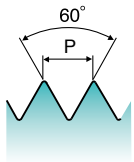
Maximum Tapping Depth is 50% Deeper than Standard USCTI Taps.

**Hole type** 2.5×D





**USCTI-Long Shank**




VA | P-HSS | UNC UNF | USCTI Long Shank | H2~H3 | 60° | 2P~3P | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Hardslick 4" OAL | Hardslick 6" OAL |
| #4 | 40 | — | H2 | 3 | **G9162** | — |
| #6 | 32 | — | H3 | 3 | **G9243** | **H0243** |
| #8 | 32 | — | H3 | 3 | **G9283** | **H0283** |
| #10 | 24 | — | H3 | 3 | **G9323** | **H0323** |
| #10 | — | 32 | H3 | 3 | **G9343** | **H0343** |
| 1/4 | 20 | — | H3 | 3 | **G9403** | **H0403** |
| 1/4 | — | 28 | H3 | 3 | — | **H0423** |
| 5/16 | 18 | — | H3 | 3 | — | **H0443** |
| 5/16 | — | 24 | H3 | 3 | — | **H0463** |
| 3/8 | 16 | — | H3 | 3 | — | **H0483** |
| 3/8 | — | 24 | H3 | 3 | — | **H0503** |
| 7/16 | 14 | — | H3 | 3 | — | **H0523** |
| 7/16 | — | 20 | H3 | 3 | — | **H0543** |
| 1/2 | 13 | — | H3 | 3 | — | **H0563** |
| 1/2 | — | 20 | H3 | 3 | — | **H0583** |
| 5/8 | 11 | — | H3 | 4 | — | **H0643** |

▶TiN Coated Available: 4" OAL G7 Series & 6" OAL G8 Series
▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

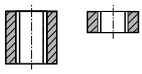
# SPIRAL FLUTE TAPS

H2 / H4 SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Machining Center Tap (Left hand spiral)

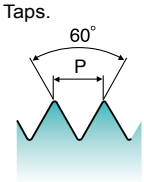
Left hand spiral, right hand cut. Reduces chip packing in deep holes Maximum. Tapping Depth is 50% Deeper than Standard USCTI Taps.

**Hole type** 3.0×D





**USCTI Long Shank**




VA | P-HSS | UNC UNF | USCTI Long Shank | H3 | 60° | 4P~5P | TiN | Hardslick | L15

| SIZE | Thread Per Inch | | Limit | Overall | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | | TiN | Hardslick |
| 1/4 | 20 | — | H3 | 6 | 2 | **H2403** | **H4403** |
| 1/4 | — | 28 | H3 | 6 | 3 | **H2423** | **H4423** |
| 5/16 | 18 | — | H3 | 6 | 3 | **H2443** | **H4443** |
| 3/8 | 16 | — | H3 | 6 | 3 | **H2483** | **H4483** |
| 7/16 | 14 | — | H3 | 6 | 3 | **H2523** | **H4523** |
| 1/2 | 13 | — | H3 | 6 | 3 | **H2563** | **H4563** |
| 5/8 | 11 | — | H3 | 6 | 3 | **H2643** | **H4643** |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

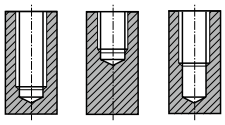
# SPIRAL FLUTE TAPS

BG / BG-GB SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steel up to 35HRc

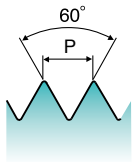
**Oil Field**

**Hole type** 2.5×D





DIN-ANSI Shank




VG | HSSE-V3 | UNC UN8 | 2B | 60° | 2P~3P | Hardslick | Gold& Black | R40

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UN | | | Hardslick | Gold-Black |
| 1/2 | 13 | — | 2B | 3 | **BG562H** | **BG562GB** |
| 5/8 | 11 | — | 2B | 3 | **BG642H** | **BG642GB** |
| 3/4 | 10 | — | 2B | 3 | **BG702H** | **BG702GB** |
| 7/8 | 9 | — | 2B | 4 | **BG742H** | **BG742GB** |
| 1 | — | 8 | 2B | 4 | **BG782H** | **BG782GB** |
| 1-1/8 | 7 | — | 2B | 4 | **BG822H** | **BG822GB** |
| 1-1/8 | — | 8 | 2B | 4 | **BG832H** | **BG832GB** |
| 1-1/4 | 7 | — | 2B | 4 | **BG862H** | **BG862GB** |
| 1-1/4 | — | 8 | 2B | 4 | **BG872H** | **BG872GB** |
| 1-3/8 | — | 8 | 2B | 5 | **BG912H** | **BG912GB** |
| 1-1/2 | — | 8 | 2B | 5 | **BG952H** | **BG952GB** |
| 1-5/8 | — | 8 | 2B | 5 | **BGB22H** | **BGB22GB** |
| 1-3/4 | — | 8 | 2B | 6 | **BGC02H** | **BGC02GB** |
| 1-7/8 | — | 8 | 2B | 6 | **BGC62H** | **BGC62GB** |
| 2 | — | 8 | 2B | 6 | **BGD42H** | **BGD42GB** |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ○ | ◎ | | ◎ | ◎ | | |

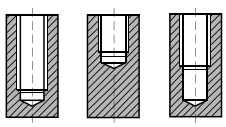
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | ◎ | | | | | |

# SPIRAL FLUTE TAPS

B1/B0/B2/D2 SERIES

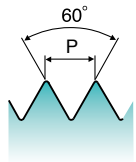
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

Hole type 2.5×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 2P~3P | Bright | Steam Oxide | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | B1082 | B0082 | B2082 | D2082 |
| #3 | 48 | — | H2 | 2 | — | B0122 | — | D2122 |
| #4 | 40 | — | H2 | 2 | B1162 | B0162 | B2162 | D2162 |
| #4 | 40 | — | H3 | 2 | — | B0163 | — | D2163 |
| #4 | 40 | — | H4 | 2 | — | B0164 | — | D2164 |
| #4 | 40 | — | H5 | 2 | B1162 | B0162 | B2162 | D2162 |
| #4 | 40 | — | H6 | 2 | B1162 | B0162 | B2162 | D2162 |
| #4 | — | 48 | H2 | 2 | — | B0182 | — | D2182 |
| #5 | 40 | — | H2 | 3 | B1202 | B0202 | B2202 | D2202 |
| #6 | 32 | — | H2 | 3 | — | B0242 | — | D2242 |
| #6 | 32 | — | H3 | 3 | B1243 | B0243 | B2243 | D2243 |
| #6 | 32 | — | H4 | 3 | — | B0244 | — | D2244 |
| #6 | 32 | — | H5 | 3 | — | B0245 | — | D2245 |
| #6 | 32 | — | H7 | 3 | — | B0247 | — | D2247 |
| #6 | — | 40 | H2 | 3 | — | B0262 | — | D2262 |
| #6 | — | 40 | H3 | 3 | — | B0263 | — | D2263 |
| #8 | 32 | — | H2 | 3 | — | B0282 | — | D2282 |
| #8 | 32 | — | H3 | 3 | B1283 | B0283 | B2283 | D2283 |
| #8 | 32 | — | H4 | 3 | — | B0284 | — | D2284 |
| #8 | 32 | — | H5 | 3 | — | B0285 | — | D2285 |
| #8 | 32 | — | H6 | 3 | — | B0286 | — | D2286 |
| #8 | 32 | — | H7 | 3 | — | B0287 | — | D2287 |
| #8 | — | 36 | H3 | 3 | — | B0303 | — | D2303 |
| #10 | 24 | — | H2 | 3 | — | B0322 | — | D2322 |
| #10 | 24 | — | H3 | 3 | B1323 | B0323 | B2323 | D2323 |
| #10 | 24 | — | H5 | 3 | — | B0325 | — | D2325 |
| #10 | 24 | — | H7 | 3 | — | B0327 | — | D2327 |
| #10 | — | 32 | H2 | 3 | — | B0342 | — | D2342 |
| #10 | — | 32 | H3 | 3 | B1343 | B0343 | B2343 | D2343 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

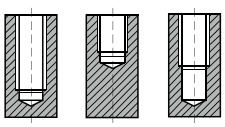
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

B1/B0/B2/D2 SERIES

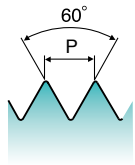
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

Hole type 2.5×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 2P~3P | Bright | Steam Oxide | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN | Hardslick |
| #10 | — | 32 | H4 | 3 | — | B0344 | — | D2344 |
| #10 | — | 32 | H5 | 3 | — | B0345 | — | D2345 |
| #10 | — | 32 | H6 | 3 | — | B0346 | — | D2346 |
| #10 | — | 32 | H7 | 3 | — | B0347 | — | D2347 |
| #12 | 24 | — | H3 | 3 | — | B0363 | — | D2363 |
| #12 | 28 | — | H3 | 3 | — | B0383 | — | D2383 |
| 1/4 | 20 | — | H2 | 3 | — | B0402 | — | D2402 |
| 1/4 | 20 | — | H3 | 3 | B1403 | B0403 | B2403 | D2403 |
| 1/4 | 20 | — | H5 | 3 | B1405 | B0405 | B2405 | D2405 |
| 1/4 | 20 | — | H7 | 3 | — | B0407 | — | D2407 |
| 1/4 | — | 28 | H2 | 3 | — | B0422 | — | D2422 |
| 1/4 | — | 28 | H3 | 3 | B1423 | B0423 | B2423 | D2423 |
| 1/4 | — | 28 | H4 | 3 | — | B0424 | — | D2424 |
| 1/4 | — | 28 | H5 | 3 | — | B0425 | — | D2425 |
| 1/4 | — | 28 | H6 | 3 | — | B0426 | — | D2426 |
| 1/4 | — | 28 | H7 | 3 | — | B0427 | — | D2427 |
| 5/16 | 18 | — | H3 | 3 | B1443 | B0443 | B2443 | D2443 |
| 5/16 | 18 | — | H5 | 3 | B1445 | B0445 | B2445 | D2445 |
| 5/16 | 18 | — | H7 | 3 | — | B0447 | — | D2447 |
| 5/16 | — | 24 | H3 | 3 | B1463 | B0463 | B2463 | D2463 |
| 5/16 | — | 24 | H4 | 3 | — | B0464 | — | D2464 |
| 5/16 | — | 24 | H5 | 3 | — | B0465 | — | D2465 |
| 5/16 | — | 24 | H7 | 3 | — | B0467 | — | D2467 |
| 3/8 | 16 | — | H3 | 3 | B1483 | B0483 | B2483 | D2483 |
| 3/8 | 16 | — | H5 | 3 | B1485 | B0485 | B2485 | D2485 |
| 3/8 | 16 | — | H7 | 3 | — | B0487 | — | D2487 |
| 3/8 | — | 24 | H3 | 3 | B1503 | B0503 | B2503 | D2503 |
| 3/8 | — | 24 | H4 | 3 | — | B0504 | — | D2504 |
| 3/8 | — | 24 | H5 | 3 | — | B0505 | — | D2505 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

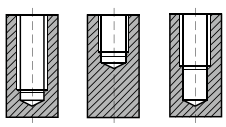
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

B1/B0/B2/D2 SERIES

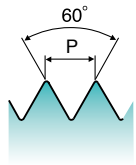
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

Hole type 2.5×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 2P~3P | Bright | Steam Oxide | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN | Hardslick |
| 7/16 | 14 | — | H3 | 3 | B1523 | B0523 | B2523 | D2523 |
| 7/16 | 14 | — | H5 | 3 | B1525 | B0525 | B2525 | D2525 |
| 7/16 | 14 | — | H7 | 3 | — | B0527 | — | D2527 |
| 7/16 | — | 20 | H3 | 3 | B1543 | B0543 | B2543 | D2543 |
| 7/16 | — | 20 | H5 | 3 | B1545 | B0545 | B2545 | D2545 |
| 7/16 | — | 20 | H7 | 3 | — | B0547 | — | D2547 |
| 1/2 | 13 | — | H3 | 3 | B1563 | B0563 | B2563 | D2563 |
| 1/2 | 13 | — | H5 | 3 | B1565 | B0565 | B2565 | D2565 |
| 1/2 | 13 | — | H7 | 3 | — | B0567 | — | D2567 |
| 1/2 | — | 20 | H3 | 3 | B1583 | B0583 | B2583 | D2583 |
| 1/2 | — | 20 | H5 | 3 | — | B0585 | — | D2585 |
| 1/2 | — | 20 | H6 | 3 | — | B0586 | — | D2586 |
| 1/2 | — | 20 | H7 | 3 | — | B0587 | — | D2587 |
| 9/16 | 12 | — | H3 | 3 | B1603 | B0603 | B2603 | D2603 |
| 9/16 | — | 18 | H3 | 3 | B1623 | B0623 | B2623 | D2623 |
| 5/8 | 11 | — | H3 | 4 | B1643 | B0643 | B2643 | D2643 |
| 5/8 | 11 | — | H5 | 4 | B1645 | B0645 | B2645 | D2645 |
| 5/8 | — | 18 | H3 | 4 | B1663 | B0663 | B2663 | D2663 |
| 5/8 | — | 18 | H5 | 4 | B1665 | B0665 | B2665 | D2665 |
| 3/4 | 10 | — | H3 | 4 | B1703 | B0703 | B2703 | D2703 |
| 3/4 | 10 | — | H6 | 4 | — | B0706 | — | D2706 |
| 3/4 | — | 16 | H3 | 4 | B1723 | B0723 | B2723 | D2723 |
| 3/4 | — | 16 | H5 | 4 | B1725 | B0725 | B2725 | D2725 |
| 7/8 | 9 | — | H4 | 4 | B1744 | B0744 | B2744 | D2744 |
| 7/8 | — | 14 | H4 | 4 | B1764 | B0764 | B2764 | D2764 |
| 1 | 8 | — | H4 | 4 | B1784 | B0784 | B2784 | D2784 |
| 1 | — | 12 | H4 | 4 | B1804 | B0804 | B2804 | D2804 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

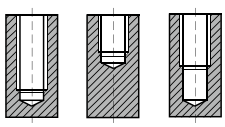
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

BS/BT SERIES

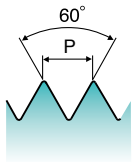
## METRIC SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

Hole type 2.5×D





USCTI




VA | HSSE-V3 | M MF | USCTI 302A | D3~D7 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **BS203** | **BT203** |
| M3.5 | 0.6 | D4 | 3 | **BS224** | **BT224** |
| M4 | 0.7 | D4 | 3 | **BS244** | **BT244** |
| M5 | 0.8 | D4 | 3 | **BS284** | **BT284** |
| M6 | 1.0 | D5 | 3 | **BS315** | **BT315** |
| M7 | 1.0 | D5 | 3 | **BS345** | **BT345** |
| M8 | 1.25 | D5 | 3 | **BS365** | **BT365** |
| M8 | 1.0 | D5 | 3 | **BS375** | **BT375** |
| M10 | 1.5 | D6 | 3 | **BS426** | **BT426** |
| M10 | 1.25 | D5 | 3 | **BS435** | **BT435** |
| M12 | 1.75 | D6 | 3 | **BS506** | **BT506** |
| M12 | 1.25 | D5 | 3 | **BS525** | **BT525** |
| M14 | 2.0 | D7 | 3 | **BS547** | **BT547** |
| M14 | 1.5 | D6 | 3 | **BS556** | **BT556** |
| M16 | 2.0 | D7 | 3 | **BS607** | **BT607** |
| M16 | 1.5 | D6 | 3 | **BS616** | **BT616** |
| M18 | 2.5 | D7 | 4 | **BS657** | **BT657** |
| M18 | 1.5 | D6 | 4 | **BS676** | **BT676** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

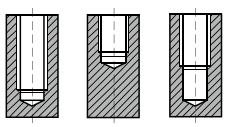
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL FLUTE TAPS

E6/E8/E9 SERIES

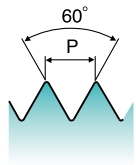
## METRIC SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Stainless Steels up to 28HRc

Hole type 2.5×D





DIN-ANSI Shank




VA | HSSE-V3 | M MF | D3~D7 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R45

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.5 | D3 | 3 | E6203 | E8203 | E9203 |
| M3.5 | 0.6 | D4 | 3 | E6224 | E8224 | E9224 |
| M4 | 0.7 | D4 | 3 | E6244 | E8244 | E9244 |
| M5 | 0.8 | D4 | 3 | E6284 | E8284 | E9284 |
| M6 | 1.0 | D5 | 3 | E6315 | E8315 | E9315 |
| M7 | 1.0 | D5 | 3 | E6345 | E8345 | E9345 |
| M8 | 1.25 | D5 | 3 | E6365 | E8365 | E9365 |
| M8 | 1.0 | D5 | 3 | E6375 | E8375 | E9375 |
| M10 | 1.5 | D6 | 3 | E6426 | E8426 | E9426 |
| M10 | 1.25 | D5 | 3 | E6435 | E8435 | E9435 |
| M12 | 1.75 | D6 | 3 | E6506 | E8506 | E9506 |
| M12 | 1.25 | D5 | 3 | E6525 | E8525 | E9525 |
| M14 | 2.0 | D7 | 3 | E6547 | E8547 | E9547 |
| M14 | 1.5 | D6 | 3 | E6556 | E8556 | E9556 |
| M16 | 2.0 | D7 | 3 | E6607 | E8607 | E9607 |
| M16 | 1.5 | D6 | 4 | E6616 | E8616 | E9616 |
| M18 | 2.5 | D7 | 4 | E6657 | E8657 | E9657 |
| M18 | 1.5 | D6 | 4 | E6676 | E8676 | E9676 |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

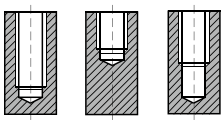
# SPIRAL FLUTE TAPS

D3 / E0 SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

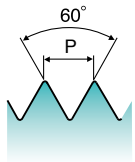
**A variety of H Limit**

**Hole type** 2.5×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| #2 | 56 | — | — | H2 | 2 | **D3082** | **E0082** |
| #3 | 48 | — | — | H2 | 2 | **D3122** | **E0122** |
| #4 | 40 | — | — | H2 | 3 | **D3162** | **E0162** |
| #4 | 40 | — | — | H3 | 3 | **D3163** | **E0163** |
| #4 | 40 | — | — | H4 | 3 | **D3164** | **E0164** |
| #4 | 40 | — | — | H5 | 3 | **D3165** | **E0165** |
| #4 | — | 48 | — | H2 | 3 | **D3162** | **E0162** |
| #5 | 40 | — | — | H2 | 3 | **D3202** | **E0202** |
| #6 | 32 | — | — | H2 | 3 | **D3242** | **E0242** |
| #6 | 32 | — | — | H3 | 3 | **D3243** | **E0243** |
| #6 | 32 | — | — | H5 | 3 | **D3245** | **E0245** |
| #6 | 32 | — | — | H7 | 3 | **D3247** | **E0247** |
| #6 | 32 | — | — | H11 | 3 | **D324A** | **E024A** |
| #6 | — | 40 | — | H2 | 3 | **D3262** | **E0262** |
| #8 | 32 | — | — | H2 | 3 | **D3282** | **E0282** |
| #8 | 32 | — | — | H3 | 3 | **D3283** | **E0283** |
| #8 | 32 | — | — | H5 | 3 | **D3285** | **E0285** |
| #8 | 32 | — | — | H7 | 3 | **D3287** | **E0287** |
| #8 | 32 | — | — | H11 | 3 | **D328A** | **E028A** |
| #10 | 24 | — | — | H3 | 3 | **D3323** | **E0323** |
| #10 | 24 | — | — | H5 | 3 | **D3325** | **E0325** |
| #10 | 24 | — | — | H11 | 3 | **D332A** | **E032A** |
| #10 | — | 32 | — | H2 | 3 | **D3342** | **E0342** |
| #10 | — | 32 | — | H3 | 3 | **D3343** | **E0343** |
| #10 | — | 32 | — | H5 | 3 | **D3345** | **E0345** |
| #10 | — | 32 | — | H7 | 3 | **D3347** | **E0347** |
| #10 | — | 32 | — | H11 | 3 | **D334A** | **E034A** |
| #12 | 24 | — | — | H3 | 3 | **D3363** | **E0363** |
| #12 | — | 28 | — | H3 | 3 | **D3383** | **E0383** |
| 1/4 | 20 | — | — | H2 | 3 | **D3402** | **E0402** |
| 1/4 | 20 | — | — | H3 | 3 | **D3403** | **E0403** |
| 1/4 | 20 | — | — | H5 | 3 | **D3405** | **E0405** |
| 1/4 | 20 | — | — | H7 | 3 | **D3407** | **E0407** |
| 1/4 | 20 | — | — | H11 | 3 | **D340A** | **E040A** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.
▶ Bright Finish Available: D4 Series
▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | K | |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

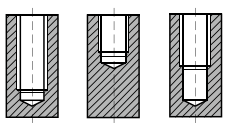
# SPIRAL FLUTE TAPS

D3 / E0 SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

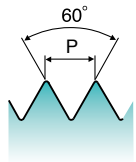
**A variety of H Limit**

Hole type 2.5×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| 1/4 | — | 28 | — | H2 | 3 | D3422 | E0422 |
| 1/4 | — | 28 | — | H3 | 3 | D3423 | E0423 |
| 1/4 | — | 28 | — | H4 | 3 | D3424 | E0424 |
| 1/4 | — | 28 | — | H5 | 3 | D3425 | E0425 |
| 1/4 | — | 28 | — | H7 | 3 | D3427 | E0427 |
| 1/4 | — | 28 | — | H11 | 3 | D342A | E042A |
| 5/16 | 18 | — | — | H2 | 3 | D3442 | E0442 |
| 5/16 | 18 | — | — | H3 | 3 | D3443 | E0443 |
| 5/16 | 18 | — | — | H5 | 3 | D3445 | E0445 |
| 5/16 | 18 | — | — | H7 | 3 | D3447 | E0447 |
| 5/16 | 18 | — | — | H11 | 3 | D344A | E044A |
| 5/16 | — | 24 | — | H2 | 3 | D3462 | E0462 |
| 5/16 | — | 24 | — | H3 | 3 | D3463 | E0463 |
| 5/16 | — | 24 | — | H4 | 3 | D3464 | E0464 |
| 5/16 | — | 24 | — | H5 | 3 | D3465 | E0465 |
| 5/16 | — | 24 | — | H6 | 3 | D3466 | E0466 |
| 5/16 | — | 24 | — | H7 | 3 | D3467 | E0467 |
| 5/16 | — | 24 | — | H11 | 3 | D346A | E046A |
| 3/8 | 16 | — | — | H2 | 3 | D3482 | E0482 |
| 3/8 | 16 | — | — | H3 | 3 | D3483 | E0483 |
| 3/8 | 16 | — | — | H5 | 3 | D3485 | E0485 |
| 3/8 | 16 | — | — | H7 | 3 | D3487 | E0487 |
| 3/8 | 16 | — | — | H11 | 3 | D348A | E048A |
| 3/8 | — | 24 | — | H2 | 3 | D3502 | E0502 |
| 3/8 | — | 24 | — | H3 | 3 | D3503 | E0503 |
| 3/8 | — | 24 | — | H4 | 3 | D3504 | E0504 |
| 3/8 | — | 24 | — | H5 | 3 | D3505 | E0505 |
| 3/8 | — | 24 | — | H7 | 3 | D3507 | E0507 |
| 3/8 | — | 24 | — | H11 | 3 | D350A | E050A |
| 7/16 | 14 | — | — | H3 | 3 | D3523 | E0523 |
| 7/16 | 14 | — | — | H5 | 3 | D3525 | E0525 |
| 7/16 | 14 | — | — | H7 | 3 | D3527 | E0527 |
| 7/16 | 14 | — | — | H11 | 3 | D352A | E052A |
| 7/16 | — | 20 | — | H3 | 3 | D3543 | E0543 |
| 7/16 | — | 20 | — | H5 | 3 | D3545 | E0545 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.
▶ Bright Finish Available: D4 Series

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

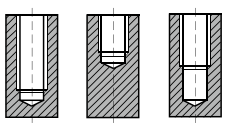
# SPIRAL FLUTE TAPS

D3 / E0 SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

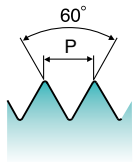
**A variety of H Limit**

**Hole type** 2.5×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| 7/16 | — | 20 | — | H7 | 3 | D3547 | E0547 |
| 7/16 | — | 20 | — | H11 | 3 | D354A | E054A |
| 1/2 | 13 | — | — | H3 | 3 | D3563 | E0563 |
| 1/2 | 13 | — | — | H5 | 3 | D3565 | E0565 |
| 1/2 | 13 | — | — | H7 | 3 | D3567 | E0567 |
| 1/2 | 13 | — | — | H11 | 3 | D356A | E056A |
| 1/2 | — | 20 | — | H3 | 3 | D3583 | E0583 |
| 1/2 | — | 20 | — | H5 | 3 | D3585 | E0585 |
| 1/2 | — | 20 | — | H7 | 3 | D3587 | E0587 |
| 1/2 | — | 20 | — | H11 | 3 | D358A | E058A |
| 9/16 | 12 | — | — | H3 | 4 | D3603 | E0603 |
| 9/16 | — | 18 | — | H3 | 4 | D3623 | E0623 |
| 5/8 | 11 | — | — | H3 | 4 | D3643 | E0643 |
| 5/8 | 11 | — | — | H5 | 4 | D3645 | E0645 |
| 5/8 | — | 18 | — | H3 | 4 | D3663 | E0663 |
| 3/4 | 10 | — | — | H3 | 4 | D3703 | E0703 |
| 3/4 | 10 | — | — | H5 | 4 | D3705 | E0705 |
| 3/4 | — | 16 | — | H3 | 4 | D3723 | E0723 |
| 3/4 | — | 16 | — | H5 | 4 | D3725 | E0725 |
| 7/8 | 9 | — | — | H5 | 4 | D3745 | E0745 |
| 7/8 | — | 14 | — | H4 | 4 | D3764 | E0764 |
| 1 | 8 | — | — | H5 | 4 | D3785 | E0785 |
| 1 | — | 12 | — | H4 | 4 | D3804 | E0804 |
| 1-1/8 | 7 | — | — | H6 | 4 | D3826 | E0826 |
| 1-1/8 | — | 12 | — | H5 | 4 | D3845 | E0845 |
| 1-1/8 | — | — | 8 | H6 | 4 | D3836 | E0836 |
| 1-1/4 | 7 | — | — | H6 | 4 | D3866 | E0866 |
| 1-1/4 | — | 12 | — | H5 | 4 | D3885 | E0885 |
| 1-1/4 | — | — | 8 | H6 | 4 | D3876 | E0876 |
| 1-3/8 | 6 | — | — | H6 | 4 | D3906 | E0906 |
| 1-3/8 | — | 12 | — | H5 | 4 | D3925 | E0925 |
| 1-3/8 | — | — | 8 | H6 | 4 | D3916 | E0916 |
| 1-1/2 | 6 | — | — | H6 | 4 | D3946 | E0946 |
| 1-1/2 | — | 12 | — | H5 | 4 | D3965 | E0965 |
| 1-1/2 | — | — | 8 | H6 | 4 | D3956 | E0956 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.
▶ Bright Finish Available: D4 Series

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

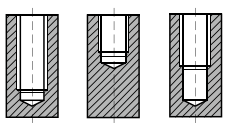
# SPIRAL FLUTE TAPS

BU / BV SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

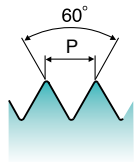
**A variety of D Limit**

Hole type 2.5×D





USCTI




VG | HSSE-V3 | M MF | USCTI 302A | D3~D11 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.50 | D3 | 3 | **BU203** | **BV203** |
| M3 | 0.50 | D11 | 3 | **BU20A** | **BV20A** |
| M3.5 | 0.60 | D4 | 3 | **BU224** | **BV224** |
| M3.5 | 0.60 | D11 | 3 | **BU22A** | **BV22A** |
| M4 | 0.70 | D4 | 3 | **BU244** | **BV244** |
| M4 | 0.70 | D11 | 3 | **BU24A** | **BV24A** |
| M5 | 0.80 | D4 | 3 | **BU284** | **BV284** |
| M5 | 0.80 | D11 | 3 | **BU28A** | **BV28A** |
| M6 | 1.00 | D5 | 3 | **BU315** | **BV315** |
| M6 | 1.00 | D11 | 3 | **BU31A** | **BV31A** |
| M7 | 1.00 | D5 | 3 | **BU345** | **BV345** |
| M7 | 1.00 | D11 | 3 | **BU34A** | **BV34A** |
| M8 | 1.00 | D5 | 3 | **BU375** | **BV375** |
| M8 | 1.00 | D11 | 3 | **BU37A** | **BV37A** |
| M8 | 1.25 | D5 | 3 | **BU365** | **BV365** |
| M8 | 1.25 | D11 | 3 | **BU36A** | **BV36A** |
| M10 | 1.00 | D5 | 3 | **BU445** | **BV445** |
| M10 | 1.00 | D11 | 3 | **BU44A** | **BV44A** |
| M10 | 1.25 | D5 | 3 | **BU435** | **BV435** |
| M10 | 1.25 | D11 | 3 | **BU43A** | **BV43A** |
| M10 | 1.50 | D6 | 3 | **BU426** | **BV426** |
| M10 | 1.50 | D11 | 3 | **BU42A** | **BV42A** |
| M12 | 1.25 | D5 | 3 | **BU525** | **BV525** |
| M12 | 1.25 | D11 | 3 | **BU52A** | **BV52A** |
| M12 | 1.50 | D6 | 3 | **BU516** | **BV516** |
| M12 | 1.50 | D11 | 3 | **BU51A** | **BV51A** |
| M12 | 1.75 | D6 | 3 | **BU506** | **BV506** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

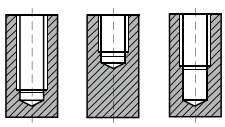
# SPIRAL FLUTE TAPS

BU / BV SERIES

## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

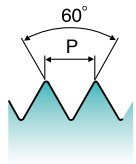
**A variety of D Limit**

**Hole type** 2.5×D





USCTI




VG | HSSE-V3 | M MF | USCTI 302A | D3~D11 | 60° | 2P~3P | Steam Oxide | Hardslick | R45

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M12 | 1.75 | D11 | 3 | **BU50A** | **BV50A** |
| M14 | 1.50 | D6 | 3 | **BU556** | **BV556** |
| M14 | 2.00 | D7 | 3 | **BU547** | **BV547** |
| M16 | 1.50 | D6 | 3 | **BU616** | **BV616** |
| M16 | 2.00 | D7 | 3 | **BU607** | **BV607** |
| M18 | 1.50 | D6 | 4 | **BU676** | **BV676** |
| M18 | 2.50 | D7 | 4 | **BU657** | **BV657** |
| M20 | 1.50 | D6 | 4 | **BU726** | **BV726** |
| M20 | 2.50 | D8 | 4 | **BU708** | **BV708** |
| M22 | 1.50 | D6 | 4 | **BU766** | **BV766** |
| M22 | 2.50 | D8 | 4 | **BU748** | **BV748** |
| M24 | 1.50 | D6 | 4 | **BU806** | **BV806** |
| M24 | 3.00 | D8 | 4 | **BU788** | **BV788** |
| M27 | 1.50 | D6 | 4 | **BU886** | **BV886** |
| M27 | 3.00 | D8 | 4 | **BU868** | **BV868** |
| M30 | 1.50 | D6 | 4 | **BU976** | **BV976** |
| M30 | 3.50 | D9 | 4 | **BU949** | **BV949** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

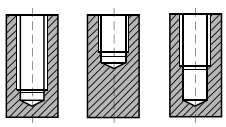
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

# SPIRAL FLUTE TAPS

E2 / E4 / E5 SERIES

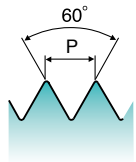
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE
## Steels up to 38HRc

Hole type 2.5×D





DIN-ANSI Shank




VG | HSSE-V3 | M MF | D3~D7 | 60° | 2P~3P | Steam Oxide | TiCN | Hardslick | R45

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.5 | D3 | 3 | **E2203** | **E4203** | **E5203** |
| M3.5 | 0.6 | D4 | 3 | **E2224** | **E4224** | **E5224** |
| M4 | 0.7 | D4 | 3 | **E2244** | **E4244** | **E5244** |
| M5 | 0.8 | D4 | 3 | **E2284** | **E4284** | **E5284** |
| M6 | 1.0 | D5 | 3 | **E2315** | **E4315** | **E5315** |
| M7 | 1.0 | D5 | 3 | **E2345** | **E4345** | **E5345** |
| M8 | 1.25 | D5 | 3 | **E2365** | **E4365** | **E5365** |
| M8 | 1.0 | D5 | 3 | **E2375** | **E4375** | **E5375** |
| M10 | 1.5 | D6 | 3 | **E2426** | **E4426** | **E5426** |
| M10 | 1.25 | D5 | 3 | **E2435** | **E4435** | **E5435** |
| M12 | 1.75 | D6 | 3 | **E2506** | **E4506** | **E5506** |
| M12 | 1.25 | D5 | 3 | **E2525** | **E4525** | **E5525** |
| M14 | 2.0 | D7 | 3 | **E2547** | **E4547** | **E5547** |
| M14 | 1.5 | D6 | 3 | **E2556** | **E4556** | **E5556** |
| M16 | 2.0 | D7 | 3 | **E2607** | **E4607** | **E5607** |
| M16 | 1.5 | D6 | 3 | **E2616** | **E4616** | **E5616** |
| M18 | 2.5 | D7 | 4 | **E2657** | **E4657** | **E5657** |
| M18 | 1.5 | D6 | 4 | **E2676** | **E4676** | **E5676** |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

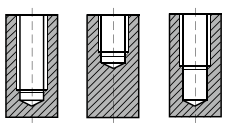
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

# SPIRAL FLUTE TAPS

C0 / D8 SERIES

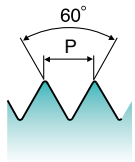
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Aluminum Alloys or Die Cast Aluminum

Hole type 2.5×D





USCTI




Al | HSSE-V3 | UNC UNF | USCTI 302A | H2~H5 | 60° | 2P~3P | Bright | Hardslick | R50

◇Call for Availability

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Hardslick |
| #4 | 40 | — | H2 | 2 | C0162 | D8162 |
| #4 | 40 | — | H3 | 2 | ◇ C0163 | D8163 |
| #6 | 32 | — | H2 | 2 | C0242 | D8242 |
| #6 | 32 | — | H3 | 2 | C0243 | D8243 |
| #8 | 32 | — | H2 | 2 | ◇ C0282 | D8282 |
| #8 | 32 | — | H3 | 2 | C0283 | D8283 |
| #10 | 24 | — | H3 | 2 | C0323 | D8323 |
| #10 | 32 | — | H2 | 2 | ◇ C0342 | D8342 |
| #10 | — | 32 | H3 | 2 | C0343 | D8343 |
| #10 | — | 32 | H5 | 2 | ◇ C0345 | D8345 |
| 1/4 | 20 | — | H3 | 2 | C0403 | D8403 |
| 1/4 | 20 | — | H5 | 2 | C0405 | D8405 |
| 1/4 | — | 28 | H3 | 2 | C0423 | D8423 |
| 5/16 | 18 | — | H3 | 2 | C0443 | D8443 |
| 5/16 | 18 | — | H5 | 2 | C0445 | D8445 |
| 5/16 | — | 24 | H3 | 2 | C0463 | D8463 |
| 5/16 | — | 24 | H5 | 2 | C0465 | D8465 |
| 3/8 | 16 | — | H3 | 2 | C0483 | D8483 |
| 3/8 | 16 | — | H5 | 2 | C0485 | D8485 |
| 3/8 | — | 24 | H3 | 2 | C0503 | D8503 |
| 3/8 | — | 24 | H5 | 2 | C0505 | D8505 |
| 1/2 | 13 | — | H3 | 2 | ◇ C0563 | D8563 |
| 1/2 | 13 | — | H5 | 2 | ◇ C0565 | D8565 |
| 1/2 | — | 20 | H3 | 2 | ◇ C0583 | D8583 |
| 5/8 | 11 | — | H3 | 3 | ◇ C0643 | D8643 |
| 5/8 | — | 18 | H3 | 3 | ◇ C0663 | D8663 |
| 3/4 | 10 | — | H3 | 3 | ◇ C0703 | D8703 |
| 3/4 | — | 16 | H3 | 3 | ◇ C0723 | D8723 |
| 7/8 | 9 | — | H4 | 3 | ◇ C0744 | D8744 |
| 7/8 | — | 14 | H4 | 3 | ◇ C0764 | D8764 |
| 1 | 8 | — | H4 | 3 | ◇ C0784 | D8784 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

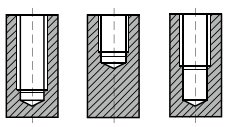
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ◎ | ◎ | | | | | |

# SPIRAL FLUTE TAPS

BW / BX SERIES

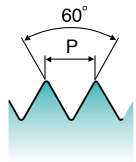
## SPIRAL FLUTE TAPS MODIFIED BOTTOMING STYLE for Aluminum Alloys or Die Cast Aluminum

Hole type 2.5×D





USCTI




AI | HSSE-V3 | M MF | USCTI 302A | D3~D6 | 60° | 2P~3P | Bright | Hardslick | R50

◇ Call for Availability

| SIZE | Pitch | Thread Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Bright | Hardslick |
| M3 | 0.5 | D3 | 2 | **BW203** | **BX203** |
| M4 | 0.7 | D4 | 2 | **BW244** | **BX244** |
| M5 | 0.8 | D5 | 2 | **BW285** | **BX285** |
| M6 | 1.0 | D5 | 2 | **BW315** | **BX315** |
| M8 | 1.25 | D5 | 2 | **BW365** | **BX365** |
| M10 | 1.50 | D6 | 2 | **BW426** | **BX426** |
| M10 | 1.25 | D5 | 2 | **BW435** | **BX435** |
| M12 | 1.75 | D6 | 2 | **BW506** | ◇ **BX506** |
| M12 | 1.50 | D5 | 2 | **BW515** | ◇ **BX515** |
| M12 | 1.25 | D5 | 2 | **BW525** | ◇ **BX525** |

▶ DIN Length available: Bright Finish F1 Series & Hardslick coated F3 Series
▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

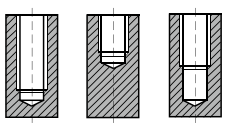
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ◎ | ◎ | | | | | |

# SPIRAL FLUTE TAPS

C2/C3/C4/D9 SERIES

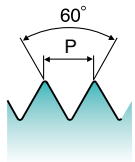
## STANDARD TAPS : SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





USCTI




GS | HSSE-V3 | UNC UNF | USCTI 302 | H2~H6 | 60° | 1.5P~2P | Steam Oxide | Bright | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Bright | TiN | Hardslick |
| #4 | 40 | — | H2 | 2 | C2162 | C3162 | C4162 | D9162 |
| #5 | 40 | — | H2 | 3 | C2202 | C3202 | C4202 | D9202 |
| #6 | 32 | — | H3 | 3 | C2243 | C3243 | C4243 | D9243 |
| #8 | 32 | — | H3 | 3 | C2283 | C3283 | C4283 | D9283 |
| #10 | 24 | — | H3 | 3 | C2323 | C3323 | C4323 | D9323 |
| #10 | — | 32 | H3 | 3 | C2343 | C3343 | C4343 | D9343 |
| 1/4 | 20 | — | H3 | 3 | C2403 | C3403 | C4403 | D9403 |
| 1/4 | 20 | — | H5 | 3 | C2405 | C3405 | C4405 | D9405 |
| 1/4 | — | 28 | H3 | 3 | C2423 | C3423 | C4423 | D9423 |
| 5/16 | 18 | — | H3 | 3 | C2443 | C3443 | C4443 | D9443 |
| 5/16 | 18 | — | H5 | 3 | C2445 | C3445 | C4445 | D9445 |
| 5/16 | — | 24 | H3 | 3 | C2463 | C3463 | C4463 | D9463 |
| 3/8 | 16 | — | H3 | 3 | C2483 | C3483 | C4483 | D9483 |
| 3/8 | 16 | — | H5 | 3 | C2485 | C3485 | C4485 | D9485 |
| 3/8 | — | 24 | H3 | 3 | C2503 | C3503 | C4503 | D9503 |
| 7/16 | 14 | — | H3 | 3 | C2523 | C3523 | C4523 | D9523 |
| 7/16 | 14 | — | H5 | 3 | C2525 | C3525 | C4525 | D9525 |
| 7/16 | — | 20 | H3 | 3 | C2543 | C3543 | C4543 | D9543 |
| 7/16 | — | 20 | H5 | 3 | C2545 | C3545 | C4545 | D9545 |
| 1/2 | 13 | — | H3 | 3 | C2563 | C3563 | C4563 | D9563 |
| 1/2 | 13 | — | H5 | 3 | C2565 | C3565 | C4565 | D9565 |
| 1/2 | — | 20 | H3 | 3 | C2583 | C3583 | C4583 | D9583 |
| 1/2 | — | 20 | H5 | 3 | C2585 | C3585 | C4585 | D9585 |
| 9/16 | 12 | — | H5 | 3 | C2605 | C3605 | C4605 | D9605 |
| 9/16 | — | 18 | H5 | 3 | C2625 | C3625 | C4625 | D9625 |
| 5/8 | 11 | — | H3 | 4 | C2643 | C3643 | C4643 | D9643 |
| 5/8 | 11 | — | H5 | 4 | C2645 | C3645 | C4645 | D9645 |
| 5/8 | — | 18 | H3 | 4 | C2663 | C3663 | C4663 | D9663 |
| 3/4 | 10 | — | H3 | 4 | C2703 | C3703 | C4703 | D9703 |
| 3/4 | 10 | — | H5 | 4 | C2705 | C3705 | C4705 | D9705 |
| 3/4 | — | 16 | H3 | 4 | C2723 | C3723 | C4723 | D9723 |
| 7/8 | 9 | — | H4 | 4 | C2744 | C3744 | C4744 | D9744 |
| 7/8 | — | 14 | H6 | 4 | C2766 | C3766 | C4766 | D9766 |
| 1 | 8 | — | H4 | 4 | C2784 | C3784 | C4784 | D9784 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

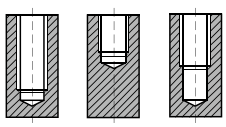
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

F4/F8/F6 SERIES

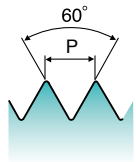
## SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





USCTI




GS | HSS-V | UNC UNF | USCTI 302A | H2~H6 | 60° | 1.5P~2P | Steam Oxide | TiN | Hardslick | R50

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | F4082 | F8082 | F6082 |
| #4 | 40 | — | H2 | 2 | F4162 | F8162 | F6162 |
| #5 | 40 | — | H2 | 2 | F4202 | F8202 | F6202 |
| #6 | 32 | — | H3 | 3 | F4243 | F8243 | F6243 |
| #8 | 32 | — | H3 | 3 | F4283 | F8283 | F6283 |
| #10 | 24 | — | H3 | 3 | F4323 | F8323 | F6323 |
| #10 | — | 32 | H3 | 3 | F4343 | F8343 | F6343 |
| 1/4 | 20 | — | H3 | 3 | F4403 | F8403 | F6403 |
| 1/4 | 20 | — | H5 | 3 | F4405 | F8405 | F6405 |
| 1/4 | — | 28 | H3 | 3 | F4423 | F8423 | F6423 |
| 5/16 | 18 | — | H3 | 3 | F4443 | F8443 | F6443 |
| 5/16 | 18 | — | H5 | 3 | F4445 | F8445 | F6445 |
| 5/16 | — | 24 | H3 | 3 | F4463 | F8463 | F6463 |
| 3/8 | 16 | — | H3 | 3 | F4483 | F8483 | F6483 |
| 3/8 | 16 | — | H5 | 3 | F4485 | F8485 | F6485 |
| 3/8 | — | 24 | H3 | 3 | F4503 | F8503 | F6503 |
| 7/16 | 14 | — | H3 | 3 | F4523 | F8523 | F6523 |
| 7/16 | 14 | — | H5 | 3 | F4525 | F8525 | F6525 |
| 7/16 | — | 20 | H3 | 3 | F4543 | F8543 | F6543 |
| 7/16 | — | 20 | H5 | 3 | F4545 | F8545 | F6545 |
| 1/2 | 13 | — | H3 | 3 | F4563 | F8563 | F6563 |
| 1/2 | 13 | — | H5 | 3 | F4565 | F8565 | F6565 |
| 1/2 | — | 20 | H3 | 3 | F4583 | F8583 | F6583 |
| 1/2 | — | 20 | H5 | 3 | F4585 | F8585 | F6585 |
| 9/16 | 12 | — | H3 | 3 | F4603 | F8603 | F6603 |
| 9/16 | 12 | — | H5 | 3 | F4605 | F8605 | F6605 |
| 9/16 | — | 18 | H3 | 3 | F4623 | F8623 | F6623 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

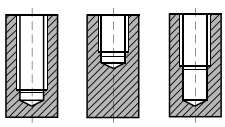
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

F4/F8/F6 SERIES

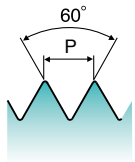
## SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





USCTI




GS | HSS-V | UNC UNF | USCTI 302A | H2~H6 | 60° | 1.5P~2P | Steam Oxide | TiN | Hardslick | R50

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiN | Hardslick |
| 9/16 | — | 18 | H5 | 3 | **F4625** | **F8625** | **F6625** |
| 5/8 | 11 | — | H3 | 4 | **F4643** | **F8643** | **F6643** |
| 5/8 | 11 | — | H5 | 4 | **F4645** | **F8645** | **F6645** |
| 5/8 | — | 18 | H3 | 4 | **F4663** | **F8663** | **F6663** |
| 5/8 | — | 18 | H5 | 4 | **F4665** | **F8665** | **F6665** |
| 3/4 | 10 | — | H3 | 4 | **F4703** | **F8703** | **F6703** |
| 3/4 | 10 | — | H5 | 4 | **F4705** | **F8705** | **F6705** |
| 3/4 | — | 16 | H3 | 4 | **F4723** | **F8723** | **F6723** |
| 3/4 | — | 16 | H5 | 4 | **F4725** | **F8725** | **F6725** |
| 7/8 | 9 | — | H4 | 4 | **F4744** | **F8744** | **F6744** |
| 7/8 | 9 | — | H6 | 4 | **F4746** | **F8746** | **F6746** |
| 7/8 | — | 14 | H4 | 4 | **F4764** | **F8764** | **F6764** |
| 7/8 | — | 14 | H6 | 4 | **F4766** | **F8766** | **F6766** |
| 1 | 8 | — | H4 | 4 | **F4784** | **F8784** | **F6784** |
| 1 | 8 | — | H6 | 4 | **F4786** | **F8786** | **F6786** |
| 1 | — | 12 | H6 | 4 | **F4806** | **F8806** | **F6806** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

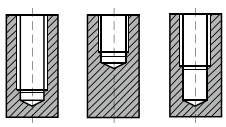
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

G4 / G5 / G6 SERIES

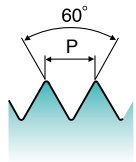
## SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





USCTI




GS | HSS-V | M MF | USCTI 302A | D3~D6 | 60° | 1.5P~2P | Bright | TiCN | Hardslick | R50

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Bright | TiCN | Hardslick |
| M3 | 0.5 | D3 | 2 | G4203 | G5203 | G6203 |
| M3.5 | 0.6 | D4 | 2 | G4224 | G5224 | G6224 |
| M4 | 0.7 | D4 | 3 | G4244 | G5244 | G6244 |
| M5 | 0.8 | D4 | 3 | G4284 | G5284 | G6284 |
| M6 | 1.0 | D5 | 3 | G4315 | G5315 | G6315 |
| M7 | 1.0 | D5 | 3 | G4345 | G5345 | G6345 |
| M8 | 1.25 | D5 | 3 | G4365 | G5365 | G6365 |
| M8 | 1.0 | D5 | 3 | G4375 | G5375 | G6375 |
| M10 | 1.5 | D6 | 3 | G4426 | G5426 | G6426 |
| M10 | 1.25 | D5 | 3 | G4435 | G5435 | G6435 |
| M12 | 1.75 | D6 | 3 | G4506 | G5506 | G6506 |
| M12 | 1.25 | D5 | 3 | G4525 | G5525 | G6525 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

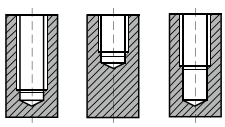
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

G0 / G1 / G2 SERIES

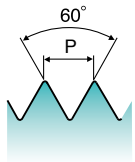
## SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





DIN-ANSI Shank




GS | HSS-V | UNC UNF | H2~H6 | 60° | 2P~3P | Bright | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | G0082 | G1082 | G2082 |
| #4 | 40 | — | H2 | 2 | G0162 | G1162 | G2162 |
| #5 | 40 | — | H2 | 3 | G0202 | G1202 | G2202 |
| #6 | 32 | — | H3 | 3 | G0243 | G1243 | G2243 |
| #8 | 32 | — | H3 | 3 | G0283 | G1283 | G2283 |
| #10 | 24 | — | H3 | 3 | G0323 | G1323 | G2323 |
| #10 | — | 32 | H3 | 3 | G0343 | G1343 | G2343 |
| 1/4 | 20 | — | H3 | 3 | G0403 | G1403 | G2403 |
| 1/4 | 20 | — | H5 | 3 | G0405 | G1405 | G2405 |
| 1/4 | — | 28 | H3 | 3 | G0423 | G1423 | G2423 |
| 5/16 | 18 | — | H3 | 3 | G0443 | G1443 | G2443 |
| 5/16 | 18 | — | H5 | 3 | G0445 | G1445 | G2445 |
| 5/16 | — | 24 | H3 | 3 | G0463 | G1463 | G2463 |
| 3/8 | 16 | — | H3 | 3 | G0483 | G1483 | G2483 |
| 3/8 | 16 | — | H5 | 3 | G0485 | G1485 | G2485 |
| 3/8 | — | 24 | H3 | 3 | G0503 | G1503 | G2503 |
| 7/16 | 14 | — | H3 | 3 | G0523 | G1523 | G2523 |
| 7/16 | 14 | — | H5 | 3 | G0525 | G1525 | G2525 |
| 7/16 | — | 20 | H3 | 3 | G0543 | G1543 | G2543 |
| 7/16 | — | 20 | H5 | 3 | G0545 | G1545 | G2545 |
| 1/2 | 13 | — | H3 | 3 | G0563 | G1563 | G2563 |
| 1/2 | 13 | — | H5 | 3 | G0565 | G1565 | G2565 |
| 1/2 | — | 20 | H3 | 3 | G0583 | G1583 | G2583 |
| 1/2 | — | 20 | H5 | 3 | G0585 | G1585 | G2585 |
| 9/16 | 12 | — | H3 | 3 | G0603 | G1603 | G2603 |
| 9/16 | 12 | — | H5 | 3 | G0605 | G1605 | G2605 |
| 9/16 | — | 18 | H3 | 3 | G0623 | G1623 | G2623 |

▶For tapping depth on DIN / ANSI Shank T aps, refer to DIN Table on page 493 & 494.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

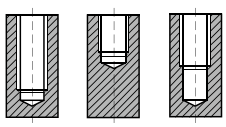
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

G0 / G1 / G2 SERIES

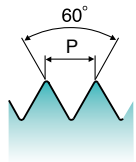
## SPIRAL FLUTE TAPS BOTTOMING STYLE for General Purpose

Hole type 2.5×D





DIN-ANSI Shank




GS | HSS-V | UNC UNF | H2~H6 | 60° | 2P~3P | Bright | TiN | Hardslick | R45

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | TiN | Hardslick |
| 9/16 | — | 18 | H5 | 3 | G0625 | G1625 | G2625 |
| 5/8 | 11 | — | H3 | 4 | G0643 | G1643 | G2643 |
| 5/8 | 11 | — | H5 | 4 | G0645 | G1645 | G2645 |
| 5/8 | — | 18 | H3 | 4 | G0663 | G1663 | G2663 |
| 5/8 | — | 18 | H5 | 4 | G0665 | G1665 | G2665 |
| 3/4 | 10 | — | H3 | 4 | G0703 | G1703 | G2703 |
| 3/4 | 10 | — | H5 | 4 | G0705 | G1705 | G2705 |
| 3/4 | — | 16 | H3 | 4 | G0723 | G1723 | G2723 |
| 3/4 | — | 16 | H5 | 4 | G0725 | G1725 | G2725 |
| 7/8 | 9 | — | H6 | 4 | G0746 | G1746 | G2746 |
| 7/8 | — | 14 | H4 | 4 | G0764 | G1764 | G2764 |
| 7/8 | — | 14 | H6 | 4 | G0766 | G1766 | G2766 |
| 1 | 8 | — | H6 | 4 | G0786 | G1786 | G2786 |
| 1 | — | 12 | H4 | 4 | G0804 | G1804 | G2804 |
| 1 | — | 12 | H6 | 4 | G0806 | G1806 | G2806 |

▶ For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

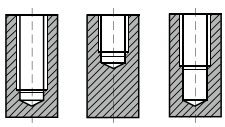
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

**T7A96 / T6A96 / T8A96** SERIES
**T7295 / T6295 / T8295** SERIES

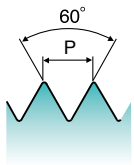
## STANDARD TAPS : SPIRAL FLUTE TAPS for General Purpose

**Hole type** 2.5×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H2~H5 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | Steam Oxide | TiN | R50

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Plug | | | Bottoming | | |
| | UNC | UNF | | | Bright | Steam Oxide | TiN | Bright | Steam Oxide | TiN |
| #3 | 48 | — | H2 | 2 | T7A96122 | T6A96122 | T8A96122 | T7295122 | T6295122 | T8295122 |
| #4 | 40 | — | H2 | 2 | T7A96162 | T6A96162 | T8A96162 | T7295162 | T6295162 | T8295162 |
| #5 | 40 | — | H2 | 2 | T7A96202 | T6A96202 | T8A96202 | T7295202 | T6295202 | T8295202 |
| #6 | 32 | — | H2 | 2 | T7A96242 | T6A96242 | T8A96242 | T7295242 | T6295242 | T8295242 |
| #6 | 32 | — | H3 | 2 | T7A96243 | T6A96243 | T8A96243 | T7295243 | T6295243 | T8295243 |
| #8 | 32 | — | H2 | 3 | T7A96282 | T6A96282 | T8A96282 | T7295282 | T6295282 | T8295282 |
| #8 | 32 | — | H3 | 3 | T7A96283 | T6A96283 | T8A96283 | T7295283 | T6295283 | T8295283 |
| #10 | 24 | — | H3 | 3 | T7A96323 | T6A96323 | T8A96323 | T7295323 | T6295323 | T8295323 |
| #10 | — | 32 | H2 | 3 | T7A96342 | T6A96342 | T8A96342 | T7295342 | T6295342 | T8295342 |
| #10 | — | 32 | H3 | 3 | T7A96343 | T6A96343 | T8A96343 | T7295343 | T6295343 | T8295343 |
| #12 | 24 | — | H3 | 3 | T7A96363 | T6A96363 | T8A96363 | T7295363 | T6295363 | T8295363 |
| 1/4 | 20 | — | H3 | 3 | T7A96403 | T6A96403 | T8A96403 | T7295403 | T6295403 | T8295403 |
| 1/4 | 20 | — | H5 | 3 | T7A96405 | T6A96405 | T8A96405 | T7295405 | T6295405 | T8295405 |
| 1/4 | — | 28 | H3 | 3 | T7A96423 | T6A96423 | T8A96423 | T7295423 | T6295423 | T8295423 |
| 5/16 | 18 | — | H3 | 3 | T7A96443 | T6A96443 | T8A96443 | T7295443 | T6295443 | T8295443 |
| 5/16 | 18 | — | H5 | 3 | T7A96445 | T6A96445 | T8A96445 | T7295445 | T6295445 | T8295445 |
| 5/16 | — | 24 | H3 | 3 | T7A96463 | T6A96463 | T8A96463 | T7295463 | T6295463 | T8295463 |
| 3/8 | 16 | — | H3 | 3 | T7A96483 | T6A96483 | T8A96483 | T7295483 | T6295483 | T8295483 |
| 3/8 | 16 | — | H5 | 3 | T7A96485 | T6A96485 | T8A96485 | T7295485 | T6295485 | T8295485 |
| 3/8 | — | 24 | H3 | 3 | T7A96503 | T6A96503 | T8A96503 | T7295503 | T6295503 | T8295503 |
| 7/16 | 14 | — | H3 | 3 | T7A96523 | T6A96523 | T8A96523 | T7295523 | T6295523 | T8295523 |
| 7/16 | 14 | — | H5 | 3 | — | — | — | T7295525 | T6295525 | T8295525 |
| 7/16 | — | 20 | H3 | 3 | T7A96543 | T6A96543 | T8A96543 | T7295543 | T6295543 | T8295543 |
| 1/2 | 13 | — | H3 | 3 | T7A96563 | T6A96563 | T8A96563 | T7295563 | T6295563 | T8295563 |
| 1/2 | 13 | — | H5 | 3 | T7A96565 | T6A96565 | T8A96565 | T7295565 | T6295565 | T8295565 |
| 1/2 | — | 20 | H3 | 3 | T7A96583 | T6A96583 | T8A96583 | T7295583 | T6295583 | T8295583 |
| 5/8 | 11 | — | H3 | 4 | T7A96643 | T6A96643 | T8A96643 | T7295643 | T6295643 | T8295643 |
| 5/8 | — | 18 | H3 | 4 | T7A96663 | T6A96663 | T8A96663 | T7295663 | T6295663 | T8295663 |
| 3/4 | 10 | — | H3 | 4 | T7A96703 | T6A96703 | T8A96703 | T7295703 | T6295703 | T8295703 |
| 3/4 | — | 16 | H3 | 4 | T7A96723 | T6A96723 | T8A96723 | T7295723 | T6295723 | T8295723 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

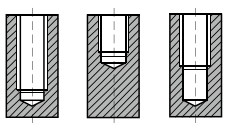
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

**T7A86 / T6A86 / T8A86** SERIES
**T7A85 / T6A85 / T8A85** SERIES

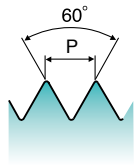
## STANDARD TAPS : METRIC SPIRAL FLUTE TAPS for General Purpose

**Hole type** 2.5×D





USCTI




**GS** | **HSS** | **M MF** | **USCTI 302** | **D3~D6** | **60°** | **4P~5P** Plug | **1.5P~2P** Bottoming | **Bright** | **Steam Oxide** | **TiN** | **R50**

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Plug | | | Bottoming | | |
| | | | | Bright | Steam Oxide | TiN | Bright | Steam Oxide | TiN |
| M3 | 0.5 | D3 | 2 | T7A86203 | T6A86203 | T8A86203 | T7A85203 | T6A85203 | T8A85203 |
| M4 | 0.7 | D4 | 3 | T7A86244 | T6A86244 | T8A86244 | T7A85244 | T6A85244 | T8A85244 |
| M5 | 0.8 | D4 | 3 | T7A86284 | T6A86284 | T8A86284 | T7A85284 | T6A85284 | T8A85284 |
| M6 | 1.0 | D5 | 3 | T7A86315 | T6A86315 | T8A86315 | T7A85315 | T6A85315 | T8A85315 |
| M8 | 1.25 | D5 | 3 | T7A86365 | T6A86365 | T8A86365 | T7A85365 | T6A85365 | T8A85365 |
| M10 | 1.5 | D6 | 3 | T7A86426 | T6A86426 | T8A86426 | T7A85426 | T6A85426 | T8A85426 |
| M12 | 1.75 | D6 | 3 | T7A86506 | T6A86506 | T8A86506 | T7A85506 | T6A85506 | T8A85506 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

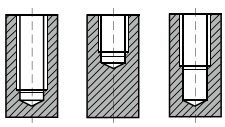
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL FLUTE TAPS

**T7D01/T8D01** SERIES
**T7D02/T8D02** SERIES

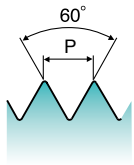
## SPIRAL FLUTE TAP, 6" EXTENSION

**Hole type** 2.5×D





**USCTI Long Shank**




GS | HSS | UNC UNF | USCTI Long Shank | H3 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN | R50

| SIZE | UNC | UNF | Thread Limit | Overall Length | No. of Flutes | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Plug | | Bottoming | |
| | | | | | | Bright | TiN | Bright | TiN |
| #6 | 32 | — | H3 | 6 | 2 | T7D01243 | T8D01243 | T7D02243 | T8D02243 |
| #8 | 32 | — | H3 | 6 | 3 | T7D01283 | T8D01283 | T7D02283 | T8D02283 |
| #10 | 24 | — | H3 | 6 | 3 | T7D01323 | T8D01323 | T7D02323 | T8D02323 |
| #10 | — | 32 | H3 | 6 | 3 | T7D01343 | T8D01343 | T7D02343 | T8D02343 |
| 1/4 | 20 | — | H3 | 6 | 3 | T7D01403 | T8D01403 | T7D02403 | T8D02403 |
| 1/4 | — | 28 | H3 | 6 | 3 | T7D01423 | T8D01423 | T7D02423 | T8D02423 |
| 5/16 | 18 | — | H3 | 6 | 3 | T7D01443 | T8D01443 | T7D02443 | T8D02443 |
| 3/8 | 16 | — | H3 | 6 | 3 | T7D01483 | T8D01483 | T7D02483 | T8D02483 |
| 7/16 | 14 | — | H3 | 6 | 3 | T7D01523 | T8D01523 | T7D02523 | T8D02523 |
| 1/2 | 13 | — | H3 | 6 | 3 | T7D01563 | T8D01563 | T7D02563 | T8D02563 |
| 5/8 | 11 | — | H3 | 6 | 4 | T7D01643 | T8D01643 | T7D02643 | T8D02643 |

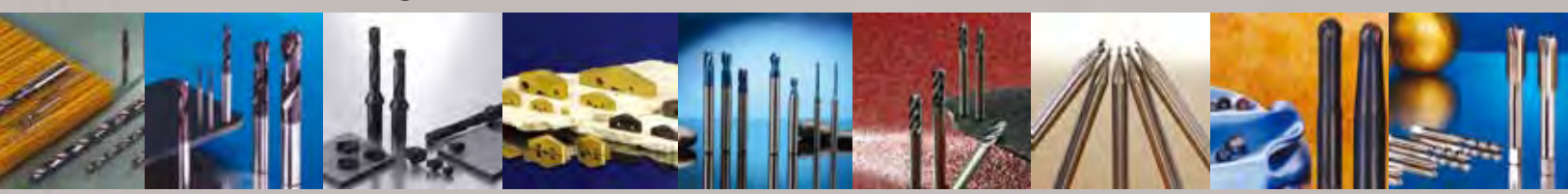
▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

Global Cutting Tool Leader **YG-1**



HSS

Being the best through innovation



# SPIRAL POINT TAPS

- Tapping Through Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS

## SPIRAL POINT TAPS

Tapping Through Holes / Super HSS, HSS-E, HSS-PM, HSS-V & HSS

### INCH

| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| M9/O1 |  | Super HSS | UNC/UNF | VG | USCTI 302A | H2~H6 | 4 ~ 5P | | Steam Oxide Hardslick | 400 |
| N7/N8 |  | Super HSS | M/MF | VG | USCTI 302A | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 402 |
| N4/O5 |  | Super HSS | UNC/UNF | VG | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Steam Oxide Hardslick | 403 |
| N3/O3 |  | Super HSS | M/MF | VG | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 404 |
| M4/M6/M7 |  | P-HSS | UNC/UNF | HR | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 405 |
| TQ808/ TK808/TR808 |  | P-HSS | M/MF | HR | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 406 |
| I3/I5/J6 |  | P-HSS | UNC/UNF | Ti Ni | USCTI 302A | H2~H5 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 407 |
| M2/M3 |  | P-HSS | UNC/UNF | VA | USCTI Long Shank | H2~H3 | 4 ~ 5P | | Hardslick | 409 |
| I0/I2/J2 |  | HSSE-V3 | UNC/UNF | VA | USCTI 302A | H2~H7 | 4 ~ 5P | 3.0D | Steam Oxide TiN Hardslick | 410 |
| O9/IA |  | HSSE-V3 | M/MF | VA | USCTI 302A | D3~D7 | 4 ~ 5P | | Steam Oxide Hardslick | 413 |
| K3/K5/K6 |  | HSSE-V3 | M/MF | VA | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 414 |
| J3/J8 |  | HSSE-V3 | UNC/UNF | VG | USCTI 302A | H2~H11 | 4 ~ 5P | | Steam Oxide Hardslick | 415 |
| IB/IC |  | HSSE-V3 | M/MF | VG | USCTI 302A | D3~D11 | 4 ~ 5P | | Steam Oxide Hardslick | 419 |
| J9/K7/K2 |  | HSSE-V3 | M/MF | VG | DIN-ANSI Shank | D3~D7 | 4 ~ 5P | | Steam Oxide TiCN Hardslick | 421 |
| T2496 |  | HSSE-V3 | UNC/UNF | Al | USCTI 302A | H2~H5 | 4 ~ 5P | | Bright | 422 |
| T2K01 |  | HSSE-V3 | M/MF | Al | USCTI 302A | D3~D6 | 4 ~ 5P | | Bright | 423 |
| I9/J0/J1/J7 |  | HSSE-V3 | UNC/UNF | GS | USCTI | H2~H6 | 4 ~ 5P | | Steam Oxide Bright/TiN Hardslick | 424 |
| K9/L0/L1 |  | HSS-V | UNC/UNF | GS | USCTI 302A | H2~H6 | 4 ~ 5P | | Bright TiN Hardslick | 425 |

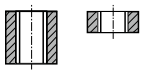
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| L7/L8/L9 |  | HSS-V | M/MF | GS | USCTI 302A | D3~D6 | 4 ~ 5P | 3.0D | Bright TiCN Hardslick | 426 |
| L3/L4/L5 |  | HSS-V | UNC/UNF | GS | DIN-ANSI Shank | H2~H6 | 4 ~ 5P | | Bright TiN Hardslick | 427 |
| T7216/T6216/ T8216T7C16/ T6C16/T8C16 |  | HSS | UNC/UNF | GS | USCTI 302 | H1~H7 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | 428 |
| T7256/ T6256 |  | HSS | UNC/UNF | GS | USCTI 302 | H1~H7 | 1.5 ~ 2P | | Bright Finish Steam Oxide | 432 |
| T7217/ T6217/ T8217 |  | HSS | M/MF | GS | USCTI 302 | D3~D7 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | 434 |
| T7226/ T6226/ T8226 |  | HSS | UNC/UNF | GS | USCTI 302 | +.005" oversize | 4 ~ 5P | | Bright Finish Steam Oxide TiN | 435 |
| T7B17/ T6B17/ T8B17 |  | HSS | M/MF | GS | USCTI 302 | +.127mm oversize | 4 ~ 5P | | Bright Finish Steam Oxide TiN | 436 |
| T7236/T6236/ T8236T7G36/ T6G36T8G36 |  | HSS | UNC/UNF | GS | USCTI Long Shank | H3 | 4 ~ 5P | | Bright Finish Steam Oxide TiN | 437 |

# SPIRAL POINT TAPS

M9/01 SERIES

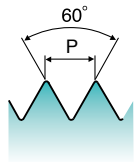
## SPIRAL POINT TAPS PLUG STYLE
## for Steels & Stainless Steels up to 35HRc

Hole type 3.0×D





USCTI




VG | Super HSS | UNC UNF | USCTI 302A | H2~H6 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| #2 | 56 | — | H2 | 2 | M9082 | 01082 |
| #4 | 40 | — | H2 | 2 | M9162 | 01162 |
| #4 | 40 | — | H3 | 2 | M9163 | 01163 |
| #4 | 40 | — | H4 | 2 | M9164 | 01164 |
| #4 | 40 | — | H5 | 2 | M9165 | 01165 |
| #5 | 40 | — | H2 | 3 | M9202 | 01202 |
| #6 | 32 | — | H2 | 3 | M9242 | 01242 |
| #6 | 32 | — | H3 | 3 | M9243 | 01243 |
| #6 | 32 | — | H4 | 3 | M9244 | 01244 |
| #6 | 32 | — | H5 | 3 | M9245 | 01245 |
| #6 | 32 | — | H6 | 3 | M9246 | 01246 |
| #8 | 32 | — | H2 | 3 | M9282 | 01282 |
| #8 | 32 | — | H3 | 3 | M9283 | 01283 |
| #8 | 32 | — | H4 | 3 | M9284 | 01284 |
| #8 | 32 | — | H5 | 3 | M9285 | 01285 |
| #8 | 32 | — | H6 | 3 | M9286 | 01286 |
| #10 | 24 | — | H3 | 3 | M9323 | 01323 |
| #10 | 24 | — | H5 | 3 | M9325 | 01325 |
| #10 | — | 32 | H2 | 3 | M9342 | 01342 |
| #10 | — | 32 | H3 | 3 | M9343 | 01343 |
| #10 | — | 32 | H4 | 3 | M9344 | 01344 |
| #10 | — | 32 | H5 | 3 | M9345 | 01345 |
| #10 | — | 32 | H6 | 3 | M9346 | 01346 |
| 1/4 | 20 | — | H3 | 3 | M9403 | 01403 |
| 1/4 | 20 | — | H5 | 3 | M9405 | 01405 |
| 1/4 | — | 28 | H3 | 3 | M9423 | 01423 |
| 1/4 | — | 28 | H4 | 3 | M9424 | 01424 |
| 1/4 | — | 28 | H5 | 3 | M9425 | 01425 |
| 1/4 | — | 28 | H6 | 3 | M9426 | 01426 |
| 5/16 | 18 | — | H3 | 3 | M9443 | 01443 |
| 5/16 | 18 | — | H5 | 3 | M9445 | 01445 |
| 5/16 | — | 24 | H3 | 3 | M9463 | 01463 |
| 5/16 | — | 24 | H4 | 3 | M9464 | 01464 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

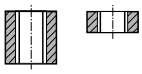
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

**M9/01 SERIES**

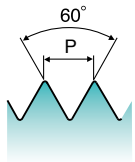
## SPIRAL POINT TAPS PLUG STYLE
## for Steels & Stainless Steels up to 35HRc

Hole type 3.0×D





USCTI




VG | Super HSS | UNC UNF | USCTI 302A | H2~H6 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| 5/16 | — | 24 | H5 | 3 | M9465 | 01465 |
| 5/16 | — | 24 | H6 | 3 | M9466 | 01466 |
| 3/8 | 16 | — | H3 | 3 | M9483 | 01483 |
| 3/8 | 16 | — | H5 | 3 | M9485 | 01485 |
| 3/8 | — | 24 | H3 | 3 | M9503 | 01503 |
| 3/8 | — | 24 | H4 | 3 | M9504 | 01504 |
| 3/8 | — | 24 | H5 | 3 | M9505 | 01505 |
| 3/8 | — | 24 | H6 | 3 | M9506 | 01506 |
| 7/16 | 14 | — | H3 | 3 | M9523 | 01523 |
| 7/16 | 14 | — | H5 | 3 | M9525 | 01525 |
| 7/16 | — | 20 | H3 | 3 | M9543 | 01543 |
| 7/16 | — | 20 | H5 | 3 | M9545 | 01545 |
| 1/2 | 13 | — | H3 | 3 | M9563 | 01563 |
| 1/2 | 13 | — | H5 | 3 | M9565 | 01565 |
| 1/2 | — | 20 | H3 | 3 | M9583 | 01583 |
| 1/2 | — | 20 | H5 | 3 | M9585 | 01585 |
| 9/16 | 12 | — | H5 | 3 | M9605 | 01605 |
| 9/16 | — | 18 | H5 | 3 | M9625 | 01625 |
| 5/8 | 11 | — | H3 | 3 | M9643 | 01643 |
| 5/8 | 11 | — | H5 | 3 | M9645 | 01645 |
| 5/8 | — | 18 | H3 | 3 | M9663 | 01663 |
| 5/8 | — | 18 | H5 | 3 | M9665 | 01665 |
| 3/4 | 10 | — | H3 | 3 | M9703 | 01703 |
| 3/4 | 10 | — | H5 | 3 | M9705 | 01705 |
| 3/4 | — | 16 | H3 | 3 | M9723 | 01723 |
| 3/4 | — | 16 | H5 | 3 | M9725 | 01725 |
| 7/8 | 9 | — | H6 | 3 | M9746 | 01746 |
| 7/8 | — | 14 | H6 | 3 | M9766 | 01766 |
| 1 | 8 | — | H6 | 3 | M9786 | 01786 |
| 1 | — | 12 | H6 | 3 | M9806 | 01806 |
| 1-1/8 | 8 | — | H6 | 4 | M9836 | 01836 |
| 1-1/4 | 8 | — | H6 | 4 | M9876 | 01876 |
| 1-3/8 | 8 | — | H6 | 4 | M9916 | 01916 |
| 1-1/2 | 8 | — | H6 | 4 | M9956 | 01956 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

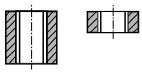
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

**N7/N8** SERIES

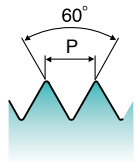
## METRIC SPIRAL POINT TAPS PLUG STYLE for Steels & Stainless Steels up to 35HRc

**Hole type** 3.0×D





USCTI




VG | Super HSS | M MF | USCTI 302A | D3~D7 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **N7203** | **N8203** |
| M3.5 | 0.6 | D4 | 3 | **N7224** | **N8224** |
| M4 | 0.7 | D4 | 3 | **N7244** | **N8244** |
| M5 | 0.8 | D4 | 3 | **N7284** | **N8284** |
| M6 | 1.0 | D5 | 3 | **N7315** | **N8315** |
| M7 | 1.0 | D5 | 3 | **N7345** | **N8345** |
| M8 | 1.25 | D5 | 3 | **N7365** | **N8365** |
| M8 | 1.0 | D5 | 3 | **N7375** | **N8375** |
| M10 | 1.5 | D6 | 3 | **N7426** | **N8426** |
| M10 | 1.25 | D5 | 3 | **N7435** | **N8435** |
| M12 | 1.75 | D6 | 3 | **N7506** | **N8506** |
| M12 | 1.25 | D5 | 3 | **N7525** | **N8525** |
| M14 | 2.0 | D7 | 3 | **N7547** | **N8547** |
| M14 | 1.5 | D6 | 3 | **N7556** | **N8556** |
| M16 | 2.0 | D7 | 3 | **N7607** | **N8607** |
| M16 | 1.5 | D6 | 3 | **N7616** | **N8616** |
| M18 | 2.5 | D7 | 3 | **N7657** | **N8657** |
| M18 | 1.5 | D6 | 3 | **N7676** | **N8676** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

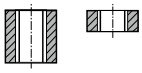
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

N4/05 SERIES

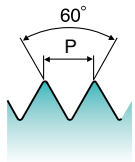
## SPIRAL POINT TAPS PLUG STYLE
## for Steels & Stainless Steels up to 35HRc

Hole type 3.0×D





DIN-ANSI Shank




VG | Super HSS | UNC UNF | H2~H6 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Hardslick |
| #2 | 56 | — | H2 | 2 | N4082 | 05082 |
| #4 | 40 | — | H2 | 2 | N4162 | 05162 |
| #5 | 40 | — | H2 | 3 | N4202 | 05202 |
| #6 | 32 | — | H3 | 3 | N4243 | 05243 |
| #8 | 32 | — | H3 | 3 | N4283 | 05283 |
| #10 | 24 | — | H3 | 3 | N4323 | 05323 |
| #10 | — | 32 | H3 | 3 | N4343 | 05343 |
| 1/4 | 20 | — | H3 | 3 | N4403 | 05403 |
| 1/4 | 20 | — | H5 | 3 | N4405 | 05405 |
| 1/4 | — | 28 | H3 | 3 | N4423 | 05423 |
| 5/16 | 18 | — | H5 | 3 | N4445 | 05445 |
| 5/16 | — | 24 | H4 | 3 | N4464 | 05464 |
| 3/8 | 16 | — | H5 | 3 | N4485 | 05485 |
| 3/8 | — | 24 | H4 | 3 | N4504 | 05504 |
| 7/16 | 14 | — | H5 | 3 | N4525 | 05525 |
| 7/16 | — | 20 | H5 | 3 | N4545 | 05545 |
| 1/2 | 13 | — | H5 | 3 | N4565 | 05565 |
| 1/2 | — | 20 | H5 | 3 | N4585 | 05585 |
| 9/16 | 12 | — | H5 | 3 | N4605 | 05605 |
| 9/16 | — | 18 | H5 | 3 | N4625 | 05625 |
| 5/8 | 11 | — | H5 | 3 | N4645 | 05645 |
| 5/8 | — | 18 | H5 | 3 | N4665 | 05665 |
| 3/4 | 10 | — | H5 | 3 | N4705 | 05705 |
| 3/4 | — | 16 | H5 | 3 | N4725 | 05725 |
| 7/8 | 9 | — | H6 | 3 | N4746 | 05746 |
| 7/8 | — | 14 | H6 | 3 | N4766 | 05766 |
| 1 | 8 | — | H6 | 3 | N4786 | 05786 |
| 1 | — | 12 | H6 | 3 | N4806 | 05806 |
| 1-1/8 | 8 | — | H6 | 4 | N4836 | 05836 |
| 1-1/4 | 8 | — | H6 | 4 | N4876 | 05876 |
| 1-3/8 | 8 | — | H6 | 4 | N4916 | 05916 |
| 1-1/2 | 8 | — | H6 | 4 | N4956 | 05956 |

▶ For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

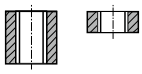
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

N3/O3 SERIES

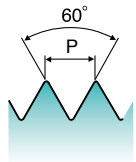
## METRIC SPIRAL POINT TAPS PLUG STYLE for Steels & Stainless Steels up to 35HRc

Hole type 3.0×D





DIN-ANSI Shank




VG | Super HSS | M MF | D3~D7 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **N3203** | **03203** |
| M3.5 | 0.6 | D4 | 3 | **N3224** | **03224** |
| M4 | 0.7 | D4 | 3 | **N3244** | **03244** |
| M5 | 0.8 | D4 | 3 | **N3284** | **03284** |
| M6 | 1.0 | D5 | 3 | **N3315** | **03315** |
| M7 | 1.0 | D5 | 3 | **N3345** | **03345** |
| M8 | 1.25 | D5 | 3 | **N3365** | **03365** |
| M8 | 1.0 | D5 | 3 | **N3375** | **03375** |
| M10 | 1.5 | D6 | 3 | **N3426** | **03426** |
| M10 | 1.25 | D5 | 3 | **N3435** | **03435** |
| M12 | 1.75 | D6 | 3 | **N3506** | **03506** |
| M12 | 1.25 | D5 | 3 | **N3525** | **03525** |
| M14 | 2.0 | D7 | 3 | **N3547** | **03547** |
| M14 | 1.5 | D6 | 3 | **N3556** | **03556** |
| M16 | 2.0 | D7 | 3 | **N3607** | **03607** |
| M16 | 1.5 | D6 | 3 | **N3616** | **03616** |
| M18 | 2.5 | D7 | 3 | **N3657** | **03657** |
| M18 | 1.5 | D6 | 3 | **N3676** | **03676** |

▶ For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ◎ | | ◎ | ◎ | | |

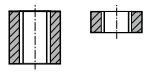
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

M4/M6/M7 SERIES

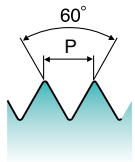
## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 45HRc

Hole type 3.0×D





USCTI




HR | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 4P~5P | Steam Oxide | TiCN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| #2 | 56 | — | H2 | 2 | M4082 | M6082 | M7082 |
| #4 | 40 | — | H2 | 2 | M4162 | M6162 | M7162 |
| #5 | 40 | — | H2 | 3 | M4202 | M6202 | M7202 |
| #6 | 32 | — | H3 | 3 | M4243 | M6243 | M7243 |
| #8 | 32 | — | H3 | 3 | M4283 | M6283 | M7283 |
| #10 | 24 | — | H3 | 3 | M4323 | M6323 | M7323 |
| #10 | — | 32 | H3 | 3 | M4343 | M6343 | M7343 |
| 1/4 | 20 | — | H5 | 3 | M4405 | M6405 | M7405 |
| 1/4 | — | 28 | H4 | 3 | M4424 | M6424 | M7424 |
| 5/16 | 18 | — | H5 | 3 | M4445 | M6445 | M7445 |
| 5/16 | — | 24 | H4 | 3 | M4464 | M6464 | M7464 |
| 3/8 | 16 | — | H5 | 3 | M4485 | M6485 | M7485 |
| 3/8 | — | 24 | H4 | 3 | M4504 | M6504 | M7504 |
| 7/16 | 14 | — | H5 | 3 | M4525 | M6525 | M7525 |
| 7/16 | — | 20 | H5 | 3 | M4545 | M6545 | M7545 |
| 1/2 | 13 | — | H5 | 3 | M4565 | M6565 | M7565 |
| 1/2 | — | 20 | H5 | 3 | M4585 | M6585 | M7585 |
| 9/16 | 12 | — | H5 | 3 | M4605 | M6605 | M7605 |
| 9/16 | — | 18 | H5 | 3 | M4625 | M6625 | M7625 |
| 5/8 | 11 | — | H5 | 3 | M4645 | M6645 | M7645 |
| 5/8 | — | 18 | H5 | 3 | M4665 | M6665 | M7665 |
| 3/4 | 10 | — | H5 | 3 | M4705 | M6705 | M7705 |
| 3/4 | — | 16 | H5 | 3 | M4725 | M6725 | M7725 |

▶ Bright Finish Available : M5 series
▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | ○ | ◎ | | ○ | ◎ | |

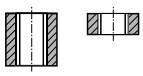
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | ◎ | | | | | ○ | ○ | ○ |

# SPIRAL POINT TAPS

**TQ808 / TK808 / TR808** SERIES

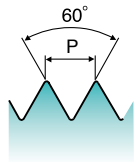
## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 45HRc

**Hole type** 3.0×D





**USCTI**




**HR** | **P-HSS** | **M MF** | **USCTI 302A** | **H2~H5** | 60° | 4P~5P | **Steam Oxide** | **TiCN** | **Hardslick**

◇Call for Availability

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.5 | D3 | 3 | TQ808203 | TK808203 | TR808203HAR |
| M4 | 0.5 | D3 | 3 | TQ808253 | TK808253 | TR808253HAR |
| M4 | 0.7 | D4 | 3 | TQ808244 | TK808244 | TR808244HAR |
| M5 | 0.5 | D3 | 3 | TQ808293 | TK808293 | TR808293HAR |
| M5 | 0.8 | D4 | 3 | TQ808284 | TK808284 | TR808284HAR |
| M6 | 0.5 | D3 | 3 | TQ808333 | TK808333 | TR808333HAR |
| M6 | 0.75 | D4 | 3 | TQ808324 | TK808324 | TR808324HAR |
| M6 | 1 | D5 | 3 | TQ808315 | TK808315 | TR808315HAR |
| M8 | 1 | D5 | 3 | TQ808375 | TK808375 | TR808375HAR |
| M8 | 1.25 | D5 | 3 | TQ808365 | TK808365 | TR808365HAR |
| M10 | 1 | D5 | 3 | TQ808445 | TK808445 | TR808445HAR |
| M10 | 1.25 | D5 | 3 | TQ808435 | TK808435 | TR808435HAR |
| M10 | 1.5 | D6 | 3 | TQ808426 | TK808426 | TR808426HAR |
| M12 | 1 | D5 | 3 | TQ808535 | TK808535 | TR808535HAR |
| M12 | 1.25 | D6 | 3 | TQ808526 | TK808526 | TR808526HAR |
| M12 | 1.5 | D6 | 3 | TQ808516 | TK808516 | TR808516HAR |
| M12 | 1.75 | D6 | 3 | TQ808506 | TK808506 | TR808506HAR |
| M14 | 1.5 | D6 | 3 | TQ808556 | TK808556 | TR808556HAR |
| M14 | 2 | D7 | 3 | TQ808547 | TK808547 | TR808547HAR |
| M16 | 1.5 | D6 | 4 | TQ808616 | TK808616 | TR808616HAR |
| M16 | 2 | D7 | 4 | TQ808607 | TK808607 | TR808607HAR |
| M18 | 1.5 | D6 | 4 | TQ808676 | TK808676 | TR808676HAR |
| M18 | 2.5 | D7 | 4 | TQ808657 | TK808657 | TR808657HAR |
| M20 | 1.5 | D6 | 4 | TQ808726 | TK808726 | TR808726HAR |
| M20 | 2.5 | D7 | 4 | TQ808707 | TK808707 | TR808707HAR |
| M22 | 1.5 | D6 | 4 | TQ808766 | TK808766 | TR808766HAR |
| M22 | 2.5 | D7 | 4 | TQ808747 | TK808747 | TR808747HAR |
| M24 | 1.5 | D6 | 4 | TQ808806 | TK808806 | TR808806HAR |
| M24 | 3 | D8 | 4 | TQ808788 | TK808788 | TR808788HAR |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | ○ | ◎ | | ○ | ◎ | |

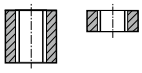
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | ◎ | | | | | ○ | ○ | ○ |

# SPIRAL POINT TAPS

I3/I5/J6 SERIES

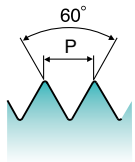
## SPIRAL POINT TAPS PLUG STYLE
## for Titanium Alloys & Nickel Base Alloys up to 44HRc

Hole type 3.0×D





USCTI




Ti Ni | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 4P~5P | Steam Oxide | TiCN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| #2 | 56 | — | H2 | 2 | I3082 | I5082 | J6082 |
| #4 | 40 | — | H2 | 2 | I3162 | I5162 | J6162 |
| #5 | 40 | — | H2 | 3 | I3202 | I5202 | J6202 |
| #6 | 32 | — | H3 | 3 | I3243 | I5243 | J6243 |
| #8 | 32 | — | H3 | 3 | I3283 | I5283 | J6283 |
| #10 | 24 | — | H3 | 3 | I3323 | I5323 | J6323 |
| #10 | — | 32 | H3 | 3 | I3343 | I5343 | J6343 |
| 1/4 | 20 | — | H3 | 3 | I3403 | I5403 | J6403 |
| 1/4 | 20 | — | H5 | 3 | I3405 | I5405 | J6405 |
| 1/4 | — | 28 | H3 | 3 | I3423 | I5423 | J6423 |
| 1/4 | — | 28 | H4 | 3 | I3424 | I5424 | J6424 |
| 5/16 | 18 | — | H3 | 3 | I3443 | I5443 | J6443 |
| 5/16 | 18 | — | H5 | 3 | I3445 | I5445 | J6445 |
| 5/16 | — | 24 | H3 | 3 | I3463 | I5463 | J6463 |
| 3/8 | 16 | — | H3 | 3 | I3483 | I5483 | J6483 |
| 3/8 | 16 | — | H5 | 3 | I3485 | I5485 | J6485 |
| 3/8 | — | 24 | H3 | 3 | I3503 | I5503 | J6503 |
| 3/8 | — | 24 | H4 | 3 | I3504 | I5504 | J6504 |
| 7/16 | 14 | — | H3 | 3 | I3523 | I5523 | J6523 |
| 7/16 | 14 | — | H5 | 3 | I3525 | I5525 | J6525 |
| 7/16 | — | 20 | H3 | 3 | I3543 | I5543 | J6543 |
| 7/16 | — | 20 | H5 | 3 | I3545 | I5545 | J6545 |
| 1/2 | 13 | — | H3 | 3 | I3563 | I5563 | J6563 |
| 1/2 | 13 | — | H5 | 3 | I3565 | I5565 | J6565 |
| 1/2 | — | 20 | H3 | 3 | I3583 | I5583 | J6583 |
| 1/2 | — | 20 | H5 | 3 | I3585 | I5585 | J6585 |

▶ TiN Coated Available: M8 Series

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

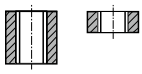
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ◎ | ◎ | ◎ |

# SPIRAL POINT TAPS

I3/I5/J6 SERIES

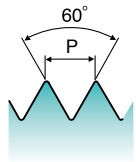
## SPIRAL POINT TAPS PLUG STYLE
## for Titanium Alloys & Nickel Base Alloys up to 44HRc

Hole type 3.0×D





USCTI




Ti Ni | P-HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 4P~5P | Steam Oxide | TiCN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiCN | Hardslick |
| 9/16 | 12 | — | H3 | 3 | **I3603** | **I5603** | **J6603** |
| 9/16 | 12 | — | H5 | 3 | **I3605** | **I5605** | **J6605** |
| 9/16 | — | 18 | H3 | 3 | **I3623** | **I5623** | **J6623** |
| 9/16 | — | 18 | H5 | 3 | **I3625** | **I5625** | **J6625** |
| 5/8 | 11 | — | H3 | 3 | **I3643** | **I5643** | **J6643** |
| 5/8 | 11 | — | H5 | 3 | **I3645** | **I5645** | **J6645** |
| 5/8 | — | 18 | H3 | 3 | **I3663** | **I5663** | **J6663** |
| 5/8 | — | 18 | H5 | 3 | **I3665** | **I5665** | **J6665** |
| 3/4 | 10 | — | H3 | 3 | **I3703** | **I5703** | **J6703** |
| 3/4 | 10 | — | H5 | 3 | **I3705** | **I5705** | **J6705** |
| 3/4 | — | 16 | H3 | 3 | **I3723** | **I5723** | **J6723** |
| 3/4 | — | 16 | H5 | 3 | **I3725** | **I5725** | **J6725** |

▶TiN Coated Available : M8 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

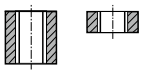
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ◎ | ◎ | ◎ |

# SPIRAL POINT TAPS

M2/M3 SERIES

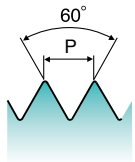
## SPIRAL POINT TAPS PLUG STYLE for Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI Long Shank




VA | P-HSS | UNC UNF | USCTI Long Shank | H2~H3 | 60° | 4P~5P | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | Maximum Tapping Depth | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | | Hardslick 4" OAL | Hardslick 6" OAL |
| #4 | 40 | — | H2 | 2 | 0.844 | **M2162** | — |
| #6 | 32 | — | H3 | 2 | 1.031 | **M2243** | **M3243** |
| #8 | 32 | — | H3 | 3 | 1.125 | **M2283** | **M3283** |
| #10 | 24 | — | H3 | 3 | 1.312 | **M2323** | **M3323** |
| #10 | — | 32 | H3 | 3 | 1.312 | **M2343** | **M3343** |
| 1/4 | 20 | — | H3 | 3 | 1.500 | **M2403** | **M3403** |
| 1/4 | — | 28 | H3 | 3 | 1.500 | — | **M3423** |
| 5/16 | 18 | — | H3 | 3 | 1.688 | — | **M3443** |
| 5/16 | — | 24 | H3 | 3 | 1.688 | — | **M3463** |
| 3/8 | 16 | — | H3 | 3 | 1.875 | — | **M3483** |
| 3/8 | — | 24 | H3 | 3 | — | — | **M3503** |
| 7/16 | 14 | — | H3 | 3 | — | — | **M3523** |
| 7/16 | — | 20 | H3 | 3 | — | — | **M3543** |
| 1/2 | 13 | — | H3 | 3 | — | — | **M3563** |
| 1/2 | — | 20 | H3 | 3 | — | — | **M3583** |
| 9/16 | 12 | — | H3 | 3 | — | — | **M3603** |
| 9/16 | — | 18 | H3 | 3 | — | — | **M3623** |
| 5/8 | 11 | — | H3 | 3 | — | — | **M3643** |

▶ TiN Coated Available: 4" OAL M0 Series & 6" OAL M1 Series
▶ For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

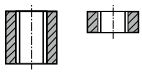
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

I0/I2/J2 SERIES

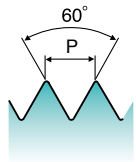
## SPIRAL POINT TAPS PLUG STYLE for Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 4P~5P | Steam Oxide | TiN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | I0082 | I2082 | J2082 |
| #2 | 56 | — | H3 | 2 | I0083 | — | J2083 |
| #2 | 56 | — | H4 | 2 | I0084 | — | J2084 |
| #3 | 48 | — | H2 | 2 | I0122 | — | J2122 |
| #4 | 40 | — | H2 | 2 | I0162 | I2162 | J2162 |
| #4 | 40 | — | H3 | 2 | I0163 | — | J2163 |
| #4 | 40 | — | H4 | 2 | I0164 | — | J2164 |
| #4 | 40 | — | H5 | 2 | I0165 | — | J2165 |
| #4 | 40 | — | H6 | 2 | I0166 | — | J2166 |
| #4 | — | 48 | H2 | 2 | I0182 | — | J2182 |
| #4 | — | 48 | H4 | 2 | I0184 | — | J2184 |
| #5 | 40 | — | H2 | 3 | I0202 | I2202 | J2202 |
| #6 | 32 | — | H3 | 3 | I0243 | I2243 | J2243 |
| #6 | 32 | — | H3 | 3 | I0244 | — | J2244 |
| #6 | 32 | — | H4 | 3 | I0245 | — | J2245 |
| #6 | 32 | — | H7 | 3 | I0247 | — | J2247 |
| #6 | — | 40 | H2 | 3 | I0262 | — | J2262 |
| #6 | — | 40 | H3 | 3 | I0263 | — | J2263 |
| #8 | 32 | — | H2 | 3 | I0282 | — | J2282 |
| #8 | 32 | — | H3 | 3 | I0283 | I2283 | J2283 |
| #8 | 32 | — | H4 | 3 | I0284 | — | J2284 |
| #8 | 32 | — | H5 | 3 | I0285 | — | J2286 |
| #8 | 32 | — | H7 | 3 | I0287 | — | J2287 |
| #8 | — | 36 | H2 | 3 | I0302 | — | J2302 |
| #10 | 24 | — | H3 | 3 | I0323 | I2323 | J2323 |
| #10 | 24 | — | H4 | 3 | I0324 | — | J2324 |
| #10 | 24 | — | H5 | 3 | I0325 | — | J2325 |
| #10 | — | 32 | H2 | 3 | I0342 | — | J2342 |
| #10 | — | 32 | H3 | 3 | I0343 | I2343 | J2343 |
| #10 | — | 32 | H4 | 3 | I0344 | — | J2344 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

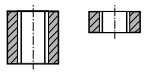
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

I0/I2/J2 SERIES

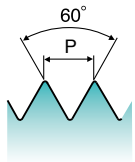
## SPIRAL POINT TAPS PLUG STYLE for Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 4P~5P | Steam Oxide | TiN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiN | Hardslick |
| #10 | — | 32 | H5 | 3 | I0345 | — | J2345 |
| #10 | — | 32 | H6 | 3 | I0346 | — | J2346 |
| #10 | — | 32 | H7 | 3 | I0347 | — | J2347 |
| #12 | 24 | — | H3 | 3 | I0363 | — | J2363 |
| #12 | — | 28 | H3 | 3 | I0383 | — | J2383 |
| 1/4 | 20 | — | H2 | 3 | I0402 | — | J2402 |
| 1/4 | 20 | — | H3 | 3 | I0403 | I2403 | J2403 |
| 1/4 | 20 | — | H5 | 3 | I0405 | I2405 | J2405 |
| 1/4 | 20 | — | H7 | 3 | I0407 | — | J2407 |
| 1/4 | — | 28 | H2 | 3 | I0422 | — | J2422 |
| 1/4 | — | 28 | H3 | 3 | I0423 | I2423 | J2423 |
| 1/4 | — | 28 | H4 | 3 | I0424 | — | J2424 |
| 1/4 | — | 28 | H5 | 3 | I0425 | — | J2425 |
| 1/4 | — | 28 | H6 | 3 | I0426 | — | J2426 |
| 1/4 | — | 28 | H7 | 3 | I0427 | — | J2427 |
| 5/16 | 18 | — | H3 | 3 | I0443 | I2443 | J2443 |
| 5/16 | 18 | — | H5 | 3 | I0445 | I2445 | J2445 |
| 5/16 | 18 | — | H7 | 3 | I0447 | — | J2447 |
| 5/16 | — | 24 | H3 | 3 | I0463 | I2463 | J2463 |
| 5/16 | — | 24 | H4 | 3 | I0464 | — | J2464 |
| 5/16 | — | 24 | H5 | 3 | I0465 | — | J2465 |
| 5/16 | — | 24 | H6 | 3 | I0466 | — | J2466 |
| 5/16 | — | 24 | H7 | 3 | I0467 | — | J2467 |
| 3/8 | 16 | — | H3 | 3 | I0483 | I2483 | J2483 |
| 3/8 | 16 | — | H5 | 3 | I0485 | I2485 | J2485 |
| 3/8 | 16 | — | H7 | 3 | I0487 | — | J2487 |
| 3/8 | — | 24 | H3 | 3 | I0503 | I2503 | J2503 |
| 3/8 | — | 24 | H4 | 3 | I0504 | — | J2504 |
| 3/8 | — | 24 | H5 | 3 | I0505 | — | J2505 |
| 3/8 | — | 24 | H7 | 3 | I0507 | — | J2507 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

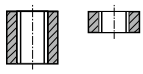
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

I0/I2/J2 SERIES

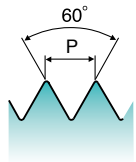
## SPIRAL POINT TAPS PLUG STYLE for Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI




VA | HSSE-V3 | UNC UNF | USCTI 302A | H2~H7 | 60° | 4P~5P | Steam Oxide | TiN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | TiN | Hardslick |
| 7/16 | 14 | — | H3 | 3 | I0523 | I2523 | J2523 |
| 7/16 | 14 | — | H5 | 3 | I0525 | I2525 | J2525 |
| 7/16 | — | 20 | H3 | 3 | I0543 | I2543 | J2543 |
| 7/16 | — | 20 | H5 | 3 | I0545 | I2545 | J2545 |
| 1/2 | 13 | — | H3 | 3 | I0563 | I2563 | J2563 |
| 1/2 | 13 | — | H5 | 3 | I0565 | I2565 | J2565 |
| 1/2 | 13 | — | H7 | 3 | I0567 | — | J2567 |
| 1/2 | — | 20 | H3 | 3 | I0583 | I2583 | J2583 |
| 1/2 | — | 20 | H5 | 3 | I0585 | — | J2585 |
| 9/16 | 12 | — | H3 | 3 | I0603 | I2603 | J2603 |
| 9/16 | — | 18 | H3 | 3 | I0623 | I2623 | J2623 |
| 5/8 | 11 | — | H3 | 3 | I0643 | I2643 | J2643 |
| 5/8 | 11 | — | H5 | 3 | I0645 | I2645 | J2645 |
| 5/8 | 11 | — | H7 | 3 | I0647 | — | J2647 |
| 5/8 | — | 18 | H3 | 3 | I0663 | — | J2663 |
| 5/8 | — | 18 | H5 | 3 | I0665 | I2665 | J2665 |
| 5/8 | — | 18 | H7 | 3 | I0667 | — | J2667 |
| 3/4 | 10 | — | H3 | 3 | I0703 | I2703 | J2703 |
| 3/4 | — | 16 | H5 | 3 | I0725 | I2725 | J2725 |
| 7/8 | 9 | — | H4 | 3 | I0744 | I2744 | J2744 |
| 7/8 | — | 14 | H6 | 3 | I0766 | I2766 | J2766 |
| 1 | 8 | — | H4 | 3 | I0784 | I2784 | J2784 |
| 1 | — | 12 | H6 | 3 | I0806 | I2806 | J2806 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

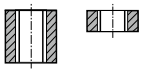
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

**09/IA** SERIES

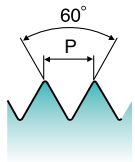
## METRIC SPIRAL POINT TAPS PLUG STYLE
## Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI




VA | HSSE-V3 | M MF | USCTI 302A | D3~D7 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **09203** | **IA203** |
| M3.5 | 0.6 | D4 | 3 | **09224** | **IA224** |
| M4 | 0.7 | D4 | 3 | **09244** | **IA244** |
| M5 | 0.8 | D4 | 3 | **09284** | **IA284** |
| M6 | 1.0 | D5 | 3 | **09315** | **IA315** |
| M7 | 1.0 | D5 | 3 | **09345** | **IA345** |
| M8 | 1.25 | D5 | 3 | **09365** | **IA365** |
| M8 | 1.0 | D5 | 3 | **09375** | **IA375** |
| M10 | 1.5 | D6 | 3 | **09426** | **IA426** |
| M10 | 1.25 | D5 | 3 | **09435** | **IA435** |
| M12 | 1.75 | D6 | 3 | **09506** | **IA506** |
| M12 | 1.25 | D5 | 3 | **09525** | **IA525** |
| M14 | 2.0 | D7 | 3 | **09547** | **IA547** |
| M14 | 1.5 | D6 | 3 | **09556** | **IA556** |
| M16 | 2.0 | D7 | 3 | **09607** | **IA607** |
| M16 | 1.5 | D6 | 3 | **09616** | **IA616** |
| M18 | 2.5 | D7 | 3 | **09657** | **IA657** |
| M18 | 1.5 | D6 | 3 | **09676** | **IA676** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

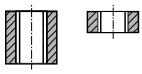
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

# SPIRAL POINT TAPS

K3/K5/K6 SERIES

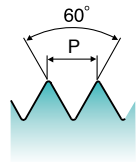
## METRIC SPIRAL POINT TAPS PLUG STYLE
## Stainless Steels up to 28HRc

Hole type 3.0×D





USCTI




VA | HSSE-V3 | M MF | D3~D7 | 60° | 4P~5P | Steam Oxide | TiCN | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.5 | D3 | 3 | K3203 | K5203 | K6203 |
| M3.5 | 0.6 | D4 | 3 | K3224 | K5224 | K6224 |
| M4 | 0.7 | D4 | 3 | K3244 | K5244 | K6244 |
| M5 | 0.8 | D4 | 3 | K3284 | K5284 | K6284 |
| M6 | 1.0 | D5 | 3 | K3315 | K5315 | K6315 |
| M7 | 1.0 | D5 | 3 | K3345 | K5345 | K6345 |
| M8 | 1.25 | D5 | 3 | K3365 | K5365 | K6365 |
| M8 | 1.0 | D5 | 3 | K3375 | K5375 | K6375 |
| M10 | 1.5 | D6 | 3 | K3426 | K5426 | K6426 |
| M10 | 1.25 | D5 | 3 | K3435 | K5435 | K6435 |
| M12 | 1.75 | D6 | 3 | K3506 | K5506 | K6506 |
| M12 | 1.25 | D5 | 3 | K3525 | K5525 | K6525 |
| M14 | 2.0 | D7 | 3 | K3547 | K5547 | K6547 |
| M14 | 1.5 | D6 | 3 | K3556 | K5556 | K6556 |
| M16 | 2.0 | D7 | 3 | K3607 | K5607 | K6607 |
| M16 | 1.5 | D6 | 3 | K3616 | K5616 | K6616 |
| M18 | 2.5 | D7 | 3 | K3657 | K5657 | K6657 |
| M18 | 1.5 | D6 | 3 | K3676 | K5676 | K6676 |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ○ | ○ | | ○ | | ○ | ○ | | | |

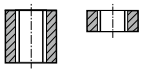
# SPIRAL POINT TAPS

J3/J8 SERIES

## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 38HRc

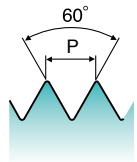
**A variety of H Limit**

Hole type 3.0×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| #2 | 56 | — | — | H2 | 2 | J3082 | J8082 |
| #3 | 48 | — | — | H2 | 2 | J3122 | J8122 |
| #4 | 40 | — | — | H2 | 2 | J3162 | J8162 |
| #4 | 40 | — | — | H3 | 2 | J3163 | J8163 |
| #4 | 40 | — | — | H4 | 2 | J3164 | J8164 |
| #4 | 40 | — | — | H5 | 2 | J3165 | J8165 |
| #4 | — | 48 | — | H2 | 2 | J3182 | J8182 |
| #5 | 40 | — | — | H2 | 2 | J3202 | J8202 |
| #6 | 32 | — | — | H2 | 2 | J3242 | J8242 |
| #6 | 32 | — | — | H3 | 2 | J3243 | J8243 |
| #6 | 32 | — | — | H4 | 2 | J3244 | J8244 |
| #6 | 32 | — | — | H5 | 2 | J3245 | J8245 |
| #6 | 32 | — | — | H6 | 2 | J3246 | J8246 |
| #6 | 32 | — | — | H7 | 2 | J3247 | J8247 |
| #6 | 32 | — | — | H11 | 2 | J324A | J824A |
| #6 | — | 40 | — | H2 | 2 | J3262 | J8262 |
| #8 | 32 | — | — | H2 | 3 | J3282 | J8282 |
| #8 | 32 | — | — | H3 | 3 | J3283 | J8283 |
| #8 | 32 | — | — | H4 | 3 | J3284 | J8284 |
| #8 | 32 | — | — | H5 | 3 | J3285 | J8285 |
| #8 | 32 | — | — | H6 | 3 | J3286 | J8286 |
| #8 | 32 | — | — | H7 | 3 | J3287 | J8287 |
| #8 | 32 | — | — | H11 | 3 | J328A | J828A |
| #8 | — | 36 | — | H2 | 3 | J3302 | J8302 |
| #10 | 24 | — | — | H3 | 3 | J3323 | J8323 |
| #10 | 24 | — | — | H5 | 3 | J3325 | J8325 |
| #10 | 24 | — | — | H11 | 3 | J332A | J832A |
| #10 | — | 32 | — | H2 | 3 | J3342 | J8342 |
| #10 | — | 32 | — | H3 | 3 | J3343 | J8343 |
| #10 | — | 32 | — | H4 | 3 | J3344 | J8344 |

▶Bright Finish Available: J4 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

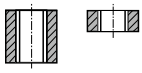
# SPIRAL POINT TAPS

J3/J8 SERIES

## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 38HRc

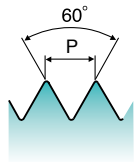
**A variety of H Limit**

Hole type 3.0×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| #10 | — | 32 | — | H5 | 3 | **J3345** | **J8345** |
| #10 | — | 32 | — | H6 | 3 | **J3346** | **J8346** |
| #10 | — | 32 | — | H7 | 3 | **J3347** | **J8347** |
| #10 | — | 32 | — | H11 | 3 | **J334A** | **J834A** |
| #12 | 24 | — | — | H3 | 3 | **J3363** | **J8363** |
| #12 | — | 28 | — | H3 | 3 | **J3383** | **J8383** |
| 1/4 | 20 | — | — | H2 | 3 | **J3402** | **J8402** |
| 1/4 | 20 | — | — | H3 | 3 | **J3403** | **J8403** |
| 1/4 | 20 | — | — | H5 | 3 | **J3405** | **J8405** |
| 1/4 | 20 | — | — | H7 | 3 | **J3407** | **J8407** |
| 1/4 | 20 | — | — | H11 | 3 | **J340A** | **J840A** |
| 1/4 | — | 28 | — | H2 | 3 | **J3422** | **J8422** |
| 1/4 | — | 28 | — | H3 | 3 | **J3423** | **J8423** |
| 1/4 | — | 28 | — | H4 | 3 | **J3424** | **J8424** |
| 1/4 | — | 28 | — | H5 | 3 | **J3425** | **J8425** |
| 1/4 | — | 28 | — | H6 | 3 | **J3426** | **J8426** |
| 1/4 | — | 28 | — | H7 | 3 | **J3427** | **J8427** |
| 1/4 | — | 28 | — | H11 | 3 | **J342A** | **J842A** |
| 5/16 | 18 | — | — | H3 | 3 | **J3443** | **J8443** |
| 5/16 | 18 | — | — | H5 | 3 | **J3445** | **J8445** |
| 5/16 | 18 | — | — | H7 | 3 | **J3447** | **J8447** |
| 5/16 | 18 | — | — | H11 | 3 | **J344A** | **J844A** |
| 5/16 | — | 24 | — | H2 | 3 | **J3462** | **J8462** |
| 5/16 | — | 24 | — | H3 | 3 | **J3463** | **J8463** |
| 5/16 | — | 24 | — | H4 | 3 | **J3464** | **J8464** |
| 5/16 | — | 24 | — | H5 | 3 | **J3465** | **J8465** |
| 5/16 | — | 24 | — | H6 | 3 | **J3466** | **J8466** |
| 5/16 | — | 24 | — | H7 | 3 | **J3467** | **J8467** |
| 5/16 | — | 24 | — | H11 | 3 | **J346A** | **J846A** |
| 3/8 | 16 | — | — | H3 | 3 | **J3483** | **J8483** |

▶ Bright Finish Available: J4 Series

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

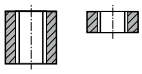
# SPIRAL POINT TAPS

J3/J8 SERIES

## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 38HRc

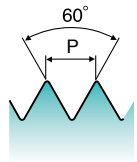
**A variety of H Limit**

Hole type 3.0×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| 3/8 | 16 | — | — | H5 | 3 | J3485 | J8485 |
| 3/8 | 16 | — | — | H7 | 3 | J3487 | J8487 |
| 3/8 | 16 | — | — | H11 | 3 | J348A | J848A |
| 3/8 | — | 24 | — | H2 | 3 | J3502 | J8502 |
| 3/8 | — | 24 | — | H3 | 3 | J3503 | J8503 |
| 3/8 | — | 24 | — | H4 | 3 | J3504 | J8504 |
| 3/8 | — | 24 | — | H5 | 3 | J3505 | J8505 |
| 3/8 | — | 24 | — | H6 | 3 | J3506 | J8506 |
| 3/8 | — | 24 | — | H7 | 3 | J3507 | J8507 |
| 3/8 | — | 24 | — | H11 | 3 | J350A | J850A |
| 7/16 | 14 | — | — | H3 | 3 | J3523 | J8523 |
| 7/16 | 14 | — | — | H5 | 3 | J3525 | J8525 |
| 7/16 | 14 | — | — | H7 | 3 | J3527 | J8527 |
| 7/16 | 14 | — | — | H11 | 3 | J352A | J852A |
| 7/16 | — | 20 | — | H3 | 3 | J3543 | J8543 |
| 7/16 | — | 20 | — | H5 | 3 | J3545 | J8545 |
| 7/16 | — | 20 | — | H7 | 3 | J3547 | J8547 |
| 7/16 | — | 20 | — | H11 | 3 | J354A | J854A |
| 1/2 | 13 | — | — | H3 | 3 | J3563 | J8563 |
| 1/2 | 13 | — | — | H5 | 3 | J3565 | J8565 |
| 1/2 | 13 | — | — | H7 | 3 | J3567 | J8567 |
| 1/2 | 13 | — | — | H11 | 3 | J356A | J856A |
| 1/2 | — | 20 | — | H2 | 3 | J3582 | J8582 |
| 1/2 | — | 20 | — | H3 | 3 | J3583 | J8583 |
| 1/2 | — | 20 | — | H5 | 3 | J3585 | J8585 |
| 1/2 | — | 20 | — | H7 | 3 | J3587 | J8587 |
| 1/2 | — | 20 | — | H11 | 3 | J358A | J858A |
| 9/16 | 12 | — | — | H5 | 3 | J3605 | J8605 |
| 9/16 | — | 18 | — | H5 | 3 | J3625 | J8625 |
| 5/8 | 11 | — | — | H3 | 3 | J3643 | J8643 |

▶Bright Finish Available: J4 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

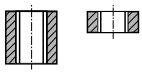
# SPIRAL POINT TAPS

J3/J8 SERIES

## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 38HRc

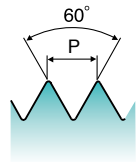
**A variety of H Limit**

Hole type 3.0×D





USCTI




VG | HSSE-V3 | UNC UNF | USCTI 302A | H2~H11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | 8 Pitch | | | Steam Oxide | Hardslick |
| 5/8 | 11 | — | — | H5 | 3 | J3645 | J8645 |
| 5/8 | — | 18 | — | H3 | 3 | J3663 | J8663 |
| 5/8 | — | 18 | — | H5 | 3 | J3665 | J8665 |
| 5/8 | — | 18 | — | H7 | 3 | J3667 | J8667 |
| 3/4 | 10 | — | — | H3 | 3 | J3703 | J8703 |
| 3/4 | 10 | — | — | H5 | 3 | J3705 | J8705 |
| 3/4 | — | 16 | — | H3 | 3 | J3723 | J8723 |
| 3/4 | — | 16 | — | H5 | 3 | J3725 | J8725 |
| 7/8 | 9 | — | — | H5 | 3 | J3745 | J8745 |
| 7/8 | — | 14 | — | H4 | 3 | J3764 | J8764 |
| 1 | 8 | — | — | H4 | 4 | J3784 | J8784 |
| 1 | — | 12 | — | H4 | 4 | J3804 | J8804 |
| 1-1/8 | 7 | — | — | H6 | 4 | J3826 | J8826 |
| 1-1/8 | — | 12 | — | H5 | 4 | J3845 | J8845 |
| 1-1/8 | — | — | 8 | H6 | 4 | J3836 | J8836 |
| 1-1/4 | 7 | — | — | H6 | 4 | J3866 | J8866 |
| 1-1/4 | — | 12 | — | H5 | 4 | J3885 | J8885 |
| 1-1/4 | — | — | 8 | H6 | 4 | J3876 | J8876 |
| 1-3/8 | 6 | — | — | H6 | 4 | J3906 | J8906 |
| 1-3/8 | — | 12 | — | H5 | 4 | J3925 | J8925 |
| 1-3/8 | — | — | 8 | H6 | 4 | J3916 | J8916 |
| 1-1/2 | 6 | — | — | H6 | 4 | J3946 | J8946 |
| 1-1/2 | — | 12 | — | H5 | 4 | J3965 | J8965 |
| 1-1/2 | — | — | 8 | H6 | 4 | J3956 | J8956 |

▶Bright Finish Available: J4 Series
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

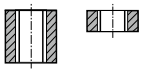
# SPIRAL POINT TAPS

IB/IC SERIES

## SPIRAL POINT TAPS PLUG STYLE
## Steels up to 38HRc

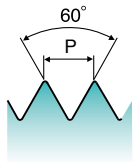
**A variety of D Limit**

Hole type 3.0×D





USCTI




VG | HSSE-V3 | M MF | USCTI 302A | D3~D11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M3 | 0.5 | D3 | 3 | **IB203** | **IC203** |
| M3 | 0.5 | D11 | 3 | **IB20A** | **IC20A** |
| M3.5 | 0.6 | D4 | 3 | **IB224** | **IC224** |
| M3.5 | 0.6 | D11 | 3 | **IB22A** | **IC22A** |
| M4 | 0.7 | D4 | 3 | **IB244** | **IC244** |
| M4 | 0.7 | D11 | 3 | **IB24A** | **IC24A** |
| M5 | 0.8 | D4 | 3 | **IB284** | **IC284** |
| M5 | 0.8 | D11 | 3 | **IB28A** | **IC28A** |
| M6 | 1.0 | D5 | 3 | **IB315** | **IC315** |
| M6 | 1.0 | D11 | 3 | **IB31A** | **IC31A** |
| M7 | 1.0 | D5 | 3 | **IB345** | **IC345** |
| M7 | 1.0 | D11 | 3 | **IB34A** | **IC34A** |
| M8 | 1.0 | D5 | 3 | **IB375** | **IC375** |
| M8 | 1.0 | D11 | 3 | **IB37A** | **IC37A** |
| M8 | 1.25 | D5 | 3 | **IB365** | **IC365** |
| M8 | 1.25 | D11 | 3 | **IB36A** | **IC36A** |
| M10 | 1.0 | D5 | 3 | **IB445** | **IC445** |
| M10 | 1.0 | D11 | 3 | **IB44A** | **IC44A** |
| M10 | 1.25 | D5 | 3 | **IB435** | **IC435** |
| M10 | 1.25 | D11 | 3 | **IB43A** | **IC43A** |
| M10 | 1.5 | D6 | 3 | **IB426** | **IC426** |
| M10 | 1.5 | D11 | 3 | **IB42A** | **IC42A** |
| M12 | 1.25 | D5 | 3 | **IB525** | **IC525** |
| M12 | 1.25 | D11 | 3 | **IB52A** | **IC52A** |
| M12 | 1.5 | D6 | 3 | **IB516** | **IC516** |
| M12 | 1.5 | D11 | 3 | **IB51A** | **IC51A** |
| M12 | 1.75 | D6 | 3 | **IB506** | **IC506** |
| M12 | 1.75 | D11 | 3 | **IB50A** | **IC50A** |
| M14 | 1.5 | D6 | 3 | **IB556** | **IC556** |
| M14 | 2.0 | D7 | 3 | **IB547** | **IC547** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

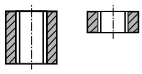
# SPIRAL POINT TAPS

IB/IC SERIES

## METRIC SPIRAL POINT TAPS PLUG STYLE
## Steels up to 35HRc

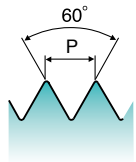
**A variety of D Limit**

**Hole type** 3.0×D





USCTI




VG | HSSE-V3 | M MF | USCTI 302A | D3~D11 | 60° | 4P~5P | Steam Oxide | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Steam Oxide | Hardslick |
| M16 | 1.5 | D6 | 3 | **IB616** | **IC616** |
| M16 | 2.0 | D7 | 3 | **IB607** | **IC607** |
| M18 | 1.5 | D6 | 4 | **IB676** | **IC676** |
| M18 | 2.5 | D7 | 4 | **IB657** | **IC657** |
| M20 | 1.5 | D6 | 3 | **IB726** | **IC726** |
| M20 | 2.5 | D8 | 3 | **IB708** | **IC708** |
| M22 | 1.5 | D6 | 3 | **IB766** | **IC766** |
| M22 | 2.5 | D8 | 3 | **IB748** | **IC748** |
| M24 | 1.5 | D6 | 4 | **IB806** | **IC806** |
| M24 | 3.0 | D8 | 4 | **IB788** | **IC788** |
| M27 | 1.5 | D6 | 4 | **IB886** | **IC886** |
| M27 | 3.0 | D8 | 4 | **IB868** | **IC868** |
| M30 | 1.5 | D6 | 4 | **IB976** | **IC976** |
| M30 | 3.5 | D9 | 4 | **IB949** | **IC949** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

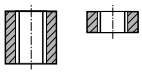
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

# SPIRAL POINT TAPS

J9/K7/K2 SERIES

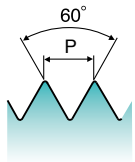
## METRIC SPIRAL POINT TAPS PLUG STYLE
## Steels up to 35HRc

Hole type 3.0×D





DIN-ANSI Shank




VG | HSSE-V3 | M MF | D3~D7 | 60° | 4P~5P | Steam Oxide | TiCN | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Steam Oxide | TiCN | Hardslick |
| M3 | 0.5 | D3 | 3 | J9203 | K7203 | K2203 |
| M3.5 | 0.6 | D4 | 3 | J9224 | K7224 | K2224 |
| M4 | 0.7 | D4 | 3 | J9244 | K7244 | K2244 |
| M5 | 0.8 | D4 | 3 | J9284 | K7284 | K2284 |
| M6 | 1.0 | D5 | 3 | J9315 | K7315 | K2315 |
| M7 | 1.0 | D5 | 3 | J9345 | K7345 | K2345 |
| M8 | 1.25 | D5 | 3 | J9365 | K7365 | K2365 |
| M8 | 1.0 | D5 | 3 | J9375 | K7375 | K2375 |
| M10 | 1.5 | D6 | 3 | J9426 | K7426 | K2426 |
| M10 | 1.25 | D5 | 3 | J9435 | K7435 | K2435 |
| M12 | 1.75 | D6 | 3 | J9506 | K7506 | K2506 |
| M12 | 1.25 | D5 | 3 | J9525 | K7525 | K2525 |
| M14 | 2.0 | D7 | 3 | J9547 | K7547 | K2547 |
| M14 | 1.5 | D6 | 3 | J9556 | K7556 | K2556 |
| M16 | 2.0 | D7 | 3 | J9607 | K7607 | K2607 |
| M16 | 1.5 | D6 | 3 | J9616 | K7616 | K2616 |
| M18 | 2.5 | D7 | 4 | J9657 | K7657 | K2657 |
| M18 | 1.5 | D6 | 4 | J9676 | K7676 | K2676 |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | ◎ | ◎ | | ○ | ○ | | |

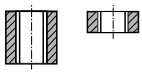
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | | | | ○ | | |

# SPIRAL POINT TAPS

T2496 SERIES

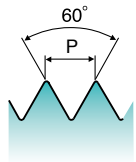
## SPIRAL POINT TAPS PLUG STYLE for Aluminum Alloy or Die Cast Aluminum

Hole type 3.0×D





USCTI




AI | HSSE-V3 | UNC UNF | USCTI 302A | H2~H5 | 60° | 4P~5P | Bright

◇Call for Availability

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Bright |
| #4 | 40 | — | H2 | 2 | T2496162 |
| #4 | 40 | — | H3 | 2 | T2496163 |
| #6 | 32 | — | H2 | 2 | T2496242 |
| #6 | 32 | — | H3 | 2 | T2496243 |
| #8 | 32 | — | H2 | 2 | T2496282 |
| #8 | 32 | — | H3 | 2 | T2496283 |
| #10 | 24 | — | H3 | 2 | T2496323 |
| #10 | — | 32 | H2 | 2 | T2496342 |
| #10 | — | 32 | H3 | 2 | T2496343 |
| #10 | — | 32 | H5 | 2 | T2496345 |
| 1/4 | 20 | — | H3 | 2 | T2496403 |
| 1/4 | 20 | — | H5 | 2 | T2496405 |
| 1/4 | — | 28 | H3 | 2 | T2496423 |
| 5/16 | 18 | — | H3 | 2 | T2496443 |
| 5/16 | 18 | — | H5 | 2 | T2496445 |
| 5/16 | — | 24 | H3 | 2 | T2496463 |
| 5/16 | — | 24 | H5 | 2 | T2496465 |
| 3/8 | 16 | — | H3 | 3 | T2496483 |
| 3/8 | 16 | — | H5 | 3 | T2496485 |
| 3/8 | — | 24 | H3 | 3 | T2496503 |
| 3/8 | — | 24 | H5 | 3 | T2496505 |
| 1/2 | 13 | — | H3 | 3 | T2496563 |
| 1/2 | 13 | — | H5 | 3 | T2496565 |
| 1/2 | — | 20 | H3 | 3 | T2496583 |
| 5/8 | 11 | — | H3 | 3 | T2496643 |
| 5/8 | — | 18 | H3 | 3 | T2496663 |
| 3/4 | 10 | — | H3 | 3 | T2496703 |
| 3/4 | — | 16 | H3 | 3 | T2496723 |
| 7/8 | 9 | — | H4 | 3 | T2496744 |
| 7/8 | — | 14 | H4 | 3 | T2496764 |
| 1 | 1 | — | H4 | 3 | T2496784 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 491.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

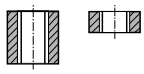
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ◎ | ◎ | | | | | |

# SPIRAL POINT TAPS

**T2K01 SERIES**

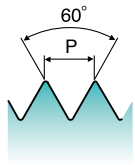
## METRIC SPIRAL POINT TAPS PLUG STYLE for Aluminum Alloy or Die Cast Aluminum

**Hole type** 3.0×D





USCTI




**Al** | HSSE-V3 | M MF | USCTI 302A | D3~D6 | 60° | 4P~5P | Bright

◇Call for Availability

| SIZE | Pitch | Thread Limit | No. of Flute | EDP No. |
|---|---|---|---|---|
| | | | | Bright |
| M3 | 0.5 | D3 | 2 | T2K01203 |
| M4 | 0.7 | D4 | 2 | T2K01244 |
| M5 | 0.8 | D4 | 2 | T2K01284 |
| M6 | 1.0 | D5 | 2 | T2K01315 |
| M8 | 1.25 | D5 | 2 | T2K01365 |
| M10 | 1.25 | D5 | 3 | T2K01435 |
| M10 | 1.5 | D6 | 3 | T2K01426 |
| M12 | 1.25 | D5 | 3 | T2K01525 |
| M12 | 1.5 | D5 | 3 | T2K01515 |
| M12 | 1.75 | D6 | 3 | T2K01506 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | |

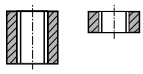
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ◎ | ◎ | | | | | |

# SPIRAL POINT TAPS

I9/J0/J1/J7 SERIES

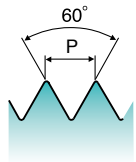
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

Hole type 3.0×D





USCTI




GS | HSSE-V3 | UNC UNF | USCTI | H2~H6 | 60° | 4P~5P | Steam Oxide | Bright | TiN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Steam Oxide | Bright | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | I9082 | J0082 | J1082 | J7082 |
| #4 | 40 | — | H2 | 2 | I9162 | J0162 | J1162 | J7162 |
| #5 | 40 | — | H2 | 2 | I9202 | J0202 | J1202 | J7202 |
| #6 | 32 | — | H3 | 2 | I9243 | J0243 | J1243 | J7243 |
| #8 | 32 | — | H3 | 2 | I9283 | J0283 | J1283 | J7283 |
| #10 | 24 | — | H3 | 2 | I9323 | J0323 | J1323 | J7323 |
| #10 | — | 32 | H3 | 2 | I9343 | J0343 | J1343 | J7343 |
| 1/4 | 20 | — | H3 | 2 | I9403 | J0403 | J1403 | J7403 |
| 1/4 | 20 | — | H5 | 2 | I9405 | J0405 | J1405 | J7405 |
| 1/4 | — | 28 | H3 | 2 | I9423 | J0423 | J1423 | J7423 |
| 5/16 | 18 | — | H3 | 2 | I9443 | J0443 | J1443 | J7443 |
| 5/16 | 18 | — | H5 | 2 | I9445 | J0445 | J1445 | J7445 |
| 5/16 | — | 24 | H3 | 2 | I9463 | J0463 | J1463 | J7463 |
| 3/8 | 16 | — | H3 | 3 | I9483 | J0483 | J1483 | J7483 |
| 3/8 | 16 | — | H5 | 3 | I9485 | J0485 | J1485 | J7485 |
| 3/8 | — | 24 | H3 | 3 | I9503 | J0503 | J1503 | J7503 |
| 7/16 | 14 | — | H3 | 3 | I9523 | J0523 | J1523 | J7523 |
| 7/16 | 14 | — | H5 | 3 | I9525 | J0525 | J1525 | J7525 |
| 7/16 | — | 20 | H3 | 3 | I9543 | J0543 | J1543 | J7543 |
| 7/16 | — | 20 | H5 | 3 | I9545 | J0545 | J1545 | J7545 |
| 1/2 | 13 | — | H3 | 3 | I9563 | J0563 | J1563 | J7563 |
| 1/2 | 13 | — | H5 | 3 | I9565 | J0565 | J1565 | J7565 |
| 1/2 | — | 20 | H3 | 3 | I9583 | J0583 | J1583 | J7583 |
| 1/2 | — | 20 | H5 | 3 | I9585 | J0585 | J1585 | J7585 |
| 9/16 | 12 | — | H3 | 3 | I9603 | J0603 | J1603 | J7603 |
| 9/16 | — | 18 | H5 | 3 | I9625 | J0625 | J1625 | J7625 |
| 5/8 | 11 | — | H3 | 3 | I9643 | J0643 | J1643 | J7643 |
| 5/8 | 11 | — | H5 | 3 | I9645 | J0645 | J1645 | J7645 |
| 5/8 | — | 18 | H5 | 3 | I9665 | J0665 | J1665 | J7665 |
| 3/4 | 10 | — | H3 | 3 | I9703 | J0703 | J1703 | J7703 |
| 3/4 | 10 | — | H5 | 3 | I9705 | J0705 | J1705 | J7705 |
| 3/4 | — | 16 | H5 | 3 | I9725 | J0725 | J1725 | J7725 |
| 7/8 | 9 | — | H4 | 3 | I9744 | J0744 | J1744 | J7744 |
| 7/8 | — | 14 | H6 | 3 | I9766 | J0766 | J1766 | J7766 |
| 1 | 8 | — | H4 | 3 | I9784 | J0784 | J1784 | J7784 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

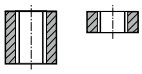
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**K9/L0/L1** SERIES

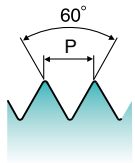
## SPIRAL POINT TAPS PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




**GS** | **HSS-V** | **UNC UNF** | **USCTI 302A** | **H2~H6** | 60° | **4P~5P** | **Bright** | **TiN** | **Hardslick**

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | K9082 | L0082 | L1082 |
| #4 | 40 | — | H2 | 2 | K9162 | L0162 | L1162 |
| #5 | 40 | — | H2 | 2 | K9202 | L0202 | L1202 |
| #6 | 32 | — | H3 | 2 | K9243 | L0243 | L1243 |
| #8 | 32 | — | H3 | 2 | K9283 | L0283 | L1283 |
| #10 | 24 | — | H3 | 2 | K9323 | L0323 | L1323 |
| #10 | — | 32 | H3 | 2 | K9343 | L0343 | L1343 |
| 1/4 | 20 | — | H3 | 2 | K9403 | L0403 | L1403 |
| 1/4 | 20 | — | H5 | 2 | K9405 | L0405 | L1405 |
| 1/4 | — | 28 | H3 | 3 | K9423 | L0423 | L1423 |
| 5/16 | 18 | — | H3 | 2 | K9443 | L0443 | L1443 |
| 5/16 | 18 | — | H5 | 3 | K9445 | L0445 | L1445 |
| 5/16 | — | 24 | H3 | 3 | K9463 | L0463 | L1463 |
| 3/8 | 16 | — | H3 | 3 | K9483 | L0483 | L1483 |
| 3/8 | 16 | — | H5 | 3 | K9485 | L0485 | L1485 |
| 3/8 | — | 24 | H3 | 3 | K9503 | L0503 | L1503 |
| 7/16 | 14 | — | H3 | 3 | K9523 | L0523 | L1523 |
| 7/16 | 14 | — | H5 | 3 | K9525 | L0525 | L1525 |
| 7/16 | — | 20 | H3 | 3 | K9543 | L0543 | L1543 |
| 7/16 | — | 20 | H5 | 3 | K9545 | L0545 | L1545 |
| 1/2 | 13 | — | H3 | 3 | K9563 | L0563 | L1563 |
| 1/2 | 13 | — | H5 | 3 | K9565 | L0565 | L1565 |
| 1/2 | — | 20 | H3 | 3 | K9583 | L0583 | L1583 |
| 1/2 | — | 20 | H5 | 3 | K9585 | L0585 | L1585 |
| 9/16 | 12 | — | H3 | 3 | K9603 | L0603 | L1603 |
| 9/16 | — | 18 | H3 | 3 | K9623 | L0623 | L1623 |
| 9/16 | — | 18 | H5 | 3 | K9625 | L0625 | L1625 |
| 5/8 | 11 | — | H3 | 3 | K9643 | L0643 | L1643 |
| 5/8 | 11 | — | H5 | 3 | K9645 | L0645 | L1645 |
| 5/8 | — | 18 | H3 | 3 | K9663 | L0663 | L1663 |
| 5/8 | — | 18 | H5 | 3 | K9665 | L0665 | L1665 |
| 3/4 | 10 | — | H3 | 3 | K9703 | L0703 | L1703 |
| 3/4 | 10 | — | H5 | 3 | K9705 | L0705 | L1705 |
| 3/4 | — | 16 | H3 | 3 | K9723 | L0723 | L1723 |
| 3/4 | — | 16 | H5 | 3 | K9725 | L0725 | L1725 |
| 7/8 | 9 | — | H6 | 3 | K9746 | L0746 | L1746 |
| 7/8 | — | 14 | H4 | 3 | K9764 | L0764 | L1764 |
| 7/8 | — | 14 | H6 | 3 | K9766 | L0766 | L1766 |
| 1 | 8 | — | H6 | 3 | K9786 | L0786 | L1786 |
| 1 | — | 12 | H6 | 3 | K9806 | L0806 | L1806 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

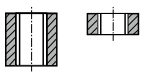
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

L7/L8/L9 SERIES

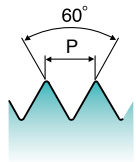
## METRIC SPIRAL POINT TAPS PLUG STYLE for General Purpose

Hole type 3.0×D





USCTI




GS | HSS-V | M MF | USCTI 302A | D3~D6 | 60° | 4P~5P | Bright | TiCN | Hardslick

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Bright | TiCN | Hardslick |
| M3 | 0.5 | D3 | 2 | **L7203** | **L8203** | **L9203** |
| M3.5 | 0.6 | D4 | 2 | **L7224** | **L8224** | **L9224** |
| M4 | 0.7 | D4 | 2 | **L7244** | **L8244** | **L9244** |
| M5 | 0.8 | D4 | 2 | **L7284** | **L8284** | **L9284** |
| M6 | 1.0 | D5 | 3 | **L7315** | **L8315** | **L9315** |
| M7 | 1.0 | D5 | 3 | **L7345** | **L8345** | **L9345** |
| M8 | 1.25 | D5 | 3 | **L7365** | **L8365** | **L9365** |
| M8 | 1.0 | D5 | 3 | **L7375** | **L8375** | **L9375** |
| M10 | 1.5 | D6 | 3 | **L7426** | **L8426** | **L9426** |
| M10 | 1.25 | D5 | 3 | **L7435** | **L8435** | **L9435** |
| M12 | 1.75 | D6 | 3 | **L7506** | **L8506** | **L9506** |
| M12 | 1.25 | D5 | 3 | **L7525** | **L8525** | **L9525** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 492.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

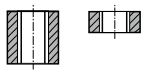
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

L3/L4/L5 SERIES

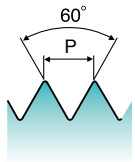
## SPIRAL POINT TAPS PLUG STYLE for General Purpose

Hole type 3.0×D





DIN-ANSI Shank




GS | HSS-V | UNC UNF | H2~H6 | 60° | 4P~5P | Bright | TiN | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | TiN | Hardslick |
| #2 | 56 | — | H2 | 2 | L3082 | L4082 | L5082 |
| #4 | 40 | — | H2 | 2 | L3162 | L4162 | L5162 |
| #5 | 40 | — | H2 | 3 | L3202 | L4202 | L5202 |
| #6 | 32 | — | H3 | 3 | L3243 | L4243 | L5243 |
| #8 | 32 | — | H3 | 3 | L3283 | L4283 | L5283 |
| #10 | 24 | — | H3 | 3 | L3323 | L4323 | L5323 |
| #10 | — | 32 | H3 | 3 | L3343 | L4343 | L5343 |
| 1/4 | 20 | — | H3 | 3 | L3403 | L4403 | L5403 |
| 1/4 | 20 | — | H5 | 3 | L3405 | L4405 | L5405 |
| 1/4 | — | 28 | H3 | 3 | L3423 | L4423 | L5423 |
| 5/16 | 18 | — | H3 | 3 | L3443 | L4443 | L5443 |
| 5/16 | 18 | — | H5 | 3 | L3445 | L4445 | L5445 |
| 5/16 | — | 24 | H3 | 3 | L3463 | L4463 | L5463 |
| 3/8 | 16 | — | H3 | 3 | L3483 | L4483 | L5483 |
| 3/8 | 16 | — | H5 | 3 | L3485 | L4485 | L5485 |
| 3/8 | — | 24 | H3 | 3 | L3503 | L4503 | L5503 |
| 7/16 | 14 | — | H3 | 3 | L3523 | L4523 | L5523 |
| 7/16 | 14 | — | H5 | 3 | L3525 | L4525 | L5525 |
| 7/16 | — | 20 | H3 | 3 | L3543 | L4543 | L5543 |
| 7/16 | — | 20 | H5 | 3 | L3545 | L4545 | L5545 |
| 1/2 | 13 | — | H3 | 3 | L3563 | L4563 | L5563 |
| 1/2 | 13 | — | H5 | 3 | L3565 | L4565 | L5565 |
| 1/2 | — | 20 | H3 | 3 | L3583 | L4583 | L5583 |
| 1/2 | — | 20 | H5 | 3 | L3585 | L4585 | L5585 |
| 9/16 | 12 | — | H5 | 3 | L3605 | L4605 | L5605 |
| 9/16 | — | 18 | H5 | 3 | L3625 | L4625 | L5625 |
| 5/8 | 11 | — | H3 | 3 | L3643 | L4643 | L5643 |
| 5/8 | 11 | — | H5 | 3 | L3645 | L4645 | L5645 |
| 3/4 | 10 | — | H3 | 3 | L3703 | L4703 | L5703 |
| 3/4 | 10 | — | H5 | 3 | L3705 | L4705 | L5705 |
| 3/4 | — | 16 | H5 | 3 | L3725 | L4725 | L5725 |
| 7/8 | 9 | — | H6 | 3 | L3746 | L4746 | L5746 |
| 7/8 | — | 14 | H6 | 3 | L3766 | L4766 | L5766 |
| 1 | 8 | — | H6 | 3 | L3786 | L4786 | L5786 |
| 1 | — | 12 | H6 | 3 | L3806 | L4806 | L5806 |

▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

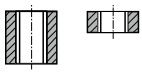
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# YG SPIRAL POINT TAPS

**T7216 / T6216 / T8216** SERIES
**T7C16 / T6C16 / T8C16** SERIES

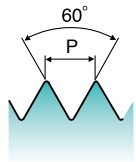
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H1~H7 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN |
| #0 | — | 80 | H1 | 2 | T7216021 | T6216021 | T8216021 |
| #0 | — | 80 | H2 | 2 | T7216022 | T6216022 | T8216022 |
| #0 | — | 80 | H3 | 2 | T7216023 | T6216023 | T8216023 |
| #1 | 64 | — | H1 | 2 | T7216041 | T6216041 | T8216041 |
| #1 | 64 | — | H2 | 2 | T7216042 | T6216042 | T8216042 |
| #1 | — | 72 | H1 | 2 | T7216061 | T6216061 | T8216061 |
| #1 | — | 72 | H2 | 2 | T7216062 | T6216062 | T8216062 |
| #2 | 56 | — | H1 | 2 | T7216081 | T6216081 | T8216081 |
| #2 | 56 | — | H2 | 2 | T7216082 | T6216082 | T8216082 |
| #2 | 56 | — | H3 | 2 | T7216083 | T6216083 | T8216083 |
| #2 | 56 | — | H5 | 2 | T7216085 | T6216085 | T8216085 |
| #2 | — | 64 | H1 | 2 | T7216101 | T6216101 | T8216101 |
| #2 | — | 64 | H2 | 2 | T7216102 | T6216102 | T8216102 |
| #3 | 48 | — | H1 | 2 | T7216121 | T6216121 | T8216121 |
| #3 | 48 | — | H2 | 2 | T7216122 | T6216122 | T8216122 |
| #3 | 48 | — | H3 | 2 | T7216123 | T6216123 | T8216123 |
| #3 | 48 | — | H5 | 2 | T7216125 | T6216125 | T8216125 |
| #3 | — | 56 | H1 | 2 | T7216141 | T6216141 | T8216141 |
| #3 | — | 56 | H2 | 2 | T7216142 | T6216142 | T8216142 |
| #4 | 40 | — | H1 | 2 | T7216161 | T6216161 | T8216161 |
| #4 | 40 | — | H2 | 2 | T7216162 | T6216162 | T8216162 |
| #4 | 40 | — | H3 | 2 | T7216163 | T6216163 | T8216163 |
| #4 | 40 | — | H5 | 2 | T7216165 | T6216165 | T8216165 |
| #4 | 40 | — | H7 | 2 | T7216167 | T6216167 | T8216167 |
| #4 | — | 48 | H1 | 2 | T7216181 | T6216181 | T8216181 |
| #4 | — | 48 | H2 | 2 | T7216182 | T6216182 | T8216182 |
| #5 | 40 | — | H1 | 2 | T7216201 | T6216201 | T8216201 |
| #5 | 40 | — | H2 | 2 | T7216202 | T6216202 | T8216202 |
| #5 | 40 | — | H5 | 2 | T7216205 | T6216205 | T8216205 |
| #5 | — | 44 | H2 | 2 | T7216222 | T6216222 | T8216222 |
| #6 | 32 | — | H1 | 2 | T7216241 | T6216241 | T8216241 |
| #6 | 32 | — | H2 | 2 | T7216242 | T6216242 | T8216242 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

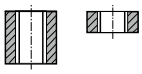
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7216 / T6216 / T8216** SERIES
**T7C16 / T6C16 / T8C16** SERIES

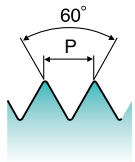
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H1~H7 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN |
| #6 | 32 | — | H3 | 2 | T7216243 | T6216243 | T8216243 |
| #6 | 32 | — | H4 | 2 | T7216244 | T6216244 | T8216244 |
| #6 | 32 | — | H5 | 2 | T7216245 | T6216245 | T8216245 |
| #6 | 32 | — | H7 | 2 | T7216247 | T6216247 | T8216247 |
| #6 | 32 | — | H3 | 3 | T7C16243 | T6C16243 | T8C16243 |
| #6 | — | 40 | H1 | 2 | T7216261 | T6216261 | T8216261 |
| #6 | — | 40 | H2 | 2 | T7216262 | T6216262 | T8216262 |
| #6 | — | 40 | H5 | 2 | T7216265 | T6216265 | T8216265 |
| #8 | 32 | — | H1 | 2 | T7216281 | T6216281 | T8216281 |
| #8 | 32 | — | H2 | 2 | T7216282 | T6216282 | T8216282 |
| #8 | 32 | — | H3 | 2 | T7216283 | T6216283 | T8216283 |
| #8 | 32 | — | H4 | 2 | T7216284 | T6216284 | T8216284 |
| #8 | 32 | — | H5 | 2 | T7216285 | T6216285 | T8216285 |
| #8 | 32 | — | H7 | 2 | T7216287 | T6216287 | T8216287 |
| #8 | 32 | — | H3 | 3 | T7C16283 | T6C16283 | T8C16283 |
| #8 | — | 36 | H1 | 2 | T7216301 | T6216301 | T8216301 |
| #8 | — | 36 | H2 | 2 | T7216302 | T6216302 | T8216302 |
| #10 | 24 | — | H1 | 2 | T7216321 | T6216321 | T8216321 |
| #10 | 24 | — | H2 | 2 | T7216322 | T6216322 | T8216322 |
| #10 | 24 | — | H3 | 2 | T7216323 | T6216323 | T8216323 |
| #10 | 24 | — | H4 | 2 | T7216324 | T6216324 | T8216324 |
| #10 | 24 | — | H5 | 2 | T7216325 | T6216325 | T8216325 |
| #10 | 24 | — | H7 | 2 | T7216327 | T6216327 | T8216327 |
| #10 | 24 | — | H3 | 3 | T7C16323 | T6C16323 | T8C16323 |
| #10 | — | 32 | H1 | 2 | T7216341 | T6216341 | T8216341 |
| #10 | — | 32 | H2 | 2 | T7216342 | T6216342 | T8216342 |
| #10 | — | 32 | H3 | 2 | T7216343 | T6216343 | T8216343 |
| #10 | — | 32 | H4 | 2 | T7216344 | T6216344 | T8216344 |
| #10 | — | 32 | H5 | 2 | T7216345 | T6216345 | T8216345 |
| #10 | — | 32 | H7 | 2 | T7216347 | T6216347 | T8216347 |
| #10 | — | 32 | H3 | 3 | T7C16343 | T6C16343 | T8C16343 |
| #12 | 24 | — | H1 | 2 | T7216361 | T6216361 | T8216361 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

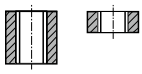
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7216 / T6216 / T8216** SERIES
**T7C16 / T6C16 / T8C16** SERIES

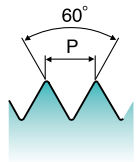
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H1~H7 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN |
| #12 | 24 | — | H3 | 2 | T7216363 | T6216363 | T8216363 |
| #12 | — | 28 | H3 | 2 | T7216383 | T6216383 | T8216383 |
| 1/4 | 20 | — | H1 | 2 | T7216401 | T6216401 | T8216401 |
| 1/4 | 20 | — | H2 | 2 | T7216402 | T6216402 | T8216402 |
| 1/4 | 20 | — | H3 | 2 | T7216403 | T6216403 | T8216403 |
| 1/4 | 20 | — | H5 | 2 | T7216405 | T6216405 | T8216405 |
| 1/4 | 20 | — | H3 | 3 | T7C16403 | T6C16403 | T8C16403 |
| 1/4 | 20 | — | H5 | 3 | T7C16405 | T6C16405 | T8C16405 |
| 1/4 | — | 28 | H1 | 2 | T7216421 | T6216421 | T8216421 |
| 1/4 | — | 28 | H2 | 2 | T7216422 | T6216422 | T8216422 |
| 1/4 | — | 28 | H3 | 2 | T7216423 | T6216423 | T8216423 |
| 1/4 | — | 28 | H4 | 2 | T7216424 | T6216424 | T8216424 |
| 1/4 | — | 28 | H2 | 3 | T7C16422 | T6C16422 | T8C16422 |
| 1/4 | — | 28 | H4 | 3 | T7C16424 | T6C16424 | T8C16424 |
| 5/16 | 18 | — | H1 | 2 | T7216441 | T6216441 | T8216441 |
| 5/16 | 18 | — | H2 | 2 | T7216442 | T6216442 | T8216442 |
| 5/16 | 18 | — | H3 | 2 | T7216443 | T6216443 | T8216443 |
| 5/16 | 18 | — | H5 | 2 | T7216445 | T6216445 | T8216445 |
| 5/16 | 18 | — | H3 | 3 | T7C16443 | T6C16443 | T8C16443 |
| 5/16 | 18 | — | H5 | 3 | T7C16445 | T6C16445 | T8C16445 |
| 5/16 | — | 24 | H1 | 2 | T7216461 | T6216461 | T8216461 |
| 5/16 | — | 24 | H2 | 2 | T7216462 | T6216462 | T8216462 |
| 5/16 | — | 24 | H3 | 2 | T7216463 | T6216463 | T8216463 |
| 5/16 | — | 24 | H4 | 2 | T7216464 | T6216464 | T8216464 |
| 5/16 | — | 24 | H2 | 3 | T7C16462 | T6C16462 | T8C16462 |
| 5/16 | — | 24 | H4 | 3 | T7C16464 | T6C16464 | T8C16464 |
| 3/8 | 16 | — | H1 | 3 | T7216481 | T6216481 | T8216481 |
| 3/8 | 16 | — | H2 | 3 | T7216482 | T6216482 | T8216482 |
| 3/8 | 16 | — | H3 | 3 | T7216483 | T6216483 | T8216483 |
| 3/8 | 16 | — | H5 | 3 | T7216485 | T6216485 | T8216485 |
| 3/8 | — | 24 | H1 | 3 | T7216501 | T6216501 | T8216501 |
| 3/8 | — | 24 | H2 | 3 | T7216502 | T6216502 | T8216502 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

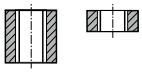
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7216 / T6216 / T8216** SERIES
**T7C16 / T6C16 / T8C16** SERIES

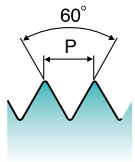
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

Hole type 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H1~H7 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide | TiN |
| 3/8 | — | 24 | H3 | 3 | T7216503 | T6216503 | T8216503 |
| 3/8 | — | 24 | H4 | 3 | T7216504 | T6216504 | T8216504 |
| 7/16 | 14 | — | H2 | 3 | T7216522 | T6216522 | T8216522 |
| 7/16 | 14 | — | H3 | 3 | T7216523 | T6216523 | T8216523 |
| 7/16 | 14 | — | H5 | 3 | T7216525 | T6216525 | T8216525 |
| 7/16 | — | 20 | H2 | 3 | T7216542 | T6216542 | T8216542 |
| 7/16 | — | 20 | H3 | 3 | T7216543 | T6216543 | T8216543 |
| 7/16 | — | 20 | H5 | 3 | T7216545 | T6216545 | T8216545 |
| 1/2 | 13 | — | H1 | 3 | T7216561 | T6216561 | T8216561 |
| 1/2 | 13 | — | H2 | 3 | T7216562 | T6216562 | T8216562 |
| 1/2 | 13 | — | H3 | 3 | T7216563 | T6216563 | T8216563 |
| 1/2 | 13 | — | H5 | 3 | T7216565 | T6216565 | T8216565 |
| 1/2 | — | 20 | H1 | 3 | T7216581 | T6216581 | T8216581 |
| 1/2 | — | 20 | H2 | 3 | T7216582 | T6216582 | T8216582 |
| 1/2 | — | 20 | H3 | 3 | T7216583 | T6216583 | T8216583 |
| 1/2 | — | 20 | H5 | 3 | T7216585 | T6216585 | T8216585 |
| 9/16 | 12 | — | H3 | 3 | T7216603 | T6216603 | T8216603 |
| 9/16 | 12 | — | H5 | 3 | T7216605 | T6216605 | T8216605 |
| 9/16 | — | 18 | H3 | 3 | T7216623 | T6216623 | T8216623 |
| 9/16 | — | 18 | H5 | 3 | T7216625 | T6216625 | T8216625 |
| 5/8 | 11 | — | H3 | 3 | T7216643 | T6216643 | T8216643 |
| 5/8 | 11 | — | H5 | 3 | T7216645 | T6216645 | T8216645 |
| 5/8 | — | 18 | H3 | 3 | T7216663 | T6216663 | T8216663 |
| 5/8 | — | 18 | H5 | 3 | T7216665 | T6216665 | T8216665 |
| 3/4 | 10 | — | H3 | 3 | T7216703 | T6216703 | T8216703 |
| 3/4 | 10 | — | H5 | 3 | T7216705 | T6216705 | T8216705 |
| 3/4 | — | 16 | H3 | 3 | T7216723 | T6216723 | T8216723 |
| 3/4 | — | 16 | H5 | 3 | T7216725 | T6216725 | T8216725 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

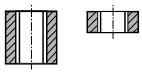
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7256 / T6256** SERIES

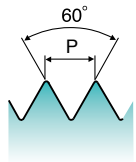
## STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H1~H7 | 60° | 1.5P~2P | Bright | Steam Oxide

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide |
| #0 | — | 80 | H1 | 2 | T7256021 | T6256021 |
| #0 | — | 80 | H2 | 2 | T7256022 | T6256022 |
| #1 | 64 | — | H2 | 2 | T7256042 | T6256042 |
| #1 | — | 72 | H1 | 2 | T7256061 | T6256061 |
| #1 | — | 72 | H2 | 2 | T7256062 | T6256062 |
| #2 | 56 | — | H1 | 2 | T7256081 | T6256081 |
| #2 | 56 | — | H2 | 2 | T7256082 | T6256082 |
| #3 | 48 | — | H2 | 2 | T7256122 | T6256122 |
| #3 | — | 56 | H2 | 2 | T7256142 | T6256142 |
| #4 | 40 | — | H2 | 2 | T7256162 | T6256162 |
| #4 | — | 48 | H2 | 2 | T7256182 | T6256182 |
| #5 | 40 | — | H2 | 2 | T7256202 | T6256202 |
| #5 | — | 44 | H2 | 2 | T7256222 | T6256222 |
| #6 | 32 | — | H2 | 2 | T7256242 | T6256242 |
| #6 | 32 | — | H3 | 2 | T7256243 | T6256243 |
| #6 | 32 | — | H7 | 2 | T7256247 | T6256247 |
| #6 | — | 40 | H2 | 2 | T7256262 | T6256262 |
| #8 | 32 | — | H2 | 2 | T7256282 | T6256282 |
| #8 | 32 | — | H3 | 2 | T7256283 | T6256283 |
| #8 | 32 | — | H7 | 2 | T7256287 | T6256287 |
| #8 | — | 36 | H2 | 2 | T7256302 | T6256302 |
| #10 | 24 | — | H2 | 2 | T7256322 | T6256322 |
| #10 | 24 | — | H3 | 2 | T7256323 | T6256323 |
| #10 | — | 32 | H1 | 2 | T7256341 | T6256341 |
| #10 | — | 32 | H2 | 2 | T7256342 | T6256342 |
| #10 | — | 32 | H3 | 2 | T7256343 | T6256343 |
| #12 | 24 | — | H3 | 2 | T7256363 | T6256363 |
| #12 | — | 28 | H3 | 2 | T7256383 | T6256383 |
| 1/4 | 20 | — | H3 | 2 | T7256403 | T6256403 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

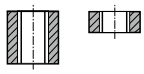
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7256/T6256** SERIES

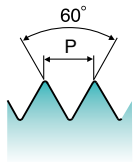
## STANDARD TAPS : SPIRAL POINT BOTTOMING STYLE for General Purpose

**Hole type** 3.0×D





USCTI




**GS** | **HSS** | **UNC UNF** | **USCTI 302** | **H1~H7** | 60° | 1.5P~2P | **Bright** | **Steam Oxide**

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Bright | Steam Oxide |
| 1/4 | — | 28 | H2 | 2 | **T7256422** | **T6256422** |
| 1/4 | — | 28 | H3 | 2 | **T7256423** | **T6256423** |
| 5/16 | 18 | — | H3 | 2 | **T7256443** | **T6256443** |
| 5/16 | — | 24 | H3 | 2 | **T7256463** | **T6256463** |
| 3/8 | 16 | — | H3 | 3 | **T7256483** | **T6256483** |
| 3/8 | — | 24 | H3 | 3 | **T7256503** | **T6256503** |
| 7/16 | 14 | — | H3 | 3 | **T7256523** | **T6256523** |
| 7/16 | — | 20 | H3 | 3 | **T7256543** | **T6256543** |
| 1/2 | 13 | — | H3 | 3 | **T7256563** | **T6256563** |
| 1/2 | — | 20 | H3 | 3 | **T7256583** | **T6256583** |
| 5/8 | 11 | — | H3 | 3 | **T7256643** | **T6256643** |
| 5/8 | — | 18 | H3 | 3 | **T7256663** | **T6256663** |
| 3/4 | 10 | — | H3 | 3 | **T7256703** | **T6256703** |
| 3/4 | — | 16 | H3 | 3 | **T7256723** | **T6256723** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

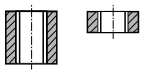
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7217/T6217/T8217** SERIES

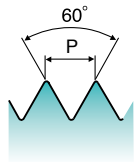
## METRIC STANDARD TAPS : SPIRAL POINT PLUG STYLE for General Purpose

**Hole type** 3.0×D





USCTI




GS | HSS | M MF | USCTI 302 | D3~D7 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | Pitch | Thread Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | | | | Bright | Steam Oxide | TiN |
| M1.6 | 0.35 | D3 | 2 | T7217093 | T6217093 | T8217093 |
| M2 | 0.40 | D3 | 2 | T7217133 | T6217133 | T8217133 |
| M2.5 | 0.45 | D3 | 2 | T7217173 | T6217173 | T8217173 |
| M3 | 0.50 | D3 | 2 | T7217203 | T6217203 | T8217203 |
| M3.5 | 0.60 | D4 | 2 | T7217224 | T6217224 | T8217224 |
| M4 | 0.70 | D4 | 2 | T7217244 | T6217244 | T8217244 |
| M4.5 | 0.75 | D4 | 2 | T7217264 | T6217264 | T8217264 |
| M5 | 0.80 | D4 | 2 | T7217284 | T6217284 | T8217284 |
| M6 | 1.00 | D5 | 2 | T7217315 | T6217315 | T8217315 |
| M7 | 1.00 | D5 | 2 | T7217345 | T6217345 | T8217345 |
| M8 | 1.25 | D5 | 2 | T7217365 | T6217365 | T8217365 |
| M8 | 1.00 | D5 | 3 | T7217375 | T6217375 | T8217375 |
| M10 | 1.50 | D6 | 3 | T7217426 | T6217426 | T8217426 |
| M10 | 1.25 | D5 | 3 | T7217435 | T6217435 | T8217435 |
| M12 | 1.75 | D6 | 3 | T7217506 | T6217506 | T8217506 |
| M12 | 1.25 | D5 | 3 | T7217525 | T6217525 | T8217525 |
| M14 | 2.00 | D7 | 3 | T7217547 | T6217547 | T8217547 |
| M14 | 1.50 | D6 | 3 | T7217556 | T6217556 | T8217556 |
| M16 | 2.00 | D7 | 3 | T7217607 | T6217607 | T8217607 |
| M16 | 1.50 | D6 | 3 | T7217616 | T6217616 | T8217616 |
| M18 | 2.50 | D7 | 3 | T7217657 | T6217657 | T8217657 |
| M20 | 2.50 | D7 | 3 | T7217707 | T6217707 | T8217707 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

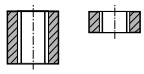
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7226/T6226/T8226** SERIES

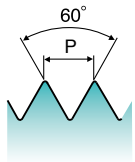
## STANDARD TAPS : SPIRAL POINT PLUG STYLE
## Oversize Tap

**Hole type** 3.0×D





USCTI




**GS** | **HSS** | **UNC UNF** | **USCTI 302** | 60° | 4P~5P | **Bright** | **Steam Oxide** | **TiN** | **+.005" oversize**

| SIZE | Thread Per Inch | | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | Bright | Steam Oxide | TiN |
| #6 | 32 | — | 2 | T7226240 | T6226240 | T8226240 |
| #8 | 32 | — | 2 | T7226280 | T6226280 | T8226280 |
| #10 | 24 | — | 2 | T7226320 | T6226320 | T8226320 |
| #10 | — | 32 | 2 | T7226340 | T6226340 | T8226340 |
| 1/4 | 20 | — | 2 | T7226400 | T6226400 | T8226400 |
| 1/4 | — | 28 | 2 | T7226420 | T6226420 | T8226420 |
| 5/16 | 18 | — | 2 | T7226440 | T6226440 | T8226440 |
| 5/16 | — | 24 | 2 | T7226460 | T6226460 | T8226460 |
| 3/8 | 16 | — | 3 | T7226480 | T6226480 | T8226480 |
| 3/8 | — | 24 | 3 | T7226500 | T6226500 | T8226500 |
| 7/16 | 14 | — | 3 | T7226520 | T6226520 | T8226520 |
| 7/16 | — | 20 | 3 | T7226540 | T6226540 | T8226540 |
| 1/2 | 13 | — | 3 | T7226560 | T6226560 | T8226560 |
| 1/2 | — | 20 | 3 | T7226580 | T6226580 | T8226580 |
| 5/8 | 11 | — | 3 | T7226640 | T6226640 | T8226640 |
| 3/4 | 10 | — | 3 | T7226700 | T6226700 | T8226700 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

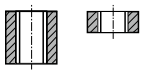
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7B17/T6B17/T8B17** SERIES

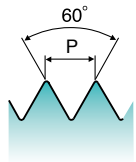
## STANDARD TAPS : SPIRAL POINT PLUG STYLE
## Oversize Tap

**Hole type** 3.0×D





USCTI




GS | HSS | M MF | USCTI 302 | 60° | 4P~5P | Bright | Steam Oxide | TiN | +.127mm oversize

| SIZE | Pitch | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|
| | | | Bright | Steam Oxide | TiN |
| M4 | 0.7 | 2 | T7B17240 | T6B17240 | T8B17240 |
| M5 | 0.8 | 2 | T7B17280 | T6B17280 | T8B17280 |
| M6 | 1 | 2 | T7B17310 | T6B17310 | T8B17310 |
| M8 | 1.25 | 2 | T7B17360 | T6B17360 | T8B17360 |
| M8 | 1 | 2 | T7B17370 | T6B17370 | T8B17370 |
| M10 | 1.5 | 3 | T7B17420 | T6B17420 | T8B17420 |
| M10 | 1.25 | 3 | T7B17430 | T6B17430 | T8B17430 |
| M12 | 1.75 | 3 | T7B17500 | T6B17500 | T8B17500 |
| M16 | 2 | 3 | T7B17600 | T6B17600 | T8B17600 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

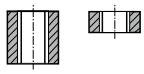
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# SPIRAL POINT TAPS

**T7236/T6236/T8236** SERIES
**T7G36/T6G36/T8G36** SERIES

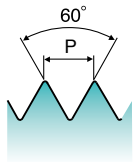
## SPIRAL POINTED TAP, 6" EXTENSION

**Hole type** 3.0×D





USCTI Long Shank




**GS** | **HSS** | **UNC UNF** | **USCTI Long Shank** | **H3** | **60°** | **4P~5P** | **Bright** | **Steam Oxide** | **TiN**

| SIZE | Thread Per Inch | | Thread Limit | Overall Length | No. of Flutes | EDP No. | | |
|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | | | | Bright | Steam Oxide | TiN |
| #6 | 32 | — | H3 | 6 | 2 | **T7236243** | **T6236243** | **T8236243** |
| #8 | 32 | — | H3 | 6 | 2 | **T7236283** | **T6236283** | **T8236283** |
| #10 | 24 | — | H3 | 6 | 2 | **T7236323** | **T6236323** | **T8236323** |
| #10 | — | 32 | H3 | 6 | 2 | **T7236343** | **T6236343** | **T8236343** |
| 1/4 | 20 | — | H3 | 6 | 2 | **T7236403** | **T6236403** | **T8236403** |
| 1/4 | — | 28 | H3 | 6 | 2 | **T7236423** | **T6236423** | **T8236423** |
| 5/16 | 18 | — | H3 | 6 | 2 | **T7236443** | **T6236443** | **T8236443** |
| 5/16 | 18 | — | H3 | 6 | 3 | **T7G36443** | **T6G36443** | **T8G36443** |
| 5/16 | — | 24 | H3 | 6 | 2 | **T7236463** | **T6236463** | **T8236463** |
| 5/16 | — | 24 | H3 | 6 | 3 | **T7G36463** | **T6G36463** | **T8G36463** |
| 3/8 | 16 | — | H3 | 6 | 3 | **T7236483** | **T6236483** | **T8236483** |
| 3/8 | — | 24 | H3 | 6 | 3 | **T7236503** | **T6236503** | **T8236503** |
| 7/16 | 14 | — | H3 | 6 | 3 | **T7236523** | **T6236523** | **T8236523** |
| 7/16 | — | 20 | H3 | 6 | 3 | **T7236543** | **T6236543** | **T8236543** |
| 1/2 | 13 | — | H3 | 6 | 3 | **T7236563** | **T6236563** | **T8236563** |
| 1/2 | — | 20 | H3 | 6 | 3 | **T7236583** | **T6236583** | **T8236583** |
| 5/8 | 11 | — | H3 | 6 | 3 | **T7236643** | **T6236643** | **T8236643** |

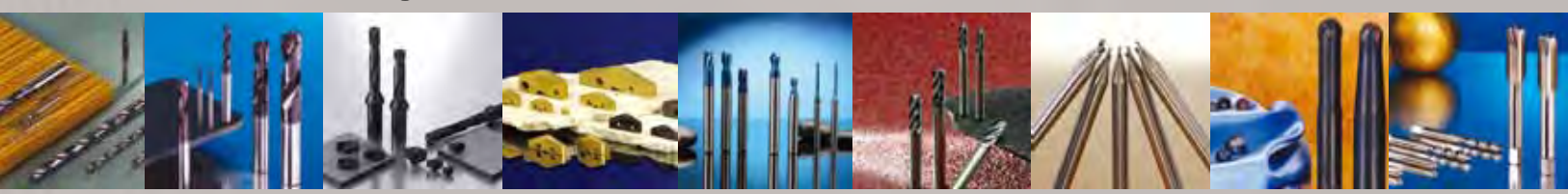
▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | ○ | ○ | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

Global Cutting Tool Leader **YG-1**



# CARBIDE & HSS

Being the best through innovation





# STRAIGHT FLUTE TAPS

**- Tapping Through & Blind Holes / Carbide, Super HSS & HSS**

## STRAIGHT FLUTE TAPS

Tapping Through & Blind Holes / Carbide, Super HSS & HSS

### INCH

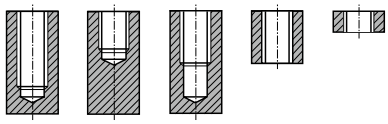
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| T0C01 |  | Carbide | UNC/UNF | GG | USCTI 302A | 2B | 1.5 ~ 2P | 2.0D | Bright | 441 |
| TR |  | Super HSS | UNC/UNF | GG | USCTI 302A | H3~H5 | 2 ~ 3P | | TiAlN | 442 |
| | | | M | GG | | D4~D6 | 2 ~ 3P | | | |
| TR-A, TR-R |  | Super HSS | UNC/UNF | GG | USCTI 302A | H3~H5 | 2 ~ 3P | | TiAlN | 444 |
| | | | M | GG | | D4~D6 | 2 ~ 3P | | | |
| T7316/T6316/ T8316/T7A16/ T7B16 |  | HSS | UNC/ UNF/ UNS | GS | USCTI 302 | H1~H7 | 9P/5P/2P | | Bright Steam Oxide TiN | 446 |
| T7315/T6315/ T8315 |  | HSS | M/MF | GS | USCTI 302 | D3~D9 | 9P/5P/2P | | Bright Steam Oxide TiN | 452 |
| T7326 |  | HSS | UNC/UNF | GS | USCTI 302 | +.005" oversize | 5P/2P | | Bright | 453 |
| T7B15 |  | HSS | M/MF | GS | USCTI 302 | +.127mm oversize | 5P/2P | | Bright | 454 |
| T7336 |  | HSS | UNC/UNF | GS | USCTI 302 (Left Hand) | H2~H4 | 5P/2P | | Bright | 455 |
| T7A15 |  | HSS | UNC/UNF | GS | USCTI 302 (Left Hand) | D4~D8 | 5P/2P | | Bright | 456 |
| T7616/T6616/ T8616 |  | HSS | UNC/UNF | GS | USCTI Long Shank | H3 | 4 ~ 5P | | Bright Steam Oxide TiN | 457 |

# STRAIGHT FLUTE TAPS

**T0C01 SERIES**

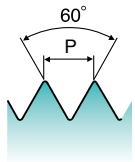
## STRAIGHT FLUTE TAP BOTTOMING STYLE for ALUMINUM ALLOY & CAST IRON

**Hole type** 2.0×D





USCTI




GG | Carbide | UNC UNF | USCTI 302A | 2B | 60° | 1.5P~2P Bottoming | Bright

| SIZE | Thread Per Inch | | Thread Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Bright |
| #10 | 24 | — | 2B | 4 | **T0C01322** |
| #10 | — | 32 | 2B | 4 | **T0C01342** |
| #12 | 24 | — | 2B | 4 | **T0C01362** |
| 1/4 | 20 | — | 2B | 4 | **T0C01402** |
| 1/4 | — | 28 | 2B | 4 | **T0C01422** |
| 5/16 | 18 | — | 2B | 4 | **T0C01442** |
| 5/16 | — | 24 | 2B | 4 | **T0C01462** |
| 3/8 | 16 | — | 2B | 4 | **T0C01482** |
| 3/8 | — | 24 | 2B | 4 | **T0C01502** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | ◎ |

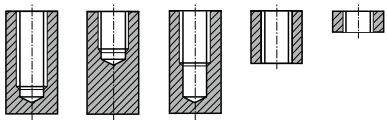
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | ◎ | | | | ○ | | | | | |

# STRAIGHT FLUTE TAPS

TR SERIES

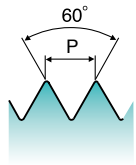
## STRAIGHT FLUTE TAP MODIFIED BOTTOMING STYLE for CAST IRON

Hole type 2.0×D





USCTI




GG | Super HSS | UNC UNF | USCTI 302A | H3~H5 | 60° | 2P~3P Bottoming | TiAlN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | TiAlN |
| #10 | 24 | — | H3 | 4 | **TR323** |
| #10 | 24 | — | H5 | 4 | **TR325** |
| #10 | — | 32 | H3 | 4 | **TR343** |
| 1/4 | 20 | — | H3 | 4 | **TR403** |
| 1/4 | 20 | — | H5 | 4 | **TR405** |
| 1/4 | — | 28 | H3 | 4 | **TR423** |
| 5/16 | 18 | — | H3 | 4 | **TR443** |
| 5/16 | 18 | — | H5 | 4 | **TR445** |
| 5/16 | — | 24 | H3 | 4 | **TR463** |
| 3/8 | 16 | — | H3 | 4 | **TR483** |
| 3/8 | 16 | — | H5 | 4 | **TR485** |
| 3/8 | — | 24 | H3 | 4 | **TR503** |
| 7/16 | 14 | — | H3 | 4 | **TR523** |
| 7/16 | 14 | — | H5 | 4 | **TR525** |
| 7/16 | — | 20 | H3 | 4 | **TR543** |
| 7/16 | — | 20 | H5 | 4 | **TR545** |
| 1/2 | 13 | — | H3 | 4 | **TR563** |
| 1/2 | 13 | — | H5 | 4 | **TR565** |
| 1/2 | — | 20 | H3 | 4 | **TR583** |
| 1/2 | — | 20 | H5 | 4 | **TR585** |
| 9/16 | 12 | — | H3 | 4 | **TR603** |
| 9/16 | 12 | — | H5 | 4 | **TR605** |
| 9/16 | — | 18 | H3 | 4 | **TR623** |
| 9/16 | — | 18 | H5 | 4 | **TR625** |
| 5/8 | 11 | — | H3 | 4 | **TR643** |
| 5/8 | 11 | — | H5 | 4 | **TR645** |
| 5/8 | — | 18 | H3 | 4 | **TR663** |
| 5/8 | — | 18 | H5 | 4 | **TR665** |
| 3/4 | 10 | — | H3 | 4 | **TR703** |
| 3/4 | 10 | — | H5 | 4 | **TR705** |
| 3/4 | — | 16 | H3 | 4 | **TR723** |
| 3/4 | — | 16 | H5 | 4 | **TR725** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | ◎ |

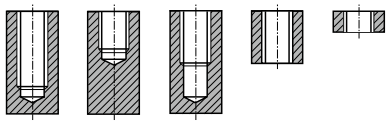
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | ◎ | | | | | |

# STRAIGHT FLUTE TAPS

TR SERIES

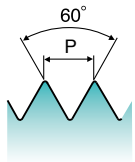
## METRIC STRAIGHT FLUTE TAP MODIFIED BOTTOMING STYLE for CAST IRON

Hole type 2.0×D





USCTI




GG | Super HSS | M | USCTI 302A | D4~D6 | 60° | 2P~3P Bottoming | TiAlN

| SIZE | Pitch | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|
| | | | | TiAlN |
| M5 | 0.8 | D4 | 4 | **TR284** |
| M6 | 1 | D5 | 4 | **TR315** |
| M8 | 1.25 | D5 | 4 | **TR365** |
| M10 | 1.5 | D6 | 4 | **TR426** |
| M12 | 1.25 | D6 | 4 | **TR526** |
| M12 | 1.75 | D6 | 4 | **TR506** |
| M14 | 1.25 | D6 | 4 | **TR566** |
| M14 | 1.5 | D6 | 4 | **TR556** |
| M16 | 1.5 | D6 | 4 | **TR616** |
| M18 | 1.5 | D6 | 4 | **TR676** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | ◎ |

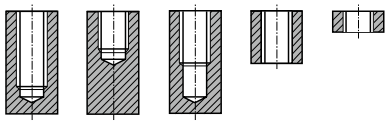
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | ◎ | | | | | |

# STRAIGHT FLUTE TAPS

TR-A, TR-R SERIES

## STRAIGHT FLUTE TAP MODIFIED BOTTOMING STYLE for CAST IRON

Hole type 2.0×D

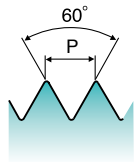


Through Coolant Hole

Radial Coolant Hole



USCTI




GG | Super HSS | UNC UNF | USCTI 302A | H3~H5 | 60° | 2P~3P Bottoming | TiAlN

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Through Coolant Hole | Radial Coolant Hole |
| #10 | 24 | — | H3 | 4 | TR323A | TR323R |
| #10 | 24 | — | H5 | 4 | TR325A | TR325R |
| #10 | — | 32 | H3 | 4 | TR343A | TR343R |
| 1/4 | 20 | — | H3 | 4 | TR403A | TR403R |
| 1/4 | 20 | — | H5 | 4 | TR405A | TR405R |
| 1/4 | — | 28 | H3 | 4 | TR423A | TR423R |
| 5/16 | 18 | — | H3 | 4 | TR443A | TR443R |
| 5/16 | 18 | — | H5 | 4 | TR445A | TR445R |
| 5/16 | — | 24 | H3 | 4 | TR463A | TR463R |
| 3/8 | 16 | — | H3 | 4 | TR483A | TR483R |
| 3/8 | 16 | — | H5 | 4 | TR485A | TR485R |
| 3/8 | — | 24 | H3 | 4 | TR503A | TR503R |
| 7/16 | 14 | — | H3 | 4 | TR523A | TR523R |
| 7/16 | 14 | — | H5 | 4 | TR525A | TR525R |
| 7/16 | — | 20 | H3 | 4 | TR543A | TR543R |
| 7/16 | — | 20 | H5 | 4 | TR545A | TR545R |
| 1/2 | 13 | — | H3 | 4 | TR563A | TR563R |
| 1/2 | 13 | — | H5 | 4 | TR565A | TR565R |
| 1/2 | — | 20 | H3 | 4 | TR583A | TR583R |
| 1/2 | — | 20 | H5 | 4 | TR585A | TR585R |
| 9/16 | 12 | — | H3 | 4 | TR603A | TR603R |
| 9/16 | 12 | — | H5 | 4 | TR605A | TR605R |
| 9/16 | — | 18 | H3 | 4 | TR623A | TR623R |
| 9/16 | — | 18 | H5 | 4 | TR625A | TR625R |
| 5/8 | 11 | — | H3 | 4 | TR643A | TR643R |
| 5/8 | 11 | — | H5 | 4 | TR645A | TR645R |
| 5/8 | — | 18 | H3 | 4 | TR663A | TR663R |
| 5/8 | — | 18 | H5 | 4 | TR665A | TR665R |
| 3/4 | 10 | — | H3 | 4 | TR703A | TR703R |
| 3/4 | 10 | — | H5 | 4 | TR705A | TR705R |
| 3/4 | — | 16 | H3 | 4 | TR723A | TR723R |
| 3/4 | — | 16 | H5 | 4 | TR725A | TR725R |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | ◎ |

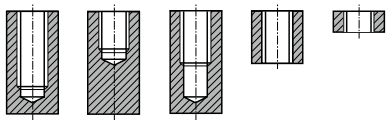
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | ◎ | | | | | |

# STRAIGHT FLUTE TAPS

TR-A, TR-R SERIES

## METRIC STRAIGHT FLUTE TAP MODIFIED BOTTOMING STYLE for CAST IRON

Hole type 2.0×D

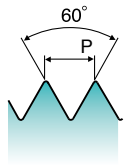


Through Coolant Hole

Radial Coolant Hole



USCTI




GG | Super HSS | M | USCTI 302A | D4~D6 | 60° | 2P~3P Bottoming | TiAlN

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Through Coolant Hole | Radial Coolant Hole |
| M5 | 0.8 | D4 | 4 | **TR284A** | **TR284R** |
| M6 | 1 | D5 | 4 | **TR315A** | **TR315R** |
| M8 | 1.25 | D5 | 4 | **TR365A** | **TR365R** |
| M10 | 1.5 | D6 | 4 | **TR426A** | **TR426R** |
| M12 | 1.25 | D6 | 4 | **TR526A** | **TR526R** |
| M12 | 1.75 | D6 | 4 | **TR506A** | **TR506R** |
| M14 | 1.25 | D6 | 4 | **TR566A** | **TR566R** |
| M14 | 1.5 | D6 | 4 | **TR556A** | **TR556R** |
| M16 | 1.5 | D6 | 4 | **TR616A** | **TR616R** |
| M18 | 1.5 | D6 | 4 | **TR676A** | **TR676R** |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| | | | | | | | ◎ |

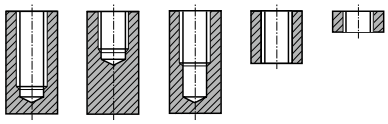
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | | ◎ | | | | | |

# STRAIGHT FLUTE TAPS

**T7316/T6316/T8316** SERIES
**T7A16/T7B16** SERIES

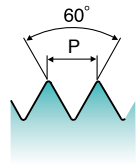
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

**Hole type** 2.0×D





USCTI




**GS** | **HSS** | **UNC UNF UNS** | **USCTI 302** | **H1~H7** | **60°** | **9P/5P/2P** | **Bright** | **Steam Oxide** | **TiN**

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| #0 | — | 80 | — | H1 | 2 | T7316026 | T7316027 | T7316028 | T6316026 | T6316027 | T6316028 | T8316027 | T8316028 |
| #0 | — | 80 | — | H2 | 2 | — | T7316027H2 | T7316028H2 | — | — | — | — | — |
| #1 | 64 | — | — | H1 | 2 | T7316046 | T7316047 | T7316048 | T6316046 | T6316047 | T6316048 | T8316047 | T8316048 |
| #1 | 64 | — | — | H2 | 2 | — | T7316047H2 | T7316048H2 | — | — | — | — | — |
| #1 | — | 72 | — | H1 | 2 | T7316066 | T7316067 | T7316068 | T6316066 | T6316067 | T6316068 | T8316067 | T8316068 |
| #1 | — | 72 | — | H2 | 2 | — | T7316067H2 | T7316068H2 | — | — | — | — | — |
| #2 | 56 | — | — | H1 | 2 | — | T7A16087H1 | T7A16088H1 | — | — | — | — | — |
| #2 | 56 | — | — | H1 | 3 | T7316086H1 | T7316087H1 | T7316088H1 | — | — | — | — | — |
| #2 | 56 | — | — | H2 | 2 | — | T7A16087 | T7A16088 | — | — | — | — | — |
| #2 | 56 | — | — | H2 | 3 | T7316086 | T7316087 | T7316088 | T6316086 | T6316087 | T6316088 | T8316087 | T8316088 |
| #2 | — | 64 | — | H2 | 3 | T7316106 | T7316107 | T7316108 | — | — | — | — | — |
| #3 | 48 | — | — | H1 | 3 | — | T7316127H1 | — | — | — | — | — | — |
| #3 | 48 | — | — | H2 | 2 | — | T7A16127 | T7A16128 | — | — | — | — | — |
| #3 | 48 | — | — | H2 | 3 | T7316126 | T7316127 | T7316128 | T6316126 | T6316127 | T6316128 | — | — |
| #3 | — | 56 | — | H2 | 3 | T7316146 | T7316147 | T7316148 | T6316146 | T6316147 | T6316148 | — | — |
| #4 | — | — | 36 | H2 | 3 | T7316156 | T7316157 | T7316158 | T6316156 | T6316157 | T6316158 | — | — |
| #4 | 40 | — | — | H1 | 2 | — | T7A16167H1 | T7A16168H1 | — | — | — | — | — |
| #4 | 40 | — | — | H1 | 3 | T7316166H1 | T7316167H1 | T7316168H1 | T6316166H1 | T6316167H1 | T6316168H1 | — | — |
| #4 | 40 | — | — | H2 | 2 | — | T7A16167 | T7A16168 | — | — | — | — | — |
| #4 | 40 | — | — | H2 | 3 | T7316166 | T7316167 | T7316168 | T6316166 | T6316167 | T6316168 | T8316167 | T8316168 |
| #4 | — | 48 | — | H1 | 3 | — | T7316187H1 | — | — | — | — | — | — |
| #4 | — | 48 | — | H2 | 3 | T7316186 | T7316187 | T7316188 | — | — | — | — | — |
| #5 | 40 | — | — | H1 | 3 | — | T7316207H1 | T7316208H1 | — | — | — | — | — |
| #5 | 40 | — | — | H2 | 2 | — | T7A16207 | T7A16208 | — | — | — | — | — |
| #5 | 40 | — | — | H2 | 3 | T7316206 | T7316207 | T7316208 | T6316206 | T6316207 | T6316208 | T8316207 | T8316208 |
| #5 | — | 44 | — | H2 | 3 | T7316226 | T7316227 | T7316228 | T6316226 | T6316227 | T6316228 | — | — |
| #6 | 32 | — | — | H1 | 2 | — | T7A16247H1 | T7A16248H1 | — | — | — | — | — |
| #6 | 32 | — | — | H1 | 3 | T7316246H1 | T7316247H1 | T7316248H1 | T6316246H1 | T6316247H1 | T6316248H1 | — | — |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

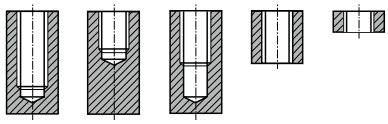
| K | N | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7316/T6316/T8316** SERIES
**T7A16/T7B16** SERIES

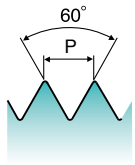
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

**Hole type** 2.0×D





USCTI




GS | HSS | UNC UNF UNS | USCTI 302 | H1~H7 | 60° | 9P/5P/2P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| #6 | 32 | — | — | H2 | 2 | — | T7A16247H2 | T7A16248H2 | — | — | — | — | — |
| #6 | 32 | — | — | H2 | 3 | T7316246H2 | T7316247H2 | T7316248H2 | T6316246H2 | T6316247H2 | T6316248H2 | — | — |
| #6 | 32 | — | — | H3 | 2 | — | T7A16247 | T7A16248 | — | — | — | — | — |
| #6 | 32 | — | — | H3 | 3 | T7316246 | T7316247 | T7316248 | T6316246 | T6316247 | T6316248 | T8316247 | T8316248 |
| #6 | 32 | — | — | H7 | 3 | — | T7B16247H7 | T7B16248H7 | — | — | — | — | — |
| #6 | — | 40 | — | H1 | 3 | — | T7B16267H1 | — | — | — | — | — | — |
| #6 | — | 40 | — | H2 | 2 | — | T7A16267 | T7A16268 | — | — | — | — | — |
| #6 | — | 40 | — | H2 | 3 | T7316266 | T7316267 | T7316268 | T6316266 | T6316267 | T6316268 | T8316267 | T8316268 |
| #8 | 32 | — | — | H1 | 2 | — | T7A16287H1 | — | — | — | — | — | — |
| #8 | 32 | — | — | H1 | 4 | T7316286H1 | T7316287H1 | T7316288H1 | T6316286H1 | T6316287H1 | T6316288H1 | — | — |
| #8 | 32 | — | — | H2 | 2 | — | T7A16287H2 | T7A16288H2 | — | — | — | — | — |
| #8 | 32 | — | — | H2 | 3 | — | T7B16287H2 | T7B16288H2 | — | — | — | — | — |
| #8 | 32 | — | — | H2 | 4 | T7316286H2 | T7316287H2 | T7316288H2 | T6316286H2 | T6316287H2 | T6316288H2 | — | — |
| #8 | 32 | — | — | H3 | 2 | — | T7A16287 | T7A16288 | — | — | — | — | — |
| #8 | 32 | — | — | H3 | 3 | — | T7B16287 | T7B16288 | — | — | — | — | — |
| #8 | 32 | — | — | H3 | 4 | T7316286 | T7316287 | T7316288 | T6316286 | T6316287 | T6316288 | T8316287 | T8316288 |
| #8 | 32 | — | — | H7 | 3 | — | T7B16287H7 | T7B16288H7 | — | — | — | — | — |
| #8 | 32 | — | — | H7 | 4 | — | T7316287H7 | T7316288H7 | — | — | — | — | — |
| #8 | — | 36 | — | H2 | 4 | T7316306 | T7316307 | T7316308 | T6316306 | T6316307 | T6316308 | T8316307 | T8316308 |
| #10 | 24 | — | — | H1 | 4 | T7316326H1 | T7316327H1 | T7316328H1 | T6316326H1 | T6316327H1 | T6316328H1 | — | — |
| #10 | 24 | — | — | H2 | 2 | — | T7A16327H2 | T7A16328H2 | — | — | — | — | — |
| #10 | 24 | — | — | H2 | 3 | — | T7B16327H2 | — | — | — | — | — | — |
| #10 | 24 | — | — | H2 | 4 | T7316326H2 | T7316327H2 | T7316328H2 | T6316326H2 | T6316327H2 | T6316328H2 | — | — |
| #10 | 24 | — | — | H3 | 2 | — | T7A16327 | T7A16328 | — | — | — | — | — |
| #10 | 24 | — | — | H3 | 3 | — | T7B16327 | T7B16328 | — | — | — | — | — |
| #10 | 24 | — | — | H3 | 4 | T7316326 | T7316327 | T7316328 | T6316326 | T6316327 | T6316328 | T8316327 | T8316328 |
| #10 | 24 | — | — | H7 | 3 | — | T7B16327H7 | T7B16328H7 | — | — | — | — | — |
| #10 | 24 | — | — | H7 | 4 | — | T7316327H7 | T7316328H7 | — | — | — | — | — |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

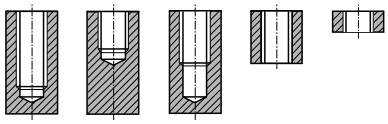
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

T7316/T6316/T8316 SERIES
T7A16/T7B16 SERIES

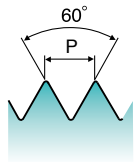
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

Hole type 2.0×D





USCTI




GS | HSS | UNC UNF UNS | USCTI 302 | H1~H7 | 60° | 9P/5P/2P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| #10 | — | 32 | — | H1 | 2 | — | T7A16347H1 | T7A16348H1 | — | — | — | — | — |
| #10 | — | 32 | — | H1 | 4 | T7316346H1 | T7316347H1 | T7316348H1 | T6316346H1 | T6316347H1 | T6316348H1 | — | — |
| #10 | — | 32 | — | H2 | 2 | — | T7A16347H2 | T7A16348H2 | — | — | — | — | — |
| #10 | — | 32 | — | H2 | 3 | — | T7B16347H2 | T7B16348H2 | — | — | — | — | — |
| #10 | — | 32 | — | H2 | 4 | T7316346H2 | T7316347H2 | T7316348H2 | T6316346H2 | T6316347H2 | T6316348H2 | — | — |
| #10 | — | 32 | — | H3 | 2 | — | T7A16347 | T7A16348 | — | — | — | — | — |
| #10 | — | 32 | — | H3 | 3 | — | T7B16347 | T7B16348 | — | — | — | — | — |
| #10 | — | 32 | — | H3 | 4 | T7316346 | T7316347 | T7316348 | T6316346 | T6316347 | T6316348 | T8316347 | T8316348 |
| #10 | — | 32 | — | H7 | 3 | — | T7B16347H7 | T7B16348H7 | — | — | — | — | — |
| #10 | — | 32 | — | H7 | 4 | — | T7316347H7 | T7316348H7 | — | — | — | — | — |
| #12 | 24 | — | — | H3 | 4 | T7316366 | T7316367 | T7316368 | T6316366 | T6316367 | T6316368 | T8316367 | T8316368 |
| #12 | — | 28 | — | H1 | 4 | — | T7316387H1 | — | — | — | — | — | — |
| # 12 | — | 28 | — | H3 | 4 | T7316386 | T7316387 | T7316388 | T6316386 | T6316387 | T6316388 | T8316387 | T8316388 |
| 1/4 | 20 | — | — | H1 | 3 | — | T7B16407H1 | — | — | — | — | — | — |
| 1/4 | 20 | — | — | H1 | 4 | T7316406H1 | T7316407H1 | T7316408H1 | — | — | — | — | — |
| 1/4 | 20 | — | — | H2 | 3 | — | T7B16407H2 | T7B16408H2 | — | — | — | — | — |
| 1/4 | 20 | — | — | H2 | 4 | T7316406H2 | T7316407H2 | T7316408H2 | — | — | — | — | — |
| 1/4 | 20 | — | — | H3 | 2 | — | T7A16407 | T7A16408 | — | — | — | — | — |
| 1/4 | 20 | — | — | H3 | 3 | — | T7B16407 | T7B16408 | — | — | — | — | — |
| 1/4 | 20 | — | — | H3 | 4 | T7316406 | T7316407 | T7316408 | T6316406 | T6316407 | T6316408 | T8316407 | T8316408 |
| 1/4 | 20 | — | — | H5 | 3 | — | T7B16407H5 | T7B16408H5 | — | — | — | — | — |
| 1/4 | 20 | — | — | H5 | 4 | — | T7316407H5 | T7316408H5 | — | — | — | — | — |
| 1/4 | — | 28 | — | H1 | 4 | — | T7316427H1 | T7316428H1 | — | — | — | — | — |
| 1/4 | — | 28 | — | H2 | 4 | — | T7316427H2 | T7316428H2 | — | — | — | — | — |
| 1/4 | — | 28 | — | H3 | 2 | — | T7A16427 | T7A16428 | — | — | — | — | — |
| 1/4 | — | 28 | — | H3 | 3 | — | T7B16427 | T7B16428 | — | — | — | — | — |
| 1/4 | — | 28 | — | H3 | 4 | T7316426 | T7316427 | T7316428 | T6316426 | T6316427 | T6316428 | T8316427 | T8316428 |
| 1/4 | — | 28 | — | H4 | 4 | — | T7316427H4 | T7316428H4 | — | — | — | — | — |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

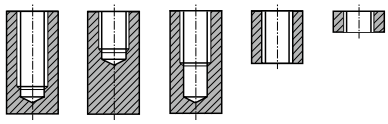
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7316/T6316/T8316** SERIES
**T7A16/T7B16** SERIES

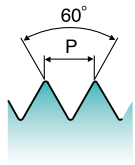
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

**Hole type** 2.0×D





USCTI




**GS** | **HSS** | **UNC UNF UNS** | **USCTI 302** | **H1~H7** | **60°** | **9P/5P/2P** | **Bright** | **Steam Oxide** | **TiN**

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| 5/16 | 18 | — | — | H1 | 4 | — | T7316447H1 | T7316448H1 | — | — | — | — | — |
| 5/16 | 18 | — | — | H2 | 4 | T7316446H2 | T7316447H2 | T7316448H2 | T6316446H2 | T6316447H2 | T6316448H2 | — | — |
| 5/16 | 18 | — | — | H3 | 2 | — | T7A16447 | T7A16448 | — | — | — | — | — |
| 5/16 | 18 | — | — | H3 | 3 | — | T7B16447 | T7B16448 | — | — | — | — | — |
| 5/16 | 18 | — | — | H3 | 4 | T7316446 | T7316447 | T7316448 | T6316446 | T6316447 | T6316448 | T8316447 | T8316448 |
| 5/16 | 18 | — | — | H5 | 3 | — | T7B16447H5 | T7B16448H5 | — | — | — | — | — |
| 5/16 | 18 | — | — | H5 | 4 | — | T7316447H5 | T7316448H5 | — | — | — | — | — |
| 5/16 | — | 24 | — | H1 | 4 | — | T7316467H1 | T7316468H1 | — | — | — | — | — |
| 5/16 | — | 24 | — | H2 | 4 | — | T7316467H2 | T7316468H2 | — | — | — | — | — |
| 5/16 | — | 24 | — | H3 | 3 | — | T7B16467 | T7B16468 | — | — | — | — | — |
| 5/16 | — | 24 | — | H3 | 4 | T7316466 | T7316467 | T7316468 | T6316466 | T6316467 | T6316468 | T8316467 | T8316468 |
| 5/16 | — | 24 | — | H4 | 4 | — | T7316467H4 | T7316468H4 | — | — | — | — | — |
| 3/8 | 16 | — | — | H1 | 3 | — | T7B16487H1 | T7B16488H1 | — | — | — | — | — |
| 3/8 | 16 | — | — | H1 | 4 | — | T7316487H1 | T7316488H1 | — | — | — | — | — |
| 3/8 | 16 | — | — | H2 | 4 | — | T7316487H2 | T7316488H2 | — | — | — | — | — |
| 3/8 | 16 | — | — | H3 | 3 | — | T7B16487 | T7B16488 | — | — | — | — | — |
| 3/8 | 16 | — | — | H3 | 4 | T7316486 | T7316487 | T7316488 | T6316486 | T6316487 | T6316488 | T8316487 | T8316488 |
| 3/8 | 16 | — | — | H5 | 3 | — | T7B16487H5 | T7B16488H5 | — | — | — | — | — |
| 3/8 | 16 | — | — | H5 | 4 | — | T7316487H5 | T7316488H5 | — | — | — | — | — |
| 3/8 | — | 24 | — | H1 | 4 | — | T7316507H1 | T7316508H1 | — | — | — | — | — |
| 3/8 | — | 24 | — | H2 | 4 | — | T7316507H2 | T7316508H2 | — | — | — | — | — |
| 3/8 | — | 24 | — | H3 | 3 | — | T7B16507 | T7B16508 | — | — | — | — | — |
| 3/8 | — | 24 | — | H3 | 4 | T7316506 | T7316507 | T7316508 | T6316506 | T6316507 | T6316508 | T8316507 | T8316508 |
| 3/8 | — | 24 | — | H4 | 4 | — | T7316507H4 | T7316508H4 | — | — | — | — | — |
| 7/16 | 14 | — | — | H2 | 4 | — | T7316527H2 | — | — | — | — | — | — |
| 7/16 | 14 | — | — | H3 | 3 | — | T7B16527 | T7B16528 | — | — | — | — | — |
| 7/16 | 14 | — | — | H3 | 4 | T7316526 | T7316527 | T7316528 | T6316526 | T6316527 | T6316528 | T8316527 | T8316528 |
| 7/16 | 14 | — | — | H5 | 4 | — | T7316527H5 | T7316528H5 | — | — | — | — | — |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

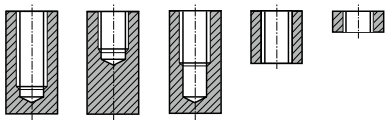
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7316/T6316/T8316** SERIES
**T7A16/T7B16** SERIES

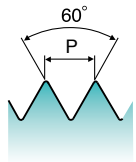
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

Hole type 2.0×D





USCTI




GS | HSS | UNC UNF UNS | USCTI 302 | H1~H7 | 60° | 9P/5P/2P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| 7/16 | — | 20 | — | H2 | 4 | – | T7316547H2 | – | – | – | – | – | – |
| 7/16 | — | 20 | — | H3 | 3 | – | T7B16547 | T7B16548 | – | – | – | – | – |
| 7/16 | — | 20 | — | H3 | 4 | T7316546 | T7316547 | T7316548 | T6316546 | T6316547 | T6316548 | T8316547 | T8316548 |
| 7/16 | — | 20 | — | H5 | 4 | – | T7316547H5 | T7316548H5 | – | – | – | – | – |
| 1/2 | 13 | — | — | H1 | 4 | – | T7316567H1 | T7316568H1 | – | – | – | – | – |
| 1/2 | 13 | — | — | H2 | 4 | – | T7316567H2 | T7316568H2 | – | – | – | – | – |
| 1/2 | 13 | — | — | H3 | 3 | – | T7B16567 | T7B16568 | – | – | – | – | – |
| 1/2 | 13 | — | — | H3 | 4 | T7316566 | T7316567 | T7316568 | T6316566 | T6316567 | T6316568 | T8316567 | T8316568 |
| 1/2 | 13 | — | — | H5 | 4 | – | T7316567H5 | T7316568H5 | – | – | – | – | – |
| 1/2 | — | 20 | — | H1 | 4 | – | T7316587H1 | T7316588H1 | – | – | – | – | – |
| 1/2 | — | 20 | — | H3 | 3 | – | T7B16587 | T7B16588 | – | – | – | – | – |
| 1/2 | — | 20 | — | H3 | 4 | T7316586 | T7316587 | T7316588 | T6316586 | T6316587 | T6316588 | T8316587 | T8316588 |
| 1/2 | — | 20 | — | H5 | 4 | – | T7316587H5 | T7316588H5 | – | – | – | – | – |
| 9/16 | 12 | — | — | H3 | 4 | T7316606 | T7316607 | T7316608 | T6316606 | T6316607 | T6316608 | T8316607 | T8316608 |
| 9/16 | 12 | — | — | H5 | 4 | – | T7316607H5 | T7316608H5 | – | – | – | – | – |
| 9/16 | — | 18 | — | H2 | 4 | – | T7316627H2 | – | – | – | – | – | – |
| 9/16 | — | 18 | — | H3 | 4 | T7316626 | T7316627 | T7316628 | T6316626 | T6316627 | T6316628 | T8316627 | T8316628 |
| 9/16 | — | 18 | — | H5 | 4 | – | T7316627H5 | T7316628H5 | – | – | – | – | – |
| 5/8 | 11 | — | — | H1 | 4 | – | T7316647H1 | – | – | – | – | – | – |
| 5/8 | 11 | — | — | H2 | 4 | – | T7316647H2 | T7316648H2 | – | – | – | – | – |
| 5/8 | 11 | — | — | H3 | 4 | T7316646 | T7316647 | T7316648 | T6316646 | T6316647 | T6316648 | T8316647 | T8316648 |
| 5/8 | 11 | — | — | H5 | 4 | – | T7316647H5 | T7316648H5 | – | – | – | – | – |
| 5/8 | — | 18 | — | H1 | 4 | – | T7316667H1 | – | – | – | – | – | – |
| 5/8 | — | 18 | — | H2 | 4 | – | T7316667H2 | – | – | – | – | – | – |
| 5/8 | — | 18 | — | H3 | 4 | T7316666 | T7316667 | T7316668 | T6316666 | T6316667 | T6316668 | T8316667 | T8316668 |
| 5/8 | — | 18 | — | H5 | 4 | – | T7316667H5 | T7316668H5 | – | – | – | – | – |
| 11/16 | — | — | 11 | H3 | 4 | T7316A06 | T7316A07 | T7316A08 | T6316A06 | T6316A07 | T6316A08 | – | – |
| 11/16 | — | — | 16 | H3 | 4 | T7316A26 | T7316A27 | T7316A28 | T6316A26 | T6316A27 | T6316A28 | – | – |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

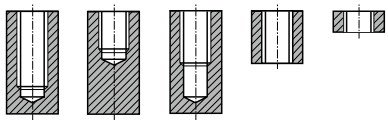
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7316/T6316/T8316** SERIES
**T7A16/T7B16** SERIES

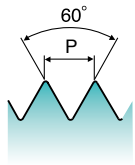
## HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

**Hole type** 2.0×D





USCTI




GS | HSS | UNC UNF UNS | USCTI 302 | H1~H7 | 60° | 9P/5P/2P | Bright | Steam Oxide | TiN

| SIZE | Thread Per Inch | | | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Bright | | | Steam Oxide | | | TiN | |
| | UNC | UNF | UNS | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| 3/4 | 10 | — | — | H1 | 4 | — | T7316707H1 | T7316708H1 | — | — | — | — | — |
| 3/4 | 10 | — | — | H2 | 4 | — | T7316707H2 | — | — | — | — | — | — |
| 3/4 | 10 | — | — | H3 | 4 | T7316706 | T7316707 | T7316708 | T6316706 | T6316707 | T6316708 | T8316707 | T8316708 |
| 3/4 | 10 | — | — | H5 | 4 | — | T7316707H5 | T7316708H5 | — | — | — | — | — |
| 3/4 | — | 16 | — | H1 | 4 | — | T7316727H1 | — | — | — | — | — | — |
| 3/4 | — | 16 | — | H2 | 4 | — | T7316727H2 | — | — | — | — | — | — |
| 3/4 | — | 16 | — | H3 | 4 | T7316726 | T7316727 | T7316728 | T6316726 | T6316727 | T6316728 | T8316727 | T8316728 |
| 3/4 | — | 16 | — | H5 | 4 | — | T7316727H5 | T7316728H5 | — | — | — | — | — |
| 7/8 | 9 | — | — | H4 | 4 | T7316746 | T7316747 | T7316748 | T6316746 | T6316747 | T6316748 | T8316747 | T8316748 |
| 7/8 | 9 | — | — | H6 | 4 | — | T7316747H6 | — | — | — | — | — | — |
| 7/8 | — | 14 | — | H2 | 4 | — | T7316767H2 | — | — | — | — | — | — |
| 7/8 | — | 14 | — | H4 | 4 | T7316766 | T7316767 | T7316768 | T6316766 | T6316767 | T6316768 | T8316767 | T8316768 |
| 7/8 | — | 14 | — | H6 | 4 | — | T7316767H6 | — | — | — | — | — | — |
| 1 | 8 | — | — | H1 | 4 | — | T7316787H1 | T7316788H1 | — | — | — | — | — |
| 1 | 8 | — | — | H2 | 4 | — | T7316787H2 | — | — | — | — | — | — |
| 1 | 8 | — | — | H4 | 4 | T7316786 | T7316787 | T7316788 | T6316786 | T6316787 | T6316788 | T8316787 | T8316788 |
| 1 | 8 | — | — | H6 | 4 | — | T7316787H6 | — | — | — | — | — | — |
| 1 | — | 12 | — | H4 | 4 | T7316806 | T7316807 | T7316808 | T6316806 | T6316807 | T6316808 | T8316807 | T8316808 |
| 1 | — | — | 14 | H2 | 4 | — | T7316817H2 | — | — | — | — | — | — |
| 1 | — | — | 14 | H4 | 4 | T7316816 | T7316817 | T7316818 | — | — | — | T8316817 | T8316818 |
| 1-1/8 | 7 | — | — | H4 | 4 | T7316826 | T7316827 | T7316828 | — | — | — | T8316827 | T8316828 |
| 1-1/8 | — | 12 | — | H4 | 4 | T7316846 | T7316847 | T7316848 | — | — | — | T8316847 | T8316848 |
| 1-1/4 | 7 | — | — | H4 | 4 | T7316866 | T7316867 | T7316868 | — | — | — | T8316867 | T8316868 |
| 1-1/4 | — | 12 | — | H4 | 6 | T7316886 | T7316887 | T7316888 | — | — | — | T8316887 | T8316888 |
| 1-3/8 | 6 | — | — | H4 | 4 | T7316906 | T7316907 | T7316908 | — | — | — | T8316907 | T8316908 |
| 1-3/8 | — | 12 | — | H4 | 6 | T7316926 | T7316927 | T7316928 | — | — | — | T8316927 | T8316928 |
| 1-1/2 | 6 | — | — | H4 | 4 | T7316946 | T7316947 | T7316948 | — | — | — | T8316947 | T8316948 |
| 1-1/2 | — | 12 | — | H4 | 6 | T7316966 | T7316967 | T7316968 | — | — | — | T8316967 | T8316968 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

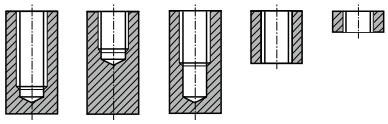
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7315/T6315/T8315** SERIES

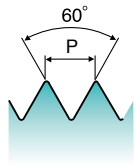
## METRIC HAND TAP
## TAPER, PLUG & BOTTOMING STYLE

Hole type 2.0×D





USCTI




GS | HSS | M MF | USCTI 302 | D3~D9 | 60° | 9P/5P/2P | Bright | Steam Oxide | TiN

| SIZE | Pitch | Limit | No. of Flute | EDP No. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Bright | | | Steam Oxide | | | TiN | |
| | | | | Taper | Plug | Bottoming | Taper | Plug | Bottoming | Plug | Bottoming |
| M1.6 | 0.35 | D3 | 3 | — | T7315097 | — | — | — | — | — | — |
| M2 | 0.40 | D3 | 3 | — | T7315137 | T7315138 | — | T6315137 | T6315138 | T8315137 | T8315138 |
| M2.5 | 0.45 | D3 | 3 | — | T7315177 | T7315178 | — | T6315177 | T6315178 | T8315177 | T8315178 |
| M3 | 0.50 | D3 | 3 | T7315206 | T7315207 | T7315208 | T6315206 | T6315207 | T6315208 | T8315207 | T8315208 |
| M3.5 | 0.60 | D4 | 3 | — | T7315227 | T7315228 | — | — | — | — | — |
| M4 | 0.70 | D4 | 4 | T7315246 | T7315247 | T7315248 | T6315246 | T6315247 | T6315248 | T8315247 | T8315248 |
| M4.5 | 0.75 | D4 | 4 | — | T7315267 | T7315268 | — | T6315267 | T6315268 | T8315267 | T8315268 |
| M5 | 0.80 | D4 | 4 | T7315286 | T7315287 | T7315288 | T6315286 | T6315287 | T6315288 | T8315287 | T8315288 |
| M6 | 1.00 | D5 | 4 | T7315316 | T7315317 | T7315318 | T6315316 | T6315317 | T6315318 | T8315317 | T8315318 |
| M7 | 1.00 | D5 | 4 | — | T7315347 | T7315348 | — | T6315347 | T6315348 | T8315347 | T8315348 |
| M8 | 1.25 | D5 | 4 | T7315366 | T7315367 | T7315368 | T6315366 | T6315367 | T6315368 | T8315367 | T8315368 |
| M8 | 1.00 | D5 | 4 | — | T7315377 | T7315378 | — | T6315377 | T6315378 | T8315377 | T8315378 |
| M10 | 1.00 | D5 | 4 | — | T7315447 | T7315448 | — | — | — | — | — |
| M10 | 1.50 | D6 | 4 | T7315426 | T7315427 | T7315428 | T6315426 | T6315427 | T6315428 | T8315427 | T8315428 |
| M10 | 1.25 | D5 | 4 | T7315436 | T7315437 | T7315438 | T6315436 | T6315437 | T6315438 | T8315437 | T8315438 |
| M12 | 1.50 | D6 | 4 | — | T7315517 | T7315518 | — | — | — | — | — |
| M12 | 1.75 | D6 | 4 | T7315506 | T7315507 | T7315508 | T6315506 | T6315507 | T6315508 | T8315507 | T8315508 |
| M12 | 1.25 | D5 | 4 | T7315526 | T7315527 | T7315528 | T6315526 | T6315527 | T6315528 | T8315527 | T8315528 |
| M14 | 2.00 | D7 | 4 | T7315546 | T7315547 | T7315548 | T6315546 | T6315547 | T6315548 | T8315547 | T8315548 |
| M14 | 1.50 | D6 | 4 | — | T7315557 | T7315558 | — | — | — | — | — |
| M14 | 1.25 | D5 | 4 | — | T7315567 | T7315568 | — | — | — | — | — |
| M16 | 2.00 | D7 | 4 | T7315606 | T7315607 | T7315608 | T6315606 | T6315607 | T6315608 | T8315607 | T8315608 |
| M16 | 1.50 | D6 | 4 | T7315616 | T7315617 | T7315618 | T6315616 | T6315617 | T6315618 | T8315617 | T8315618 |
| M18 | 2.50 | D7 | 4 | — | T7315657 | T7315658 | — | — | — | — | — |
| M18 | 1.50 | D6 | 4 | T7315676 | T7315677 | T7315678 | T6315676 | T6315677 | T6315678 | T8315677 | T8315678 |
| M20 | 2.50 | D7 | 4 | T7315706 | T7315707 | T7315708 | T6315706 | T6315707 | T6315708 | T8315707 | T8315708 |
| M20 | 1.50 | D6 | 4 | T7315726 | T7315727 | T7315728 | T6315726 | T6315727 | T6315728 | T8315727 | T8315728 |
| M24 | 3.00 | D8 | 4 | T7315786 | T7315787 | T7315788 | T6315786 | T6315787 | T6315788 | T8315787 | T8315788 |
| M30 | 3.50 | D9 | 4 | T7315946 | T7315947 | T7315948 | T6315946 | T6315947 | T6315948 | — | — |
| M36 | 4.00 | D9 | 4 | — | T7315B37 | T7315B38 | — | — | — | — | — |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

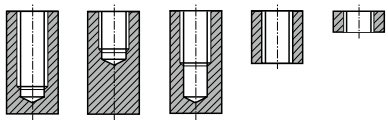
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7326 SERIES**

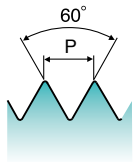
## METRIC HAND TAP
## Oversize Tap

**Hole type** 2.0×D





**USCTI**




**GS** | **HSS** | **UNC UNF** | **USCTI 302** | **60°** | **5P/2P** | **Bright** | **+.005" oversize**

| SIZE | Thread Per Inch | | No. of Flute | EDP No. Bright | |
|---|---|---|---|---|---|
| | UNC | UNF | | Plug | Bottoming |
| #6 | 32 | — | 3 | T7326247 | — |
| #8 | 32 | — | 4 | T7326287 | — |
| #10 | 24 | — | 4 | T7326327 | — |
| #10 | — | 32 | 4 | T7326347 | — |
| 1/4 | 20 | — | 4 | T7326407 | T7326408 |
| 1/4 | — | 28 | 4 | T7326427 | — |
| 5/16 | 18 | — | 4 | T7326447 | T7326448 |
| 5/16 | — | 24 | 4 | T7326467 | — |
| 3/8 | 16 | — | 4 | T7326487 | T7326488 |
| 3/8 | — | 24 | 4 | T7326507 | — |
| 7/16 | 14 | — | 4 | T7326527 | — |
| 1/2 | 13 | — | 4 | T7326567 | — |
| 1/2 | — | 20 | 4 | T7326587 | — |
| 5/8 | 11 | — | 4 | T7326647 | — |
| 3/4 | 10 | — | 4 | T7326707 | — |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

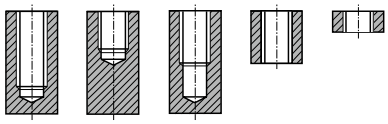
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

T7B15 SERIES

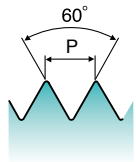
## METRIC HAND TAP Oversize Tap

Hole type 2.0×D





USCTI




GS | HSS | M MF | USCTI 302 | 60° | 5P/2P | Bright | +.127mm oversize

| SIZE | Pitch | No. of Flute | EDP No. Bright | |
|---|---|---|---|---|
| | | | Plug | Bottoming |
| M4 | 0.70 | 4 | T7B15247 | T7B15248 |
| M4.5 | 0.75 | 4 | T7B15267 | T7B15268 |
| M5 | 0.80 | 4 | T7B15287 | T7B15288 |
| M6 | 1.00 | 4 | T7B15317 | T7B15318 |
| M7 | 1.00 | 4 | T7B15347 | T7B15348 |
| M8 | 1.25 | 4 | T7B15367 | T7B15368 |
| M8 | 1.00 | 4 | T7B15377 | T7B15378 |
| M10 | 1.50 | 4 | T7B15427 | T7B15428 |
| M10 | 1.25 | 4 | T7B15437 | T7B15438 |
| M12 | 1.75 | 4 | T7B15507 | T7B15508 |
| M12 | 1.25 | 4 | T7B15527 | T7B15528 |
| M16 | 2.00 | 4 | T7B15607 | T7B15608 |
| M20 | 2.50 | 4 | T7B15707 | T7B15708 |
| M24 | 3.00 | 4 | T7B15787 | T7B15788 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

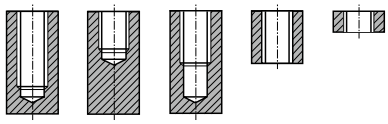
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7336 SERIES**

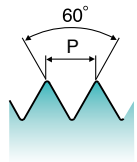
## LEFT HAND TAP

**Hole type** 2.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | H2~H4 | 60° | 5P/2P | Bright

| SIZE | Thread Per Inch | | Thread Limit | No. of Flute | EDP No. Bright | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Plug | Bottoming |
| #6 | 32 | — | H3 | 3 | T7336247 | T7336248 |
| #6 | — | 40 | H2 | 3 | T7336267 | T7336268 |
| #8 | 32 | — | H3 | 4 | T7336287 | T7336288 |
| #8 | — | 36 | H2 | 4 | T7336307 | T7336308 |
| #10 | 24 | — | H3 | 4 | T7336327 | T7336328 |
| #10 | — | 32 | H3 | 4 | T7336347 | T7336348 |
| 1/4 | 20 | — | H3 | 4 | T7336407 | T7336408 |
| 1/4 | — | 28 | H3 | 4 | T7336427 | T7336428 |
| 5/16 | 18 | — | H3 | 4 | T7336447 | T7336448 |
| 5/16 | — | 24 | H3 | 4 | T7336467 | T7336468 |
| 3/8 | 16 | — | H3 | 4 | T7336487 | T7336488 |
| 3/8 | — | 24 | H3 | 4 | T7336507 | T7336508 |
| 7/16 | 14 | — | H3 | 4 | T7336527 | T7336528 |
| 7/16 | — | 20 | H3 | 4 | T7336547 | T7336548 |
| 1/2 | 13 | — | H3 | 4 | T7336567 | T7336568 |
| 1/2 | — | 20 | H3 | 4 | T7336587 | T7336588 |
| 9/16 | 12 | — | H3 | 4 | T7336607 | T7336608 |
| 9/16 | — | 18 | H3 | 4 | T7336627 | T7336628 |
| 5/8 | 11 | — | H3 | 4 | T7336647 | T7336648 |
| 5/8 | — | 18 | H3 | 4 | T7336667 | T7336668 |
| 3/4 | 10 | — | H3 | 4 | T7336707 | T7336708 |
| 3/4 | — | 16 | H3 | 4 | T7336727 | T7336728 |
| 7/8 | 9 | — | H4 | 4 | T7336747 | T7336748 |
| 7/8 | — | 14 | H4 | 4 | T7336767 | T7336768 |
| 1 | 8 | — | H4 | 4 | T7336787 | T7336788 |
| 1 | — | 12 | H4 | 4 | T7336807 | T7336808 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

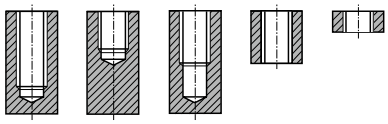
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

T7A15 SERIES

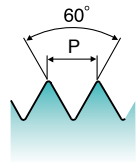
## METRIC LEFT HAND TAP

Hole type 2.0×D





USCTI




GS | HSS | UNC UNF | USCTI 302 | D4~D8 | 60° | 5P/2P | Bright

| SIZE | Pitch | Limit | No. of Flute | EDP No. Bright Plug | EDP No. Bright Bottoming |
|---|---|---|---|---|---|
| M3.5 | 0.6 | D4 | 3 | T7A15227 | T7A15228 |
| M4 | 0.7 | D4 | 4 | T7A15247 | T7A15248 |
| M4.5 | 0.75 | D4 | 4 | T7A15267 | T7A15268 |
| M5 | 0.8 | D4 | 4 | T7A15287 | T7A15288 |
| M6 | 1.0 | D5 | 4 | T7A15317 | T7A15318 |
| M7 | 1.0 | D5 | 4 | T7A15347 | T7A15348 |
| M8 | 1.25 | D5 | 4 | T7A15367 | T7A15368 |
| M8 | 1.0 | D5 | 4 | T7A15377 | T7A15378 |
| M10 | 1.5 | D6 | 4 | T7A15427 | T7A15428 |
| M10 | 1.25 | D5 | 4 | T7A15437 | T7A15438 |
| M12 | 1.75 | D6 | 4 | T7A15507 | T7A15508 |
| M12 | 1.25 | D5 | 4 | T7A15527 | T7A15528 |
| M14 | 2.0 | D7 | 4 | T7A15547 | T7A15548 |
| M14 | 1.5 | D6 | 4 | T7A15557 | T7A15558 |
| M16 | 2.0 | D7 | 4 | T7A15607 | T7A15608 |
| M16 | 1.5 | D6 | 4 | T7A15617 | T7A15618 |
| M18 | 2.5 | D7 | 4 | T7A15657 | T7A15658 |
| M18 | 1.5 | D6 | 4 | T7A15677 | T7A15678 |
| M20 | 2.5 | D7 | 4 | T7A15707 | T7A15708 |
| M20 | 1.5 | D6 | 4 | T7A15727 | T7A15728 |
| M22 | 2.5 | D7 | 4 | T7A15747 | T7A15748 |
| M22 | 1.5 | D6 | 4 | T7A15767 | T7A15768 |
| M24 | 3.0 | D8 | 4 | T7A15787 | T7A15788 |
| M24 | 2.0 | D7 | 4 | T7A15797 | T7A15798 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 495.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

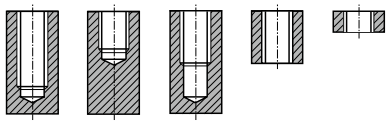
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# STRAIGHT FLUTE TAPS

**T7616/T6616/T8616** SERIES

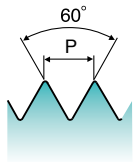
## PULLEY TAPS, 6" EXTENSION PLUG STYLE

**Hole type** 2.0×D





USCTI Long Shank




GS | HSS | UNC UNF | USCTI Long Shank | H3 | 60° | 4P~5P | Bright | Steam Oxide | TiN

| SIZE | UNC | Overall Length | Limit | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|---|---|
| | | | | | Bright | Steam Oxide | TiN |
| 1/4 | 20 | 6 | H3 | 4 | **T7616403** | **T6616403** | **T8616403** |
| 5/16 | 18 | 6 | H3 | 4 | **T7616443** | **T6616443** | **T8616443** |
| 3/8 | 16 | 6 | H3 | 4 | **T7616483** | **T6616483** | **T8616483** |
| 7/16 | 14 | 6 | H3 | 4 | **T7616523** | **T6616523** | **T8616523** |
| 1/2 | 13 | 6 | H3 | 4 | **T7616563** | **T6616563** | **T8616563** |
| 5/8 | 11 | 6 | H3 | 4 | **T7616643** | **T6616643** | **T8616643** |

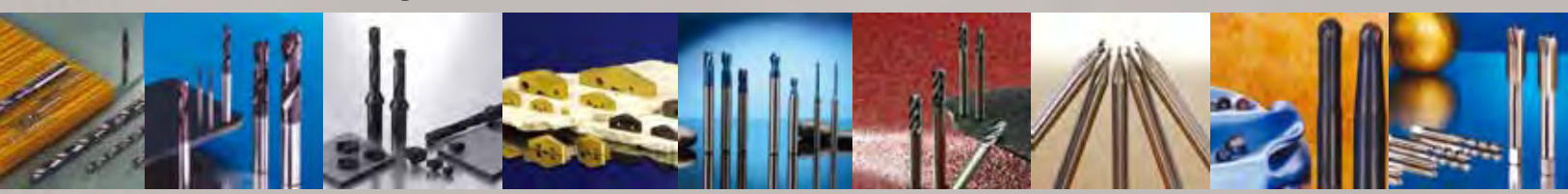
▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

Global Cutting Tool Leader **YG-1**



HSS

YG

Being the best through innovation







# FORMING TAPS

**- Tapping by Forming Soft Materials (No Chips)**

## FORMING TAPS
Tapping by Forming Soft Materials

### INCH

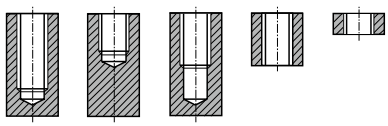
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| **TKR03** |  | Super HSS | UNC/UNF | **GV** | USCTI 302A | H3~H7 | 2 ~ 3P | 3.0D | TiCN | **461** |
| **ZF** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302 | H2~H5 | 2 ~ 3P | | Bright | **462** |
| **Z0/Z1/Z2/Z3** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302A | H2~H12 | 4 ~ 5P<br>1.5 ~ 2P | | Bright<br>TiN | **463** |
| **Z4/Z5/Z6/Z7** |  | HSSE-V3 | UNC/UNF | **GV** | USCTI 302A | H3~H12 | 4 ~ 5P<br>1.5 ~ 2P | | Bright<br>TiN | **465** |
| **Z8/ZA/ZC<br>Z9/ZB/ZD** |  | HSSE-V3 | M/MF | **GV** | USCTI 302A | D3~D11 | 4 ~ 5P<br>1.5 ~ 2P | | Bright<br>TiN / TiCN | **467** |
| **T7R01/T8R01/<br>THR01<br>T7R02/T8R02/<br>THR02** |  | HSS | UNC/UNF | **GV** | USCTI 302A | H2~H5 | 4 ~ 5P<br>1.5 ~ 2P | | Bright<br>TiN / TiCN | **468** |

# FORMING TAPS

**TKR03 SERIES**

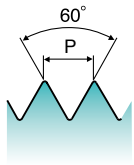
## FORMING TAPS BOTTOMING STYLE

**Hole type** 3.0×D





**USCTI**




**GV** | **Super HSS** | **UNC UNF** | **USCTI 302A** | **H3~H7** | 60° | **2P~3P** | **TiCN**

| SIZE | Thread Per Inch | | No. of Lobe | EDP No. | | | |
|---|---|---|---|---|---|---|---|
| | | | | Class of fit | | | |
| | UNC | UNF | | 2B (TiCN) | | 3B (TiCN) | |
| #4 | 40 | — | 4 | **TKR03165** | H5 | **TKR03163** | H3 |
| #5 | 40 | — | 4 | **TKR03205** | H5 | **TKR03203** | H3 |
| #6 | 32 | — | 4 | **TKR03245** | H5 | **TKR03243** | H3 |
| #8 | 32 | — | 4 | **TKR03285** | H5 | **TKR03283** | H3 |
| #10 | 24 | — | 4 | **TKR03326** | H6 | **TKR03324** | H4 |
| #10 | — | 32 | 4 | **TKR03346** | H6 | **TKR03344** | H4 |
| 1/4 | 20 | — | 4 | **TKR03406** | H6 | **TKR03404** | H4 |
| 1/4 | — | 28 | 4 | **TKR03426** | H6 | **TKR03424** | H4 |
| 5/16 | 18 | — | 4 | **TKR03447** | H7 | **TKR03445** | H5 |
| 5/16 | — | 24 | 4 | **TKR03467** | H7 | **TKR03465** | H5 |
| 3/8 | 16 | — | 4 | **TKR03487** | H7 | **TKR03485** | H5 |
| 3/8 | — | 24 | 4 | **TKR03507** | H7 | **TKR03505** | H5 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

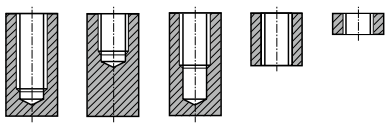
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

ZF SERIES

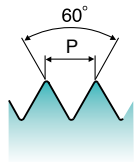
## MINIATURE FORMING TAPS BOTTOMING STYLE

Hole type 3.0×D





USCTI




GV | HSSE-V3 | UNC UNF | USCTI 302 | H2~H5 | 60° | 2P~3P | Bright

| SIZE | Nominal Size (mm) | Pitch | | Limit | No. of Lobe | EDP No. |
|---|---|---|---|---|---|---|
| | | UNC | UNF | | | |
| #00 | 1.1938 | 90 | — | H2 | 4 | ZFM52 |
| #00 | 1.1938 | 90 | — | H3 | 4 | ZFM53 |
| #00 | 1.1938 | — | 96 | H2 | 4 | ZFM82 |
| #00 | 1.1938 | — | 96 | H3 | 4 | ZFM83 |
| #0 | 1.5240 | — | 80 | H2 | 4 | ZF022 |
| #0 | 1.5240 | — | 80 | H3 | 4 | ZF023 |
| #0 | 1.5240 | — | 80 | H4 | 4 | ZF024 |
| #1 | 1.8540 | 64 | — | H2 | 4 | ZF042 |
| #1 | 1.8540 | 64 | — | H3 | 4 | ZF043 |
| #1 | 1.8540 | 64 | — | H4 | 4 | ZF044 |
| #1 | 1.8540 | — | 72 | H2 | 4 | ZF062 |
| #1 | 1.8540 | — | 72 | H3 | 4 | ZF063 |
| #1 | 1.8540 | — | 72 | H4 | 4 | ZF064 |
| #2 | 2.1844 | 56 | — | H2 | 4 | ZF082 |
| #2 | 2.1844 | 56 | — | H3 | 4 | ZF083 |
| #2 | 2.1844 | 56 | — | H4 | 4 | ZF084 |
| #2 | 2.1844 | — | 64 | H2 | 4 | ZF102 |
| #2 | 2.1844 | — | 64 | H3 | 4 | ZF103 |
| #2 | 2.1844 | — | 64 | H4 | 4 | ZF104 |
| #3 | 2.5146 | 48 | — | H2 | 4 | ZF122 |
| #3 | 2.5146 | 48 | — | H3 | 4 | ZF123 |
| #3 | 2.5146 | 48 | — | H4 | 4 | ZF124 |
| #3 | 2.5146 | 48 | — | H5 | 4 | ZF125 |
| #3 | 2.5146 | — | 56 | H2 | 4 | ZF142 |
| #3 | 2.5146 | — | 56 | H3 | 4 | ZF143 |
| #3 | 2.5146 | — | 56 | H4 | 4 | ZF144 |
| #3 | 2.5146 | — | 56 | H5 | 4 | ZF145 |

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ◎ | ◎ | | | | | |

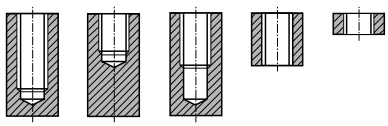
# FORMING TAPS

**Z0/Z1/Z2/Z3** SERIES

## FORMING TAPS PLUG & BOTTOMING STYLE

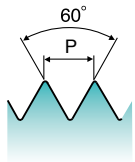
### A variety of H Limit

**Hole type** 3.0×D





**USCTI**




**GV** | **HSSE-V3** | **UNC UNF** | **USCTI 302A** | **H2~H12** | 60° | 4P~5P Plug | 1.5P~2P Bottoming | **Bright** | **TiN**

| SIZE | Thread Per Inch | | Limit | No. of Lobe | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Plug | | Bottoming | |
| | UNC | UNF | | | Bright | TiN | Bright | TiN |
| #0 | — | 80 | H2 | 4 | — | — | Z2022 | Z3022 |
| #0 | — | 80 | H3 | 4 | — | — | Z2023 | Z3023 |
| #1 | 64 | — | H2 | 4 | — | — | Z2042 | Z3042 |
| #1 | — | 72 | H2 | 4 | — | — | Z2062 | Z3062 |
| #1 | — | 72 | H3 | 4 | — | — | Z2063 | Z3063 |
| #2 | 56 | — | H2 | 4 | — | — | Z2082 | Z3082 |
| #2 | 56 | — | H3 | 4 | — | — | Z2083 | Z3083 |
| #2 | — | 64 | H2 | 4 | — | — | Z2102 | Z3102 |
| #3 | 48 | — | H2 | 4 | — | — | Z2122 | Z3122 |
| #3 | 48 | — | H3 | 4 | — | — | Z2123 | Z3123 |
| #3 | — | 56 | H3 | 4 | — | — | Z2143 | Z3143 |
| #4 | 40 | — | H3 | 4 | Z0163 | Z1163 | Z2163 | Z3163 |
| #4 | 40 | — | H5 | 4 | Z0165 | Z1165 | Z2165 | Z3165 |
| #4 | — | 48 | H3 | 4 | Z0183 | Z1183 | Z2183 | Z3183 |
| #4 | — | 48 | H5 | 4 | Z0185 | Z1185 | Z2185 | Z3185 |
| #5 | 40 | — | H3 | 4 | Z0203 | Z1203 | Z2203 | Z3203 |
| #5 | 40 | — | H5 | 4 | Z0205 | Z1205 | Z2205 | Z3205 |
| #5 | — | 44 | H5 | 4 | Z0225 | Z1225 | Z2225 | Z3225 |
| #6 | 32 | — | H3 | 4 | Z0243 | Z1243 | Z2243 | Z3243 |
| #6 | 32 | — | H5 | 4 | Z0245 | Z1245 | Z2245 | Z3245 |
| #6 | — | 40 | H3 | 4 | Z0263 | Z1263 | Z2263 | Z3263 |
| #6 | — | 40 | H5 | 4 | Z0265 | Z1265 | Z2265 | Z3265 |
| #8 | 32 | — | H3 | 4 | Z0283 | Z1283 | Z2283 | Z3283 |
| #8 | 32 | — | H5 | 4 | Z0285 | Z1285 | Z2285 | Z3285 |
| #8 | — | 36 | H3 | 4 | Z0303 | Z1303 | Z2303 | Z3303 |
| #8 | — | 36 | H5 | 4 | Z0305 | Z1305 | Z2305 | Z3305 |
| #10 | 24 | — | H4 | 4 | Z0324 | Z1324 | Z2324 | Z3324 |
| #10 | 24 | — | H6 | 4 | Z0326 | Z1326 | Z2326 | Z3326 |
| #10 | — | 32 | H4 | 4 | Z0344 | Z1344 | Z2344 | Z3344 |
| #10 | — | 32 | H6 | 4 | Z0346 | Z1346 | Z2346 | Z3346 |
| #12 | 24 | — | H4 | 4 | Z0364 | Z1364 | Z2364 | Z3364 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.
▶ Hardslck coating is available on your request (Bright Finish EDP No + H)

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

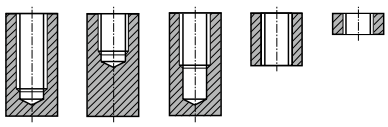
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

Z0/Z1/Z2/Z3 SERIES

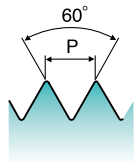
## FORMING TAPS PLUG & BOTTOMING STYLE

Hole type 3.0×D





USCTI




GV | HSSE-V3 | UNC UNF | USCTI 302A | H2~H12 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN

| SIZE | Thread Per Inch | | Limit | No. of Lobe | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Plug | | Bottoming | |
| | UNC | UNF | | | Bright | TiN | Bright | TiN |
| #12 | 24 | — | H6 | 4 | Z0366 | Z1366 | Z2366 | Z3366 |
| 1/4 | 20 | — | H4 | 4 | Z0404 | Z1404 | Z2404 | Z3404 |
| 1/4 | 20 | — | H6 | 4 | Z0406 | Z1406 | Z2406 | Z3406 |
| 1/4 | — | 28 | H4 | 4 | Z0424 | Z1424 | Z2424 | Z3424 |
| 1/4 | — | 28 | H6 | 4 | Z0426 | Z1426 | Z2426 | Z3426 |
| 5/16 | 18 | — | H5 | 4 | Z0445 | Z1445 | Z2445 | Z3445 |
| 5/16 | 18 | — | H7 | 4 | Z0447 | Z1447 | Z2447 | Z3447 |
| 5/16 | — | 24 | H5 | 4 | Z0465 | Z1465 | Z2465 | Z3465 |
| 5/16 | — | 24 | H7 | 4 | Z0467 | Z1467 | Z2467 | Z3467 |
| 3/8 | 16 | — | H5 | 4 | Z0485 | Z1485 | Z2485 | Z3485 |
| 3/8 | 16 | — | H7 | 4 | Z0487 | Z1487 | Z2487 | Z3487 |
| 3/8 | — | 24 | H5 | 4 | Z0505 | Z1505 | Z2505 | Z3505 |
| 3/8 | — | 24 | H7 | 4 | Z0507 | Z1507 | Z2507 | Z3507 |
| 7/16 | 14 | — | H8 | 4 | Z0528 | Z1528 | Z2528 | Z3528 |
| 7/16 | — | 20 | H8 | 4 | Z0548 | Z1548 | Z2548 | Z3548 |
| 1/2 | 13 | — | H8 | 4 | Z0568 | Z1568 | Z2568 | Z3568 |
| 1/2 | 13 | — | H5 | 4 | Z0565 | Z1565 | Z2565 | Z3565 |
| 1/2 | — | 20 | H5 | 4 | Z0585 | Z1585 | Z2585 | Z3585 |
| 1/2 | — | 20 | H8 | 4 | Z0588 | Z1588 | Z2588 | Z3588 |
| 9/16 | 12 | — | H7 | 4 | Z0607 | Z1607 | Z2607 | Z3607 |
| 9/16 | 12 | — | H10 | 4 | Z0600 | Z1600 | Z2600 | Z3600 |
| 9/16 | — | 18 | H8 | 4 | Z0628 | Z1628 | Z2628 | Z3628 |
| 9/16 | — | 18 | H10 | 4 | Z0620 | Z1620 | Z2620 | Z3620 |
| 5/8 | 11 | — | H8 | 4 | Z0648 | Z1648 | Z2648 | Z3648 |
| 5/8 | 11 | — | H10 | 4 | Z0640 | Z1640 | Z2640 | Z3640 |
| 5/8 | — | 18 | H10 | 4 | Z0660 | Z1660 | Z2660 | Z3660 |
| 3/4 | 10 | — | H10 | 4 | Z0700 | Z1700 | Z2700 | Z3700 |
| 3/4 | 10 | — | H12 | 4 | Z070B | Z170B | Z270B | Z370B |
| 3/4 | — | 16 | H8 | 4 | Z0728 | Z1728 | Z2728 | Z3728 |
| 3/4 | — | 16 | H10 | 4 | Z0720 | Z1720 | Z2720 | Z3720 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.
▶Hardslck coating is available on your request (Bright Finish EDP No + H)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

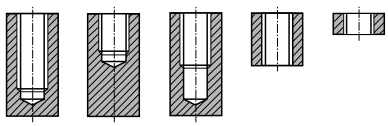
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

Z4/Z5/Z6/Z7 SERIES

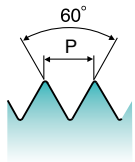
## FORMING TAPS WITH OIL GROOVE PLUG & BOTTOMING STYLE

Hole type 3.0×D





USCTI




GV | HSSE-V3 | UNC UNF | USCTI 302A | H3~H12 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN

| SIZE | Thread Per Inch | | Limit | No. of Lobe | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Plug | | Bottoming | |
| | UNC | UNF | | | Bright | TiN | Bright | TiN |
| #4 | 40 | — | H3 | 4 | Z4163 | Z5163 | Z6163 | Z7163 |
| #4 | 40 | — | H5 | 4 | Z4165 | Z5165 | Z6165 | Z7165 |
| #4 | — | 48 | H3 | 4 | Z4183 | Z5183 | Z6183 | Z7183 |
| #4 | — | 48 | H5 | 4 | Z4185 | Z5185 | Z6185 | Z7185 |
| #5 | 40 | — | H3 | 4 | Z4203 | Z5203 | Z6203 | Z7203 |
| #5 | 40 | — | H5 | 4 | Z4205 | Z5205 | Z6205 | Z7205 |
| #5 | — | 44 | H5 | 4 | Z4225 | Z5225 | Z6225 | Z7225 |
| #6 | 32 | — | H3 | 4 | Z4243 | Z5243 | Z6243 | Z7243 |
| #6 | 32 | — | H5 | 4 | Z4245 | Z5245 | Z6245 | Z7245 |
| #6 | — | 40 | H3 | 4 | Z4263 | Z5263 | Z6263 | Z7263 |
| #6 | — | 40 | H5 | 4 | Z4265 | Z5265 | Z6265 | Z7265 |
| #8 | 32 | — | H3 | 4 | Z4283 | Z5283 | Z6283 | Z7283 |
| #8 | 32 | — | H5 | 4 | Z4285 | Z5285 | Z6285 | Z7285 |
| #8 | — | 36 | H3 | 4 | Z4303 | Z5303 | Z6303 | Z7303 |
| #8 | — | 36 | H5 | 4 | Z4305 | Z5305 | Z6305 | Z7305 |
| #10 | 24 | — | H4 | 4 | Z4324 | Z5324 | Z6324 | Z7324 |
| #10 | 24 | — | H6 | 4 | Z4326 | Z5326 | Z6326 | Z7326 |
| #10 | — | 32 | H4 | 4 | Z4344 | Z5344 | Z6344 | Z7344 |
| #10 | — | 32 | H6 | 4 | Z4346 | Z5346 | Z6346 | Z7346 |
| #12 | 24 | — | H4 | 4 | Z4364 | Z5364 | Z6364 | Z7364 |
| #12 | 24 | — | H6 | 4 | Z4366 | Z5366 | Z6366 | Z7366 |
| 1/4 | 20 | — | H4 | 4 | Z4404 | Z5404 | Z6404 | Z7404 |
| 1/4 | 20 | — | H6 | 4 | Z4406 | Z5406 | Z6406 | Z7406 |
| 1/4 | — | 28 | H4 | 4 | Z4424 | Z5424 | Z6424 | Z7424 |
| 1/4 | — | 28 | H6 | 4 | Z4426 | Z5426 | Z6426 | Z7426 |
| 5/16 | 18 | — | H5 | 4 | Z4445 | Z5445 | Z6445 | Z7445 |
| 5/16 | 18 | — | H7 | 4 | Z4447 | Z5447 | Z6447 | Z7447 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.
▶Hardslck coating is available on your request (Bright Finish EDP No + H)

▶ NEXT PAGE

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

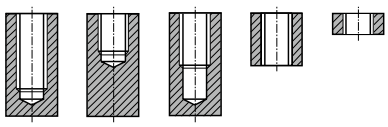
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

Z4/Z5/Z6/Z7 SERIES

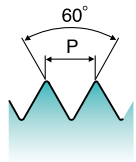
## FORMING TAPS WITH OIL GROOVE PLUG & BOTTOMING STYLE for General Purpose

Hole type 3.0×D





USCTI




GV | HSSE-V3 | UNC UNF | USCTI 302A | H3~H12 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN

| SIZE | Thread Per Inch | | Limit | No. of Lobe | EDP No. | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Plug | | Bottoming | |
| | UNC | UNF | | | Bright | TiN | Bright | TiN |
| 5/16 | — | 24 | H5 | 4 | Z4465 | Z5465 | Z6465 | Z7465 |
| 5/16 | — | 24 | H7 | 4 | Z4467 | Z5467 | Z6467 | Z7467 |
| 3/8 | 16 | — | H5 | 4 | Z4485 | Z5485 | Z6485 | Z7485 |
| 3/8 | 16 | — | H7 | 4 | Z4487 | Z5487 | Z6487 | Z7487 |
| 3/8 | — | 24 | H5 | 4 | Z4505 | Z5505 | Z6505 | Z7505 |
| 3/8 | — | 24 | H7 | 4 | Z4507 | Z5507 | Z6507 | Z7507 |
| 7/16 | 14 | — | H8 | 4 | Z4528 | Z5528 | Z6528 | Z7528 |
| 7/16 | — | 20 | H8 | 4 | Z4548 | Z5548 | Z6548 | Z7548 |
| 1/2 | 13 | — | H8 | 4 | Z4568 | Z5568 | Z6568 | Z7568 |
| 1/2 | 13 | — | H5 | 4 | Z4565 | Z5565 | Z6565 | Z7565 |
| 1/2 | — | 20 | H5 | 4 | Z4585 | Z5585 | Z6585 | Z7585 |
| 1/2 | — | 20 | H8 | 4 | Z4588 | Z5588 | Z6588 | Z7588 |
| 9/16 | 12 | — | H7 | 4 | Z4607 | Z5607 | Z6607 | Z7607 |
| 9/16 | 12 | — | H10 | 4 | Z4600 | Z5600 | Z6600 | Z7600 |
| 9/16 | — | 18 | H8 | 4 | Z4628 | Z5628 | Z6628 | Z7628 |
| 9/16 | — | 18 | H10 | 4 | Z4620 | Z5620 | Z6620 | Z7620 |
| 5/8 | 11 | — | H8 | 4 | Z4648 | Z5648 | Z6648 | Z7648 |
| 5/8 | 11 | — | H10 | 4 | Z4640 | Z5640 | Z6640 | Z7640 |
| 5/8 | — | 18 | H10 | 4 | Z4660 | Z5660 | Z6660 | Z7660 |
| 3/4 | 10 | — | H10 | 4 | Z4700 | Z5700 | Z6700 | Z7700 |
| 3/4 | 10 | — | H12 | 4 | Z470B | Z570B | Z670B | Z770B |
| 3/4 | — | 16 | H8 | 4 | Z4728 | Z5728 | Z6728 | Z7728 |
| 3/4 | — | 16 | H10 | 4 | Z4720 | Z5720 | Z6720 | Z7720 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.
▶Hardslck coating is available on your request (Bright Finish EDP No + H)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

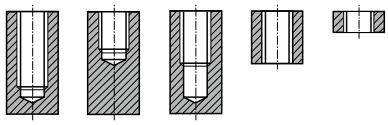
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

Z8/ZA/ZC SERIES
Z9/ZB/ZD SERIES

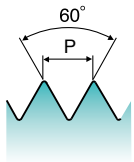
## FORMING TAPS WITH OIL GROOVE PLUG & BOTTOMING STYLE for General Purpose

Hole type 3.0×D





USCTI




GV | HSSE-V3 | M MF | USCTI 302A | D3~D11 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN | TiCN

| SIZE | Pitch | Limit | No. of Lobe | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Plug | | | Bottoming | | |
| | | | | Bright | TiN | TiCN | Bright | TiN | TiCN |
| M2 | 0.4 | D3 | 4 | — | — | — | Z9133 | ZB133 | ZD133 |
| M3 | 0.5 | D5 | 4 | Z8205 | ZA205 | ZC205 | Z9205 | ZB205 | ZD205 |
| M4 | 0.7 | D6 | 4 | Z8246 | ZA246 | ZC246 | Z9246 | ZB246 | ZD246 |
| M5 | 0.8 | D7 | 4 | Z8287 | ZA287 | ZC287 | Z9287 | ZB287 | ZD287 |
| M6 | 1.0 | D8 | 4 | Z8318 | ZA318 | ZC318 | Z9318 | ZB318 | ZD318 |
| M8 | 1.25 | D9 | 4 | Z8369 | ZA369 | ZC369 | Z9369 | ZB369 | ZD369 |
| M10 | 1.5 | D10 | 4 | Z8420 | ZA420 | ZC420 | Z9420 | ZB420 | ZD420 |
| M12 | 1.75 | D11 | 4 | Z850A | ZA50A | ZC50A | Z950A | ZB50A | ZD50A |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.
▶ Hardslck coating is available on your request (Bright Finish EDP No + H)

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

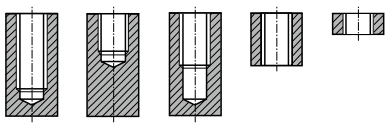
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

# FORMING TAPS

**T7R01/T8R01/THR01** SERIES
**T7R02/T8R02/THR02** SERIES

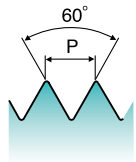
## FORMING TAPS PLUG & BOTTOMING STYLE

**Hole type** 3.0×D





**USCTI**




GV | HSS | UNC UNF | USCTI 302A | H2~H5 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright | TiN | TiCN

| SIZE | Thread Per Inch | | Limit | EDP No. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Plug | | | Bottoming | | |
| | UNC | UNF | | Bright | TiN | TiCN | Bright | TiN | TiCN |
| #0 | — | 80 | H2 | — | — | — | T7R02022 | T8R02022 | THR02022 |
| #2 | 56 | — | H2 | — | — | — | T7R02082 | T8R02082 | THR02082 |
| #3 | 48 | — | H3 | — | — | — | T7R02123 | T8R02123 | THR02123 |
| #4 | 40 | — | H3 | T7R01163 | T8R01163 | THR01163 | T7R02163 | T8R02163 | THR02163 |
| #5 | 40 | — | H3 | T7R01203 | T8R01203 | THR01203 | T7R02203 | T8R02203 | THR02203 |
| #6 | 32 | — | H3 | T7R01243 | T8R01243 | THR01243 | T7R02243 | T8R02243 | THR02243 |
| #8 | 32 | — | H3 | T7R01283 | T8R01283 | THR01283 | T7R02283 | T8R02283 | THR02283 |
| #10 | 24 | — | H4 | T7R01324 | T8R01324 | THR01324 | T7R02324 | T8R02324 | THR02324 |
| #10 | — | 32 | H4 | T7R01344 | T8R01344 | THR01344 | T7R02344 | T8R02344 | THR02344 |
| 1/4 | 20 | — | H4 | T7R01404 | T8R01404 | THR01404 | T7R02404 | T8R02404 | THR02404 |
| 1/4 | — | 28 | H4 | T7R01424 | T8R01424 | THR01424 | T7R02424 | T8R02424 | THR02424 |
| 5/16 | 18 | — | H5 | T7R01445 | T8R01445 | THR01445 | T7R02445 | T8R02445 | THR02445 |
| 3/8 | 16 | — | H5 | T7R01485 | T8R01485 | THR01485 | T7R02485 | T8R02485 | THR02485 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 497.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | | | ◎ | | | |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | ◎ | ◎ | | ◎ | ◎ | ◎ | ◎ | | | |

HSS

Being the best through innovation





# SCREW THREAD INSERT TAPS

**- Tapping STI Threads of Soft Materials (HSS-E)**

## SCREW THREAD INSERT TAPS

Tapping STI Threads of Soft Materials (HSS-E)

### INCH

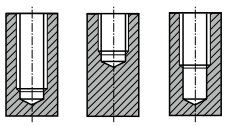
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| ST/SI |  | HSSE-V3 | UNC/UNF | GS | USCTI 322 | 2B | 1.5 ~ 2P | 2.5D | Hardslick | 471 |
| T7406 |  | HSS | UNC/UNF | GS | USCTI 322 | H2~H4 | 1.5 ~ 2P | | Bright | 472 |
| T7425 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 1.5 ~ 2P | | Bright | 473 |
| ST/SI |  | HSSE-V3 | UNC/UNF | GS | USCTI 322 | 2B | 4 ~ 5P | 3.0D | Hardslick | 474 |
| T7436 |  | HSS | UNC/UNF | GS | USCTI 322 | H1~H4 | 4 ~ 5P | | Bright | 475 |
| T7415 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 4 ~ 5P | | Bright | 476 |
| T7426 |  | HSS | UNC/UNF | GS | USCTI 322 | H1~H4 | 4 ~ 5P<br>1.5 ~ 2P | 2.0D | Bright | 477 |
| T7405 |  | HSS | M/MF | GS | USCTI 322A | D2~D4 | 4 ~ 5P<br>1.5 ~ 2P | | Bright | 478 |

# SCREW THREAD INSERT TAPS

ST/SI SERIES

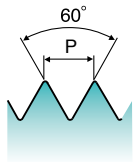
## SPIRAL FLUTE TAPS SCREW THREAD INSERT for General Purpose

Hole type 2.5×D





USCTI




GS | HSSE-V3 | UNC UNF | USCTI 322 | 2B | 60° | 1.5P~2P | Hardslick | R40

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Hardslick |
| #4 | 40 | — | 2B | 3 | ST162 |
| #4 | — | 48 | 2B | 3 | SI182 |
| #5 | 40 | — | 2B | 3 | ST202 |
| #5 | — | 44 | 2B | 3 | SI222 |
| #6 | 32 | — | 2B | 3 | ST242 |
| #6 | — | 40 | 2B | 3 | SI262 |
| #8 | 32 | — | 2B | 3 | ST282 |
| #8 | — | 36 | 2B | 3 | SI302 |
| #10 | 24 | — | 2B | 3 | ST322 |
| #10 | — | 32 | 2B | 3 | SI342 |
| #12 | 24 | — | 2B | 3 | ST362 |
| #12 | — | 28 | 2B | 3 | SI382 |
| 1/4 | 20 | — | 2B | 3 | ST402 |
| 1/4 | — | 28 | 2B | 3 | SI422 |
| 5/16 | 18 | — | 2B | 3 | ST442 |
| 5/16 | — | 24 | 2B | 3 | SI462 |
| 3/8 | 16 | — | 2B | 3 | ST482 |
| 3/8 | — | 24 | 2B | 3 | SI502 |
| 7/16 | 14 | — | 2B | 3 | ST522 |
| 7/16 | — | 20 | 2B | 3 | SI542 |
| 1/2 | 13 | — | 2B | 3 | ST562 |
| 1/2 | — | 20 | 2B | 3 | SI582 |
| 9/16 | 12 | — | 2B | 4 | ST602 |
| 9/16 | — | 18 | 2B | 4 | SI622 |
| 5/8 | 11 | — | 2B | 4 | ST642 |
| 5/8 | — | 18 | 2B | 4 | SI662 |
| 3/4 | 10 | — | 2B | 4 | ST702 |
| 3/4 | — | 16 | 2B | 4 | SI722 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | | | | ○ |

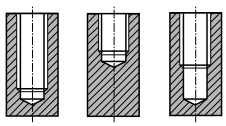
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

**T7406 SERIES**

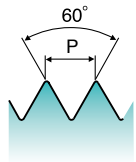
## SPIRAL FLUTE TAPS SCREW THREAD INSERT for General Purpose

**Hole type** 2.5×D





USCTI




GS | HSS | UNC UNF | USCTI 322 | H2~H4 | 60° | 1.5P~2P | Bright | R50

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Bright |
| #2 | 56 | — | H2 | 2 | T7406082 |
| #3 | 48 | — | H2 | 2 | T7406122 |
| #4 | 40 | — | H2 | 2 | T7406162 |
| #4 | — | 48 | H2 | 3 | T7406182 |
| #6 | 32 | — | H2 | 3 | T7406242 |
| #6 | 32 | — | H3 | 3 | T7406243 |
| #6 | — | 40 | H2 | 3 | T7406262 |
| #8 | 32 | — | H2 | 3 | T7406282 |
| #8 | 32 | — | H3 | 3 | T7406283 |
| #8 | — | 36 | H2 | 3 | T7406302 |
| #10 | 24 | — | H2 | 3 | T7406322 |
| #10 | 24 | — | H3 | 3 | T7406323 |
| #10 | — | 32 | H2 | 3 | T7406342 |
| #10 | — | 32 | H3 | 3 | T7406343 |
| 1/4 | 20 | — | H2 | 3 | T7406402 |
| 1/4 | 20 | — | H3 | 3 | T7406403 |
| 1/4 | — | 28 | H2 | 3 | T7406422 |
| 1/4 | — | 28 | H3 | 3 | T7406423 |
| 5/16 | 18 | — | H3 | 3 | T7406443 |
| 5/16 | 18 | — | H4 | 3 | T7406444 |
| 5/16 | — | 24 | H2 | 3 | T7406462 |
| 5/16 | — | 24 | H3 | 3 | T7406463 |
| 3/8 | 16 | — | H3 | 3 | T7406483 |
| 3/8 | 16 | — | H4 | 3 | T7406484 |
| 3/8 | — | 24 | H2 | 3 | T7406502 |
| 3/8 | — | 24 | H3 | 3 | T7406503 |
| 7/16 | 14 | — | H3 | 4 | T7406523 |
| 7/16 | 14 | — | H4 | 4 | T7406524 |
| 7/16 | — | 20 | H3 | 3 | T7406543 |
| 7/16 | — | 20 | H4 | 3 | T7406544 |
| 1/2 | 13 | — | H3 | 4 | T7406563 |
| 1/2 | 13 | — | H4 | 4 | T7406564 |
| 1/2 | — | 20 | H3 | 4 | T7406583 |
| 1/2 | — | 20 | H4 | 4 | T7406584 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

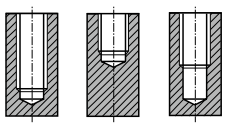
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

**T7425 SERIES**

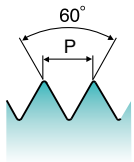
## METRIC SPIRAL FLUTE TAPS SCREW THREAD INSERT for General Purpose

**Hole type** 2.5×D





USCTI




GS | HSS | M MF | USCTI 322A | D2~D4 | 60° | 1.5P~2P | Bright | R50

| SIZE | Pitch | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|
| | | | | Bright |
| M2 | 0.40 | D2 | 2 | T7425132 |
| M2.5 | 0.45 | D2 | 2 | T7425172 |
| M3 | 0.50 | D2 | 3 | T7425202 |
| M4 | 0.70 | D3 | 3 | T7425243 |
| M5 | 0.80 | D3 | 3 | T7425283 |
| M6 | 1.00 | D3 | 3 | T7425313 |
| M8 | 1.25 | D3 | 3 | T7425363 |
| M10 | 1.50 | D4 | 3 | T7425424 |
| M12 | 1.75 | D4 | 3 | T7425504 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

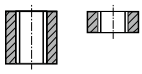
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

ST/SI SERIES

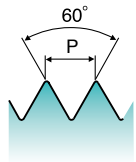
## SPIRAL POINT TAPS SCREW THREAD INSERT for General Purpose

Hole type 3.0×D





USCTI




GS | HSSE-V3 | UNC UNF | USCTI 322 | 2B | 60° | 4P~5P | Hardslick

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Hardslick |
| #4 | 40 | — | 2B | 3 | SI162 |
| #4 | — | 48 | 2B | 3 | ST182 |
| #6 | 32 | — | 2B | 3 | SI242 |
| #6 | — | 40 | 2B | 3 | ST262 |
| #8 | 32 | — | 2B | 3 | SI282 |
| #8 | — | 36 | 2B | 3 | ST302 |
| #10 | 24 | — | 2B | 3 | SI322 |
| #10 | — | 32 | 2B | 3 | ST342 |
| 1/4 | 20 | — | 2B | 3 | SI402 |
| 1/4 | — | 28 | 2B | 3 | ST422 |
| 5/16 | 18 | — | 2B | 3 | SI442 |
| 5/16 | — | 24 | 2B | 3 | ST462 |
| 3/8 | 16 | — | 2B | 3 | SI482 |
| 3/8 | — | 24 | 2B | 3 | ST502 |
| 7/16 | 14 | — | 2B | 3 | SI522 |
| 7/16 | — | 20 | 2B | 3 | ST542 |
| 1/2 | 13 | — | 2B | 3 | SI562 |
| 1/2 | — | 20 | 2B | 3 | ST582 |
| 9/16 | 12 | — | 2B | 3 | SI602 |
| 9/16 | — | 18 | 2B | 3 | ST622 |
| 5/8 | 11 | — | 2B | 3 | SI642 |
| 5/8 | — | 18 | 2B | 3 | ST662 |
| 3/4 | 10 | — | 2B | 3 | SI702 |
| 3/4 | — | 16 | 2B | 3 | ST722 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | | | | ○ |

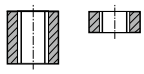
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

T7436 SERIES

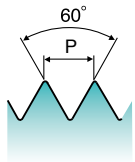
## SPIRAL POINT TAPS SCREW THREAD INSERT for General Purpose

Hole type 3.0×D





USCTI




GS | HSS | UNC UNF | USCTI 322 | H1~H4 | 60° | 4P~5P | Bright

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. |
|---|---|---|---|---|---|
| | UNC | UNF | | | Bright |
| #2 | 56 | — | H2 | 2 | T7436082 |
| #3 | 48 | — | H2 | 2 | T7436122 |
| #4 | 40 | — | H1 | 2 | T7436161 |
| #4 | 40 | — | H2 | 2 | T7436162 |
| #4 | — | 48 | H2 | 2 | T7436182 |
| #5 | 40 | — | H2 | 2 | T7436202 |
| #6 | 32 | — | H2 | 2 | T7436242 |
| #6 | 32 | — | H3 | 2 | T7436243 |
| #6 | — | 40 | H2 | 2 | T7436262 |
| #8 | 32 | — | H2 | 2 | T7436282 |
| #8 | 32 | — | H3 | 2 | T7436283 |
| #8 | — | 36 | H2 | 2 | T7436302 |
| #10 | 24 | — | H2 | 2 | T7436322 |
| #10 | 24 | — | H3 | 2 | T7436323 |
| #10 | — | 32 | H2 | 2 | T7436342 |
| #10 | — | 32 | H3 | 2 | T7436343 |
| 1/4 | 20 | — | H2 | 3 | T7436402 |
| 1/4 | 20 | — | H3 | 3 | T7436403 |
| 1/4 | — | 28 | H2 | 3 | T7436422 |
| 1/4 | — | 28 | H3 | 3 | T7436423 |
| 5/16 | 18 | — | H3 | 3 | T7436443 |
| 5/16 | 18 | — | H4 | 3 | T7436444 |
| 5/16 | — | 24 | H2 | 3 | T7436462 |
| 5/16 | — | 24 | H3 | 3 | T7436463 |
| 3/8 | 16 | — | H3 | 3 | T7436483 |
| 3/8 | 16 | — | H4 | 3 | T7436484 |
| 3/8 | — | 24 | H2 | 3 | T7436502 |
| 3/8 | — | 24 | H3 | 3 | T7436503 |
| 7/16 | 14 | — | H3 | 3 | T7436523 |
| 7/16 | 14 | — | H4 | 3 | T7436524 |
| 7/16 | — | 20 | H3 | 3 | T7436543 |
| 7/16 | — | 20 | H4 | 3 | T7436544 |
| 1/2 | 13 | — | H3 | 4 | T7436563 |
| 1/2 | 13 | — | H4 | 4 | T7436564 |
| 1/2 | — | 20 | H3 | 4 | T7436583 |
| 1/2 | — | 20 | H4 | 4 | T7436584 |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

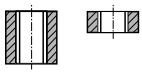
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

**T7415 SERIES**

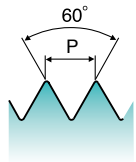
## METRIC SPIRAL POINT TAPS SCREW THREAD INSERT for General Purpose

**Hole type** 3.0×D





USCTI




**GS** | **HSS** | **M MF** | **USCTI 322A** | **D2~D4** | **60°** | **4P~5P** | **Bright**

| SIZE | Pitch | Limit | No. of Flute | EDP No. Bright |
|---|---|---|---|---|
| M2 | 0.4 | D2 | 2 | **T7415132** |
| M2.5 | 0.45 | D2 | 2 | **T7415172** |
| M3 | 0.5 | D2 | 3 | **T7415202** |
| M4 | 0.7 | D3 | 3 | **T7415243** |
| M5 | 0.8 | D3 | 3 | **T7415283** |
| M6 | 1.0 | D3 | 3 | **T7415313** |
| M8 | 1.25 | D3 | 3 | **T7415363** |
| M10 | 1.5 | D4 | 3 | **T7415424** |
| M12 | 1.75 | D4 | 3 | **T7415504** |

▶ For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 499.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

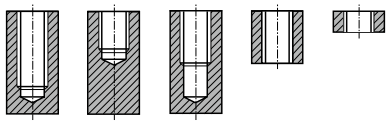
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

**T7426 SERIES**

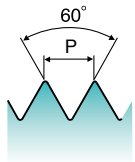
## STRAIGHT FLUTE TAPS SCREW THREAD INSERT for General Purpose

**Hole type** 2 .0×D





USCTI




GS | HSS | UNC UNF | USCTI 322 | H1~H4 | 60° | 4P~5P Plug | 1.5P~2P Bottoming | Bright

| SIZE | Thread Per Inch | | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|---|
| | UNC | UNF | | | Plug | Bottoming |
| #2 | 56 | — | H2 | 3 | T7426087 | T7426088 |
| #3 | 48 | — | H2 | 3 | T7426127 | T7426128 |
| #4 | 40 | — | H1 | 3 | T7426167H1 | T7426168H1 |
| #4 | 40 | — | H2 | 3 | T7426167 | T7426168 |
| #4 | — | 48 | H2 | 3 | T7426187 | T7426188 |
| #5 | 40 | — | H2 | 3 | T7426207 | T7426208 |
| #6 | 32 | — | H2 | 3 | T7426247H2 | T7426248H2 |
| #6 | 32 | — | H3 | 3 | T7426247 | T7426248 |
| #6 | — | 40 | H2 | 3 | T7426267 | T7426268 |
| #8 | 32 | — | H2 | 3 | T7426287H2 | T7426288H2 |
| #8 | 32 | — | H3 | 3 | T7426287 | T7426288 |
| #8 | — | 36 | H2 | 3 | T7426307 | T7426308 |
| #10 | 24 | — | H2 | 3 | T7426327H2 | T7426328H2 |
| #10 | 24 | — | H3 | 3 | T7426327 | T7426328 |
| #10 | — | 32 | H2 | 3 | T7426347H2 | T7426348H2 |
| #10 | — | 32 | H3 | 3 | T7426347 | T7426348 |
| 1/4 | 20 | — | H2 | 3 | T7426407H2 | T7426408H2 |
| 1/4 | 20 | — | H3 | 3 | T7426407 | T7426408 |
| 1/4 | — | 28 | H2 | 3 | T7426427H2 | T7426428H2 |
| 1/4 | — | 28 | H3 | 3 | T7426427 | T7426428 |
| 5/16 | 18 | — | H3 | 4 | T7426447 | T7426448 |
| 5/16 | 18 | — | H4 | 4 | T7426447H4 | T7426448H4 |
| 5/16 | — | 24 | H2 | 4 | T7426467H2 | T7426468H2 |
| 5/16 | — | 24 | H3 | 4 | T7426467 | T7426468 |
| 3/8 | 16 | — | H3 | 4 | T7426487 | T7426488 |
| 3/8 | 16 | — | H4 | 4 | T7426487H4 | T7426488H4 |
| 3/8 | — | 24 | H2 | 4 | T7426507H2 | T7426508H2 |
| 3/8 | — | 24 | H3 | 4 | T7426507 | T7426508 |
| 7/16 | 14 | — | H3 | 4 | T7426527 | T7426528 |
| 7/16 | 14 | — | H4 | 4 | T7426527H4 | T7426528H4 |
| 7/16 | — | 20 | H3 | 4 | T7426547 | T7426548 |
| 7/16 | — | 20 | H4 | 4 | T7426547H4 | T7426548H4 |
| 1/2 | 13 | — | H3 | 4 | T7426567 | T7426568 |
| 1/2 | 13 | — | H4 | 4 | T7426567H4 | T7426568H4 |
| 1/2 | — | 20 | H3 | 4 | T7426587 | T7426588 |
| 1/2 | — | 20 | H4 | 4 | T7426587H4 | T7426588H4 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 498.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

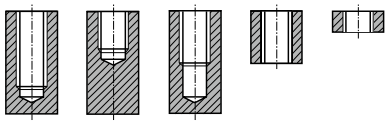
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# SCREW THREAD INSERT TAPS

**T7405** SERIES

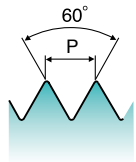
## METRIC STRAIGHT FLUTE TAPS SCREW THREAD INSERT for General Purpose

**Hole type** 2.0×D





USCTI




GS | HSS | M | USCTI 322A | D2~D4 | 4P~5P Plug | 1.5P~2P Bottoming | 60° | Bright

| SIZE | Pitch | Limit | No. of Flute | EDP No. | |
|---|---|---|---|---|---|
| | | | | Plug | Bottoming |
| M2 | 0.4 | D2 | 2 | T7405137 | T7405138 |
| M2.5 | 0.45 | D2 | 2 | T7405177 | T7405178 |
| M3 | 0.5 | D2 | 3 | T7405207 | T7405208 |
| M4 | 0.7 | D3 | 3 | T7405247 | T7405248 |
| M5 | 0.8 | D3 | 3 | T7405287 | T7405288 |
| M6 | 1.0 | D3 | 3 | T7405317 | T7405318 |
| M8 | 1.25 | D3 | 3 | T7405367 | T7405368 |
| M10 | 1.5 | D4 | 3 | T7405427 | T7405428 |
| M12 | 1.75 | D4 | 3 | T7405507 | T7405508 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 498.

◎ : Excellent ○: Good

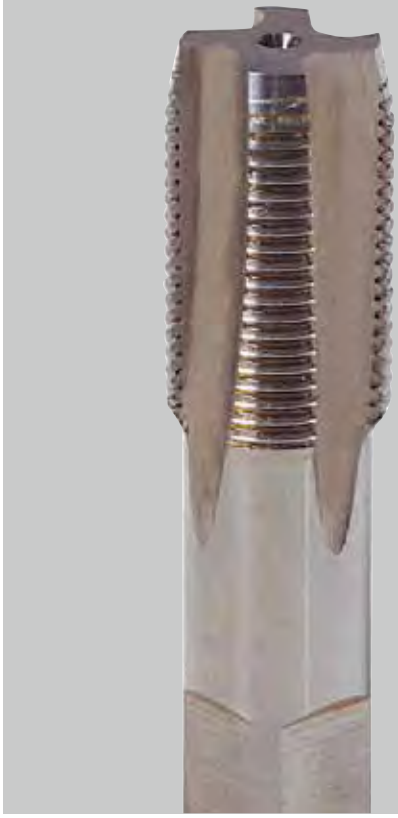
| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# HSS

Being the best through innovation







# PIPE TAPS

- Tapping NPT, NPTF, NPS & NPSF threads

## PIPE TAPS

Tapping NPT, NPTF, NPS & NPSF threads

### INCH

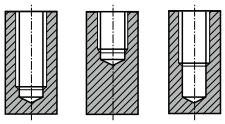
| EDP No. | MODEL | Tool Material | Standard | Work Material | Dimensions | Tolerance | Chamfer | Thread Depth | Surface Treatment | Page |
|---|---|---|---|---|---|---|---|---|---|---|
| Q1/Q0/Q6 |  | HSSE-V3 | NPTF | VA | USCTI 311 | | 2 ~ 3P | 2.5D | Bright Steam Oxide Hardslick | 481 |
| Q9/R0/R1 |  | HSSE-V3 | NPTF | GG | USCTI 311 | | 2 ~ 3P | | Bright TiN Hardslick | 482 |
| R7/R8/R9/S0 |  | HSSE-V3 | NPTF | GG | USCTI 311 | | 2 ~ 3P | 2.0D | Bright TiN Hardslick Nitrided-Steam Oxide | 483 |
| S1/S2 |  | HSSE-V3 | NPTF | GG | USCTI 311 | | 2 ~ 3P | | Bright TiCN | 484 |
| T7L36/T6L36 T7536/T6536 |  | HSS | NPS/NPSF | GS | USCTI 311 | | 4 ~ 5P | | Bright Steam Oxide | 485 |
| T7505/T6505/ TH505 |  | HSS | NPT | GS | USCTI 311 | | 2 ~ 3P | | Bright Steam Oxide TiCN | 486 |
| T7546/T8546 |  | HSS | NPTF | GS | USCTI 311 | | 2 ~ 3P | | Bright TiN | 487 |

# PIPE TAPS

Q1/Q0/Q6 SERIES

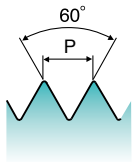
## TAPER PIPE TAPS : SPIRAL FLUTE for Steels & Stainless Steels

Hole type 2.5×D





USCTI




VA | HSSE-V3 | NPTF | USCTI 311 | 60° | 2P~3P | Bright | Steam Oxide | Hardslick | R15

| SIZE | Thread Per Inch | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|
| | | | Bright | Steam Oxide | Hardslick |
| 1/16 | 27 | 4 | Q1020 | Q0020 | Q6020 |
| 1/8(Lg.) | 27 | 4 | Q1200 | Q0200 | Q6200 |
| 1/8(Sm.) | 27 | 4 | Q1210 | Q0210 | Q6210 |
| 1/4 | 18 | 4 | Q1400 | Q0400 | Q6400 |
| 3/8 | 18 | 4 | Q1480 | Q0480 | Q6480 |
| 1/2 | 14 | 4 | Q1560 | Q0560 | Q6560 |
| 3/4 | 14 | 4 | Q1700 | Q0700 | Q6700 |
| 1 | 11-1/2 | 4 | Q1780 | Q0780 | Q6780 |
| 1-1/4 | 11-1/2 | 5 | Q1860 | Q0860 | Q6860 |
| 1-1/2 | 11-1/2 | 7 | Q1960 | Q0960 | Q6960 |
| 2 | 11-1/2 | 7 | Q1D20 | Q0D20 | Q6D20 |

▶These Taps meet both NPT and NPTF Standards.
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ◎ | ○ | | ◎ | ○ | | |

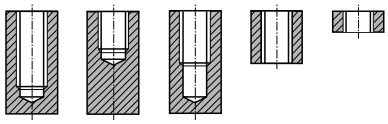
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ○ | | | | | ○ | | | | | |

# PIPE TAPS

Q9/R0/R1 SERIES

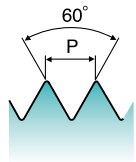
## TAPER PIPE TAPS : SPIRAL FLUTE for Cast Irons & Steels

Hole type 2.5×D





USCTI




GG | HSSE-V3 | NPTF | USCTI 311 | 60° | 2P~3P | Bright | TiN | Hardslick | R15

| SIZE | Thread Per Inch | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|
| | | | Bright | TiN | Hardslick |
| 1/16 | 27 | 4 | Q9020 | R0020 | R1020 |
| 1/8(Lg.) | 27 | 4 | Q9200 | R0200 | R1200 |
| 1/8(Sm.) | 27 | 4 | Q9210 | R0210 | R1210 |
| 1/4 | 18 | 4 | Q9400 | R0400 | R1400 |
| 3/8 | 18 | 4 | Q9480 | R0480 | R1480 |
| 1/2 | 14 | 4 | Q9560 | R0560 | R1560 |
| 3/4 | 14 | 4 | Q9700 | R0700 | R1700 |
| 1 | 11-1/2 | 4 | Q9780 | R0780 | R1780 |
| 1-1/4 | 11-1/2 | 5 | Q9860 | R0860 | R1860 |
| 1-1/2 | 11-1/2 | 7 | Q9960 | R0960 | R1960 |
| 2 | 11-1/2 | 7 | Q9D20 | R0D20 | R1D20 |

▶These Taps meet both NPT and NPTF Standards.
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | | | | ◎ |

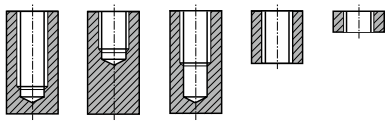
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | | | | | | | | | | |

# PIPE TAPS

R7/R8/R9/S0 SERIES

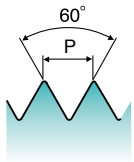
## TAPER PIPE TAPS : STRAIGHT FLUTE for Cast Irons & Steels

Hole type 2.0×D





USCTI




GG | HSSE-V3 | NPTF | USCTI 311 | 60° | 2P~3P | Bright | TiN | Hardslick | Nitrided Steam Oxide

| SIZE | Thread Per Inch | No. of Flute | EDP No. | | | |
|---|---|---|---|---|---|---|
| | | | Bright | TiN | Hardslick | Nitrided Steam Oxide |
| 1/16 | 27 | 4 | R7020 | R8020 | R9020 | S0020 |
| 1/8(Lg.) | 27 | 4 | R7200 | R8200 | R9200 | S0200 |
| 1/8(Sm.) | 27 | 4 | R7210 | R8210 | R9210 | S0210 |
| 1/4 | 18 | 4 | R7400 | R8400 | R9400 | S0400 |
| 3/8 | 18 | 4 | R7480 | R8480 | R9480 | S0480 |
| 1/2 | 14 | 4 | R7560 | R8560 | R9560 | S0560 |
| 3/4 | 14 | 5 | R7700 | R8700 | R9700 | S0700 |
| 1 | 11-1/2 | 5 | R7780 | R8780 | R9780 | S0780 |
| 1-1/4 | 11-1/2 | 5 | R7860 | R8860 | R9860 | S0860 |
| 1-1/2 | 11-1/2 | 7 | R7960 | R8960 | R9960 | S0960 |
| 2 | 11-1/2 | 7 | R7D20 | R8D20 | R9D20 | S0D20 |

▶These Taps meet both NPT and NPTF Standards.
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | | | | ◎ |

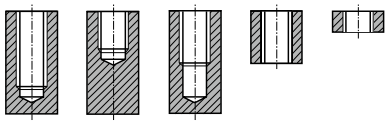
| K | N | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | | | | | | | | | | |

# PIPE TAPS

S1 / S2 SERIES

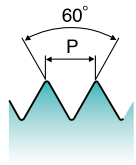
## TAPER PIPE TAPS : STRAIGHT FLUTE INTERRUPTED THREAD for Cast Irons & Steels

Hole type 2.0×D





USCTI




GG | HSSE-V3 | NPTF | USCTI 311 | 60° | 2P~3P | Bright | TiCN

| SIZE | Thread Per Inch | No. of Flute | EDP No. | |
|---|---|---|---|---|
| | | | Bright | TiCN |
| 1/16 | 27 | 5 | S1020 | S2020 |
| 1/8(Lg.) | 27 | 5 | S1200 | S2200 |
| 1/8(Sm.) | 27 | 5 | S1210 | S2210 |
| 1/4 | 18 | 5 | S1400 | S2400 |
| 3/8 | 18 | 5 | S1480 | S2480 |
| 1/2 | 14 | 5 | S1560 | S2560 |
| 3/4 | 14 | 5 | S1700 | S2700 |
| 1 | 11-1/2 | 5 | S1780 | S2780 |

▶These Taps meet both NPT and NPTF Standards.
▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ◎ | ◎ | ○ | | | | | ◎ |

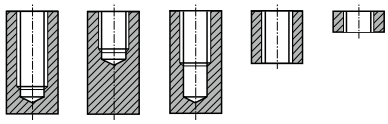
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| ◎ | | | | | | | | | | |

# PIPE TAPS

**T7L36/T6L36** SERIES
**T7536/T6536** SERIES

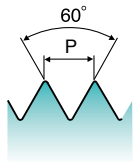
## STRAIGHT PIPE TAPS for General Purpose

**Hole type** 2.0×D





USCTI




GS | HSS | NPS NPSF | USCTI 311 | 60° | 4P~5P | Bright | Steam Oxide

## T7L36 / T6L36 Series (NPS)

| SIZE | Thread Per Inch | No. of Flute | EDP No. | |
|---|---|---|---|---|
| | | | Bright | Steam Oxide |
| 1/8 (Lg.) | 27 | 4 | T7L36200 | T6L36200 |
| 1/8 (Sm.) | 27 | 4 | T7L36210 | T6L36210 |
| 1/4 | 18 | 4 | T7L36400 | T6L36400 |
| 3/8 | 18 | 4 | T7L36480 | T6L36480 |
| 1/2 | 14 | 4 | T7L36560 | T6L36560 |
| 3/4 | 14 | 5 | T7L36700 | T6L36700 |
| 1 | 11-1/2 | 5 | T7L36780 | T6L36780 |

## T7536 / T6536 Series (NPSF)

| SIZE | Thread Per Inch | No. of Flute | EDP No. | |
|---|---|---|---|---|
| | | | Bright | Steam Oxide |
| 1/8 (Lg.) | 27 | 4 | T7536200 | T6536200 |
| 1/8 (Sm.) | 27 | 4 | T7536210 | T6536210 |
| 1/4 | 18 | 4 | T7536400 | T6536400 |
| 3/8 | 18 | 4 | T7536480 | T6536480 |
| 1/2 | 14 | 4 | T7536560 | T6536560 |
| 3/4 | 14 | 5 | T7536700 | T6536700 |
| 1 | 11-1/2 | 5 | T7536780 | T6536780 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

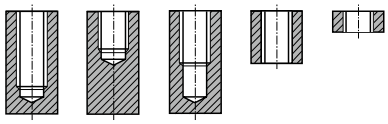
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# PIPE TAPS

T7505/T6505/TH505 SERIES

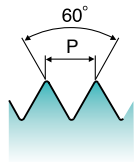
## TAPER PIPE TAPS INTERRUPTED THREAD for General Purpose

Hole type 2.0×D





USCTI




GS | HSS | NPT | USCTI 311 | 60° | 2P~3P | Bright | Steam Oxide | TiCN

| SIZE | Thread Per Inch | No. of Flute | EDP No. | | |
|---|---|---|---|---|---|
| | | | Bright | Steam Oxide | TiCN |
| 1/8 (Lg.) | 27 | 5 | T7505200 | T6505200 | TH505200 |
| 1/8 (Sm.) | 27 | 5 | T7505210 | T6505210 | TH505210 |
| 1/4 | 18 | 5 | T7505400 | T6505400 | TH505400 |
| 3/8 | 18 | 5 | T7505480 | T6505480 | TH505480 |
| 1/2 | 14 | 5 | T7505560 | T6505560 | TH505560 |
| 3/4 | 14 | 5 | T7505700 | T6505700 | TH505700 |
| 1 | 11-1/2 | 5 | T7505780 | T6505780 | TH505780 |

▶For tapping depth on ANSI Length Taps, refer to MCTI 302 on page 496.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

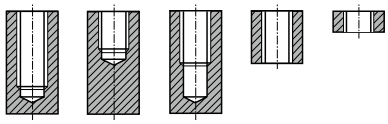
| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

# PIPE TAPS

T7546/T8546 SERIES

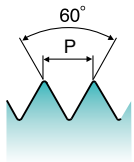
## TAPER PIPE TAPS 6" EXTENSION

Hole type 2.0×D





USCTI




GS | HSS | NPTF | USCTI 311 | 60° | 2P~3P | Bright | TiN

| SIZE | Threads Per Inch | Overall Length L | Thread Length Lt | Shank Diameter D | No. of Flute | EDP No. Bright | EDP No. TiN |
|---|---|---|---|---|---|---|---|
| 1/8 | 27 | 6.0 | 3/4 | .4375 | 4 | T7546200 | T8546200 |
| 1/4 | 18 | 6.0 | 1-1/16 | .5625 | 4 | T7546400 | T8546400 |
| 3/8 | 18 | 6.0 | 1-1/16 | .7000 | 4 | T7546480 | T8546480 |
| 1/2 | 14 | 6.0 | 1-3/8 | .6875 | 4 | T7546560 | T8546560 |
| 3/4 | 14 | 6.0 | 1-3/8 | .9063 | 5 | T7546700 | T8546700 |
| 1 | 11-1/2 | 6.0 | 1-3/4 | 1.1250 | 5 | T7546780 | T8546780 |

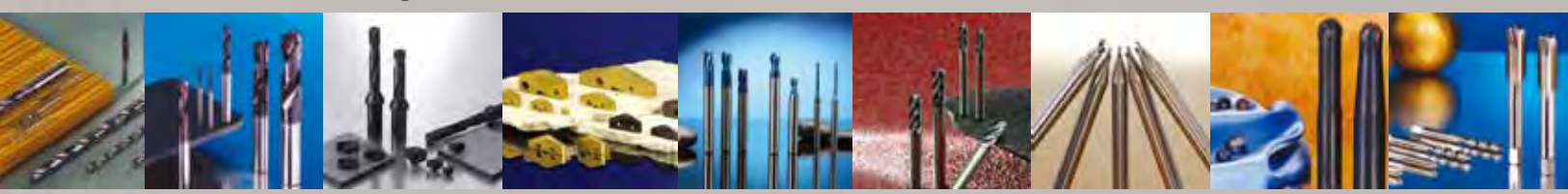
▶For tapping depth on DIN / ANSI Shank Taps, refer to DIN Table on page 493 & 494.

◎ : Excellent ○: Good

| P | | | | M | | | K |
|---|---|---|---|---|---|---|---|
| Low carbon steels/ Free machining carbon steels | Medium to high carbon steels/ Low alloyed steels | Steel castings & forgings / Heat-treatable alloy steels | Alloyed tool steels / Mold steels | Free machining stainless steels | Heat-and corrosionresistant stainless steels / Valve stainless steels | Stainless steel castings / Precipitation hardening stainless steels | Grey cast iron |
| ○ | ○ | | | | | | ○ |

| K | N | | | | | | | S | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Nodular cast iron / Chilled cast iron / Meehanite iron / Ductile iron | Pure and alloyed copper | Free machining brass / Alloyed brass | Bronze | Pure Aluminum/ Aluminum alloy | Aluminum alloy castings | Zinc | Magnesium | 718 & 625 INCO / Waspaloy / Hastelloy / Invar / Monel / Incoloy | 718 Inconel / A286 | Titanium |
| | | | | ○ | ○ | | | | | |

Global Cutting Tool Leader **YG-1**



# TAPS

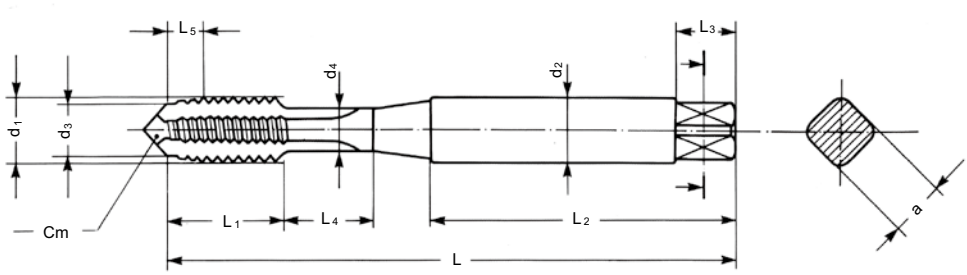
Being the best through innovation

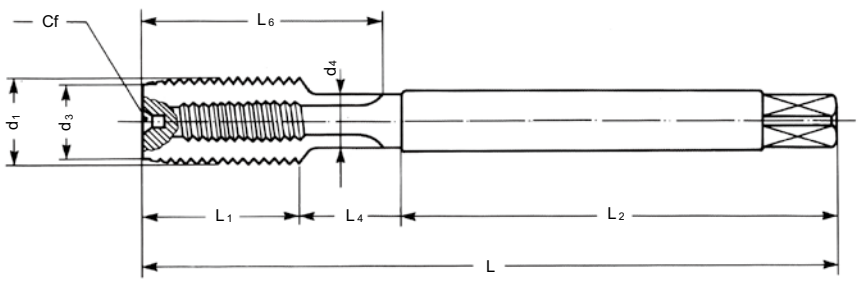


# TECHNICAL DATA

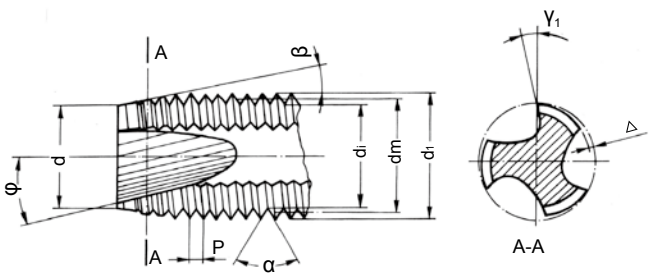
# TECHNICAL DATA

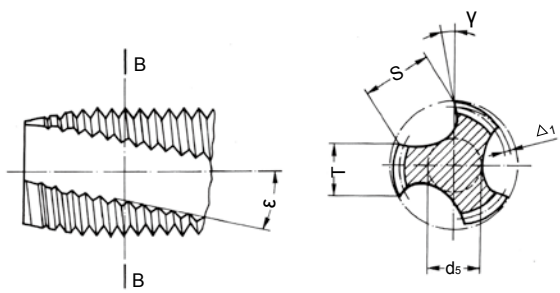
## TAPS TERMINOLOGY



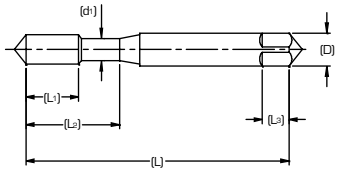

| | |
|---|---|
| $d_1$ | Major diameter |
| $d_2$ | Shank diameter |
| $d_3$ | Chamfer diameter |
| $d_4$ | Neck diameter |
| L | Total length |
| $L_1$ | Thread length |
| $L_2$ | Shank length |
| $L_3$ | Square length |
| $L_4$ | Neck length |
| $L_5$ | Chamfer length |
| $L_6$ | Flutes length |
| a | Square size |
| Cm | Center male |
| Cf | Center female |



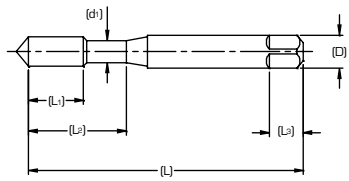




| | |
|---|---|
| $d_1$ | Major diameter |
| $d_m$ | Flank diameter |
| $d_i$ | Minor diameter |
| $d_3$ | Chamfer diameter |
| P | Pitch |
| a | Flank angle |
| $\beta$ | Chamfer angle |
| $\varphi$ | Gun nose angle |
| $\gamma$ | Gun nose rake angle in front |
| $\Delta$ | Chamfer relief |
| $\Delta_1$ | Pitch diameter relief on the land |
| $\gamma$ | Rake angle |
| T | Width of land |
| S | Flute width |
| $d_5$ | Web tickness |
| $\varepsilon$ | Angle of spiral flute |

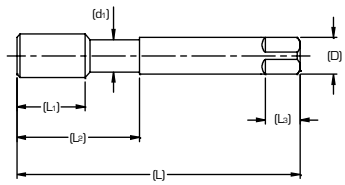
## MODI TAP BLANK DIMENSION



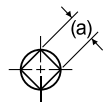

Blank Design (1)




Blank Design (2)




Blank Design (3)



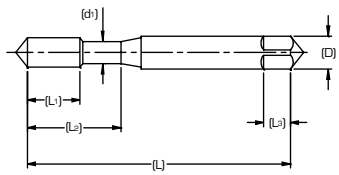

### Unified Tap Blank

| Nominal Size | Overall Length | Thread Length | | Length to neck | | Shank Diameter | Neck Diameter | Square Length | Square Size | Blank Design No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SF | SP | SF | SP | | | | | |
| | (L) | (L1) | | (L2) | | (D) | (d1) | (L3) | (a) | |
| #2 | 1.75 | .157 | .256 | .433 | | .141 | .061 | .19 | .110 | 1 |
| #3 | 1.81 | .197 | .295 | .492 | | .141 | .069 | .19 | .110 | 1 |
| #4 | 1.88 | .236 | .335 | .563 | | .141 | .077 | .19 | .110 | 1 |
| #5 | 1.94 | .236 | .374 | .626 | | .141 | .090 | .19 | .110 | 1 |
| #6 | 2.00 | .276 | .413 | .689 | | .141 | .094 | .19 | .110 | 1 |
| #8 | 2.13 | .276 | .453 | .752 | | .168 | .120 | .25 | .131 | 1 |
| #10-24 | 2.38 | .354 | .531 | .906 | | .194 | .131 | .25 | .152 | 1 |
| #10-32 | | .276 | | | | | .146 | | | 1 |
| #12-24 | 2.38 | .354 | .571 | .906 | | .220 | .157 | .28 | .165 | 1 |
| #12-28 | | .276 | | | | | .166 | | | 1 |
| 1/4-20 | 2.50 | .433 | .591 | 1.000 | | .255 | .180 | .31 | .191 | 2 |
| 1/4-28 | | .354 | | | | | .200 | | | 2 |
| 5/16-18 | 2.72 | .472 | .669 | 1.126 | | .318 | .234 | .38 | .238 | 2 |
| 5/16-24 | | .394 | | | | | .254 | | | 2 |
| 3/8-16 | 2.94 | .551 | .748 | 1.252 | | .381 | .287 | .44 | .286 | 2 |
| 3/8-24 | | .394 | | | | | .316 | | | 2 |
| 7/16-14 | 3.16 | .591 | .866 | 1.850 | 1.437 | .323 | .311 | .41 | .242 | 3 |
| 7/16-20 | | .472 | | | | | | | | 3 |
| 1/2-13 | 3.38 | .630 | .984 | 2.067 | 1.657 | .367 | .354 | .44 | .275 | 3 |
| 1/2-20 | | .472 | | | | | | | | 3 |
| 9/16-12 | 3.59 | .709 | .984 | 2.067 | 1.657 | .429 | .417 | .50 | .322 | 3 |
| 9/16-18 | | .512 | | | | | | | | 3 |
| 5/8-11 | 3.81 | .748 | 1.083 | 2.205 | 1.811 | .480 | .469 | .56 | .360 | 3 |
| 5/8-18 | | .512 | | | | | | | | 3 |
| 3/4-10 | 4.25 | .827 | 1.201 | 2.480 | 2.000 | .590 | .577 | .69 | .442 | 3 |
| 3/4-10 | | .591 | | | | | | | | 3 |
| 7/8-9 | 4.69 | .827 | 1.339 | 2.815 | 2.220 | .697 | .685 | .75 | .523 | 3 |
| 7/8-14 | | .709 | | | | | | | | 3 |
| 1-8 | 5.13 | .984 | 1.496 | 3.091 | 2.500 | .800 | .787 | .81 | .600 | 3 |
| 1-12 | | .709 | | | | | | | | 3 |
| 1-1/8-7 | 5.44 | 1.024 | 1.535 | 3.15 | 2.563 | .896 | .878 | .88 | .672 | 3 |
| 1-1/8-12 | | .787 | | | | | | | | 3 |
| 1-1/4-7 | 5.75 | 1.024 | 1.535 | 3.15 | 2.563 | 1.021 | 1.002 | 1.00 | .766 | 3 |
| 1-1/4-12 | | .787 | | | | | | | | 3 |
| 1-3/8-6 | 6.06 | 1.181 | 1.791 | 3.583 | 3.000 | 1.108 | 1.089 | 1.06 | .831 | 3 |
| 1-3/8-12 | | .866 | | | | | | | | 3 |
| 1-1/2-6 | 6.38 | 1.181 | 1.791 | 3.583 | 3.000 | 1.233 | 1.213 | 1.13 | .925 | 3 |
| 1-1/2-12 | | .866 | | | | | | | | 3 |

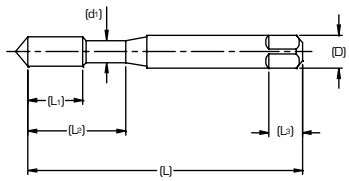
***SF** : Spiral Fluted Taps
***SP** : Spiral Pointed Taps

# TECHNICAL DATA

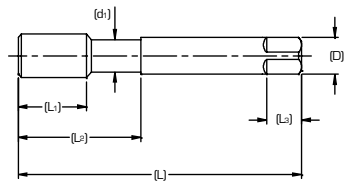
## MODI TAP BLANK DIMENSION - METRIC



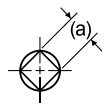

Blank Design (1)




Blank Design (2)




Blank Design (3)

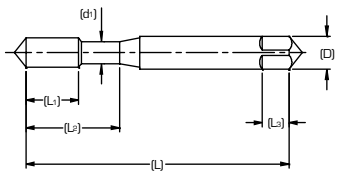



### Metric Tap Blank

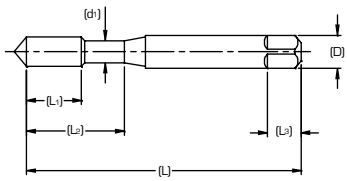
| Nominal Size | Overall Length | Thread Length | | Length to neck | | Shank Diameter | Neck Diameter | Square Length | Square Size | Blank Design No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SF | SP | SF | SP | | | | | |
| | (L) | ($L_1$) | | ($L_2$) | | (D) | ($d_1$) | ($L_3$) | (a) | |
| M3 | 1.94 | .197 | .374 | .646 | | .141 | .090 | .19 | .110 | 1 |
| M3.5 | 2.00 | .276 | .413 | .646 | | .141 | .104 | .19 | .110 | 1 |
| M4 | 2.13 | .276 | .453 | .768 | | .168 | .119 | .25 | .131 | 1 |
| M4.5 | 2.38 | .354 | .531 | .933 | | .194 | .135 | .25 | .152 | 1 |
| M5 | 2.38 | .354 | .531 | .933 | | .194 | .152 | .25 | .152 | 1 |
| M5.5 | 2.38 | .354 | .571 | 1.000 | | .220 | .189 | .28 | .165 | 2 |
| M6 | 2.50 | .433 | .591 | 1.000 | | .255 | .181 | .31 | .191 | 2 |
| M7 | 2.72 | .433 | .669 | 1.126 | | .318 | .220 | .38 | .238 | 2 |
| M8x 1.25 | 2.72 | .472 | .669 | 1.126 | | .318 | .246 | .38 | .238 | 2 |
| M8x 1.0 | | .433 | | | | | | | | 2 |
| M10x 1.5 | 2.94 | .512 | .748 | 1.252 | | .381 | .310 | .44 | .286 | 2 |
| M10x 1.25 | | .472 | | | | | | | | 2 |
| M12x 1.75 | 3.38 | .591 | .984 | 2.067 | 1.657 | .367 | .354 | .44 | .275 | 3 |
| M12x 1.25 | | .551 | | | | | | | | 3 |
| M14x 2.0 | 3.59 | .709 | .984 | 2.067 | 1.657 | .429 | .417 | .50 | .322 | 3 |
| M14x 1.5 | | .551 | | | | | | | | 3 |
| M16x 2.0 | 3.81 | .709 | 1.083 | 2.205 | 1.811 | .480 | .469 | .56 | .360 | 3 |
| M16x 1.5 | | .551 | | | | | | | | 3 |
| M18x 2.5 | 4.03 | .787 | 1.083 | 2.205 | 1.811 | .542 | .530 | .63 | .406 | 3 |
| M18x 1.5 | | .551 | | | | | | | | 3 |
| M20x 1.5 | 4.47 | .551 | 1.201 | 2.48 | 2.000 | .652 | .64 | .69 | .489 | 3 |
| M20x 2.5 | | .787 | | | | | | | | 3 |
| M22x 1.5 | 4.69 | .551 | 1.339 | 2.815 | 2.220 | .697 | .685 | .75 | .523 | 3 |
| M22x 2.5 | | .787 | | | | | | | | 3 |
| M24x 1.5 | 4.91 | .551 | 1.339 | 2.815 | 2.220 | .760 | .748 | .75 | .57 | 3 |
| M24x 3 | | .945 | | | | | | | | 3 |
| M27x 1.5 | 5.13 | .591 | 1.496 | 3.091 | 2.500 | .896 | .878 | .88 | .672 | 3 |
| M27x 3 | | .945 | | | | | | | | 3 |
| M30x 1.5 | 5.44 | .591 | 1.713 | 3.15 | 2.854 | 1.021 | 1.002 | 1.00 | .766 | 3 |
| M30x 3.5 | | 1.102 | | | | | | | | 3 |

***SF** : Spiral Fluted Taps
***SP** : Spiral Pointed Taps

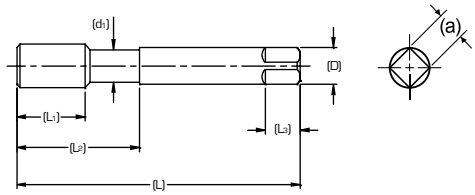
## HIGH PERFORMANCE TAPS DIN LENGTH / ANSI SHANK - INCH




Blank Design (1)




Blank Design (2)



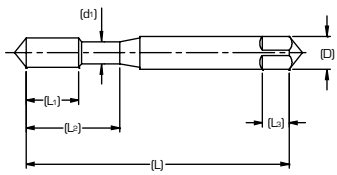

Blank Design (3)

| Nominal Size | Overall Length | Thread Length | | Length to neck | | Shank Diameter | Neck Diameter | Square Length | Square Size | Blank Design No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SF | SP | SF | SP | | | | | |
| | (L) | (L1) | | (L2) | | (D) | (d1) | (L3) | (a) | |
| #2 | 1.772 | .157 | .256 | .433 | | .141 | .061 | .19 | .110 | 1 |
| #3 | 1.969 | .197 | .295 | .492 | | .141 | .069 | .19 | .110 | 1 |
| #4 | 2.205 | .236 | .335 | .563 | | .141 | .077 | .19 | .110 | 1 |
| #5 | 2.205 | .236 | .374 | .626 | | .141 | .090 | .19 | .110 | 1 |
| #6 | 2.205 | .276 | .413 | .689 | | .141 | .094 | .19 | .110 | 1 |
| #8 | 2.480 | .276 | .453 | .752 | | .168 | .120 | .25 | .131 | 1 |
| #10-24 | 2.756 | .354 | .531 | .906 | | .194 | .131 | .25 | .152 | 1 |
| #10-32 | | .276 | | | | | .146 | | | 1 |
| #12-24 | 3.150 | .354 | .571 | .906 | | .220 | .157 | .28 | .165 | 1 |
| #12-28 | | .276 | | | | | .166 | | | 1 |
| 1/4-20 | 3.150 | .433 | .591 | 1.000 | | .255 | .180 | .31 | .191 | 2 |
| 1/4-28 | | .354 | | | | | .200 | | | 2 |
| 5/16-18 | 3.543 | .472 | .669 | 1.126 | | .318 | .234 | .38 | .238 | 2 |
| 5/16-24 | | .394 | | | | | .254 | | | 2 |
| 3/8-16 | 3.937 | .551 | .748 | 1.252 | | .381 | .287 | .44 | .286 | 2 |
| 3/8-24 | | .394 | | | | | .316 | | | 2 |
| 7/16-14 | 3.937 | .591 | .866 | 1.850 | 1.437 | .323 | .311 | .41 | .242 | 3 |
| 7/16-20 | | .472 | | | | | | | | 3 |
| 1/2-13 | 4.331 | .630 | .984 | 2.067 | 1.657 | .367 | .354 | .44 | .275 | 3 |
| 1/2-20 | 3.937 | .472 | | | | | | | | 3 |
| 9/16-12 | 4.331 | .709 | .984 | 2.067 | 1.657 | .429 | .417 | .50 | .322 | 3 |
| 9/16-18 | 3.937 | .512 | | | | | | | | 3 |
| 5/8-11 | 4.331 | .748 | 1.083 | 2.205 | 1.811 | .480 | .469 | .56 | .360 | 3 |
| 5/8-18 | 3.937 | .512 | | | | | | | | 3 |
| 3/4-10 | 4.921 | .827 | 1.201 | 2.480 | 2.000 | .590 | .577 | .69 | .442 | 3 |
| 3/4-10 | 4.331 | .591 | | | | | | | | 3 |
| 7/8-9 | 5.512 | .827 | 1.339 | 2.815 | 2.220 | .697 | .685 | .75 | .523 | 3 |
| 7/8-14 | 4.921 | .709 | | | | | | | | 3 |
| 1-8 | 6.299 | .984 | 1.496 | 3.091 | 2.500 | .800 | .787 | .81 | .600 | 3 |
| 1-12 | 5.512 | .709 | | | | | | | | 3 |

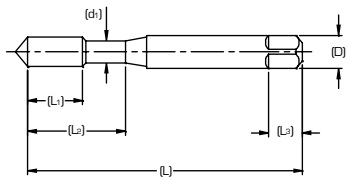
***SF :** Spiral Fluted Taps
***SP :** Spiral Pointed Taps

# TECHNICAL DATA

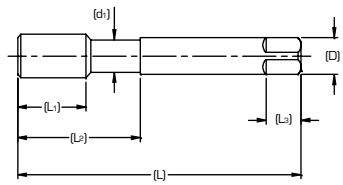
## HIGH PERFORMANCE TAPS DIN LENGTH / ANSI SHANK - METRIC



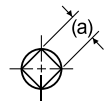

Blank Design (1)




Blank Design (2)



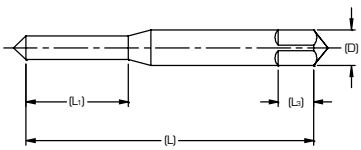

Blank Design (3)



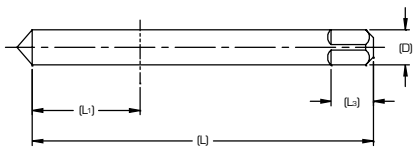

| Nominal Size | Overall Length | Thread Length | | Length to neck | | Shank Diameter | Neck Diameter | Square Length | Square Size | Blank Design No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | SF | SP | SF | SP | | | | | |
| | (L) | (L1) | | (L2) | | (D) | (d1) | (L3) | (a) | |
| M3 | 2.205 | .197 | .374 | .646 | | .141 | .090 | .19 | .110 | 1 |
| M3.5 | 2.205 | .276 | .413 | .646 | | .141 | .104 | .19 | .110 | 1 |
| M4 | 2.480 | .276 | .453 | .768 | | .168 | .119 | .25 | .131 | 1 |
| M5 | 2.756 | .354 | .531 | .933 | | .194 | .152 | .25 | .152 | 1 |
| M6 | 3.150 | .433 | .591 | 1.000 | | .255 | .181 | .28 | .191 | 2 |
| M8x 1.25 | 3.543 | .472 | .669 | 1.126 | | .318 | .246 | .38 | .238 | 2 |
| M8x 1.0 | | .433 | | | | | | | | 2 |
| M10x 1.5 | 3.937 | .512 | .748 | 1.252 | | .381 | .310 | .44 | .286 | 2 |
| M10x 1.25 | | .472 | | | | | | | | 2 |
| M12x 1.75 | 4.331 | .591 | .984 | 2.067 | 1.657 | .367 | .354 | .44 | .275 | 3 |
| M12x 1.25 | 3.937 | .551 | | | | | | | | 3 |
| M14x 2.0 | 4.331 | .709 | .984 | 2.067 | 1.657 | .429 | .417 | .50 | .322 | 3 |
| M14x 1.5 | 3.937 | .551 | | | | | | | | 3 |
| M16x 2.0 | 4.331 | .709 | 1.083 | 2.205 | 1.811 | .480 | .469 | .56 | .360 | 3 |
| M16x 1.5 | 3.937 | .551 | | | | | | | | 3 |
| M18x 2.5 | 4.921 | .787 | 1.083 | 2.205 | 1.811 | .542 | .530 | .63 | .406 | 3 |
| M18x 1.5 | 4.331 | .551 | | | | | | | | 3 |

***SF** : Spiral Fluted Taps
***SP** : Spiral Pointed Taps

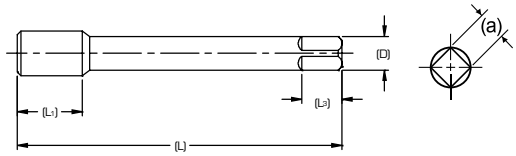
## YG-1 USCTI 302 TAP BLANK DIMENSION




Blank Design (1)




Blank Design (2)




Blank Design (3)

### Unified Tap Blank

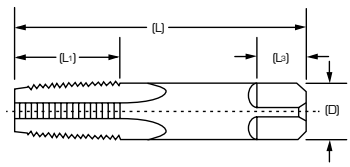
| Nominal Size | Overall Length (L) | Thread Length ($L_1$) | Shank Diameter (D) | Square Length ($L_3$) | Square Size (a) | Blank Design No. |
|---|---|---|---|---|---|---|
| #0 | 1.63 | .31 | .141 | .19 | .110 | 1 |
| #1 | 1.69 | .38 | .141 | .19 | .110 | 1 |
| #2 | 1.75 | .44 | .141 | .19 | .110 | 1 |
| #3 | 1.81 | .50 | .141 | .19 | .110 | 1 |
| #4 | 1.88 | .56 | .141 | .19 | .110 | 1 |
| #5 | 1.94 | .63 | .141 | .19 | .110 | 1 |
| #6 | 2.00 | .69 | .141 | .19 | .110 | 1 |
| #8 | 2.13 | .75 | .168 | .25 | .131 | 1 |
| #10 | 2.38 | .88 | .194 | .25 | .152 | 1 |
| #12 | 2.38 | .94 | .220 | .28 | .165 | 1 |
| 1/4 | 2.50 | 1.00 | .255 | .31 | .191 | 2 |
| 5/16 | 2.72 | 1.13 | .318 | .38 | .238 | 2 |
| 3/8 | 2.94 | 1.25 | .381 | .44 | .286 | 2 |
| 7/16 | 3.16 | 1.44 | .323 | .41 | .242 | 3 |
| 1/2 | 3.38 | 1.66 | .367 | .44 | .275 | 3 |
| 9/16 | 3.59 | 1.66 | .429 | .50 | .322 | 3 |
| 5/8 | 3.81 | 1.81 | .480 | .56 | .360 | 3 |
| 11/16 | 4.03 | 1.81 | .542 | .63 | .406 | 3 |
| 3/4 | 4.25 | 2.00 | .590 | .69 | .442 | 3 |
| 13/16 | 4.47 | 2.00 | .652 | .69 | .489 | 3 |
| 7/8 | 4.69 | 2.22 | .697 | .75 | .523 | 3 |
| 15/16 | 4.91 | 2.22 | .760 | .75 | .570 | 3 |
| 1 | 5.13 | 2.50 | .800 | .81 | .600 | 3 |
| 1-1/8 | 5.44 | 2.56 | .896 | .88 | .672 | 3 |
| 1-1/4 | 5.75 | 2.56 | 1.021 | 1.00 | .766 | 3 |
| 1-3/8 | 6.06 | 3.00 | 1.108 | 1.06 | .831 | 3 |
| 1-1/2 | 6.38 | 3.00 | 1.233 | 1.13 | .925 | 3 |

### Metric Tap Blank

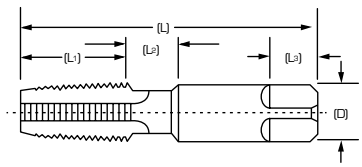
| Nominal Size | Overall Length (L) | Thread Length ($L_1$) | Shank Diameter (D) | Square Length ($L_3$) | Square Size (a) | Blank Design No. |
|---|---|---|---|---|---|---|
| M1.6 | 1.63 | .310 | .141 | .19 | .110 | 1 |
| M1.8 | 1.69 | .380 | .141 | .19 | .110 | 1 |
| M2 | 1.75 | .440 | .141 | .19 | .110 | 1 |
| M2.5 | 1.81 | .500 | .141 | .19 | .110 | 1 |
| M3 | 1.94 | .630 | .141 | .19 | .110 | 1 |
| M3.5 | 2.00 | .690 | .141 | .19 | .110 | 1 |
| M4 | 2.13 | .750 | .168 | .25 | .131 | 1 |
| M4.5 | 2.38 | .880 | .194 | .25 | .152 | 1 |
| M5 | 2.38 | .880 | .194 | .25 | .152 | 1 |
| M6 | 2.50 | 1.00 | .255 | .31 | .191 | 2 |
| M7 | 2.72 | 1.13 | .318 | .38 | .238 | 2 |
| M8 | 2.72 | 1.13 | .318 | .38 | .238 | 2 |
| M10 | 2.94 | 1.25 | .381 | .44 | .286 | 2 |
| M12 | 3.38 | 1.66 | .367 | .44 | .275 | 3 |
| M14 | 3.59 | 1.66 | .429 | .50 | .322 | 3 |
| M16 | 3.81 | 1.81 | .480 | .56 | .360 | 3 |
| M18 | 4.03 | 1.81 | .542 | .63 | .406 | 3 |
| M20 | 4.47 | 2.00 | .652 | .69 | .489 | 3 |
| M22 | 4.69 | 2.22 | .697 | .75 | .523 | 3 |
| M24 | 4.91 | 2.22 | .760 | .75 | .570 | 3 |
| M30 | 5.44 | 2.56 | 1.021 | 1.00 | .766 | 3 |
| M33 | 5.75 | 2.56 | 1.108 | 1.06 | .831 | 3 |
| M36 | 6.06 | 3.00 | 1.233 | 1.13 | .925 | 3 |

# TECHNICAL DATA

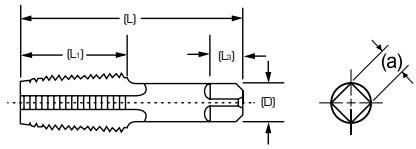
## STANDARD PIPE TAP DIMENSION (STRAIGHT AND TAPER, GROUND THREAD)




Blank Design (1)



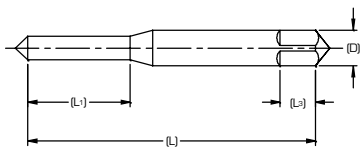

Blank Design (2)



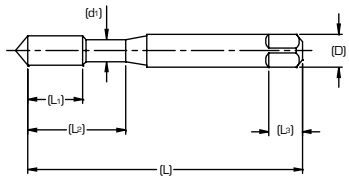

Blank Design (3)

| Nominal Size | Overall Length | Thread Length | Shank Diameter | Square Length | Square Size | Optional Neck Length |
|---|---|---|---|---|---|---|
| | (L) | ($L_1$) | (D) | ($L_3$) | (a) | ($L_2$) |
| 1/16 | 2.13 | .69 | .3125 | .38 | .234 | .375 |
| 1/8 | 2.13 | .75 | .3125 | .38 | .234 | ... |
| 1/8 | 2.13 | .75 | .4375 | .38 | .328 | .375 |
| 1/4 | 2.44 | 1.06 | .5625 | .44 | .421 | .375 |
| 3/8 | 2.56 | 1.06 | .7000 | .50 | .531 | .375 |
| 1/2 | 3.13 | 1.38 | .6875 | .63 | .515 | ... |
| 3/4 | 3.25 | 1.38 | .9063 | .69 | .679 | ... |
| 1 | 3.75 | 1.75 | 1.1250 | .81 | .843 | ... |
| 1-1/4 | 4.00 | 1.75 | 1.3125 | .94 | .984 | ... |
| 1-1/2 | 4.25 | 1.75 | 1.5000 | 1.00 | 1.125 | ... |
| 2 | 4.25 | 1.75 | 1.8750 | 1.13 | 1.406 | ... |
| 2-1/2 | 5.50 | 2.56 | 2.2500 | 1.25 | 1.687 | ... |
| 3 | 6.00 | 2.63 | 2.6250 | 1.38 | 1.968 | ... |
| 3-1/2 | 6.50 | 2.69 | 2.8125 | 1.50 | 2.108 | ... |
| 4 | 6.75 | 2.75 | 3.0000 | 1.56 | 2.250 | ... |

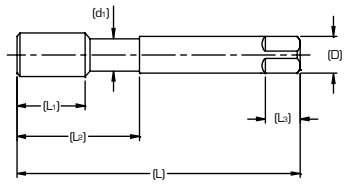
## STANDARD FORMING TAP DIMENSION



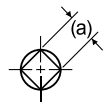

Blank Design (1)




Blank Design (2)




Blank Design (3)




### Forming Tap Blank (Inch)

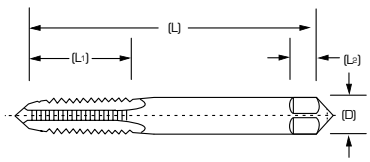
| Nominal Size | Overall Length (L) | Thread Length ($L_1$) | Neck Length ($L_2$) | Shank Diameter (D) | Square Length ($L_3$) | Square Size (a) | Blank Design No. |
|---|---|---|---|---|---|---|---|
| #0 | 1.63 | .31 | – | .141 | .19 | .110 | 1 |
| #1 | 1.69 | .38 | – | .141 | .19 | .110 | 1 |
| #2 | 1.75 | .44 | – | .141 | .19 | .110 | 1 |
| #3 | 1.81 | .50 | – | .141 | .19 | .110 | 1 |
| #4 | 1.88 | .56 | – | .141 | .19 | .110 | 1 |
| #5 | 1.94 | .63 | – | .141 | .19 | .110 | 1 |
| #6 | 2.00 | .48 | .69 | .141 | .19 | .110 | 1 |
| #8 | 2.13 | .50 | .75 | .168 | .25 | .131 | 1 |
| #10 | 2.38 | .63 | .88 | .194 | .25 | .152 | 1 |
| #12 | 2.38 | .63 | .94 | .220 | .28 | .165 | 1 |
| 1/4 | 2.50 | .86 | 1.00 | .255 | .31 | .191 | 2 |
| 5/16 | 2.72 | .93 | 1.13 | .318 | .38 | .238 | 2 |
| 3/8 | 2.94 | .98 | 1.25 | .381 | .44 | .286 | 2 |
| 7/16 | 3.16 | .95 | 1.44 | .323 | .41 | .242 | 3 |
| 1/2 | 3.38 | 1.00 | 1.60 | .367 | .44 | .275 | 3 |
| 9/16 | 3.59 | 1.00 | 1.66 | .429 | .50 | .322 | 3 |
| 5/8 | 3.81 | 1.00 | 1.81 | .480 | .56 | .360 | 3 |
| 3/4 | 4.25 | 1.00 | 2.0 | .590 | .69 | .442 | 3 |

### Forming Tap Blank (Metric)

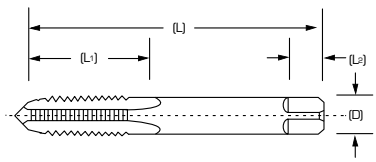
| Nominal Size | Overall Length (L) | Thread Length ($L_1$) | Neck Length ($L_2$) | Shank Diameter (D) | Square Length ($L_3$) | Square Size (a) | Blank Design No. |
|---|---|---|---|---|---|---|---|
| M2 | 1.75 | .40 | – | .141 | .19 | .110 | 1 |
| M3 | 1.94 | .63 | – | .141 | .19 | .110 | 1 |
| M4 | 2.13 | .50 | .75 | .168 | .25 | .131 | 1 |
| M5 | 2.38 | .63 | .88 | .194 | .25 | .152 | 1 |
| M6 | 2.50 | .86 | 1.0 | .255 | .31 | .191 | 2 |
| M8 | 2.72 | .93 | 1.13 | .318 | .38 | .238 | 2 |
| M10 | 2.94 | .98 | 1.25 | .381 | .44 | .286 | 2 |
| M12 | 3.38 | 1.00 | 1.60 | .367 | .44 | .275 | 3 |

# TECHNICAL DATA

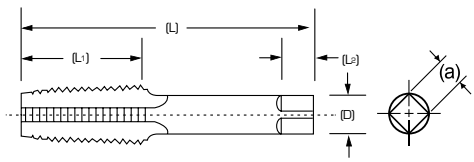
## STI STRAIGHT TAP DIMENSION




Blank Design (1)




Blank Design (2)




Blank Design (3)

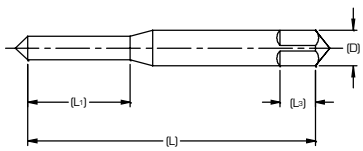
### STI Tap blank (Inch)

| Nominal Size (STI) | Threads per Inch | | Overall Length | Thread Length | Shank Diameter | Square Length | Square Size | Blank Design No. | Table 302 Blank Equivalent |
|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | (L) | ($L_2$) | (D) | ($L_3$) | (a) | | |
| #2 | 56 | – | 1.88 | .560 | .141 | .190 | .110 | 1 | No.4 |
| #2 | | 64 | 1.88 | .560 | .141 | .190 | .110 | 1 | No.4 |
| #3 | 48 | – | 1.94 | .630 | .141 | .190 | .110 | 1 | No.5 |
| #3 | | 56 | 1.94 | .630 | .141 | .190 | .110 | 1 | No.5 |
| #4 | 40 | – | 2.00 | .690 | .141 | .190 | .110 | 1 | No.6 |
| #4 | | 48 | 2.00 | .690 | .141 | .190 | .110 | 1 | No.6 |
| #5 | 40 | – | 2.13 | .750 | .168 | .250 | .131 | 1 | No.8 |
| #6 | 32 | – | 2.38 | .880 | .194 | .250 | .152 | 1 | No.10 |
| #6 | | 40 | 2.13 | .750 | .168 | .250 | .131 | 1 | No.8 |
| #8 | 32 | – | 2.38 | .940 | .220 | .280 | .165 | 1 | No.12 |
| #8 | | 36 | 2.38 | .940 | .220 | .280 | .165 | 1 | No.12 |
| #10 | 24 | – | 2.50 | 1.000 | .255 | .310 | .191 | 2 | 1/4 |
| #10 | | 32 | 2.50 | 1.000 | .255 | .310 | .191 | 2 | 1/4 |
| #12 | 24 | – | 2.72 | 1.130 | .318 | .380 | .238 | 2 | 5/16 |
| 1/4 | 20 | – | 2.72 | 1.130 | .318 | .380 | .238 | 2 | 5/16 |
| 1/4 | | 28 | 2.72 | 1.130 | .318 | .380 | .238 | 2 | 5/16 |
| 5/16 | 18 | – | 2.94 | 1.250 | .381 | .440 | .286 | 2 | 3/8 |
| 5/16 | | 24 | 2.94 | 1.250 | .381 | .440 | .286 | 2 | 3/8 |
| 3/8 | 16 | – | 3.38 | 1.660 | .367 | .440 | .275 | 3 | 1/2 |
| 3/8 | | 24 | 3.16 | 1.440 | .323 | .410 | .242 | 3 | 7/16 |
| 7/16 | 14 | – | 3.59 | 1.660 | .429 | .500 | .322 | 3 | 9/16 |
| 7/16 | | 20 | 3.38 | 1.660 | .367 | .440 | .275 | 3 | 1/2 |
| 1/2 | 13 | – | 3.81 | 1.810 | .480 | .560 | .360 | 3 | 5/8 |
| 1/2 | | 20 | 3.59 | 1.660 | .429 | .500 | .322 | 3 | 9/16 |

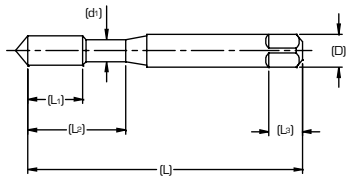
### STI Tap blank (Metric)

| Nominal Size (STI) | Thread Pitch (mm) | Overall Length | Thread Length | Shank Diameter | Square Length | Square Size | Blank Design No. | Table 302 Blank Equivalent |
|---|---|---|---|---|---|---|---|---|
| | | (L) | ($L_2$) | (D) | ($L_3$) | (a) | | |
| M2 | 0.4 | 1.81 | .50 | .141 | .190 | .110 | 1 | No.3 |
| M2.5 | 0.45 | 1.94 | .630 | .141 | .190 | .110 | 1 | No.5 |
| M3 | 0.5 | 2.00 | .690 | .141 | .190 | .110 | 1 | No.6 |
| M4 | 0.7 | 2.38 | .880 | .194 | .250 | .152 | 1 | No.10 |
| M5 | 0.8 | 2.50 | 1.000 | .255 | .310 | .191 | 2 | 1/4 |
| M6 | 1 | 2.72 | 1.130 | .318 | .380 | .238 | 2 | 5/16 |
| M8 | 1.25 | 2.94 | 1.250 | .381 | .440 | .286 | 2 | 3/8 |
| M10 | 1.5 | 3.38 | 1.660 | .367 | .440 | .275 | 3 | 1/2 |
| M12 | 1.75 | 3.59 | 1.660 | .429 | .500 | .322 | 3 | 9/16 |

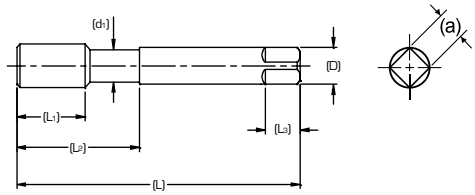
## STI SPIRAL FLUTE & SPIRAL POINT TAP DIMENSION




Blank Design (1)




Blank Design (2)




Blank Design (3)

### STI Tap blank (Inch)

| Nominal Size (STI) | Threads per Inch | | Overall Length | Thread Length | | Neck Length | Shank Diameter | Square Length | Square Size | Blank Design No. | Table 302 Blank Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | (L) | SP | SF | ($L_2$) | (D) | ($L_3$) | (a) | | |
| #2 | 56 | – | 1.88 | .335 | .236 | .56 | .141 | .190 | .110 | 1 | No.4 |
| #2 | | 64 | 1.88 | .335 | .236 | .56 | .141 | .190 | .110 | 1 | No.4 |
| #3 | 48 | – | 1.94 | .374 | .236 | .63 | .141 | .190 | .110 | 1 | No.5 |
| #3 | | 56 | 1.94 | .374 | .236 | .63 | .141 | .190 | .110 | 1 | No.5 |
| #4 | 40 | – | 2.00 | .413 | .276 | .68 | .141 | .190 | .110 | 1 | No.6 |
| #4 | | 48 | 2.00 | .413 | .276 | .68 | .141 | .190 | .110 | 1 | No.6 |
| #5 | 40 | – | 2.13 | .453 | .276 | .75 | .168 | .250 | .131 | 1 | No.8 |
| #6 | 32 | – | 2.38 | .531 | .354 | .88 | .194 | .250 | .152 | 1 | No.10 |
| #6 | | 40 | 2.13 | .453 | .276 | .75 | .168 | .250 | .131 | 1 | No.8 |
| #8 | 32 | – | 2.38 | .571 | .354 | .94 | .220 | .280 | .165 | 1 | No.12 |
| #8 | | 36 | 2.38 | .571 | .354 | .94 | .220 | .280 | .165 | 1 | No.12 |
| #10 | 24 | – | 2.50 | .591 | .433 | 1.0 | .255 | .310 | .191 | 2 | 1/4 |
| #10 | | 32 | 2.50 | .591 | .433 | 1.0 | .255 | .310 | .191 | 2 | 1/4 |
| #12 | 24 | – | 2.72 | .669 | .472 | 1.13 | .318 | .380 | .238 | 2 | 5/16 |
| 1/4 | 20 | – | 2.72 | .669 | .472 | 1.13 | .318 | .380 | .238 | 2 | 5/16 |
| 1/4 | | 28 | 2.72 | .669 | .472 | 1.13 | .318 | .380 | .238 | 2 | 5/16 |
| 5/16 | 18 | – | 2.94 | .748 | .551 | 1.25 | .381 | .440 | .286 | 2 | 3/8 |
| 5/16 | | 24 | 2.94 | .748 | .551 | 1.25 | .381 | .440 | .286 | 2 | 3/8 |
| 3/8 | 16 | – | 3.38 | .984 | .630 | 1.66 | .367 | .440 | .275 | 3 | 1/2 |
| 3/8 | | 24 | 3.16 | .866 | .591 | 1.44 | .323 | .410 | .242 | 3 | 7/16 |
| 7/16 | 14 | – | 3.59 | .984 | .709 | 1.66 | .429 | .500 | .322 | 3 | 9/16 |
| 7/16 | | 20 | 3.38 | .984 | .630 | 1.66 | .367 | .440 | .275 | 3 | 1/2 |
| 1/2 | 13 | – | 3.81 | 1.083 | .748 | 1.81 | .480 | .560 | .360 | 3 | 5/8 |
| 1/2 | | 20 | 3.59 | .984 | .709 | 1.66 | .429 | .500 | .322 | 3 | 9/16 |

### STI Tap blank (Metric)

| Nominal Size (STI) | Thread Pitch (mm) | Overall Length | Thread Length | | Neck Length | Shank Diameter | Square Length | Square Size | Blank Design No. | Table 302 Blank Equivalent |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (L) | SP | SF | ($L_2$) | (D) | ($L_3$) | (a) | | |
| M2 | 0.4 | 1.81 | .295 | .236 | .56 | .141 | .190 | .110 | 1 | No.3 |
| M2.5 | 0.45 | 1.94 | .374 | .197 | .63 | .141 | .190 | .110 | 1 | No.5 |
| M3 | 0.5 | 2.00 | .413 | .276 | .69 | .141 | .190 | .110 | 1 | No.6 |
| M4 | 0.7 | 2.38 | .531 | .354 | .93 | .194 | .250 | .152 | 1 | No.10 |
| M5 | 0.8 | 2.50 | .591 | .433 | 1.0 | .255 | .310 | .191 | 2 | 1/4 |
| M6 | 1 | 2.72 | .669 | .433 | 1.13 | .318 | .380 | .238 | 2 | 5/16 |
| M8 | 1.25 | 2.94 | .748 | .512 | 1.25 | .381 | .440 | .286 | 2 | 3/8 |
| M10 | 1.5 | 3.38 | .984 | .591 | 2.07 | .367 | .440 | .275 | 3 | 1/2 |
| M12 | 1.75 | 3.59 | .984 | .709 | 2.07 | .429 | .500 | .322 | 3 | 9/16 |

# TECHNICAL DATA

## TAP RECOMMENDATIONS FOR CLASSES OF THREAD - INCH

### Internal Screw Thread Classes and Tap Recommendations

| Size | Threads per Inch | | Recommended Tap for Class of Thread | | | | Pitch Diameter Limits for Class of Thread | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Unified Class of Thread | | American National Class of Thread | | Min. All Class (Basic) | Unified Class of Thread | | American National Class of Thread | |
| | UNC | UNF | Class 2 | Class 3 | Class 2B | Class 3B | | Max. Class 2 | Max. Class 3 | Max. Class 2B | Max. Class 3B |
| #0 | – | 80 | GH1 | GH1 | GH2 | GH1 | .0519 | .0536 | .0532 | .0542 | .0536 |
| #1 | 64 | – | GH1 | GH1 | GH2 | GH1 | .0629 | .0648 | .0643 | .0655 | .0648 |
| #1 | – | 72 | GH1 | GH1 | GH2 | GH1 | .0640 | .0658 | .0653 | .0665 | .0659 |
| #2 | 56 | – | GH1 | GH1 | GH2 | GH1 | .0744 | .0764 | .0759 | .0772 | .0765 |
| #2 | – | 64 | GH1 | GH1 | GH2 | GH1 | .0759 | .0778 | .0773 | .0786 | .0779 |
| #3 | 48 | – | GH1 | GH1 | GH2 | GH1 | .0855 | .0877 | .0871 | .0885 | .0877 |
| #3 | – | 56 | GH1 | GH1 | GH2 | GH1 | .0874 | .0894 | .8890 | .0902 | .0895 |
| #4 | 40 | – | GH2 | GH1 | GH2 | GH2 | .0958 | .0982 | .0975 | .0991 | .0982 |
| #4 | – | 48 | GH1 | GH1 | GH2 | GH1 | .0985 | .1007 | .1001 | .1016 | .1008 |
| #5 | 40 | – | GH2 | GH1 | GH2 | GH2 | .1088 | .1112 | .1105 | .1121 | .1113 |
| #5 | – | 44 | GH1 | GH1 | GH2 | GH1 | .1102 | .1125 | .1118 | .1134 | .1126 |
| #6 | 32 | – | GH2 | GH1 | GH3 | GH2 | .1177 | .1204 | .1196 | .1214 | .1204 |
| #6 | – | 40 | GH2 | GH1 | GH2 | GH2 | .1218 | .1242 | .1235 | .1252 | .1243 |
| #8 | 32 | – | GH2 | GH1 | GH3 | GH2 | .1437 | .1464 | .1456 | .1475 | .1465 |
| #8 | – | 36 | GH2 | GH1 | GH2 | GH2 | .1460 | .1485 | .1478 | .1496 | .1487 |
| #10 | 24 | – | GH3 | GH1 | GH3 | GH3 | .1629 | .1662 | .1653 | .1672 | .1661 |
| #10 | – | 32 | GH2 | GH1 | GH3 | GH2 | .1697 | .1724 | .1716 | .1736 | .1726 |
| #12 | 24 | – | GH3 | GH1 | GH3 | GH3 | .1889 | .1922 | .1913 | .1933 | .1922 |
| #12 | – | 28 | GH3 | GH1 | GH3 | GH3 | .1928 | .1959 | .1950 | .1970 | .1959 |
| 1/4 | 20 | – | GH3 | GH2 | GH5 | GH3 | .2175 | .2211 | .2201 | .2223 | .2211 |
| 1/4 | – | 28 | GH3 | GH1 | GH4 | GH3 | .2268 | .2299 | .2290 | .2311 | .2300 |
| 5/16 | 18 | – | GH3 | GH2 | GH5 | GH3 | .2764 | .2805 | .2794 | .2817 | .2803 |
| 5/16 | — | 24 | GH3 | GH1 | GH4 | GH3 | .2854 | .2887 | .2878 | .2902 | .2890 |
| 3/8 | 16 | – | GH3 | GH2 | GH5 | GH3 | .3344 | .3389 | .3376 | .3401 | .3387 |
| 3/8 | – | 24 | GH3 | GH1 | GH4 | GH3 | .3479 | .3512 | .3503 | .3528 | .3516 |
| 7/16 | 14 | – | GH5 | GH3 | GH5 | GH3 | .3911 | .3960 | .3947 | .3972 | .3957 |
| 7/16 | – | 20 | GH3 | GH1 | GH5 | GH3 | .4050 | .4086 | .4076 | .4104 | .4091 |
| 1/2 | 13 | – | GH5 | GH3 | GH5 | GH3 | .4500 | .4552 | .4537 | .4565 | .4548 |
| 1/2 | – | 20 | GH3 | GH1 | GH5 | GH3 | .4675 | .4711 | .4701 | .4731 | .4717 |
| 9/16 | 12 | – | GH5 | GH3 | GH5 | GH3 | .5084 | .5140 | .5124 | .5152 | .5135 |
| 9/16 | – | 18 | GH3 | GH2 | GH5 | GH3 | .5264 | .5305 | .5294 | .5323 | .5308 |
| 5/8 | 11 | – | GH5 | GH3 | GH5 | GH3 | .5660 | .5719 | .5702 | .5732 | .5714 |
| 5/8 | – | 18 | GH3 | GH2 | GH5 | GH3 | .5889 | .5930 | .5919 | .5949 | .5934 |
| 3/4 | 10 | – | GH5 | GH3 | GH5 | GH3 | .6850 | .6914 | .6895 | .6927 | .6907 |
| 3/4 | – | 16 | GH3 | GH2 | GH5 | GH3 | .7094 | .7139 | .7126 | .7159 | .7143 |
| 7/8 | 9 | – | GH6 | GH4 | GH6 | GH4 | .8028 | .8098 | .8077 | .8110 | .8089 |
| 7/8 | – | 14 | GH4 | GH2 | GH6 | GH4 | .8286 | .8335 | .8322 | .8356 | .8339 |
| 1 | 8 | – | GH6 | GH4 | GH6 | GH4 | .9188 | .9264 | .9242 | .9276 | .9254 |
| 1 | – | 12 | GH4 | GH2 | GH6 | GH4 | .9459 | .9515 | .9499 | .9535 | .9516 |

**The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary.**

## 12 TAP RECOMMENDATIONS FOR CLASSES OF THREAD -METRIC

| Size | Pitch | Recommended Tap for Class of Thread | | Pitch Diameter Limits for Class of Thread (mm) | | | Pitch Diameter Limits for Class of Thread (inch) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 4H | 6H | Min. (Basic) | Max. 4H | Max. 6H | Min. (Basic) | Max. 4H | Max. 6H |
| M1.6 | 0.35 | D1 | D3 | 1.373 | 1.426 | 1.458 | .05406 | .05614 | .05740 |
| M2 | 0.40 | D1 | D3 | 1.740 | 1.796 | 1.830 | .06850 | .07071 | .07205 |
| M2.5 | 0.45 | D1 | D3 | 2.208 | 2.268 | 2.303 | .08693 | .08929 | .09067 |
| M3 | 0.50 | D1 | D3 | 2.675 | 2.738 | 2.775 | .10531 | .10780 | .10925 |
| M3.5 | 0.60 | D1 | D4 | 3.110 | 3.181 | 3.222 | .12244 | .12524 | .12685 |
| M4 | 0.70 | D2 | D4 | 3.545 | 3.620 | 3.663 | .13957 | .14252 | .14421 |
| M4.5 | 0.75 | D2 | D4 | 4.013 | 4.088 | 4.131 | .15789 | .16094 | .16264 |
| M5 | 0.80 | D2 | D4 | 4.480 | 4.560 | 4.605 | .17638 | .17953 | .18130 |
| M6 | 1.00 | D3 | D5 | 5.350 | 5.445 | 5.500 | .21063 | .21437 | .21654 |
| M7 | 1.00 | D3 | D5 | 6.350 | 6.445 | 6.500 | .25000 | .25374 | .25591 |
| M8 | 1.25 | D3 | D5 | 7.188 | 7.288 | 7.348 | .28299 | .28693 | .28929 |
| M10 | 1.50 | D3 | D6 | 9.026 | 9.138 | 9.206 | .35535 | .35976 | .36244 |
| M12 | 1.75 | D3 | D6 | 10.863 | 10.988 | 11.063 | .42768 | .43260 | .43555 |
| M14 | 2.00 | D3 | D7 | 12.701 | 12.833 | 12.913 | .50004 | .50524 | .50839 |
| M16 | 2.00 | D4 | D7 | 14.701 | 14.833 | 14.913 | .57878 | .58398 | .58713 |
| M20 | 2.50 | D4 | D7 | 18.376 | 18.516 | 18.600 | .72346 | .72898 | .73228 |
| M24 | 3.00 | D4 | D8 | 22.051 | 22.221 | 22.316 | .86815 | .87484 | .87858 |
| M30 | 3.50 | D5 | D9 | 27.727 | 27.907 | 28.007 | 1.09161 | 1.0987 | 1.10264 |
| M36 | 4.00 | D5 | D9 | 33.402 | 33.592 | 33.702 | 1.31504 | 1.32252 | 1.32685 |

## 13 TOLERANCE CHART - USCTI

| Element | Nominal Diameter Range in Inches | | Direction | Tolerance (Inches) |
|---|---|---|---|---|
| | Over | To (Inc.) | | |
| Overall Length - L | .0520 | 1.0100 | Plus or Minus | .031 |
| | 1.0100 | 4.0100 | Plus or Minus | .063 |
| Thread Length - L1 | .0520 | .2230 | Plus or Minus | .047 |
| | .2230 | .5100 | Plus or Minus | .063 |
| | .5100 | 1.5100 | Plus or Minus | .094 |
| | 1.5100 | 4.0100 | Plus or Minus | .125 |
| Square Length - L3 | .0520 | 1.0100 | Plus or Minus | .031 |
| | 1.0100 | 4.0100 | Plus or Minus | .063 |
| Shank Diameter - D | .0520 | .2230 | Minus | .0015 |
| | .2230 | .6350 | Minus | .0015 |
| | .6350 | 1.0100 | Minus | .0020 |
| | 1.0100 | 1.5100 | Minus | .0020 |
| | 1.5100 | 2.0100 | Minus | .0030 |
| | 2.0100 | 4.0100 | Minus | .0030 |
| Square Size - a | .0520 | .5100 | Minus | .004 |
| | .5100 | 1.0100 | Minus | .006 |
| | 1.0100 | 2.0100 | Minus | .008 |
| | 2.0100 | 4.0100 | Minus | .010 |

# TECHNICAL DATA

## 14 THREAD LIMITS

### Unified Thread, Machine Screw Size - Ground Thread

| Size | Thread per Inch | | | Major Diameter (Inches) | | | Pitch Diameter Limits (Inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Basic Pitch Dia. | H1 Limit | | H2 Limit | | H3 Limit | | H7 Limit | |
| | UNC | UNF | UNS | Basic | Min. | Max. | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| #0 | – | 80 | – | .0600 | .0605 | .0615 | .0519 | .0519 | .0524 | .0524 | .0529 | – | – | – | – |
| #1 | 64 | – | – | .0730 | .0735 | .0745 | .0629 | .0629 | .0634 | .0634 | .0639 | – | – | – | – |
| | – | 72 | – | .0730 | .0735 | .0745 | .0640 | .0640 | .0645 | .0645 | .0650 | – | – | – | – |
| #2 | 56 | – | – | .0860 | .0865 | .0875 | .0744 | .0744 | .0749 | .0749 | .0754 | – | – | – | – |
| | – | 64 | – | .0860 | .0865 | .0875 | .0759 | – | – | .0764 | .0769 | – | – | – | – |
| #3 | 48 | – | – | .0990 | .0100 | .1010 | .0855 | .0855 | .0860 | .0860 | .0865 | – | – | – | – |
| | – | 56 | – | .0990 | .0995 | .1005 | .0874 | .0874 | .0879 | .0879 | .0884 | – | – | – | – |
| #4 | – | – | 36 | .1120 | .1135 | .1145 | .0940 | – | – | .0945 | .0950 | – | – | – | – |
| | 40 | – | – | .1120 | .1135 | .1145 | .0958 | .0958 | .0963 | .0963 | .0968 | – | – | – | – |
| | – | 48 | – | .1120 | .1130 | .1140 | .0985 | .0985 | .0990 | .0990 | .0995 | – | – | – | – |
| #5 | 40 | – | – | .1250 | .1265 | .1275 | .1088 | .1088 | .1093 | .1093 | .1098 | – | – | – | – |
| | – | 44 | – | .1250 | .1260 | .1270 | .1102 | – | – | .1107 | .1112 | – | – | – | – |
| #6 | 32 | – | – | .1380 | .1400 | .1410 | .1177 | .1177 | .1182 | .1182 | .1187 | .1187 | .1192 | .1207 | .1212 |
| | – | 40 | – | .1380 | .1395 | .1405 | .1218 | .1218 | .1223 | .1223 | .1228 | — | — | — | — |
| #8 | 32 | – | – | .1640 | .1660 | .1670 | .1437 | .1437 | .1442 | .1442 | .1447 | .1447 | .1452 | .1467 | .1472 |
| | – | 36 | – | .1640 | .1655 | .1665 | .1460 | – | – | .1465 | .1470 | — | — | — | — |
| #10 | 24 | – | – | .1900 | .1930 | .1940 | .1629 | .1629 | .1634 | .1634 | .1639 | .1639 | .1644 | .1659 | .1664 |
| | – | 32 | – | .1900 | .1920 | .1930 | .1697 | .1697 | .1702 | .1702 | .1707 | .1707 | .1712 | .1727 | .1732 |
| #12 | 24 | – | – | .2160 | .2190 | .2200 | .1889 | – | – | – | – | .1899 | .1904 | – | – |
| | – | 28 | – | .2160 | .2185 | .2195 | .1928 | – | – | – | – | .1938 | .1943 | – | – |

### Lead Tolerance

**A maximum lead deviation of plus or minus .0005" within any two threads not farther apart than 1" is permitted**

### Pitch Diameter Limits

**H1 = Basic to basic plus .0005"**

**H2 = Basic plus .0005" to basic plus .001"**

**H3 = Basic plus .001" to basic plus .0015"**

**H7 = Basic plus .003" to basic plus .0035"**

### Angle Tolerance

**24 to 80 threads per inch incl. = 30 plus or minus in 1/2 angle.**

## Unified Thread, Machine Screw Size - Ground Thread

| Size | Thread per Inch | | | Major Diameter (Inches) | | | Pitch Diameter Limits (Inches) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNS | Basic | Min. | Max. | Basic Pitch Dia. | H1 Limit | | H2 Limit | | H3 Limit | | H4 Limit | | H5 Limit | | H6 Limit | |
| | | | | | | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| 1/4 | 20 | – | – | .2500 | .2540 | .2550 | .2175 | .2175 | .2180 | .2180 | .2185 | .2185 | .2190 | – | – | .2195 | .2200 | – | – |
| | – | 28 | – | .2500 | .2525 | .2535 | .2268 | .2268 | .2273 | .2273 | .2278 | .2278 | .2283 | .2283 | .2288 | – | – | – | – |
| 5/16 | 18 | – | – | .3125 | .3170 | .3180 | .2764 | .2764 | .2769 | .2769 | .2774 | .2774 | .2779 | – | – | .2784 | .2789 | – | – |
| | – | 24 | – | .3125 | .3155 | .3165 | .2854 | .2854 | .2859 | .2859 | .2864 | .2864 | .2869 | .2869 | .2874 | – | – | – | – |
| 3/8 | 16 | – | – | .3750 | .3800 | .3810 | .3344 | .3344 | .3349 | .3349 | .3354 | .3354 | .3359 | – | – | .3364 | .3369 | – | – |
| | – | 24 | – | .3750 | .3780 | .3790 | .3479 | .3479 | .3484 | .3484 | .3489 | .3489 | .3494 | .3494 | .3499 | – | – | – | – |
| 7/16 | 14 | – | – | .4375 | .4435 | .4445 | .3911 | – | – | .3916 | .3921 | .3921 | .3926 | – | – | .3931 | .3936 | – | – |
| | – | 20 | – | .4375 | .4415 | .4425 | .4050 | – | – | – | – | .4060 | .4065 | – | – | .4070 | .4075 | – | – |
| 1/2 | 13 | – | – | .5000 | .5065 | .5075 | .4500 | .4500 | .4505 | .4505 | .4510 | .4510 | .4515 | – | – | .4520 | .4525 | – | – |
| | – | 20 | – | .5000 | .5040 | .5050 | .4675 | .4675 | .4680 | .4680 | .4685 | .4685 | .4690 | – | – | .4695 | .4700 | – | – |
| 9/16 | 12 | – | – | .5625 | .5690 | .5700 | .5084 | – | – | .5089 | .5094 | .5094 | .5099 | – | – | .5104 | .5109 | – | – |
| | – | 18 | – | .5625 | .5670 | .5680 | .5264 | – | – | .5269 | .5274 | .5274 | .5279 | – | – | .5284 | .5289 | – | – |
| 5/8 | 11 | – | – | .6250 | .6320 | .6330 | .5660 | – | – | .5665 | .5670 | .5670 | .5675 | – | – | .5680 | .5685 | – | – |
| | – | 18 | – | .6250 | .6295 | .6305 | .5889 | – | – | .5894 | .5899 | .5899 | .5904 | – | – | .5909 | .5914 | – | – |
| 11/16 | – | – | 11 | .6875 | .6945 | .6955 | .6285 | – | – | – | – | .6295 | .6300 | – | – | – | – | – | – |
| | – | – | 16 | .6875 | .6925 | .6935 | .6469 | – | – | .6855 | .6860 | .6479 | .6484 | – | – | – | – | – | – |
| 3/4 | 10 | – | – | .7500 | .7525 | .7590 | .6850 | .6850 | .6855 | .7099 | .7104 | .6860 | .6865 | – | – | .6870 | .6875 | – | – |
| | – | 16 | – | .7500 | .7550 | .7560 | .7094 | .7094 | .7099 | – | – | .7104 | .7109 | – | – | .7114 | .7119 | .8053 | – |
| 7/8 | 9 | – | – | .8750 | .8835 | .8850 | .8028 | – | – | .8291 | .8296 | – | – | .8043 | .8048 | – | – | .8311 | .8058 |
| | – | 14 | – | .8750 | .8810 | .8820 | .8286 | – | – | .9193 | .9198 | – | – | .8301 | .8306 | – | – | .9213 | .8318 |
| 1 | 8 | – | – | 1.0000 | 1.0095 | 1.0110 | .9188 | – | – | – | – | – | – | .9203 | .9208 | – | – | – | .9218 |
| | – | 12 | – | 1.0000 | 1.0065 | 1.0075 | .9459 | – | – | – | – | – | – | .9474 | .9479 | – | – | – | – |
| | – | – | 14 | 1.0000 | 1.0060 | 1.0070 | .9536 | – | – | | | – | – | .9551 | .9556 | – | – | | – |

### Lead Tolerance

**A maximum lead deviation of plus or minus .0005" within any two threads not farther apart than 1" is permitted**

### Pitch Diameter Limits

**H1 = Basic to basic plus .0005"**
**H2 = Basic plus .0005" to basic plus .001"**
**H3 = Basic plus .001" to basic plus .0015"**
**H4 = Basic plus .0015" to basic plus .0020"**
**H5 = Basic plus .0020" to basic plus .0025"**
**H6 = Basic plus .0025" to basic plus .0030"**

### Angle Tolerance

| Threads per Inch | Deviation in Half Angle |
|---|---|
| 6 to 9 Incl.<br>10 to 28 Incl. | 25' Plus or Minus<br>30' Plus or Minus |

# TECHNICAL DATA

## Metric Thread - Ground Thread

| Size | Pitch | | Major Diameter (Inches) | | | Pitch Diameter Limits (Inches) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coarse | Fine | Basic | Min. | Max. | Basic Pitch Dia. | D2 Limit | | D3 Limit | | D4 Limit | | D5 Limit | | D6 Limit | |
| | | | | | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| M2 | 0.4 | – | .0787 | .0801 | .0811 | .0685 | .0690 | .0696 | .0695 | .0701 | .0700 | .0706 | – | – | – | – |
| M2.2 | 0.45 | – | .0866 | .0881 | .0891 | .0751 | .0756 | .0762 | .0761 | .0767 | .0766 | .0772 | – | – | – | – |
| M2.3 | 0.4 | – | .0906 | .0919 | .0929 | .0803 | .0808 | .0814 | .0813 | .0819 | .0818 | .0824 | – | – | – | – |
| M2.6 | 0.45 | – | .1024 | .1038 | .1048 | .0909 | .0913 | .0919 | .0918 | .0924 | .0923 | .0929 | – | – | – | – |
| M3 | 0.5 | – | .1181 | .1198 | .1208 | .1053 | .1058 | .1064 | .1063 | .1069 | .1068 | .1074 | .1073 | .1079 | – | – |
| | – | 0.35 | .1181 | .1193 | .1203 | .1092 | .1096 | .1102 | .1101 | .1107 | .1106 | .1112 | .1111 | .1117 | – | – |
| M3.5 | 0.6 | – | .1378 | .1397 | .1407 | .1225 | .1227 | .1235 | .1232 | .1240 | .1237 | .1245 | .1242 | .1250 | – | – |
| | – | 0.35 | .1378 | .1389 | .1399 | .1289 | .1293 | .1299 | .1298 | .1304 | .1303 | .1309 | .1308 | .1314 | – | – |
| M4 | 0.7 | — | .1575 | .1597 | .1613 | .1396 | .1398 | .1406 | .1403 | .1411 | .1408 | .1416 | .1413 | .1421 | – | – |
| | – | 0.5 | .1575 | .1591 | .1601 | .1447 | .1451 | .1457 | .1456 | .1462 | .1461 | .1467 | .1466 | .1472 | – | – |
| M5 | 0.8 | – | .1969 | .1994 | .2010 | .1764 | .1766 | .1774 | .1771 | .1779 | .1776 | .1784 | .1781 | .1789 | – | – |
| | – | 0.5 | .1969 | .1985 | .1995 | .1841 | .1845 | .1851 | .1850 | .1856 | .1855 | .1861 | .1861 | .1866 | – | – |
| M6 | 1 | — | .2362 | .2395 | .2411 | .2106 | .2107 | .2117 | .2112 | .2122 | .2117 | .2127 | .2122 | .2132 | .2127 | .2137 |
| | – | 0.75 | .2362 | .2387 | .2403 | .2170 | .2173 | .2181 | .2178 | .2186 | .2183 | .2191 | .2188 | .2196 | .2193 | .2201 |
| M7 | 1 | – | .2756 | .2788 | .2804 | .2500 | .2501 | .2511 | .2506 | .2516 | .2511 | .2521 | .2516 | .2526 | .2521 | .2531 |
| | – | 0.75 | .2756 | .2780 | .2796 | .2564 | .2565 | .2575 | .2570 | .2580 | .2575 | .2585 | .2580 | .2590 | .2585 | .2595 |
| M8 | 1.25 | – | .3150 | .3189 | .3214 | .2830 | .2828 | .2840 | .2833 | .2845 | .2838 | .2850 | .2843 | .2855 | .2848 | .2860 |
| | – | 1 | .3150 | .3182 | .3198 | .2894 | .2894 | .2904 | .2899 | .2909 | .2904 | .2914 | .2909 | .2919 | .2914 | .2924 |
| M10 | 1.5 | – | .3937 | .3984 | .4009 | .3553 | .3552 | .3564 | .3557 | .3569 | .3562 | .3574 | .3567 | .3579 | .3572 | .3584 |
| | – | 1.25 | .3937 | .3976 | .4001 | .3617 | .3616 | .3628 | .3621 | .3633 | .3626 | .3638 | .3631 | .3643 | .3636 | .3648 |
| | | 1 | .3937 | .3969 | .3985 | .3681 | .3682 | .3692 | .3687 | .3697 | .3692 | .3702 | .3697 | .3707 | .3702 | .3712 |
| M12 | 1.75 | – | .4724 | .4780 | .4805 | .4277 | .4275 | .4287 | .4280 | .4292 | .4285 | .4297 | .4290 | .4302 | .4295 | .4307 |
| | – | 1.5 | .4724 | .4772 | .4797 | .4341 | .4339 | .4351 | .4344 | .4356 | .4349 | .4361 | .4354 | .4366 | .4359 | .4371 |
| | – | 1.25 | .4724 | .4764 | .4789 | .4405 | .4403 | .4415 | .4408 | .4420 | .4413 | .4425 | .4418 | .4430 | .4423 | .4435 |

### Lead Tolerance

**The tap major and pitch diameter conversions have been rounded upward.**

**A maximum lead deviation of +/- .0005˝ within any two threads not further apart than 1˝ is permitted**

### Angle Tolerance

| Pitch(mm) | Deviation in Half Angle |
|---|---|
| Over 0.25 to 2.5 Incl.<br>Over 2.5 to 4.0 Incl. | 30' Plus or Minus<br>25' Plus or Minus |

## Metric Thread - Ground Thread

| Size | Pitch | | Major Diameter (Inches) | | | Pitch Diameter Limits (Inches) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Basic Pitch Dia. | D2 Limit | | D3 Limit | | D4 Limit | | D5 Limit | |
| | Coarse | Fine | Basic | Min. | Max. | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| M14 | 2 | – | .5512 | .5575 | .5600 | .5000 | .5015 | .5031 | .5020 | .5036 | .5025 | .5041 | – | – |
| | – | 1.5 | .5512 | .5559 | .5584 | .5128 | .5147 | .5159 | .5152 | .5164 | .5157 | .5169 | – | – |
| | – | 1.25 | .5512 | .5551 | .5576 | .5192 | .5211 | .5223 | .5216 | .5228 | .5221 | .5233 | – | – |
| M16 | 2 | – | .6299 | .6363 | .6388 | .5788 | .5802 | .5818 | .5807 | .5823 | .5812 | .5828 | – | – |
| | – | 1.5 | .6299 | .6347 | .6372 | .5916 | .5934 | .5946 | .5939 | .5951 | .5944 | .5956 | – | – |
| M18 | 2.5 | – | .7087 | .7166 | .7191 | .6448 | .6462 | .6478 | .6467 | .6483 | .6472 | .6488 | – | – |
| | – | 2 | .7087 | .7150 | .7175 | .6576 | .6590 | .6606 | .6595 | .6611 | .6600 | .6616 | – | – |
| | – | 1.5 | .7087 | .7134 | .7159 | .6703 | .6722 | .6734 | .6727 | .6739 | .6732 | .6744 | – | – |
| M20 | 2.5 | – | .7874 | .7953 | .7976 | .7235 | .7249 | .7265 | .7254 | .7270 | .7259 | .7275 | – | – |
| | – | 2 | .7874 | .7937 | .7962 | .7363 | .7377 | .7393 | .7382 | .7398 | .7387 | .7403 | – | – |
| | – | 1.5 | .7874 | .7921 | .7946 | .7490 | .7509 | .7521 | .7514 | .7526 | .7519 | .7531 | – | – |
| | – | 1 | .7874 | .7906 | .7922 | .7618 | .7639 | .7649 | .7644 | .7654 | .7649 | .7659 | – | – |
| M22 | 2.5 | – | .8661 | .8741 | .8766 | .8022 | .8037 | .8053 | .8042 | .8058 | .8047 | .8063 | – | – |
| | – | 2 | .8661 | .8725 | .8750 | .8150 | .8164 | .8180 | .8169 | .8185 | .8174 | .8190 | – | – |
| | – | 1.5 | .8661 | .8709 | .8734 | .8278 | .8296 | .8308 | .8301 | .8313 | .8306 | .8318 | – | – |
| | – | 1 | .8661 | .8694 | .8710 | .8406 | .8426 | .8436 | .8431 | .8441 | .8436 | .8446 | – | – |
| M24 | 3 | – | .9449 | .9544 | .9583 | .8682 | .8696 | .8712 | .8701 | .8717 | .8706 | .8722 | .8711 | .8727 |
| | – | 2 | .9449 | .9512 | .9537 | .8938 | .8952 | .8968 | .8957 | .8973 | .8962 | .8978 | – | – |
| | – | 1.5 | .9449 | .9496 | .9521 | .9065 | .9084 | .9096 | .9089 | .9101 | .9094 | .9106 | – | – |
| | – | 1 | .9449 | .9481 | .9497 | .9193 | .9214 | .9224 | .9219 | .9229 | .9224 | .9234 | – | – |
| M27 | 3 | – | 1.0630 | 1.0725 | 1.0764 | .9863 | .9873 | .9893 | .9878 | .9898 | .9883 | .9903 | .9888 | .9908 |
| | – | 2 | 1.0630 | 1.0693 | 1.0718 | 1.0118 | 1.0133 | 1.0149 | 1.0138 | 1.0154 | 1.0143 | 1.0159 | – | – |
| | – | 1.5 | 1.0630 | 1.0677 | 1.0702 | 1.0246 | 1.0265 | 1.0277 | 1.0270 | 1.0282 | 1.0275 | 1.0287 | – | – |
| | – | 1 | 1.0630 | 1.0662 | 1.0678 | 1.0374 | 1.0393 | 1.0405 | 1.0398 | 1.0410 | 1.0403 | 1.0415 | – | – |
| M28 | – | 2 | 1.1024 | 1.1087 | 1.1112 | 1.0512 | 1.0527 | 1.0543 | 1.0532 | 1.0548 | 1.0537 | 1.0553 | – | – |
| | – | 1.5 | 1.1024 | 1.1071 | 1.1096 | 1.0640 | 1.0659 | 1.0671 | 1.0664 | 1.0676 | 1.0669 | 1.0681 | – | – |
| | – | 1 | 1.1024 | 1.1056 | 1.1072 | 1.0768 | 1.0786 | 1.0798 | 1.0791 | 1.0803 | 1.0796 | 1.0808 | – | – |
| M30 | 3.5 | – | 1.1811 | 1.1921 | 1.1961 | 1.0916 | 1.0926 | 1.0946 | 1.0931 | 1.0951 | 1.0936 | 1.0956 | 1.0941 | 1.0961 |
| | – | 3 | 1.1811 | 1.1906 | 1.1945 | 1.1044 | 1.1054 | 1.1074 | 1.1059 | 1.1079 | 1.1064 | 1.1084 | 1.1069 | 1.1089 |
| | – | 2 | 1.1811 | 1.1874 | 1.1899 | 1.1300 | 1.1314 | 1.1330 | 1.1319 | 1.1335 | 1.1324 | 1.1340 | – | – |
| | – | 1.5 | 1.1811 | 1.1858 | 1.1883 | 1.1427 | 1.1446 | 1.1458 | 1.1451 | 1.1463 | 1.1456 | 1.1468 | – | – |
| M33 | 3.5 | – | 1.2992 | 1.3103 | 1.3142 | 1.2097 | 1.2108 | 1.2128 | 1.2113 | 1.2133 | 1.2118 | 1.2138 | 1.2123 | 1.2143 |
| | – | 3 | 1.2992 | 1.3088 | 1.3127 | 1.2225 | 1.2235 | 1.2255 | 1.2240 | 1.2260 | 1.2245 | 1.2265 | 1.2250 | 1.2270 |
| | – | 2 | 1.2992 | 1.3056 | 1.3081 | 1.2481 | 1.2495 | 1.2511 | 1.2500 | 1.2516 | 1.2505 | 1.2521 | – | – |
| | – | 1.5 | 1.2992 | 1.3040 | 1.3065 | 1.2609 | 1.2627 | 1.2639 | 1.2632 | 1.2644 | 1.2637 | 1.2649 | – | – |

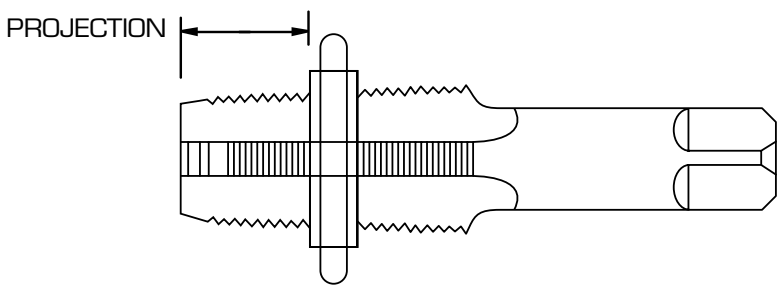
# TECHNICAL DATA

## Pipe Tap (Limit)

| Tap Thread Limits | | | | | | Reference Dimensions | |
|---|---|---|---|---|---|---|---|
| Nominal Size Inches | Threads per Inch | Projection* Inches | Projection Tolerance + or - | Taper per Foot Limits | | Length | Tap Drill Size** NPT, ANPT, NPTF |
| | | | | Min. | Max. | ($L_1$) | |
| 1/16 | 27 | .312 | .063 | .719 | .781 | .160 | C |
| 1/8 | 27 | .312 | .063 | .719 | .781 | .1615 | Q |
| 1/8 | 18 | .459 | .063 | .719 | .781 | .2278 | 7/16 |
| 3/8 | 18 | .454 | .063 | .719 | .781 | .240 | 9/16 |
| 1/2 | 14 | .579 | .063 | .719 | .781 | .320 | 45/64 |
| 3/4 | 14 | .565 | .063 | .719 | .781 | .339 | 29/32 |
| 1 | 11-1/2 | .678 | .094 | .719 | .781 | .400 | 1-9/64 |
| 1-1/4 | 11-1/2 | .686 | .094 | .719 | .781 | .420 | 1-31/64 |
| 1-1/2 | 11-1/2 | .699 | .094 | .719 | .781 | .420 | 1-23/32 |
| 2 | 11-1/2 | .667 | .094 | .719 | .781 | .436 | 2-3/16 |
| 2-1/2 | 8 | .925 | .094 | .734 | .781 | .682 | 2-39/64 |
| 3 | 8 | .925 | .094 | .734 | .781 | .766 | 3-15/64 |
| 3-1/2 | 8 | .938 | .125 | .734 | .781 | .821 | ... |
| 4 | 8 | .950 | .125 | .734 | .781 | .844 | ... |

*** Distance small end of tap projects through L1 Taper Thread Ring Gage.**

**** Recommended size given permit direct tapping without reaming the hole, but only give a full thread for approx. the L1 length.**



## TAP DRILL SIZES - UNIFIED THREAD

| Size | Threads Per Inch | | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | UN | Min. 2B&3B | Max. 2B | Max. 3B | 80% Thread | 75% Thread | 70% Thread | 65% Thread | 60% Thread |
| #0 | - | 80 | - | - | .0465 | .0514 | .0514 | .0470 | .0478 | .0486 | .0494 | .0503 |
| #1 | 64 | - | - | - | .0561 | .0623 | .0623 | .0568 | .0578 | .0588 | .0598 | .0608 |
| | - | 72 | - | - | .0580 | .0635 | .0635 | .0586 | .0595 | .0604 | .0613 | .0622 |
| #2 | 56 | - | - | - | .0667 | .0737 | .0737 | .0674 | .0686 | .0698 | .0709 | .0721 |
| | - | 64 | - | - | .0691 | .0753 | .0753 | .0698 | .0708 | .0718 | .0728 | .0738 |
| #3 | 48 | - | - | - | .0764 | .0845 | .0845 | .0774 | .0787 | .0801 | .0814 | .0828 |
| | - | 56 | - | - | .0797 | .0865 | .0865 | .0804 | .0816 | .0828 | .0839 | .0851 |
| #4 | 40 | - | - | - | .0849 | .0939 | .0939 | .0860 | .0876 | .0893 | .0909 | .0925 |
| | - | 48 | - | - | .0894 | .0968 | .0968 | .0904 | .0917 | .0931 | .0944 | .0958 |
| #5 | 40 | - | - | - | .0979 | .1062 | .1062 | .0990 | .1006 | .1023 | .1039 | .1055 |
| | - | 44 | - | - | .1004 | .1079 | .1079 | .1014 | .1029 | .1043 | .1058 | .1073 |
| #6 | 32 | - | - | - | .1040 | .1140 | .1140 | .1055 | .1076 | .1096 | .1116 | .1136 |
| | - | 40 | - | - | .1110 | .1190 | .1186 | .1120 | .1136 | .1153 | .1169 | .1185 |
| #8 | 32 | - | - | - | .1300 | .1390 | .1389 | .1315 | .1336 | .1356 | .1376 | .1396 |
| | - | 36 | - | - | .1340 | .1420 | .1416 | .1351 | .1369 | .1387 | .1405 | .1424 |
| #10 | 24 | - | - | - | .1450 | .1560 | .1555 | .1467 | .1494 | .1521 | .1548 | .1575 |
| | - | 32 | - | - | .1560 | .1640 | .1641 | .1575 | .1596 | .1616 | .1636 | .1656 |
| #12 | 24 | - | - | - | .1710 | .1810 | .1807 | .1727 | .1754 | .1781 | .1808 | .1835 |
| | - | 28 | - | - | .1770 | .1860 | .1857 | .1789 | .1812 | .1835 | .1858 | .1882 |
| | - | - | 32 | - | .1820 | .1900 | .1895 | .1835 | .1856 | .1876 | .1896 | .1916 |
| 1/4 | 20 | - | - | - | .1960 | .2070 | .2067 | .1980 | .2013 | .2045 | .2078 | .2110 |
| | - | 28 | - | - | .2110 | .2200 | .2190 | .2129 | .2152 | .2175 | .2198 | .2222 |
| | - | - | 32 | - | .2160 | .2240 | .2229 | .2175 | .2196 | .2216 | .2236 | .2256 |
| 5/16 | 18 | - | - | - | .2520 | .2650 | .2630 | .2548 | .2584 | .2620 | .2656 | .2692 |
| | - | - | - | 20 | .2580 | .2700 | .2680 | .2605 | .2638 | .2670 | .2703 | .2735 |
| | - | 24 | - | - | .2670 | .2770 | .2754 | .2692 | .2719 | .2746 | .2773 | .2800 |
| | - | - | - | 28 | .2740 | .2820 | .2807 | .2754 | .2777 | .2800 | .2823 | .2847 |
| | - | - | 32 | - | .2790 | .2860 | .2847 | .2800 | .2821 | .2841 | .2861 | .2881 |
| 3/8 | 16 | - | - | - | .3070 | .3210 | .3182 | .3101 | .3141 | .3182 | .3222 | .3263 |
| | - | - | - | 20 | .3210 | .3320 | .3297 | .3230 | .3263 | .3295 | .3328 | .3360 |
| | - | 24 | - | - | .3300 | .3400 | .3372 | .3317 | .3344 | .3371 | .3398 | .3425 |
| | - | - | - | 28 | .3360 | .3450 | .3426 | .3379 | .3402 | .3425 | .3448 | .3472 |
| | - | - | 32 | - | .3410 | .3490 | .3469 | .3425 | .3446 | .3466 | .3486 | .3506 |
| 7/16 | 14 | - | - | - | .3600 | .3760 | .3717 | .3633 | .3679 | .3726 | .3772 | .3818 |
| | - | - | - | 16 | .3700 | .3840 | .3800 | .3726 | .3766 | .3807 | .3847 | .3888 |
| | - | 20 | - | - | .3830 | .3950 | .3916 | .3855 | .3888 | .3920 | .3953 | .3985 |
| | - | - | 28 | - | .3990 | .4070 | .4051 | .4004 | .4027 | .4050 | .4073 | .4097 |
| | - | - | - | 32 | .4040 | .4110 | .4094 | .4050 | .4071 | .4091 | .4111 | .4131 |
| 1/2 | 13 | - | - | - | .4170 | .4340 | .4284 | .4201 | .4251 | .4301 | .4351 | .4400 |
| | - | - | - | 16 | .4320 | .4460 | .4419 | .4351 | .4391 | .4432 | .4472 | .4513 |
| | - | 20 | - | - | .4460 | .4570 | .4537 | .4480 | .4513 | .4545 | .4578 | .4610 |
| | - | - | 28 | - | .4610 | .4700 | .4676 | .4629 | .4652 | .4675 | .4698 | .4722 |
| | - | - | - | 32 | .4660 | .4740 | .4719 | .4675 | .4696 | .4716 | .4736 | .4756 |
| 9/16 | 12 | - | - | - | .4720 | .4900 | .4843 | .4759 | .4813 | .4867 | .4921 | .4976 |
| | - | - | - | 16 | .4950 | .5090 | .5040 | .4976 | .5016 | .5057 | .5097 | .5138 |
| | - | 18 | - | - | .5020 | .5150 | .5106 | .5048 | .5084 | .5120 | .5156 | .5192 |
| | - | - | - | 20 | .5080 | .5200 | .5162 | .5105 | .5138 | .5170 | .5203 | .5235 |
| | - | - | 24 | - | .5170 | .5270 | .5244 | .5192 | .5219 | .5246 | .5273 | .5300 |
| | - | - | - | 28 | .5240 | .5320 | .5301 | .5254 | .5277 | .5300 | .5323 | .5347 |
| | - | - | - | 32 | .5290 | .5360 | .5344 | .5300 | .5321 | .5341 | .5361 | .5381 |
| 5/8 | 11 | - | - | - | .5270 | .5460 | .5391 | .5305 | .5364 | .5423 | .5482 | .5541 |

# TECHNICAL DATA

| Size | Threads Per Inch | | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | UN | Min. 2B&3B | Max. 2B | Max. 3B | 80% Thread | 75% Thread | 70% Thread | 65% Thread | 60% Thread |
| 5/8 | - | - | - | 12 | .5350 | .5530 | .5463 | .5384 | .5438 | .5492 | .5546 | .5601 |
| | - | - | - | 16 | .5570 | .5710 | .5662 | .5601 | .5641 | .5682 | .5722 | .5763 |
| | - | 18 | - | - | .5650 | .5780 | .5730 | .5673 | .5709 | .5745 | .5781 | .5817 |
| | - | - | - | 20 | .5710 | .5820 | .5787 | .5730 | .5763 | .5795 | .5828 | .5860 |
| | - | - | 24 | - | .5800 | .5900 | .5869 | .5817 | .5844 | .5871 | .5898 | .5925 |
| | - | - | - | 28 | .5860 | .5950 | .5926 | .5879 | .5902 | .5925 | .5948 | .5972 |
| | - | - | - | 32 | .5910 | .5980 | .5969 | .5925 | .5946 | .5966 | .5986 | .6006 |
| 11/16 | - | - | - | 12 | .5970 | .6150 | .6085 | .6009 | .6063 | .6117 | .6171 | .6226 |
| | - | - | - | 16 | .6200 | .6340 | .6284 | .6226 | .6266 | .6307 | .6347 | .6388 |
| | - | - | - | 20 | .6330 | .6450 | .6412 | .6355 | .6388 | .6420 | .6453 | .6485 |
| | - | - | 24 | - | .6420 | .6520 | .6494 | .6442 | .6469 | .6496 | .6523 | .6550 |
| | - | - | - | 28 | .6490 | .6570 | .6551 | .6504 | .6527 | .6550 | .6573 | .6597 |
| | - | - | - | 32 | .6540 | .6610 | .6594 | .6550 | .6571 | .6591 | .6611 | .6631 |
| 3/4 | 10 | - | - | - | .6420 | .6630 | .6545 | .6461 | .6526 | .6591 | .6656 | .6721 |
| | - | - | - | 12 | .6600 | .6780 | .6707 | .6634 | .6688 | .6742 | .6796 | .6851 |
| | - | 16 | - | - | .6820 | .6960 | .6908 | .6851 | .6891 | .6932 | .6972 | .7013 |
| | - | - | 20 | - | .6960 | .7070 | .7037 | .6980 | .7013 | .7045 | .7078 | .7110 |
| | - | - | - | 28 | .7110 | .7200 | .7176 | .7129 | .7152 | .7175 | .7198 | .7222 |
| | - | - | - | 32 | .7160 | .7240 | .7219 | .7175 | .7196 | .7216 | .7236 | .7256 |
| 13/16 | - | - | - | 12 | .7220 | .7400 | .7329 | .7259 | .7313 | .7367 | .7421 | .7476 |
| | - | - | - | 16 | .7450 | .7590 | .7533 | .7476 | .7516 | .7557 | .7597 | .7638 |
| | - | - | 20 | - | .7580 | .7700 | .7662 | .7605 | .7638 | .7670 | .7703 | .7735 |
| | - | - | - | 28 | .7740 | .7820 | .7801 | .7754 | .7777 | .7800 | .7823 | .7847 |
| | - | - | - | 32 | .7790 | .7860 | .7844 | .7800 | .7821 | .7841 | .7861 | .7881 |
| 7/8 | 9 | - | - | - | .7550 | .7780 | .7681 | .7595 | .7668 | .7740 | .7812 | .7884 |
| | - | - | - | 12 | .7850 | .8030 | .7948 | .7884 | .7938 | .7992 | .8046 | .8101 |
| | - | 14 | - | - | .7980 | .8140 | .8068 | .8008 | .8054 | .8101 | .8147 | .8193 |
| | - | - | - | 16 | .8070 | .8210 | .8158 | .8101 | .8141 | .8182 | .8222 | .8263 |
| | - | - | 20 | - | .8210 | .8320 | .8287 | .8230 | .8263 | .8295 | .8328 | .8360 |
| | - | - | - | 28 | .8360 | .8450 | .8426 | .8379 | .8402 | .8425 | .8448 | .8472 |
| | - | - | - | 32 | .8410 | .8490 | .8469 | .8425 | .8446 | .8466 | .8486 | .8506 |
| 15/16 | - | - | - | 12 | .8470 | .8650 | .8575 | .8509 | .8563 | .8617 | .8671 | .8726 |
| | - | - | - | 16 | .8700 | .8840 | .8783 | .8726 | .8766 | .8807 | .8847 | .8888 |
| | - | - | 20 | - | .8830 | .8950 | .8912 | .8855 | .8888 | .8920 | .8953 | .8985 |
| | - | - | - | 28 | .8990 | .9070 | .9051 | .9004 | .9027 | .9050 | .9073 | .9097 |
| | - | - | - | 32 | .9040 | .9110 | .9094 | .9050 | .9071 | .9091 | .9111 | .9131 |
| 1 | 8 | - | - | - | .8650 | .8900 | .8797 | .8701 | .8782 | .8863 | .8945 | .9026 |
| | - | 12 | - | - | .9100 | .9280 | .9198 | .9134 | .9188 | .9242 | .9296 | .9351 |
| | - | - | - | 16 | .9320 | .9460 | .9408 | .9351 | .9391 | .9432 | .9472 | .9513 |
| | - | - | 20 | - | .9460 | .9570 | .9537 | .9480 | .9513 | .9545 | .9578 | .9610 |
| | - | - | - | 28 | .9610 | .9700 | .9676 | .9629 | .9652 | .9675 | .9698 | .9722 |
| | - | - | - | 32 | .9660 | .9740 | .9719 | .9675 | .9696 | .9716 | .9736 | .9756 |
| 1-1/16 | - | - | - | 8 | .9270 | .9520 | .9422 | .9326 | .9407 | .9488 | .9570 | .9651 |
| | - | - | - | 12 | .9720 | .9900 | .9823 | .9759 | .9813 | .9867 | .9921 | .9976 |
| | - | - | - | 16 | .9950 | 1.0090 | 1.0033 | .9976 | 1.0016 | 1.0057 | 1.0097 | 1.0138 |
| | - | - | 18 | - | 1.0020 | 1.0150 | 1.0105 | 1.0048 | 1.0084 | 1.0120 | 1.0156 | 1.0192 |
| | - | - | - | 20 | 1.0080 | 1.0200 | 1.0162 | 1.0105 | 1.0138 | 1.0170 | 1.0203 | 1.0235 |
| | - | - | - | 28 | 1.0240 | 1.0320 | 1.0301 | 1.0254 | 1.0277 | 1.0300 | 1.0323 | 1.0347 |
| 1-1/8 | 7 | - | - | - | .9700 | .9980 | .9875 | .9765 | .9858 | .9951 | 1.0044 | 1.0137 |
| | - | - | - | 8 | .9900 | 1.0150 | 1.0047 | .9951 | 1.0032 | 1.0113 | 1.0195 | 1.0276 |
| | - | 12 | - | - | 1.0350 | 1.0530 | 1.0448 | 1.0384 | 1.0438 | 1.0492 | 1.0546 | 1.0601 |
| | - | - | - | 16 | 1.0570 | 1.0710 | 1.0658 | 1.0601 | 1.0641 | 1.0682 | 1.0722 | 1.0763 |
| | - | - | 18 | - | 1.0650 | 1.0780 | 1.0730 | 1.0673 | 1.0709 | 1.0745 | 1.0781 | 1.0817 |
| | - | - | - | 20 | 1.0710 | 1.0820 | 1.0787 | 1.0730 | 1.0763 | 1.0795 | 1.0828 | 1.0860 |

# TECHNICAL DATA

| Size | Threads Per Inch | | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | UN | Min. 2B&3B | Max. 2B | Max. 3B | 80% Thread | 75% Thread | 70% Thread | 65% Thread | 60% Thread |
| 1-1/8 | - | - | - | 28 | 1.0860 | 1.0950 | 1.0926 | 1.0879 | 1.0902 | 1.0925 | 1.0948 | 1.0972 |
| 1-3/16 | - | - | - | 8 | 1.0520 | 1.0770 | 1.0672 | 1.0576 | 1.0657 | 1.0738 | 1.0820 | 1.0901 |
| | - | - | - | 12 | 1.0970 | 1.1150 | 1.1073 | 1.1009 | 1.1063 | 1.1117 | 1.1171 | 1.1226 |
| | - | - | - | 16 | 1.1200 | 1.1340 | 1.1283 | 1.1226 | 1.1266 | 1.1307 | 1.1347 | 1.1388 |
| | - | - | 18 | - | 1.1270 | 1.1400 | 1.1355 | 1.1298 | 1.1334 | 1.1370 | 1.1406 | 1.1442 |
| | - | - | - | 20 | 1.1330 | 1.1450 | 1.1412 | 1.1355 | 1.1388 | 1.1420 | 1.1453 | 1.1485 |
| | - | - | - | 28 | 1.1490 | 1.1570 | 1.1551 | 1.1504 | 1.1527 | 1.1550 | 1.1573 | 1.1597 |
| 1-1/4 | 7 | - | - | - | 1.0950 | 1.1230 | 1.1125 | 1.1015 | 1.1108 | 1.1201 | 1.1294 | 1.1387 |
| | - | - | - | 8 | 1.1150 | 1.1400 | 1.1297 | 1.1201 | 1.1282 | 1.1363 | 1.1445 | 1.1526 |
| | - | 12 | - | - | 1.1600 | 1.1780 | 1.1698 | 1.1634 | 1.1688 | 1.1742 | 1.1796 | 1.1851 |
| | - | - | - | 16 | 1.1820 | 1.1960 | 1.1908 | 1.1851 | 1.1891 | 1.1932 | 1.1972 | 1.2013 |
| | - | - | 18 | - | 1.1900 | 1.2030 | 1.1980 | 1.1923 | 1.1959 | 1.1995 | 1.2031 | 1.2067 |
| | - | - | - | 20 | 1.1960 | 1.2070 | 1.2037 | 1.1980 | 1.2013 | 1.2045 | 1.2078 | 1.2110 |
| | - | - | - | 28 | 1.2110 | 1.2200 | 1.2176 | 1.2129 | 1.2152 | 1.2175 | 1.2198 | 1.2222 |
| 1-5/16 | - | - | - | 8 | 1.1770 | 1.2020 | 1.2176 | 1.1826 | 1.1907 | 1.1988 | 1.2070 | 1.2151 |
| | - | - | - | 12 | 1.2220 | 1.2400 | 1.2323 | 1.2259 | 1.2313 | 1.2367 | 1.2421 | 1.2476 |
| | - | - | - | 16 | 1.2450 | 1.2590 | 1.2533 | 1.2476 | 1.2516 | 1.2557 | 1.2597 | 1.2638 |
| | - | - | 18 | - | 1.2520 | 1.2650 | 1.2605 | 1.2548 | 1.2584 | 1.2620 | 1.2656 | 1.2692 |
| | - | - | - | 20 | 1.2580 | 1.2700 | 1.2662 | 1.2605 | 1.2638 | 1.2670 | 1.2703 | 1.2735 |
| | - | - | - | 28 | 1.2740 | 1.2820 | 1.2801 | 1.2754 | 1.2777 | 1.2800 | 1.2823 | 1.2847 |
| 1-3/8 | 6 | - | - | - | 1.1950 | 1.2250 | 1.2146 | 1.2018 | 1.2126 | 1.2235 | 1.2343 | 1.2451 |
| | - | - | - | 8 | 1.2400 | 1.2650 | 1.2547 | 1.2451 | 1.2532 | 1.2613 | 1.2695 | 1.2776 |
| | - | 12 | - | - | 1.2850 | 1.3030 | 1.2948 | 1.2884 | 1.2938 | 1.2992 | 1.3046 | 1.3101 |
| | - | - | - | 16 | 1.3070 | 1.3210 | 1.3158 | 1.3101 | 1.3141 | 1.3182 | 1.3222 | 1.3263 |
| | - | - | 18 | - | 1.3150 | 1.3280 | 1.3230 | 1.3173 | 1.3209 | 1.3245 | 1.3281 | 1.3317 |
| | - | - | - | 20 | 1.3210 | 1.3320 | 1.3287 | 1.3230 | 1.3263 | 1.3295 | 1.3328 | 1.3360 |
| | - | - | - | 28 | 1.3360 | 1.3450 | 1.3426 | 1.3379 | 1.3402 | 1.3425 | 1.3448 | 1.3472 |
| 1-7/16 | - | - | - | 6 | 1.2570 | 1.2880 | 1.2770 | 1.2643 | 1.2751 | 1.2860 | 1.2968 | 1.3076 |
| | - | - | - | 8 | 1.3020 | 1.3270 | 1.3172 | 1.3076 | 1.3157 | 1.3238 | 1.3320 | 1.3401 |
| | - | - | - | 12 | 1.3470 | 1.3650 | 1.3573 | 1.3509 | 1.3563 | 1.3617 | 1.3671 | 1.3726 |
| | - | - | - | 16 | 1.3700 | 1.3840 | 1.3783 | 1.3726 | 1.3766 | 1.3807 | 1.3847 | 1.3888 |
| | - | - | 18 | - | 1.3770 | 1.3900 | 1.3855 | 1.3798 | 1.3834 | 1.3870 | 1.3906 | 1.3942 |
| | - | - | - | 20 | 1.3830 | 1.3950 | 1.3912 | 1.3855 | 1.3888 | 1.3920 | 1.3953 | 1.3985 |
| | - | - | - | 28 | 1.3990 | 1.4070 | 1.4051 | 1.4004 | 1.4027 | 1.4050 | 1.4073 | 1.4097 |
| 1-1/2 | 6 | - | - | - | 1.3200 | 1.3500 | 1.3396 | 1.3268 | 1.3376 | 1.3485 | 1.3593 | 1.3701 |
| | - | - | - | 8 | 1.3650 | 1.3900 | 1.3797 | 1.3701 | 1.3782 | 1.3863 | 1.3945 | 1.4026 |
| | - | 12 | - | - | 1.4100 | 1.4280 | 1.4198 | 1.4134 | 1.4188 | 1.4242 | 1.4296 | 1.4351 |
| | - | - | - | 16 | 1.4320 | 1.4460 | 1.4408 | 1.4351 | 1.4391 | 1.4432 | 1.4472 | 1.4513 |
| | - | - | 18 | - | 1.4400 | 1.4520 | 1.4480 | 1.4423 | 1.4459 | 1.4495 | 1.4531 | 1.4567 |
| | - | - | - | 20 | 1.4460 | 1.4570 | 1.4537 | 1.4480 | 1.4513 | 1.4545 | 1.4578 | 1.4610 |
| | - | - | - | 28 | 1.4610 | 1.4700 | 1.4676 | 1.4629 | 1.4652 | 1.4675 | 1.4698 | 1.4722 |
| 1-9/16 | - | - | - | 6 | 1.3820 | 1.4130 | 1.4021 | 1.3893 | 1.4001 | 1.4110 | 1.4218 | 1.4326 |
| | - | - | - | 8 | 1.4270 | 1.4520 | 1.4422 | 1.4326 | 1.4407 | 1.4488 | 1.4570 | 1.4651 |
| | - | - | - | 12 | 1.4720 | 1.4900 | 1.4823 | 1.4759 | 1.4813 | 1.4867 | 1.4921 | 1.4976 |
| | - | - | - | 16 | 1.4950 | 1.5090 | 1.5033 | 1.4976 | 1.5016 | 1.5057 | 1.5097 | 1.5138 |
| | - | - | 18 | - | 1.5020 | 1.5150 | 1.5105 | 1.5048 | 1.5084 | 1.5120 | 1.5156 | 1.5192 |
| | - | - | - | 20 | 1.5080 | 1.5200 | 1.5162 | 1.5105 | 1.5138 | 1.5170 | 1.5203 | 1.5235 |
| 1-5/8 | - | - | - | 6 | 1.4450 | 1.4750 | 1.4646 | 1.4518 | 1.4626 | 1.4735 | 1.4843 | 1.4951 |
| | - | - | - | 8 | 1.4900 | 1.5150 | 1.5047 | 1.4951 | 1.5032 | 1.5113 | 1.5195 | 1.5276 |
| | - | - | - | 12 | 1.5350 | 1.5530 | 1.5448 | 1.5384 | 1.5438 | 1.5492 | 1.5546 | 1.5601 |
| | - | - | - | 16 | 1.5570 | 1.5710 | 1.5658 | 1.5601 | 1.5641 | 1.5682 | 1.5722 | 1.5763 |
| | - | - | 18 | - | 1.5650 | 1.5780 | 1.5730 | 1.5673 | 1.5709 | 1.5745 | 1.5781 | 1.5817 |
| | - | - | - | 20 | 1.5710 | 1.5820 | 1.5787 | 1.5730 | 1.5763 | 1.5795 | 1.5828 | 1.5860 |
| 1-11/16 | - | - | - | 6 | 1.5070 | 1.5380 | 1.5271 | 1.5143 | 1.5251 | 1.5360 | 1.5468 | 1.5576 |

# TECHNICAL DATA

| Size | Threads Per Inch | | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | UN | Min. 2B&3B | Max. 2B | Max. 3B | 80% Thread | 75% Thread | 70% Thread | 65% Thread | 60% Thread |
| 1-11/16 | - | - | - | 8 | 1.5520 | 1.5770 | 1.5672 | 1.5576 | 1.5657 | 1.5738 | 1.5820 | 1.5901 |
| | - | - | - | 12 | 1.5970 | 1.6150 | 1.6073 | 1.6009 | 1.6063 | 1.6117 | 1.6171 | 1.6226 |
| | - | - | - | 16 | 1.6200 | 1.6340 | 1.6283 | 1.6226 | 1.6266 | 1.6307 | 1.6347 | 1.6388 |
| | - | - | 18 | - | 1.6270 | 1.6400 | 1.6355 | 1.6298 | 1.6334 | 1.6370 | 1.6406 | 1.6442 |
| | - | - | - | 20 | 1.6330 | 1.6450 | 1.6412 | 1.6355 | 1.6388 | 1.6420 | 1.6453 | 1.6485 |
| 1-3/4 | 5 | - | - | - | 1.5340 | 1.5680 | 1.5575 | 1.5422 | 1.5552 | 1.5681 | 1.5811 | 1.5941 |
| | - | - | - | 6 | 1.5700 | 1.6000 | 1.5896 | 1.5768 | 1.5876 | 1.5985 | 1.6093 | 1.6201 |
| | - | - | - | 8 | 1.6150 | 1.6400 | 1.6297 | 1.6201 | 1.6282 | 1.6363 | 1.6445 | 1.6526 |
| | - | - | - | 12 | 1.6600 | 1.6780 | 1.6698 | 1.6634 | 1.6688 | 1.6742 | 1.6796 | 1.6851 |
| | - | - | - | 16 | 1.6820 | 1.6960 | 1.6908 | 1.6851 | 1.6891 | 1.6932 | 1.6972 | 1.7013 |
| | - | - | - | 20 | 1.6960 | 1.7070 | 1.7037 | 1.6980 | 1.7013 | 1.7045 | 1.7078 | 1.7110 |
| 1-13/16 | - | - | - | 6 | 1.6320 | 1.6630 | 1.6521 | 1.6393 | 1.6501 | 1.6610 | 1.6718 | 1.6826 |
| | - | - | - | 8 | 1.6770 | 1.7020 | 1.6922 | 1.6826 | 1.6907 | 1.6988 | 1.7070 | 1.7151 |
| | - | - | - | 12 | 1.7220 | 1.7400 | 1.7323 | 1.7259 | 1.7313 | 1.7367 | 1.7421 | 1.7476 |
| | - | - | - | 16 | 1.7450 | 1.7590 | 1.7533 | 1.7476 | 1.7516 | 1.7557 | 1.7597 | 1.7638 |
| | - | - | - | 20 | 1.7580 | 1.7700 | 1.7662 | 1.7605 | 1.7638 | 1.7670 | 1.7703 | 1.7735 |
| 1-7/8 | - | - | - | 6 | 1.6950 | 1.7250 | 1.7146 | 1.7018 | 1.7126 | 1.7235 | 1.7343 | 1.7451 |
| | - | - | - | 8 | 1.7400 | 1.7650 | 1.7547 | 1.7451 | 1.7532 | 1.7613 | 1.7695 | 1.7776 |
| | - | - | - | 12 | 1.7850 | 1.8030 | 1.7948 | 1.7884 | 1.7938 | 1.7992 | 1.8046 | 1.8101 |
| | - | - | - | 16 | 1.8070 | 1.8210 | 1.8158 | 1.8101 | 1.8141 | 1.8182 | 1.8222 | 1.8263 |
| | - | - | - | 20 | 1.8210 | 1.8320 | 1.8287 | 1.8230 | 1.8263 | 1.8295 | 1.8328 | 1.8360 |
| 1-15/16 | - | - | - | 6 | 1.7570 | 1.7880 | 1.7771 | 1.7643 | 1.7751 | 1.7860 | 1.7968 | 1.8076 |
| | - | - | - | 8 | 1.8020 | 1.8270 | 1.8172 | 1.8076 | 1.8157 | 1.8238 | 1.8320 | 1.8401 |
| | - | - | - | 12 | 1.8470 | 1.8650 | 1.8573 | 1.8509 | 1.8563 | 1.8617 | 1.8671 | 1.8726 |
| | - | - | - | 16 | 1.8700 | 1.8840 | 1.8783 | 1.8726 | 1.8766 | 1.8807 | 1.8847 | 1.8888 |
| | - | - | - | 20 | 1.8830 | 1.8950 | 1.8912 | 1.8855 | 1.8888 | 1.8920 | 1.8953 | 1.8985 |
| 2 | 4 1/2 | - | - | - | 1.7590 | 1.7950 | 1.7861 | 1.7691 | 1.7835 | 1.7979 | 1.8124 | 1.8268 |
| | - | - | - | 6 | 1.8200 | 1.8500 | 1.8396 | 1.8268 | 1.8376 | 1.8485 | 1.8593 | 1.8701 |
| | - | - | - | 8 | 1.8650 | 1.8900 | 1.8797 | 1.8701 | 1.8782 | 1.8863 | 1.8945 | 1.9026 |
| | - | - | - | 12 | 1.9100 | 1.9280 | 1.9198 | 1.9134 | 1.9188 | 1.9242 | 1.9296 | 1.9351 |
| | - | - | - | 16 | 1.9320 | 1.9460 | 1.9408 | 1.9351 | 1.9391 | 1.9432 | 1.9472 | 1.9513 |
| | - | - | - | 20 | 1.9460 | 1.9570 | 1.9537 | 1.9480 | 1.9513 | 1.9545 | 1.9578 | 1.9610 |
| 2-1/8 | - | - | - | 6 | 1.9450 | 1.9750 | 1.9646 | 1.9518 | 1.9626 | 1.9735 | 1.9843 | 1.9951 |
| | - | - | - | 8 | 1.9900 | 2.0150 | 2.0047 | 1.9951 | 2.0032 | 2.0113 | 2.0195 | 2.0276 |
| | - | - | - | 12 | 2.0350 | 2.0530 | 2.0448 | 2.0384 | 2.0438 | 2.0492 | 2.0546 | 2.0601 |
| | - | - | - | 16 | 2.0570 | 2.0710 | 2.0658 | 2.0601 | 2.0641 | 2.0682 | 2.0722 | 2.0763 |
| | - | - | - | 20 | 2.0710 | 2.0820 | 2.0787 | 2.0730 | 2.0763 | 2.0795 | 2.0828 | 2.0860 |
| 2-1/4 | 4 1/2 | - | - | - | 2.0090 | 2.0450 | 2.0361 | 2.0191 | 2.0335 | 2.0479 | 2.0624 | 2.0768 |
| | - | - | - | 6 | 2.0700 | 2.1000 | 2.0896 | 2.0768 | 2.0876 | 2.0985 | 2.1093 | 2.1201 |
| | - | - | - | 8 | 2.1150 | 2.1400 | 2.1297 | 2.1201 | 2.1282 | 2.1363 | 2.1445 | 2.1526 |
| | - | - | - | 12 | 2.1600 | 2.1780 | 2.1698 | 2.1634 | 2.1688 | 2.1742 | 2.1796 | 2.1851 |
| | - | - | - | 16 | 2.1820 | 2.1960 | 2.1908 | 2.1851 | 2.1891 | 2.1932 | 2.1972 | 2.2013 |
| | - | - | - | 20 | 2.1960 | 2.2070 | 2.2037 | 2.1980 | 2.2013 | 2.2045 | 2.2078 | 2.2110 |
| 2-3/8 | - | - | - | 6 | 2.1950 | 2.2260 | 2.2146 | 2.2018 | 2.2126 | 2.2235 | 2.2343 | 2.2451 |
| | - | - | - | 8 | 2.2400 | 2.2650 | 2.2547 | 2.2451 | 2.2532 | 2.2613 | 2.2695 | 2.2776 |
| | - | - | - | 12 | 2.2850 | 2.3030 | 2.2948 | 2.2884 | 2.2938 | 2.2992 | 2.3046 | 2.3101 |
| | - | - | - | 16 | 2.3070 | 2.3210 | 2.3158 | 2.3101 | 2.3141 | 2.3182 | 2.3222 | 2.3263 |
| | - | - | - | 20 | 2.3210 | 2.3320 | 2.3287 | 2.3230 | 2.3263 | 2.3295 | 2.3328 | 2.3360 |
| 2-1/2 | 4 | - | - | - | 2.2290 | 2.2670 | 2.2594 | 2.2402 | 2.2564 | 2.2727 | 2.2889 | 2.3052 |
| | - | - | - | 6 | 2.3200 | 2.3500 | 2.3396 | 2.3268 | 2.3376 | 2.3485 | 2.3593 | 2.3701 |
| | - | - | - | 8 | 2.3650 | 2.3900 | 2.3797 | 2.3701 | 2.3782 | 2.3863 | 2.3945 | 2.4026 |
| | - | - | - | 12 | 2.4100 | 2.4280 | 2.4198 | 2.4134 | 2.4188 | 2.4242 | 2.4296 | 2.4351 |
| | - | - | - | 16 | 2.4320 | 2.4460 | 2.4408 | 2.4351 | 2.4391 | 2.4432 | 2.4472 | 2.4513 |
| | - | - | - | 20 | 2.4460 | 2.4570 | 2.4537 | 2.4480 | 2.4513 | 2.4545 | 2.4578 | 2.4610 |

## TAP DRILL SIZES - METRIC THREAD

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 80% Thread | | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M1 | 0.25 | – | .729 | .798 | 0.74 | .0291 | 0.76 | .0298 | 0.77 | .0304 | 0.79 | .0311 | 0.81 | .0317 |
| | – | 0.2 | .783 | .841 | 0.79 | .0312 | 0.81 | .0317 | 0.82 | .0322 | 0.83 | .0327 | 0.84 | .0332 |
| M1.1 | 0.25 | – | .829 | .898 | 0.84 | .0331 | 0.86 | .0337 | 0.87 | .0344 | 0.89 | .0350 | 0.91 | .0356 |
| | – | 0.2 | .883 | .941 | 0.89 | .0351 | 0.91 | .0356 | 0.92 | .0361 | 0.93 | .0367 | 0.94 | .0372 |
| M1.2 | 0.25 | – | .929 | .998 | 0.94 | .0370 | 0.96 | .0377 | 0.97 | .0383 | 0.99 | .0389 | 1.01 | .0396 |
| | – | 0.2 | .983 | 1.041 | 0.99 | .0391 | 1.01 | .0396 | 1.02 | .0401 | 1.03 | .0406 | 1.04 | .0411 |
| M1.4 | 0.3 | – | 1.075 | 1.159 | 1.09 | .0428 | 1.11 | .0436 | 1.13 | .0444 | 1.15 | .0451 | 1.17 | .0459 |
| | – | 0.2 | 1.183 | 1.241 | 1.19 | .0469 | 1.21 | .0474 | 1.22 | .0480 | 1.23 | .0485 | 1.24 | .0490 |
| M1.6 | 0.35 | – | 1.221 | 1.321 | 1.24 | .0487 | 1.26 | .0496 | 1.28 | .0505 | 1.30 | .0514 | 1.33 | .0523 |
| | – | 0.2 | 1.383 | 1.441 | 1.39 | .0548 | 1.41 | .0553 | 1.42 | .0558 | 1.43 | .0563 | 1.44 | .0569 |
| M1.7 | 0.35 | – | 1.321 | 1.421 | 1.34 | .0526 | 1.36 | .0535 | 1.38 | .0544 | 1.40 | .0553 | 1.43 | .0562 |
| | – | 0.3 | 1.375 | 1.459 | 1.39 | .0547 | 1.41 | .0554 | 1.43 | .0562 | 1.45 | .0570 | 1.47 | .0577 |
| | – | 0.25 | 1.429 | 1.498 | 1.44 | .0567 | 1.46 | .0573 | 1.47 | .0580 | 1.49 | .0586 | 1.51 | .0593 |
| | – | 0.2 | 1.483 | 1.541 | 1.49 | .0587 | 1.51 | .0593 | 1.52 | .0598 | 1.53 | .0603 | 1.54 | .0608 |
| M1.8 | 0.35 | – | 1.421 | 1.521 | 1.44 | .0565 | 1.46 | .0574 | 1.48 | .0583 | 1.50 | .0592 | 1.53 | .0601 |
| | – | 0.2 | 1.583 | 1.641 | 1.59 | .0627 | 1.61 | .0632 | 1.62 | .0637 | 1.63 | .0642 | 1.64 | .0647 |
| M2 | 0.4 | – | 1.567 | 1.679 | 1.58 | .0624 | 1.61 | .0634 | 1.64 | .0644 | 1.66 | .0654 | 1.69 | .0665 |
| | – | 0.25 | 1.729 | 1.798 | 1.74 | .0685 | 1.76 | .0692 | 1.77 | .0698 | 1.79 | .0704 | 1.81 | .0711 |
| M2.2 | 0.45 | – | 1.713 | 1.838 | 1.73 | .0682 | 1.76 | .0694 | 1.79 | .0705 | 1.82 | .0717 | 1.85 | .0728 |
| | – | 0.25 | 1.929 | 1.998 | 1.94 | .0764 | 1.96 | .0770 | 1.97 | .0777 | 1.99 | .0783 | 2.01 | .0789 |
| M2.3 | 0.4 | – | 1.867 | 1.979 | 1.88 | .0742 | 1.91 | .0752 | 1.94 | .0762 | 1.96 | .0773 | 1.99 | .0783 |
| | – | 0.35 | 1.921 | 2.021 | 1.94 | .0762 | 1.96 | .0771 | 1.98 | .0780 | 2.00 | .0789 | 2.03 | .0798 |
| | – | 0.25 | 2.029 | 2.098 | 2.04 | .0803 | 2.06 | .0810 | 2.07 | .0816 | 2.09 | .0822 | 2.11 | .0829 |
| M2.5 | 0.45 | – | 2.013 | 2.138 | 2.03 | .0800 | 2.06 | .0812 | 2.09 | .0823 | 2.12 | .0835 | 2.15 | .0846 |
| | – | 0.35 | 2.121 | 2.221 | 2.14 | .0841 | 2.16 | .0850 | 2.18 | .0859 | 2.20 | .0868 | 2.23 | .0877 |
| M2.6 | 0.45 | – | 2.113 | 2.238 | 2.13 | .0840 | 2.16 | .0851 | 2.19 | .0863 | 2.22 | .0874 | 2.25 | .0886 |
| | – | 0.35 | 2.221 | 2.321 | 2.24 | .0880 | 2.26 | .0889 | 2.28 | .0898 | 2.30 | .0907 | 2.33 | .0916 |
| M3 | 0.5 | – | 2.459 | 2.599 | 2.48 | .0977 | 2.51 | .0989 | 2.55 | .1002 | 2.58 | .1015 | 2.61 | .1028 |
| | – | 0.35 | 2.621 | 2.721 | 2.64 | .1038 | 2.66 | .1047 | 2.68 | .1056 | 2.70 | .1065 | 2.73 | .1074 |
| M3.5 | 0.6 | – | 2.850 | 3.010 | 2.88 | .1132 | 2.92 | .1148 | 2.95 | .1163 | 2.99 | .1178 | 3.03 | .1194 |
| | – | 0.35 | 3.121 | 3.221 | 3.14 | .1235 | 3.16 | .1244 | 3.18 | .1253 | 3.20 | .1262 | 3.23 | .1271 |
| M4 | 0.7 | – | 3.242 | 3.422 | 3.27 | .1288 | 3.32 | .1306 | 3.36 | .1324 | 3.41 | .1342 | 3.45 | .1360 |
| | – | 0.5 | 3.459 | 3.599 | 3.48 | .1370 | 3.51 | .1383 | 3.55 | .1396 | 3.58 | .1409 | 3.61 | .1421 |
| M4.5 | 0.75 | – | 3.688 | 3.878 | 3.72 | .1465 | 3.77 | .1484 | 3.82 | .1503 | 3.87 | .1522 | 3.92 | .1542 |
| | – | 0.5 | 3.959 | 4.099 | 3.98 | .1567 | 4.01 | .1580 | 4.05 | .1593 | 4.08 | .1605 | 4.11 | .1618 |
| M5 | 0.9 | – | 4.026 | 4.226 | 4.06 | .1600 | 4.12 | .1623 | 4.18 | .1646 | 4.24 | .1669 | 4.30 | .1692 |
| | 0.8 | – | 4.134 | 4.334 | 4.17 | .1641 | 4.22 | .1662 | 4.27 | .1682 | 4.32 | .1703 | 4.38 | .1723 |
| | – | 0.5 | 4.459 | 4.599 | 4.48 | .1764 | 4.51 | .1777 | 4.55 | .1790 | 4.58 | .1802 | 4.61 | .1815 |
| M5.5 | – | 0.9 | 4.526 | 4.726 | 4.56 | .1797 | 4.62 | .1820 | 4.68 | .1843 | 4.74 | .1866 | 4.80 | .1889 |
| | – | 0.75 | 4.688 | 4.878 | 4.72 | .1858 | 4.77 | .1878 | 4.82 | .1897 | 4.87 | .1916 | 4.92 | .1935 |
| | – | 0.5 | 4.959 | 5.099 | 4.98 | .1961 | 5.01 | .1974 | 5.05 | .1986 | 5.08 | .1999 | 5.11 | .2012 |
| M6 | 1 | – | 4.917 | 5.153 | 4.96 | .1953 | 5.03 | .1979 | 5.09 | .2004 | 5.16 | .2030 | 5.22 | .2055 |
| | – | 0.75 | 5.188 | 5.378 | 5.22 | .2055 | 5.27 | .2075 | 5.32 | .2094 | 5.37 | .2113 | 5.42 | .2132 |
| | – | 0.5 | 5.459 | 5.599 | 5.48 | .2158 | 5.51 | .2170 | 5.55 | .2183 | 5.58 | .2196 | 5.61 | .2209 |
| M7 | 1 | – | 5.917 | 6.153 | 5.96 | .2347 | 6.03 | .2372 | 6.09 | .2398 | 6.16 | .2423 | 6.22 | .2449 |
| | – | 0.75 | 6.188 | 6.378 | 6.22 | .2449 | 6.27 | .2468 | 6.32 | .2487 | 6.37 | .2507 | 6.42 | .2526 |
| | – | 0.5 | 6.459 | 6.599 | 6.48 | .2551 | 6.51 | .2564 | 6.55 | .2577 | 6.58 | .2590 | 6.61 | .2602 |
| M8 | 1.25 | – | 6.647 | 6.912 | 6.70 | .2638 | 6.78 | .2670 | 6.86 | .2702 | 6.94 | .2734 | 7.03 | .2766 |
| | – | 1 | 6.917 | 7.153 | 6.96 | .2740 | 7.03 | .2766 | 7.09 | .2792 | 7.16 | .2817 | 7.22 | .2843 |
| | – | 0.75 | 7.188 | 7.378 | 7.22 | .2843 | 7.27 | .2862 | 7.32 | .2881 | 7.37 | .2900 | 7.42 | .2919 |
| | – | 0.5 | 7.459 | 7.599 | 7.48 | .2945 | 7.51 | .2958 | 7.55 | .2971 | 7.58 | .2983 | 7.61 | .2996 |

# TECHNICAL DATA

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 80% Thread | | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M9 | 1.25 | – | 7.647 | 7.912 | 7.70 | .3032 | 7.78 | .3064 | 7.86 | .3096 | 7.94 | .3128 | 8.03 | .3160 |
| | – | 1 | 7.917 | 8.153 | 7.96 | .3134 | 8.03 | .3160 | 8.09 | .3185 | 8.16 | .3211 | 8.22 | .3236 |
| | – | 0.75 | 8.188 | 8.378 | 8.22 | .3236 | 8.27 | .3256 | 8.32 | .3275 | 8.37 | .3294 | 8.42 | .3313 |
| | – | 0.5 | 8.459 | 8.599 | 8.48 | .3339 | 8.51 | .3352 | 8.55 | .3364 | 8.58 | .3377 | 8.61 | .3390 |
| M10 | 1.5 | – | 8.376 | 8.676 | 8.44 | .3323 | 8.54 | .3362 | 8.64 | .3400 | 8.73 | .3438 | 8.83 | .3477 |
| | – | 1.25 | 8.647 | 8.912 | 8.70 | .3426 | 8.78 | .3458 | 8.86 | .3490 | 8.94 | .3521 | 9.03 | .3553 |
| | – | 1 | 8.917 | 9.153 | 8.96 | .3528 | 9.03 | .3553 | 9.09 | .3579 | 9.16 | .3605 | 9.22 | .3630 |
| | – | 0.75 | 9.188 | 9.378 | 9.22 | .3630 | 9.27 | .3649 | 9.32 | .3669 | 9.37 | .3688 | 9.42 | .3707 |
| | – | 0.5 | 9.459 | 9.599 | 9.48 | .3732 | 9.51 | .3745 | 9.55 | .3758 | 9.58 | .3771 | 9.61 | .3784 |
| M11 | 1.5 | – | 9.376 | 9.676 | 9.44 | .3717 | 9.54 | .3755 | 9.64 | .3794 | 9.73 | .3832 | 9.83 | .3870 |
| | – | 1 | 9.917 | 10.153 | 9.96 | .3922 | 10.03 | .3947 | 10.09 | .3973 | 10.16 | .3998 | 10.22 | .4024 |
| | – | 0.75 | 10.188 | 10.378 | 10.22 | .4024 | 10.27 | .4043 | 10.32 | .4062 | 10.37 | .4081 | 10.42 | .4101 |
| | – | 0.5 | 10.459 | 10.599 | 10.48 | .4126 | 10.51 | .4139 | 10.55 | .4152 | 10.58 | .4164 | 10.61 | .4177 |
| M12 | 1.75 | – | 10.106 | 10.441 | 10.18 | .4008 | 10.30 | .4053 | 10.41 | .4098 | 10.52 | .4143 | 10.64 | .4187 |
| | – | 1.5 | 10.376 | 10.676 | 10.44 | .4111 | 10.54 | .4149 | 10.64 | .4187 | 10.73 | .4226 | 10.83 | .4264 |
| | – | 1.25 | 10.647 | 10.912 | 10.70 | .4213 | 10.78 | .4245 | 10.86 | .4277 | 10.94 | .4309 | 11.03 | .4341 |
| | – | 1 | 10.917 | 11.153 | 10.96 | .4315 | 11.03 | .4341 | 11.09 | .4366 | 11.16 | .4392 | 11.22 | .4418 |
| | – | 0.75 | 11.188 | 11.378 | 11.22 | .4418 | 11.27 | .4437 | 11.32 | .4456 | 11.37 | .4475 | 11.42 | .4494 |
| | – | 0.5 | 11.459 | 11.599 | 11.48 | .4520 | 11.51 | .4533 | 11.55 | .4545 | 11.58 | .4558 | 11.61 | .4571 |
| M13 | – | 1.75 | 11.106 | 11.441 | 11.18 | .4402 | 11.30 | .4447 | 11.41 | .4492 | 11.52 | .4536 | 11.64 | .4581 |
| | – | 1.5 | 11.376 | 11.676 | 11.44 | .4504 | 11.54 | .4543 | 11.64 | .4581 | 11.73 | .4619 | 11.83 | .4658 |
| | – | 1.25 | 11.647 | 11.912 | 11.70 | .4607 | 11.78 | .4639 | 11.86 | .4671 | 11.94 | .4703 | 12.03 | .4735 |
| | – | 1 | 11.917 | 12.153 | 11.96 | .4709 | 12.03 | .4735 | 12.09 | .4760 | 12.16 | .4786 | 12.22 | .4811 |
| | – | 0.75 | 12.188 | 12.378 | 12.22 | .4811 | 12.27 | .4830 | 12.32 | .4850 | 12.37 | .4869 | 12.42 | .4888 |
| | – | 0.5 | 12.459 | 12.599 | 12.48 | .4914 | 12.51 | .4926 | 12.55 | .4939 | 12.58 | .4952 | 12.61 | .4965 |
| M14 | 2 | – | 11.835 | 12.210 | 11.92 | .4694 | 12.05 | .4745 | 12.18 | .4796 | 12.31 | .4847 | 12.44 | .4898 |
| | – | 1.5 | 12.376 | 12.676 | 12.44 | .4898 | 12.54 | .4936 | 12.64 | .4975 | 12.73 | .5013 | 12.83 | .5052 |
| | – | 1.25 | 12.647 | 12.912 | 12.70 | .5000 | 12.78 | .5032 | 12.86 | .5064 | 12.94 | .5096 | 13.03 | .5128 |
| | – | 1 | 12.917 | 13.153 | 12.96 | .5103 | 13.03 | .5128 | 13.09 | .5154 | 13.16 | .5179 | 13.22 | .5205 |
| | – | 0.75 | 13.188 | 13.378 | 13.22 | .5205 | 13.27 | .5224 | 13.32 | .5243 | 13.37 | .5262 | 13.42 | .5282 |
| | – | 0.5 | 13.459 | 13.599 | 13.48 | .5307 | 13.51 | .5320 | 13.55 | .5333 | 13.58 | .5346 | 13.61 | .5358 |
| M15 | – | 2 | 12.835 | 13.210 | 12.92 | .5087 | 13.05 | .5138 | 13.18 | .5190 | 13.31 | .5241 | 13.44 | .5292 |
| | – | 1.5 | 13.376 | 13.676 | 13.44 | .5292 | 13.54 | .5330 | 13.64 | .5369 | 13.73 | .5407 | 13.83 | .5445 |
| | – | 1.25 | 13.647 | 13.912 | 13.70 | .5394 | 13.78 | .5426 | 13.86 | .5458 | 13.94 | .5490 | 14.03 | .5522 |
| | – | 1 | 13.917 | 14.153 | 13.96 | .5496 | 14.03 | .5522 | 14.09 | .5548 | 14.16 | .5573 | 14.22 | .5599 |
| | – | 0.75 | 14.188 | 14.378 | 14.22 | .5599 | 14.27 | .5618 | 14.32 | .5637 | 14.37 | .5656 | 14.42 | .5675 |
| | – | 0.5 | 14.459 | 14.599 | 14.48 | .5701 | 14.51 | .5714 | 14.55 | .5727 | 14.58 | .5739 | 14.61 | .5752 |
| M16 | 2 | – | 13.835 | 14.210 | 13.92 | .5481 | 14.05 | .5532 | 14.18 | .5583 | 14.31 | .5634 | 14.44 | .5685 |
| | – | 1.5 | 14.376 | 14.676 | 14.44 | .5685 | 14.54 | .5724 | 14.64 | .5762 | 14.73 | .5801 | 14.83 | .5839 |
| | – | 1 | 14.917 | 15.153 | 14.96 | .5890 | 15.03 | .5916 | 15.09 | .5941 | 15.16 | .5967 | 15.22 | .5992 |
| M17 | – | 2 | 14.835 | 15.210 | 14.92 | .5875 | 15.05 | .5926 | 15.18 | .5977 | 15.31 | .6028 | 15.44 | .6079 |
| | – | 1.5 | 15.376 | 15.676 | 15.44 | .6079 | 15.54 | .6118 | 15.64 | .6156 | 15.73 | .6194 | 15.83 | .6233 |
| | – | 1.25 | 15.647 | 15.912 | 15.70 | .6181 | 15.78 | .6213 | 15.86 | .6245 | 15.94 | .6277 | 16.03 | .6309 |
| | – | 1 | 15.917 | 16.153 | 15.96 | .6284 | 16.03 | .6309 | 16.09 | .6335 | 16.16 | .6360 | 16.22 | .6386 |
| | – | 0.75 | 16.188 | 16.378 | 16.22 | .6386 | 16.27 | .6405 | 16.32 | .6424 | 16.37 | .6444 | 16.42 | .6463 |
| | – | 0.5 | 16.459 | 16.599 | 16.48 | .6488 | 16.51 | .6501 | 16.55 | .6514 | 16.58 | .6527 | 16.61 | .6539 |
| M18 | 2.5 | – | 15.294 | 15.744 | 15.40 | .6064 | 15.56 | .6128 | 15.73 | .6192 | 15.89 | .6256 | 16.05 | .6319 |
| | – | 2 | 15.835 | 16.210 | 15.92 | .6268 | 16.05 | .6319 | 16.18 | .6371 | 16.31 | .6422 | 16.44 | .6473 |
| | – | 1.5 | 16.376 | 16.676 | 16.44 | .6473 | 16.54 | .6511 | 16.64 | .6550 | 16.73 | .6588 | 16.83 | .6626 |
| | – | 1 | 16.917 | 17.153 | 16.96 | .6677 | 17.03 | .6703 | 17.09 | .6729 | 17.16 | .6754 | 17.22 | .6780 |
| M19 | – | 2.5 | 16.294 | 16.744 | 16.40 | .6457 | 16.56 | .6521 | 16.73 | .6585 | 16.89 | .6649 | 17.05 | .6713 |
| | – | 2 | 16.835 | 17.210 | 16.92 | .6662 | 17.05 | .6713 | 17.18 | .6764 | 17.31 | .6815 | 17.44 | .6867 |

# TECHNICAL DATA

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 80% Thread | | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M19 | – | 1.5 | 17.376 | 17.676 | 17.44 | .6867 | 17.54 | .6905 | 17.64 | .6943 | 17.73 | .6982 | 17.83 | .7020 |
| | – | 1.25 | 17.647 | 17.912 | 17.70 | .6969 | 17.78 | .7001 | 17.86 | .7033 | 17.94 | .7065 | 18.03 | .7097 |
| | – | 1 | 17.917 | 18.153 | 17.96 | .7071 | 18.03 | .7097 | 18.09 | .7122 | 18.16 | .7148 | 18.22 | .7173 |
| | – | 0.75 | 18.188 | 18.378 | 18.22 | .7173 | 18.27 | .7193 | 18.32 | .7212 | 18.37 | .7231 | 18.42 | .7250 |
| | – | 0.5 | 18.459 | 18.599 | 18.48 | .7276 | 18.51 | .7289 | 18.55 | .7301 | 18.58 | .7314 | 18.61 | .7327 |
| M20 | 2.5 | – | 17.294 | 17.744 | 17.40 | .6851 | 17.56 | .6915 | 17.73 | .6979 | 17.89 | .7043 | 18.05 | .7107 |
| | – | 2 | 17.835 | 18.210 | 17.92 | .7056 | 18.05 | .7107 | 18.18 | .7158 | 18.31 | .7209 | 18.44 | .7260 |
| | – | 1.5 | 18.376 | 18.676 | 18.44 | .7260 | 18.54 | .7299 | 18.64 | .7337 | 18.73 | .7375 | 18.83 | .7414 |
| | – | 1 | 18.917 | 19.153 | 18.96 | .7465 | 19.03 | .7490 | 19.09 | .7516 | 19.16 | .7542 | 19.22 | .7567 |
| M21 | – | 2.5 | 18.294 | 18.744 | 18.40 | .7245 | 18.56 | .7309 | 18.73 | .7373 | 18.89 | .7437 | 19.05 | .7501 |
| | – | 1.5 | 19.376 | 19.676 | 19.44 | .7654 | 19.54 | .7692 | 19.64 | .7731 | 19.73 | .7769 | 19.83 | .7807 |
| | – | 1 | 19.917 | 20.153 | 19.96 | .7859 | 20.03 | .7884 | 20.09 | .7910 | 20.16 | .7935 | 20.22 | .7961 |
| M22 | 2.5 | – | 19.294 | 19.744 | 19.40 | .7639 | 19.56 | .7702 | 19.73 | .7766 | 19.89 | .7830 | 20.05 | .7894 |
| | – | 2 | 19.835 | 20.210 | 19.92 | .7843 | 20.05 | .7894 | 20.18 | .7945 | 20.31 | .7997 | 20.44 | .8048 |
| | – | 1.5 | 20.376 | 20.676 | 20.44 | .8048 | 20.54 | .8086 | 20.64 | .8124 | 20.73 | .8163 | 20.83 | .8201 |
| | – | 1 | 20.917 | 21.153 | 20.96 | .8252 | 21.03 | .8278 | 21.09 | .8303 | 21.16 | .8329 | 21.22 | .8355 |
| M23 | – | 2.5 | 20.294 | 20.744 | 20.40 | .8032 | 20.56 | .8096 | 20.73 | .8160 | 20.89 | .8224 | 21.05 | .8288 |
| | – | 2 | 20.835 | 21.210 | 20.92 | .8237 | 21.05 | .8288 | 21.18 | .8339 | 21.31 | .8390 | 21.44 | .8441 |
| | – | 1.5 | 21.376 | 21.676 | 21.44 | .8441 | 21.54 | .8480 | 21.64 | .8518 | 21.73 | .8556 | 21.83 | .8595 |
| | – | 1 | 21.917 | 22.153 | 21.96 | .8646 | 22.03 | .8672 | 22.09 | .8697 | 22.16 | .8723 | 22.22 | .8748 |
| M24 | 3 | – | 20.752 | 21.252 | 20.88 | .8221 | 21.08 | .8298 | 21.27 | .8375 | 21.47 | .8452 | 21.66 | .8528 |
| | – | 2 | 21.835 | 22.210 | 21.92 | .8631 | 22.05 | .8682 | 22.18 | .8733 | 22.31 | .8784 | 22.44 | .8835 |
| | – | 1.5 | 22.376 | 22.676 | 22.44 | .8835 | 22.54 | .8873 | 22.64 | .8912 | 22.73 | .8950 | 22.83 | .8989 |
| | – | 1 | 22.917 | 23.153 | 22.96 | .9040 | 23.03 | .9065 | 23.09 | .9091 | 23.16 | .9116 | 23.22 | .9142 |
| M25 | – | 3 | 21.752 | 22.252 | 21.88 | .8615 | 22.08 | .8692 | 22.27 | .8769 | 22.47 | .8845 | 22.66 | .8922 |
| | – | 2 | 22.835 | 23.210 | 22.92 | .9024 | 23.05 | .9075 | 23.18 | .9127 | 23.31 | .9178 | 23.44 | .9229 |
| | – | 1.5 | 23.376 | 23.676 | 23.44 | .9229 | 23.54 | .9267 | 23.64 | .9306 | 23.73 | .9344 | 23.83 | .9382 |
| | – | 1 | 23.917 | 24.153 | 23.96 | .9433 | 24.03 | .9459 | 24.09 | .9485 | 24.16 | .9510 | 24.22 | .9536 |
| M26 | – | 3 | 22.752 | 23.252 | 22.88 | .9009 | 23.08 | .9085 | 23.27 | .9162 | 23.47 | .9239 | 23.66 | .9316 |
| | – | 2 | 23.835 | 24.210 | 23.92 | .9418 | 24.05 | .9469 | 24.18 | .9520 | 24.31 | .9571 | 24.44 | .9623 |
| | – | 1.5 | 24.376 | 24.676 | 24.44 | .9623 | 24.54 | .9661 | 24.64 | .9699 | 24.73 | .9738 | 24.83 | .9776 |
| M27 | 3 | – | 23.752 | 24.252 | 23.88 | .9402 | 24.08 | .9479 | 24.27 | .9556 | 24.47 | .9633 | 24.66 | .9709 |
| | – | 2.5 | 24.294 | 24.744 | 24.40 | .9607 | 24.56 | .9671 | 24.73 | .9735 | 24.89 | .9799 | 25.05 | .9863 |
| | – | 2 | 24.835 | 25.210 | 24.92 | .9812 | 25.05 | .9863 | 25.18 | .9914 | 25.31 | .9965 | 25.44 | 1.0016 |
| | – | 1.5 | 25.376 | 25.676 | 25.44 | 1.0016 | 25.54 | 1.0055 | 25.64 | 1.0093 | 25.73 | 1.0131 | 25.83 | 1.0170 |
| | – | 1 | 25.917 | 26.153 | 25.96 | 1.0221 | 26.03 | 1.0246 | 26.09 | 1.0272 | 26.16 | 1.0297 | 26.22 | 1.0323 |
| M28 | – | 3 | 24.752 | 25.252 | 24.88 | .9796 | 25.08 | .9873 | 25.27 | .9950 | 25.47 | 1.0026 | 25.66 | 1.0103 |
| | – | 2 | 25.835 | 26.210 | 25.92 | 1.0205 | 26.05 | 1.0256 | 26.18 | 1.0308 | 26.31 | 1.0359 | 26.44 | 1.0410 |
| | – | 1.5 | 26.376 | 26.676 | 26.44 | 1.0410 | 26.54 | 1.0448 | 26.64 | 1.0487 | 26.73 | 1.0525 | 26.83 | 1.0563 |
| | – | 1 | 26.917 | 27.153 | 26.96 | 1.0614 | 27.03 | 1.0640 | 27.09 | 1.0666 | 27.16 | 1.0691 | 27.22 | 1.0717 |
| M30 | 3.5 | – | 26.211 | 26.771 | 26.36 | 1.0379 | 26.59 | 1.0469 | 26.82 | 1.0558 | 27.04 | 1.0648 | 27.27 | 1.0737 |
| | – | 3 | 26.752 | 27.252 | 26.88 | 1.0584 | 27.08 | 1.0660 | 27.27 | 1.0737 | 27.47 | 1.0814 | 27.66 | 1.0890 |
| | – | 2 | 27.835 | 28.210 | 27.92 | 1.0993 | 28.05 | 1.1044 | 28.18 | 1.1095 | 28.31 | 1.1146 | 28.44 | 1.1197 |
| | – | 1.5 | 28.376 | 28.676 | 28.44 | 1.1197 | 28.54 | 1.1236 | 28.64 | 1.1274 | 28.73 | 1.1312 | 28.83 | 1.1351 |
| | – | 1 | 28.917 | 29.153 | 28.96 | 1.1402 | 29.03 | 1.1427 | 29.09 | 1.1453 | 29.16 | 1.1479 | 29.22 | 1.1504 |
| M32 | – | 3 | 28.752 | 29.252 | 28.88 | 1.1371 | 29.08 | 1.1448 | 29.27 | 1.1524 | 29.47 | 1.1601 | 29.66 | 1.1678 |
| | – | 2 | 29.835 | 30.210 | 29.92 | 1.1780 | 30.05 | 1.1831 | 30.18 | 1.1882 | 30.31 | 1.1934 | 30.44 | 1.1985 |
| | – | 1.5 | 30.376 | 30.676 | 30.44 | 1.1985 | 30.54 | 1.2023 | 30.64 | 1.2061 | 30.73 | 1.2100 | 30.83 | 1.2138 |
| M33 | 3.5 | – | 29.211 | 29.771 | 29.36 | 1.1560 | 29.59 | 1.1650 | 29.82 | 1.1739 | 30.04 | 1.1829 | 30.27 | 1.1918 |
| | – | 3 | 29.752 | 30.252 | 29.88 | 1.1765 | 30.08 | 1.1841 | 30.27 | 1.1918 | 30.47 | 1.1995 | 30.66 | 1.2072 |
| | – | 2 | 30.835 | 31.210 | 30.92 | 1.2174 | 31.05 | 1.2225 | 31.18 | 1.2276 | 31.31 | 1.2327 | 31.44 | 1.2378 |
| | – | 1.5 | 31.376 | 31.676 | 31.44 | 1.2378 | 31.54 | 1.2417 | 31.64 | 1.2455 | 31.73 | 1.2493 | 31.83 | 1.2532 |
| | – | 1 | 31.917 | 32.153 | 31.96 | 1.2583 | 32.03 | 1.2609 | 32.09 | 1.2634 | 32.16 | 1.2660 | 32.22 | 1.2685 |

# TECHNICAL DATA

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 80% Thread | | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M34 | – | 3 | 30.752 | 31.252 | 30.88 | 1.2158 | 31.08 | 1.2235 | 31.27 | 1.2312 | 31.47 | 1.2389 | 31.66 | 1.2465 |
| | – | 2 | 31.835 | 32.210 | 31.92 | 1.2568 | 32.05 | 1.2619 | 32.18 | 1.2670 | 32.31 | 1.2721 | 32.44 | 1.2772 |
| | – | 1.5 | 32.376 | 32.676 | 32.44 | 1.2772 | 32.54 | 1.2810 | 32.64 | 1.2849 | 32.73 | 1.2887 | 32.83 | 1.2926 |
| | – | 1 | 32.917 | 33.153 | 32.96 | 1.2977 | 33.03 | 1.3002 | 33.09 | 1.3028 | 33.16 | 1.3053 | 33.22 | 1.3079 |
| M35 | – | 3 | 31.752 | 32.252 | 31.88 | 1.2552 | 32.08 | 1.2629 | 32.27 | 1.2706 | 32.47 | 1.2782 | 32.66 | 1.2859 |
| | – | 1.5 | 33.376 | 33.676 | 33.44 | 1.3166 | 33.54 | 1.3204 | 33.64 | 1.3243 | 33.73 | 1.3281 | 33.83 | 1.3319 |
| | – | 1 | 33.917 | 34.153 | 33.96 | 1.3370 | 34.03 | 1.3396 | 34.09 | 1.3422 | 34.16 | 1.3447 | 34.22 | 1.3473 |
| M36 | 4 | – | 31.670 | 32.270 | 31.84 | 1.2537 | 32.10 | 1.2639 | 32.36 | 1.2741 | 32.62 | 1.2844 | 32.88 | 1.2946 |
| | – | 3 | 32.752 | 33.252 | 32.88 | 1.2946 | 33.08 | 1.3023 | 33.27 | 1.3099 | 33.47 | 1.3176 | 33.66 | 1.3253 |
| | – | 2 | 33.835 | 34.210 | 33.92 | 1.3355 | 34.05 | 1.3406 | 34.18 | 1.3457 | 34.31 | 1.3508 | 34.44 | 1.3560 |
| | – | 1.5 | 34.376 | 34.676 | 34.44 | 1.3560 | 34.54 | 1.3598 | 34.64 | 1.3636 | 34.73 | 1.3675 | 34.83 | 1.3713 |
| | – | 1 | 34.917 | 35.153 | 34.96 | 1.3764 | 35.03 | 1.3790 | 35.09 | 1.3815 | 35.16 | 1.3841 | 35.22 | 1.3866 |
| M37 | – | 1.5 | 35.376 | 35.676 | 35.44 | 1.3953 | 35.54 | 1.3992 | 35.64 | 1.4030 | 35.73 | 1.4068 | 35.83 | 1.4107 |
| | – | 1 | 35.917 | 36.153 | 35.96 | 1.4158 | 36.03 | 1.4183 | 36.09 | 1.4209 | 36.16 | 1.4234 | 36.22 | 1.4260 |
| M38 | – | 4 | 33.670 | 34.270 | 33.84 | 1.3324 | 34.10 | 1.3426 | 34.36 | 1.3529 | 34.62 | 1.3631 | 34.88 | 1.3733 |
| | – | 3 | 34.752 | 35.252 | 34.88 | 1.3733 | 35.08 | 1.3810 | 35.27 | 1.3887 | 35.47 | 1.3963 | 35.66 | 1.4040 |
| | – | 2 | 35.835 | 36.210 | 35.92 | 1.4142 | 36.05 | 1.4193 | 36.18 | 1.4245 | 36.31 | 1.4296 | 36.44 | 1.4347 |
| | – | 1.5 | 36.376 | 36.676 | 36.44 | 1.4347 | 36.54 | 1.4385 | 36.64 | 1.4424 | 36.73 | 1.4462 | 36.83 | 1.4500 |
| M39 | 4 | – | 34.670 | 35.270 | 34.84 | 1.3718 | 35.10 | 1.3820 | 35.36 | 1.3922 | 35.62 | 1.4025 | 35.88 | 1.4127 |
| | – | 3 | 35.752 | 36.252 | 35.88 | 1.4127 | 36.08 | 1.4204 | 36.27 | 1.4280 | 36.47 | 1.4357 | 36.66 | 1.4434 |
| | – | 2 | 36.835 | 37.210 | 36.92 | 1.4536 | 37.05 | 1.4587 | 37.18 | 1.4638 | 37.31 | 1.4689 | 37.44 | 1.4741 |
| | – | 1.5 | 37.376 | 37.676 | 37.44 | 1.4741 | 37.54 | 1.4779 | 37.64 | 1.4817 | 37.73 | 1.4856 | 37.83 | 1.4894 |
| | – | 1 | 37.917 | 38.153 | 37.96 | 1.4945 | 38.03 | 1.4971 | 38.09 | 1.4996 | 38.16 | 1.5022 | 38.22 | 1.5047 |
| M40 | – | 4 | 35.670 | 36.270 | 35.84 | 1.4111 | 36.10 | 1.4214 | 36.36 | 1.4316 | 36.62 | 1.4418 | 36.88 | 1.4521 |
| | – | 3 | 36.752 | 37.252 | 36.88 | 1.4521 | 37.08 | 1.4597 | 37.27 | 1.4674 | 37.47 | 1.4751 | 37.66 | 1.4827 |
| | – | 2 | 37.835 | 38.210 | 37.92 | 1.4930 | 38.05 | 1.4981 | 38.18 | 1.5032 | 38.31 | 1.5083 | 38.44 | 1.5134 |
| | – | 1.5 | 38.376 | 38.676 | 38.44 | 1.5134 | 38.54 | 1.5173 | 38.64 | 1.5211 | 38.73 | 1.5249 | 38.83 | 1.5288 |
| | – | 1 | 38.917 | 39.153 | 38.96 | 1.5339 | 39.03 | 1.5364 | 39.09 | 1.5390 | 39.16 | 1.5416 | 39.22 | 1.5441 |
| M42 | 4.5 | – | 37.129 | 37.799 | 37.32 | 1.4694 | 37.62 | 1.4809 | 37.91 | 1.4924 | 38.20 | 1.5039 | 38.49 | 1.5155 |
| | – | 4 | 37.670 | 38.270 | 37.84 | 1.4899 | 38.10 | 1.5001 | 38.36 | 1.5103 | 38.62 | 1.5206 | 38.88 | 1.5308 |
| | – | 3 | 38.752 | 39.252 | 38.88 | 1.5308 | 39.08 | 1.5385 | 39.27 | 1.5461 | 39.47 | 1.5538 | 39.66 | 1.5615 |
| | – | 2 | 39.835 | 40.210 | 39.92 | 1.5717 | 40.05 | 1.5768 | 40.18 | 1.5819 | 40.31 | 1.5871 | 40.44 | 1.5922 |
| | – | 1.5 | 40.376 | 40.676 | 40.44 | 1.5922 | 40.54 | 1.5960 | 40.64 | 1.5998 | 40.73 | 1.6037 | 40.83 | 1.6075 |
| M45 | 4.5 | – | 40.129 | 40.799 | 40.32 | 1.5875 | 40.62 | 1.5990 | 40.91 | 1.6106 | 41.20 | 1.6221 | 45.00 | 1.7717 |
| | – | 4 | 40.670 | 41.270 | 40.84 | 1.6080 | 41.10 | 1.6182 | 41.36 | 1.6285 | 41.62 | 1.6387 | 41.88 | 1.6489 |
| | – | 3 | 41.752 | 42.252 | 41.88 | 1.6489 | 42.08 | 1.6566 | 42.27 | 1.6643 | 42.47 | 1.6719 | 42.66 | 1.6796 |
| | – | 2 | 42.835 | 43.210 | 42.92 | 1.6898 | 43.05 | 1.6949 | 43.18 | 1.7001 | 43.31 | 1.7052 | 43.44 | 1.7103 |
| | – | 1.5 | 43.376 | 43.676 | 43.44 | 1.7103 | 43.54 | 1.7141 | 43.64 | 1.7180 | 43.73 | 1.7218 | 43.83 | 1.7256 |
| | – | 1 | 43.917 | 44.153 | 43.96 | 1.7307 | 44.03 | 1.7333 | 44.09 | 1.7359 | 44.16 | 1.7384 | 44.22 | 1.7410 |
| M46 | – | 1.5 | 44.376 | 44.676 | 44.44 | 1.7497 | 44.54 | 1.7535 | 44.64 | 1.7573 | 44.73 | 1.7612 | 44.83 | 1.7650 |
| M48 | 5 | – | 42.587 | 43.297 | 42.80 | 1.6852 | 43.13 | 1.6980 | 43.45 | 1.7108 | 43.78 | 1.7235 | 44.10 | 1.7363 |
| | – | 4 | 43.670 | 44.270 | 43.84 | 1.7261 | 44.10 | 1.7363 | 44.36 | 1.7466 | 44.62 | 1.7568 | 44.88 | 1.7670 |
| | – | 3 | 44.752 | 45.252 | 44.88 | 1.7670 | 45.08 | 1.7747 | 45.27 | 1.7824 | 45.47 | 1.7900 | 45.66 | 1.7977 |
| | – | 2 | 45.835 | 46.210 | 45.92 | 1.8079 | 46.05 | 1.8130 | 46.18 | 1.8182 | 46.31 | 1.8233 | 46.44 | 1.8284 |
| | – | 1.5 | 46.376 | 46.676 | 46.44 | 1.8284 | 46.54 | 1.8322 | 46.64 | 1.8361 | 46.73 | 1.8399 | 46.83 | 1.8437 |
| | – | 1 | 46.917 | 47.153 | 46.96 | 1.8488 | 47.03 | 1.8514 | 47.09 | 1.8540 | 47.16 | 1.8565 | 47.22 | 1.8591 |
| M50 | – | 5 | 44.587 | 45.297 | 44.80 | 1.7639 | 45.13 | 1.7767 | 45.45 | 1.7895 | 45.78 | 1.8023 | 46.10 | 1.8151 |
| | – | 3 | 46.752 | 47.252 | 46.88 | 1.8458 | 47.08 | 1.8534 | 47.27 | 1.8611 | 47.47 | 1.8688 | 47.66 | 1.8764 |
| | – | 2 | 47.835 | 48.210 | 47.92 | 1.8867 | 48.05 | 1.8918 | 48.18 | 1.8969 | 48.31 | 1.9020 | 48.44 | 1.9071 |
| | – | 1.5 | 48.376 | 48.676 | 48.44 | 1.9071 | 48.54 | 1.9110 | 48.64 | 1.9148 | 48.73 | 1.9186 | 48.83 | 1.9225 |
| | – | 1 | 48.917 | 49.153 | 48.96 | 1.9276 | 49.03 | 1.9301 | 49.09 | 1.9327 | 49.16 | 1.9353 | 49.22 | 1.9378 |

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 80% Thread | | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M52 | 5 | – | 46.587 | 47.297 | 46.80 | 1.8427 | 47.13 | 1.8555 | 47.45 | 1.8682 | 47.78 | 1.8810 | 48.10 | 1.8938 |
| | – | 4 | 47.670 | 48.270 | 47.84 | 1.8836 | 48.10 | 1.8938 | 48.36 | 1.9040 | 48.62 | 1.9143 | 48.88 | 1.9245 |
| | – | 3 | 48.752 | 49.252 | 48.88 | 1.9245 | 49.08 | 1.9322 | 49.27 | 1.9398 | 49.47 | 1.9475 | 49.66 | 1.9552 |
| | – | 2 | 49.835 | 50.210 | 49.92 | 1.9654 | 50.05 | 1.9705 | 50.18 | 1.9756 | 50.31 | 1.9808 | 50.44 | 1.9859 |
| | – | 1.5 | 50.376 | 50.676 | 50.44 | 1.9859 | 50.54 | 1.9897 | 50.64 | 1.9935 | 50.73 | 1.9974 | 50.83 | 2.0012 |
| M55 | – | 4 | 50.670 | 51.270 | 50.84 | 2.0017 | 51.10 | 2.0119 | 51.36 | 2.0222 | 51.62 | 2.0324 | 51.88 | 2.0426 |
| | – | 3 | 51.752 | 52.252 | 51.88 | 2.0426 | 52.08 | 2.0503 | 52.27 | 2.0580 | 52.47 | 2.0656 | 52.66 | 2.0733 |
| | – | 2 | 52.835 | 53.210 | 52.92 | 2.0835 | 53.05 | 2.0886 | 53.18 | 2.0938 | 53.31 | 2.0989 | 53.44 | 2.1040 |
| | – | 1.5 | 53.376 | 53.676 | 53.44 | 2.1040 | 53.54 | 2.1078 | 53.64 | 2.1117 | 53.73 | 2.1155 | 53.83 | 2.1193 |
| M56 | 5.5 | – | 50.046 | 50.796 | 50.28 | 1.9797 | 50.64 | 1.9938 | 51.00 | 2.0078 | 51.36 | 2.0219 | 51.71 | 2.0360 |
| | – | 4 | 51.670 | 52.270 | 51.84 | 2.0411 | 52.10 | 2.0513 | 52.36 | 2.0615 | 52.62 | 2.0718 | 52.88 | 2.0820 |
| | – | 3 | 52.752 | 53.252 | 52.88 | 2.0820 | 53.08 | 2.0897 | 53.27 | 2.0973 | 53.47 | 2.1050 | 53.66 | 2.1127 |
| | – | 2 | 53.835 | 54.210 | 53.92 | 2.1229 | 54.05 | 2.1280 | 54.18 | 2.1331 | 54.31 | 2.1382 | 54.44 | 2.1434 |
| | – | 1.5 | 54.376 | 54.676 | 54.44 | 2.1434 | 54.54 | 2.1472 | 54.64 | 2.1510 | 54.73 | 2.1549 | 54.83 | 2.1587 |
| M58 | – | 4 | 53.670 | 54.270 | 53.84 | 2.1198 | 54.10 | 2.1300 | 54.36 | 2.1403 | 54.62 | 2.1505 | 54.88 | 2.1607 |
| | – | 3 | 54.752 | 55.252 | 54.88 | 2.1607 | 55.08 | 2.1684 | 55.27 | 2.1761 | 55.47 | 2.1837 | 55.66 | 2.1914 |
| | – | 2 | 55.835 | 56.210 | 55.92 | 2.2016 | 56.05 | 2.2067 | 56.18 | 2.2119 | 56.31 | 2.2170 | 56.44 | 2.2221 |
| | – | 1.5 | 56.376 | 56.676 | 56.44 | 2.2221 | 56.54 | 2.2259 | 56.64 | 2.2298 | 56.73 | 2.2336 | 56.83 | 2.2374 |
| M60 | 5.5 | – | 54.046 | 54.796 | 54.28 | 2.1372 | 54.64 | 2.1512 | 55.00 | 2.1653 | 55.36 | 2.1794 | 55.71 | 2.1934 |
| | – | 4 | 55.670 | 56.270 | 55.84 | 2.1985 | 56.10 | 2.2088 | 56.36 | 2.2190 | 56.62 | 2.2292 | 56.88 | 2.2395 |
| | – | 3 | 56.752 | 57.252 | 56.88 | 2.2395 | 57.08 | 2.2471 | 57.27 | 2.2548 | 57.47 | 2.2625 | 57.66 | 2.2701 |
| | – | 2 | 57.835 | 58.210 | 57.92 | 2.2804 | 58.05 | 2.2855 | 58.18 | 2.2906 | 58.31 | 2.2957 | 58.44 | 2.3008 |
| | – | 1.5 | 58.376 | 58.676 | 58.44 | 2.3008 | 58.54 | 2.3047 | 58.64 | 2.3085 | 58.73 | 2.3123 | 58.83 | 2.3162 |
| M62 | – | 4 | 57.670 | 58.270 | 57.84 | 2.2773 | 58.10 | 2.2875 | 58.36 | 2.2977 | 58.62 | 2.3080 | 58.88 | 2.3182 |
| | – | 3 | 58.752 | 59.252 | 58.88 | 2.3182 | 59.08 | 2.3259 | 59.27 | 2.3335 | 59.47 | 2.3412 | 59.66 | 2.3489 |
| | – | 1 | 60.917 | 61.153 | 60.96 | 2.4000 | 61.03 | 2.4026 | 61.09 | 2.4051 | 61.16 | 2.4077 | 61.22 | 2.4103 |
| | – | 1.5 | 60.376 | 60.676 | 60.44 | 2.3796 | 60.54 | 2.3834 | 60.64 | 2.3872 | 60.73 | 2.3911 | 60.83 | 2.3949 |
| M64 | 6 | – | 57.505 | 58.305 | 57.76 | 2.2742 | 58.15 | 2.2895 | 58.54 | 2.3049 | 58.93 | 2.3202 | 59.32 | 2.3356 |
| | – | 4 | 59.670 | 60.270 | 59.84 | 2.3560 | 60.10 | 2.3663 | 60.36 | 2.3765 | 60.62 | 2.3867 | 60.88 | 2.3969 |
| | – | 3 | 60.752 | 61.252 | 60.88 | 2.3969 | 61.08 | 2.4046 | 61.27 | 2.4123 | 61.47 | 2.4200 | 61.66 | 2.4276 |
| | – | 2 | 61.835 | 62.210 | 61.92 | 2.4379 | 62.05 | 2.4430 | 62.18 | 2.4481 | 62.31 | 2.4532 | 62.44 | 2.4583 |
| | – | 1.5 | 62.376 | 62.676 | 62.44 | 2.4583 | 62.54 | 2.4621 | 62.64 | 2.4660 | 62.73 | 2.4698 | 62.83 | 2.4737 |
| M65 | – | 4 | 60.670 | 61.270 | 60.84 | 2.3954 | 61.10 | 2.4056 | 61.36 | 2.4159 | 61.62 | 2.4261 | 61.88 | 2.4363 |
| | – | 3 | 61.752 | 62.252 | 61.88 | 2.4363 | 62.08 | 2.4440 | 62.27 | 2.4517 | 62.47 | 2.4593 | 62.66 | 2.4670 |
| | – | 2 | 62.835 | 63.210 | 62.92 | 2.4772 | 63.05 | 2.4823 | 63.18 | 2.4875 | 63.31 | 2.4926 | 63.44 | 2.4977 |
| | – | 1.5 | 63.376 | 63.676 | 63.44 | 2.4977 | 63.54 | 2.5015 | 63.64 | 2.5054 | 63.73 | 2.5092 | 63.83 | 2.5130 |

# TECHNICAL DATA

## TAP DRILL SIZES - UNIFIED THREAD / FORMING TAPS

| Size | Threads Per Inch | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | Min. 2B&3B | Max. 2B | Max. 3B | 75% Thread | 70% Thread | 65% Thread | 60% Thread | 55% Thread |
| #0 | - | 80 | - | .0465 | .0514 | .0514 | .0536 | .0541 | .0545 | .0549 | .0553 |
| #1 | 64 | - | - | .0561 | .0623 | .0623 | .0650 | .0656 | .0661 | .0666 | .0672 |
| | - | 72 | - | .0580 | .0635 | .0635 | .0659 | .0664 | .0669 | .0673 | .0678 |
| #2 | 56 | - | - | .0667 | .0737 | .0737 | .0769 | .0775 | .0781 | .0787 | .0793 |
| | - | 64 | - | .0691 | .0753 | .0753 | .0780 | .0786 | .0791 | .0796 | .0802 |
| #3 | 48 | - | - | .0764 | .0845 | .0845 | .0884 | .0891 | .0898 | .0905 | .0912 |
| | - | 56 | - | .0797 | .0865 | .0865 | .0899 | .0905 | .0911 | .0917 | .0923 |
| #4 | 40 | - | - | .0849 | .0939 | .0939 | .0993 | .1001 | .1010 | .1018 | .1027 |
| | - | 48 | - | .0894 | .0968 | .0968 | .1014 | .1021 | .1028 | .1035 | .1042 |
| #5 | 40 | - | - | .0979 | .1062 | .1062 | .1123 | .1131 | .1140 | .1148 | .1157 |
| | - | 44 | - | .1004 | .1079 | .1079 | .1134 | .1142 | .1150 | .1157 | .1165 |
| #6 | 32 | - | - | .1040 | .1140 | .1140 | .1221 | .1231 | .1242 | .1253 | .1263 |
| | - | 40 | - | .1110 | .1190 | .1186 | .1253 | .1261 | .1270 | .1278 | .1287 |
| #8 | 32 | - | - | .1300 | .1390 | .1389 | .1481 | .1491 | .1502 | .1513 | .1523 |
| | - | 36 | - | .1340 | .1420 | .1416 | .1498 | .1508 | .1517 | .1527 | .1536 |
| #10 | 24 | - | - | .1450 | .1560 | .1555 | .1688 | .1702 | .1716 | .1730 | .1744 |
| | - | 32 | - | .1560 | .1640 | .1641 | .1741 | .1751 | .1762 | .1773 | .1783 |
| #12 | 24 | - | - | .1710 | .1810 | .1807 | .1948 | .1962 | .1976 | .1990 | .2004 |
| | - | 28 | - | .1770 | .1860 | .1857 | .1978 | .1990 | .2002 | .2014 | .2026 |
| | - | - | 32 | .1820 | .1900 | .1895 | .2001 | .2011 | .2022 | .2033 | .2043 |
| 1/4 | 20 | - | - | .1960 | .2070 | .2067 | .2245 | .2262 | .2279 | .2296 | .2313 |
| | - | 28 | - | .2110 | .2200 | .2190 | .2318 | .2330 | .2342 | .2354 | .2366 |
| | - | - | 32 | .2160 | .2240 | .2229 | .2341 | .2351 | .2362 | .2373 | .2383 |
| 5/16 | 18 | - | - | .2520 | .2650 | .2630 | .2842 | .2861 | .2879 | .2898 | .2917 |
| | - | 24 | - | .2670 | .2770 | .2754 | .2913 | .2927 | .2941 | .2955 | .2969 |
| | - | - | - | .2740 | .2820 | .2807 | .2943 | .2955 | .2967 | .2979 | .2991 |
| | - | - | 32 | .2790 | .2860 | .2847 | .2966 | .2976 | .2987 | .2998 | .3008 |
| 3/8 | 16 | - | - | .3070 | .3210 | .3182 | .3431 | .3453 | .3474 | .3495 | .3516 |
| | - | 24 | - | .3300 | .3400 | .3372 | .3538 | .3552 | .3566 | .3580 | .3594 |
| | - | - | - | .3360 | .3450 | .3426 | .3568 | .3580 | .3592 | .3604 | .3616 |
| | - | - | 32 | .3410 | .3490 | .3469 | .3591 | .3601 | .3612 | .3623 | .3633 |
| 7/16 | 14 | - | - | .3600 | .3760 | .3717 | .4011 | .4035 | .4059 | .4084 | .4108 |
| | - | 20 | - | .3830 | .3950 | .3916 | .4120 | .4137 | .4154 | .4171 | .4188 |
| | - | - | 28 | .3990 | .4070 | .4051 | .4193 | .4205 | .4217 | .4229 | .4241 |
| 1/2 | 13 | - | - | .4170 | .4340 | .4284 | .4608 | .4634 | .4660 | .4686 | .4712 |
| | - | 20 | - | .4460 | .4570 | .4537 | .4745 | .4762 | .4779 | .4796 | .4813 |
| | - | - | 28 | .4610 | .4700 | .4676 | .4818 | .4830 | .4842 | .4854 | .4866 |
| 9/16 | 12 | - | - | .4720 | .4900 | .4843 | .5200 | .5228 | .5257 | .5285 | .5313 |
| | - | 18 | - | .5020 | .5150 | .5106 | .5342 | .5361 | .5379 | .5398 | .5417 |
| | - | - | 24 | .5170 | .5270 | .5244 | .5413 | .5427 | .5441 | .5455 | .5469 |
| 5/8 | 11 | - | - | .5270 | .5460 | .5391 | .5786 | .5817 | .5848 | .5879 | .5910 |
| | - | - | - | .5570 | .5710 | .5662 | .5931 | .5953 | .5974 | .5995 | .6016 |
| | - | 18 | - | .5650 | .5780 | .5730 | .5967 | .5986 | .6004 | .6023 | .6042 |
| | - | - | 24 | .5800 | .5900 | .5869 | .6038 | .6052 | .6066 | .6080 | .6094 |
| 3/4 | 10 | - | - | .6420 | .6630 | .6545 | .6990 | .7024 | .7058 | .7092 | .7126 |
| | - | 16 | - | .6820 | .6960 | .6908 | .7181 | .7203 | .7224 | .7245 | .7266 |
| | - | - | 20 | .6960 | .7070 | .7037 | .7245 | .7262 | .7279 | .7296 | .7313 |

| Size | Threads Per Inch | | | Minor Diameter | | | Tap Drill Diameter (Cutting Tap) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | UNC | UNF | UNEF | Min. 2B&3B | Max. 2B | Max. 3B | 75% Thread | 70% Thread | 65% Thread | 60% Thread | 55% Thread |
| 7/8 | 9 | - | - | .7550 | .7780 | .7681 | .8183 | .8221 | .8259 | .8297 | .8334 |
| | - | 14 | - | .7980 | .8140 | 8068 | .8386 | .8410 | .8434 | .8459 | .8483 |
| | - | - | 20 | .8210 | .8320 | .8287 | .8495 | .8512 | .8529 | .8546 | .8563 |
| 1 | 8 | - | - | .8650 | .8900 | .8797 | .9363 | .9405 | .9448 | .9490 | .9533 |
| | - | 12 | - | .9100 | .9280 | .9198 | .9575 | .9603 | .9632 | .9660 | .9688 |
| | - | - | 20 | .9460 | .9570 | .9537 | .9745 | .9762 | .9779 | .9796 | .9813 |
| 1-1/8 | 7 | - | - | .9700 | .9980 | .9875 | 1.0521 | 1.0570 | 1.0619 | 1.0667 | 1.0716 |
| | - | 12 | - | 1.0350 | 1.0530 | 1.0448 | 1.0825 | 1.0853 | 1.0882 | 1.0910 | 1.0938 |
| | - | - | 18 | 1.0650 | 1.0780 | 1.0730 | 1.0967 | 1.0986 | 1.1004 | 1.1023 | 1.1042 |
| 1-1/4 | 7 | - | - | 1.0950 | 1.1230 | 1.1125 | 1.1771 | 1.1820 | 1.1869 | 1.1917 | 1.1966 |
| | - | 12 | - | 1.1600 | 1.1780 | 1.1698 | 1.2075 | 1.2103 | 1.2132 | 1.2160 | 1.2188 |
| | - | - | 18 | 1.1900 | 1.2030 | 1.1980 | 1.2217 | 1.2236 | 1.2254 | 1.2273 | 1.2292 |

# TECHNICAL DATA

## 18 TAP DRILL SIZES - METRIC THREAD / FORMING TAPS

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | | 55% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M1 | 0.25 | – | 0.729 | 0.798 | 0.87 | .0344 | 0.88 | .0347 | 0.89 | .0350 | 0.90 | .0354 | 0.91 | .03569 |
| | – | 0.2 | 0.783 | 0.841 | 0.90 | .0354 | 0.90 | .0356 | 0.91 | .0359 | 0.92 | .0362 | 0.93 | .03643 |
| M1.1 | 0.25 | – | 0.829 | 0.898 | 0.97 | .0383 | 0.98 | .0386 | 0.99 | .0390 | 1.00 | .0393 | 1.01 | .03963 |
| | – | 0.2 | 0.883 | 0.941 | 1.00 | .0393 | 1.00 | .0396 | 1.01 | .0398 | 1.02 | .0401 | 1.03 | .04036 |
| M1.2 | 0.25 | – | 0.929 | 0.998 | 1.07 | .0422 | 1.08 | .0426 | 1.09 | .0429 | 1.10 | .0432 | 1.11 | .04356 |
| | – | 0.2 | 0.983 | 1.041 | 1.10 | .0432 | 1.10 | .0435 | 1.11 | .0438 | 1.12 | .0440 | 1.13 | .04430 |
| M1.4 | 0.3 | – | 1.075 | 1.159 | 1.25 | .0491 | 1.26 | .0495 | 1.27 | .0499 | 1.28 | .0503 | 1.29 | .05070 |
| | – | 0.2 | 1.183 | 1.241 | 1.30 | .0511 | 1.30 | .0514 | 1.31 | .0516 | 1.32 | .0519 | 1.33 | .05217 |
| M1.6 | 0.35 | – | 1.221 | 1.321 | 1.42 | .0560 | 1.43 | .0564 | 1.45 | .0569 | 1.46 | .0574 | 1.47 | .05784 |
| | – | 0.2 | 1.383 | 1.441 | 1.50 | .0590 | 1.50 | .0592 | 1.51 | .0595 | 1.52 | .0598 | 1.53 | .06005 |
| M1.7 | 0.35 | – | 1.321 | 1.421 | 1.52 | .0599 | 1.53 | .0604 | 1.55 | .0608 | 1.56 | .0613 | 1.57 | .06178 |
| | – | 0.3 | 1.375 | 1.459 | 1.55 | .0609 | 1.56 | .0613 | 1.57 | .0617 | 1.58 | .0621 | 1.59 | .06251 |
| | – | 0.25 | 1.429 | 1.498 | 1.57 | .0619 | 1.58 | .0622 | 1.59 | .0626 | 1.60 | .0629 | 1.61 | .06325 |
| | – | 0.2 | 1.483 | 1.541 | 1.60 | .0629 | 1.60 | .0632 | 1.61 | .0634 | 1.62 | .0637 | 1.63 | .06398 |
| M1.8 | 0.35 | – | 1.421 | 1.521 | 1.62 | .0638 | 1.63 | .0643 | 1.65 | .0648 | 1.66 | .0652 | 1.67 | .06571 |
| | – | 0.2 | 1.583 | 1.641 | 1.70 | .0669 | 1.70 | .0671 | 1.71 | .0674 | 1.72 | .0677 | 1.73 | .06792 |
| M2 | 0.4 | – | 1.567 | 1.679 | 1.80 | .0707 | 1.81 | .0712 | 1.82 | .0718 | 1.84 | .0723 | 1.85 | .07285 |
| | – | 0.25 | 1.729 | 1.798 | 1.87 | .0737 | 1.88 | .0741 | 1.89 | .0744 | 1.90 | .0747 | 1.91 | .07506 |
| M2.2 | 0.45 | – | 1.713 | 1.838 | 1.97 | .0776 | 1.99 | .0782 | 2.00 | .0788 | 2.02 | .0794 | 2.03 | .07999 |
| | – | 0.25 | 1.929 | 1.998 | 2.07 | .0816 | 2.08 | .0819 | 2.09 | .0823 | 2.10 | .0826 | 2.11 | .08293 |
| M2.3 | 0.4 | – | 1.867 | 1.979 | 2.10 | .0825 | 2.11 | .0831 | 2.12 | .0836 | 2.14 | .0841 | 2.15 | .08466 |
| | – | 0.35 | 1.921 | 2.021 | 2.12 | .0835 | 2.13 | .0840 | 2.15 | .0845 | 2.16 | .0849 | 2.17 | .08540 |
| | – | 0.25 | 2.029 | 2.098 | 2.17 | .0855 | 2.18 | .0859 | 2.19 | .0862 | 2.20 | .0865 | 2.21 | .08687 |
| M2.5 | 0.45 | – | 2.013 | 2.138 | 2.27 | .0894 | 2.29 | .0900 | 2.30 | .0906 | 2.32 | .0912 | 2.33 | .09180 |
| | – | 0.35 | 2.121 | 2.221 | 2.32 | .0914 | 2.33 | .0919 | 2.35 | .0923 | 2.36 | .0928 | 2.37 | .09327 |
| M2.6 | 0.45 | – | 2.113 | 2.238 | 2.37 | .0933 | 2.39 | .0939 | 2.40 | .0945 | 2.42 | .0951 | 2.43 | .09574 |
| | – | 0.35 | 2.221 | 2.321 | 2.42 | .0953 | 2.43 | .0958 | 2.45 | .0963 | 2.46 | .0967 | 2.47 | .09721 |
| M3 | 0.5 | – | 2.459 | 2.599 | 2.75 | .1081 | 2.76 | .1087 | 2.78 | .1094 | 2.80 | .1101 | 2.81 | .11075 |
| | – | 0.35 | 2.621 | 2.721 | 2.82 | .1111 | 2.83 | .1116 | 2.85 | .1120 | 2.86 | .1125 | 2.87 | .11296 |
| M3.5 | 0.6 | – | 2.850 | 3.010 | 3.19 | .1257 | 3.21 | .1266 | 3.23 | .1274 | 3.26 | .1282 | 3.28 | .12896 |
| | – | 0.35 | 3.121 | 3.221 | 3.32 | .1308 | 3.33 | .1312 | 3.35 | .1317 | 3.36 | .1322 | 3.37 | .13264 |
| M4 | 0.7 | – | 3.242 | 3.422 | 3.64 | .1434 | 3.67 | .1444 | 3.69 | .1453 | 3.71 | .1462 | 3.74 | .14717 |
| | – | 0.5 | 3.459 | 3.599 | 3.75 | .1474 | 3.76 | .1481 | 3.78 | .1488 | 3.80 | .1494 | 3.81 | .15012 |
| M4.5 | 0.75 | – | 3.688 | 3.878 | 4.12 | .1621 | 4.14 | .1631 | 4.17 | .1641 | 4.19 | .1651 | 4.22 | .16612 |
| | – | 0.5 | 3.959 | 4.099 | 4.25 | .1671 | 4.26 | .1678 | 4.28 | .1685 | 4.30 | .1691 | 4.31 | .16980 |
| M5 | 0.9 | – | 4.026 | 4.226 | 4.54 | .1788 | 4.57 | .1800 | 4.60 | .1812 | 4.63 | .1824 | 4.66 | .18360 |
| | 0.8 | – | 4.134 | 4.334 | 4.59 | .1808 | 4.62 | .1819 | 4.65 | .1829 | 4.67 | .1840 | 4.70 | .18507 |
| | – | 0.5 | 4.459 | 4.599 | 4.75 | .1868 | 4.76 | .1875 | 4.78 | .1881 | 4.80 | .1888 | 4.81 | .18949 |
| M6 | 1 | – | 4.917 | 5.153 | 5.49 | .2161 | 5.52 | .2175 | 5.56 | .2188 | 5.59 | .2202 | 5.63 | .22150 |
| | – | 0.75 | 5.188 | 5.378 | 5.62 | .2212 | 5.64 | .2222 | 5.67 | .2232 | 5.69 | .2242 | 5.72 | .22518 |
| | – | 0.5 | 5.459 | 5.599 | 5.75 | .2262 | 5.76 | .2269 | 5.78 | .2275 | 5.80 | .2282 | 5.81 | .22886 |
| M7 | 1 | – | 5.917 | 6.153 | 6.49 | .2555 | 6.52 | .2569 | 6.56 | .2582 | 6.59 | .2595 | 6.63 | .26087 |
| | – | 0.75 | 6.188 | 6.378 | 6.62 | .2605 | 6.64 | .2615 | 6.67 | .2625 | 6.69 | .2635 | 6.72 | .26455 |
| | – | 0.5 | 6.459 | 6.599 | 6.75 | .2656 | 6.76 | .2662 | 6.78 | .2669 | 6.80 | .2676 | 6.81 | .26823 |
| M8 | 1.25 | – | 6.647 | 6.912 | 7.36 | .2899 | 7.41 | .2915 | 7.45 | .2932 | 7.49 | .2949 | 7.53 | .29656 |
| | – | 1 | 6.917 | 7.153 | 7.49 | .2949 | 7.52 | .2962 | 7.56 | .2976 | 7.59 | .2989 | 7.63 | .30024 |
| | – | 0.75 | 7.188 | 7.378 | 7.62 | .2999 | 7.64 | .3009 | 7.67 | .3019 | 7.69 | .3029 | 7.72 | .30392 |
| | – | 0.5 | 7.459 | 7.599 | 7.75 | .3049 | 7.76 | .3056 | 7.78 | .3063 | 7.80 | .3069 | 7.81 | .30760 |
| M9 | 1.25 | – | 7.647 | 7.912 | 8.36 | .3292 | 8.41 | .3309 | 8.45 | .3326 | 8.49 | .3343 | 8.53 | .33593 |
| | – | 1 | 7.917 | 8.153 | 8.49 | .3343 | 8.52 | .3356 | 8.56 | .3369 | 8.59 | .3383 | 8.63 | .33961 |
| | – | 0.75 | 8.188 | 8.378 | 8.62 | .3393 | 8.64 | .3403 | 8.67 | .3413 | 8.69 | .3423 | 8.72 | .34329 |
| | – | 0.5 | 8.459 | 8.599 | 8.75 | .3443 | 8.76 | .3450 | 8.78 | .3456 | 8.80 | .3463 | 8.81 | .34697 |

# TECHNICAL DATA

| Size | Pitch | | Minor dia. | | Tap Drill Diameter | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M | MF | Min. 6H | Max. 6H | 75% Thread | | 70% Thread | | 65% Thread | | 60% Thread | | 55% Thread | |
| | | | | | mm | Inch | mm | Inch | mm | Inch | mm | Inch | mm | Inch |
| M10 | 1.5 | – | 8.376 | 8.676 | 9.24 | .3636 | 9.29 | .3656 | 9.34 | .3676 | 9.39 | .3696 | 9.44 | .37161 |
| | – | 1.25 | 8.647 | 8.912 | 9.36 | .3686 | 9.41 | .3703 | 9.45 | .3719 | 9.49 | .3736 | 9.53 | .37530 |
| | – | 1 | 8.917 | 9.153 | 9.49 | .3736 | 9.52 | .3750 | 9.56 | .3763 | 9.59 | .3776 | 9.63 | .37898 |
| | – | 0.75 | 9.188 | 9.378 | 9.62 | .3786 | 9.64 | .3796 | 9.67 | .3806 | 9.69 | .3817 | 9.72 | .38266 |
| | – | 0.5 | 9.459 | 9.599 | 9.75 | .3837 | 9.76 | .3843 | 9.78 | .3850 | 9.80 | .3857 | 9.81 | .38634 |
| M12 | 1.75 | – | 10.106 | 10.441 | 11.11 | .4373 | 11.17 | .4396 | 11.23 | .4420 | 11.29 | .4443 | 11.35 | .44667 |
| | – | 1.5 | 10.376 | 10.676 | 11.24 | .4423 | 11.29 | .4443 | 11.34 | .4463 | 11.39 | .4483 | 11.44 | .45035 |
| | – | 1.25 | 10.647 | 10.912 | 11.36 | .4473 | 11.41 | .4490 | 11.45 | .4507 | 11.49 | .4524 | 11.53 | .45404 |
| | – | 1 | 10.917 | 11.153 | 11.49 | .4524 | 11.52 | .4537 | 11.56 | .4550 | 11.59 | .4564 | 11.63 | .45772 |
| | – | 0.75 | 11.188 | 11.378 | 11.62 | .4574 | 11.64 | .4584 | 11.67 | .4594 | 11.69 | .4604 | 11.72 | .46140 |
| | – | 0.5 | 11.459 | 11.599 | 11.75 | .4624 | 11.76 | .4631 | 11.78 | .4637 | 11.80 | .4644 | 11.81 | .46508 |
| M14 | 2 | – | 11.835 | 12.210 | 12.98 | .5110 | 13.05 | .5137 | 13.12 | .5164 | 13.18 | .5191 | 13.25 | .52173 |
| | – | 1.5 | 12.376 | 12.676 | 13.24 | .5211 | 13.29 | .5231 | 13.34 | .5251 | 13.39 | .5271 | 13.44 | .52909 |
| | – | 1.25 | 12.647 | 12.912 | 13.36 | .5261 | 13.41 | .5278 | 13.45 | .5294 | 13.49 | .5311 | 13.53 | .53278 |
| | – | 1 | 12.917 | 13.153 | 13.49 | .5311 | 13.52 | .5324 | 13.56 | .5338 | 13.59 | .5351 | 13.63 | .53646 |
| | – | 0.75 | 13.188 | 13.378 | 13.62 | .5361 | 13.64 | .5371 | 13.67 | .5381 | 13.69 | .5391 | 13.72 | .54014 |
| | – | 0.5 | 13.459 | 13.599 | 13.75 | .5411 | 13.76 | .5418 | 13.78 | .5425 | 13.80 | .5431 | 13.81 | .54382 |
| M16 | 2 | – | 13.835 | 14.210 | 14.98 | .5898 | 15.05 | .5924 | 15.12 | .5951 | 15.18 | .5978 | 15.25 | .60047 |
| | – | 1.5 | 14.376 | 14.676 | 15.24 | .5998 | 15.29 | .6018 | 15.34 | .6038 | 15.39 | .6058 | 15.44 | .60783 |
| | – | 1 | 14.917 | 15.153 | 15.49 | .6098 | 15.52 | .6112 | 15.56 | .6125 | 15.59 | .6139 | 15.63 | .61520 |
| M18 | 2.5 | – | 15.294 | 15.744 | 16.73 | .6585 | 16.81 | .6618 | 16.90 | .6652 | 16.98 | .6685 | 17.07 | .67185 |
| | – | 2 | 15.835 | 16.210 | 16.98 | .6685 | 17.05 | .6712 | 17.12 | .6739 | 17.18 | .6765 | 17.25 | .67921 |
| | – | 1.5 | 16.376 | 16.676 | 17.24 | .6785 | 17.29 | .6806 | 17.34 | .6826 | 17.39 | .6846 | 17.44 | .68657 |
| | – | 1 | 16.917 | 17.153 | 17.49 | .6886 | 17.52 | .6899 | 17.56 | .6913 | 17.59 | .6926 | 17.63 | .69394 |
| M20 | 2.5 | – | 17.294 | 17.744 | 18.73 | .7372 | 18.81 | .7406 | 18.90 | .7439 | 18.98 | .7472 | 19.07 | .75059 |
| | – | 2 | 17.835 | 18.210 | 18.98 | .7472 | 19.05 | .7499 | 19.12 | .7526 | 19.18 | .7553 | 19.25 | .75795 |
| | – | 1.5 | 18.376 | 18.676 | 19.24 | .7573 | 19.29 | .7593 | 19.34 | .7613 | 19.39 | .7633 | 19.44 | .76531 |
| | – | 1 | 18.917 | 19.153 | 19.49 | .7673 | 19.52 | .7687 | 19.56 | .7700 | 19.59 | .7713 | 19.63 | .77268 |
| M22 | 2.5 | – | 19.294 | 19.744 | 20.73 | .8159 | 20.81 | .8193 | 20.90 | .8226 | 20.98 | .8260 | 21.07 | .82933 |
| | – | 2 | 19.835 | 20.210 | 20.98 | .8260 | 21.05 | .8287 | 21.12 | .8313 | 21.18 | .8340 | 21.25 | .83669 |
| | – | 1.5 | 20.376 | 20.676 | 21.24 | .8360 | 21.29 | .8380 | 21.34 | .8400 | 21.39 | .8420 | 21.44 | .84406 |
| | – | 1 | 20.917 | 21.153 | 21.49 | .8461 | 21.52 | .8474 | 21.56 | .8487 | 21.59 | .8501 | 21.63 | .85142 |
| M24 | 3 | – | 20.752 | 21.252 | 22.47 | .8846 | 22.57 | .8887 | 22.67 | .8927 | 22.78 | .8967 | 22.88 | .90071 |
| | – | 2 | 21.835 | 22.210 | 22.98 | .9047 | 23.05 | .9074 | 23.12 | .9101 | 23.18 | .9128 | 23.25 | .91543 |
| | – | 1.5 | 22.376 | 22.676 | 23.24 | .9148 | 23.29 | .9168 | 23.34 | .9188 | 23.39 | .9208 | 23.44 | .92280 |
| | – | 1 | 22.917 | 23.153 | 23.49 | .9248 | 23.52 | .9261 | 23.56 | .9275 | 23.59 | .9288 | 23.63 | .93016 |
| M26 | – | 3 | 22.752 | 23.252 | 24.47 | .9634 | 24.57 | .9674 | 24.67 | .9714 | 24.78 | .9754 | 24.88 | .97945 |
| | – | 2 | 23.835 | 24.210 | 24.98 | .9835 | 25.05 | .9861 | 25.12 | .9888 | 25.18 | .9915 | 25.25 | .99417 |
| | – | 1.5 | 24.376 | 24.676 | 25.24 | .9935 | 25.29 | .9955 | 25.34 | .9975 | 25.39 | .9995 | 25.44 | 1.00154 |
| M27 | 3 | – | 23.752 | 24.252 | 25.47 | 1.0028 | 25.57 | 1.0068 | 25.67 | 1.0108 | 25.78 | 1.0148 | 25.88 | 1.01882 |
| | – | 2.5 | 24.294 | 24.744 | 25.73 | 1.0128 | 25.81 | 1.0161 | 25.90 | 1.0195 | 25.98 | 1.0228 | 26.07 | 1.02618 |
| | – | 2 | 24.835 | 25.210 | 25.98 | 1.0228 | 26.05 | 1.0255 | 26.12 | 1.0282 | 26.18 | 1.0309 | 26.25 | 1.03354 |
| | – | 1.5 | 25.376 | 25.676 | 26.24 | 1.0329 | 26.29 | 1.0349 | 26.34 | 1.0369 | 26.39 | 1.0389 | 26.44 | 1.04091 |
| | – | 1 | 25.917 | 26.153 | 26.49 | 1.0429 | 26.52 | 1.0443 | 26.56 | 1.0456 | 26.59 | 1.0469 | 26.63 | 1.04827 |
| M30 | 3.5 | – | 26.211 | 26.771 | 28.22 | 1.1108 | 28.33 | 1.1155 | 28.45 | 1.1202 | 28.57 | 1.1249 | 28.69 | 1.12957 |
| | – | 3 | 26.752 | 27.252 | 28.47 | 1.1209 | 28.57 | 1.1249 | 28.67 | 1.1289 | 28.78 | 1.1329 | 28.88 | 1.13693 |
| | – | 2 | 27.835 | 28.210 | 28.98 | 1.1409 | 29.05 | 1.1436 | 29.12 | 1.1463 | 29.18 | 1.1490 | 29.25 | 1.15165 |
| | – | 1.5 | 28.376 | 28.676 | 29.24 | 1.1510 | 29.29 | 1.1530 | 29.34 | 1.1550 | 29.39 | 1.1570 | 29.44 | 1.15902 |
| | – | 1 | 28.917 | 29.153 | 29.49 | 1.1610 | 29.52 | 1.1624 | 29.56 | 1.1637 | 29.59 | 1.1650 | 29.63 | 1.16638 |

# TECHNICAL DATA

## 19 TAP DRILL SIZES - METRIC THREAD / FORMING TAPS

### Metric

| Size | RECOMMENDATION Drill Size | |
|---|---|---|
| | Inch | metric (mm) |
| M2 × 0.4 | .0827 | 2.10 |
| M2.2 × 0.45 | .0906 | 2.30 |
| M2.5 × 0.45 | .1024 | 2.60 |
| M3 × 0.5 | .1240 | 3.15 |
| M3.5 × 0.6 | .1457 | 3.70 |
| M4 × 0.7 | .1654 | 4.20 |
| M5 × 0.8 | .2047 | 5.20 |
| M6 × 1.0 | .2480 | 6.30 |
| M7 × 1.0 | .2874 | 7.30 |
| M8 × 1.0 | .3268 | 8.30 |
| M8 × 1.25 | .3307 | 8.40 |
| M9 × 1.25 | .3701 | 9.40 |
| M10 × 1.25 | .4094 | 10.40 |
| M10 × 1.5 | .4134 | 10.50 |
| M11 × 1.5 | .4528 | 11.50 |
| M12 × 1.25 | .4882 | 12.40 |
| M12 × 1.5 | .4921 | 12.50 |
| M12 × 1.75 | .4921 | 12.50 |
| M14 × 1.5 | .5709 | 14.50 |
| M14 × 2.0 | .5709 | 14.50 |
| M16 × 1.5 | .6496 | 16.50 |
| M16 × 2.0 | .6496 | 16.50 |
| M18 × .5 | .7283 | 18.50 |
| M18 × 2.0 | .7283 | 18.50 |
| M18 × 2.5 | .7382 | 18.75 |
| M20 × 1.5 | .8071 | 20.50 |
| M20 × 2.0 | .8071 | 20.50 |
| M20 × 2.5 | .8169 | 20.75 |
| M22 × 1.5 | .8858 | 22.50 |
| M22 × 2.0 | .8858 | 22.50 |
| M22 × 2.5 | .8957 | 22.75 |
| M24 × 2.0 | .9646 | 24.50 |
| M24 × 3.0 | .9843 | 25.00 |
| M27 × 3.0 | 1.1024 | 28.00 |
| M30 × 3.5 | 1.2205 | 31.00 |

### Unified

| Size | RECOMMENDATION Drill Size | |
|---|---|---|
| | Inch | metric (mm) |
| #2 - 56 UNC | .0906 | 2.30 |
| #3 - 48 UNC | .1063 | 2.70 |
| #3 - 56 UNF | .1043 | 2.65 |
| #4 - 40 UNC | .1181 | 3.00 |
| #4 - 48 UNF | .1181 | 3.00 |
| #5 - 40 UNC | .1339 | 3.40 |
| #5 - 44 UNF | .1299 | 3.30 |
| #6 - 32 UNC | .1457 | 3.70 |
| #6 - 40 UNF | .1457 | 3.70 |
| #8 - 32 UNC | .1732 | 4.40 |
| #8 - 36 UNF | .1732 | 4.40 |
| #10 - 24 UNC | .2008 | 5.10 |
| #10 - 32 UNF | .2008 | 5.10 |
| #12 - 24 UNC | .2283 | 5.80 |
| 1/4 - 20 UNC | .2638 | 6.70 |
| 1/4 - 28 UNF | .2598 | 6.60 |
| 5/16 - 18 UNC | .3307 | 8.40 |
| 5/16 - 24 UNF | .3228 | 8.20 |
| 3/8 - 16 UNC | .3937 | 10.00 |
| 3/8 - 24 UNF | .3858 | 9.80 |
| 7/16 - 14 UNC | .4528 | 11.50 |
| 7/16 - 20 UNF | .4528 | 11.50 |
| 1/2 - 13 UNC | .5236 | 13.30 |
| 1/2 - 20 UNF | .5157 | 13.10 |
| 9/16 - 12 UNC | .5866 | 14.90 |
| 9/16 - 18 UNF | .5787 | 14.70 |
| 5/8 - 11 UNC | .6496 | 16.50 |
| 5/8 - 18 UNF | .6417 | 16.30 |
| 3/4 - 10 UNC | .7795 | 19.80 |
| 3/4 - 16 UNF | .7677 | 19.50 |
| 7/8 - 9 UNC | .9055 | 23.00 |
| 7/8 - 14 UNF | .8858 | 22.50 |
| 1 - 8 UNC | 1.0433 | 26.50 |
| 1 - 12 UNF | 1.0236 | 26.00 |
| 1-1/8 - 7 UNC | 1.1713 | 29.75 |
| 1-1/8 - 8 UN | 1.1417 | 29.00 |
| 1-1/8 - 12 UNF | 1.1516 | 29.25 |
| 1-1/4 - 7 UNC | 1.2992 | 33.00 |
| 1-1/4 - 8 UN | 1.2795 | 32.50 |
| 1-1/4 - 12 UNF | 1.2795 | 32.50 |
| 1-3/8 - 6 UNC | 1.4173 | 36.00 |
| 1-3/8 - 8 UN | 1.3976 | 35.50 |
| 1-3/8 - 12 UNF | 1.4173 | 36.00 |
| 1-1/2 - 6 UNC | 1.5354 | 39.00 |
| 1-1/2 - 8 UN | 1.5354 | 39.00 |
| 1-1/2 - 12 UNF | 1.5354 | 39.00 |

## CONVERSION TABLE

### SURFACE FEET PER MINUTE TO REVOLUTIONS PER MINUTE

| Surface Feet Per Minute | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Tap Size** | **Revolutions Per Minute** | | | | | | | | | | | | | | |
| #0 | 1273 | 1592 | 1910 | 2546 | 3183 | 3820 | 4456 | 5093 | 5730 | 6366 | 7003 | 7639 | 8276 | 8913 | 9549 |
| #1 | 1047 | 1308 | 1570 | 2093 | 2617 | 3140 | 3663 | 4186 | 4710 | 5233 | 5756 | 6279 | 6808 | 7326 | 7849 |
| #2 | 888 | 1110 | 1333 | 1777 | 2221 | 2665 | 3109 | 3554 | 3999 | 4222 | 4886 | 5330 | 5774 | 6218 | 6662 |
| #3 | 772 | 964 | 1157 | 1543 | 1929 | 2315 | 2701 | 3086 | 3472 | 3858 | 4244 | 4629 | 5015 | 5401 | 5787 |
| #4 | 682 | 853 | 1023 | 1364 | 1705 | 2046 | 2387 | 2728 | 3069 | 3411 | 3751 | 4092 | 4434 | 4775 | 5116 |
| #5 | 611 | 764 | 917 | 1222 | 1528 | 1833 | 2139 | 2445 | 2750 | 3056 | 3361 | 3367 | 3973 | 4278 | 4584 |
| #6 | 553 | 691 | 829 | 1106 | 1382 | 1658 | 1934 | 2211 | 2487 | 2764 | 3040 | 3316 | 3592 | 3869 | 4145 |
| #8 | 466 | 583 | 699 | 932 | 1165 | 1398 | 1631 | 1864 | 2097 | 2330 | 2563 | 2796 | 3029 | 3262 | 3495 |
| #10 | 402 | 502 | 603 | 804 | 1005 | 1205 | 1406 | 1607 | 1808 | 2009 | 2210 | 2411 | 2612 | 2813 | 3014 |
| #12 | 354 | 442 | 531 | 707 | 884 | 1061 | 1238 | 1415 | 1592 | 1769 | 1945 | 2122 | 2300 | 2476 | 2653 |
| 1/4 | 306 | 382 | 458 | 611 | 764 | 917 | 1070 | 1222 | 1375 | 1528 | 1681 | 1833 | 1986 | 2139 | 2292 |
| 5/16 | 245 | 306 | 367 | 486 | 611 | 733 | 856 | 978 | 1100 | 1222 | 1345 | 1467 | 1589 | 1711 | 1833 |
| 3/8 | 204 | 255 | 306 | 407 | 509 | 611 | 713 | 815 | 917 | 1019 | 1120 | 1222 | 1324 | 1426 | 1528 |
| 7/16 | 175 | 219 | 262 | 349 | 437 | 524 | 611 | 698 | 786 | 873 | 960 | 1048 | 1135 | 1222 | 1310 |
| 1/2 | 153 | 191 | 229 | 306 | 382 | 458 | 535 | 611 | 688 | 764 | 840 | 917 | 993 | 1070 | 1146 |
| 9/16 | 137 | 172 | 206 | 275 | 344 | 412 | 481 | 550 | 619 | 687 | 756 | 825 | 893 | 963 | 1031 |
| 5/8 | 122 | 153 | 183 | 244 | 306 | 367 | 428 | 489 | 550 | 611 | 672 | 733 | 794 | 856 | 917 |
| 3/4 | 102 | 128 | 153 | 203 | 255 | 306 | 357 | 407 | 458 | 509 | 560 | 611 | 662 | 713 | 764 |
| 7/8 | 87 | 109 | 131 | 175 | 218 | 252 | 306 | 350 | 392 | 437 | 480 | 524 | 568 | 611 | 655 |
| 1 | 76 | 96 | 115 | 153 | 191 | 230 | 268 | 306 | 344 | 382 | 420 | 458 | 497 | 535 | 573 |

# TECHNICAL DATA

## TROUBLE SHOOTING GUIDE

| Specific Problem | Cause | Solution |
|---|---|---|
| **Dimensional Accuracy** | | |
| **Oversize Pitch Diameter** | **Tap** | 1. Use proper limits of taps<br>2. Use longer chamfered taps |
| | **Chip Packing** | 1. Use spiral point or spiral fluted taps<br>2. Reduce number of flutes to provied extra chip room<br>3. Use larger hole size<br>4. If tapping a hole, allow deeper hole where applicable or shorten the thread length of the parts<br>5. Use proper lubricant |
| | **Galling** | 1. Apply proper surface treatment such as Hardslick or chrome<br>2. Use proper cutting lubricant<br>3. Reduce tapping speed<br>4. Use proper cutting angle in accordance with material being tapped<br>5. Use large hole size |
| | **Operating Conditions** | 1. Apply proper tapping speed<br>2. Correct alignment of tap and drill hole<br>3. Free cutting either tap or workpiece<br>4. Use proper tapping speed to avoid torn or rough threads<br>5. Use lead screw tapper<br>6. Use proper tapping machine with suitable power<br>7. Avoid misalignment of the tap and drill hole from loose spindle or worn holder |
| | **Tool Condition** | 1. Obtain proper indexing angle for the flutes at the cutting edge<br>2. Grind proper cutting angle and chamfer angle<br>3. Avoid too narrow a land width<br>4. Remove burrs from regrinding |
| **Oversize Internal Diameter** | **Hole Size** | 1. Use minimum hole size<br>2. Avoid tapered hole<br>3. Use proper chamfered taps |
| | **Galling** | 1. Galling solutions 1 through 4 above can be applied to this specific problem |
| **Undersize Pitch Diameter** | **Incorrect Tap** | 1. Use oversize taps<br>2. Apply proper chamfer angle<br>3. Increase cutting angle |
| | **Damaged Thread** | 1. Use proper reversing speed to avoid damaging tapped thread on the way out of the hole |
| | **Left-over Chips** | 1. Increase cutting performance to avoid any left over chips in the hole<br>2. Remove left over chips from the hole for gage checking |
| **Undersize Internal Diameter** | **Hole Size** | 1. Use maximum drill size |

| Specific Problem | Cause | Solution |
|---|---|---|
| **Tool Life** | | |
| **Breakage** | **Incorrect Tap Selection** | 1. Avoid chip packing in the flutes or the bottom of the hole. Use spiral pointed or spiral fluted taps or fluteless taps.<br>2. Apply correct surface treatment such as Hardslick or bright |
| | **Excessive Tapping Torque** | 1. Use larger drill size<br>2. Try to shorten thread length<br>3. Increase cutting angle<br>4. Apply a tap with more thread relief and reduced land width<br>5. Apply correct surface treatment such as Hardslick |
| | **Operating Conditions** | 1. Reduce tapping speed<br>2. Avoid misalignment between tap and the hole and tapered hole<br>3. Use floating type of tapping holder<br>4. Use tapping holder with torque adjustment<br>5. Avoid hitting bottom of the hole with tap |
| | **Tool Condition** | 1. Do not grind the bottom of the flute<br>2. Avoid too narrow a land width<br>3. Remove all worn sections when regrindig the flutes<br>4. Regrind tool more frequently |
| **Chipping** | **Incorrect Tap Selection** | 1. Reduce cutting angle<br>2. Use a different kind of high-speed steel tap<br>3. Reduce hardness of the tap<br>4. Increase chamfer length<br>5. Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps |
| | **Wear** | 1. Reduce tapping speed<br>2. Avoid misalignment between tap and hole<br>3. Avoid sudden return of reverse in blind hole tapping<br>4. Avoid galling<br>5. Use larger hole size |
| **Wearx** | **Incorrect Tap Selection** | 1. Apply specially designed tap for tapping heat treated materal<br>2. Change to a type of high-speed steel tap that contains vanadium<br>3. Apply special surface treatment such as TiCN or Hardslick<br>4. Increase chamfer length |
| | **Operating Conditions** | 1. Reduce tapping speed<br>2. Apply proper cutting lubricants<br>3. Avoid work hardened hole<br>4. Use larger hole size |
| | **Tool Condition** | 1. Grind proper cutting angle<br>2. Avoid hardness reduction from grinding process |
| **Torn or Rough Thread** | **Chamfer Too Short** | 1. Increase chamfer length |
| | **Wrong Cutting Angle** | 1. Apply proper cutting angle |

# TECHNICAL DATA

| Specific Problem | Cause | Solution |
|---|---|---|
| **Surface Finish** | | |
| **Torn or Rough Thread** | **Galling** | 1. Use thread relieved taps<br>2. Reduce land width<br>3. Apply surface treatment such as Hardslick or chrome<br>4. Use proper cutting lubricant<br>5. Reduce tapping speed<br>6. Use larger hole size<br>7. Obtain proper alignment between tap and work |
| | **Chip Packing** | 1. Use spiral pointed or spiral fluted taps<br>2. Use larger drill size |
| **Chattering on Tapped Thread** | **Tool Free Cutting** | 1. Reduce cutting angle<br>2. Reduce amount of thread relief |
| | **Tool Condition** | 1. Do not grind the bottom of the flute<br>2. Avoid too narrow a land width |

# MILLING TOOLS


CBN END MILLS
i-Xmills, CARBIDE INSERT END MILLS
i-SMART MODULAR TYPE END MILLS
X5070 NANO SOLID CARBIDE END MILLS
4G MILL SOLID CARBIDE END MILLS
X-POWER SOLID CARBIDE END MILLS
JET-POWER SOLID CARBIDE & HSS-PM END MILLS
TitaNox-POWER SOLID CARBIDE END MILLS
V7 PLUS A SOLID CARBIDE END MILLS
V7 Mill INOX SOLID CARBIDE END MILLS
ALU-POWER SOLID CARBIDE & HSS-PM END MILLS
D-POWER GRAPHITE DIAMOND COATED SOLID CARBIDE END MILLS
D-POWER CFRP DIAMOND COATED SOLID CARBIDE END MILLS
SOLID CARBIDE ROUTERS
STANDARD CARBIDE END MILLS
ONLY ONE COATED PM60 END MILLS
SINE-POWER HSS END MILLS
TANK-POWER HSS-PM END MILLS
COBALT & HSS END MILLS
TECHNICAL DATA


YG-1 CO., LTD.

# Contents

## MILLING TOOLS


CBN END MILLS

CARBIDE INSERTEND MILLS

SOLID CARBIDE END MILLS

HSS END MILLS

TECHNICAL DATA



YG-1 CO., LTD.

# Contents / MILLING TOOLS


CBN END MILLS
Machining High Hardened Steels up to HRc70 / Mirror Finish — CBN END MILLS

i-Xmills, CARBIDE INSERT END MILLS
Available for General Steels(~HRc50), Hardened Steels(up to HRc65) and Graphite — i-Xmill END MILLS

i-Smart MODULAR TYPE END MILLS
Indexable Modular Head for Semi-finishing and finishing on Pre-Hardened Steels up to HRc55 — i-SMART MODULAR TYPE END MILLS

X5070 NANO SOLID CARBIDE END MILLS
High Hardened Steels HRc45 to HRc70 / High Speed Machining / Dry Cutting — X5070 END MILLS

4G MILL SOLID CARBIDE END MILLS
High Speed Cutting for Pre-Hardened Steels up to HRc55 — 4G MILL END MILLS

X-POWER SOLID CARBIDE END MILLS
Medium Steels to High Hardened Steels up to HRc70 — X-POWER END MILLS

JET-POWER SOLID CARBIDE & HSS-PM END MILLS
Exotic materials like Stainless Steels, Nickel alloys and Titanium — JET-POWER END MILLS

TitaNox-POWER SOLID CARBIDE END MILLS
High Speed Machining for Exotic Materials:Titanium, Inconel and Stainless Steels — TitaNox -POWER END MILLS

V7 PLUS A SOLID CARBIDE END MILLS
Silent Cutting of Steels up to HRc40 / Designed as Unequal Leads — V7 PLUS A END MILLS

V7 Mill INOX SOLID CARBIDE END MILLS
Stainless Steels in Heavy and Silent Cutting Materials up to HRc40
Designed as Variable Leads / YG-1's Patent — V7 MILL INOX END MILLS

ALU-POWER SOLID CARBIDE & HSS-PM END MILLS
Aluminium Alloys and Silent Cutting / Mirror Surface — ALU-POWER END MILLS

D-POWER GRAPHITE DIAMOND COATED SOLID CARIDE END MILLS
Diamond Coated Carbide End Mills for Graphite — D-POWER GRAPHITE END MILLS

D-POWER CFRP DIAMOND COATED SOLID CARBIDE END MILLS
Diamond Coated Carbide End Mills for composite materials including CFRP, GFRP — D-POWER CFRP END MILLS

SOLID CARBIDE ROUTERS
For composite materials including CFRP, GFRP — ROUTERS

STANDARD CARBIDE END MILLS
General Purpose / Any Coating Available — STANDARD CARBIDE END MILLS

ONLY ONE COATED PM60 END MILLS
The optimal solution for unstable cutting condition — ONLY ONE COATED PM60 END MILLS

SINE-POWER HSS END MILLS
High Performance HSS Rougher for Titanium and Titanium Alloys — SINE -POWER END MILLS

TANK-POWER HSS-PM END MILLS
Next Generation of Powdered Metal End Mills / Higher Edge Strength & Feed Rates — TANK-POWER END MILLS

COBALT & HSS END MILLS
General Purpose / Non-coated / Any Coating Available — STANDARD COBALT & HSS END MILLS

TECHNICAL DATA — TECHNICAL DATA

| | ITEM | MODEL | DESCRIPTION | SIZE RANGE MIN | SIZE RANGE MAX | PAGE |
|---|---|---|---|---|---|---|
| i-Xmill | XB1A<br>XB1N |  | i-Xmill Ball Insert for General Purpose | R5/32 (R4) | R5/8 (R16) | **566**<br>**571** |
| | XB2C<br>XB2N | | i-Xmill Ball Insert for Hardened Steels | | | |
| | XB1D<br>XBAD | | i-Xmill Ball Insert for Graphite | | | |
| | XR1A<br>XRAA |  | i-Xmill Corner Radius Insert for General Purpose | Ø5/16 (Ø8) | Ø1-1/4 (Ø32) | **569**<br>**574** |
| | XR2A<br>XRBA | | i-Xmill Corner Radius Insert for Hardened Steels | | | |
| | XR1D<br>XRAD | | i-Xmill Corner Radius Insert for Graphite | | | |

| | ITEM | MODEL | DESCRIPTION | SIZE RANGE MIN | SIZE RANGE MAX | PAGE |
|---|---|---|---|---|---|---|
| i-Smart | XGMF15 |  | CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE | R3/16 | R5/8 | **584** |
| | XGMF17 |  | CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE | R3/16 | R5/8 | **585** |
| | XGMF20 |  | CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS | D3/8 | D1-1/4 | **586** |
| | XGMF25 |  | CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX | D3/8 | D1-1/4 | **587** |
| | XGMF29 |  | CARBIDE MODULAR HEAD, 6 FLUTE 45° HELIX | D3/8 | D1-1/4 | **588** |

◎ : Excellent ○ : Good

| P | | | | | | | M | K | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite |
| ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | |
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| CBN | ESB94 |  | 2Flute | 30° | Metric | Ball | R0.2 | R1.5 | **560** |
| | ESD02 |  | 2Flute | 0° | Metric | Radius | D0.5 | D2.0 | **561** |
| X5070 | G826 | High Feed End Mill  | 4Flute | 0° | Inch | Radius | D1/8 | D1/2 | **598** |
| | G8A43 |  | 2Flute | 30° | Inch | Ball | R1/64 | R1/4 | **599** |
| | G850 |  | 4Flute | 30° | Inch | Radius | D1/16 | D3/4 | **600** |
| | G851 |  | 6&8Flute | 45° | Inch | Radius | D1/4 | D1 | **601** |
| | G859 | High Feed End Mill  | 4Flute | 0° | Metric | Radius | D2.0 | D16.0 | **602** |
| | G854 | High Feed End Mill  | 4Flute | 0° | Metric | Radius | D2.0 | D16.0 | **603** |
| | G8A46 |  | 2Flute | 30° | Metric | Ball for Rib | R0.05 | R2.0 | **604** |
| | G8A54 |  | 2Flute | 30° | Metric | Ball for Rib | R0.25 | R1.0 | **608** |
| | G8A28 |  | 2Flute | 30° | Metric | Ball | R0.05 | R6.0 | **609** |
| | G8A38 |  | 2Flute | 30° | Metric | Stub Ball with Extended Neck | R0.5 | R12.5 | **610** |
| | G8A53 |  | 2Flute | 30° | Metric | Miniature Ball | R0.2 | R1.0 | **611** |
| | G8A59 |  | 3Flute | 30° | Metric | Ball | R1.5 | R10.0 | **612** |
| | G8A36 |  | 2Flute | 30° | Metric | Stub Radius with Extended Neck | D0.3 | D20.0 | **613** |
| | G8A50 |  | 2Flute | 30° | Metric | Miniature Radius | D0.3 | D2.0 | **615** |
| | G8A47 |  | 4Flute | 30° | Metric | Radius | D3.0 | D12.0 | **616** |
| | G8A37 |  | 4Flute | 30° | Metric | Stub Radius with Extended Neck | D1.0 | D20.0 | **617** |
| | G8A39 |  | 6Flute | 45° | Metric | Radius | D6.0 | D20.0 | **618** |
| 4G Mill | GMF15 |  | 2Flute | 30° | Inch | Ball | R.002 | R3/8 | **634** |
| | GMF16 |  | 2Flute | 30° | Inch | Ball with Neck | R.004 | R1/4 | **636** |
| | GMF17 |  | 4Flute | 30° | Inch | Ball | R.1/16 | R1/4 | **639** |
| | GMF18 |  | 2Flute | 30° | Inch | Radius | D3/64 | D3/4 | **640** |
| | GMF19 |  | 2Flute | 30° | Inch | Radius with Neck | D.008 | D3/4 | **643** |
| | GMF20 |  | 4Flute | M-Helix | Inch | Radius | D3/64 | D3/4 | **649** |
| | GMF21 |  | 4Flute | M-Helix | Inch | Radius with Neck | D3/64 | D3/4 | **651** |
| | GMF22 |  | 2Flute | 30° | Inch | with Neck | D.008 | D1/2 | **656** |
| | GMF23 |  | 2Flute | 30° | Inch | Square | D.004 | D3/4 | **659** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
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| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| 4G Mill | GMF24 |  | 2Flute | 30° | Inch | Long Square | D3/64 | D3/4 | **662** |
| | GMF25 |  | 4Flute | M-Helix | Inch | Square | D3/64 | D3/4 | **664** |
| | GMF26 |  | 4Flute | M-Helix | Inch | Square | D3/64 | D3/4 | **665** |
| | GMF27 |  | 4Flute | 30° | Inch | Long Square | D3/64 | D1 | **666** |
| | GMF28 |  | 4Flute | 30° | Inch | with Neck | D3/64 | D1/2 | **668** |
| | GMF29 |  | 6Flute | 45° | Inch | Square | D1/4 | D3/4 | **669** |
| | G907<br>G928 |  | 4&5Flute | M-Helix | Inch | Stub Roughing Radius | D1/4 | D1 | **670** |
| | G908<br>G929 |  | 4&5Flute | M-Helix | Inch | Regular Roughing Radius | D1/4 | D1 | **671** |
| | G909<br>G930 |  | 4&5Flute | M-Helix | Inch | Extended Reach Roughing Radius | D1/4 | D3/4 | **672** |
| | SEMD98 |  | 2Flute | 30° | Metric | Ball | R0.05 | R12.5 | **673** |
| | SEM846 |  | 2Flute | 30° | Metric | Long Neck Ball | R0.05 | R6.0 | **678** |
| | SEM846 |  | 2Flute | 30° | Metric | Long Neck Ball (6mm Shank) | R0.25 | R1.0 | **686** |
| | SEMD99 |  | 2Flute | 30° | Metric | Radius | D0.2 | D20.0 | **689** |
| | SEME61 |  | 2Flute | 30° | Metric | Long Neck Radius | D0.2 | D20.0 | **695** |
| | SEME01 |  | 4Flute | M-Helix | Metric | Radius | D1.0 | D20.0 | **710** |
| | SEME64 |  | 4Flute | M-Helix | Metric | Long Neck Radius | D1.0 | D20.0 | **715** |
| | SEME35 |  | 2Flute | 30° | Metric | Square | D0.03 | D25.0 | **727** |
| | SEME70 |  | 2Flute | 30° | Metric | Long Square | D1.0 | D25.0 | **732** |
| | SEM845 |  | 2Flute | 30° | Metric | Long Neck Square | D0.1 | D12.0 | **737** |
| | SEME36 |  | 4Flute | M-Helix | Metric | Square | D0.8 | D25.0 | **744** |
| | SEME71 |  | 4Flute | M-Helix | Metric | Square | D1.0 | D20.0 | **746** |
| | SEME72 |  | 4Flute | 30° | Metric | Long Square | D1.0 | D25.0 | **749** |
| | SEME73 |  | 4Flute | 30° | Metric | Long Neck Square | D1.0 | D12.0 | **754** |
| | SEME75 |  | 6Flute | 45° | Metric | Square | D6.0 | D20.0 | **758** |
| | G9D75<br>G9D67 |  | 4&5Flute | M-Helix | Metric | Short Radius | D6.0 | D20.0 | **759** |
| | G9D76<br>G9D68 |  | 4&5Flute | M-Helix | Metric | Long Radius | D6.0 | D20.0 | **760** |
| | G9D77<br>G9D69 |  | 4&5Flute | M-Helix | Metric | Long Reach Radius | D6.0 | D20.0 | **761** |
| | GAE53 |  | 4&5Flute | M-Helix | Metric | Short Radius | D6.0 | D20.0 | **762** |

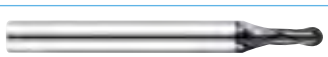
◎ : Excellent ○ : Good

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| X-POWER | EM154 |  | 2Flute | 30° | Inch | Regular | D1/16 | D1 | **824** |
| | EM206 |  | 2Flute | 30° | Inch | Long | D1/8 | D1 | **824** |
| | EM959 |  | 2Flute | 30° | Inch | Miniature | D.016 | D.062 | **825** |
| | EM153 |  | 4Flute | 30° | Inch | Regular | D1/16 | D1 | **826** |
| | EM207 |  | 4Flute | 30° | Inch | Long | D1/8 | D1 | **826** |
| | EM636 |  | 2Flute | 30° | Inch | Short Radius | D1/16 | D1/2 | **827** |
| | EM639 |  | 4Flute | 30° | Inch | Short Radius | D1/16 | D1/2 | **827** |
| | EM637 |  | 2Flute | 30° | Inch | Regular Radius | D1/16 | D1/2 | **828** |
| | EM649 |  | 4Flute | 30° | Inch | Regular Radius | D1/16 | D1/2 | **828** |
| | EM211 |  | 2Flute | 30° | Inch | Long Radius | D1/4 | D1/2 | **829** |
| | EM212 |  | 4Flute | 30° | Inch | Long Radius | D1/4 | D1/2 | **829** |
| | EM102 |  | 4Flute | 45° | Inch | Long | D3/8 | D7/8 | **830** |
| | EM103 |  | 4Flute | 45° | Inch | Long Reach Radius | D3/8 | D7/8 | **831** |
| | EM965 |  | 4Flute | 55° | Inch | Stub Radius | D1/4 | D1/2 | **832** |
| | EM208 |  | 6&8Flute | 45° | Inch | Long | D1/4 | D1 | **833** |
| | EM218 |  | 6&8Flute | 45° | Inch | Extra Long | D1/4 | D1 | **833** |
| | EM668 |  | 6&8Flute | 45° | Inch | Long Radius | D1/4 | D3/4 | **834** |
| | EM209 |  | 2Flute | 30° | Inch | Long Ball | R1/64 | R1/2 | **835** |
| | EM210 |  | 4Flute | 30° | Inch | Long Ball | R1/16 | R1/2 | **835** |
| | EM961 |  | 2Flute | 30° | Inch | Medium Ball | R1/16 | R1/2 | **836** |
| | EM962 |  | 2Flute | 30° | Inch | Long Reach Ball | R3/64 | R3/8 | **837** |
| | EM960 |  | 2Flute | 30° | Inch | Miniature Ball | R.012 | R.031 | **838** |
| | EM109 |  | 2Flute | 15° | Inch | Stub Ball | R1/64 | R1/4 | **839** |
| | EM963 |  | 2Flute | 30° | Inch | Ball with Taper Neck | R1/32 | R1/4 | **840** |
| | EM979 |  | 2Flute | 30° | Inch | Ball with Pencil Neck | R3/32 | R1/4 | **841** |
| | EM084 |  | 2Flute | 30° | Inch | Long Ball | R1/16 | R5/16 | **843** |
| | EM093 |  | 4Flute | 30° | Inch | Long Ball | R1/16 | R5/16 | **844** |
| | EM096 |  | 2Flute | 30° | Inch | Long Ball | R1/16 | R5/16 | **845** |

◎ : Excellent ○ : Good

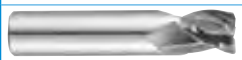
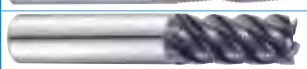
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| X-POWER | EM097 |  | 4Flute | 30° | Inch | Long Ball | R1/16 | R5/16 | **846** |
| | EM666 |  | 3~5Flute | 20° | Inch | Stub Roughing | D1/4 | D1 | **847** |
| | EM156 |  | 3~5Flute | 20° | Inch | Long Roughing | D1/4 | D1 | **847** |
| | EM662 |  | 3~5Flute | 20° | Inch | Long Roughing Ball | R1/8 | R1/2 | **848** |
| | EM966 |  | 2Flute | 30° | Inch | Rib | D1/32 | D1/8 | **849** |
| | EM967 |  | 2Flute | 30° | Inch | Ball for Rib | R1/64 | R1/16 | **850** |
| | EM810 |  | 2Flute | 30° | Metric | Short | D1.0 | D25.0 | **851** |
| | EM816 |  | 2Flute | 30° | Metric | Long | D2.0 | D25.0 | **852** |
| | EM811 |  | 4Flute | 30° | Metric | Short | D2.0 | D25.0 | **853** |
| | EM817 |  | 4Flute | 30° | Metric | Long | D2.0 | D25.0 | **854** |
| | EM895 |  | 3Flute | 38° | Metric | Short | D1.0 | D20.0 | **855** |
| | EM810 |  | 2Flute | 30° | Metric | Miniature | D0.4 | D1.5 | **856** |
| | EM818 |  | 2Flute | 30° | Metric | Long Radius | D3.0 | D20.0 | **857** |
| | EM819 |  | 4Flute | 30° | Metric | Long Radius | D3.0 | D20.0 | **857** |
| | EM905 |  | 4Flute | 45° | Metric | Short Radius | D10.0 | D22.0 | **858** |
| | EM839 |  | 4Flute | 30° | Metric | Stub Radius | D2.0 | D16.0 | **859** |
| | EM812 |  | 6&8Flute | 45° | Metric | Long | D6.0 | D25.0 | **860** |
| | EM834 |  | 6&8Flute | 45° | Metric | Extra Long | D6.0 | D25.0 | **860** |
| | EM835 |  | 6Flute | 45° | Metric | Long Radius | D6.0 | D20.0 | **861** |
| | EM897 |  | 6Flute | 45° | Metric | Stub Radius | D6.0 | D12.0 | **862** |
| | EM876 |  | 2Flute | 30° | Metric | Long Ball | R0.5 | R12.5 | **863** |
| | EM813<br>EM823 |  | 2Flute | 30° | Metric | Long Ball | R0.5 | R12.5 | **864** |
| | EM815<br>EM825 |  | 4Flute | 30° | Metric | Long Ball | R0.5 | R12.5 | **864** |
| | EM899 |  | 2Flute | 30° | Metric | Medium Ball | R1.5 | R12.5 | **865** |
| | EM838 |  | 2Flute | 30° | Metric | Long Reach Ball | R1.0 | R10.0 | **866** |
| | EM865 |  | 2Flute | 30° | Metric | Miniature Ball | R0.3 | R0.75 | **867** |
| | EM868 |  | 2Flute | 15° | Metric | Stub Ball | R0.5 | R12.5 | **868** |
| | EM902 |  | 2Flute | 30° | Metric | Ball with Taper Neck | R0.5 | R6.0 | **869** |

◎ : Excellent ○ : Good

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| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| X-POWER | EM669 |  | 2Flute | 30° | Metric | Long Ball | R1.5 | R8.0 | **870** |
| | EM673 |  | 4Flute | 30° | Metric | Long Ball | R2.5 | R8.0 | **871** |
| | EM863 |  | 2Flute | 30° | Metric | Long Ball | R1.5 | R8.0 | **872** |
| | EM864 |  | 4Flute | 30° | Metric | Long Ball | R2.5 | R8.0 | **873** |
| | EM832 |  | 3~5Flute | 20° | Metric | Short Roughing | D6.0 | D25.0 | **874** |
| | EM814 |  | 3~5Flute | 20° | Metric | Long Roughing | D6.0 | D25.0 | **875** |
| | EM833 |  | 3&4Flute | 20° | Metric | Long Roughing Ball | R3.0 | R10.0 | **876** |
| | EM837 |  | 2Flute | 30° | Metric | Taper | D2.0 | D8.0 | **877** |
| | EM883 |  | 2Flute | 30° | Metric | Rib | D0.8 | D3.0 | **878** |
| | EM886 |  | 2Flute | 30° | Metric | Ball for Rib | R0.3 | R2.0 | **879** |
| JET-POWER | EH108 |  | 3&4Flute | 50° | Inch | Regular | D1/8 | D1 | **906** |
| | EE882 |  | 6Flute | 35° | Inch | Regular | D3/4 | D1-1/2 | **907** |
| | E5075<br>E5105 |  | 3Flute | 35° | Inch | Stub Radius | D1/8 | D1 | **908** |
| | E5074<br>E5104 |  | 3Flute | 35° | Inch | Regular Radius | D1/8 | D1 | **909** |
| | EH094 |  | 3~5Flute | 30° | Inch | Stub Roughing | D1/4 | D1 | **910** |
| | EH095 |  | 3~5Flute | 30° | Inch | Long Roughing | D1/4 | D1 | **911** |
| | EH969 |  | 3~6Flute | 45° | Inch | Long Roughing | D3/16 | D1 | **912** |
| | EH970 |  | 4~6Flute | 45° | Inch | Long Reach Roughing | D1/4 | D3/4 | **913** |
| | EH830 |  | 3&4Flute | 50° | Metric | Long Square | D6.0 | D25.0 | **914** |
| | EE515 |  | 4&6Flute | 30° | Metric | Short Square | D3.0 | D25.0 | **915** |
| | EH852 |  | 3&5Flute | 30° | Metric | Short Roughing | D6.0 | D25.0 | **916** |
| | EH831 |  | 3&5Flute | 30° | Metric | Long Roughing | D6.0 | D25.0 | **917** |
| | EH917 |  | 4&6Flute | 45° | Metric | Short Roughing | D6.0 | D20.0 | **918** |
| | EH919 |  | 3&6Flute | 45° | Metric | Long Roughing | D4.0 | D25.0 | **919** |
| | EH921 |  | 4&6Flute | 45° | Metric | Long Reach Roughing | D6.0 | D20.0 | **920** |
| TitaNox-POWER | UGMG42 |  | 4Flute | M-Helix | Inch | Radius with Double Core | D1/4 | D1 | **928** |
| | UGMG34 |  | 5Flute | M-Helix | Inch | Square | D1/8 | D1 | **930** |
| | UGMG32 |  | 5Flute | M-Helix | Inch | Radius | D1/8 | D1 | **933** |

◎ : Excellent ○ : Good

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| TitaNox-POWER | GMG40 |  | 4Flute | M-Helix | Metric | Radius with Double Core | D6.0 | D25.0 | **934** |
| | GMG24 |  | 5Flute | M-Helix | Metric | Short | D6.0 | D25.0 | **936** |
| | GMG26 |  | 5Flute | M-Helix | Metric | Long | D6.0 | D25.0 | **937** |
| | GMG28 |  | 5Flute | M-Helix | Metric | Short Radius | D6.0 | D25.0 | **938** |
| | GMG30 |  | 5Flute | M-Helix | Metric | Long Radius | D6.0 | D25.0 | **939** |
| V7 PLUS A | UGMG53<br>UGMG54 |  | 4Flute | M-Helix | Inch | Ball | 1/8<br>11/32 | 1 | **950** |
| | UGMF70<br>UGMF71 |  | 4Flute | M-Helix | Inch | Radius | 1/8<br>3/8 | 1 | **951** |
| | UGMF74<br>UGMF75 |  | 4Flute | M-Helix | Inch | Radius with Neck | 1/4<br>3/8 | 1 | **954** |
| | UGMF68<br>UGMF69 |  | 4Flute | M-Helix | Inch | Square | 1/8<br>11/32 | 1 | **955** |
| | UGMF76<br>UGMF77 |  | 4Flute | M-Helix | Inch | Square | 3/8 | 1 | **956** |
| | UGMF72<br>UGMF73 |  | 4Flute | M-Helix | Inch | with Neck | 1/4<br>3/8 | 1 | **957** |
| | UGMG22<br>UGMG23 |  | 6Flute | 45° | Inch | Radius | 1/4<br>3/8 | 1 | **958** |
| | UGMG20<br>UGMG21 |  | 6Flute | 45° | Inch | Square | 1/4<br>3/8 | 1 | **961** |
| | GMG55<br>GMG56 |  | 4Flute | M-Helix | Metric | Ball | R1.5 | R12.5 | **962** |
| | GMF54<br>GMF55 |  | 4Flute | M-Helix | Metric | Short Radius | D3.0 | D20.0 | **963** |
| | GMF58<br>GMF59 |  | 4Flute | M-Helix | Metric | Long Radius | D3.0 | D25.0 | **964** |
| | GMF62<br>GMF63 |  | 4Flute | M-Helix | Metric | Radius with Neck | D3.0 | D20.0 | **965** |
| | GMF52<br>GMF53 |  | 4Flute | M-Helix | Metric | Short | D3.0 | D20.0 | **968** |
| | GMF56<br>GMF57 |  | 4Flute | M-Helix | Metric | Long | D3.0 | D25.0 | **969** |
| | GMF60<br>GMF61 |  | 4Flute | M-Helix | Metric | with Neck | R3.0 | R20.0 | **970** |
| | GMG16<br>GMG17 |  | 6Flute | 45° | Metric | Long Radius | D6.0 | D25.0 | **972** |
| | GMG18<br>GMG19 |  | 6Flute | 45° | Metric | Extra Long Radius | D6.0 | D25.0 | **973** |
| | GMG12<br>GMG13 |  | 6Flute | 45° | Metric | Long Square | D6.0 | D25.0 | **975** |
| | GMG14<br>GMG15 |  | 6Flute | 45° | Metric | Extra Long Square | D6.0 | D25.0 | **975** |
| V7 Mill INOX | EMC75<br>EMD60 |  | 4Flute | Sinusoidal | Inch | Stub Square | D1/8 | D1 | **988** |
| | EMC76<br>EMD61 |  | 4Flute | Sinusoidal | Inch | Stub Radius | D1/8 | D1 | **989** |
| | EMB12<br>EMB37 |  | 4Flute | Sinusoidal | Inch | Regular Square | D1/8 | D1 | **990** |
| | EMB13<br>EMB38 |  | 4Flute | Sinusoidal | Inch | Regular Radius | D1/8 | D1 | **991** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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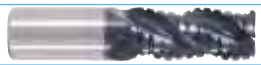
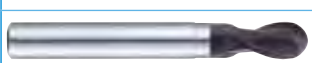
# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| V7 Mill INOX | EMB20 |  | 4Flute | Sinusoidal | Inch | Extended Long Reach | D1/4 | D1 | **992** |
| | EMB78<br>EMB79 |  | 4Flute | Sinusoidal | Inch | Regular Ball | R1/16 | R1/2 | **993** |
| | EMB76<br>EMB77 |  | 5Flute | Sinusoidal | Inch | Regular Square | D1/4 | D1 | **994** |
| | EMB41<br>EMB42 |  | 4Flute | Sinusoidal | Metric | Short Square | D3.0 | D20.0 | **995** |
| | EMB43<br>EMB44 |  | 4Flute | Sinusoidal | Metric | Short Radius | D3.0 | D20.0 | **996** |
| | EMB14<br>EMB39 |  | 4Flute | Sinusoidal | Metric | Regular Square | D3.0 | D25.0 | **997** |
| | EMB15<br>EMB40 |  | 4Flute | Sinusoidal | Metric | Regular Radius | D3.0 | D25.0 | **998** |
| | EMB74<br>EMB75 |  | 4Flute | Sinusoidal | Metric | Regular Ball | R1.5 | R12.5 | **999** |
| | EMB72<br>EMB73 |  | 5Flute | Sinusoidal | Metric | Regular Square | D6.0 | D25.0 | **1000** |
| ALU-POWER | E5253 |  | 2Flute | 42° | Inch | Regular | D1/4 | D1 | **1008** |
| | E5254 |  | 2Flute | 42° | Inch | Regular | D1/16 | D1 | **1009** |
| | E5976 |  | 2Flute | 37° | Inch | with Extended Neck | D1/4 | D1 | **1010** |
| | E5980 |  | 3Flute | 45° | Inch | Stub Square | D1/8 | D1 | **1011** |
| | E5981 |  | 3Flute | 45° | Inch | Regular Square | D1/8 | D1 | **1012** |
| | E5983 |  | 3Flute | 45° | Inch | Regular Radius | D1/2 | D1 | **1012** |
| | E5982 |  | 3Flute | 45° | Inch | Long Square | D1/4 | D1 | **1013** |
| | E5984 |  | 3Flute | 45° | Inch | Long Radius | D1/2 | D1 | **1013** |
| | E5E44 |  | 3Flute | 30° | Inch | Roughing | D1/4 | D1 | **1014** |
| | E5E98 |  | 3Flute | 30° | Inch | Roughing with Neck | D1/4 | D1 | **1014** |
| | E5E45 |  | 3Flute | 30° | Inch | Roughing Ball | D1/4 | D1 | **1015** |
| | E5977 |  | 3Flute | 37° | Inch | with Extended Neck | D1/4 | D1 | **1016** |
| | E5985 |  | 3Flute | 37° | Inch | Radius with Extended Neck | D1/2 | D1 | **1017** |
| | E5973 |  | 2Flute | 30° | Inch | Radius with Neck | D5/32 | D3/4 | **1018** |
| | E5974 |  | 3Flute | 50° | Inch | Stub Ball with Neck | R1/8 | R3/8 | **1019** |
| | E5978 |  | 2Flute | 37° | Inch | Long Reach Ball | R1/8 | R1/2 | **1020** |
| | E5975 |  | 3Flute | 40° | Inch | Long Ball with Neck | R3/64 | R5/16 | **1021** |
| | E5522<br>EG522 |  | 2Flute | 45° | Metric | Long Square | D3.0 | D20.0 | **1022** |
| | EG930 |  | 2Flute | 25° | Metric | Stub Radius | D2.0 | D20.0 | **1023** |

◎ : Excellent ○ : Good

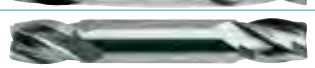
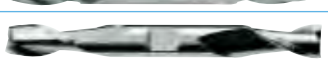
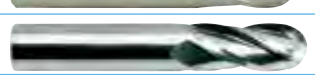
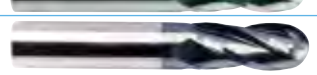
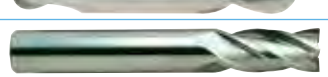
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| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| ALU-POWER | EG909 |  | 2Flute | 30° | Metric | Stub Radius with Extended Neck | D4.0 | D20.0 | **1024** |
| | EG910 |  | 2Flute | 50° | Metric | Stub Ball with Extended Neck | R3.0 | R10.0 | **1025** |
| | EG908 |  | 3Flute | 40° | Metric | Stub Ball with Extended Neck | R1.0 | R8.0 | **1026** |
| | EK191 |  | 3Flute | 42° | Inch | Regular Roughing | D1/2 | D2 | **1027** |
| | EK191 |  | 3Flute | 42° | Inch | Regular Radius Roughing | D3/4 | D1-1/4 | **1027** |
| | EK226 |  | 3Flute | 42° | Inch | Medium Roughing | D3/4 | D2 | **1028** |
| | EK226 |  | 3Flute | 42° | Inch | Medium Radius Roughing | D3/4 | D1-1/4 | **1028** |
| | EK192 |  | 3Flute | 42° | Inch | Long Roughing | D1/2 | D2 | **1029** |
| | EK192 |  | 3Flute | 42° | Inch | Long Radius Roughing | D3/4 | D1-1/4 | **1030** |
| | EK196 |  | 3Flute | 42° | Inch | Regular Ball Roughing | R1/4 | R5/8 | **1031** |
| | EK193<br>EK132 |  | 3Flute | 42° | Inch | Regular, Medium & Long Radius | D1/2 | D1-1/2 | **1032** |
| | EP922 |  | 3Flute | 42° | Metric | Short Roughing | D12.0 | D32.0 | **1034** |
| | EP924 |  | 3Flute | 42° | Metric | Long Roughing | D12.0 | D32.0 | **1035** |
| D-POWER GRAPHITE | EI107 |  | 4(2)Flute | 30° | Inch | Regular Square | D1/64 | D1/2 | **1050** |
| | EI099 |  | 2Flute | 30° | Inch | Regular Ball | R.0391 | R1/4 | **1051** |
| | EI106 |  | 4Flute | 30° | Inch | Regular Ball | R.0391 | R1/4 | **1051** |
| | EI971 |  | 2Flute | 30° | Inch | Long Ball | R.0391 | R1/4 | **1052** |
| | EI972 |  | 2Flute | 30° | Inch | Long Reach Ball | R.0391 | R5/32 | **1053** |
| | EIB07 |  | 4Flute | 30° | Inch | Regular Ball with Extended Neck | R.0156 | R.0625 | **1054** |
| | EIB05 |  | 4Flute | 30° | Inch | Regular Radius | D1/16 | D1/2 | **1055** |
| | EIB06 |  | 4Flute | 30° | Inch | Regular Radius with Extended Neck | D1/32 | D3/8 | **1056** |
| | EI880 |  | 2Flute | 30° | Metric | Short Ball | R1.0 | R6.0 | **1057** |
| | EI881 |  | 3Flute | 30° | Metric | Short Ball | R1.0 | R6.0 | **1057** |
| | EI451 |  | 2Flute | 30° | Metric | Long Ball | R1.0 | R6.0 | **1058** |
| | EI450 |  | 2Flute | 30° | Metric | Long Reach Ball | R1.0 | R4.0 | **1059** |
| D-POWER CFRP | GUG82 |  | 4&8Flute | 20°/20° | Inch | - | D1/4 | D1/2 | **1066** |
| | GUG83 |  | 4Flute | 15° | Inch | - | D1/4 | D1/2 | **1067** |
| ROUTERS | RTI105 |  | - | - | Inch | - | D1/4 | D1/2 | **1072** |

◎ : Excellent ○ : Good

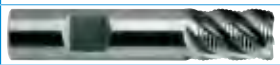
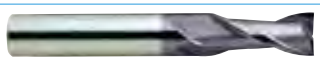
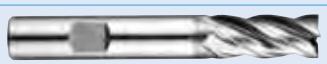
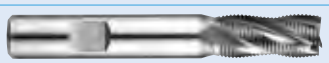
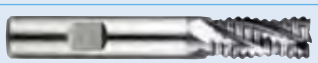
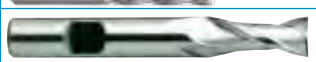
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| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| CARBIDE | UGMF90 |  | 2Flute | 30° | Inch | Regular Square | D1/8 | D1 | **1080** |
| | E5020 |  | 2Flute | 30° | Inch | Regular Square | D1/32 | D1 | **1081** |
| | UGMF89 |  | 4Flute | 30° | Inch | Square | D1/16 | D1 | **1082** |
| | E5021 |  | 4Flute | 30° | Inch | Regular Square | D1/16 | D1 | **1083** |
| | E5244 |  | 2Flute | 30° | Inch | Stub Square | D1/16 | D3/4 | **1084** |
| | UGMGF57 |  | 4Flute | 30° | Inch | Square | D1/16 | D3/4 | **1085** |
| | E5245 |  | 4Flute | 30° | Inch | Stub Square | D1/16 | D3/4 | **1086** |
| | E5011 |  | 2Flute | 30° | Inch | Long Square | D1/8 | D1 | **1087** |
| | E5012 |  | 4Flute | 30° | Inch | Long Square | D1/8 | D1 | **1087** |
| | UGMGF58 |  | 4Flute | 30° | Inch | Long Square | D1/8 | D1 | **1088** |
| | E5026 |  | 2Flute | 30° | Inch | Extra Long Square | D1/8 | D1 | **1089** |
| | UGMGF59 |  | 4Flute | 30° | Inch | Extra Long Square | D1/8 | D1 | **1090** |
| | E5065 |  | 4Flute | 30° | Inch | Extra Long Square | D1/8 | D1 | **1091** |
| | E5022 |  | 2Flute | 30° | Inch | Stub Double | D1/32 | D1/2 | **1092** |
| | E5023 |  | 4Flute | 30° | Inch | Stub Double | D1/16 | D1/2 | **1093** |
| | E5025 |  | 2Flute | 30° | Inch | Regular Double | D1/8 | D1/2 | **1094** |
| | E5024 |  | 4Flute | 30° | Inch | Regular Double | D1/8 | D1/2 | **1094** |
| | E5249 |  | 2Flute | 30° | Inch | Regular Ball | R1/16 | R1/2 | **1095** |
| | E5250 |  | 4Flute | 30° | Inch | Regular Ball | R1/16 | R1/2 | **1095** |
| | UGMF91 |  | 4Flute | 30° | Inch | Regular Ball | R1/16 | R1/2 | **1096** |
| | E5014 |  | 2Flute | 45° | Inch | Long Ball | R1/16 | R1/2 | **1097** |
| | E5060 |  | 4Flute | 30° | Inch | Long Ball | R1/16 | R1/2 | **1097** |
| | E5018 |  | 2Flute | 30° | Inch | Extra Long Ball | R1/16 | R1/2 | **1098** |
| | E5062 |  | 4Flute | 30° | Inch | Extra Long Ball | R1/16 | R1/2 | **1099** |
| | E5251<br>E5252 |  | 2&4Flute | 30° | Inch | Stub Ball Double | R7/64 | R1/4 | **1100** |
| | E5216 |  | 4Flute | 30° | Inch | Regular Radius | D1/8 | D1 | **1101** |
| | E5069 |  | 5Flute | 45° | Inch | Regular Radius | D1/4 | D1 | **1103** |
| | E5243 |  | 3Flute | 45° | Inch | Regular | D1/8 | D1 | **1104** |

◎ : Excellent ○ : Good

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
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| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
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| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
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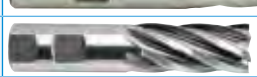
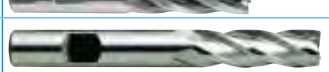
# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| CARBIDE | E5059 |  | 3Flute | 50° | Inch | Stub | D1/4 | D3/4 | **1105** |
| | E5246 |  | 3Flute | 60° | Inch | Regular | D1/8 | D1 | **1106** |
| | E5066 |  | 5Flute | 45° | Inch | Stub | D1/8 | D1 | **1107** |
| | E5067 |  | 5Flute | 45° | Inch | Regular | D1/8 | D1 | **1108** |
| | E5068 |  | 5Flute | 45° | Inch | Long Square | D1/4 | D1 | **1109** |
| | E5073 |  | 5Flute | 45° | Inch | Extra Long Square | D5/16 | D1 | **1110** |
| | E5058 |  | 6Flute | 40° | Inch | Regular Square | D3/16 | D3/4 | **1111** |
| | E5056<br>E5057 |  | 5Flute | 45° | Inch | Stub & Regular Roughing | D3/8 | D1 | **1112** |
| | E5077 |  | 3Flute | 30° | Inch | Taper | D3/32 | D1/4 | **1113** |
| | E5078 |  | 3Flute | 30° | Inch | Taper Ball | R.047 | R.125 | **1114** |
| | EH527 |  | 2Flute | 30° | Metric | Long | D3.5 | D20.0 | **1115** |
| | EH540 |  | 4Flute | 30° | Metric | Long | D3.5 | D20.0 | **1116** |
| | EH882 |  | 3Flute | 35° | Metric | Radius | D3.0 | D20.0 | **1117** |
| ONLY ONE | GYG64 |  | 2Flute | 30° | Inch | Square | D1/8 | D1 | **1130** |
| | GYG67 |  | 4Flute | 30° | Inch | Ball | R1/16 | R1/2 | **1131** |
| | GYG65 |  | 4Flute | 30° | Inch | Square | D1/8 | D1 | **1132** |
| | GYG66 |  | 4Flute | M-Helix | Inch | Square | D1/8 | D1 | **1133** |
| | GYG69 |  | 4&5Flute | M-Helix | Inch | Roughing Radius | D1/4 | D1 | **1134** |
| | GYG68 |  | 3-6Flute | 30° | Inch | Roughing | D1/4 | D1-1/4 | **1135** |
| | GYG70 |  | 3-6Flute | 30° | Inch | Roughing | D1/4 | D1-1/4 | **1136** |
| SINE-POWER | E2F64 |  | 4&6Flute | 35° | Inch | Square | D3/4 | D2 | **1146** |
| TANK-POWER | E9983 |  | 2Flute | 30° | Inch | Regular Square | D1/8 | D1 | **1152** |
| | E9984 |  | 2Flute | 30° | Inch | Regular Double Square | D1/8 | D1 | **1153** |
| | E9985 |  | 4Flute | 30° | Inch | Regular Square | D1/8 | D1 | **1154** |
| | E9986 |  | 4Flute | 30° | Inch | Regular Double Square | D1/8 | D1 | **1155** |
| | E9988 |  | 3&4Flute | 60° | Inch | Regular Square | D1/4 | D1 | **1156** |
| | E9992 |  | 2Flute | 30° | Inch | Regular Ball | R1/16 | R1/2 | **1157** |
| | E9990 |  | 3~6Flute | 30° | Inch | Regular Roughing | D1/4 | D1-1/4 | **1158** |

◎ : Excellent ○ : Good

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
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| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ○ | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |
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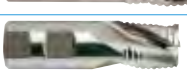
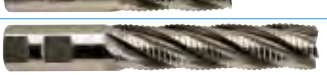
# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| TANK-POWER | E9991 |  | 3~6Flute | 30° | Inch | Regular Roughing | D1/4 | D1-1/4 | **1159** |
| | E9A86 |  | 3~6Flute | 30° | Inch | Long Roughing | D5/16 | D1-1/4 | **1160** |
| | E9A87 |  | 3~6Flute | 30° | Inch | Long Roughing | D5/16 | D1-1/4 | **1161** |
| | E9921 |  | 5~6Flute | 35° | Inch | Long Roughing with Neck | D1/2 | D1-1/4 | **1162** |
| COBALT & HSS | E2030<br>E1030 |  | 2Flute | 30° | Inch | Regular Square | D1/8 | D2 | **1175** |
| | E2080<br>E1080 |  | 2Flute | 30° | Inch | Long Square | D1/4 | D2 | **1177** |
| | E2033<br>E1033 |  | 2Flute | 30° | Inch | Extended Square | D1/8 | D1-1/4 | **1178** |
| | E2050<br>E1050 |  | 2Flute | 30° | Inch | Regular Double Square | D1/8 | D1 | **1179** |
| | E2110<br>E1110 |  | 2Flute | 30° | Inch | Regular Ball | R1/16 | R1 | **1181** |
| | E2111<br>E1111 |  | 2Flute | 30° | Inch | Extended Ball | R1/16 | R1/2 | **1182** |
| | E2112<br>E1112 |  | 2Flute | 30° | Inch | Regular Ball Double | R1/16 | R1/2 | **1183** |
| | E2031<br>E1031 |  | 4Flute | 30° | Inch | Regular Square | D1/8 | D1 | **1184** |
| | E2032<br>E1032 |  | 6Flute | 30° | Inch | Regular Square | D5/8 | D2 | **1186** |
| | E2034<br>E1034 |  | 4Flute | 30° | Inch | Long Square | D1/4 | D1 | **1187** |
| | E2035<br>E1035 |  | 6Flute | 30° | Inch | Long Square | D1-1/8 | D2 | **1187** |
| | E2036<br>E1036 |  | 4Flute | 30° | Inch | Extra Long Square | D1/4 | D1 | **1188** |
| | E2037<br>E1037 |  | 6Flute | 30° | Inch | Extra Long Square | D1-1/4 | D2 | **1188** |
| | E2051<br>E1051 |  | 4Flute | 30° | Inch | Regular Double Square | D1/8 | D1 | **1189** |
| | E2031<br>E1031 |  | 4Flute | 30° | Inch | Regular Square | D3/4 | D1 | **1191** |
| | E2032<br>E1032 |  | 6&8Flute | 30° | Inch | Regular Square | D1-1/8 | D2 | **1191** |
| | E2020 |  | 4Flute | 30° | Inch | Regular Ball | R1/16 | R1 | **1192** |
| | E2021 |  | 4Flute | 30° | Inch | Long Ball | R1/8 | R1/2 | **1193** |
| | E2069 |  | 4Flute | 30° | Inch | Regular Ball Double | R1/16 | R1/2 | **1194** |
| | E2039<br>E1039 |  | 4Flute | 30° | Inch | Regular Square | D1/8 | D1-1/2 | **1195** |
| | E2042<br>E1042 |  | 6Flute | 30° | Inch | Regular Square | D1/2 | D2 | **1197** |
| | E2039<br>E2042 |  | 4~8Flute | 30° | Inch | Medium Square | D1 | D2 | **1198** |
| | E2040<br>E1040 |  | 4Flute | 30° | Inch | Long Square | D1/4 | D1-1/2 | **1199** |
| | E2162<br>E1162 |  | 6Flute | 30° | Inch | Long Square | D1/2 | D2 | **1199** |

◎ : Excellent ○ : Good

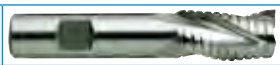
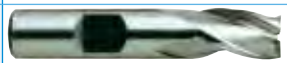
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# MILLING TOOLS **APPLICATION TABLE**

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| COBALT & HSS | E2041<br>E1041 |  | 4Flute | 30° | Inch | Extra Long Square | D1/4 | D1-1/4 | **1200** |
| | E2175<br>E1175 |  | 6Flute | 30° | Inch | Extra Long Square | D1/2 | D2 | **1200** |
| | E2053<br>E1053 |  | 4Flute | 30° | Inch | Regular Double Square | D1/8 | D1 | **1201** |
| | E2100<br>E1100 |  | 6Flute | 30° | Inch | Regular with Combination | D2 | D2 | **1203** |
| | E2001<br>E1001 |  | 2Flute | 30° & 39° | Inch | Miniature Stub Double | D1/32 | D3/16 | **1204** |
| | E2003<br>E1003 |  | 2Flute | 30° & 39° | Inch | Miniature Regular Double | D1/32 | D3/16 | **1205** |
| | E2005<br>E1005 |  | 2Flute | 30° & 39° | Inch | Miniature Long Double | D1/16 | D3/16 | **1206** |
| | E2002<br>E1002 |  | 4Flute | 30° & 39° | Inch | Miniature Stub Double | D1/16 | D3/16 | **1207** |
| | E2004<br>E1004 |  | 4Flute | 30° & 39° | Inch | Miniature Regular Double | D1/16 | D3/16 | **1208** |
| | E2006<br>E1006 |  | 4Flute | 30° & 39° | Inch | Miniature Long Double | D1/16 | D3/16 | **1209** |
| | E2008<br>E1008 |  | 2Flute | 30° & 39° | Inch | Miniature Stub Ball Double | R1/32 | R3/32 | **1210** |
| | E2013<br>E1013 |  | 2Flute | 30° & 39° | Inch | Miniature Regular Ball Double | R1/64 | R3/32 | **1211** |
| | E2015<br>E1015 |  | 2Flute | 30° & 39° | Inch | Miniature Long Ball Double | R1/32 | R3/32 | **1212** |
| | E1070 |  | 2Flute | 42° | Inch | Regular & Medium Square | D1/4 | D2 | **1213** |
| | E1071 |  | 2Flute | 42° | Inch | Long Square | D1/4 | D2 | **1214** |
| | E1072 |  | 2Flute | 42° | Inch | Extra Long Square | D1/4 | D1-1/2 | **1214** |
| | E2086 |  | 4~5Flute | 30° | Inch | Stub Roughing | D1/4 | D1 | **1215** |
| | E2085 |  | 3~5Flute | 30° | Inch | Regular Roughing | D1/4 | D1 | **1216** |
| | E2079 |  | 3~6Flute | 30° | Inch | Regular Roughing | D1/4 | D2 | **1217** |
| | E2077 |  | 4~6Flute | 30° | Inch | Long Roughing | D1/2 | D2 | **1218** |
| | E2086 |  | 3Flute | 30° | Inch | Stub Roughing | D1/4 | D1 | **1219** |
| | E2170 |  | 3~8Flute | 30° | Inch | Regular Roughing | D1/4 | D2 | **1220** |
| | E2171 |  | 5~8Flute | 30° | Inch | Medium Roughing | D1 | D2 | **1221** |
| | E2172 |  | 4~8Flute | 30° | Inch | Long Roughing | D1/2 | D2 | **1222** |
| | E2241 |  | 3Flute | 30° | Inch | Stub Roughing | D1/4 | D1 | **1223** |
| | E2195 |  | 4~6Flute | 30° | Inch | Regular Roughing | D1/2 | D1-1/2 | **1244** |
| | E2197 |  | 4~6Flute | 30° | Inch | Long Roughing | D1/2 | D1-1/2 | **1224** |
| | E2193<br>E2125 |  | 3~6Flute | 30° | Inch | Regular & Long Roughing | R1/8 | R3/4 | **1225** |

◎ : Excellent ○ : Good

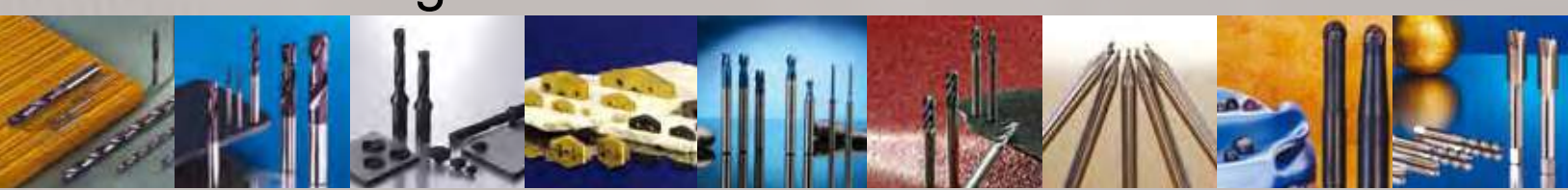
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

| | ITEM | MODEL | FLUTES | HELIX | INCH / METRIC | TYPE | SIZE RANGE | | PAGE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MIN | MAX | |
| COBALT & HSS | E2248 |  | 4~8Flute | 30° | Inch | Regular Roughing&Finishing | D1/4 | D2 | **1226** |
| | E2191 |  | 3Flute | 37° | Inch | Regular Roughing | D1/4 | D1-1/2 | **1227** |
| | E2226<br>E2192 |  | 3Flute | 37° | Inch | Medium & Long Roughing | D1/2 | D1-1/2 | **1228** |
| | E2163<br>E1163 |  | 2Flute | 15° | Inch | Keyway | D1/8 | D1 | **1229** |
| | E2120<br>E2121 |  | 3&4Flute | 60° | Inch | Regular Square | D1/4<br>D7/8 | D3/4<br>D2 | **1230** |
| | E2160 |  | 3Flute | 30° | Inch | Short Square | D1/16 | D1/4 | **1231** |
| | E2161 |  | 3Flute | 30° | Inch | Long Square | D1/16 | D1/4 | **1231** |
| | E2237<br>E1237 |  | 4Flute | 0° | Inch | Corner Rounding | D1/4 | D5/8 | **1232** |
| | E2482<br>E1482 |  | 4Flute | 30° | Inch | Regular Square | D2.0<br>(.0787) | D45.0<br>(1.772) | **1233** |
| | E2483<br>E1483 |  | 2Flute | 30° | Inch | Regular Square | D2.0<br>(.0787) | D45.0<br>(1.772) | **1234** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

Global Cutting Tool Leader **YG-1**



YG

Being the best through innovation



# CBN (Cubic Boron Nitride) END MILLS

- Cubic Boron Nitride, Machining High Hardened Steels up to HRc70, Mirror Finish

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| **ESB94** |  | CBN, 2 FLUTE BALL NOSE | R0.2 | R1.5 | **560** |
| **ESD02** |  | CBN, 2 FLUTE CORNER RADIUS | D0.5 | D2.0 | **561** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **562** |

◎ : Excellent ○ : Good

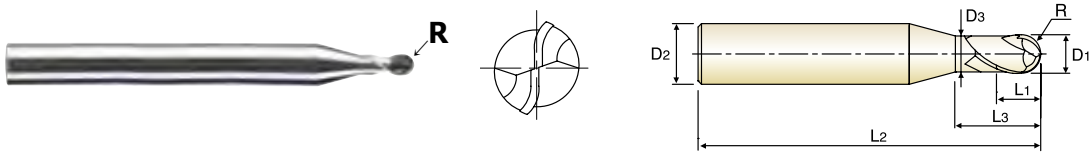
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |

# CBN END MILLS

**ESB94 SERIES** PLAIN SHANK

## CBN, 2 FLUTE BALL NOSE

- Higher accuracy, better finishes, longer tool life.
- Special geometry improves tool rigidity at high Speed.
- Tighter radius tolerance (±0.005mm) assures higher accuracy.




CBN | 2 | 30° | R ±0.005 | PLAIN

P.562

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| ESB94004012 | R0.2 | 0.4 | .0157 | 4 | 0.3 | 1.2 | 50 | 0.37 |
| ESB94005015 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 1.5 | 50 | 0.46 |
| ESB94006015 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 1.5 | 50 | 0.56 |
| ESB94008020 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 2 | 50 | 0.76 |
| ESB94010025 | R0.5 | 1.0 | .0394 | 4 | 0.6 | 2.5 | 50 | 0.95 |
| ESB94010040 | R0.5 | 1.0 | .0394 | 4 | 0.6 | 4 | 50 | 0.95 |
| ESB94010060 | R0.5 | 1.0 | .0394 | 4 | 0.6 | 6 | 50 | 0.95 |
| ESB94012030 | R0.6 | 1.2 | .0472 | 4 | 0.8 | 3 | 50 | 1.15 |
| ESB94015030 | R0.75 | 1.5 | .0591 | 4 | 0.95 | 3 | 50 | 1.45 |
| ESB94015040 | R0.75 | 1.5 | .0591 | 4 | 0.95 | 4 | 50 | 1.45 |
| ESB94015060 | R0.75 | 1.5 | .0591 | 4 | 0.95 | 6 | 50 | 1.45 |
| ESB94020050 | R1.0 | 2.0 | .0787 | 4 | 1.2 | 5 | 50 | 1.95 |
| ESB94020060 | R1.0 | 2.0 | .0787 | 4 | 1.2 | 6 | 50 | 1.95 |
| ESB94030060 | R1.5 | 3.0 | .1181 | 4 | 1.8 | 6 | 50 | 2.85 |

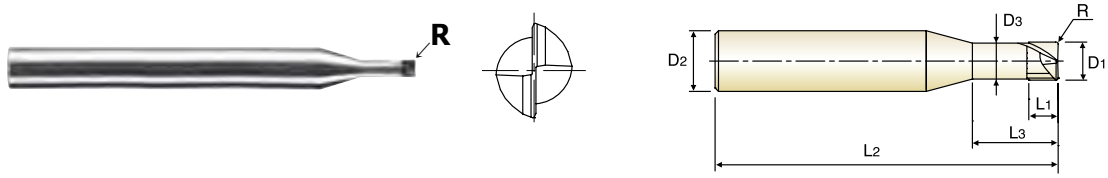
| Radius Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| ±0.005 | h5 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |

# CBN, 2 FLUTE CORNER RADIUS

- Higher accuracy, better finishes, longer tool life.
- Special geometry improves tool rigidity at high Speed.
- Tighter radius tolerance (±0.005mm) assures higher accuracy.




P.562

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| ESD02005052 | R0.05 | 0.5 | .0197 | 4 | 0.3 | 2 | 50 | 0.46 |
| ESD02005053 | R0.05 | 0.5 | .0197 | 4 | 0.3 | 3 | 50 | 0.46 |
| ESD02010053 | R0.05 | 1.0 | .0394 | 4 | 0.7 | 3 | 50 | 0.95 |
| ESD02010055 | R0.05 | 1.0 | .0394 | 4 | 0.7 | 5 | 50 | 0.95 |
| ESD02010103 | R0.1 | 1.0 | .0394 | 4 | 0.7 | 3 | 50 | 0.95 |
| ESD02010105 | R0.1 | 1.0 | .0394 | 4 | 0.7 | 5 | 50 | 0.95 |
| ESD02015105 | R0.1 | 1.5 | .0591 | 4 | 1.0 | 5 | 50 | 1.45 |
| ESD02015108 | R0.1 | 1.5 | .0591 | 4 | 1.0 | 8 | 50 | 1.45 |
| ESD02015205 | R0.2 | 1.5 | .0591 | 4 | 1.0 | 5 | 50 | 1.45 |
| ESD02015208 | R0.2 | 1.5 | .0591 | 4 | 1.0 | 8 | 50 | 1.45 |
| ESD02020106 | R0.1 | 2.0 | .0787 | 4 | 1.2 | 6 | 50 | 1.95 |
| ESD02020100 | R0.1 | 2.0 | .0787 | 4 | 1.2 | 10 | 50 | 1.95 |
| ESD02020206 | R0.2 | 2.0 | .0787 | 4 | 1.2 | 6 | 50 | 1.95 |
| ESD02020200 | R0.2 | 2.0 | .0787 | 4 | 1.2 | 10 | 50 | 1.95 |

| Corner Radius Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| ±0.005 | h5 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | ◎ | ◎ | | | | | | | | | |

# CBN END MILLS

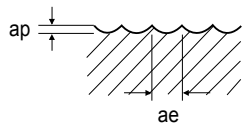
## RECOMMENDED CUTTING CONDITIONS

## CBN, 2 FLUTE BALL NOSE

### ESB94 SERIES

| MATERIAL | P | | H | |
|---|---|---|---|---|
| | HARDENED STEELS | | HIGH HARDENED STEELS | |
| HARDNESS | HRc50 ~ HRc60 | | HRc60 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R0.2 × 0.4 | 50,000 | 47.2 | 50,000 | 47.2 |
| R0.25 × 0.5 | 50,000 | 59.1 | 50,000 | 59.1 |
| R0.3 × 0.6 | 50,000 | 78.7 | 50,000 | 78.7 |
| R0.4 × 0.8 | 50,000 | 78.7 | 50,000 | 78.7 |
| R0.5 × 1.0 | 50,000 | 118.1 | 50,000 | 118.1 |
| R0.6 × 1.2 | 50,000 | 118.1 | 50,000 | 118.1 |
| R0.75 × 1.5 | 50,000 | 118.1 | 50,000 | 118.1 |
| R1.0 × 2.0 | 40,000 | 126.0 | 32,000 | 98.4 |
| R1.5 × 3.0 | 26,500 | 82.7 | 21,500 | 66.9 |

ap : R0.2 ~ R0.4 =0.005mm
R0.5 ~ R1.5 =0.01mm
ae : R0.2 ~ R0.4 =0.005mm
R0.5 ~ R1.5 =0.01 mm

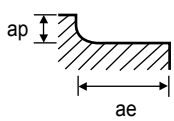



RPM = rev./min.
FEED = inch/min.

## CBN, 2 FLUTE CORNER RADIUS

### ESD02 SERIES

| MATERIAL | P | | | | H | | | |
|---|---|---|---|---|---|---|---|---|
| | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | HRc50 ~ HRc60 | | | | HRc60 ~ HRc70 | | | |
| DIAMETER | RPM | FEED | DEPTH OF CUT ae[mm] | DEPTH OF CUT ap[mm] | RPM | FEED | DEPTH OF CUT ae[mm] | DEPTH OF CUT ap[mm] |
| 0.5 | 50,000 | 27.6 | 0.10 | 0.01 | 50,000 | 21.7 | 0.06 | 0.005 |
| 1.0 | 43,000 | 39.4 | 0.20 | 0.01 | 30,000 | 27.6 | 0.10 | 0.10 |
| 1.5 | 30,000 | 39.4 | 0.40 | 0.02 | 19,000 | 27.6 | 0.20 | 0.20 |
| 2.0 | 22,000 | 35.4 | 0.60 | 0.03 | 14,000 | 31.5 | 0.30 | 0.30 |




RPM = rev./min.
FEED = inch/min.

# CARBIDE INSERT & HOLDER

Being the best through innovation











# i-Xmill

- Available for General Steels(~HRc50) Hardened Steels (up to HRc65) and Graphite

# SELECTION GUIDE


| ITEM | MODEL | DESCRIPTION | PAGE |
|---|---|---|---|
| **INCH** | | | |
| **XB1A** |  | i-Xmill BALL INSERT FOR GENERAL PURPOSE | **566** |
| **XB2C** | | i-Xmill BALL INSERT FOR HARDENED STEEL | |
| **XB1D** | | i-Xmill BALL INSERT FOR GRAPHITE | |
| **ZBT / ZBS** |  | i-Xmill BALL HOLDERS - STEEL | **567** |
| **ZBC** |  | i-Xmill BALL HOLDERS - CARBIDE | **568** |
| **XR1A** |  | i-Xmill CORNER RADIUS INSERTS FOR GENERAL PURPOSE | **569** |
| **XR2A** | | i-Xmill CORNER RADIUS INSERTS FOR HARDENED STEEL | |
| **XR1D** | | i-Xmill CORNER RADIUS INSERTS FOR GRAPHITE | |
| **ZRT / ZRS** |  | i-Xmill CORNER RADIUS HOLDERS - STEEL | **570** |
| **METRIC** | | | |
| **XB1N** |  | i-Xmill BALL INSERT FOR GENERAL PURPOSE | **571** |
| **XB2N** | | i-Xmill BALL INSERT FOR HARDENED STEEL | |
| **XBAD** | | i-Xmill BALL INSERT FOR GRAPHITE | |
| **ZBT / ZBS** |  | i-Xmill BALL HOLDERS - STEEL | **572** |
| **ZBC** |  | i-Xmill BALL HOLDERS - CARBIDE | **573** |
| **XRAA** |  | i-Xmill CORNER RADIUS INSERTS FOR GENERAL PURPOSE | **574** |
| **XRBA** | | i-Xmill CORNER RADIUS INSERTS FOR HARDENED STEEL | |
| **XRAD** | | i-Xmill CORNER RADIUS INSERTS FOR GRAPHITE | |
| **ZRT / ZRS** |  | i-Xmill CORNER RADIUS HOLDERS - STEEL | **576** |
| | | ASSEMBLY RECOMMENDATIONS | **577** |
| | | RECOMMENDED CUTTING CONDITIONS | **578** |

◎ : Excellent ○ : Good

| P | | | | | | | M | K | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite |
| ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | |
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |
| | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | |
| ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | |
| ○ | | ○ | | ○ | | | | | ○ | ◎ |
| | | | | | | | | | | |

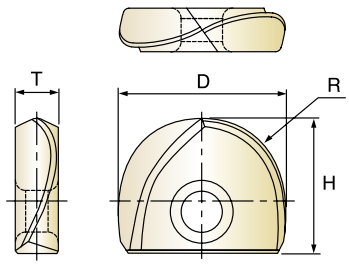
# i-Xmill END MILLS

XB1A SERIES
XB2C SERIES
XB1D SERIES

## i-Xmill BALL INSERTS

- Indexable Ball End Mill for economic use
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- Special Geometry and extremely abrasive resistant Coating for Excellent Performance






cutting conditions : p.578

Unit : Inch

| EDP No. For General Material | EDP No. For Hardened Material | EDP No. For Graphite | Radius of Ball Nose R | Mill Diameter D | Height H | Thickness T |
|---|---|---|---|---|---|---|
| **XB1A020** | **XB2C020** | **XB1D020** | R5/32 | **5/16** | 5/16 | .094 |
| **XB1A024** | **XB2C024** | **XB1D024** | R3/16 | **3/8** | 3/8 | .106 |
| **XB1A032** | **XB2C032** | **XB1D032** | R1/4 | **1/2** | 7/16 | .126 |
| **XB1A040** | **XB2C040** | **XB1D040** | R5/16 | **5/8** | 1/2 | .165 |
| **XB1A048** | **XB2C048** | **XB1D048** | R3/8 | **3/4** | 5/8 | .205 |
| **XB1A100** | **XB2C100** | **XB1D100** | R1/2 | **1** | 3/4 | .244 |
| **XB1A116** | **XB2C116** | **XB1D116** | R5/8 | **1-1/4** | 31/32 | .283 |

- The ball radius tolerance is ±.0004″ and the set-up accuracy is ±.0008″

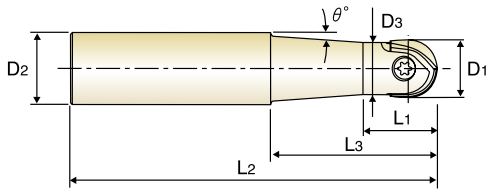
◎ : Excellent ○ : Good

| | P | | | | | | | M | K | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite | |
| | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | | |
| **XB1A** | ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | | |
| **XB2C** | ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | | |
| **XB1D** | ○ | | ○ | | ○ | | | | | ○ | ◎ | |

# i-Xmill BALL HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.





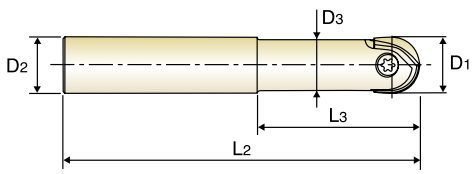

## Taper neck Type

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Interference Angle | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | D1 | D2 | L1 | L3 | L2 | D3 | θ ° | | | |
| ZBT1020 | 5/16 | 1/2 | 1/2 | 1-5/8 | 3-5/8 | 9/32 | 4° 33' | Short | TWF07 | TX0807 |
| ZBT2020 | | | 1 | 2-1/2 | 4-3/8 | | 3° 25' | Regular | | |
| ZBT1024 | 3/8 | 1/2 | 5/8 | 1-1/2 | 3-9/16 | 11/32 | 3° 49' | Short | TWF08 | TX1008 |
| ZBT2024 | | | 1-1/4 | 2-5/16 | 4-3/8 | | 3° 08' | Regular | | |
| ZBT1032 | 1/2 | 5/8 | 11/16 | 2-3/16 | 4-3/8 | 7/16 | 2° 49' | Short | TWF10 | TX1210 |
| ZBT1040 | 5/8 | 3/4 | 13/16 | 2-9/16 | 5 | 9/16 | 2° 25' | Short | TWF15 | TX1615 |
| ZBT1048 | 3/4 | 1 | 1 | 3-1/8 | 6 | 43/64 | 3° 53' | Short | ● TWB20 | TX2020 |
| ZBT1100 | 1 | 1-1/4 | 1-1/4 | 3-9/16 | 7 | 29/32 | 3° 45' | Short | ● TWB25 | TX2525 |
| ZBT1116 | 1-1/4 | 1-1/4 | 1-9/16 | 4-3/8 | 8 | 1-1/16 | 1° 30' | Short | ● TWB30 | TX3030 |

● Need to use T Handle : TWH600 (See page 52)






## Straight neck Type

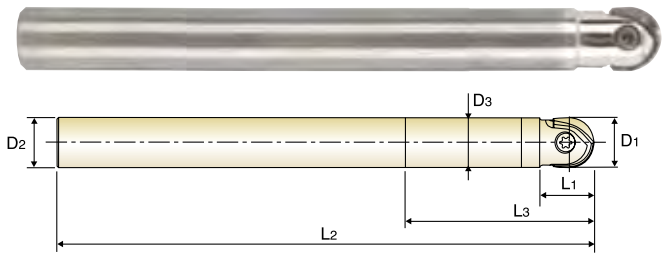
Unit :Inch

| EDP No. | Mill Diameter | Shank Diameter | Length Below Shank | Overall Length | Neck Diameter | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|
| | D1 | D2 | L3 | L2 | D3 | | | |
| ZBS1032 | 1/2 | 1/2 | 1-3/8 | 3-1/2 | 7/16 | Short | TWF10 | TX1210 |
| ZBS2032 | | | 2-3/16 | 4-3/8 | | Regular | | |
| ZBS1040 | 5/8 | 5/8 | 1-3/8 | 3-3/4 | 9/16 | Short | TWF15 | TX1615 |
| ZBS2040 | | | 2-9/16 | 5 | | Regular | | |
| ZBS1048 | 3/4 | 3/4 | 1-9/16 | 4-3/8 | 43/64 | Short | ● TWB20 | TX2020 |
| ZBS2048 | | | 3 | 6 | | Regular | | |
| ZBS1100 | 1 | 1 | 1-3/4 | 5 | 29/32 | Short | ● TWB25 | TX2525 |
| ZBS2100 | | | 3-9/16 | 6-3/4 | | Regular | | |
| ZBS1116 | 1-1/4 | 1-1/4 | 2-1/4 | 5-1/2 | 1-1/16 | Short | ● TWB30 | TX3030 |
| ZBS2116 | | | 4-3/8 | 7-3/4 | | Regular | | |

● Need to use T Handle : TWH600 (See page 52)

# i-Xmill BALL HOLDERS - CARBIDE

- Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- The high finishing machining for the deeper part of mold.
- The tool's life of carbide ball holders is longer than steel holder.
- Shrink Fit Holding system can be applied.
- Upon request, the worn holder is able to be regenerated.




Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|
| ZBCB020 | 5/16 | 5/16 | 1/2 | 1-9/16 | 5-1/8 | 19/64 | Long | TWF07 | TX0807 |
| ZBCB024 | 3/8 | 3/8 | 5/8 | 2 | 5-1/2 | 23/64 | Long | TWF08 | TX1008 |
| ZBCB032 | 1/2 | 1/2 | 11/16 | 2-3/8 | 5-15/16 | 31/64 | Long | TWF10 | TX1210 |
| ZBCB040 | 5/8 | 5/8 | 13/16 | 3-3/16 | 7-15/16 | 39/64 | Long | TWF15 | TX1615 |
| ZBCD040 | | | | | 9-7/8 | | | | |
| ZBCB048 | 3/4 | 3/4 | 1 | 3-3/16 | 7-15/16 | 47/64 | Long | ● TWB20 | TX2020 |
| ZBCC048 | | | | 4 | 9-7/8 | | | | |
| ZBCB100 | 1 | 1 | 1-3/16 | 4-3/4 | 9-7/8 | 63/64 | Long | ● TWB25 | TX2525 |
| ZBCB116 | 1-1/4 | 1-1/4 | 1-9/16 | 5-15/16 | 11-7/8 | 1-15/64 | Long | ● TWB30 | TX3030 |

● Need to use T Handle : TWH600 (See page 52)

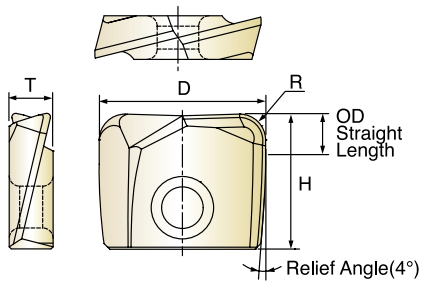
# i-Xmill END MILLS

XR1A SERIES
XR2A SERIES
XR1D SERIES

## i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The various and wide cutting range makes it possible to machine over the roughing and finishing.
- Special coating makes high hardness with high thermal stability against oxidation.
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite






cutting conditions : p.579

Unit : Inch

| EDP No. | | | Radius of Ball Nose | Mill Diameter | Height | Thickness | Thickness |
|---|---|---|---|---|---|---|---|
| For General Material | For Hardened Material | For Graphite | R | D | H | T | |
| XR1A020 01 | XR2A020 01 | XR1D020 01 | R1/64 | 5/16 | 5/16 | .094 | 2 |
| XR1A020 02 | XR2A020 02 | XR1D020 02 | R1/32 | | | | |
| XR1A024 01 | XR2A024 01 | XR1D024 01 | R1/64 | 3/8 | 3/8 | .106 | 3 |
| XR1A024 02 | XR2A024 02 | XR1D024 02 | R1/32 | | | | |
| XR1A024 04 | XR2A024 04 | XR1D024 04 | R1/16 | | | | |
| XR1A032 01 | XR2A032 01 | XR1D032 01 | R1/64 | 1/2 | 7/16 | .126 | 3 |
| XR1A032 02 | XR2A032 02 | XR1D032 02 | R1/32 | | | | |
| XR1A032 04 | XR2A032 04 | XR1D032 04 | R1/16 | | | | |
| XR1A040 01 | XR2A040 01 | XR1D040 01 | R1/64 | 5/8 | 1/2 | .165 | 4 |
| XR1A040 02 | XR2A040 02 | XR1D040 02 | R1/32 | | | | |
| XR1A040 04 | XR2A040 04 | XR1D040 04 | R1/16 | | | | |
| XR1A040 08 | XR2A040 08 | XR1D040 08 | R1/8 | | | | |
| XR1A048 01 | XR2A048 01 | XR1D048 01 | R1/64 | 3/4 | 5/8 | .205 | 4 |
| XR1A048 02 | XR2A048 02 | XR1D048 02 | R1/32 | | | | |
| XR1A048 04 | XR2A048 04 | XR1D048 04 | R1/16 | | | | |
| XR1A048 08 | XR2A048 08 | XR1D048 08 | R1/8 | | | | |
| XR1A100 01 | XR2A100 01 | XR1D100 01 | R1/64 | 1 | 3/4 | .244 | 4 |
| XR1A100 02 | XR2A100 02 | XR1D100 02 | R1/32 | | | | |
| XR1A100 04 | XR2A100 04 | XR1D100 04 | R1/16 | | | | |
| XR1A100 08 | XR2A100 08 | XR1D100 08 | R1/8 | | | | |
| XR1A116 01 | XR2A116 01 | XR1D116 01 | R1/64 | 1-1/4 | 29/32 | .283 | 4 |
| XR1A116 02 | XR2A116 02 | XR1D116 02 | R1/32 | | | | |
| XR1A116 04 | XR2A116 04 | XR1D116 04 | R1/16 | | | | |
| XR1A116 08 | XR2A116 08 | XR1D116 08 | R1/8 | | | | |

- The other corner radius values are available on request.
- The corner radius tolerance is ±.0006″ and the set-up accuracy is ±.0008″

◎ : Excellent ○ : Good

| | P | | | | | | | M | K | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite | |
| | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | | |
| XR1A | ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | | |
| XR2A | ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | | |
| XR1D | ○ | | ○ | | ○ | | | | | ○ | ◎ | |

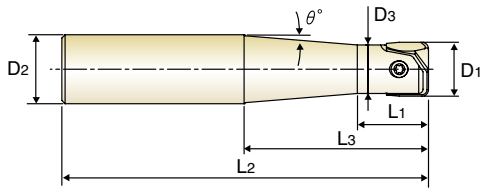
YG i-Xmill END MILLS

ZRT SERIES
ZRS SERIES

# i-Xmill CORNER RADIUS HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.



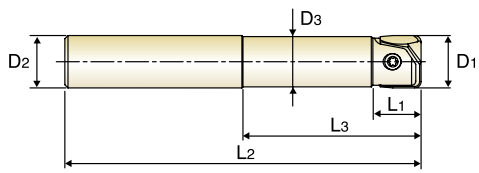



## Taper neck Type

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Interference Angle θ ° | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|
| ZRT1032 | 5/16 | 1/2 | 13/32 | 7/8 | 4 | 17/64 | 13° 58' | Regular | TWF07 | TX0807 |
| ZRT2032 | | | | 2 | 5-1/8 | | 4° 12' | Long | | |
| ZRT2410 | 3/8 | 1/2 | 17/32 | 1 | 4 | 5/16 | 9° 27' | Regular | TWF08 | TX1008 |
| ZRT2420 | | | | 2 | 5-15/16 | | 3° 6' | Long | | |
| ZRT3220 | 1/2 | 5/8 | 5/8 | 2-3/8 | 6-5/16 | 27/64 | 3° 19' | Long | TWF10 | TX1210 |






## Straight neck Type

Unit :Inch

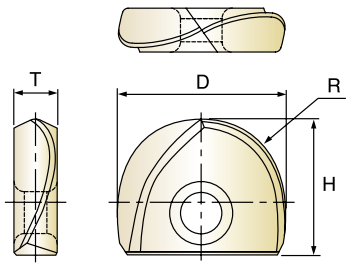
| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|
| ZRS1032 | 1/2 | 1/2 | 17/32 | 1-3/16 | 4-3/8 | 7/16 | Regular | TWF10 | TX1210 |
| ZRS1040 | 5/8 | 5/8 | 5/8 | 2 | 5-1/8 | 19/32 | Regular | TWF15 | TX1615 |
| ZRS2040 | | | | 2-9/16 | 6-1/2 | | Intermediate | | |
| ZRS1048 | 3/4 | 3/4 | 23/32 | 2-3/8 | 5-1/2 | 23/32 | Regular | ● TWB20 | TX2020 |
| ZRS2048 | | | | 3-1/8 | 7-1/8 | | Intermediate | | |
| ZRS1100 | 1 | 1 | 29/32 | 2-3/4 | 5-15/16 | 31/32 | Regular | ● TWB25 | TX2525 |
| ZRS2100 | | | | 3-9/16 | 8 | | Intermediate | | |
| ZRS1116 | 1-1/4 | 1-1/4 | 1-1/8 | 3-1/8 | 6-5/16 | 1-7/32 | Regular | ● TWB30 | TX3030 |
| ZRS2116 | | | | 4 | 8-11/16 | | Intermediate | | |

● Need to use T Handle : TWH600 (See page 52)

# i-Xmill BALL INSERTS

- ▶ Indexable Ball End Mill for economic use
- ▶ Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite
- ▶ Special Geometry and extremely abrasive resistant Coating for Excellent Performance






cutting conditions : p.578

Unit : mm

| EDP No. | | | Radius of Ball Nose | Mill Diameter | Height | Thickness |
|---|---|---|---|---|---|---|
| For General Material | For Hardened Material | For Graphite | R | D | H | T |
| XB1N080 | XB2N080 | XBAD080 | R4.0 | 8.0 | 8 | 2.4 |
| XB1N100 | XB2N100 | XBAD100 | R5.0 | 10.0 | 9.5 | 2.7 |
| XB1N120 | XB2N120 | XBAD120 | R6.0 | 12.0 | 11 | 3.2 |
| XB1N160 | XB2N160 | XBAD160 | R8.0 | 16.0 | 13 | 4.2 |
| XB1N200 | XB2N200 | XBAD200 | R10.0 | 20.0 | 16 | 5.2 |
| XB1N250 | XB2N250 | XBAD250 | R12.5 | 25.0 | 19.5 | 6.2 |
| XB1N300 | XB2N300 | XBAD300 | R15.0 | 30.0 | 23.5 | 7.2 |
| XB1N320 | XB2N320 | XBAD320 | R16.0 | 32.0 | 24.5 | 7.2 |

• The ball radius tolerance is ±0.01mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

| | P | | | | | | | M | K | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite | |
| | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | | |
| XB1N | ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | | |
| XB2N | ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | | |
| XBAD | ○ | | ○ | | ○ | | | | | ○ | ◎ | |

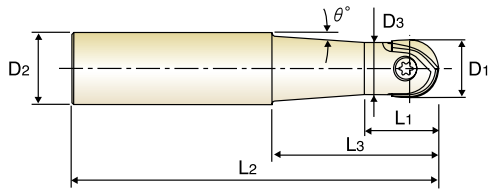
YG i-Xmill END MILLS

ZBT SERIES
ZBS SERIES

# i-Xmill BALL HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.





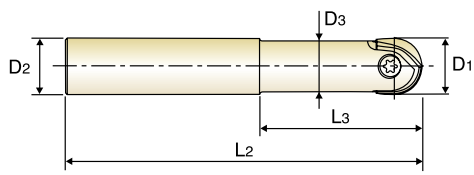

## Taper neck Type

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Interference Angle θ ° | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|
| ZBT0801 | 8.0 | 12 | 12 | 35 | 90 | 7.2 | 4° 43′ | Short | TWF07 | TX0807 |
| ZBT0802 | | | 25 | 55 | 110 | | 3° 37′ | Regular | | |
| ZBT1001 | 10.0 | 12 | 15 | 35 | 90 | 9 | 2° 51′ | Short | TWF08 | TX1008 |
| ZBT1002 | | | 30 | 55 | 110 | | 2° 17′ | Regular | | |
| ZBT1201 | 12.0 | 16 | 17 | 55 | 110 | 10.5 | 3° 23′ | Short | TWF10 | TX1210 |
| ZBT1601 | 16.0 | 20 | 20 | 65 | 125 | 14.5 | 2° 51′ | Short | TWF15 | TX1615 |
| ZBT2001 | 20.0 | 25 | 25 | 75 | 145 | 18 | 3° 26′ | Short | ● TWB20 | TX2020 |
| ZBT2501 | 25.0 | 32 | 30 | 90 | 170 | 22.5 | 4° 03′ | Short | ● TWB25 | TX2525 |
| ZBT3001 | 30.0<br>32.0 | 32 | 40 | 110 | 195 | 27 | 1° 38′ | Short | ● TWB30 | TX3030 |

● Need to use T Handle : TWH600 (See page 52)






## Straight neck Type

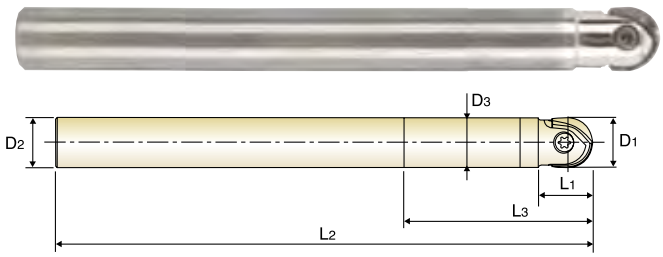
Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|
| ZBS1201 | 12.0 | 12 | 35 | 90 | 10.5 | Short | TWF10 | TX1210 |
| ZBS1202 | | | 55 | 110 | | Regular | | |
| ZBS1601 | 16.0 | 16 | 35 | 95 | 14.5 | Short | TWF15 | TX1615 |
| ZBS1602 | | | 65 | 125 | | Regular | | |
| ZBS2001 | 20.0 | 20 | 40 | 110 | 18 | Short | ● TWB20 | TX2020 |
| ZBS2002 | | | 75 | 145 | | Regular | | |
| ZBS2501 | 25.0 | 25 | 45 | 125 | 22.5 | Short | ● TWB25 | TX2525 |
| ZBS2502 | | | 90 | 170 | | Regular | | |
| ZBS3001 | 30.0<br>32.0 | 32 | 55 | 140 | 27 | Short | ● TWB30 | TX3030 |
| ZBS3002 | | | 110 | 195 | | Regular | | |

● Need to use T Handle : TWH600 (See page 52)

# i-Xmill BALL HOLDERS - CARBIDE

- Equal tool rigidity like solid carbide end mill that makes the stable and high finishing machining with less vibration.
- The high finishing machining for the deeper part of mold.
- The tool's life of carbide ball holders is longer than steel holder.
- Shrink Fit Holding system can be applied.
- Upon request, the worn holder is able to be regenerated.




Unit : mm

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|
| | D1 | D2 | L1 | L3 | L2 | D3 | | | |
| ZBC1080 | 8.0 | 8 | 12 | 25 | 130 | 7.7 | Long | TWF07 | TX0807 |
| ZBC1100 | 10.0 | 10 | 15 | 30 | 140 | 9.7 | Long | TWF08 | TX1008 |
| ZBC1120 | 12.0 | 12 | 17 | 35 | 150 | 11.7 | Long | TWF10 | TX1210 |
| ZBC1160 | 16.0 | 16 | 20 | 50 | 200 | 15.7 | Long | TWF15 | TX1615 |
| ZBC1200 | 20.0 | 20 | 25 | 60 | 200 | 19.7 | Long | ● TWB20 | TX2020 |
| ZBC1250 | 25.0 | 25 | 30 | 75 | 200 | 24.7 | Long | ● TWB25 | TX2525 |
| ZBC1320 | 30.0<br>32.0 | 32 | 40 | 90 | 250 | 29.7 | Long | ● TWB30 | TX3030 |

● Need to use T Handle : TWH600 (See page 52)

# i-Xmill END MILLS

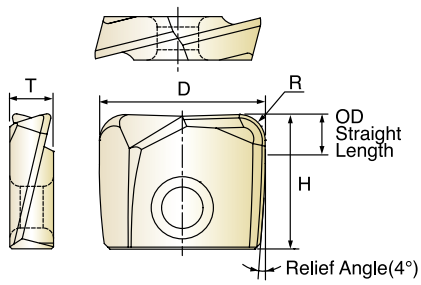
XRAA SERIES
XRBA SERIES
XRAD SERIES

## i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The various and wide cutting range makes it possible to machine over the roughing and finishing.
- Special coating makes high hardness with high thermal stability against oxidation.
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Material (HRc40~HRc65)
  - For Graphite



cutting conditions : p.579




Unit : mm

| EDP No. For General Material | EDP No. For Hardened Material | EDP No. For Graphite | Corner Radius R | Mill Diameter D | Height H | Thickness T | OD Straight Length |
|---|---|---|---|---|---|---|---|
| XRAA080 03 | XRBA080 03 | XRAD080 03 | R0.3 | 8.0 | 8 | 2.4 | 2 |
| XRAA080 05 | XRBA080 05 | XRAD080 05 | R0.5 | | | | |
| XRAA080 10 | XRBA080 10 | XRAD080 10 | R1.0 | | | | |
| XRAA100 05 | XRBA100 05 | XRAD100 05 | R0.5 | 10.0 | 9.5 | 2.7 | 3 |
| XRAA100 10 | XRBA100 10 | XRAD100 10 | R1.0 | | | | |
| XRAA100 20 | XRBA100 20 | XRAD100 20 | R2.0 | | | | |
| XRAA120 05 | XRBA120 05 | XRAD120 05 | R0.5 | 12.0 | 11 | 3.2 | 3 |
| XRAA120 10 | XRBA120 10 | XRAD120 10 | R1.0 | | | | |
| XRAA120 20 | XRBA120 20 | XRAD120 20 | R2.0 | | | | |
| XRAA130 05 | XRBA130 05 | XRAD130 05 | R0.5 | 13.0 | 11.2 | 3.2 | 3 |
| XRAA130 10 | XRBA130 10 | XRAD130 10 | R1.0 | | | | |
| XRAA130 20 | XRBA130 20 | XRAD130 20 | R2.0 | | | | |
| XRAA160 05 | XRBA160 05 | XRAD160 05 | R0.5 | 16.0 | 13 | 4.2 | 4 |
| XRAA160 10 | XRBA160 10 | XRAD160 10 | R1.0 | | | | |
| XRAA160 20 | XRBA160 20 | XRAD160 20 | R2.0 | | | | |
| XRAA170 05 | XRBA170 05 | XRAD170 05 | R0.5 | 17.0 | 13 | 4.2 | 4 |
| XRAA170 10 | XRBA170 10 | XRAD170 10 | R1.0 | | | | |
| XRAA170 20 | XRBA170 20 | XRAD170 20 | R2.0 | | | | |

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

▶ NEXT PAGE

◎ : Excellent ○ : Good

| | P | | | | | | | M | K | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite | |
| | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | | |
| XRAA | ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | | |
| XRBA | ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | | |
| XRAD | ○ | | ○ | | ○ | | | | | ○ | ◎ | |

# i-Xmill END MILLS

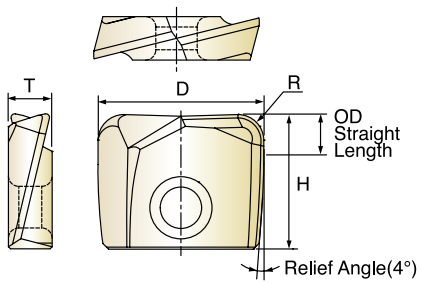
XRAA SERIES XRBA SERIES XRAD SERIES

## i-Xmill CORNER RADIUS INSERTS

- The optimum geometry of the tool to achieve the better reliability and less vibration and cutting load.
- Interchangeability with i-Xmill ball holder, but the precise cutting is possible with i-Xmill corner radius holder due to higher stability and strength of tool.
- The various and wide cutting range makes it possible to machine over the roughing and finishing.
- Special coating makes high hardness with high thermal stability against oxidation.
- Three Types of Inserts are available
  - For General Purpose (~HRc50)
  - For Hardened Mat erial (HRc40~HRc65)
  - For Graphite



cutting conditions : p.579




Unit : mm

| EDP No. | | | Corner Radius | Mill Diameter | Height | Thickness | OD Straight Length |
|---|---|---|---|---|---|---|---|
| For General Material | For Hardened Material | For Graphite | R | D | H | T | |
| XRAA200 05 | XRBA200 05 | XRAD200 05 | R0.5 | 20.0 | 16 | 5.2 | 4 |
| XRAA200 10 | XRBA200 10 | XRAD200 10 | R1.0 | | | | |
| XRAA200 20 | XRBA200 20 | XRAD200 20 | R2.0 | | | | |
| XRAA210 05 | XRBA210 05 | XRAD210 05 | R0.5 | 21.0 | 16 | 5.2 | 4 |
| XRAA210 10 | XRBA210 10 | XRAD210 10 | R1.0 | | | | |
| XRAA210 20 | XRBA210 20 | XRAD210 20 | R2.0 | | | | |
| XRAA250 05 | XRBA250 05 | XRAD250 05 | R0.5 | 25.0 | 19.5 | 6.2 | 4 |
| XRAA250 10 | XRBA250 10 | XRAD250 10 | R1.0 | | | | |
| XRAA250 20 | XRBA250 20 | XRAD250 20 | R2.0 | | | | |
| XRAA260 05 | XRBA260 05 | XRAD260 05 | R0.5 | 26.0 | 19.5 | 6.2 | 4 |
| XRAA260 10 | XRBA260 10 | XRAD260 10 | R1.0 | | | | |
| XRAA260 20 | XRBA260 20 | XRAD260 20 | R2.0 | | | | |
| XRAA300 05 | XRBA300 05 | XRAD300 05 | R0.5 | 30.0 | 23.5 | 7.2 | 4 |
| XRAA300 10 | XRBA300 10 | XRAD300 10 | R1.0 | | | | |
| XRAA300 20 | XRBA300 20 | XRAD300 20 | R2.0 | | | | |
| XRAA320 05 | XRBA320 05 | XRAD320 05 | R0.5 | 32.0 | 23.5 | 7.2 | 4 |
| XRAA320 10 | XRBA320 10 | XRAD320 10 | R1.0 | | | | |
| XRAA320 20 | XRBA320 20 | XRAD320 20 | R2.0 | | | | |

- The other corner radius values are available on request.
- The corner radius tolerance is ±0.015mm and the set-up accuracy is ±0.02mm

◎ : Excellent ○ : Good

| | P | | | | | | | M | K | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | | Alloy Steels | | Tool Steels | | Hardened Steels | Stainless Steels | Cast Iron | Aluminum | Graphite | |
| | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | ~HRc35 | HRc35~ | HRc50~ | ~HRc28 | ~HRc35 | ~HRc8 | | |
| XRAA | ◎ | ○ | ◎ | ○ | ◎ | ○ | | ○ | ○ | ○ | | |
| XRBA | ○ | ◎ | ○ | ◎ | ○ | ◎ | ◎ | | ◎ | | | |
| XRAD | ○ | | ○ | | ○ | | | | | ○ | ◎ | |

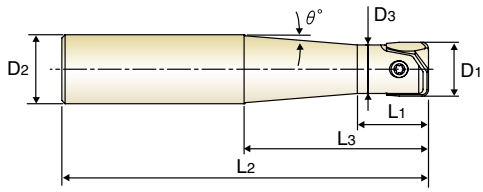
# i-Xmill END MILLS

ZRT SERIES
ZRS SERIES

## i-Xmill CORNER RADIUS HOLDERS - STEEL

- Premium alloy steel with excellent strength.
- Precise shank, Tolerance (h6).
- Nickel plated, to prevent corrosion and improve lubricity.



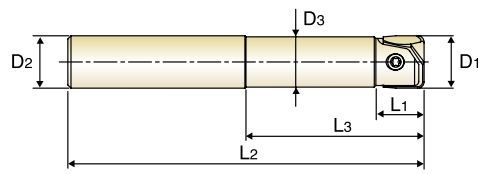



### Taper neck Type

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Interference Angle θ ° | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|---|
| ZRT8011 | 8.0 | 12 | 10 | 22 | 100 | 6.7 | 9° | Regular | TWF07 | TX0807 |
| ZRT8021 | | | | 50 | 130 | | 2° 43' | Long | | |
| ZRT1001 | 10.0 | 12 | 13 | 25 | 100 | 8.6 | 4° 45' | Regular | TWF08 | TX1008 |
| ZRT1002 | | | | 50 | 150 | | 1° 32' | Long | | |
| ZRT1202 | 12.0<br>13.0 | 16 | 15 | 60 | 160 | 10.2 | 2° 32' | Long | TWF10 | TX1210 |






### Straight neck Type

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | Length Type | Wrench No. | Screw No. |
|---|---|---|---|---|---|---|---|---|---|
| ZRS1120 | 12.0<br>13.0 | 12 | 13 | 30 | 110 | 11 | Regular | TWF10 | TX1210 |
| ZRS1160 | 16.0<br>17.0 | 16 | 15 | 50 | 130 | 15 | Regular | TWF15 | TX1615 |
| ZRS2160 | | | | 65 | 165 | | Intermediate | | |
| ZRS1200 | 20.0<br>21.0 | 20 | 18 | 60 | 140 | 19 | Regular | ● TWB20 | TX2020 |
| ZRS2200 | | | | 80 | 180 | | Intermediate | | |
| ZRS1250 | 25.0<br>26.0 | 25 | 23 | 70 | 150 | 24 | Regular | ● TWB25 | TX2525 |
| ZRS2250 | | | | 90 | 200 | | Intermediate | | |
| ZRS1300 | 30.0 | 32 | 27 | 80 | 160 | 29 | Regular | ● TWB30 | TX3030 |
| ZRS2300 | | | | 100 | 220 | | Intermediate | | |
| ZRS1320 | 32.0 | 32 | 28 | 80 | 160 | 31 | Regular | ● TWB30 | TX3030 |
| ZRS2320 | | | | 100 | 220 | | Intermediate | | |

● Need to use T Handle : TWH600 (See page 52)

## ASSEMBLY OF *i*-Xmill



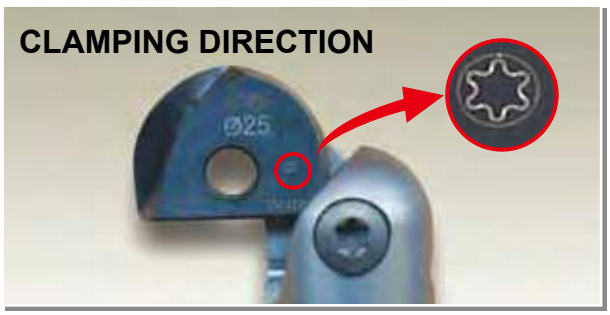

◀ Make sure to clean the insert and insert seat.



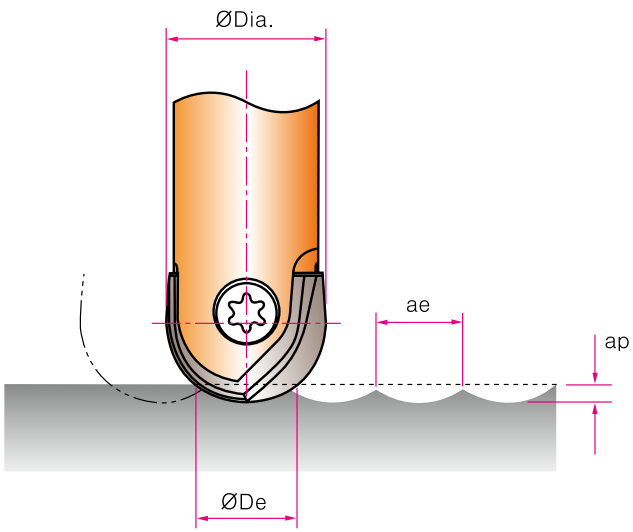

◀ Slide the insert into the slot of the holder.
Tighten the screw using anti-seize compound.

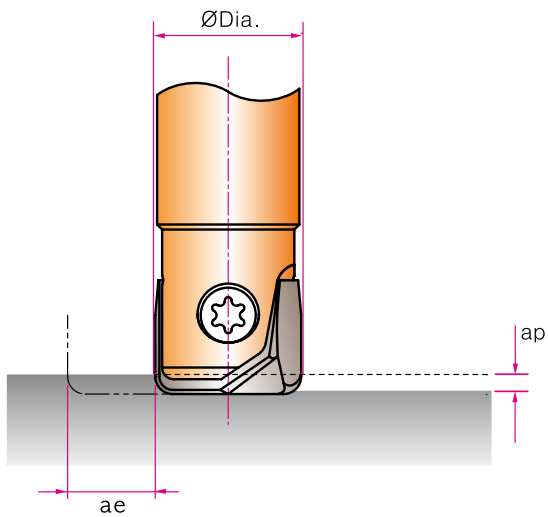
| SIZE ØD | CLAMPING TORQUE [ in · lbs ] |
|---|---|
| Ø5/16 (Ø8) | 9.0 |
| Ø3/8 (Ø10) | 13.5 |
| Ø1/2 (Ø12~Ø13) | 22.5 |
| Ø5/8 (Ø16~Ø17) | 31.5 |
| Ø3/4 (Ø20~Ø21) | 44.5 |
| Ø1 (Ø25~Ø26) | 53.0 |
| Ø1-1/4 (Ø30~Ø32) | 58.0 |

* When the screw is worn out, please change the new screw.
* Please tighten up the screw with recommended torque. (Please refer to the table)
* Don't press down the insert, when the screw is tightened.




## CUTTING CONDITION




**RPM** = revolution per minute (rev/min)
**SFM** = surface feet per minute (ft/min)
**Dia.** = diameter of insert (inch)
**IPR** = feed rate (inch/rev)
**IPM** = inch per minute penetration rate
**De** = effective tool diameter (inch)
**ap** = axial depth of cut (inch)
**ae** = radial depth of cut (inch)

$$\text{SFM [ft/min]} = \frac{(\text{RPM}) \cdot (\pi) \cdot (\text{Dia.})}{12}$$

$$\text{IPM [inch/min]} = (\text{RPM}) \cdot (\text{IPR})$$

$$\text{RPM [rev/min]} = \frac{(\text{SFM}) \cdot (12)}{(\pi) \cdot (\text{Dia.})}$$

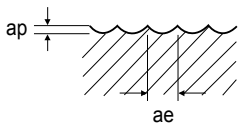
$$\text{De [inch]} = 2\sqrt{(\text{ap}) \cdot (\text{Dia.-ap})}$$

# i-Xmill BALL INSERTS

## XB1A, XB2C, XB1N, XB2N SERIES

| WORK MATERIAL | | P | | | | P | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | |
| HARDNESS | HB | ~280 | | | | 280~380 | | | |
| | HRc | ~30 | | | | 30~40 | | | |
| STRENGTH | N/mm² | ~1000 | | | | 1000~1250 | | | |
| *i*-Xmill TYPE | | XB1A, XB1N | | | | XB1A, XB1N | | | |
| CUTTING CONDITION Roughing~Finishing | | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] |
| Ø5/16(Ø8) | | 6370~12730 | 100~200 | 525~1050 | .008~.008 | 4770~11140 | 80~180 | 394~919 | .008~.008 |
| Ø3/8(Ø10 ) | | 5090~11460 | 80~180 | 525~1181 | .008~.008 | 3820~9550 | 60~150 | 394~984 | .008~.008 |
| Ø1/2(Ø12, Ø13) | | 4240~10080 | 70~160 | 525~1247 | .008~.008 | 3180~9280 | 50~150 | 394~1148 | .008~.008 |
| Ø5/8(Ø16, Ø17) | | 3180~9550 | 60~230 | 525~1575 | .010~.012 | 2390~7560 | 50~180 | 394~1247 | .010~.012 |
| Ø3/4(Ø20, Ø21) | | 2550~9230 | 50~290 | 525~1903 | .010~.016 | 1910~6680 | 40~210 | 394~1378 | .010~.016 |
| Ø1(Ø25, Ø26) | | 2040~7640 | 40~300 | 525~1969 | .010~.020 | 1530~6110 | 30~240 | 394~1575 | .010~.020 |
| Ø1-1/4(Ø30, Ø32) | | 1700~7430 | 30~350 | 525~2297 | .010~.024 | 1270~5840 | 30~280 | 394~1804 | .010~.024 |

| P | | | | P | | | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIE TOOL STEELS PRE-HARDENED | | | | HARDENED STEELS | | | | GRAPHITE | | | |
| 380~480 | | | | 480~740 | | | | | | | |
| 40~50 | | | | 50~65 | | | | | | | |
| 1250~1500 | | | | 1500~ | | | | | | | |
| XB1A, XB1N XB2C, XB2N | | | | XB2C, XB2N | | | | XB1D, XBAD | | | |
| RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] |
| 3980~8750 | 50~140 | 328~722 | .006~.008 | 3180~7160 | 30~110 | 262~591 | .004~.008 | 11940~15920 | 190~250 | 984~1312 | .008~.008 |
| 3180~8280 | 40~130 | 328~853 | .006~.008 | 2550~6370 | 20~100 | 262~656 | .004~.008 | 9550~12730 | 150~200 | 984~1312 | .008~.008 |
| 2650~7430 | 30~120 | 328~919 | .006~.008 | 2120~5840 | 20~90 | 262~722 | .004~.008 | 7960~10610 | 130~170 | 984~1312 | .008~.008 |
| 1990~6960 | 30~160 | 328~1148 | .008~.012 | 1590~5170 | 20~120 | 262~853 | .006~.012 | 5970~7960 | 120~190 | 984~1312 | .010~.012 |
| 1590~6370 | 30~200 | 328~1312 | .008~.016 | 1270~5090 | 20~160 | 262~1050 | .006~.016 | 4770~7640 | 110~210 | 984~1575 | .012~.014 |
| 1270~5730 | 20~230 | 328~1476 | .008~.020 | 1020~4580 | 10~180 | 262~1181 | .006~.020 | 3820~7130 | 110~220 | 984~1837 | .014~.016 |
| 1060~5310 | 20~250 | 328~1640 | .008~.024 | 850~4240 | 10~200 | 262~1312 | .006~.024 | 3180~6900 | 100~270 | 984~2133 | .016~.020 |




ae : Roughing - 0.1 x D
Finishing - Under Ø1/2 : 0.01
Under Ø3/4 : 0.012
From Ø3/4 : 0.016

ap : Roughing - Under Ø5/8 : 0.025 x D
From Ø5/8 : 0.05 x D
Finishing - 0.004

▶ Recommend to reduce the feed rate to 70 ~ 85% when you use long (long & intermediate Type Holder)

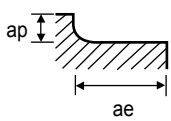
RPM = rev./min.
FEED = inch/min.

## i-Xmill CORNER RADIUS INSERTS

# XR1A, XR2A, XRAA, XRBA SERIES

| WORK MATERIAL | | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | |
| HARDNESS | HB | ~280 | | | | 280~380 | | | |
| | HRc | ~30 | | | | 30~40 | | | |
| STRENGTH | N/mm² | ~1000 | | | | 1000~1250 | | | |
| *i*-Xmill TYPE | | XR1A, XRAA | | | | XR1A, XRAA | | | |
| CUTTING CONDITION Roughing~Finishing | | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] |
| Ø5/16(Ø8) | | 6370~11940 | 100~140 | 525~984 | .008~.006 | 4770~11140 | 80~130 | 394~919 | .008~.006 |
| Ø3/8(Ø10 ) | | 5090~9550 | 80~110 | 525~984 | .008~.006 | 3820~8910 | 60~110 | 394~919 | .008~.006 |
| Ø1/2(Ø12,Ø13) | | 4240~7960 | 70~90 | 525~984 | .008~.006 | 3180~7430 | 50~90 | 394~919 | .008~.006 |
| Ø5/8(Ø16,Ø17) | | 3180~5970 | 60~90 | 525~984 | .010~.008 | 2390~5570 | 50~90 | 394~919 | .010~.008 |
| Ø3/4(Ø20,Ø21) | | 2550~4770 | 50~80 | 525~984 | .010~.008 | 1910~4460 | 40~70 | 394~919 | .010~.008 |
| Ø1(Ø25,Ø26) | | 2040~3820 | 40~60 | 525~984 | .010~.008 | 1530~3570 | 30~60 | 394~919 | .010~.008 |
| Ø1-1/4(Ø30,Ø32) | | 1700~3180 | 30~50 | 525~984 | .010~.008 | 1270~2970 | 30~50 | 394~919 | .010~.008 |

| P | | | | | | | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DIE TOOL STEELS PRE-HARDENED | | | | HARDENED STEELS | | | | GRAPHITE | | | |
| 380~480 | | | | 480~740 | | | | | | | |
| 40~50 | | | | 50~65 | | | | | | | |
| 1250~1500 | | | | 1500~ | | | | | | | |
| XR1A, XRAA XR2A, XRBA | | | | XR2A, XRBA | | | | XR1D, XRAD | | | |
| RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] | RPM [rev/min] | Feed (IPM) [inch/min] | Vc (SFM) [ft/min] | fz [inch/t] |
| 3980~11140 | 40~52 | 328~919 | .005~.002 | 3180~7160 | 25~34 | 262~722 | .004~.002 | 11940~15920 | 190~250 | 984~1312 | .008~.008 |
| 3180~8910 | 30~42 | 328~919 | .005~.002 | 2550~6370 | 20~28 | 262~722 | .004~.002 | 9550~12730 | 150~200 | 984~1312 | .008~.008 |
| 2650~7430 | 25~35 | 328~919 | .005~.002 | 2120~5840 | 18~24 | 262~722 | .004~.002 | 7960~10610 | 130~170 | 984~1312 | .008~.008 |
| 1990~5570 | 24~34 | 328~919 | .006~.003 | 1590~5170 | 18~22 | 262~722 | .006~.002 | 5970~7960 | 90~130 | 984~1312 | .008~.008 |
| 1590~4460 | 20~26 | 328~919 | .006~.003 | 1270~5090 | 15~18 | 262~722 | .006~.002 | 4770~6370 | 90~130 | 984~1312 | .010~.010 |
| 1270~3570 | 15~20 | 328~919 | .006~.003 | 1020~4580 | 12~14 | 262~722 | .006~.002 | 3820~5090 | 80~100 | 984~1312 | .010~.010 |
| 1060~2970 | 14~18 | 328~919 | .006~.003 | 850~4240 | 10~12 | 262~722 | .006~.002 | 3180~4240 | 60~80 | 984~1312 | .010~.010 |

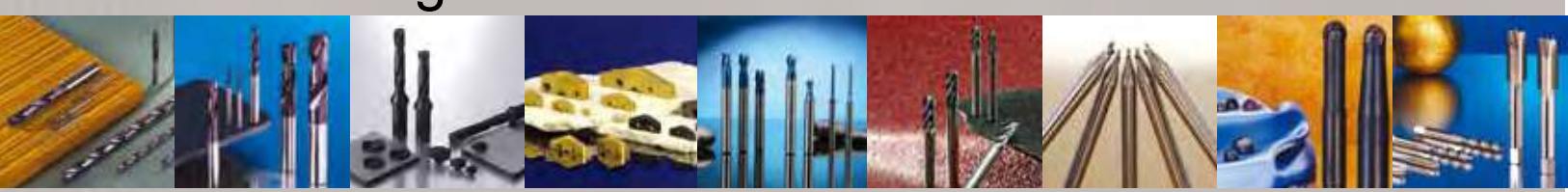



ae : Roughing - 0.1 x D
Finishing - 0.008

ap : Roughing - Under Ø5/8 : 0.025 x D
From Ø5/8 : 0.05 x D
Finishing - Under Ø5/8 : 0.004
From Ø5/8 : 0.008

▶ Recommend to reduce the feed rate to 70 ~ 85% when you use long (long & intermediate Type Holder)

Global Cutting Tool Leader **YG-1**



# CARBIDE MODULAR HEAD & HOLDER

YG

Being the best through innovation



# i-Smart
# MODULAR TYPE END MILLS

- Exchangeable Modular Head for Semi-finishing and finishing on Pre-Hardened Steels up to HRc55

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| XGMF15 |  | CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE | R3/16 | R5/8 | 584 |
| XGMF17 |  | CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE | R3/16 | R5/8 | 585 |
| XGMF20 |  | CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS | D3/8 | D1-1/4 | 586 |
| XGMF25 |  | CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX | D3/8 | D1-1/4 | 587 |
| XGMF29 |  | CARBIDE MODULAR HEAD, 6 FLUTE 45° HELIX | D3/8 | D1-1/4 | 588 |
| ZMC |  | CARBIDE HOLDER, STRAIGHT NECK TYPE | | | 589 |
| ZMS |  | STEEL HOLDER, STRAIGHT NECK TYPE | | | 590 |
| ZMT |  | STEEL HOLDER, TAPER NECK TYPE | | | 591 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 592 |

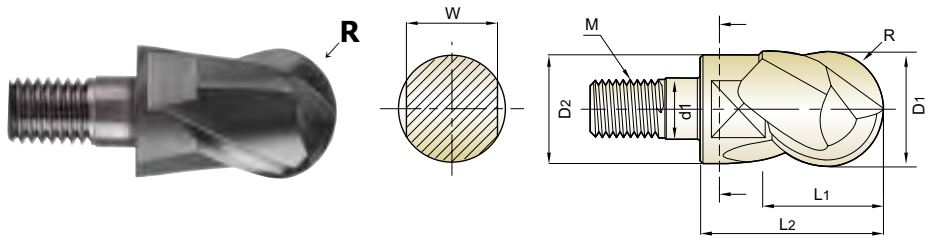
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

# i-Smart END MILLS

**XGMF15 SERIES**

## CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE




MG | 2 | 30° | R ±.0004 | P.592

Unit: Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Coupling Diameter | Wrench Width | Thread | Wrench |
|---|---|---|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1 | L2 | d1 | W | M | |
| **XGMF15024** | R3/16 | **3/8** | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| **XGMF15032** | R1/4 | **1/2** | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| **XGMF15040** | R5/16 | **5/8** | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| **XGMF15048** | R3/8 | **3/4** | .711 | .750 | 1.144 | .413 | .669 | M10 | SPIS1700 |
| **XGMF15100** | R1/2 | **1** | .961 | 1.000 | 1.472 | .492 | .866 | M12 | SPIS2200 |
| **XGMF15116** | R5/8 | **1-1/4** | 1.220 | 1.260 | 1.772 | .669 | 1.063 | M16 | SPIS2700 |

| Radius Tolerance(Inch) | Mill Dia. Tolerance(Inch) |
|---|---|
| ±.0004 | 0~−.0008 |

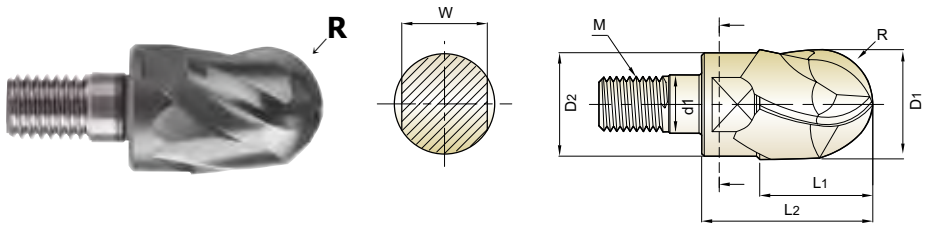
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

i-Smart END MILLS

XGMF17 SERIES

# CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE




MG | 4 | 30° | R ±.0004 | P.592

Unit: Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Coupling Diameter | Wrench Width | Thread | Wrench |
|---|---|---|---|---|---|---|---|---|---|
| | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | $d_1$ | W | M | |
| **XGMF17024** | R3/16 | **3/8** | .354 | .394 | .689 | .256 | M6 | .315 | SPIS0810 |
| **XGMF17032** | R1/4 | **1/2** | .461 | .500 | .835 | .256 | M6 | .394 | SPIS0810 |
| **XGMF17040** | R5/16 | **5/8** | .591 | .630 | 1.004 | .335 | M8 | .512 | SPIS1300 |
| **XGMF17048** | R3/8 | **3/4** | .711 | .750 | 1.144 | .413 | M10 | .669 | SPIS1700 |
| **XGMF17100** | R1/2 | **1** | .961 | 1.000 | 1.472 | .492 | M12 | .866 | SPIS2200 |
| **XGMF17116** | R5/8 | **1-1/4** | 1.220 | 1.260 | 1.772 | .669 | M16 | 1.063 | SPIS2700 |

| Radius Tolerance(Inch) | Mill Dia. Tolerance(Inch) |
|---|---|
| ±.0004 | 0~−.0008 |

◎ : Excellent ○ : Good

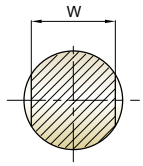
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

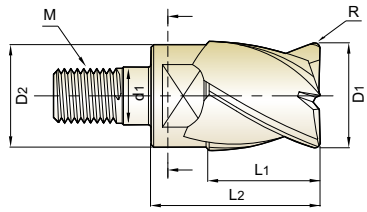
# i-Smart END MILLS

**XGMF20 SERIES**

## CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS




MG | 4 | M-Helix | R ±.0008 | P.593

Unit: Inch

| EDP No. | Corner Radius | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Coupling Diameter | Wrench Width | Thread | Wrench |
|---|---|---|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1 | L2 | d1 | W | M | |
| XGMF20024 012 | R.012 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 020 | R.020 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 030 | R.030 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 040 | R.040 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 050 | R.050 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 060 | R.060 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20024 080 | R.080 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF20032 020 | R.020 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF20032 030 | R.030 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF20032 040 | R.040 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF20032 060 | R.060 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF20032 080 | R.080 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF20040 020 | R.020 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF20040 030 | R.030 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF20040 040 | R.040 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF20040 060 | R.060 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF20040 080 | R.080 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF20048 030 | R.030 | 3/4 | .711 | .750 | 1.144 | .413 | .669 | M10 | SPIS1700 |
| XGMF20048 040 | R.040 | 3/4 | .711 | .750 | 1.144 | .413 | .669 | M10 | SPIS1700 |
| XGMF20048 080 | R.080 | 3/4 | .711 | .750 | 1.144 | .413 | .669 | M10 | SPIS1700 |
| XGMF20100 030 | R.030 | 1 | .961 | 1.000 | 1.472 | .492 | .866 | M12 | SPIS2200 |
| XGMF20100 040 | R.040 | 1 | .961 | 1.000 | 1.472 | .492 | .866 | M12 | SPIS2200 |
| XGMF20100 080 | R.080 | 1 | .961 | 1.000 | 1.472 | .492 | .866 | M12 | SPIS2200 |
| XGMF20116 030 | R.030 | 1-1/4 | 1.220 | 1.260 | 1.772 | .669 | 1.063 | M16 | SPIS2700 |
| XGMF20116 040 | R.040 | 1-1/4 | 1.220 | 1.260 | 1.772 | .669 | 1.063 | M16 | SPIS2700 |
| XGMF20116 080 | R.080 | 1-1/4 | 1.220 | 1.260 | 1.772 | .669 | 1.063 | M16 | SPIS2700 |

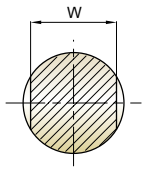
| Corner Radius Tolerance(Inch) | Mill Dia. Tolerance(Inch) |
|---|---|
| ±.0008 | 0~−.0012 |

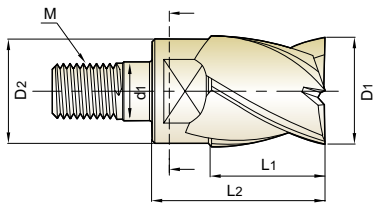
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | | | | | | | |

# CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX






MG 4 M-Helix P.593

Unit: Inch

| EDP No. | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Coupling Diameter | Wrench Width | Thread | Wrench |
|---|---|---|---|---|---|---|---|---|
| | $D_1$ | $D_2$ | $L_1$ | $L_2$ | $d_1$ | W | M | |
| XGMF25024 | 3/8 | .354 | .394 | .689 | .256 | M6 | .315 | SPIS0810 |
| XGMF25032 | 1/2 | .461 | .500 | .835 | .256 | M6 | .394 | SPIS0810 |
| XGMF25040 | 5/8 | .591 | .630 | 1.004 | .335 | M8 | .512 | SPIS1300 |
| XGMF25048 | 3/4 | .711 | .750 | 1.144 | .413 | M10 | .669 | SPIS1700 |
| XGMF25100 | 1 | .961 | 1.000 | 1.472 | .492 | M12 | .866 | SPIS2200 |
| XGMF25116 | 1-1/4 | 1.220 | 1.260 | 1.772 | .669 | M16 | 1.063 | SPIS2700 |

| Mill Dia. Tolerance(Inch) |
|---|
| 0~−.0012 |

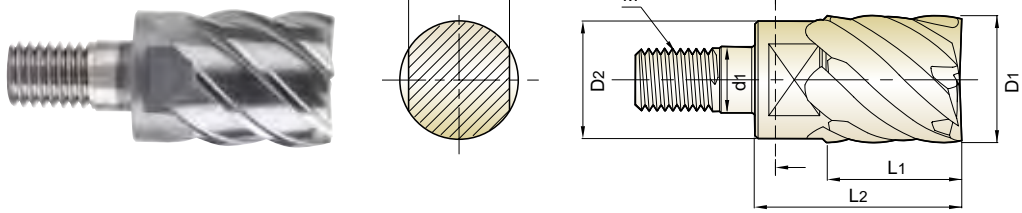
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# i-Smart END MILLS

## XGMF29 SERIES

## CARBIDE MODULAR HEAD, 6 FLUTE 45º HELIX




MG 6 45° P.594

Unit: Inch

| EDP No. | Mill Diameter | Neck Diameter | Length of Cut | Length Below Shank | Coupling Diameter | Wrench Width | Thread | Wrench |
|---|---|---|---|---|---|---|---|---|
| | $D_1$ | $D_2$ | $L_1$ | $L_2$ | $d_1$ | W | M | |
| XGMF29024 | 3/8 | .354 | .394 | .689 | .256 | .315 | M6 | SPIS0810 |
| XGMF29032 | 1/2 | .461 | .500 | .835 | .256 | .394 | M6 | SPIS0810 |
| XGMF29040 | 5/8 | .591 | .630 | 1.004 | .335 | .512 | M8 | SPIS1300 |
| XGMF29048 | 3/4 | .711 | .750 | 1.144 | .413 | .669 | M10 | SPIS1700 |
| XGMF29100 | 1 | .961 | 1.000 | 1.472 | .492 | .866 | M12 | SPIS2200 |
| XGMF29116 | 1-1/4 | 1.220 | 1.260 | 1.772 | .669 | 1.063 | M16 | SPIS2700 |

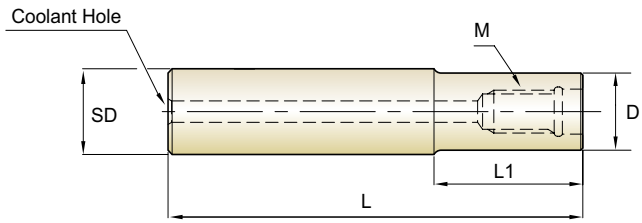
| Mill Dia. Tolerance(Inch) |
|---|
| 0~−.0012 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# CARBIDE HOLDER, STRAIGHT NECK TYPE






Unit: Inch

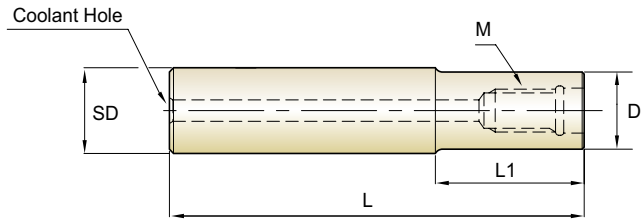
| EDP No. | Mill Diameter | Shank Diameter SD | Overall Length L | Neck Length $L_1$ | Neck Diameter D | Thread Size M | Wrench No. | Coolant Hole |
|---|---|---|---|---|---|---|---|---|
| ZMC024A024 | 3/8 | 3/8 | 2-3/4 | 25/32 | 23/64 | M6 | SPIS0810 | 5/64 |
| ZMC024B024 | | | 3-15/16 | 1-37/64 | | | | |
| ZMC024C024 | | | 5-1/8 | 2-3/4 | | | | |
| ZMC032A032 | 1/2 | 1/2 | 3-1/8 | 25/32 | 29/64 | M6 | SPIS0810 | 5/64 |
| ZMC032B032 | | | 3-15/16 | 1-37/64 | | | | |
| ZMC032C032 | | | 5-1/8 | 2-3/4 | | | | |
| ZMC040A040 | 5/8 | 5/8 | 3-15/16 | 1-37/64 | 19/32 | M8 | SPIS1300 | 1/8 |
| ZMC040B040 | | | 5-7/8 | 3-5/32 | | | | |
| ZMC040C040 | | | 7-7/8 | 4-23/32 | | | | |
| ZMC048A048 | 3/4 | 3/4 | 3-15/16 | 1-37/64 | 45/64 | M10 | SPIS1700 | 5/32 |
| ZMC048B048 | | | 5-7/8 | 3-5/32 | | | | |
| ZMC048C048 | | | 7-7/8 | 4-23/32 | | | | |
| ZMC048D048 | | | 9-13/16 | 6-19/64 | | | | |
| ZMC100A100 | 1 | 1 | 5-7/8 | 2-3/4 | 61/64 | M12 | SPIS2200 | 13/64 |
| ZMC100B100 | | | 7-7/8 | 3-15/16 | | | | |
| ZMC100C100 | | | 9-13/16 | 5-29/32 | | | | |
| ZMC100D100 | | | 11-13/16 | 7-7/8 | | | | |
| ZMC116A116 | 1-1/4 | 1-1/4 | 5-7/8 | 2-3/4 | 1-9/64 | M16 | SPIS2700 | 15/64 |
| ZMC116B116 | | | 7-7/8 | 4-23/32 | | | | |
| ZMC116C116 | | | 9-13/16 | 5-29/32 | | | | |
| ZMC116D116 | | | 11-13/16 | 7-7/8 | | | | |
| ZMC116E116 | | | 13-3/4 | 9-27/32 | | | | |

# i-Smart END MILLS

ZMS SERIES

## STEEL HOLDER, STRAIGHT NECK TYPE

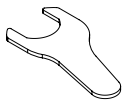
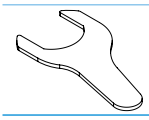





Unit: Inch

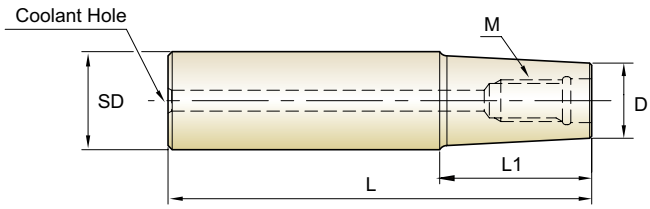
| EDP No. | Mill Diameter | Shank Diameter | Overall Length | Neck Length | Neck Diameter | Thread Size | Coolant Hole |
|---|---|---|---|---|---|---|---|
| | | SD | L | $L_1$ | D | M | |
| ZMS024A024 | 3/8 | 3/8 | 2-3/4 | 25/32 | 23/64 | M6 | 1/8 |
| ZMS032A032 | 1/2 | 1/2 | 3-35/64 | 1-3/16 | 29/64 | M6 | 1/8 |
| ZMS040A040 | 5/8 | 5/8 | 3-15/16 | 1-3/16 | 19/32 | M8 | 5/32 |
| ZMS048A048 | 3/4 | 3/4 | 3-15/16 | 1-3/16 | 45/64 | M10 | 13/64 |
| ZMS100A100 | 1 | 1 | 4-17/32 | 1-37/64 | 61/64 | M12 | 13/64 |
| ZMS116A116 | 1-1/4 | 1-1/4 | 4-59/64 | 1-37/64 | 1-9/64 | M16 | 15/64 |

### Wrench

| Model | Wrench No. | Wrench Width | Mill Diameter | Clamping Torque [in•lbs] |
|---|---|---|---|---|
|  | SPIS0810 | .315 | 3/8 | 57.6 |
| | | .394 | 1/2 | 57.6 |
|  | SPIS1300 | .335 | 5/8 | 88.6 |
|  | SPIS1700 | .413 | 3/4 | 106.3 |
|  | SPIS2200 | .492 | 1 | 132.9 |
|  | SPIS2700 | .669 | 1-1/4 | 177.1 |

# STEEL HOLDER, TAPER NECK TYPE

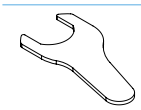
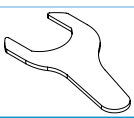





Unit: Inch

| EDP No. | Mill Diameter | Shank Diameter | Overall Length | Neck Length | Neck Diameter | Thread Size | Coolant Hole |
|---|---|---|---|---|---|---|---|
| | | SD | L | $L_1$ | D | M | |
| ZMT024A032 | 3/8 | 1/2 | 3-15/16 | 1-31/32 | 23/64 | M6 | 1/8 |
| ZMT032A040 | 1/2 | 5/8 | 5-1/8 | 2-3/4 | 29/64 | M6 | 1/8 |
| ZMT040A048 | 5/8 | 3/4 | 5-29/32 | 3-35/64 | 19/32 | M8 | 5/32 |
| ZMT048A100 | 3/4 | 1 | 6-11/16 | 3-15/16 | 45/64 | M10 | 13/64 |
| ZMT100A116 | 1 | 1-1/4 | 7-14/16 | 4-21/64 | 61/64 | M12 | 13/64 |
| ZMT116A116 | 1-1/4 | 1-1/4 | 7-14/16 | 4-21/64 | 1-9/64 | M16 | 15/64 |

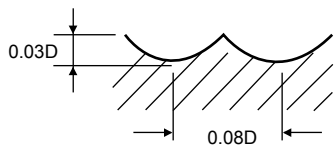
## Wrench

| Model | Wrench No. | Wrench Width | Mill Diameter | Clamping Torque [in•lbs] |
|---|---|---|---|---|
|  | SPIS0810 | .315 | 3/8 | 57.6 |
| | | .394 | 1/2 | 57.6 |
|  | SPIS1300 | .335 | 5/8 | 88.6 |
|  | SPIS1700 | .413 | 3/4 | 106.3 |
|  | SPIS2200 | .492 | 1 | 132.9 |
|  | SPIS2700 | .669 | 1-1/4 | 177.1 |

## CARBIDE MODULAR HEAD, 2 FLUTE BALL NOSE

### XGMF15 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35~ HRc45 | | | | HRc45~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| R3/16 ×3/8 | 5860 | 91.7 | 575 | .008 | 5610 | 77.0 | 551 | .007 | 4720 | 59.5 | 463 | .006 |
| R1/4 ×1/2 | 4200 | 65.8 | 550 | .008 | 4050 | 55.7 | 530 | .007 | 3390 | 42.3 | 444 | .006 |
| R5/16 ×5/8 | 3370 | 63.2 | 551 | .009 | 3240 | 52.4 | 530 | .008 | 2720 | 40.6 | 445 | .007 |
| R3/8 ×3/4 | 2800 | 58.3 | 550 | .010 | 2710 | 48.4 | 532 | .009 | 2270 | 37.2 | 446 | .008 |
| R1/2 ×1 | 2100 | 46.5 | 550 | .011 | 2020 | 42.5 | 529 | .011 | 1700 | 32.5 | 445 | .010 |
| R1-1/8×1-1/4 | 1680 | 38.0 | 550 | .011 | 1620 | 36.5 | 530 | .011 | 1360 | 28.5 | 445 | .010 |

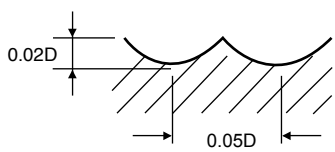



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

## CARBIDE MODULAR HEAD, 4 FLUTE BALL NOSE

### XGMF17 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35~ HRc45 | | | | HRc45~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| R3/16 ×3/8 | 9600 | 189.8 | 942 | .005 | 7720 | 142.5 | 758 | .005 | 6990 | 118.7 | 686 | .004 |
| R1/4 ×1/2 | 7200 | 158.5 | 942 | .006 | 5790 | 118.7 | 758 | .005 | 5230 | 89.4 | 685 | .004 |
| R5/16 ×5/8 | 5760 | 138.2 | 942 | .006 | 4630 | 92.6 | 758 | .005 | 4180 | 66.9 | 684 | .004 |
| R3/8 ×3/4 | 4800 | 134.4 | 942 | .007 | 3860 | 92.6 | 758 | .006 | 3480 | 69.6 | 683 | .005 |
| R1/2 ×1 | 3600 | 115.2 | 942 | .008 | 2890 | 69.4 | 757 | .006 | 2610 | 52.2 | 683 | .005 |
| R1-1/8×1-1/4 | 2880 | 103.7 | 942 | .009 | 2310 | 64.7 | 756 | .007 | 2090 | 50.2 | 684 | .006 |

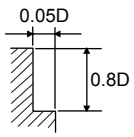


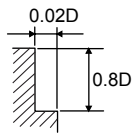

RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

## CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX CORNER RADIUS

### XGMF20 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35~ HRc45 | | | | HRc45~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| RPM | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| 3/8 | 5300 | 19.1 | 520 | .001 | 3440 | 15 | 338 | .001 | 2120 | 7.1 | 208 | .001 |
| 1/2 | 3900 | 13.4 | 511 | .001 | 2630 | 11.8 | 344 | .001 | 1590 | 5.1 | 208 | .001 |
| 5/8 | 3100 | 11.0 | 507 | .001 | 2120 | 9.1 | 347 | .001 | 1290 | 4.5 | 211 | .001 |
| 3/4 | 2600 | 9.5 | 511 | .001 | 1720 | 7.5 | 338 | .001 | 1050 | 3.7 | 206 | .001 |
| 1 | 1950 | 11.7 | 511 | .002 | 1290 | 7.7 | 338 | .002 | 780 | 4.7 | 204 | .002 |
| 1-1/4 | 1560 | 9.4 | 511 | .002 | 1030 | 6.2 | 337 | .002 | 620 | 3.7 | 203 | .002 |



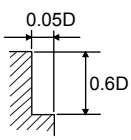

* 1.5xD Axial cutting depth should be for DIA over 5/8inch

RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

## CARBIDE MODULAR HEAD, 4 FLUTE MULTIPLE HELIX

### XGMF25 SERIES

| MATERIAL | P | | | | | | | | | | | | M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | | STAINLESS STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35~ HRc45 | | | | HRc45~ HRc55 | | | | | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | | | | | |
| DIAMETER | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| 3/8 | 4280 | 26.5 | 420 | .002 | 2620 | 13 | 257 | .001 | 1780 | 3.9 | 175 | .001 | 2200 | 13 | 216 | .001 |
| 1/2 | 3240 | 20.7 | 424 | .002 | 1980 | 9.9 | 259 | .001 | 1370 | 3.2 | 179 | .001 | 1610 | 9.5 | 211 | .001 |
| 5/8 | 2770 | 17.6 | 453 | .002 | 1710 | 8.5 | 280 | .001 | 1140 | 2.5 | 187 | .001 | 1390 | 8.3 | 227 | .001 |
| 3/4 | 2200 | 13.9 | 432 | .002 | 1400 | 7 | 275 | .001 | 890 | 1.8 | 175 | .001 | 1100 | 6.4 | 216 | .001 |
| 1 | 1650 | 16.5 | 432 | .003 | 1050 | 6.3 | 275 | .002 | 680 | 1.6 | 178 | .001 | 820 | 4.9 | 215 | .002 |
| 1-1/4 | 1320 | 13.2 | 432 | .003 | 835 | 5.0 | 273 | .002 | 530 | 1.5 | 173 | .001 | 655 | 3.9 | 214 | .002 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

# i-Smart END MILLS

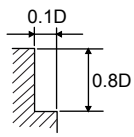
## RECOMMENDED CUTTING CONDITIONS

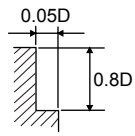
## CARBIDE MODULAR HEAD, 6 FLUTE 45º HELIX

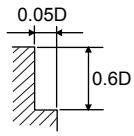
### XGMF29 SERIES

### NORMAL SPEED

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35~ HRc45 | | | | HRc45~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| 3/8 | 3705 | 86.8 | 364 | .004 | 2560 | 59.5 | 251 | .004 | 1105 | 9.1 | 108 | .001 |
| 1/2 | 2780 | 58.5 | 364 | .004 | 1950 | 40.7 | 255 | .003 | 840 | 6.3 | 110 | .001 |
| 5/8 | 2225 | 44.7 | 364 | .003 | 1565 | 31.2 | 256 | .003 | 670 | 4.6 | 110 | .001 |
| 3/4 | 1850 | 37.2 | 363 | .003 | 1280 | 25.4 | 251 | .003 | 545 | 4.1 | 107 | .001 |
| 1 | 1390 | 33.4 | 364 | .004 | 960 | 23.0 | 251 | .004 | 420 | 3.8 | 110 | .002 |
| 1-1/4 | 1110 | 26.6 | 363 | .004 | 770 | 18.5 | 252 | .004 | 330 | 3.0 | 108 | .002 |



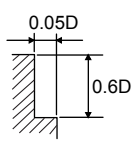



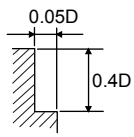




RPM = rev./min.
FEED = inch/min.
Vc = ft/min.
fz = inch/tooth

### HIGH SPEED

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc50 | | | | HRc50~ HRc60 | | | |
| STRENGTH | 1750N/mm² | | | | 1750 ~ 2080N/mm² | | | |
| DIAMETER | RPM | Feed (IPM) | Vc (SFM) | fz | RPM | Feed (IPM) | Vc (SFM) | fz |
| 3/8 | 11005 | 260.0 | 1080 | .004 | 5555 | 132.3 | 545 | .004 |
| 1/2 | 8330 | 175.4 | 1090 | .004 | 4180 | 87.7 | 547 | .003 |
| 5/8 | 6670 | 133.9 | 1091 | .003 | 3340 | 67.0 | 547 | .003 |
| 3/4 | 5555 | 112.4 | 1091 | .003 | 2785 | 54.2 | 547 | .003 |
| 1 | 4165 | 100.0 | 1090 | .004 | 2090 | 50.2 | 547 | .004 |
| 1-1/4 | 3330 | 79.9 | 1090 | .004 | 1670 | 40.1 | 547 | .004 |




RPM = rev./min.
FEED = inch/min.
Vc = ft/min.
fz = inch/tooth

# CARBIDE

YG

Being the best through innovation



# X5070 END MILLS

- High Hardened Steels HRc45 to HRc70, High Speed Machining, Dry Cutting

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| G826 | High Feed End Mill  | CARBIDE, 4FLUTE STUB LENGTH CORNER RADIUS HIGH FEED ◆ | D1/8 | D1/2 | 598 |
| G8A43 |  | CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK ◆ | R1/64 | R1/4 | 599 |
| G850 |  | CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK ◆ | D1/16 | D3/4 | 600 |
| G851 |  | CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS ◆ | D1/4 | D1 | 601 |
| **METRIC** | | | | | |
| G859 | High Feed End Mill  | CARBIDE, 4FLUTE STUB LENGTH CORNER RADIUS HIGH FEED ◇ | D2.0 | D16.0 | 602 |
| G854 | High Feed End Mill  | CARBIDE, 4FLUTE STUB LENGTH CORNER RADIUS HIGH FEED ◇ | D2.0 | D16.0 | 603 |
| G8A46 |  | CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING ◇ | R0.05 | R2.0 | 604 |
| G8A54 |  | CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING ◇ | R0.25 | R1.0 | 608 |
| G8A28 |  | CARBIDE, 2 FLUTE BALL NOSE ◇ | R0.05 | R6.0 | 609 |
| G8A38 |  | CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK ◇ | R0.5 | R12.5 | 610 |
| G8A53 |  | CARBIDE, 2 FLUTE MINIATURE BALL NOSE ◇ | R0.2 | R1.0 | 611 |
| G8A59 |  | CARBIDE, 3 FLUTE BALL NOSE ◇ | R1.5 | R10.0 | 612 |
| G8A36 |  | CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK ◇ | D0.3 | D20.0 | 613 |
| G8A50 |  | CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS ◇ | D0.3 | D2.0 | 615 |
| G8A47 |  | CARBIDE, 4 FLUTE CORNER RADIUS with EXTENDED NECK ◇ | D3.0 | D12.0 | 616 |
| G8A37 |  | CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK ◇ | D1.0 | D20.0 | 617 |
| G8A39 |  | CARBIDE, 6 FLUTE 45° HELIX CORNER RADIUS with EXTENDED NECK ◇ | D6.0 | D20.0 | 618 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 619 |

◆ U.S.A Stock

◇ Call for Availability

◎ : Excellent ○ : Good

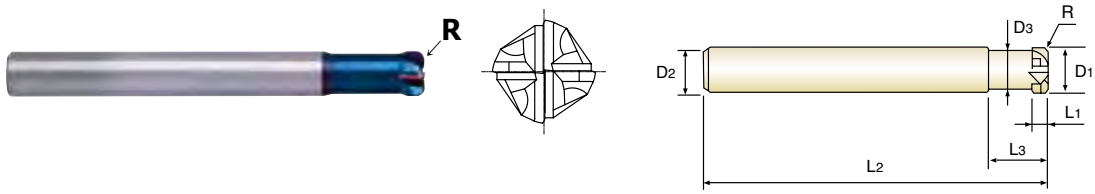
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

G826 SERIES PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.




NG | 4 | BLUE | PLAIN | R ±.0002 | P.619

## High Feed End Mill

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1 | L3 | L2 | D3 |
| G826082 | R1/32 | 1/8 | 1/4 | .050 | 3/8 | 2-1/4 | .110 |
| G826124 | R1/16 | 3/16 | 1/4 | .075 | 3/8 | 2-1/4 | .180 |
| G826164 | R1/16 | 1/4 | 1/4 | .100 | 1/2 | 2-1/2 | .220 |
| G826206 | R3/32 | 5/16 | 5/16 | .130 | 5/8 | 2-1/2 | .280 |
| G826246 | R3/32 | 3/8 | 3/8 | .150 | 3/4 | 2-3/4 | .330 |
| G826328 | R1/8 | 1/2 | 1/2 | .200 | 1 | 3-1/4 | .460 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance (inch) | Corner Radius Tolerance (inch) | Shank Dia. Tolerance |
|---|---|---|
| 0~−.0008 | ±.0002 | h6 |

◎ : Excellent ○ : Good

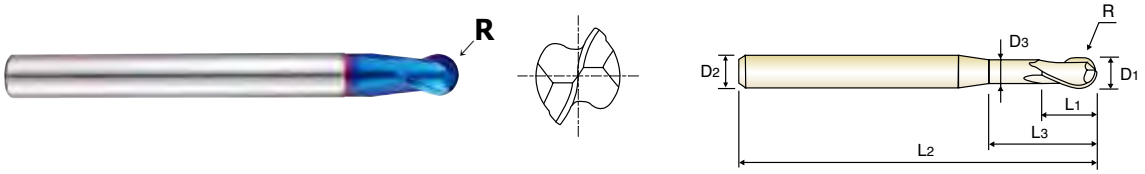
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A43 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB CUT LENGTH BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±.0002 | R ±.0004 | PLAIN

R1/64~R1/8 R5/32~R1/4

P.620

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1 | L3 | L2 | D3 |
| G8A43002 | R1/64 | 1/32 | 1/4 | 1/32 | 1/16 | 2 | .029 |
| G8A43004 | R1/32 | 1/16 | 1/4 | 1/16 | 1/8 | 2 | .059 |
| G8A43006 | R3/64 | 3/32 | 1/4 | 3/32 | 3/16 | 2 | .090 |
| G8A43008 | R1/16 | 1/8 | 1/4 | 1/8 | 1/4 | 2-1/2 | .121 |
| G8A43012 | R3/32 | 3/16 | 1/4 | 3/16 | 3/8 | 3 | .184 |
| G8A43016 | R1/8 | 1/4 | 1/4 | 1/4 | 1/2 | 3-1/2 | .246 |
| G8A43020 | R5/32 | 5/16 | 5/16 | 5/16 | 5/8 | 4 | .309 |
| G8A43024 | R3/16 | 3/8 | 3/8 | 3/8 | 3/4 | 4 | .371 |
| G8A43032 | R1/4 | 1/2 | 1/2 | 1/2 | 1 | 4-1/2 | .496 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0004 | 0~−.0006 | |

◎ : Excellent ○ : Good

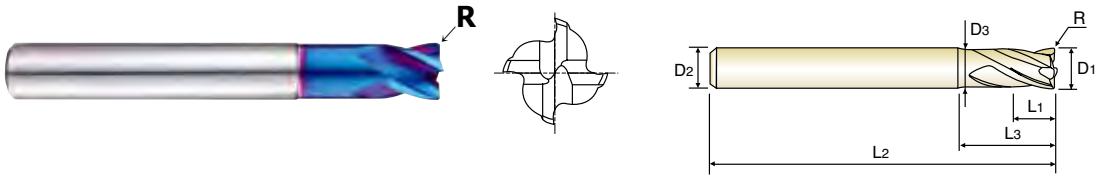
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

G850 SERIES PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 4 | BLUE | 30° | R ±.0002 | PLAIN

P.621

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1 | L3 | L2 | D3 |
| G85004 | R.004 | 1/16 | 1/8 | 3/32 | - | 1-1/2 | - |
| G85008 | R.004 | 1/8 | 1/4 | 5/32 | 1/4 | 2 | .119 |
| G85012 | R.004 | 3/16 | 1/4 | 1/4 | 3/8 | 2 | .181 |
| G85016 | R.008 | 1/4 | 1/4 | 5/16 | 9/16 | 2 | .238 |
| G85020 | R.008 | 5/16 | 5/16 | 3/8 | 3/4 | 2-1 | .301 |
| G85024 | R.008 | 3/8 | 3/8 | 1/2 | 1 | 3 | .363 |
| G85032 | R.012 | 1/2 | 1/2 | 5/16 | 1-3/16 | 3 | .488 |
| G85040 | R.012 | 5/8 | 5/8 | 3/4 | 1-1/2 | 3-1 | .613 |
| G85048 | R.012 | 3/4 | 3/4 | 1 | 1-3/4 | 4 | .738 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Corner Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0004 | 0~−.0006 | |

◎ : Excellent ○ : Good

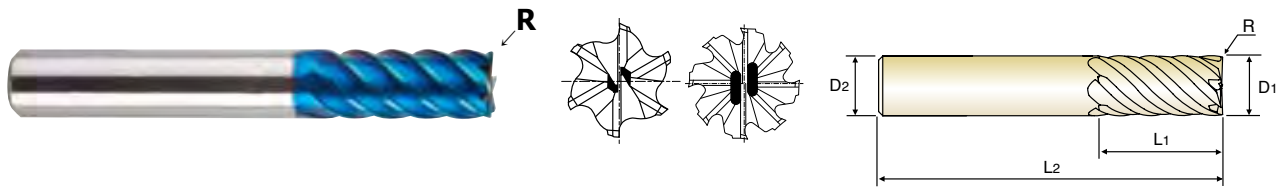
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G851 SERIES** PLAIN SHANK

## CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 6&8 | BLUE | 45° | R ±.0002 | PLAIN

P.621

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | No. of Flute |
|---|---|---|---|---|---|---|
| G85116 | R.02 | 1/4 | 1/4 | 1/2 | 2-1/4 | 6 |
| G85120 | R.02 | 5/16 | 5/16 | 3/4 | 2-1/2 | 6 |
| G85125 | R.03 | 3/8 | 3/8 | 7/8 | 2-7/8 | 6 |
| G85133 | R.03 | 1/2 | 1/2 | 1 | 3-1/4 | 6 |
| G85140 | R.03 | 5/8 | 5/8 | 1-1/4 | 3-5/8 | 6 |
| G85141 | R.06 | 5/8 | 5/8 | 1-1/4 | 3-5/8 | 6 |
| G85148 | R.03 | 3/4 | 3/4 | 1-1/2 | 4-1/8 | 8 |
| G85149 | R.06 | 3/4 | 3/4 | 1-1/2 | 4-1/8 | 8 |
| G85164 | R.03 | 1 | 1 | 1-3/4 | 4-1/4 | 8 |
| G85165 | R.06 | 1 | 1 | 1-3/4 | 4-1/4 | 8 |
| G85167 | R.03 | 1 | 1 | 4-1/8 | 7 | 8 |
| G85168 | R.06 | 1 | 1 | 4-1/8 | 7 | 8 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Corner Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0004 | 0~−.0006 | |

◎ : Excellent ○ : Good

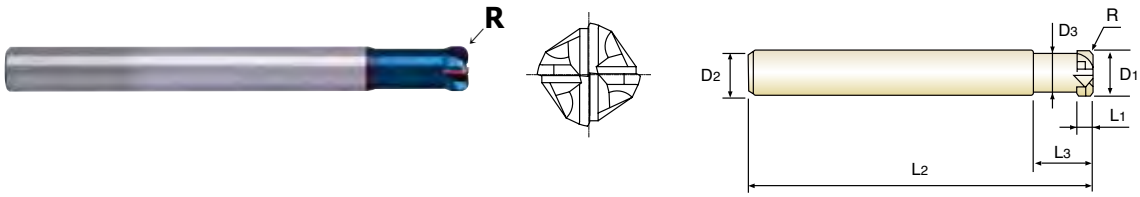
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

G859 SERIES PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.




NG | 4 | BLUE | PLAIN | R ±0.005 | P.622

### High Feed End Mill

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G859020 | R0.5 | 2.0 | .0787 | 6 | 1 | 6 | 50 | 1.8 |
| G859030 | R0.5 | 3.0 | .1181 | 6 | 1.2 | 8 | 50 | 2.8 |
| G859040 | R0.5 | 4.0 | .1575 | 6 | 1.5 | 10 | 50 | 3.8 |
| G859060 | R0.5 | 6.0 | .2362 | 6 | 2.5 | 12 | 60 | 5.4 |
| G859061 | R1.0 | 6.0 | .2362 | 6 | 2.5 | 12 | 60 | 5.4 |
| G859081 | R1.0 | 8.0 | .3150 | 8 | 3.5 | 16 | 60 | 7.2 |
| G859082 | R2.0 | 8.0 | .3150 | 8 | 3.5 | 16 | 60 | 7.2 |
| G859101 | R1.0 | 10.0 | .3937 | 10 | 4 | 20 | 70 | 9 |
| G859102 | R2.0 | 10.0 | .3937 | 10 | 4 | 20 | 70 | 9 |
| G859122 | R2.0 | 12.0 | .4724 | 12 | 5 | 25 | 80 | 11 |
| G859123 | R3.0 | 12.0 | .4724 | 12 | 5 | 25 | 80 | 11 |
| G859163 | R3.0 | 16.0 | .6299 | 16 | 6.5 | 30 | 90 | 15 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance (inch) | Corner Radius Tolerance (inch) | Shank Dia. Tolerance |
|---|---|---|
| 0 ~ −.0008 | ±.0002 | h6 |

◎ : Excellent ○ : Good

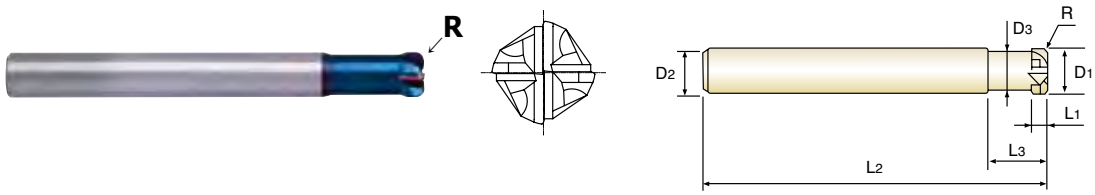
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G854 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

- Excellent wear resistance at heavy feed rates on high hardened material.
- Designed with reduced clearance angles and short flutes for strength.
- High hardness & heat resistance coating for long life in dry applications.




NG | 4 | BLUE | PLAIN | R ±0.005 | P.622

### High Feed End Mill

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G854020 | R0.5 | 2.0 | .0787 | 6 | 1 | 6 | 70 | 1.8 |
| G854030 | R0.5 | 3.0 | .1181 | 6 | 1.2 | 8 | 70 | 2.8 |
| G854040 | R0.5 | 4.0 | .1575 | 6 | 1.5 | 10 | 70 | 3.8 |
| G854050 | R1.0 | 5.0 | .1969 | 6 | 2 | 10 | 70 | 4.6 |
| G854060 | R0.5 | 6.0 | .2362 | 6 | 2.5 | 12 | 90 | 5.4 |
| G854061 | R1.0 | 6.0 | .2362 | 6 | 2.5 | 12 | 90 | 5.4 |
| G854062 | R1.5 | 6.0 | .2362 | 6 | 2.5 | 12 | 90 | 5.4 |
| G854081 | R1.0 | 8.0 | .3150 | 8 | 3.5 | 16 | 100 | 7.2 |
| G854082 | R2.0 | 8.0 | .3150 | 8 | 3.5 | 16 | 100 | 7.2 |
| G854101 | R1.0 | 10.0 | .3937 | 10 | 4 | 20 | 100 | 9 |
| G854102 | R2.0 | 10.0 | .3937 | 10 | 4 | 20 | 100 | 9 |
| G854122 | R2.0 | 12.0 | .4724 | 12 | 5 | 25 | 110 | 11 |
| G854123 | R3.0 | 12.0 | .4724 | 12 | 5 | 25 | 110 | 11 |
| G854163 | R3.0 | 16.0 | .6299 | 16 | 6.5 | 30 | 130 | 15 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance (inch) | Corner Radius Tolerance (inch) | Shank Dia. Tolerance |
|---|---|---|
| 0 ~ −.0008 | ±.0002 | h6 |

◎ : Excellent ○ : Good

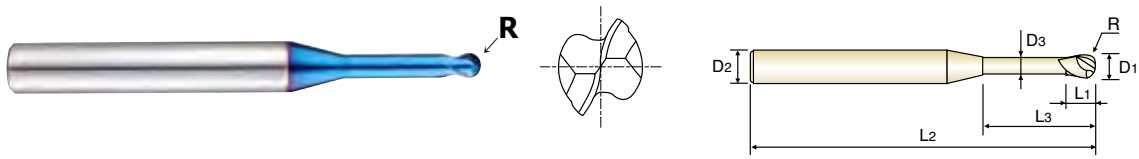
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# YG X5070 END MILLS

**G8A46 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A46805 | R0.05 | 0.1 | .0039 | 4 | 0.1 | 0.3 | 45 | 0.085 |
| G8A46806 | R0.05 | 0.1 | .0039 | 4 | 0.1 | 0.5 | 45 | 0.085 |
| G8A46002 | R0.1 | 0.2 | .0079 | 4 | 0.2 | 0.5 | 45 | 0.17 |
| G8A46977 | R0.1 | 0.2 | .0079 | 4 | 0.2 | 1 | 45 | 0.17 |
| G8A46958 | R0.1 | 0.2 | .0079 | 4 | 0.2 | 1.5 | 45 | 0.17 |
| G8A46003 | R0.15 | 0.3 | .0118 | 4 | 0.3 | 1 | 45 | 0.27 |
| G8A46959 | R0.15 | 0.3 | .0118 | 4 | 0.3 | 2 | 45 | 0.27 |
| G8A46986 | R0.15 | 0.3 | .0118 | 4 | 0.3 | 3 | 45 | 0.27 |
| G8A46004 | R0.2 | 0.4 | .0157 | 4 | 0.4 | 1 | 45 | 0.37 |
| G8A46960 | R0.2 | 0.4 | .0157 | 4 | 0.4 | 2 | 45 | 0.37 |
| G8A46961 | R0.2 | 0.4 | .0157 | 4 | 0.4 | 3 | 45 | 0.37 |
| G8A46981 | R0.2 | 0.4 | .0157 | 4 | 0.4 | 4 | 45 | 0.37 |
| G8A46987 | R0.2 | 0.4 | .0157 | 4 | 0.4 | 5 | 45 | 0.37 |
| G8A46005 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 2 | 45 | 0.45 |
| G8A46804 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 2.5 | 45 | 0.45 |
| G8A46962 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 4 | 45 | 0.45 |
| G8A46963 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 6 | 45 | 0.45 |
| G8A46964 | R0.25 | 0.5 | .0197 | 4 | 0.4 | 8 | 45 | 0.45 |
| G8A46957 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 2 | 45 | 0.55 |
| G8A46988 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 3 | 45 | 0.55 |
| G8A46915 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 4 | 45 | 0.55 |
| G8A46989 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 5 | 45 | 0.55 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

▶ NEXT PAGE

◎ : Excellent ○ : Good

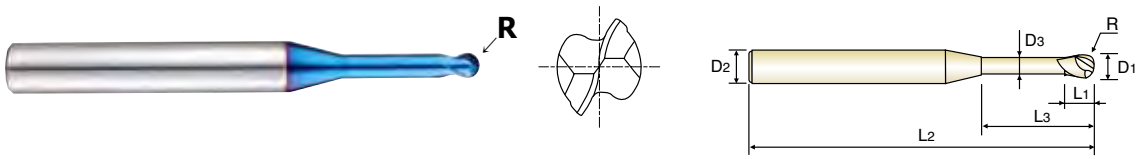
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A46 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A46916 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 6 | 45 | 0.55 |
| G8A46917 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 8 | 45 | 0.55 |
| G8A46990 | R0.3 | 0.6 | .0236 | 4 | 0.5 | 10 | 45 | 0.55 |
| G8A46918 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 2 | 45 | 0.75 |
| G8A46919 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 4 | 45 | 0.75 |
| G8A46008 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 6 | 45 | 0.75 |
| G8A46901 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 8 | 45 | 0.75 |
| G8A46965 | R0.4 | 0.8 | .0315 | 4 | 0.6 | 10 | 45 | 0.75 |
| G8A46920 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 3 | 45 | 0.95 |
| G8A46921 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 4 | 45 | 0.95 |
| G8A46923 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 5 | 45 | 0.95 |
| G8A46010 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 6 | 45 | 0.95 |
| G8A46924 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 7 | 45 | 0.95 |
| G8A46902 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 8 | 45 | 0.95 |
| G8A46925 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 9 | 45 | 0.95 |
| G8A46903 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 10 | 45 | 0.95 |
| G8A46904 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 12 | 45 | 0.95 |
| G8A46926 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 14 | 50 | 0.95 |
| G8A46927 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 16 | 50 | 0.95 |
| G8A46966 | R0.5 | 1.0 | .0394 | 4 | 0.8 | 20 | 55 | 0.95 |
| G8A46982 | R0.6 | 1.2 | .0472 | 4 | 1.0 | 6 | 45 | 1.15 |
| G8A46012 | R0.6 | 1.2 | .0472 | 4 | 1.0 | 8 | 45 | 1.15 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

▶ NEXT PAGE

◎ : Excellent ○ : Good

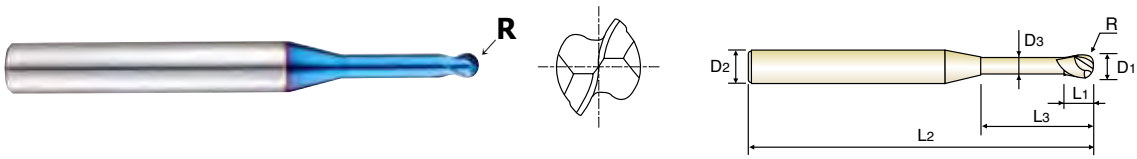
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A46 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A46983 | R0.6 | 1.2 | .0472 | 4 | 1.0 | 10 | 45 | 1.15 |
| G8A46905 | R0.6 | 1.2 | .0472 | 4 | 1.0 | 12 | 45 | 1.15 |
| G8A46930 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 6 | 45 | 1.45 |
| G8A46015 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 8 | 45 | 1.45 |
| G8A46931 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 10 | 45 | 1.45 |
| G8A46906 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 12 | 45 | 1.45 |
| G8A46992 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 14 | 50 | 1.45 |
| G8A46907 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 16 | 50 | 1.45 |
| G8A46932 | R0.75 | 1.5 | .0472 | 4 | 1.2 | 20 | 55 | 1.45 |
| G8A46939 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 4 | 45 | 1.95 |
| G8A46940 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 6 | 45 | 1.95 |
| G8A46020 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 8 | 45 | 1.95 |
| G8A46941 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 10 | 45 | 1.95 |
| G8A46942 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 12 | 50 | 1.95 |
| G8A46943 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 14 | 50 | 1.95 |
| G8A46909 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 16 | 50 | 1.95 |
| G8A46993 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 18 | 55 | 1.95 |
| G8A46910 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 20 | 55 | 1.95 |
| G8A46944 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 22 | 60 | 1.95 |
| G8A46945 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 25 | 60 | 1.95 |
| G8A46967 | R1.0 | 2.0 | .0787 | 4 | 1.6 | 30 | 70 | 1.95 |
| G8A46948 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 12 | 50 | 2.85 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

▶ NEXT PAGE

◎ : Excellent ○ : Good

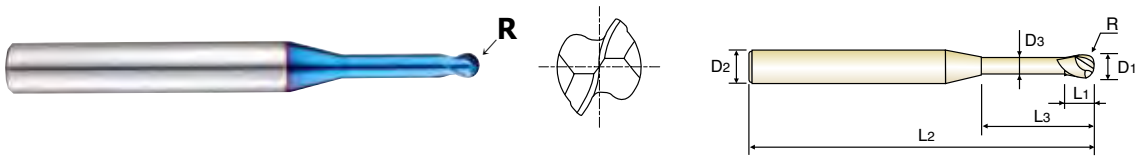
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A46 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A46984 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 14 | 55 | 2.85 |
| G8A46030 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 16 | 55 | 2.85 |
| G8A46985 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 18 | 60 | 2.85 |
| G8A46911 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 20 | 60 | 2.85 |
| G8A46968 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 25 | 65 | 2.85 |
| G8A46969 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 30 | 70 | 2.85 |
| G8A46970 | R1.5 | 3.0 | .1181 | 6 | 2.4 | 35 | 80 | 2.85 |
| G8A46950 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 12 | 60 | 3.85 |
| G8A46040 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 16 | 60 | 3.85 |
| G8A46912 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 20 | 65 | 3.85 |
| G8A46913 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 25 | 70 | 3.85 |
| G8A46971 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 30 | 70 | 3.85 |
| G8A46972 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 35 | 80 | 3.85 |
| G8A46973 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 40 | 90 | 3.85 |
| G8A46974 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 45 | 90 | 3.85 |
| G8A46975 | R2.0 | 4.0 | .1575 | 6 | 3.2 | 50 | 100 | 3.85 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

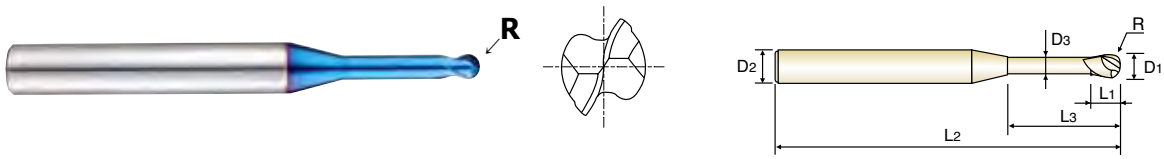
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# YG X5070 END MILLS

**G8A54 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.005) | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A54005 | R0.25 | 0.5 | .0197 | 6 | 0.5 | 1.5 | 50 | 0.45 |
| G8A54901 | R0.25 | 0.5 | .0197 | 6 | 0.5 | 3.3 | 50 | 0.45 |
| G8A54006 | R0.3 | 0.6 | .0236 | 6 | 0.6 | 2 | 50 | 0.55 |
| G8A54902 | R0.3 | 0.6 | .0236 | 6 | 0.6 | 4 | 50 | 0.55 |
| G8A54008 | R0.4 | 0.8 | .0315 | 6 | 0.8 | 2.5 | 50 | 0.75 |
| G8A54903 | R0.4 | 0.8 | .0315 | 6 | 0.8 | 5.5 | 50 | 0.75 |
| G8A54010 | R0.5 | 1.0 | .0394 | 6 | 1 | 3.3 | 50 | 0.95 |
| G8A54904 | R0.5 | 1.0 | .0394 | 6 | 1 | 6.7 | 50 | 0.95 |
| G8A54905 | R0.5 | 1.0 | .0394 | 6 | 1 | 12 | 50 | 0.95 |
| G8A54012 | R0.6 | 1.2 | .0472 | 6 | 1.2 | 4.4 | 50 | 1.15 |
| G8A54906 | R0.6 | 1.2 | .0472 | 6 | 1.2 | 8 | 50 | 1.15 |
| G8A54015 | R0.75 | 1.5 | .0591 | 6 | 1.5 | 5 | 50 | 1.45 |
| G8A54907 | R0.75 | 1.5 | .0591 | 6 | 1.5 | 9.7 | 50 | 1.45 |
| G8A54908 | R0.75 | 1.5 | .0591 | 6 | 1.5 | 15 | 50 | 1.45 |
| G8A54020 | R1.0 | 2.0 | .0787 | 6 | 2 | 6 | 50 | 1.95 |
| G8A54909 | R1.0 | 2.0 | .0787 | 6 | 2 | 13 | 50 | 1.95 |
| G8A54910 | R1.0 | 2.0 | .0787 | 6 | 2 | 20 | 60 | 1.95 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

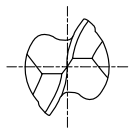
# X5070 END MILLS

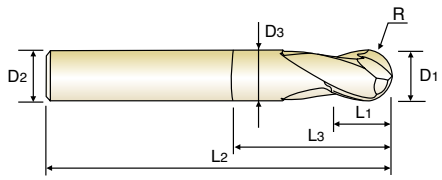
**G8A28 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.






NG | 2 | BLUE | 30° | R ±0.005 (R0.5~R3) | R ±0.010 (R3.5~R6) | PLAIN

P.626

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A28001 | R0.05 | 0.1 | .0039 | 4 | 0.2 | - | 40 | - |
| G8A28002 | R0.1 | 0.2 | .0079 | 4 | 0.3 | - | 40 | - |
| G8A28003 | R0.15 | 0.3 | .0118 | 4 | 0.5 | - | 40 | - |
| G8A28004 | R0.2 | 0.4 | .0157 | 4 | 0.6 | - | 40 | - |
| G8A28005 | R0.25 | 0.5 | .0197 | 4 | 0.7 | - | 40 | - |
| G8A28006 | R0.3 | 0.6 | .0236 | 4 | 0.9 | - | 40 | - |
| G8A28007 | R0.35 | 0.7 | .0276 | 4 | 1.1 | - | 40 | - |
| G8A28008 | R0.4 | 0.8 | .0315 | 4 | 1.2 | - | 40 | - |
| G8A28009 | R0.45 | 0.9 | .0354 | 4 | 1.4 | - | 40 | - |
| G8A28010 | R0.5 | 1.0 | .0394 | 6 | 1.5 | 3 | 50 | 0.95 |
| G8A28015 | R0.75 | 1.5 | .0591 | 6 | 2 | 4 | 50 | 1.45 |
| G8A28020 | R1.0 | 2.0 | .0787 | 6 | 2.5 | 5 | 50 | 1.95 |
| G8A28025 | R1.25 | 2.5 | .0984 | 6 | 3 | 7 | 50 | 2.4 |
| G8A28030 | R1.5 | 3.0 | .1181 | 6 | 4 | 10 | 60 | 2.85 |
| G8A28035 | R1.75 | 3.5 | .1378 | 6 | 4.5 | 10 | 60 | 3.35 |
| G8A28040 | R2.0 | 4.0 | .1575 | 6 | 5 | 10 | 60 | 3.85 |
| G8A28045 | R2.25 | 4.5 | .1772 | 6 | 5.5 | 10 | 60 | 4.35 |
| G8A28050 | R2.5 | 5.0 | .1969 | 6 | 6 | 12 | 60 | 4.85 |
| G8A28055 | R2.75 | 5.5 | .2165 | 6 | 6.5 | 12 | 60 | 5.35 |
| G8A28060 | R3.0 | 6.0 | .2362 | 6 | 7 | 15 | 60 | 5.85 |
| G8A28903 | R3.0 | 6.0 | .2362 | 6 | 9 | 30 | 90 | 5.85 |
| G8A28901 | R4.0 | 8.0 | .3150 | 8 | 9 | 15 | 60 | 7.7 |
| G8A28080 | R4.0 | 8.0 | .3150 | 8 | 9 | 15 | 80 | 7.7 |
| G8A28904 | R4.0 | 8.0 | .3150 | 8 | 12 | 30 | 100 | 7.7 |
| G8A28902 | R5.0 | 10.0 | .3937 | 10 | 11 | 25 | 60 | 9.7 |
| G8A28100 | R5.0 | 10.0 | .3937 | 10 | 11 | 25 | 80 | 9.7 |
| G8A28905 | R5.0 | 10.0 | .3937 | 10 | 15 | 30 | 100 | 9.7 |
| G8A28120 | R6.0 | 12.0 | .4724 | 12 | 14 | 25 | 80 | 11.7 |

| Size | Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to R3 | ±0.005 | 0~−0.012 | h6 |
| over R3 | ±0.010 | 0~−0.015 | |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

◎ : Excellent ○ : Good

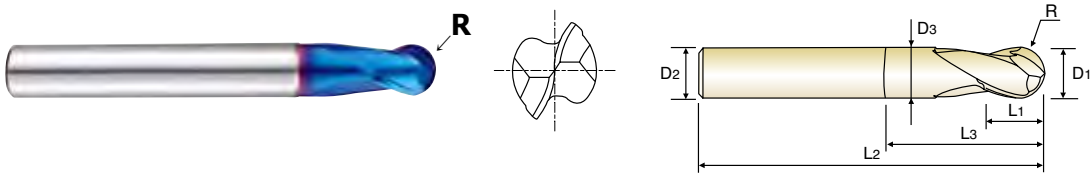
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A38 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB LENGTH BALL NOSE with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 (R0.5~R3) | R ±0.010 (R3.5~R12.5) | PLAIN

P.626

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A38010 | R0.5 | 1.0 | .0394 | 4 | 1 | 2.2 | 50 | 0.95 |
| G8A38012 | R0.6 | 1.2 | .0472 | 4 | 1.2 | 2.6 | 50 | 1.15 |
| G8A38015 | R0.75 | 1.5 | .0591 | 4 | 1.5 | 3 | 50 | 1.45 |
| G8A38020 | R1.0 | 2.0 | .0787 | 6 | 2 | 4 | 50 | 1.95 |
| G8A38030 | R1.5 | 3.0 | .1181 | 6 | 3 | 6 | 60 | 2.85 |
| G8A38040 | R2.0 | 4.0 | .1575 | 6 | 4 | 8 | 70 | 3.85 |
| G8A38050 | R2.5 | 5.0 | .1969 | 6 | 5 | 10 | 80 | 4.85 |
| G8A38060 | R3.0 | 6.0 | .2362 | 6 | 6 | 12 | 90 | 5.85 |
| G8A38070 | R3.5 | 7.0 | .2756 | 8 | 7 | 14 | 90 | 6.7 |
| G8A38080 | R4.0 | 8.0 | .3150 | 8 | 8 | 16 | 100 | 7.7 |
| G8A38090 | R4.5 | 9.0 | .3543 | 10 | 9 | 18 | 100 | 8.7 |
| G8A38100 | R5.0 | 10.0 | .3937 | 10 | 10 | 20 | 100 | 9.7 |
| G8A38120 | R6.0 | 12.0 | .4724 | 12 | 12 | 24 | 110 | 11.7 |
| G8A38140 | R7.0 | 14.0 | .5512 | 14 | 14 | 28 | 110 | 13.7 |
| G8A38160 | R8.0 | 16.0 | .6299 | 16 | 16 | 32 | 140 | 15.7 |
| G8A38180 | R9.0 | 18.0 | .7087 | 18 | 18 | 36 | 140 | 17.7 |
| G8A38200 | R10.0 | 20.0 | .7874 | 20 | 20 | 40 | 160 | 19.7 |
| G8A38250 | R12.5 | 25.0 | .9843 | 25 | 25 | 50 | 180 | 24.7 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to R3 | ±0.005 | 0~−0.012 | h6 |
| over R3 | ±0.010 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

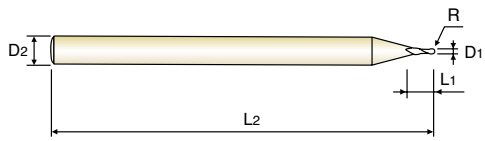
# X5070 END MILLS

**G8A53 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE MINIATURE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.005 | PLAIN

P.626

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | | Metric | Inch | | | |
| | R (±0.005) | $D_1$ | | $D_2$ | $L_1$ | $L_2$ |
| G8A53004 | R0.2 | 0.4 | .0157 | 6 | 0.4 | 50 |
| G8A53005 | R0.25 | 0.5 | .0197 | 6 | 0.5 | 50 |
| G8A53006 | R0.3 | 0.6 | .0236 | 6 | 0.6 | 50 |
| G8A53008 | R0.4 | 0.8 | .0315 | 6 | 0.8 | 50 |
| G8A53010 | R0.5 | 1.0 | .0394 | 6 | 1.0 | 50 |
| G8A53012 | R0.6 | 1.2 | .0472 | 6 | 1.2 | 50 |
| G8A53015 | R0.75 | 1.5 | .0591 | 6 | 1.5 | 50 |
| G8A53020 | R1.0 | 2.0 | .0787 | 6 | 2.0 | 50 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

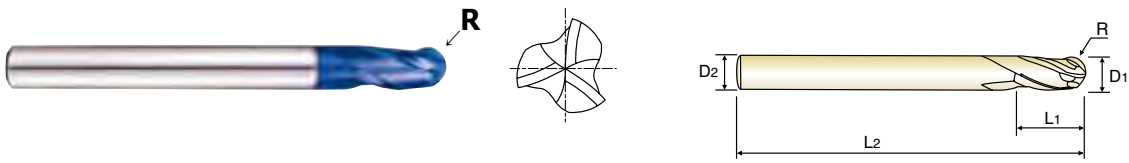
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A59 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE BALL NOSE

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Designed for high precision milling operation.
- Higher wear-resistance.




NG | 3 | BLUE | 30° | R ±0.005 (R1.5~R3) | R ±0.010 (R4~R10) | PLAIN

P.623

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | | Metric | Inch | | | |
| | R | $D_1$ | | $D_2$ | $L_1$ | $L_2$ |
| G8A59030 | R1.5 | 3.0 | .1181 | 6 | 8 | 60 |
| G8A59040 | R2.0 | 4.0 | .1575 | 6 | 8 | 70 |
| G8A59050 | R2.5 | 5.0 | .1969 | 6 | 10 | 80 |
| G8A59060 | R3.0 | 6.0 | .2362 | 6 | 12 | 90 |
| G8A59080 | R4.0 | 8.0 | .3150 | 8 | 14 | 100 |
| G8A59100 | R5.0 | 10.0 | .3937 | 10 | 18 | 100 |
| G8A59120 | R6.0 | 12.0 | .4724 | 12 | 22 | 110 |
| G8A59160 | R8.0 | 16.0 | .6299 | 16 | 30 | 140 |
| G8A59200 | R10.0 | 20.0 | .7874 | 20 | 38 | 160 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to R3 | ±0.005 | 0~−0.012 | h6 |
| over R3 | ±0.010 | 0~−0.015 | |

◎ : Excellent ○ : Good

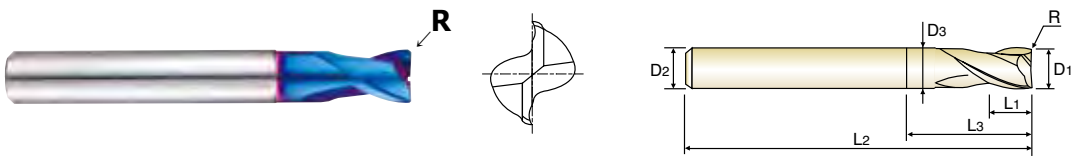
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A36 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.010 Ø0.3~Ø6 | R ±0.015 Ø8~Ø20 | PLAIN

P.624, 625

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A36003 | - | 0.3 | .0118 | 3 | 0.45 | - | 40 | - |
| G8A36004 | - | 0.4 | .0157 | 3 | 0.6 | - | 40 | - |
| G8A36005 | R0.05 | 0.5 | .0197 | 3 | 0.7 | - | 40 | - |
| G8A36907 | R0.05 | 0.5 | .0197 | 4 | 1 | - | 40 | - |
| G8A36006 | R0.05 | 0.6 | .0236 | 3 | 0.9 | - | 40 | - |
| G8A36908 | R0.05 | 0.6 | .0236 | 4 | 1.2 | - | 40 | - |
| G8A36909 | R0.05 | 0.7 | .0276 | 4 | 1.4 | - | 40 | - |
| G8A36008 | R0.05 | 0.8 | .0315 | 3 | 1.2 | - | 40 | - |
| G8A36910 | R0.05 | 0.8 | .0315 | 4 | 1.6 | - | 40 | - |
| G8A36911 | R0.05 | 0.9 | .0354 | 4 | 2 | - | 40 | - |
| G8A36010 | R0.1 | 1.0 | .0394 | 3 | 1.5 | - | 40 | - |
| G8A36901 | R0.1 | 1.0 | .0394 | 4 | 1.5 | - | 40 | - |
| G8A36903 | R0.1 | 1.0 | .0394 | 6 | 1.5 | - | 40 | - |
| G8A36015 | R0.1 | 1.5 | .0591 | 3 | 2.2 | - | 40 | - |
| G8A36904 | R0.1 | 1.5 | .0591 | 6 | 2.2 | - | 40 | - |
| G8A36020 | R0.1 | 2.0 | .0787 | 3 | 3 | 6 | 40 | 1.95 |
| G8A36902 | R0.1 | 2.0 | .0787 | 4 | 3 | 6 | 40 | 1.95 |
| G8A36905 | R0.1 | 2.0 | .0787 | 6 | 3 | 6 | 40 | 1.95 |
| G8A36025 | R0.1 | 2.5 | .0984 | 3 | 4 | 6 | 40 | 2.4 |
| G8A36906 | R0.1 | 2.5 | .0984 | 6 | 4 | 6 | 40 | 2.4 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

▶ NEXT PAGE

◎ : Excellent ○ : Good

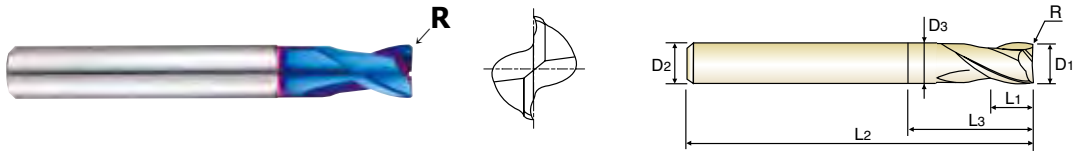
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A36 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.010 Ø0.3~Ø6 | R ±0.015 Ø8~Ø20 | PLAIN

P.624

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A36030 | R0.1 | 3.0 | .1181 | 6 | 4 | 7 | 45 | 2.85 |
| G8A36035 | R0.1 | 3.5 | .1378 | 6 | 5 | 9 | 45 | 3.35 |
| G8A36040 | R0.1 | 4.0 | .1575 | 6 | 5 | 9 | 45 | 3.85 |
| G8A36045 | R0.1 | 4.5 | .1772 | 6 | 6 | 10 | 45 | 4.35 |
| G8A36050 | R0.2 | 5.0 | .1969 | 6 | 6 | 11 | 50 | 4.85 |
| G8A36060 | R0.2 | 6.0 | .2362 | 6 | 7 | 14 | 50 | 5.85 |
| G8A36080 | R0.2 | 8.0 | .3150 | 8 | 9 | 18 | 60 | 7.7 |
| G8A36100 | R0.2 | 10.0 | .3937 | 10 | 12 | 25 | 75 | 9.7 |
| G8A36120 | R0.3 | 12.0 | .4724 | 12 | 15 | 30 | 75 | 11.7 |
| G8A36160 | R0.3 | 16.0 | .6299 | 16 | 18 | 38 | 90 | 15.7 |
| G8A36200 | R0.3 | 20.0 | .7874 | 20 | 24 | 45 | 100 | 19.7 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.012 | h6 |
| over Ø6 | ±0.015 | 0~−0.015 | |

◎ : Excellent ○ : Good

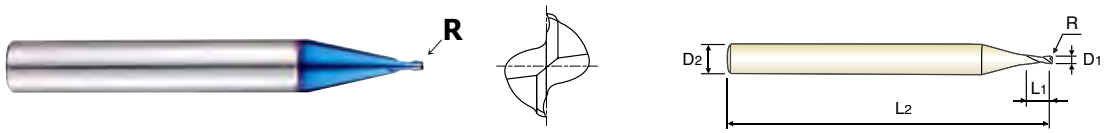
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

G8A50 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 2 | BLUE | 30° | R ±0.010 | PLAIN

P.627

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | | Metric | Inch | | | |
| | R (±0.010) | $D_1$ | | $D_2$ | $L_1$ | $L_2$ |
| G8A50003 | - | 0.3 | .0118 | 6 | 0.45 | 50 |
| G8A50004 | - | 0.4 | .0157 | 6 | 0.6 | 50 |
| G8A50005 | R0.05 | 0.5 | .0197 | 6 | 0.7 | 50 |
| G8A50006 | R0.05 | 0.6 | .0236 | 6 | 0.9 | 50 |
| G8A50008 | R0.05 | 0.8 | .0315 | 6 | 1.2 | 50 |
| G8A50010 | R0.1 | 1.0 | .0394 | 6 | 1.5 | 50 |
| G8A50012 | R0.1 | 1.2 | .0472 | 6 | 1.8 | 50 |
| G8A50015 | R0.15 | 1.5 | .0591 | 6 | 2.2 | 50 |
| G8A50020 | R0.15 | 2.0 | .0787 | 6 | 2.2 | 50 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

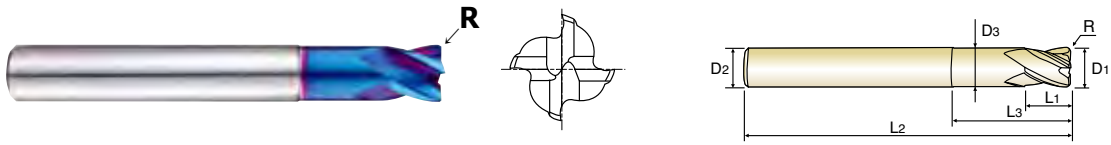
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A47 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting thanks to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 4 | BLUE | 30° | R ±0.010 Ø1~Ø6 | R ±0.015 Ø8~Ø12 | PLAIN

P.627

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A47916 | R0.3 | 3.0 | .1181 | 6 | 4 | 12 | 55 | 2.85 |
| G8A47917 | R0.3 | 3.0 | .1181 | 6 | 4 | 16 | 55 | 2.85 |
| G8A47918 | R0.3 | 3.0 | .1181 | 6 | 4 | 20 | 55 | 2.85 |
| G8A47030 | R0.5 | 3.0 | .1181 | 6 | 4 | 10 | 55 | 2.85 |
| G8A47901 | R0.5 | 3.0 | .1181 | 6 | 4 | 16 | 55 | 2.85 |
| G8A47902 | R0.5 | 3.0 | .1181 | 6 | 4 | 20 | 55 | 2.85 |
| G8A47919 | R0.3 | 4.0 | .1575 | 6 | 5 | 12 | 55 | 3.85 |
| G8A47920 | R0.3 | 4.0 | .1575 | 6 | 5 | 16 | 55 | 3.85 |
| G8A47921 | R0.3 | 4.0 | .1575 | 6 | 5 | 20 | 55 | 3.85 |
| G8A47040 | R0.5 | 4.0 | .1575 | 6 | 5 | 12 | 55 | 3.85 |
| G8A47903 | R0.5 | 4.0 | .1575 | 6 | 5 | 16 | 55 | 3.85 |
| G8A47904 | R0.5 | 4.0 | .1575 | 6 | 5 | 20 | 55 | 3.85 |
| G8A47922 | R1.0 | 4.0 | .1575 | 6 | 5 | 12 | 55 | 3.85 |
| G8A47060 | R0.5 | 6.0 | .2362 | 6 | 7 | 20 | 60 | 5.85 |
| G8A47905 | R1.0 | 6.0 | .2362 | 6 | 7 | 20 | 60 | 5.85 |
| G8A47906 | R1.5 | 6.0 | .2362 | 6 | 7 | 20 | 60 | 5.85 |
| G8A47910 | R0.5 | 8.0 | .3150 | 8 | 9 | 25 | 60 | 7.7 |
| G8A47080 | R1.0 | 8.0 | .3150 | 8 | 9 | 25 | 60 | 7.7 |
| G8A47907 | R1.5 | 8.0 | .3150 | 8 | 9 | 25 | 60 | 7.7 |
| G8A47913 | R2.0 | 8.0 | .3150 | 8 | 9 | 25 | 60 | 7.7 |
| G8A47911 | R0.5 | 10.0 | .3937 | 10 | 11 | 32 | 70 | 9.7 |
| G8A47100 | R1.0 | 10.0 | .3937 | 10 | 11 | 32 | 70 | 9.7 |
| G8A47908 | R1.5 | 10.0 | .3937 | 10 | 11 | 32 | 70 | 9.7 |
| G8A47914 | R2.0 | 10.0 | .3937 | 10 | 11 | 32 | 70 | 9.7 |
| G8A47912 | R0.5 | 12.0 | .4724 | 12 | 12 | 38 | 80 | 11.7 |
| G8A47120 | R1.0 | 12.0 | .4724 | 12 | 12 | 38 | 80 | 11.7 |
| G8A47909 | R1.5 | 12.0 | .4724 | 12 | 12 | 38 | 80 | 11.7 |
| G8A47915 | R2.0 | 12.0 | .4724 | 12 | 12 | 38 | 80 | 11.7 |

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.012 | h6 |
| over Ø6 | ±0.015 | 0~−0.015 | |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

◎ : Excellent ○ : Good

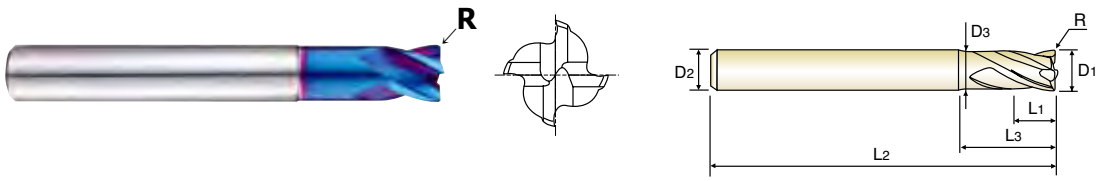
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A37 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials.
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining.
- Higher wear-resistance.




NG | 4 | BLUE | 30° | R ±0.010 Ø1~Ø6 | R ±0.015 Ø8~Ø20 | PLAIN

P.628

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A37010 | RO.1 | 1.0 | .0394 | 3 | 1.5 | - | 40 | - |
| G8A37901 | RO.1 | 1.0 | .0394 | 6 | 1.5 | - | 40 | - |
| G8A37015 | RO.1 | 1.5 | .0591 | 3 | 2.2 | - | 40 | - |
| G8A37902 | RO.1 | 1.5 | .0591 | 6 | 2.2 | - | 40 | - |
| G8A37020 | RO.1 | 2.0 | .0787 | 3 | 3 | 6 | 40 | 1.95 |
| G8A37903 | RO.1 | 2.0 | .0787 | 6 | 3 | 6 | 40 | 1.95 |
| G8A37025 | RO.1 | 2.5 | .0984 | 3 | 4 | 6 | 40 | 2.4 |
| G8A37904 | RO.1 | 2.5 | .0984 | 6 | 4 | 6 | 40 | 2.4 |
| G8A37030 | RO.1 | 3.0 | .1181 | 6 | 4 | 7 | 45 | 2.85 |
| G8A37035 | RO.1 | 3.5 | .1378 | 6 | 5 | 9 | 45 | 3.35 |
| G8A37040 | RO.1 | 4.0 | .1575 | 6 | 5 | 9 | 45 | 3.85 |
| G8A37045 | RO.1 | 4.5 | .1772 | 6 | 6 | 10 | 45 | 4.35 |
| G8A37050 | RO.2 | 5.0 | .1969 | 6 | 6 | 11 | 50 | 4.85 |
| G8A37060 | RO.2 | 6.0 | .2362 | 6 | 7 | 14 | 50 | 5.85 |
| G8A37080 | RO.2 | 8.0 | .3150 | 8 | 9 | 18 | 60 | 7.7 |
| G8A37100 | RO.2 | 10.0 | .3937 | 10 | 12 | 25 | 75 | 9.7 |
| G8A37120 | RO.3 | 12.0 | .4724 | 12 | 15 | 30 | 75 | 11.7 |
| G8A37160 | RO.3 | 16.0 | .6299 | 16 | 18 | 38 | 90 | 15.7 |
| G8A37200 | RO.3 | 20.0 | .7874 | 20 | 24 | 45 | 100 | 19.7 |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.012 | h6 |
| over Ø6 | ±0.015 | 0~−0.015 | |

◎ : Excellent ○ : Good

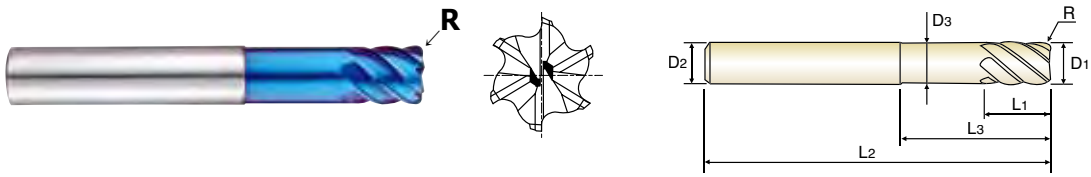
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

# X5070 END MILLS

**G8A39 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 45° HELIX CORNER RADIUS with EXTENDED NECK

- Designed to machine high hardened materials
- Suitable for dry cutting, high speed cutting due to newly developed raw-material and new coating.
- Excellent workpiece finish.
- Deep slotting is possible by reduced neck.
- Corner radius for preventing the chipping in high speed machining
- Higher wear-resistance.




NG | 6 | BLUE | 45° | R ±0.010 Ø6 | R ±0.015 Ø8~Ø20 | PLAIN | P.628

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| G8A39916 | R0.25 | 6.0 | .2362 | 6 | 6 | 14 | 50 | 5.85 |
| G8A39060 | R0.5 | 6.0 | .2362 | 6 | 6 | 14 | 50 | 5.85 |
| G8A39901 | R0.5 | 6.0 | .2362 | 6 | 13 | - | 70 | - |
| G8A39910 | R0.5 | 6.0 | .2362 | ✻ 6 | 26 | - | 70 | - |
| G8A39080 | R0.5 | 8.0 | .3150 | 8 | 8 | 24 | 60 | 7.7 |
| G8A39902 | R0.5 | 8.0 | .3150 | 8 | 19 | - | 90 | - |
| G8A39911 | R0.5 | 8.0 | .3150 | ✻ 8 | 36 | - | 90 | - |
| G8A39903 | R0.5 | 10.0 | .3937 | 10 | 22 | - | 100 | - |
| G8A39100 | R1.0 | 10.0 | .3937 | 10 | 10 | 30 | 70 | 9.7 |
| G8A39904 | R1.0 | 10.0 | .3937 | 10 | 22 | - | 100 | - |
| G8A39912 | R1.0 | 10.0 | .3937 | ✻ 10 | 46 | - | 100 | - |
| G8A39905 | R0.5 | 12.0 | .4724 | 12 | 26 | - | 110 | - |
| G8A39120 | R1.0 | 12.0 | .4724 | 12 | 12 | 30 | 75 | 11.7 |
| G8A39906 | R1.0 | 12.0 | .4724 | 12 | 26 | - | 110 | - |
| G8A39913 | R1.0 | 12.0 | .4724 | ✻ 12 | 56 | - | 110 | - |
| G8A39160 | R1.0 | 16.0 | .6299 | 16 | 32 | - | 130 | - |
| G8A39907 | R1.5 | 16.0 | .6299 | 16 | 32 | - | 130 | - |
| G8A39914 | R1.5 | 16.0 | .6299 | ✻ 16 | 66 | - | 130 | - |
| G8A39200 | R1.0 | 20.0 | .7874 | 20 | 38 | - | 140 | - |
| G8A39908 | R1.5 | 20.0 | .7874 | 20 | 38 | - | 140 | - |
| G8A39909 | R2.0 | 20.0 | .7874 | 20 | 38 | - | 140 | - |
| G8A39915 | R2.0 | 20.0 | .7874 | ✻ 20 | 76 | - | 140 | - |

The original bright blue color may discolor during use, however, the performance will not be negatively affected

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.02 (✻Extra Long Type : 0~-0.03) | h6 |
| over Ø6 | ±0.015 | | |

◎ : Excellent ○ : Good

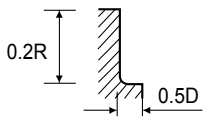
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | ○ | ○ | ◎ | ◎ | | | | | | | | | |

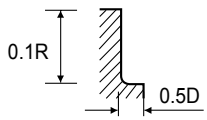
# CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

## G826 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | | H | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HARDENED STEELS | | | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 × R1/32 | 9000 | 245 | 6500 | 155 | 4300 | 100 | 2700 | 43 | 1800 | 23 |
| 3/16 × R1/16 | 7500 | 310 | 5100 | 200 | 3800 | 140 | 2350 | 70 | 1650 | 30 |
| 1/4 × R1/16 | 5500 | 310 | 3900 | 200 | 2800 | 140 | 1750 | 70 | 1250 | 30 |
| 5/16 × R3/32 | 4500 | 310 | 3100 | 200 | 2200 | 140 | 1400 | 70 | 1000 | 30 |
| 3/8 × R3/32 | 3800 | 310 | 2600 | 200 | 1850 | 140 | 1170 | 70 | 840 | 30 |
| 1/2 × R1/8 | 2800 | 310 | 1950 | 200 | 1400 | 140 | 880 | 70 | 630 | 30 |

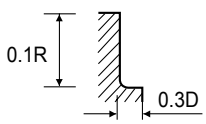


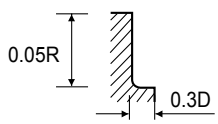




RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | | H | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HARDENED STEELS | | | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 × R1/32 | 21000 | 600 | 16000 | 380 | 12000 | 300 | 9000 | 170 | 6500 | 92 |
| 3/16 × R1/16 | 16500 | 720 | 13500 | 550 | 11500 | 420 | 8000 | 250 | 5700 | 150 |
| 1/4 × R1/16 | 12500 | 720 | 10000 | 550 | 8500 | 420 | 6000 | 250 | 4300 | 150 |
| 5/16 × R3/32 | 10000 | 720 | 8000 | 550 | 6800 | 420 | 4800 | 250 | 3400 | 150 |
| 3/8 × R3/32 | 8500 | 720 | 6700 | 550 | 5700 | 420 | 4000 | 250 | 2850 | 150 |
| 1/2 × R1/8 | 6500 | 720 | 5000 | 550 | 4300 | 420 | 3000 | 250 | 2150 | 150 |




RPM = rev./min.
FEED = inch/min.

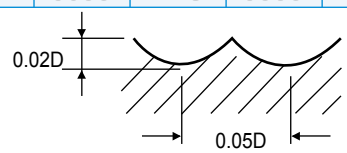
# X5070 END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE with EXTENDED NECK

### G8A43 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/64 × 1/32 | 50000 | 189.0 | 50000 | 165.4 | 45000 | 149.6 | 40000 | 118.1 | 35000 | 102.4 | 35000 | 90.6 |
| R1/32 × 1/16 | 49700 | 224.4 | 47800 | 189.0 | 40000 | 157.5 | 35000 | 124.0 | 32000 | 110.2 | 28500 | 90.6 |
| R3/64 × 3/32 | 49700 | 224.4 | 47800 | 189.0 | 40000 | 157.5 | 35000 | 124.0 | 32000 | 110.2 | 28500 | 90.6 |
| R1/16 × 1/8 | 33100 | 236.2 | 31800 | 208.7 | 26500 | 157.5 | 23500 | 124.0 | 21000 | 110.2 | 19000 | 90.6 |
| R3/32 × 3/16 | 18600 | 228.4 | 17800 | 192.9 | 15000 | 147.6 | 13500 | 120.1 | 11500 | 100.4 | 10500 | 82.7 |
| R1/8 × 1/14 | 13900 | 190.9 | 13400 | 161.4 | 11000 | 122.1 | 10000 | 98.4 | 8800 | 84.7 | 8000 | 68.9 |
| R5/32 × 5/16 | 11100 | 165.4 | 10700 | 137.8 | 9000 | 106.3 | 8000 | 84.7 | 7000 | 72.8 | 6500 | 61.0 |
| R3/16 × 3/8 | 9300 | 145.7 | 8900 | 122.1 | 7500 | 94.5 | 6600 | 74.8 | 5800 | 65.0 | 5300 | 54.3 |
| R1/4 × 1/2 | 6950 | 116.1 | 6680 | 98.4 | 5600 | 74.8 | 5000 | 61.0 | 4400 | 49.2 | 4000 | 41.3 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

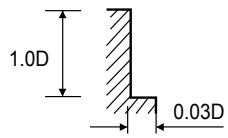
# X5070 END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

### G850 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/16 | 41950 | 69.4 | 32750 | 49.6 | 22050 | 33.3 | 18250 | 20.6 | 13850 | 12.7 | 11950 | 9.1 |
| 1/8 | 20600 | 52.1 | 16350 | 37.2 | 10850 | 25.0 | 9000 | 15.5 | 7100 | 9.5 | 6050 | 6.9 |
| 3/16 | 16500 | 66.2 | 13100 | 49.5 | 8700 | 33.0 | 6700 | 19.1 | 5350 | 12.2 | 4650 | 8.9 |
| 1/4 | 12400 | 58.1 | 9800 | 41.8 | 6500 | 28.2 | 5000 | 16.6 | 3950 | 10.4 | 3500 | 7.8 |
| 5/16 | 9950 | 59.6 | 7850 | 42.8 | 5250 | 28.6 | 4050 | 16.6 | 3250 | 10.6 | 2800 | 7.6 |
| 3/8 | 8200 | 57.9 | 6450 | 41.6 | 4300 | 27.8 | 3350 | 15.8 | 2700 | 10.3 | 2300 | 7.2 |
| 1/2 | 6300 | 52.2 | 4950 | 37.4 | 3300 | 24.9 | 2500 | 14.3 | 2000 | 9.0 | 1750 | 6.5 |
| 5/8 | 4950 | 47.7 | 3950 | 35.1 | 2600 | 23.0 | 2000 | 13.2 | 1600 | 8.5 | 1400 | 6.3 |
| 3/4 | 4100 | 43.0 | 3250 | 32.0 | 2150 | 21.5 | 1700 | 12.7 | 1350 | 8.2 | 1150 | 5.9 |

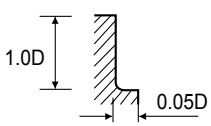


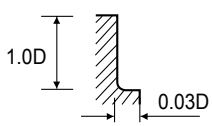

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS

### G851 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 23450 | 199.2 | 22200 | 182.2 | 15100 | 182.1 | 12750 | 122.7 | 9900 | 78.0 | 7550 | 53.9 |
| 5/16 | 20650 | 191.3 | 19600 | 174.8 | 13200 | 171.8 | 11150 | 115.3 | 8700 | 73.3 | 6600 | 51.2 |
| 3/8 | 17900 | 183.4 | 17000 | 167.3 | 11350 | 161.6 | 9500 | 108.0 | 7450 | 68.7 | 5700 | 48.5 |
| 1/2 | 12300 | 167.6 | 11800 | 152.4 | 7550 | 141.2 | 6250 | 93.2 | 5000 | 59.4 | 3800 | 43.0 |
| 5/8 | 10100 | 159.1 | 9800 | 147.2 | 6050 | 135.0 | 5050 | 91.5 | 4050 | 49.8 | 3000 | 34.3 |
| 3/4 | 8850 | 140.7 | 8600 | 133.3 | 5300 | 123.2 | 4400 | 82.7 | 3550 | 43.7 | 2650 | 30.0 |
| 1 | 6300 | 103.9 | 6150 | 105.5 | 3800 | 99.7 | 3150 | 65.1 | 2500 | 31.4 | 1900 | 21.5 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

# X5070 END MILLS

## RECOMMENDED CUTTING CONDITIONS

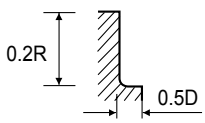
## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS HIGH FEED

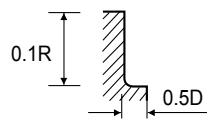
### G859, G854 SERIES

### ■ NORMAL SPEED

| MATERIAL | | P | | | | | | H | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HARDENED STEELS | | | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | | ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| DIAMETER | | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 × R0.5 | | 13500 | 255.9 | 9550 | 149.6 | 5500 | 86.6 | 3200 | 39.4 | 2200 | 21.7 |
| 3.0 × R0.5 | | 9550 | 255.9 | 6900 | 163.4 | 4550 | 108.3 | 2850 | 45.3 | 1900 | 24.0 |
| 4.0 × R0.5 | | 7950 | 275.6 | 5750 | 181.1 | 4000 | 126.0 | 2550 | 53.2 | 1750 | 27.6 |
| 5.0 × R0.5 | | 6500 | 287.4 | 4800 | 189.0 | 3400 | 126.0 | 2200 | 63.0 | 1500 | 27.6 |
| 6.0 × R0.5 | | 5800 | 301.2 | 4100 | 192.9 | 2900 | 137.8 | 1850 | 72.8 | 1350 | 31.3 |
| 6.0 × R1.0 | | 5800 | 301.2 | 4100 | 192.9 | 2900 | 137.8 | 1850 | 72.8 | 1350 | 31.3 |
| 8.0 × R1.0 | | 4350 | 301.2 | 3050 | 192.9 | 2200 | 137.8 | 1400 | 72.8 | 995 | 31.3 |
| 8.0 × R2.0 | | 4350 | 301.2 | 3050 | 192.9 | 2200 | 137.8 | 1400 | 72.8 | 995 | 31.3 |
| 10.0 × R1.0 | | 3500 | 301.2 | 2450 | 192.9 | 1750 | 137.8 | 1100 | 72.8 | 795 | 31.3 |
| 10.0 × R2.0 | | 3500 | 301.2 | 2450 | 192.9 | 1750 | 137.8 | 1100 | 72.8 | 795 | 31.3 |
| 12.0 × R2.0 | | 2900 | 301.2 | 2050 | 192.9 | 1450 | 137.8 | 925 | 72.8 | 665 | 31.3 |
| 12.0 × R3.0 | | 2900 | 301.2 | 2050 | 192.9 | 1450 | 137.8 | 925 | 72.8 | 665 | 31.3 |
| 16.0 × R3.0 | | 2200 | 301.2 | 1550 | 192.9 | 1100 | 137.8 | 700 | 72.8 | 500 | 31.3 |

RPM = rev./min.
FEED = inch/min.

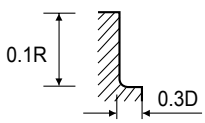


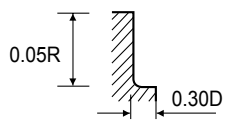




### ■ HIGH SPEED

| MATERIAL | | P | | | | | | H | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | HARDENED STEELS | | | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | | ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| DIAMETER | | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 × R0.5 | | 29000 | 590.6 | 22000 | 385.8 | 15000 | 309.1 | 11000 | 175.2 | 8700 | 96.5 |
| 3.0 × R0.5 | | 22000 | 629.9 | 17000 | 393.7 | 12500 | 315.0 | 9500 | 181.1 | 6900 | 98.4 |
| 4.0 × R0.5 | | 17000 | 689.0 | 13000 | 472.4 | 11000 | 362.2 | 8000 | 216.5 | 5600 | 114.2 |
| 5.0 × R0.5 | | 15000 | 708.7 | 11000 | 192.1 | 10000 | 393.7 | 7000 | 236.2 | 4900 | 122.1 |
| 6.0 × R0.5 | | 13500 | 728.4 | 10500 | 543.3 | 9000 | 433.1 | 6400 | 252.0 | 4500 | 141.7 |
| 6.0 × R1.0 | | 13500 | 728.4 | 10500 | 543.3 | 9000 | 433.1 | 6400 | 252.0 | 4500 | 141.7 |
| 8.0 × R1.0 | | 10000 | 728.4 | 8000 | 551.2 | 6800 | 433.1 | 4800 | 263.8 | 3400 | 161.4 |
| 8.0 × R2.0 | | 10000 | 728.4 | 8000 | 551.2 | 6800 | 433.1 | 4800 | 263.8 | 3400 | 161.4 |
| 10.0 × R1.0 | | 8000 | 728.4 | 6400 | 551.2 | 5400 | 433.1 | 3800 | 267.7 | 2700 | 149.6 |
| 10.0 × R2.0 | | 8000 | 728.4 | 6400 | 551.2 | 5400 | 433.1 | 3800 | 267.7 | 2700 | 149.6 |
| 12.0 × R2.0 | | 6600 | 728.4 | 5300 | 551.2 | 4500 | 433.1 | 3200 | 275.6 | 2250 | 141.7 |
| 12.0 × R3.0 | | 6600 | 728.4 | 5300 | 551.2 | 4500 | 433.1 | 3200 | 275.6 | 2250 | 141.7 |
| 16.0 × R3.0 | | 5000 | 728.4 | 3900 | 551.2 | 3300 | 433.1 | 2400 | 275.6 | 1650 | 129.9 |

RPM = rev./min.
FEED = inch/min.

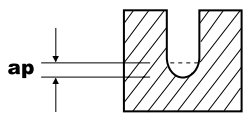


## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

### G8A46, G8A54 SERIES

| MATERIAL | P | | | | | | H | | | N | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | | HIGH HARDENED STEELS | | | COPPER | | |
| HARDNESS | HRc30 ~ HRc45 | | | HRc45 ~ HRc55 | | | HRc55 ~ HRc65 | | | | | |
| DIAMETER | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) | RPM | FEED | ap (mm) |
| R0.1 × 0.2 | 50000 | 11.8~13.8 | 0.006~0.016 | 50000 | 10.4~12.2 | 0.005~0.013 | 50000 | 8.9~10.4 | 0.005~0.012 | 50000 | 17.9~20.9 | 0.010~0.022 |
| R0.15 × 0.3 | 48000~50000 | 18.9~20.5 | 0.010~0.017 | 48000~50000 | 17.3~18.1 | 0.008~0.014 | 46000~50000 | 15..4~16.5 | 0.007~0.013 | 48000~50000 | 27.2~31.1 | 0.002~0.023 |
| R0.2 × 0.4 | 48000~50000 | 28.4~31.1 | 0.013~0.032 | 48000~50000 | 17.7~21.7 | 0.011~0.026 | 46000~50000 | 15.8~18.1 | 0.010~0.024 | 48000~50000 | 39.4~45.3 | 0.019~0.048 |
| R0.25 × 0.5 | 34100~49500 | 23.6~34.3 | 0.007~0.028 | 31900~35200 | 19.3~21.3 | 0.005~0.023 | 31900~35200 | 17.3~18.9 | 0.005~0.021 | 49000~50000 | 39.4~55.1 | 0.010~0.042 |
| R0.3 × 0.6 | 28600~40700 | 23.2~33.5 | 0.007~0.034 | 26400~29700 | 18.9~21.3 | 0.006~0.028 | 26400~29700 | 15.8~18.9 | 0.006~0.025 | 42000~50000 | 43.3~66.9 | 0.011~0.050 |
| R0.4 × 0.8 | 22000~30800 | 25.2~35.0 | 0.016~0.064 | 19800~22000 | 19.3~21.7 | 0.013~0.052 | 19800~22000 | 17.3~19.7 | 0.012~0.048 | 31000~50000 | 43.3~88.6 | 0.024~0.096 |
| R0.5 × 1.0 | 17600~24200 | 23.6~33.5 | 0.008~0.080 | 15400~17600 | 18.5~21.3 | 0.007~0.065 | 15400~17600 | 17.3~19.7 | 0.006~0.060 | 24000~49500 | 43.3~86.6 | 0.012~0.120 |
| R0.6 × 1.2 | 14300~18700 | 23.2~30.7 | 0.024~0.032 | 12000~14000 | 18.9~21.3 | 0.020~0.026 | 12000~14000 | 16.5~18.9 | 0.018~0.024 | 28500~38500 | 58.3~76.8 | 0.036~0.048 |
| R0.75 × 1.5 | 11000~14300 | 22.8~29.9 | 0.031~0.048 | 10000~11500 | 18.9~21.3 | 0.025~0.039 | 10000~11500 | 16.5~18.9 | 0.023~0.036 | 17000~28500 | 43.3~76.8 | 0.046~0.072 |
| R1.0 × 2.0 | 8500~11000 | 23.2~31.5 | 0.024~0.160 | 7900~8800 | 18.5~20.9 | 0.020~0.130 | 7900~8800 | 17.3~18.9 | 0.018~0.120 | 12600~24000 | 43.3~84.7 | 0.036~0.240 |
| R1.5 × 3.0 | 5700~8200 | 28.7~39.4 | 0.064~0.240 | 5300~5800 | 23.2~25.6 | 0.052~0.195 | 5300~5800 | 21.7~24.4 | 0.048~0.120 | 11900~17000 | 72.8~106.3 | 0.096~0.360 |
| R2.0 × 4.0 | 4300~6200 | 26.8~39.0 | 0.080~0.320 | 3950~4400 | 21.7~24.4 | 0.065~0.026 | 3850~4400 | 20.9~22.4 | 0.060~0.240 | 6600~12500 | 49.6~98.4 | 0.120~0.480 |

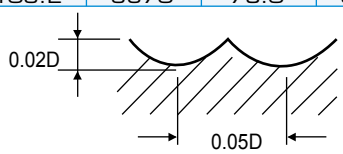



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE BALL NOSE

### G8A59 SERIES

| MATERIAL | P | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1.5 × 3.0 | 32000 | 338.6 | 26840 | 228.4 | 19840 | 168.5 | 18680 | 159.1 | 12780 | 108.7 |
| R2.0 × 4.0 | 24080 | 303.2 | 20130 | 213.8 | 14880 | 152.8 | 14220 | 143.7 | 9580 | 98.4 |
| R2.5 × 5.0 | 20000 | 285.4 | 16780 | 213.8 | 12400 | 145.3 | 11670 | 136.6 | 8000 | 93.3 |
| R3.0 × 6.0 | 18000 | 337.4 | 15200 | 244.9 | 12200 | 177.2 | 11100 | 150.8 | 7590 | 96.9 |
| R4.0 × 8.0 | 13500 | 289.4 | 11300 | 206.7 | 9200 | 156.7 | 8320 | 131.9 | 5690 | 83.9 |
| R5.0 × 10.0 | 10800 | 257.1 | 9100 | 180.7 | 7350 | 135.8 | 6660 | 113.0 | 4550 | 77.2 |
| R6.0 × 12.0 | 9050 | 240.2 | 7590 | 167.7 | 6130 | 125.6 | 5530 | 94.5 | 3800 | 64.6 |
| R8.0 × 16.0 | 6700 | 181.1 | 5690 | 128.0 | 4600 | 97.6 | 4160 | 70.9 | 2850 | 48.4 |
| R10.0×20.0 | 5400 | 141.7 | 4550 | 103.2 | 3670 | 78.0 | 3300 | 56.7 | 2280 | 38.6 |




RPM = rev./min.
FEED = inch/min.

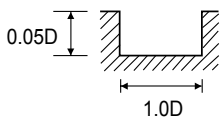
# X5070 END MILLS

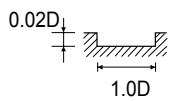
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE - SLOTTING

### G8A36 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.2 | 50000 | 5.1 | 45000 | 4.5 | 40000 | 3.7 | 33000 | 2.4 | 33000 | 1.8 | 26400 | 1.2 |
| 0.3 | 50000 | 7.5 | 45000 | 5.5 | 40000 | 4.5 | 33000 | 2.8 | 25000 | 2.0 | 20000 | 1.4 |
| 0.4 | 50000 | 9.3 | 45000 | 7.1 | 40000 | 5.5 | 33000 | 3.5 | 25000 | 2.2 | 20000 | 1.6 |
| 0.5 | 50000 | 14.6 | 45000 | 11.0 | 40000 | 8.7 | 33000 | 5.5 | 25000 | 3.4 | 20000 | 2.4 |
| 0.6 | 50000 | 18.5 | 45000 | 14.2 | 40000 | 11.2 | 30000 | 6.3 | 25000 | 4.1 | 20000 | 3.0 |
| 0.8 | 50000 | 23.6 | 40000 | 17.3 | 30000 | 11.6 | 25000 | 7.3 | 19000 | 4.3 | 15200 | 3.2 |
| 0.9 | 49000 | 25.8 | 39000 | 20.5 | 27800 | 13.0 | 22700 | 8.1 | 17500 | 4.9 | 14000 | 3.5 |
| 1.0 | 48000 | 29.5 | 38000 | 22.4 | 25500 | 14.2 | 20500 | 8.5 | 16000 | 5.3 | 12500 | 3.4 |
| 2.0 | 33300 | 33.5 | 26000 | 26.8 | 17500 | 16.5 | 14500 | 10.2 | 11000 | 6.3 | 9500 | 4.5 |
| 3.0 | 21800 | 33.5 | 17300 | 26.8 | 11500 | 16.5 | 9500 | 10.2 | 7500 | 6.3 | 6400 | 4.5 |
| 4.0 | 16700 | 34.7 | 13200 | 27.6 | 8800 | 17.3 | 7200 | 10.6 | 5600 | 6.7 | 4750 | 4.7 |
| 5.0 | 15700 | 39.4 | 12500 | 31.7 | 8300 | 19.7 | 6400 | 11.2 | 5100 | 7.1 | 4450 | 5.2 |
| 6.0 | 13100 | 37.4 | 10350 | 30.3 | 6900 | 18.9 | 5300 | 11.0 | 4200 | 7.1 | 3700 | 5.1 |
| 8.0 | 9880 | 36.6 | 7800 | 28.4 | 5200 | 17.5 | 4000 | 10.0 | 3200 | 6.5 | 2800 | 4.7 |
| 10.0 | 7800 | 33.5 | 6150 | 26.8 | 4100 | 16.3 | 3200 | 9.5 | 2550 | 6.1 | 2200 | 4.4 |
| 12.0 | 6650 | 33.5 | 5250 | 26.8 | 3500 | 16.3 | 2650 | 9.5 | 2100 | 6.1 | 1860 | 4.4 |
| 16.0 | 4900 | 28.7 | 3900 | 22.8 | 2600 | 14.4 | 2000 | 8.3 | 1600 | 5.3 | 1400 | 3.7 |
| 20.0 | 3900 | 26.0 | 3100 | 20.7 | 2050 | 14.4 | 1600 | 7.7 | 1300 | 4.9 | 1100 | 3.4 |



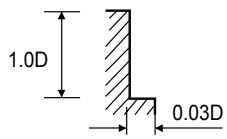




RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE - SIDE CUTTING

### G8A36 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1.0 | 48000 | 41.3 | 38000 | 32.3 | 25500 | 20.1 | 20500 | 12.2 | 16000 | 7.5 | 12500 | 4.9 |
| 2.0 | 33300 | 47.2 | 26000 | 38.2 | 17500 | 23.6 | 14500 | 14.6 | 11000 | 9.1 | 9500 | 6.5 |
| 3.0 | 21800 | 47.2 | 17300 | 38.2 | 11500 | 23.6 | 9500 | 14.6 | 7500 | 9.1 | 6400 | 6.5 |
| 4.0 | 16700 | 49.2 | 13200 | 39.4 | 8800 | 24.6 | 7200 | 15.2 | 5600 | 9.5 | 4750 | 6.7 |
| 5.0 | 15700 | 57.1 | 12500 | 45.3 | 8300 | 28.0 | 6400 | 16.1 | 5100 | 10.2 | 4450 | 7.5 |
| 6.0 | 13100 | 53.2 | 10350 | 43.3 | 6900 | 27.2 | 5300 | 15.8 | 4200 | 10.0 | 3700 | 7.3 |
| 8.0 | 9880 | 52.0 | 7800 | 40.6 | 5200 | 25.0 | 4000 | 14.4 | 3200 | 9.3 | 2800 | 6.7 |
| 10.0 | 7800 | 47.2 | 6150 | 38.2 | 4100 | 23.2 | 3200 | 13.4 | 2550 | 8.7 | 2200 | 6.3 |
| 12.0 | 6650 | 47.2 | 5250 | 38.2 | 3500 | 23.2 | 2650 | 13.4 | 2100 | 8.7 | 1860 | 6.3 |
| 16.0 | 4900 | 41.3 | 3900 | 33.1 | 2600 | 20.5 | 2000 | 11.8 | 1600 | 7.5 | 1400 | 5.5 |
| 20.0 | 3900 | 37.4 | 3100 | 29.5 | 2050 | 18.7 | 1600 | 10.8 | 1300 | 6.9 | 1100 | 4.2 |




RPM = rev./min.
FEED = inch/min.

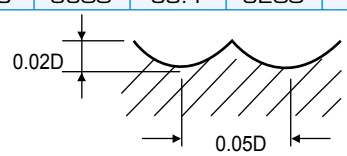
# X5070 END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE

### G8A38, G8A28, G8A53 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEEl | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R0.1 x 0.2 | 50000 | 47.2 | 50000 | 41.3 | 45000 | 37.8 | 40000 | 30.3 | 35000 | 26.54 | 31500 | 22.4 |
| R0.15 x 0.3 | 50000 | 59.1 | 50000 | 53.6 | 45000 | 47.2 | 40000 | 37.9 | 35000 | 33.1 | 31500 | 27.6 |
| R0.2 x 0.4 | 50000 | 74.8 | 50000 | 66.9 | 45000 | 59.1 | 40000 | 47.2 | 35000 | 41.3 | 31500 | 35.0 |
| R0.25 x 0.5 | 50000 | 94.5 | 50000 | 82.7 | 45000 | 74.8 | 40000 | 59.1 | 35000 | 51.2 | 31500 | 43.3 |
| R0.3 x 0.6 | 50000 | 114.2 | 50000 | 98.4 | 45000 | 86.6 | 40000 | 70.9 | 35000 | 63.0 | 31500 | 55.1 |
| R0.4 x 0.8 | 50000 | 153.5 | 50000 | 129.9 | 45000 | 118.1 | 40000 | 94.5 | 35000 | 82.7 | 31500 | 70.9 |
| R0.5 x 1.0 | 50000 | 189.0 | 50000 | 165.4 | 45000 | 149.6 | 40000 | 118.1 | 35000 | 102.4 | 35000 | 90.6 |
| R0.6 x 1.2 | 50000 | 200.8 | 48000 | 169.3 | 43000 | 151.6 | 38000 | 118.1 | 34000 | 106.3 | 30600 | 90.6 |
| R0.75 x 1.5 | 50000 | 212.6 | 48000 | 177.2 | 43000 | 157.5 | 37000 | 122.1 | 33000 | 106.3 | 29700 | 90.6 |
| R1.0 x 2.0 | 49700 | 224.4 | 47800 | 189.0 | 40000 | 157.5 | 35000 | 124.0 | 32000 | 110.2 | 28500 | 90.6 |
| R1.5 x 3.0 | 33100 | 236.2 | 31800 | 208.7 | 26500 | 157.5 | 23500 | 124.0 | 21000 | 110.2 | 19000 | 90.6 |
| R2.0 x 4.0 | 24900 | 236.2 | 23900 | 208.7 | 20000 | 157.5 | 17500 | 124.0 | 16000 | 110.2 | 14500 | 90.6 |
| R2.5 x 5.0 | 18600 | 228.4 | 17800 | 192.9 | 15000 | 147.6 | 13500 | 120.1 | 11500 | 100.4 | 10500 | 82.7 |
| R3.0 x 6.0 | 13900 | 190.9 | 13400 | 161.4 | 11000 | 122.1 | 10000 | 98.4 | 8800 | 84.7 | 8000 | 68.9 |
| R4.0 x 8.0 | 11100 | 165.4 | 10700 | 137.8 | 9000 | 106.3 | 8000 | 84.7 | 7000 | 72.8 | 6500 | 61.0 |
| R5.0 x 10.0 | 9300 | 145.7 | 8900 | 122.1 | 7500 | 94.5 | 6600 | 74.8 | 5800 | 65.0 | 5300 | 54.3 |
| R6.0 x 12.0 | 6950 | 116.1 | 6680 | 98.4 | 5600 | 74.8 | 5000 | 61.0 | 4400 | 49.2 | 4000 | 41.3 |
| R8.0 x 16.0 | 5570 | 104.3 | 5350 | 86.6 | 4500 | 66.9 | 4000 | 53.2 | 3500 | 39.4 | 3200 | 33.5 |
| R10.0 x 20.0 | 4450 | 92.5 | 4300 | 76.8 | 3600 | 59.1 | 3200 | 47.2 | 2800 | 31.5 | 2550 | 26.0 |

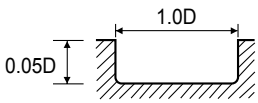


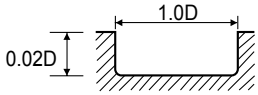

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE MINIATURE CORNER RADIUS - SLOTTING

### G8A50 SERIES

| MATERIAL | P | | | | | | H | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 0.3 | 50000 | 7.5 | 45000 | 5.5 | 40000 | 4.5 | 33000 | 2.8 | 25000 | 1.6 |
| 0.4 | 50000 | 9.3 | 45000 | 7.1 | 40000 | 5.5 | 33000 | 3.5 | 25000 | 2.2 |
| 0.5 | 50000 | 14.6 | 45000 | 11.0 | 40000 | 8.7 | 33000 | 5.5 | 25000 | 3.4 |
| 0.6 | 50000 | 18.5 | 45000 | 14.2 | 40000 | 11.2 | 30000 | 6.3 | 25000 | 4.1 |
| 0.8 | 50000 | 23.6 | 40000 | 17.3 | 30000 | 11.6 | 25000 | 7.3 | 19000 | 4.3 |
| 1.0 | 48000 | 29.5 | 38000 | 22.4 | 25500 | 14.2 | 20500 | 8.5 | 16000 | 5.3 |
| 1.2 | 42000 | 31.1 | 34000 | 25.2 | 22500 | 15.0 | 20000 | 9.8 | 14500 | 5.7 |
| 1.5 | 37000 | 31.0 | 30500 | 26.4 | 21000 | 16.1 | 17000 | 9.8 | 13000 | 6.2 |
| 2.0 | 33300 | 33.5 | 26000 | 26.8 | 17500 | 16.5 | 14500 | 10.2 | 11000 | 6.3 |



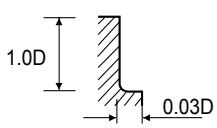




RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE CORNER RADIUS

### G8A47 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1.0 | 48000 | 46.6 | 38000 | 33.1 | 25500 | 22.4 | 20500 | 13.5 | 16000 | 8.5 | 12500 | 5.5 |
| 2.0 | 33300 | 55.1 | 26000 | 39.4 | 17500 | 26.5 | 14500 | 16.4 | 11000 | 10.1 | 9500 | 7.2 |
| 3.0 | 21800 | 55.1 | 17300 | 39.4 | 11500 | 26.5 | 9500 | 16.4 | 7500 | 10.1 | 6400 | 7.2 |
| 4.0 | 16700 | 56.7 | 13200 | 40.9 | 8800 | 27.7 | 7200 | 17.0 | 5600 | 10.6 | 4750 | 7.6 |
| 5.0 | 15700 | 63.0 | 12500 | 47.2 | 8300 | 31.5 | 6400 | 18.3 | 5100 | 11.7 | 4450 | 8.5 |
| 6.0 | 13100 | 61.4 | 10350 | 44.1 | 6900 | 29.9 | 5300 | 17.6 | 4200 | 11.0 | 3700 | 8.2 |
| 8.0 | 9880 | 59.2 | 7800 | 42.5 | 5200 | 28.4 | 4000 | 16.4 | 3200 | 10.4 | 2800 | 7.6 |
| 10.0 | 7800 | 55.1 | 6150 | 39.7 | 4100 | 26.5 | 3200 | 15.1 | 2550 | 9.8 | 2200 | 6.9 |
| 12.0 | 6650 | 55.1 | 5250 | 39.7 | 3500 | 26.5 | 2650 | 15.1 | 2100 | 9.5 | 1860 | 6.9 |
| 16.0 | 4900 | 47.2 | 3900 | 34.7 | 2600 | 23.0 | 2000 | 13.2 | 1600 | 8.5 | 1400 | 6.3 |
| 20.0 | 3900 | 40.9 | 3100 | 30.6 | 2050 | 20.5 | 1600 | 12.0 | 1300 | 7.9 | 1100 | 5.7 |




RPM = rev./min. FEED = inch/min.

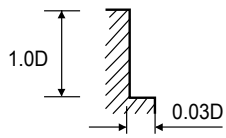
# X5070 END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS with EXTENDED NECK

### G8A37 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1.0 | 48000 | 58.3 | 38000 | 41.3 | 25500 | 28.0 | 20500 | 16.9 | 16000 | 10.6 | 12500 | 6.9 |
| 2.0 | 33300 | 68.9 | 26000 | 49.2 | 17500 | 33.1 | 14500 | 20.5 | 11000 | 12.6 | 9500 | 9.1 |
| 3.0 | 21800 | 68.9 | 17300 | 49.2 | 11500 | 33.1 | 9500 | 20.5 | 7500 | 12.6 | 6400 | 9.1 |
| 4.0 | 16700 | 70.9 | 13200 | 51.2 | 8800 | 34.7 | 7200 | 21.3 | 5600 | 13.2 | 4750 | 9.5 |
| 5.0 | 15700 | 78.7 | 12500 | 59.1 | 8300 | 39.4 | 6400 | 22.8 | 5100 | 14.6 | 4450 | 10.6 |
| 6.0 | 13100 | 76.8 | 10350 | 55.1 | 6900 | 37.4 | 5300 | 22.1 | 4200 | 13.8 | 3700 | 10.2 |
| 8.0 | 9880 | 74.0 | 7800 | 53.2 | 5200 | 35.4 | 4000 | 20.5 | 3200 | 13.0 | 2800 | 9.5 |
| 10.0 | 7800 | 68.9 | 6150 | 49.6 | 4100 | 33.1 | 3200 | 18.9 | 2550 | 12.2 | 2200 | 8.7 |
| 12.0 | 6650 | 68.9 | 5250 | 49.6 | 3500 | 33.1 | 2650 | 18.9 | 2100 | 11.8 | 1860 | 8.7 |
| 16.0 | 4900 | 59.1 | 3900 | 43.3 | 2600 | 28.7 | 2000 | 16.5 | 1600 | 10.6 | 1400 | 7.9 |
| 20.0 | 3900 | 51.2 | 3100 | 38.2 | 2050 | 25.6 | 1600 | 15.0 | 1300 | 9.8 | 1100 | 7.1 |

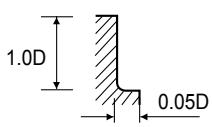


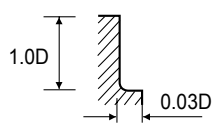

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 6 FLUTE 45° HELIX CORNER RADIUS

### G8A39 SERIES

| MATERIAL | P | | | | | | H | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | | | HIGH HARDENED STEELS | | | | | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc65 | | HRc65 ~ HRc70 | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6.0 | 24800 | 210.6 | 23500 | 192.9 | 16000 | 192.9 | 13500 | 129.9 | 10500 | 82.7 | 8000 | 57.1 |
| 8.0 | 20000 | 216.5 | 19000 | 196.9 | 12000 | 181.1 | 10000 | 122.1 | 8000 | 78.7 | 6000 | 55.1 |
| 10.0 | 16000 | 192.9 | 15500 | 177.2 | 9500 | 161.4 | 8000 | 114.2 | 6400 | 70.9 | 4800 | 51.2 |
| 12.0 | 13000 | 177.2 | 12500 | 161.4 | 8000 | 149.6 | 6600 | 98.4 | 5300 | 63.0 | 4000 | 45.3 |
| 16.0 | 10000 | 157.5 | 9700 | 145.7 | 6000 | 133.9 | 5000 | 90.6 | 4000 | 49.2 | 3000 | 34.3 |
| 20.0 | 8000 | 131.9 | 7800 | 133.9 | 4800 | 126.0 | 4000 | 82.7 | 3200 | 40.2 | 2400 | 27.2 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

# CARBIDE

Being the best through innovation



# 4G MILLS

- High Speed Cutting for Pre-Hardened Steels up to HRc55

# SELECTION GUIDE

## INCH

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| GMF15 |  | CARBIDE, 2 FLUTE BALL NOSE | R.002 | R3/8 | 634 |
| GMF16 |  | CARBIDE, 2 FLUTE BALL NOSE WITH NECK | R.004 | R1/4 | 636 |
| GMF17 |  | CARBIDE, 4 FLUTE BALL NOSE | R1/16 | R1/4 | 639 |
| GMF18 |  | CARBIDE, 2 FLUTE CORNER RADIUS | D3/64 | D3/4 | 640 |
| GMF19 |  | CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK | D.008 | D3/4 | 643 |
| GMF20 |  | CARBIDE, 4 FLUTE CORNER RADIUS | D3/64 | D3/4 | 649 |
| GMF21 |  | CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK | D3/64 | D3/4 | 651 |
| GMF22 |  | CARBIDE, 2 FLUTE WITH NECK | D.008 | D1/2 | 656 |
| GMF23 |  | CARBIDE, 2 FLUTE | D.004 | D3/4 | 659 |
| GMF24 |  | CARBIDE, 2 FLUTE LONG | D3/64 | D3/4 | 662 |
| GMF25 |  | CARBIDE, 4 FLUTE | D3/64 | D3/4 | 664 |
| GMF26 |  | CARBIDE, 4 FLUTE | D3/64 | D3/4 | 665 |
| GMF27 |  | CARBIDE, 4 FLUTE LONG | D3/64 | D1 | 666 |
| GMF28 |  | CARBIDE, 4 FLUTE WITH NECK | D3/64 | D1/2 | 668 |
| GMF29 |  | CARBIDE, 6 FLUTE 45° HELIX | D1/4 | D3/4 | 669 |

### X-SPEED ROUGHER

| | | | | | |
|---|---|---|---|---|---|
| G907 G928 |  | CARBIDE, 4&5 FLUTE STUB LENGTH ROUGHING CORNER RADIUS | D1/4 | D1 | 670 |
| G908 G929 |  | CARBIDE, 4&5 FLUTE REGULAR LENGTH ROUGHING CORNER RADIUS | D1/4 | D1 | 671 |
| G909 G930 |  | CARBIDE, 4&5 FLUTE EXTENDED REACH ROUGHING CORNER RADIUS | D1/4 | D3/4 | 672 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
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| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

# SELECTION GUIDE

## METRIC

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| SEMD98 |  | CARBIDE, 2 FLUTE BALL NOSE ◇ | R0.05 | R12.5 | 673 |
| SEM846 |  | CARBIDE, 2 FLUTE LONG NECK BALL NOSE ◇ | R0.05 | R6.0 | 678 |
| SEM846 |  | CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank) ◇ | R0.25 | R1.0 | 686 |
| SEMD99 |  | CARBIDE, 2 FLUTE CORNER RADIUS ◇ | D0.2 | D20.0 | 689 |
| SEME61 |  | CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS ◇ | D0.2 | D20.0 | 695 |
| SEME01 |  | CARBIDE, 4 FLUTE CORNER RADIUS ◇ | D1.0 | D20.0 | 710 |
| SEME64 |  | CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS ◇ | D1.0 | D20.0 | 715 |
| SEME35 |  | CARBIDE, 2 FLUTE ◇ | D0.03 | D25.0 | 727 |
| SEME70 |  | CARBIDE, 2 FLUTE LONG LENGTH ◇ | D1.0 | D25.0 | 732 |
| SEM845 |  | CARBIDE, 2 FLUTE LONG NECK ◇ | D0.1 | D12.0 | 737 |
| SEME36 |  | CARBIDE, 4 FLUTE ◇ | D0.8 | D25.0 | 744 |
| SEME71 |  | CARBIDE, 4 FLUTE ◇ | D1.0 | D20.0 | 746 |
| SEME72 |  | CARBIDE, 4 FLUTE LONG LENGTH ◇ | D1.0 | D25.0 | 749 |
| SEME73 |  | CARBIDE, 4 FLUTE LONG NECK ◇ | D1.0 | D12.0 | 754 |
| SEME75 |  | CARBIDE, 6 FLUTE 45° HELIX ◇ | D6.0 | D20.0 | 758 |

### X-SPEED ROUGHER

| | | | | | |
|---|---|---|---|---|---|
| G9D75 G9D67 |  | CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS ◇ | D6.0 | D20.0 | 759 |
| G9D76 G9D68 |  | CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH ROUGHING CORNER RADIUS ◇ | D6.0 | D20.0 | 760 |
| G9D77 G9D69 |  | CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH ROUGHING CORNER RADIUS ◇ | D6.0 | D20.0 | 761 |
| GAE53 |  | HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS ◇ | D6.0 | D20.0 | 762 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 763 |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
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| ◎ | ◎ | ○ | | | | ◎ | ◎ | ○ | | | | | | |

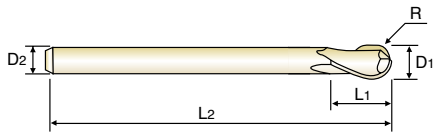
# 4G MILL END MILLS

**GMF15 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55




NG | 2 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN

P.763

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF15901 | R.002 | .004 | 3/16 | .008 | 1-1/2 |
| GMF15902 | R.004 | .008 | 3/16 | 1/64 | 1-1/2 |
| GMF15903 | R.006 | .012 | 3/16 | 1/32 | 1-1/2 |
| GMF15904 | R.075 | .015 | 3/16 | 1/32 | 1-1/2 |
| GMF15905 | R.010 | .020 | 3/16 | 3/64 | 1-1/2 |
| GMF15906 | R.012 | .024 | 3/16 | 3/64 | 1-1/2 |
| GMF15907 | R.014 | .028 | 3/16 | 1/16 | 1-1/2 |
| GMF15908 | R.0155 | .031 | 3/16 | 1/16 | 1-1/2 |
| GMF15909 | R.0175 | .035 | 3/16 | 5/64 | 1-1/2 |
| GMF15003 | R.0234 | 3/64 | 3/16 | 3/32 | 2 |
| GMF15910 | R.0234 | 3/64 | 1/4 | 3/32 | 2 |
| GMF15911 | R.0234 | 3/64 | 1/4 | 3/32 | 2-3/4 |
| GMF15004 | R1/32 | 1/16 | 3/16 | 5/32 | 2 |
| GMF15912 | R1/32 | 1/16 | 1/4 | 5/32 | 2 |
| GMF15913 | R1/32 | 1/16 | 1/4 | 5/32 | 2-3/4 |
| GMF15005 | R.0391 | 5/64 | 1/4 | 1/8 | 1-1/2 |
| GMF15914 | R.0391 | 5/64 | 3/16 | 3/16 | 2 |
| GMF15915 | R.0391 | 5/64 | 1/4 | 3/16 | 2 |
| GMF15916 | R.0391 | 5/64 | 1/4 | 3/16 | 3-1/8 |
| GMF15006 | R3/64 | 3/32 | 1/4 | 1/4 | 2-3/8 |
| GMF15917 | R3/64 | 3/32 | 1/4 | 1/4 | 3-1/8 |
| GMF15008 | R1/16 | 1/8 | 1/4 | 3/16 | 1-1/2 |
| GMF15918 | R1/16 | 1/8 | 3/16 | 1/4 | 2-3/8 |
| GMF15919 | R1/16 | 1/8 | 1/4 | 1/4 | 2-3/8 |
| GMF15920 | R1/16 | 1/8 | 1/4 | 1/4 | 3-1/8 |
| GMF15921 | R1/16 | 1/8 | 1/4 | 1/4 | 4 |
| GMF15012 | R3/32 | 3/16 | 1/4 | 1/4 | 2 |
| GMF15922 | R3/32 | 3/16 | 3/16 | 5/16 | 2-3/4 |
| GMF15923 | R3/32 | 3/16 | 1/4 | 5/16 | 2-3/4 |
| GMF15924 | R3/32 | 3/16 | 3/16 | 5/16 | 4 |
| GMF15925 | R3/32 | 3/16 | 1/4 | 5/16 | 4 |
| GMF15926 | R3/32 | 3/16 | 1/4 | 5/16 | 4-1/2 |
| GMF15013 | R.102 | 13/64 | 1/4 | 5/16 | 2-3/8 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

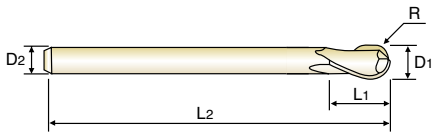
# 4G MILL END MILLS

**GMF15 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55




NG | 2 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN | P.763

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF15927 | R.102 | 13/64 | 1/4 | 3/8 | 3-1/8 |
| GMF15016 | R1/8 | 1/4 | 1/4 | 3/8 | 2 |
| GMF15928 | R1/8 | 1/4 | 1/4 | 3/8 | 3-1/8 |
| GMF15929 | R1/8 | 1/4 | 1/4 | 1/2 | 3-1/2 |
| GMF15930 | R1/8 | 1/4 | 1/4 | 1/2 | 5 |
| GMF15018 | R9/64 | 9/32 | 5/16 | 9/16 | 3-1/2 |
| GMF15020 | R5/32 | 5/16 | 5/16 | 1/2 | 2 |
| GMF15931 | R5/32 | 5/16 | 5/16 | 1/2 | 3-1/2 |
| GMF15932 | R5/32 | 5/16 | 5/16 | 9/16 | 4 |
| GMF15933 | R5/32 | 5/16 | 5/16 | 9/16 | 6 |
| GMF15024 | R3/16 | 3/8 | 3/8 | 5/8 | 2-3/8 |
| GMF15934 | R3/16 | 3/8 | 3/8 | 5/8 | 3-1/2 |
| GMF15935 | R3/16 | 3/8 | 3/8 | 11/16 | 4 |
| GMF15936 | R3/16 | 3/8 | 3/8 | 11/16 | 5 |
| GMF15937 | R3/16 | 3/8 | 3/8 | 11/16 | 6 |
| GMF15938 | R3/16 | 3/8 | 3/8 | 11/16 | 7 |
| GMF15032 | R1/4 | 1/2 | 1/2 | 11/16 | 3-1/8 |
| GMF15939 | R1/4 | 1/2 | 1/2 | 11/16 | 4 |
| GMF15940 | R1/4 | 1/2 | 1/2 | 7/8 | 4-1/4 |
| GMF15941 | R1/4 | 1/2 | 1/2 | 7/8 | 6 |
| GMF15942 | R1/4 | 1/2 | 1/2 | 7/8 | 8 |
| GMF15036 | R9/32 | 9/16 | 9/16 | 1 | 4 |
| GMF15040 | R5/16 | 5/8 | 5/8 | 1 | 4 |
| GMF15943 | R5/16 | 5/8 | 5/8 | 1-3/16 | 6 |
| GMF15048 | R3/8 | 3/4 | 3/4 | 1-3/16 | 4 |
| GMF15944 | R3/8 | 3/4 | 3/4 | 1-1/2 | 6 |

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0004 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

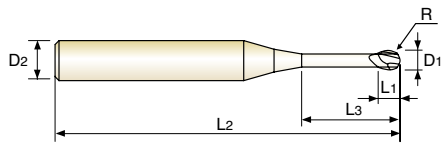
# 4G MILL END MILLS

**GMF16 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55




NG | 2 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN

P.764~766

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF16901 | R.004 | .008 | 3/16 | .008 | 1/64 | 1-1/2 |
| GMF16902 | R.004 | .008 | 3/16 | .008 | 3/64 | 1-1/2 |
| GMF16903 | R.006 | .012 | 3/16 | .010 | 3/64 | 1-1/2 |
| GMF16904 | R.006 | .012 | 3/16 | .010 | 5/64 | 1-1/2 |
| GMF16905 | R.006 | .012 | 3/16 | .010 | 1/8 | 1-1/2 |
| GMF16906 | R.0075 | .015 | 3/16 | 1/64 | 3/64 | 1-1/2 |
| GMF16907 | R.0075 | .015 | 3/16 | 1/64 | 5/64 | 1-1/2 |
| GMF16908 | R.0075 | .015 | 3/16 | 1/64 | 1/8 | 1-1/2 |
| GMF16909 | R.0075 | .015 | 3/16 | 1/64 | 5/32 | 1-1/2 |
| GMF16910 | R.010 | .020 | 3/16 | 1/64 | 3/64 | 1-3/4 |
| GMF16911 | R.010 | .020 | 3/16 | 1/64 | 5/64 | 1-3/4 |
| GMF16912 | R.010 | .020 | 3/16 | 1/64 | 1/8 | 1-3/4 |
| GMF16913 | R.010 | .020 | 3/16 | 1/64 | 5/32 | 1-3/4 |
| GMF16914 | R.010 | .020 | 3/16 | 1/64 | 3/16 | 1-3/4 |
| GMF16915 | R.010 | .020 | 3/16 | 1/64 | 1/4 | 1-3/4 |
| GMF16916 | R.010 | .020 | 3/16 | 1/64 | 5/16 | 1-3/4 |
| GMF16917 | R.010 | .020 | 3/16 | 1/64 | 3/8 | 1-3/4 |
| GMF16918 | R.012 | .024 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF16919 | R.012 | .024 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF16920 | R.012 | .024 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF16921 | R.012 | .024 | 3/16 | 1/32 | 3/16 | 1-3/4 |
| GMF16922 | R.012 | .024 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF16923 | R.012 | .024 | 3/16 | 1/32 | 5/16 | 1-3/4 |
| GMF16924 | R.012 | .024 | 3/16 | 1/32 | 3/8 | 1-3/4 |
| GMF16925 | R.012 | .024 | 3/16 | 1/32 | 1/2 | 1-3/4 |
| GMF16002 | R1/64 | 1/32 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF16926 | R1/64 | 1/32 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF16927 | R1/64 | 1/32 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF16928 | R1/64 | 1/32 | 3/16 | 1/32 | 3/16 | 1-3/4 |
| GMF16929 | R1/64 | 1/32 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF16930 | R1/64 | 1/32 | 3/16 | 1/32 | 5/16 | 1-3/4 |
| GMF16931 | R1/64 | 1/32 | 3/16 | 1/32 | 3/8 | 1-3/4 |

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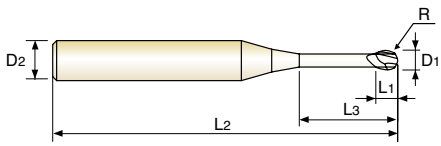
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# CARBIDE, 2 FLUTE BALL NOSE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55




NG | 2 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN

P.764~766

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF16003 | R.0234 | 3/64 | 3/16 | 3/64 | 1/8 | 2 |
| GMF16932 | R.0234 | 3/64 | 3/16 | 3/64 | 5/32 | 2 |
| GMF16933 | R.0234 | 3/64 | 3/16 | 3/64 | 3/16 | 2 |
| GMF16934 | R.0234 | 3/64 | 3/16 | 3/64 | 1/4 | 2 |
| GMF16935 | R.0234 | 3/64 | 3/16 | 3/64 | 5/16 | 2 |
| GMF16936 | R.0234 | 3/64 | 3/16 | 3/64 | 3/8 | 2 |
| GMF16937 | R.0234 | 3/64 | 3/16 | 3/64 | 1/2 | 2 |
| GMF16938 | R.0234 | 3/64 | 3/16 | 3/64 | 9/16 | 2 |
| GMF16939 | R.0234 | 3/64 | 3/16 | 3/64 | 5/8 | 2 |
| GMF16940 | R.0234 | 3/64 | 3/16 | 3/64 | 3/4 | 2 |
| GMF16004 | R1/32 | 1/16 | 3/16 | 1/16 | 5/32 | 2 |
| GMF16941 | R1/32 | 1/16 | 3/16 | 1/16 | 1/4 | 2 |
| GMF16942 | R1/32 | 1/16 | 3/16 | 1/16 | 5/16 | 2 |
| GMF16943 | R1/32 | 1/16 | 3/16 | 1/16 | 3/8 | 2 |
| GMF16944 | R1/32 | 1/16 | 3/16 | 1/16 | 1/2 | 2 |
| GMF16945 | R1/32 | 1/16 | 3/16 | 1/16 | 9/16 | 2 |
| GMF16946 | R1/32 | 1/16 | 3/16 | 1/16 | 5/8 | 2 |
| GMF16947 | R1/32 | 1/16 | 3/16 | 1/16 | 3/4 | 2 |
| GMF16005 | R.0391 | 5/64 | 3/16 | 5/64 | 1/4 | 2 |
| GMF16948 | R.0391 | 5/64 | 3/16 | 5/64 | 5/16 | 2 |
| GMF16949 | R.0391 | 5/64 | 3/16 | 5/64 | 3/8 | 2 |
| GMF16950 | R.0391 | 5/64 | 3/16 | 5/64 | 1/2 | 2 |
| GMF16951 | R.0391 | 5/64 | 3/16 | 5/64 | 9/16 | 2 |
| GMF16952 | R.0391 | 5/64 | 3/16 | 5/64 | 5/8 | 2 |
| GMF16953 | R.0391 | 5/64 | 3/16 | 5/64 | 11/16 | 2 |
| GMF16954 | R.0391 | 5/64 | 3/16 | 5/64 | 3/4 | 2 |
| GMF16955 | R.0391 | 5/64 | 3/16 | 5/64 | 1 | 2-3/8 |
| GMF16956 | R.0391 | 5/64 | 3/16 | 5/64 | 1-3/16 | 2-3/4 |
| GMF16006 | R3/64 | 3/32 | 3/16 | 3/32 | 3/8 | 2 |
| GMF16957 | R3/64 | 3/32 | 3/16 | 3/32 | 3/4 | 2 |
| GMF16008 | R1/16 | 1/8 | 1/4 | 1/8 | 5/16 | 2 |
| GMF16958 | R1/16 | 1/8 | 1/4 | 1/8 | 3/8 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

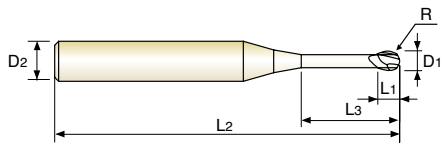
# 4G MILL END MILLS

**GMF16 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55




NG | 2 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN

P.764~766

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF16959 | R1/16 | 1/8 | 1/4 | 1/8 | 1/2 | 2 |
| GMF16960 | R1/16 | 1/8 | 1/4 | 1/8 | 9/16 | 2-3/8 |
| GMF16961 | R1/16 | 1/8 | 1/4 | 1/8 | 5/8 | 2-3/8 |
| GMF16962 | R1/16 | 1/8 | 1/4 | 1/8 | 11/16 | 2-3/8 |
| GMF16963 | R1/16 | 1/8 | 1/4 | 1/8 | 3/4 | 2-3/8 |
| GMF16964 | R1/16 | 1/8 | 1/4 | 1/8 | 1 | 2-3/4 |
| GMF16965 | R1/16 | 1/8 | 1/4 | 1/8 | 1-3/16 | 2-3/4 |
| GMF16966 | R1/16 | 1/8 | 1/4 | 1/8 | 1-3/8 | 2-3/4 |
| GMF16012 | R3/32 | 3/16 | 1/4 | 5/32 | 3/8 | 2 |
| GMF16967 | R3/32 | 3/16 | 1/4 | 5/32 | 1/2 | 2 |
| GMF16968 | R3/32 | 3/16 | 1/4 | 5/32 | 9/16 | 2-3/8 |
| GMF16969 | R3/32 | 3/16 | 1/4 | 5/32 | 5/8 | 2-3/8 |
| GMF16970 | R3/32 | 3/16 | 1/4 | 5/32 | 11/16 | 2-3/8 |
| GMF16971 | R3/32 | 3/16 | 1/4 | 5/32 | 3/4 | 2-3/8 |
| GMF16972 | R3/32 | 3/16 | 1/4 | 5/32 | 1 | 2-3/4 |
| GMF16973 | R3/32 | 3/16 | 1/4 | 5/32 | 1-3/16 | 2-3/4 |
| GMF16974 | R3/32 | 3/16 | 1/4 | 5/32 | 1-3/8 | 2-3/4 |
| GMF16975 | R3/32 | 3/16 | 1/4 | 5/32 | 1-1/2 | 3-1/8 |
| GMF16013 | R.102 | 13/64 | 1/4 | 1/4 | 1-3/16 | 2-3/4 |
| GMF16016 | R1/8 | 1/4 | 1/4 | 5/16 | 3/4 | 2-3/8 |
| GMF16976 | R1/8 | 1/4 | 1/4 | 5/16 | 1-3/16 | 2-3/8 |
| GMF16020 | R5/32 | 5/16 | 5/16 | 3/8 | 1 | 2-3/4 |
| GMF16977 | R5/32 | 5/16 | 5/16 | 9/16 | 1-3/8 | 4 |
| GMF16024 | R3/16 | 3/8 | 3/8 | 1/2 | 1-3/16 | 3 |
| GMF16978 | R3/16 | 3/8 | 3/8 | 11/16 | 1-3/16 | 4 |
| GMF16979 | R3/16 | 3/8 | 3/8 | 11/16 | 1-1/2 | 4 |
| GMF16032 | R1/4 | 1/2 | 1/2 | 9/16 | 1-1/4 | 3-1/8 |
| GMF16980 | R1/4 | 1/2 | 1/2 | 7/8 | 1-1/4 | 4-1/4 |

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0004 | 0~−.0006 | |

◎ : Excellent ○ : Good

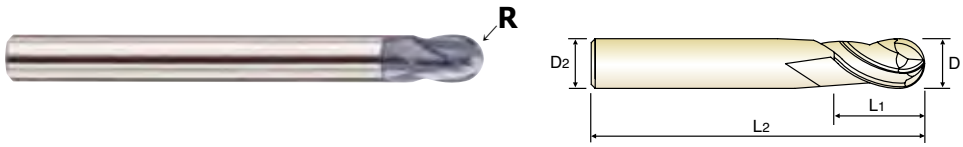
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF17 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE BALL NOSE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Unique ball nose geometry with superior cutting edges result in decreased cutting forces.
- Excellent performance when cutting steels, up to HRc55
- Cutting edge strength is increased and part finish is improved due to new End Geometry




NG | 4 | 30° | R ±.0002 (R≤1/8) | R ±.0004 (R>1/8) | PLAIN

P.766

Unit : Inch

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF17008 | R1/16 | 1/8 | 1/4 | 1/8 | 2-3/8 |
| GMF17012 | R3/32 | 3/16 | 1/4 | 5/32 | 2-3/4 |
| GMF17016 | R1/8 | 1/4 | 1/4 | 1/4 | 3-1/2 |
| GMF17020 | R5/32 | 5/16 | 5/16 | 5/16 | 4 |
| GMF17024 | R3/16 | 3/8 | 3/8 | 3/8 | 4 |
| GMF17032 | R1/4 | 1/2 | 1/2 | 1/2 | 4-1/4 |

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0002 | 0~−.0008 | h6 |
| over Ø1/4 | ±.0004 | | |

◎ : Excellent ○ : Good

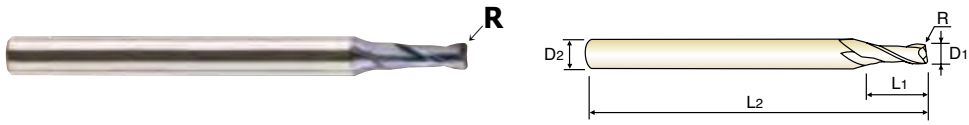
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF18 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.767

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF18003 | R.008 | 3/64 | 1/4 | 3/32 | 2 |
| GMF18901 | R.012 | 3/64 | 1/4 | 3/32 | 2 |
| GMF18004 | R.008 | 1/16 | 1/4 | 5/32 | 2 |
| GMF18902 | R.012 | 1/16 | 1/4 | 5/32 | 2 |
| GMF18903 | R.020 | 1/16 | 1/4 | 5/32 | 2 |
| GMF18005 | R.008 | 5/64 | 1/4 | 1/4 | 2 |
| GMF18904 | R.012 | 5/64 | 1/4 | 1/4 | 2 |
| GMF18905 | R.020 | 5/64 | 1/4 | 1/4 | 2 |
| GMF18008 | R.008 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF18906 | R.012 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF18907 | R.020 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF18940 | R.030 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF18009 | R.008 | 9/64 | 1/4 | 3/8 | 2-3/4 |
| GMF18908 | R.012 | 9/64 | 1/4 | 3/8 | 2-3/4 |
| GMF18909 | R.020 | 9/64 | 1/4 | 3/8 | 2-3/4 |
| GMF18941 | R.030 | 9/64 | 1/4 | 3/8 | 2-3/4 |
| GMF18910 | R.040 | 9/64 | 1/4 | 3/8 | 2-3/4 |
| GMF18013 | R.008 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF18911 | R.012 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF18912 | R.020 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF18942 | R.030 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF18913 | R.040 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF18016 | R.008 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF18914 | R.012 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF18915 | R.020 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF18943 | R.030 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF18916 | R.040 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF18917 | R.008 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF18918 | R.012 | 1/4 | 1/4 | 5/8 | 3-1/2 |

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◎ : Excellent ○ : Good

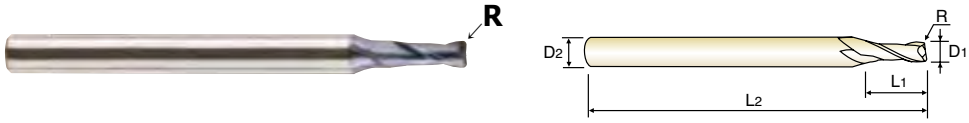
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF18 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.767

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF18919 | R.020 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF18944 | R.030 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF18920 | R.040 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF18020 | R.020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF18945 | R.030 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF18921 | R.040 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF18922 | R.020 | 5/16 | 5/16 | 3/4 | 4 |
| GMF18946 | R.030 | 5/16 | 5/16 | 3/4 | 4 |
| GMF18923 | R.040 | 5/16 | 5/16 | 3/4 | 4 |
| GMF18924 | R.060 | 5/16 | 5/16 | 3/4 | 4 |
| GMF18925 | R.080 | 5/16 | 5/16 | 3/4 | 4 |
| GMF18024 | R.020 | 3/8 | 3/8 | 1 | 3 |
| GMF18947 | R.030 | 3/8 | 3/8 | 1 | 3 |
| GMF18926 | R.040 | 3/8 | 3/8 | 1 | 3 |
| GMF18927 | R.020 | 3/8 | 3/8 | 1 | 4 |
| GMF18948 | R.030 | 3/8 | 3/8 | 1 | 4 |
| GMF18928 | R.040 | 3/8 | 3/8 | 1 | 4 |
| GMF18929 | R.060 | 3/8 | 3/8 | 1 | 4 |
| GMF18930 | R.080 | 3/8 | 3/8 | 1 | 4 |
| GMF18032 | R.020 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF18949 | R.030 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF18931 | R.040 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF18932 | R.020 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18950 | R.030 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18933 | R.040 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18934 | R.060 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18935 | R.080 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18936 | R.100 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF18937 | R.118 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

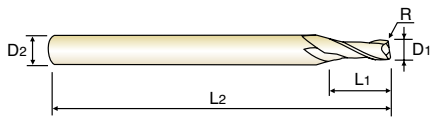
# 4G MILL END MILLS

**GMF18 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN P.767

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF18951 | R.030 | 9/16 | 5/8 | 1-3/8 | 6 |
| GMF18036 | R.040 | 9/16 | 5/8 | 1-3/8 | 6 |
| GMF18952 | R.030 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF18040 | R.040 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF18938 | R.080 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF18953 | R.030 | 3/4 | 3/4 | 1-1/2 | 6 |
| GMF18048 | R.040 | 3/4 | 3/4 | 1-1/2 | 6 |
| GMF18939 | R.080 | 3/4 | 3/4 | 1-1/2 | 6 |

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0004 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0006 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

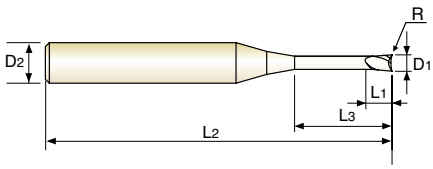
# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN | P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF19901 | R.001 | .008 | 3/16 | .010 | 3/64 | 1-1/2 |
| GMF19902 | R.002 | .008 | 3/16 | .010 | 3/64 | 1-1/2 |
| GMF19903 | R.001 | .012 | 3/16 | 1/64 | 3/64 | 1-1/2 |
| GMF19904 | R.001 | .012 | 3/16 | 1/64 | 5/64 | 1-1/2 |
| GMF19905 | R.002 | .012 | 3/16 | 1/64 | 3/64 | 1-1/2 |
| GMF19906 | R.002 | .012 | 3/16 | 1/64 | 5/64 | 1-1/2 |
| GMF19907 | R.002 | .015 | 3/16 | 1/32 | 3/64 | 1-1/2 |
| GMF19908 | R.002 | .015 | 3/16 | 1/32 | 1/16 | 1-1/2 |
| GMF19909 | R.002 | .015 | 3/16 | 1/32 | 5/64 | 1-1/2 |
| GMF19910 | R.002 | .015 | 3/16 | 1/32 | 3/32 | 1-1/2 |
| GMF19911 | R.004 | .015 | 3/16 | 1/32 | 3/64 | 1-1/2 |
| GMF19912 | R.004 | .015 | 3/16 | 1/32 | 5/64 | 1-1/2 |
| GMF19913 | R.002 | .020 | 3/16 | 1/32 | 3/64 | 1-3/4 |
| GMF19914 | R.002 | .020 | 3/16 | 1/32 | 1/16 | 1-3/4 |
| GMF19915 | R.002 | .020 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF19916 | R.002 | .020 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF19917 | R.004 | .020 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF19918 | R.004 | .020 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF19919 | R.002 | .024 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF19920 | R.002 | .024 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF19921 | R.004 | .024 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF19922 | R.004 | .024 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF19923 | R.004 | .024 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF19924 | R.008 | .024 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF19925 | R.008 | .024 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF19926 | R.008 | .024 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF19927 | R.002 | .031 | 3/16 | 3/64 | 5/64 | 1-3/4 |
| GMF19928 | R.002 | .031 | 3/16 | 3/64 | 5/32 | 1-3/4 |
| GMF19929 | R.002 | .031 | 3/16 | 3/64 | 1/4 | 1-3/4 |
| GMF19930 | R.004 | .031 | 3/16 | 3/64 | 5/64 | 1-3/4 |
| GMF19931 | R.004 | .031 | 3/16 | 3/64 | 5/32 | 1-3/4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

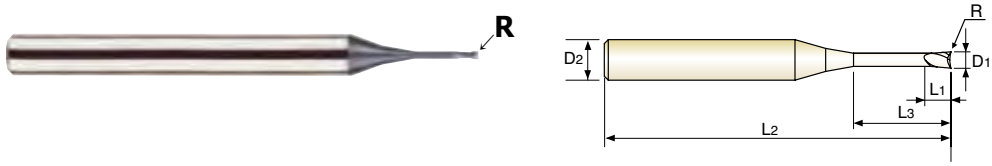
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF19932 | R.004 | .031 | 3/16 | 3/64 | 1/4 | 1-3/4 |
| GMF19933 | R.004 | .031 | 3/16 | 3/64 | 5/16 | 1-3/4 |
| GMF19934 | R.008 | .031 | 3/16 | 3/64 | 5/32 | 1-3/4 |
| GMF19935 | R.008 | .031 | 3/16 | 3/64 | 1/4 | 1-3/4 |
| GMF19936 | R.008 | .031 | 3/16 | 3/64 | 5/16 | 1-3/4 |
| GMF19003 | R.002 | 3/64 | 3/16 | 1/16 | 1/8 | 2 |
| GMF19937 | R.002 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF19938 | R.002 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF19939 | R.004 | 3/64 | 3/16 | 1/16 | 1/8 | 2 |
| GMF19940 | R.004 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF19941 | R.004 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF19942 | R.004 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF19943 | R.004 | 3/64 | 3/16 | 1/16 | 3/8 | 2 |
| GMF19944 | R.008 | 3/64 | 3/16 | 1/16 | 1/8 | 2 |
| GMF19945 | R.008 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF19946 | R.008 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF19947 | R.008 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF19948 | R.008 | 3/64 | 3/16 | 1/16 | 3/8 | 2 |
| GMF19949 | R.012 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF19950 | R.012 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF19951 | R.012 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF19952 | R.012 | 3/64 | 3/16 | 1/16 | 3/8 | 2 |
| GMF19004 | R.002 | 1/16 | 3/16 | 3/32 | 5/32 | 2 |
| GMF19953 | R.002 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF19954 | R.002 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF19955 | R.004 | 1/16 | 3/16 | 3/32 | 5/32 | 2 |
| GMF19956 | R.004 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF19957 | R.004 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF19958 | R.008 | 1/16 | 3/16 | 3/32 | 5/32 | 2 |
| GMF19959 | R.008 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF19960 | R.008 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

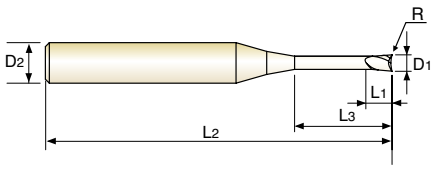
# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN | P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF19961 | R.008 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF19962 | R.008 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF19963 | R.012 | 1/16 | 3/16 | 3/32 | 5/32 | 2 |
| GMF19964 | R.012 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF19965 | R.012 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF19966 | R.012 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF19967 | R.012 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF19005 | R.004 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF19968 | R.004 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF19969 | R.004 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF19970 | R.004 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF19971 | R.008 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF19972 | R.008 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF19973 | R.008 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF19974 | R.008 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF19975 | R.008 | 5/64 | 3/16 | 1/8 | 5/8 | 2 |
| GMF19976 | R.012 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF19977 | R.012 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF19978 | R.012 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF19979 | R.012 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF19980 | R.012 | 5/64 | 3/16 | 1/8 | 5/8 | 2 |
| GMF19981 | R.020 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF19982 | R.020 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF19983 | R.020 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF19984 | R.020 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF19985 | R.020 | 5/64 | 3/16 | 1/8 | 9/16 | 2 |
| GMF19008 | R.004 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF19986 | R.004 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19987 | R.004 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19988 | R.008 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF19989 | R.008 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |

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◎ : Excellent ○ : Good

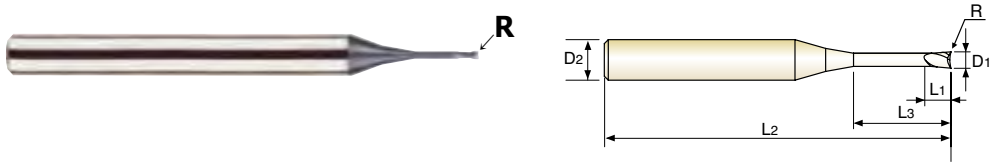
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF19990 | R.008 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19991 | R.008 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19992 | R.008 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF19993 | R.008 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |
| GMF19994 | R.012 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF19995 | R.012 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF19996 | R.012 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19997 | R.012 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19998 | R.012 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF19999 | R.020 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF19801 | R.020 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF19802 | R.020 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19803 | R.020 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19804 | R.020 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF19805 | R.020 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |
| GMF19845 | R.030 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF19846 | R.030 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19847 | R.030 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF19848 | R.030 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF19849 | R.030 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19850 | R.030 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |
| GMF19806 | R.040 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF19807 | R.040 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF19808 | R.040 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF19809 | R.040 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF19810 | R.040 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF19012 | R.004 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF19811 | R.004 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF19812 | R.004 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19813 | R.008 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF19814 | R.008 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

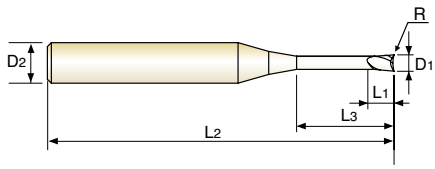
# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF19815 | R.008 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19816 | R.008 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF19817 | R.008 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF19818 | R.012 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF19819 | R.012 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19820 | R.012 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF19821 | R.012 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF19822 | R.020 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF19823 | R.020 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF19824 | R.020 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19825 | R.020 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF19826 | R.020 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF19827 | R.020 | 3/16 | 1/4 | 1/4 | 1-3/16 | 2-3/4 |
| GMF19851 | R.030 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF19852 | R.030 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF19853 | R.030 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19854 | R.030 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF19855 | R.030 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF19856 | R.030 | 3/16 | 1/4 | 1/4 | 1-3/16 | 2-3/4 |
| GMF19828 | R.040 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF19829 | R.040 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF19830 | R.040 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF19831 | R.040 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF19016 | R.008 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF19832 | R.012 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF19833 | R.020 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF19834 | R.040 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF19835 | R.020 | 1/4 | 1/4 | 5/8 | 1-3/16 | 3-1/2 |
| GMF19857 | R.030 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF19858 | R.030 | 1/4 | 1/4 | 5/8 | 1-3/16 | 3-1/2 |
| GMF19020 | R.008 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

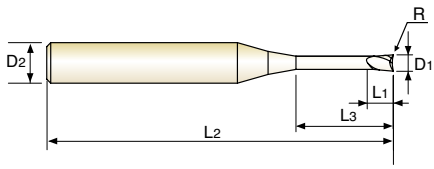
# 4G MILL END MILLS

**GMF19 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.




MG | 2 | 30° | R ±.0004 (D≤1/4) | R ±.0006 (D>1/4) | PLAIN

P.768, 769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| **GMF19836** | R.012 | **5/16** | 5/16 | 1/2 | 1 | 2-3/4 |
| **GMF19837** | R.020 | **5/16** | 5/16 | 1/2 | 1 | 2-3/4 |
| **GMF19859** | R.030 | **5/16** | 5/16 | 1/2 | 1 | 2-3/4 |
| **GMF19838** | R.040 | **5/16** | 5/16 | 1/2 | 1 | 2-3/4 |
| **GMF19024** | R.012 | **3/8** | 3/8 | 5/8 | 1-3/16 | 3 |
| **GMF19839** | R.020 | **3/8** | 3/8 | 5/8 | 1-3/16 | 3 |
| **GMF19860** | R.030 | **3/8** | 3/8 | 5/8 | 1-3/16 | 3 |
| **GMF19840** | R.040 | **3/8** | 3/8 | 5/8 | 1-3/16 | 3 |
| **GMF19032** | R.020 | **1/2** | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| **GMF19861** | R.030 | **1/2** | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| **GMF19841** | R.040 | **1/2** | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| **GMF19842** | R.060 | **1/2** | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| **GMF19040** | R.020 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF19862** | R.030 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF19843** | R.040 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF19048** | R.020 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |
| **GMF19863** | R.030 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |
| **GMF19844** | R.040 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |

| Size | Radius Tolerance (Inch) | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø1/4 | ±.0004 | 0~−.0005 | h6 |
| over Ø1/4 | ±.0006 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

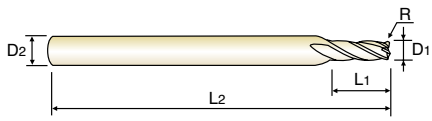
# 4G MILL END MILLS

**GMF20 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF20003 | R.004 | 3/64 | 1/4 | 3/32 | 2 |
| GMF20005 | R.004 | 5/64 | 1/4 | 1/4 | 2 |
| GMF20901 | R.008 | 5/64 | 1/4 | 1/4 | 2 |
| GMF20008 | R.008 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF20902 | R.012 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF20903 | R.020 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF20933 | R.030 | 1/8 | 1/4 | 5/16 | 2-3/8 |
| GMF20012 | R.008 | 3/16 | 1/4 | 3/8 | 2-3/4 |
| GMF20904 | R.012 | 3/16 | 1/4 | 3/8 | 2-3/4 |
| GMF20905 | R.020 | 3/16 | 1/4 | 3/8 | 2-3/4 |
| GMF20934 | R.030 | 3/16 | 1/4 | 3/8 | 2-3/4 |
| GMF20906 | R.040 | 3/16 | 1/4 | 3/8 | 2-3/4 |
| GMF20013 | R.012 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF20907 | R.020 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF20935 | R.030 | 13/64 | 1/4 | 1/2 | 3-1/2 |
| GMF20016 | R.008 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF20908 | R.012 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF20909 | R.020 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF20936 | R.030 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF20910 | R.040 | 1/4 | 1/4 | 5/8 | 3-1/2 |
| GMF20020 | R.012 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF20911 | R.020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF20937 | R.030 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF20912 | R.040 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF20913 | R.008 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20914 | R.012 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20915 | R.020 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20938 | R.030 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20916 | R.040 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20917 | R.060 | 5/16 | 5/16 | 3/4 | 4 |
| GMF20918 | R.080 | 5/16 | 5/16 | 3/4 | 4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**GMF20 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Available in many more various length shanks and corner radiuses.
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations







MG | 4 | M-Helix | R ±.0008 | PLAIN

P.769

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF20024 | R.020 | 3/8 | 3/8 | 1 | 3 |
| GMF20939 | R.030 | 3/8 | 3/8 | 1 | 3 |
| GMF20919 | R.012 | 3/8 | 3/8 | 1 | 4 |
| GMF20920 | R.020 | 3/8 | 3/8 | 1 | 4 |
| GMF20940 | R.030 | 3/8 | 3/8 | 1 | 4 |
| GMF20921 | R.040 | 3/8 | 3/8 | 1 | 4 |
| GMF20922 | R.060 | 3/8 | 3/8 | 1 | 4 |
| GMF20923 | R.080 | 3/8 | 3/8 | 1 | 4 |
| GMF20032 | R.020 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF20924 | R.040 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF20925 | R.020 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF20941 | R.030 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF20942 | R.030 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF20926 | R.040 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF20927 | R.060 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF20928 | R.080 | 1/2 | 1/2 | 1-3/16 | 4-1/4 |
| GMF20040 | R.020 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF20943 | R.030 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF20929 | R.040 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF20930 | R.060 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF20931 | R.080 | 5/8 | 5/8 | 1-1/4 | 6 |
| GMF20944 | R.030 | 3/4 | 3/4 | 1-1/2 | 6 |
| GMF20048 | R.040 | 3/4 | 3/4 | 1-1/2 | 6 |
| GMF20932 | R.080 | 3/4 | 3/4 | 1-1/2 | 6 |

| Mill Dia. Tolerance (Inch) | Corner Radius Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|
| 0~−.0012 | ±.0008 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

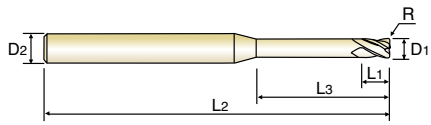
# 4G MILL END MILLS

**GMF21 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.770

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF21003 | R.004 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF21901 | R.004 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF21902 | R.004 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF21903 | R.008 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF21904 | R.008 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF21905 | R.008 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF21906 | R.012 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF21907 | R.012 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF21908 | R.012 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF21004 | R.004 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF21909 | R.004 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF21910 | R.004 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF21911 | R.004 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF21912 | R.008 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF21913 | R.008 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF21914 | R.008 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF21915 | R.008 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF21916 | R.012 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF21917 | R.012 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF21918 | R.012 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF21919 | R.012 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF21920 | R.020 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF21921 | R.020 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF21922 | R.020 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF21923 | R.020 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF21005 | R.004 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF21924 | R.004 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF21925 | R.004 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF21926 | R.004 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF21927 | R.008 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF21928 | R.008 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

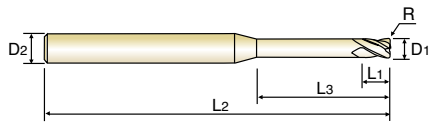
# 4G MILL END MILLS

**GMF21 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.770

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF21929 | R.008 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF21930 | R.008 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF21931 | R.012 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF21932 | R.012 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF21933 | R.012 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF21934 | R.012 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF21935 | R.020 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF21936 | R.020 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF21937 | R.020 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF21938 | R.020 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF21008 | R.004 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF21939 | R.004 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF21940 | R.004 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21941 | R.004 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21942 | R.008 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF21943 | R.008 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21944 | R.008 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21945 | R.008 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF21946 | R.012 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF21947 | R.012 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF21948 | R.012 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21949 | R.012 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21950 | R.012 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF21951 | R.020 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF21952 | R.020 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF21953 | R.020 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21954 | R.020 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21955 | R.020 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF21956 | R.020 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |
| GMF21999 | R.030 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF21801 | R.030 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

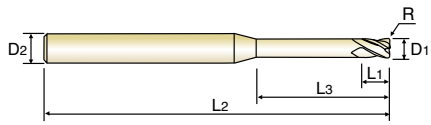
# 4G MILL END MILLS

**GMF21 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.770

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF21802 | R.030 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21803 | R.030 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21804 | R.030 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF21805 | R.030 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |
| GMF21957 | R.040 | 1/8 | 1/4 | 3/16 | 5/16 | 2-3/4 |
| GMF21958 | R.040 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF21959 | R.040 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF21960 | R.040 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF21012 | R.004 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21961 | R.004 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21962 | R.004 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21963 | R.004 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF21964 | R.008 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21965 | R.008 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21966 | R.008 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21967 | R.008 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF21968 | R.008 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF21969 | R.012 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21970 | R.012 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21971 | R.012 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21972 | R.012 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF21973 | R.012 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF21974 | R.020 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21975 | R.020 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21976 | R.020 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21977 | R.020 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF21978 | R.020 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF21806 | R.030 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21807 | R.030 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21808 | R.030 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21809 | R.030 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

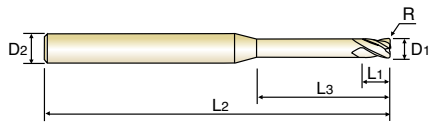
# 4G MILL END MILLS

**GMF21 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.770

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| GMF21810 | R.030 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF21979 | R.040 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF21980 | R.040 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF21981 | R.040 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF21982 | R.040 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF21983 | R.040 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF21016 | R.012 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF21984 | R.020 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF21811 | R.030 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF21985 | R.040 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF21020 | R.008 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF21986 | R.012 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF21987 | R.020 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF21988 | R.040 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF21989 | R.020 | 5/16 | 5/16 | 3/4 | 1-3/8 | 4 |
| GMF21812 | R.030 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF21813 | R.030 | 5/16 | 5/16 | 3/4 | 1-3/8 | 4 |
| GMF21024 | R.020 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF21990 | R.040 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF21991 | R.060 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF21992 | R.020 | 3/8 | 3/8 | 1 | 1-1/2 | 4 |
| GMF21814 | R.030 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF21815 | R.030 | 3/8 | 3/8 | 1 | 1-1/2 | 4 |
| GMF21032 | R.020 | 1/2 | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| GMF21816 | R.030 | 1/2 | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| GMF21817 | R.030 | 1/2 | 1/2 | 1-3/16 | 1-3/4 | 4-1/4 |
| GMF21993 | R.040 | 1/2 | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| GMF21994 | R.060 | 1/2 | 1/2 | 11/16 | 1-1/4 | 3-1/8 |
| GMF21995 | R.080 | 1/2 | 1/2 | 11/16 | 1-1/4 | 3-1/8 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

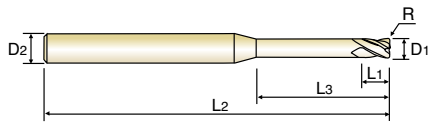
# 4G MILL END MILLS

**GMF21 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- 4 flute series has new designs to reduce vibrations




MG | 4 | M-Helix | R ±.0008 | PLAIN

P.770

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| **GMF21996** | R.020 | **1/2** | 1/2 | 1-3/16 | 1-3/4 | 4-1/4 |
| **GMF21040** | R.020 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF21818** | R.030 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF21997** | R.040 | **5/8** | 5/8 | 3/4 | 1-3/8 | 4 |
| **GMF21048** | R.020 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |
| **GMF21819** | R.030 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |
| **GMF21998** | R.040 | **3/4** | 3/4 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (Inch) | Corner Radius Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|
| 0~−.0012 | ±.0008 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

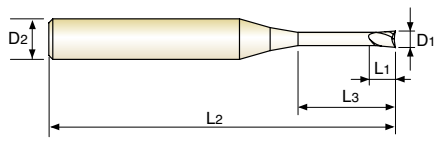
# 4G MILL END MILLS

**GMF22 SERIES** PLAIN SHANK

## CARBIDE, 2FLUTE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths






MG | 2 | 30° | PLAIN

P.771, 772

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF22901 | .008 | 3/16 | .010 | 3/64 | 1-1/2 |
| GMF22902 | .015 | 3/16 | 1/32 | 3/64 | 1-1/2 |
| GMF22903 | .015 | 3/16 | 1/32 | 5/64 | 1-1/2 |
| GMF22904 | .015 | 3/16 | 1/32 | 1/8 | 1-1/2 |
| GMF22905 | .015 | 3/16 | 1/32 | 5/32 | 1-1/2 |
| GMF22906 | .015 | 3/16 | 1/32 | 3/16 | 1-1/2 |
| GMF22907 | .020 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF22908 | .020 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF22909 | .020 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF22910 | .020 | 3/16 | 1/32 | 3/16 | 1-3/4 |
| GMF22911 | .020 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF22912 | .024 | 3/16 | 1/32 | 5/64 | 1-3/4 |
| GMF22913 | .024 | 3/16 | 1/32 | 1/8 | 1-3/4 |
| GMF22914 | .024 | 3/16 | 1/32 | 5/32 | 1-3/4 |
| GMF22915 | .024 | 3/16 | 1/32 | 3/16 | 1-3/4 |
| GMF22916 | .024 | 3/16 | 1/32 | 1/4 | 1-3/4 |
| GMF22917 | .024 | 3/16 | 1/32 | 5/16 | 1-3/4 |
| GMF22918 | .024 | 3/16 | 1/32 | 3/8 | 1-3/4 |
| GMF22002 | 1/32 | 3/16 | 3/64 | 5/64 | 1-3/4 |
| GMF22919 | 1/32 | 3/16 | 3/64 | 1/8 | 1-3/4 |
| GMF22920 | 1/32 | 3/16 | 3/64 | 5/32 | 1-3/4 |
| GMF22921 | 1/32 | 3/16 | 3/64 | 3/16 | 1-3/4 |
| GMF22922 | 1/32 | 3/16 | 3/64 | 1/4 | 1-3/4 |
| GMF22923 | 1/32 | 3/16 | 3/64 | 5/16 | 1-3/4 |
| GMF22924 | 1/32 | 3/16 | 3/64 | 3/8 | 1-3/4 |
| GMF22003 | 3/64 | 3/16 | 1/16 | 1/8 | 2 |
| GMF22925 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF22926 | 3/64 | 3/16 | 1/16 | 3/16 | 2 |
| GMF22927 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF22928 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF22929 | 3/64 | 3/16 | 1/16 | 3/8 | 2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

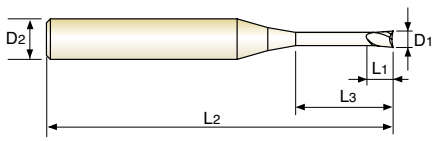
# 4G MILL END MILLS

**GMF22 SERIES** PLAIN SHANK

## CARBIDE, 2FLUTE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths






MG | 2 | 30° | PLAIN

P.771, 772

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF22930 | 3/64 | 3/16 | 1/16 | 1/2 | 2 |
| GMF22931 | 3/64 | 3/16 | 1/16 | 9/16 | 2 |
| GMF22932 | 3/64 | 3/16 | 1/16 | 5/8 | 2 |
| GMF22933 | 3/64 | 3/16 | 1/16 | 3/4 | 2 |
| GMF22004 | 1/16 | 3/16 | 3/32 | 5/32 | 2 |
| GMF22934 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF22935 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF22936 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF22937 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF22938 | 1/16 | 3/16 | 3/32 | 9/16 | 2 |
| GMF22939 | 1/16 | 3/16 | 3/32 | 5/8 | 2 |
| GMF22940 | 1/16 | 3/16 | 3/32 | 3/4 | 2 |
| GMF22005 | 5/64 | 3/16 | 1/8 | 1/4 | 2 |
| GMF22941 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF22942 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF22943 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF22944 | 5/64 | 3/16 | 1/8 | 9/16 | 2 |
| GMF22945 | 5/64 | 3/16 | 1/8 | 5/8 | 2 |
| GMF22946 | 5/64 | 3/16 | 1/8 | 3/4 | 2 |
| GMF22006 | 3/32 | 3/16 | 5/32 | 5/16 | 2 |
| GMF22947 | 3/32 | 3/16 | 5/32 | 1/2 | 2 |
| GMF22948 | 3/32 | 3/16 | 5/32 | 5/8 | 2 |
| GMF22949 | 3/32 | 3/16 | 5/32 | 3/4 | 2 |
| GMF22008 | 1/8 | 1/4 | 3/16 | 5/16 | 2 |
| GMF22950 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF22951 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF22952 | 1/8 | 1/4 | 3/16 | 9/16 | 2-3/8 |
| GMF22953 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF22954 | 1/8 | 1/4 | 3/16 | 11/16 | 2-3/8 |
| GMF22955 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF22956 | 1/8 | 1/4 | 3/16 | 1 | 2-3/4 |

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◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

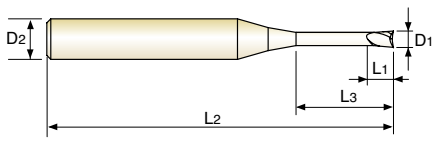
# 4G MILL END MILLS

**GMF22 SERIES** PLAIN SHANK

## CARBIDE, 2FLUTE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Due to Multiple Helix on 1/8" and over diameter end mills, vibration is minimized and tool life increased.
- For 1/32" and under 1/32" diameter sizes, double neck increases tool rigidity and minimizes vibration.
- Excellent for Rib Processing of various depths






MG | 2 | 30° | PLAIN

P.771, 772

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF22012 | 3/16 | 1/4 | 1/4 | 3/8 | 2 |
| GMF22957 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF22958 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF22959 | 3/16 | 1/4 | 1/4 | 11/16 | 2-3/8 |
| GMF22960 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF22961 | 3/16 | 1/4 | 1/4 | 1 | 2-3/4 |
| GMF22962 | 3/16 | 1/4 | 1/4 | 1-3/16 | 2-3/4 |
| GMF22013 | 13/64 | 1/4 | 5/16 | 3/4 | 2-3/8 |
| GMF22963 | 13/64 | 1/4 | 5/16 | 1-3/16 | 2-3/4 |
| GMF22964 | 13/64 | 1/4 | 5/16 | 1-3/8 | 3 |
| GMF22965 | 13/64 | 1/4 | 5/16 | 1-1/2 | 3-1/8 |
| GMF22966 | 13/64 | 1/4 | 5/16 | 2 | 3-1/2 |
| GMF22016 | 1/4 | 1/4 | 3/8 | 5/8 | 2-3/8 |
| GMF22967 | 1/4 | 1/4 | 3/8 | 3/4 | 2-3/8 |
| GMF22968 | 1/4 | 1/4 | 3/8 | 1-3/16 | 2-3/4 |
| GMF22020 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF22024 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF22969 | 3/8 | 3/8 | 5/8 | 1-3/4 | 4 |
| GMF22032 | 1/2 | 1/2 | 3/4 | 1-3/8 | 3-1/8 |
| GMF22970 | 1/2 | 1/2 | 3/4 | 2 | 4-1/4 |

| Size | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|
| up to Ø1/4 | 0~−.0005 | h6 |
| over Ø1/4 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

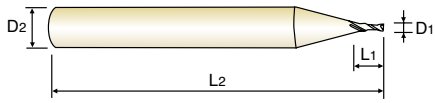
# 4G MILL END MILLS

**GMF23 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Sharp End tooth geometry allows more efficient cutting






MG | 2 | 30° | PLAIN

P.773

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF23901 | .004 | 3/16 | .008 | 1-1/2 |
| GMF23902 | .008 | 3/16 | 1/64 | 1-1/2 |
| GMF23903 | .012 | 3/16 | 1/32 | 1-1/2 |
| GMF23904 | .015 | 3/16 | 1/32 | 1-1/2 |
| GMF23905 | .020 | 3/16 | 3/64 | 1-1/2 |
| GMF23906 | .024 | 3/16 | 3/64 | 1-1/2 |
| GMF23907 | .028 | 3/16 | 1/16 | 1-1/2 |
| GMF23908 | .031 | 3/16 | 1/16 | 1-1/2 |
| GMF23909 | .035 | 3/16 | 5/64 | 1-1/2 |
| GMF23910 | .040 | 1/4 | 3/32 | 2 |
| GMF23911 | .047 | 1/4 | 1/8 | 2 |
| GMF23004 | 1/16 | 1/4 | 5/32 | 2 |
| GMF23005 | 5/64 | 1/4 | 1/4 | 2 |
| GMF23006 | 3/32 | 1/4 | 1/4 | 2 |
| GMF23008 | 1/8 | 1/4 | 5/16 | 2 |
| GMF23009 | 9/64 | 1/4 | 3/8 | 2 |
| GMF23012 | 3/16 | 1/4 | 3/8 | 2 |
| GMF23013 | 13/64 | 1/4 | 5/8 | 2-3/8 |
| GMF23016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF23017 | 17/64 | 5/16 | 11/16 | 2-3/8 |
| GMF23018 | 9/32 | 5/16 | 3/4 | 2-3/8 |
| GMF23020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF23022 | 11/32 | 3/8 | 7/8 | 2-3/4 |
| GMF23023 | 23/64 | 3/8 | 7/8 | 2-3/4 |
| GMF23024 | 3/8 | 3/8 | 1 | 3 |
| GMF23026 | 13/32 | 1/2 | 1 | 3 |
| GMF23028 | 7/16 | 1/2 | 1-3/16 | 3 |
| GMF23032 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF23036 | 9/16 | 9/16 | 1-3/8 | 4 |
| GMF23912 | 9/16 | 5/8 | 1-3/8 | 4 |
| GMF23040 | 5/8 | 5/8 | 1-1/2 | 4 |
| GMF23048 | 3/4 | 3/4 | 1-3/4 | 4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

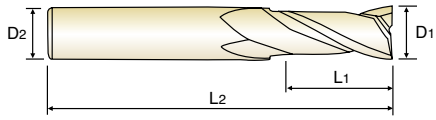
# 4G MILL END MILLS

**GMF23 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE (3/16 SHANK)

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Sharp End tooth geometry allows more efficient cutting






MG | 2 | 30° | PLAIN

P.773

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF23913 | .040 | 3/16 | 3/32 | 2 |
| GMF23914 | .047 | 3/16 | 1/8 | 2 |
| GMF23915 | .050 | 3/16 | 1/8 | 2 |
| GMF23916 | .055 | 3/16 | 5/32 | 2 |
| GMF23917 | .060 | 3/16 | 5/32 | 2 |
| GMF23918 | .063 | 3/16 | 5/32 | 2 |
| GMF23919 | .070 | 3/16 | 3/16 | 2 |
| GMF23920 | .079 | 3/16 | 1/4 | 2 |
| GMF23921 | .087 | 3/16 | 1/4 | 2 |
| GMF23922 | .094 | 3/16 | 1/4 | 2 |
| GMF23923 | .098 | 3/16 | 5/16 | 2 |
| GMF23924 | .102 | 3/16 | 5/16 | 2 |
| GMF23925 | .106 | 3/16 | 5/16 | 2 |
| GMF23926 | .110 | 3/16 | 5/16 | 2 |
| GMF23927 | .120 | 3/16 | 5/16 | 2 |

▶ NEXT PAGE

| Size | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|
| up to Ø1/4 | 0~−.0005 | h6 |
| over Ø1/4 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

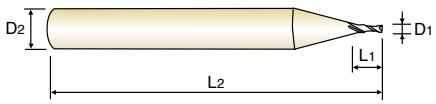
# 4G MILL END MILLS

GMF23 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE (1/8 Shank)

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Sharp End tooth geometry allows more efficient cutting






MG | 2 | 30° | PLAIN

P.773

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF23928 | .004 | 1/8 | .008 | 1-1/2 |
| GMF23929 | .008 | 1/8 | 1/64 | 1-1/2 |
| GMF23930 | .012 | 1/8 | 1/32 | 1-1/2 |
| GMF23931 | .015 | 1/8 | 1/32 | 1-1/2 |
| GMF23932 | .020 | 1/8 | 3/64 | 1-1/2 |
| GMF23933 | .024 | 1/8 | 3/64 | 1-1/2 |
| GMF23934 | .028 | 1/8 | 1/16 | 1-1/2 |
| GMF23935 | .031 | 1/8 | 1/16 | 1-1/2 |
| GMF23936 | .035 | 1/8 | 5/64 | 1-1/2 |
| GMF23937 | .040 | 1/8 | 3/32 | 2 |
| GMF23938 | .047 | 1/8 | 1/8 | 2 |
| GMF23939 | .060 | 1/8 | 5/32 | 2 |
| GMF23940 | .079 | 1/8 | 1/4 | 2 |
| GMF23941 | .098 | 1/8 | 1/4 | 2 |
| GMF23942 | .120 | 1/8 | 5/16 | 2 |

| Size | Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|---|
| up to Ø1/4 | 0~−.0005 | h6 |
| over Ø1/4 | 0~−.0006 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

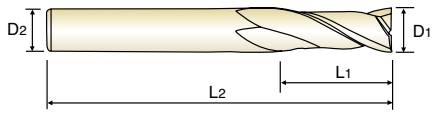
# 4G MILL END MILLS

**GMF24 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
▶ Excellent performance when cutting steels, up to HRc55
▶ Various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.774, 775

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF24003 | 3/64 | 1/4 | 1/8 | 2-3/8 |
| GMF24901 | 3/64 | 1/4 | 5/32 | 2-3/8 |
| GMF24902 | 3/64 | 1/4 | 1/4 | 2-3/8 |
| GMF24903 | 3/64 | 1/4 | 5/16 | 2-3/8 |
| GMF24904 | 3/64 | 1/4 | 3/8 | 2-3/8 |
| GMF24004 | 1/16 | 1/4 | 1/4 | 2-3/8 |
| GMF24905 | 1/16 | 1/4 | 5/16 | 2-3/8 |
| GMF24906 | 1/16 | 1/4 | 3/8 | 2-3/8 |
| GMF24907 | 1/16 | 1/4 | 1/2 | 2-3/8 |
| GMF24908 | 1/16 | 1/4 | 5/8 | 2-3/8 |
| GMF24005 | 5/64 | 1/4 | 5/16 | 2-3/8 |
| GMF24909 | 5/64 | 1/4 | 3/8 | 2-3/8 |
| GMF24910 | 5/64 | 1/4 | 1/2 | 2-3/8 |
| GMF24911 | 5/64 | 1/4 | 5/8 | 2-3/8 |
| GMF24006 | 3/32 | 1/4 | 5/8 | 2-3/8 |
| GMF24008 | 1/8 | 1/4 | 3/8 | 2-3/4 |
| GMF24912 | 1/8 | 1/4 | 1/2 | 2-3/4 |
| GMF24913 | 1/8 | 1/4 | 5/8 | 2-3/4 |
| GMF24914 | 1/8 | 1/4 | 3/4 | 2-3/4 |
| GMF24915 | 1/8 | 1/4 | 1 | 2-3/4 |
| GMF24012 | 3/16 | 1/4 | 1/2 | 2-3/4 |
| GMF24916 | 3/16 | 1/4 | 5/8 | 2-3/4 |
| GMF24917 | 3/16 | 1/4 | 3/4 | 2-3/4 |
| GMF24918 | 3/16 | 1/4 | 1 | 2-3/4 |
| GMF24919 | 3/16 | 1/4 | 1-3/16 | 2-3/4 |
| GMF24013 | 13/64 | 1/4 | 3/4 | 2-3/4 |
| GMF24920 | 13/64 | 1/4 | 1 | 2-3/4 |
| GMF24921 | 13/64 | 1/4 | 1-3/16 | 3-1/8 |
| GMF24922 | 13/64 | 1/4 | 1-1/2 | 4 |
| GMF24016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF24923 | 1/4 | 1/4 | 5/8 | 3-1/8 |
| GMF24924 | 1/4 | 1/4 | 3/4 | 2-3/4 |
| GMF24925 | 1/4 | 1/4 | 3/4 | 3-1/2 |
| GMF24926 | 1/4 | 1/4 | 1 | 3 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

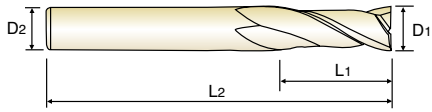
# 4G MILL END MILLS

**GMF24 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.774, 775

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF24927 | 1/4 | 1/4 | 1-3/16 | 3-1/8 |
| GMF24928 | 1/4 | 1/4 | 1-3/16 | 4 |
| GMF24929 | 1/4 | 1/4 | 1-3/16 | 6 |
| GMF24930 | 1/4 | 1/4 | 1-3/8 | 3-1/2 |
| GMF24931 | 1/4 | 1/4 | 1-1/2 | 3-1/2 |
| GMF24932 | 1/4 | 1/4 | 1-3/4 | 6 |
| GMF24020 | 5/16 | 5/16 | 1 | 3-1/8 |
| GMF24933 | 5/16 | 5/16 | 1-3/16 | 3-1/8 |
| GMF24934 | 5/16 | 5/16 | 1-3/8 | 3-1/2 |
| GMF24935 | 5/16 | 5/16 | 1-1/2 | 3-1/2 |
| GMF24936 | 5/16 | 5/16 | 1-1/2 | 4-1/2 |
| GMF24937 | 5/16 | 5/16 | 1-3/4 | 4 |
| GMF24938 | 5/16 | 5/16 | 2 | 4 |
| GMF24024 | 3/8 | 3/8 | 1-3/16 | 3-1/8 |
| GMF24939 | 3/8 | 3/8 | 1-3/16 | 4 |
| GMF24940 | 3/8 | 3/8 | 1-3/8 | 3-1/2 |
| GMF24941 | 3/8 | 3/8 | 1-1/2 | 3-1/2 |
| GMF24942 | 3/8 | 3/8 | 1-1/2 | 4-1/2 |
| GMF24943 | 3/8 | 3/8 | 1-3/4 | 4 |
| GMF24944 | 3/8 | 3/8 | 2 | 4 |
| GMF24945 | 3/8 | 3/8 | 2-3/8 | 4-1/4 |
| GMF24032 | 1/2 | 1/2 | 1-3/8 | 3-1/2 |
| GMF24946 | 1/2 | 1/2 | 1-1/2 | 4 |
| GMF24947 | 1/2 | 1/2 | 1-1/2 | 4-1/2 |
| GMF24948 | 1/2 | 1/2 | 1-3/4 | 5 |
| GMF24949 | 1/2 | 1/2 | 2 | 4 |
| GMF24950 | 1/2 | 1/2 | 2-1/8 | 4-1/4 |
| GMF24951 | 1/2 | 1/2 | 2-3/8 | 4-1/4 |
| GMF24952 | 1/2 | 1/2 | 2-3/8 | 6 |
| GMF24040 | 5/8 | 5/8 | 1-1/2 | 6 |
| GMF24048 | 3/4 | 3/4 | 3-1/2 | 8 |
| GMF24953 | 3/4 | 3/4 | 4-1/4 | 8 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

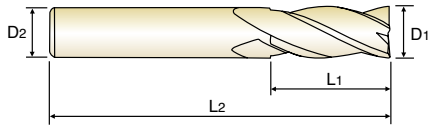
# 4G MILL END MILLS

**GMF25 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
▶ Excellent performance when cutting steels, up to HRc55
▶ Due to Multiple Helix on 1/8" and over diameter end mills, vibration will be minimized and tool life increased.






MG 4 M-Helix PLAIN P.776

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF25003 | 3/64 | 1/4 | 3/32 | 2 |
| GMF25004 | 1/16 | 1/4 | 5/32 | 2 |
| GMF25005 | 5/64 | 1/4 | 1/4 | 2 |
| GMF25006 | 3/32 | 1/4 | 1/4 | 2 |
| GMF25008 | 1/8 | 1/4 | 5/16 | 2 |
| GMF25009 | 9/64 | 1/4 | 3/8 | 2 |
| GMF25012 | 3/16 | 1/4 | 3/8 | 2 |
| GMF25013 | 13/64 | 1/4 | 5/8 | 2-3/8 |
| GMF25014 | 7/32 | 1/4 | 5/8 | 2-3/8 |
| GMF25016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF25017 | 17/64 | 5/16 | 11/16 | 2-3/8 |
| GMF25018 | 9/32 | 5/16 | 3/4 | 2-3/8 |
| GMF25019 | 19/64 | 5/16 | 3/4 | 2-3/8 |
| GMF25020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF25022 | 11/32 | 3/8 | 7/8 | 2-3/4 |
| GMF25023 | 23/64 | 3/8 | 7/8 | 2-3/4 |
| GMF25024 | 3/8 | 3/8 | 1 | 3 |
| GMF25028 | 7/16 | 1/2 | 1-3/16 | 3 |
| GMF25032 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF25036 | 9/16 | 9/16 | 1-3/8 | 4 |
| GMF25901 | 9/16 | 5/8 | 1-3/8 | 4 |
| GMF25040 | 5/8 | 5/8 | 1-1/2 | 4 |
| GMF25044 | 11/16 | 5/8 | 1-3/4 | 4 |
| GMF25048 | 3/4 | 3/4 | 1-3/4 | 4 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

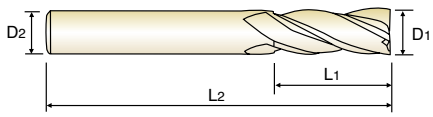
# 4G MILL END MILLS

**GMF26 SERIES**

## CARBIDE, 4 FLUTE

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Due to Multiple Helix on 1/8″ and over diameter end mills, vibration will be minimized and tool life increased.
- ▶ Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
  Various length products Available



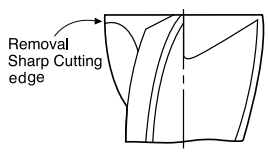



MG | 4 | M-Helix | PLAIN P.776

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF26003 | 3/64 | 1/4 | 3/32 | 2 |
| GMF26004 | 1/16 | 1/4 | 5/32 | 2 |
| GMF26005 | 5/64 | 1/4 | 1/4 | 2 |
| GMF26006 | 3/32 | 1/4 | 1/4 | 2 |
| GMF26008 | 1/8 | 1/4 | 5/16 | 2 |
| GMF26012 | 3/16 | 1/4 | 3/8 | 2 |
| GMF26013 | 13/64 | 1/4 | 5/8 | 2-3/8 |
| GMF26016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF26020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF26024 | 3/8 | 3/8 | 1 | 3 |
| GMF26032 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF26040 | 5/8 | 5/8 | 1-1/4 | 4 |
| GMF26048 | 3/4 | 3/4 | 1-3/4 | 4 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

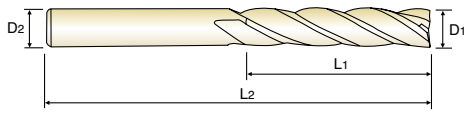
# 4G MILL END MILLS

**GMF27 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length products available






MG | 4 | 30° | PLAIN

P.777, 778

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF27003 | 3/64 | 1/4 | 1/8 | 2-3/8 |
| GMF27901 | 3/64 | 1/4 | 5/32 | 2-3/8 |
| GMF27902 | 3/64 | 1/4 | 3/16 | 2-3/8 |
| GMF27903 | 3/64 | 1/4 | 1/4 | 2-3/8 |
| GMF27004 | 1/16 | 1/4 | 1/4 | 2-3/8 |
| GMF27005 | 5/64 | 1/4 | 5/16 | 2-3/8 |
| GMF27904 | 5/64 | 1/4 | 3/8 | 2-3/8 |
| GMF27905 | 5/64 | 1/4 | 1/2 | 2-3/8 |
| GMF27906 | 5/64 | 1/4 | 9/16 | 2-3/8 |
| GMF27006 | 3/32 | 1/4 | 3/8 | 2-3/8 |
| GMF27907 | 3/32 | 1/4 | 1/2 | 2-3/8 |
| GMF27008 | 1/8 | 1/4 | 3/8 | 2-3/4 |
| GMF27908 | 1/8 | 1/4 | 1/2 | 2-3/4 |
| GMF27909 | 1/8 | 1/4 | 5/8 | 2-3/4 |
| GMF27910 | 1/8 | 1/4 | 3/4 | 2-3/4 |
| GMF27911 | 1/8 | 1/4 | 1 | 2-3/4 |
| GMF27912 | 1/8 | 1/4 | 1-3/16 | 2-3/4 |
| GMF27012 | 3/16 | 1/4 | 1/2 | 2-3/4 |
| GMF27913 | 3/16 | 1/4 | 5/8 | 2-3/4 |
| GMF27914 | 3/16 | 1/4 | 3/4 | 2-3/4 |
| GMF27915 | 3/16 | 1/4 | 1 | 2-3/4 |
| GMF27916 | 3/16 | 1/4 | 1-3/16 | 2-3/4 |
| GMF27013 | 13/64 | 1/4 | 3/4 | 2-3/4 |
| GMF27917 | 13/64 | 1/4 | 1 | 2-3/4 |
| GMF27918 | 13/64 | 1/4 | 1-3/16 | 3-1/8 |
| GMF27016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF27919 | 1/4 | 1/4 | 3/4 | 2-3/4 |
| GMF27920 | 1/4 | 1/4 | 3/4 | 3-1/2 |
| GMF27921 | 1/4 | 1/4 | 1 | 3 |
| GMF27922 | 1/4 | 1/4 | 1-3/16 | 3-1/8 |
| GMF27923 | 1/4 | 1/4 | 1-3/16 | 4 |
| GMF27924 | 1/4 | 1/4 | 1-3/8 | 3-1/2 |
| GMF27925 | 1/4 | 1/4 | 1-1/2 | 3-1/2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

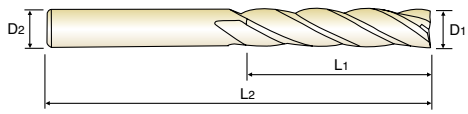
# 4G MILL END MILLS

**GMF27 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Various length of cut and overall length products available






MG | 4 | 30° | PLAIN

P.777, 778

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF27926 | 1/4 | 1/4 | 1-1/2 | 4-1/2 |
| GMF27927 | 1/4 | 1/4 | 1-3/4 | 6 |
| GMF27020 | 5/16 | 5/16 | 1 | 3-1/8 |
| GMF27928 | 5/16 | 5/16 | 1-3/16 | 3-1/8 |
| GMF27929 | 5/16 | 5/16 | 1-3/8 | 3-1/2 |
| GMF27930 | 5/16 | 5/16 | 1-1/2 | 3-1/2 |
| GMF27931 | 5/16 | 5/16 | 1-3/4 | 4 |
| GMF27932 | 5/16 | 5/16 | 2 | 4 |
| GMF27933 | 5/16 | 5/16 | 2 | 6 |
| GMF27024 | 3/8 | 3/8 | 1-3/16 | 3-1/8 |
| GMF27934 | 3/8 | 3/8 | 1-3/16 | 4 |
| GMF27935 | 3/8 | 3/8 | 1-3/8 | 3-1/2 |
| GMF27936 | 3/8 | 3/8 | 1-1/2 | 3-1/2 |
| GMF27937 | 3/8 | 3/8 | 1-3/4 | 4 |
| GMF27938 | 3/8 | 3/8 | 2 | 4 |
| GMF27032 | 1/2 | 1/2 | 1-3/8 | 3-1/2 |
| GMF27939 | 1/2 | 1/2 | 1-1/2 | 4 |
| GMF27940 | 1/2 | 1/2 | 1-3/4 | 5 |
| GMF27941 | 1/2 | 1/2 | 2 | 4 |
| GMF27942 | 1/2 | 1/2 | 2-1/8 | 4-1/4 |
| GMF27943 | 1/2 | 1/2 | 2-3/8 | 4-1/4 |
| GMF27944 | 1/2 | 1/2 | 2-3/8 | 6 |
| GMF27036 | 9/16 | 5/8 | 2 | 4-1/4 |
| GMF27040 | 5/8 | 5/8 | 2 | 4-1/4 |
| GMF27945 | 5/8 | 5/8 | 2-3/8 | 4-1/2 |
| GMF27946 | 5/8 | 5/8 | 2-3/4 | 5 |
| GMF27947 | 5/8 | 5/8 | 2-3/4 | 6 |
| GMF27048 | 3/4 | 3/4 | 2-3/8 | 5 |
| GMF27948 | 3/4 | 3/4 | 3-1/2 | 8 |
| GMF27064 | 1 | 1 | 3-1/2 | 6 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

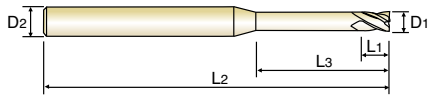
# 4G MILL END MILLS

**GMF28 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE WITH NECK

- New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- Excellent performance when cutting steels, up to HRc55
- Many more various effective lengths and overall lengths than previous standard products.






MG | 4 | 30° | PLAIN

P.779

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| GMF28003 | 3/64 | 3/16 | 1/16 | 5/32 | 2 |
| GMF28901 | 3/64 | 3/16 | 1/16 | 3/16 | 2 |
| GMF28902 | 3/64 | 3/16 | 1/16 | 1/4 | 2 |
| GMF28903 | 3/64 | 3/16 | 1/16 | 5/16 | 2 |
| GMF28004 | 1/16 | 3/16 | 3/32 | 1/4 | 2 |
| GMF28904 | 1/16 | 3/16 | 3/32 | 5/16 | 2 |
| GMF28905 | 1/16 | 3/16 | 3/32 | 3/8 | 2 |
| GMF28906 | 1/16 | 3/16 | 3/32 | 1/2 | 2 |
| GMF28907 | 1/16 | 3/16 | 3/32 | 5/8 | 2 |
| GMF28005 | 5/64 | 3/16 | 1/8 | 5/16 | 2 |
| GMF28908 | 5/64 | 3/16 | 1/8 | 3/8 | 2 |
| GMF28909 | 5/64 | 3/16 | 1/8 | 1/2 | 2 |
| GMF28910 | 5/64 | 3/16 | 1/8 | 5/8 | 2 |
| GMF28008 | 1/8 | 1/4 | 3/16 | 3/8 | 2 |
| GMF28911 | 1/8 | 1/4 | 3/16 | 1/2 | 2 |
| GMF28912 | 1/8 | 1/4 | 3/16 | 5/8 | 2-3/8 |
| GMF28913 | 1/8 | 1/4 | 3/16 | 3/4 | 2-3/8 |
| GMF28914 | 1/8 | 1/4 | 3/16 | 1-3/16 | 2-3/4 |
| GMF28012 | 3/16 | 1/4 | 1/4 | 1/2 | 2 |
| GMF28915 | 3/16 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF28916 | 3/16 | 1/4 | 1/4 | 3/4 | 2-3/8 |
| GMF28917 | 3/16 | 1/4 | 1/4 | 1-3/16 | 2-3/4 |
| GMF28918 | 3/16 | 1/4 | 1/4 | 1-1/2 | 3-1/8 |
| GMF28013 | 13/64 | 1/4 | 5/16 | 3/4 | 2-3/8 |
| GMF28919 | 13/64 | 1/4 | 5/16 | 1-1/2 | 3-1/8 |
| GMF28016 | 1/4 | 1/4 | 3/8 | 5/8 | 2-3/8 |
| GMF28920 | 1/4 | 1/4 | 3/8 | 1-3/16 | 2-3/4 |
| GMF28020 | 5/16 | 5/16 | 1/2 | 1 | 2-3/4 |
| GMF28921 | 5/16 | 5/16 | 1/2 | 1-5/8 | 4 |
| GMF28024 | 3/8 | 3/8 | 5/8 | 1-3/16 | 3 |
| GMF28922 | 3/8 | 3/8 | 5/8 | 1-3/4 | 4 |
| GMF28032 | 1/2 | 1/2 | 3/4 | 1-3/8 | 3-1/8 |
| GMF28923 | 1/2 | 1/2 | 3/4 | 2 | 4-1/4 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

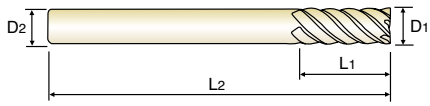
# 4G MILL END MILLS

**GMF29 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 45° HELIX

- ▶ New coating and new tool geometry gives outstanding cutting performance and wear resistance.
- ▶ Excellent performance when cutting steels, up to HRc55
- ▶ Due to 45 helix angle, better surface finish can be achieved when side cutting.
- ▶ Various effective length and overall length products.






MG | 6 | 45° | PLAIN

P.780

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| GMF29016 | 1/4 | 1/4 | 5/8 | 2-3/8 |
| GMF29901 | 1/4 | 1/4 | 1-3/16 | 3-1/8 |
| GMF29020 | 5/16 | 5/16 | 3/4 | 2-3/4 |
| GMF29902 | 5/16 | 5/16 | 1-1/2 | 3-1/2 |
| GMF29024 | 3/8 | 3/8 | 1 | 3 |
| GMF29903 | 3/8 | 3/8 | 1-1/2 | 3-1/2 |
| GMF29032 | 1/2 | 1/2 | 1-3/16 | 3-1/8 |
| GMF29904 | 1/2 | 1/2 | 2 | 4 |
| GMF29040 | 5/8 | 5/8 | 1-1/2 | 4 |
| GMF29905 | 5/8 | 5/8 | 2-3/8 | 4-1/2 |
| GMF29048 | 3/4 | 3/4 | 1-3/4 | 4 |
| GMF29906 | 3/4 | 3/4 | 2-3/8 | 4-1/2 |

| Mill Dia. Tolerance (Inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

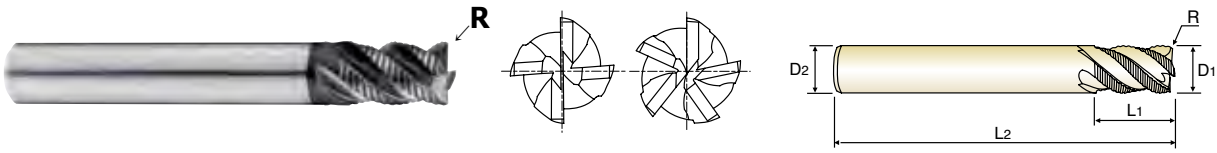
# 4G MILL END MILLS

X-SPEED ROUGHER

**G907 SERIES** PLAIN SHANK
**G928 SERIES** FLAT SHANK

## CARBIDE, 4&5 FLUTE STUB LENGTH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.




MG | 4&5 | M-Helix | PLAIN | FLAT

P.781

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **G90716** | - | R.020 | **1/4** | 1/4 | 3/8 | 2 | 4 |
| **G90720** | - | R.020 | **5/16** | 5/16 | 7/16 | 2 | 4 |
| **G90724** | **G92824** | R.020 | **3/8** | 3/8 | 1/2 | 2-1/4 | 4 |
| **G90732** | **G92832** | R.020 | **1/2** | 1/2 | 5/8 | 2-1/2 | 4 |
| **G90740** | **G92840** | R.040 | **5/8** | 5/8 | 3/4 | 3 | 5 |
| **G90748** | **G92848** | R.040 | **3/4** | 3/4 | 1 | 3-1/4 | 5 |
| **G90764** | **G92864** | R.040 | **1** | 1 | 1-1/4 | 4 | 5 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.002 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

# 4G MILL END MILLS

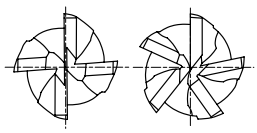
X-SPEED ROUGHER

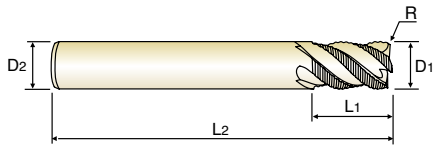
G908 SERIES PLAIN SHANK
G929 SERIES FLAT SHANK

## CARBIDE, 4&5 FLUTE REGULAR LENGTH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to all ng tool life and excellent chip evacuation.






MG 4&5 M-Helix PLAIN FLAT P.781

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **G90816** | - | R.020 | **1/4** | 1/4 | 5/8 | 2-1/2 | 4 |
| **G90820** | - | R.020 | **5/16** | 5/16 | 3/4 | 2-1/2 | 4 |
| **G90824** | **G92924** | R.020 | **3/8** | 3/8 | 7/8 | 2-1/2 | 4 |
| **G90832** | **G92932** | R.020 | **1/2** | 1/2 | 1 | 3 | 4 |
| **G90840** | **G92940** | R.040 | **5/8** | 5/8 | 1-1/4 | 3-1/2 | 5 |
| **G90848** | **G92948** | R.040 | **3/4** | 3/4 | 1-5/8 | 4 | 5 |
| **G90864** | **G92964** | R.040 | **1** | 1 | 1-3/4 | 4-1/4 | 5 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.002 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

# 4G MILL END MILLS

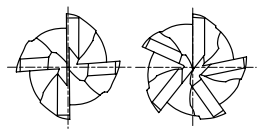
X-SPEED ROUGHER

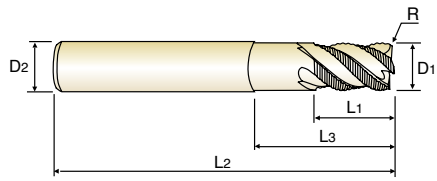
G909 SERIES PLAIN SHANK
G930 SERIES FLAT SHANK

## CARBIDE, MULTI FLUTE EXTENDED REACH ROUGHING CORNER RADIUS - FINE

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.






MG 4&5 M-Helix PLAIN FLAT

P.781

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L3 | L2 | |
| G90916 | - | R.020 | 1/4 | 1/4 | 3/8 | 7/8 | 2-1/2 | 4 |
| G90920 | - | R.020 | 5/16 | 5/16 | 7/16 | 1 | 2-1/2 | 4 |
| G90924 | G93024 | R.020 | 3/8 | 3/8 | 1/2 | 1 | 2-3/4 | 4 |
| G90932 | G93032 | R.020 | 1/2 | 1/2 | 5/8 | 1-1/4 | 3-1/4 | 4 |
| G90940 | G93040 | R.040 | 5/8 | 5/8 | 3/4 | 2 | 4 | 5 |
| G90948 | G93048 | R.040 | 3/4 | 3/4 | 1 | 2-3/8 | 4-1/2 | 5 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.002 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

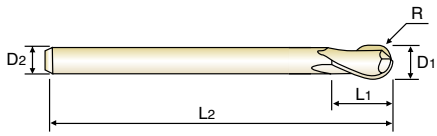
# 4G MILL END MILLS

**SEMD98 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.782

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD98001S | R0.05 | 0.1 | 4 | 0.1 | 40 | Short |
| SEMD98001 | R0.05 | 0.1 | 4 | 0.2 | 40 | Regular |
| SEMD980013S | R0.05 | 0.1 | 3 | 0.2 | 40 | 3mm Shank |
| SEMD980015S | R0.075 | 0.15 | 4 | 0.15 | 40 | Short |
| SEMD980015 | R0.075 | 0.15 | 4 | 0.3 | 40 | Regular |
| SEMD98001535 | R0.075 | 0.15 | 3 | 0.3 | 40 | 3mm Shank |
| SEMD98002S | R0.1 | 0.2 | 4 | 0.2 | 40 | Short |
| SEMD98002 | R0.1 | 0.2 | 4 | 0.4 | 40 | Regular |
| SEMD980023S | R0.1 | 0.2 | 3 | 0.4 | 40 | 3mm Shank |
| SEMD98003S | R0.15 | 0.3 | 4 | 0.3 | 40 | Short |
| SEMD98003 | R0.15 | 0.3 | 4 | 0.6 | 40 | Regular |
| SEMD980033S | R0.15 | 0.3 | 3 | 0.6 | 40 | 3mm Shank |
| SEMD98004S | R0.2 | 0.4 | 4 | 0.4 | 40 | Short |
| SEMD98004 | R0.2 | 0.4 | 4 | 0.8 | 40 | Regular |
| SEMD980043S | R0.2 | 0.4 | 3 | 0.8 | 40 | 3mm Shank |
| SEMD98005S | R0.25 | 0.5 | 4 | 0.5 | 40 | Short |
| SEMD98005 | R0.25 | 0.5 | 4 | 1.0 | 40 | Regular |
| SEMD980053S | R0.25 | 0.5 | 3 | 1.0 | 40 | 3mm Shank |
| SEMD98006S | R0.3 | 0.6 | 4 | 0.6 | 40 | Short |
| SEMD98006 | R0.3 | 0.6 | 4 | 1.2 | 40 | Regular |
| SEMD980063S | R0.3 | 0.6 | 3 | 1.2 | 40 | 3mm Shank |
| SEMD98007S | R0.35 | 0.7 | 4 | 0.7 | 40 | Short |
| SEMD98007 | R0.35 | 0.7 | 4 | 1.4 | 40 | Regular |
| SEMD980073S | R0.35 | 0.7 | 3 | 1.4 | 40 | 3mm Shank |
| SEMD98008S | R0.4 | 0.8 | 4 | 0.8 | 40 | Short |
| SEMD98008 | R0.4 | 0.8 | 4 | 1.6 | 40 | Regular |
| SEMD980083S | R0.4 | 0.8 | 3 | 1.6 | 40 | 3mm Shank |
| SEMD98009S | R0.45 | 0.9 | 4 | 0.9 | 40 | Short |
| SEMD98009 | R0.45 | 0.9 | 4 | 1.8 | 40 | Regular |
| SEMD980093S | R0.45 | 0.9 | 3 | 1.8 | 40 | 3mm Shank |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

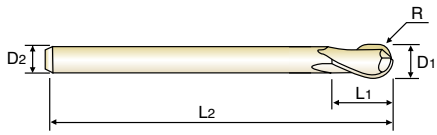
# 4G MILL END MILLS

**SEMD98 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.782

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD98010040 | R0.5 | 1.0 | 6 | 1.5 | 40 | Short |
| SEMD980103S | R0.5 | 1.0 | 3 | 2.5 | 50 | 3mm Shank |
| SEMD980104S | R0.5 | 1.0 | 4 | 2.5 | 50 | Regular |
| SEMD98010 | R0.5 | 1.0 | 6 | 2.5 | 50 | Regular |
| SEMD98010070 | R0.5 | 1.0 | 6 | 2.5 | 70 | Long Shank |
| SEMD98010100 | R0.5 | 1.0 | 6 | 2.5 | 100 | Long Shank |
| SEMD98012040 | R0.6 | 1.2 | 6 | 2 | 40 | Short |
| SEMD980123S | R0.6 | 1.2 | 3 | 3 | 50 | 3mm Shank |
| SEMD980124S | R0.6 | 1.2 | 4 | 3 | 50 | Regular |
| SEMD98012 | R0.6 | 1.2 | 6 | 3 | 50 | Regular |
| SEMD98012070 | R0.6 | 1.2 | 6 | 3 | 70 | Long Shank |
| SEMD98012100 | R0.6 | 1.2 | 6 | 3 | 100 | Long Shank |
| SEMD98015040 | R0.75 | 1.5 | 6 | 2.5 | 40 | Short |
| SEMD980153S | R0.75 | 1.5 | 3 | 4 | 50 | 3mm Shank |
| SEMD980154S | R0.75 | 1.5 | 4 | 4 | 50 | Regular |
| SEMD98015 | R0.75 | 1.5 | 6 | 4 | 50 | Regular |
| SEMD98015070 | R0.75 | 1.5 | 6 | 4 | 70 | Long Shank |
| SEMD98015100 | R0.75 | 1.5 | 6 | 4 | 100 | Long Shank |
| SEMD98020040 | R1.0 | 2.0 | 6 | 3 | 40 | Short |
| SEMD980203S | R1.0 | 2.0 | 3 | 5 | 50 | 3mm Shank |
| SEMD980204S | R1.0 | 2.0 | 4 | 5 | 50 | Regular |
| SEMD98020 | R1.0 | 2.0 | 6 | 5 | 50 | Regular |
| SEMD98020080 | R1.0 | 2.0 | 6 | 5 | 80 | Long Shank |
| SEMD98020100 | R1.0 | 2.0 | 6 | 5 | 100 | Long Shank |
| SEMD98025040 | R1.25 | 2.5 | 6 | 4 | 40 | Short |
| SEMD980253S | R1.25 | 2.5 | 3 | 6 | 60 | 3mm Shank |
| SEMD980254S | R1.25 | 2.5 | 4 | 6 | 60 | Regular |
| SEMD98025 | R1.25 | 2.5 | 6 | 6 | 60 | Regular |
| SEMD98025080 | R1.25 | 2.5 | 6 | 6 | 80 | Long Shank |
| SEMD98025100 | R1.25 | 2.5 | 6 | 6 | 100 | Long Shank |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

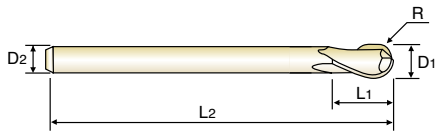
# 4G MILL END MILLS

**SEMD98 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.782

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD98030040 | R1.5 | 3.0 | 6 | 4.5 | 40 | Short |
| SEMD980303S | R1.5 | 3.0 | 3 | 6 | 60 | 3mm Shank |
| SEMD980304S | R1.5 | 3.0 | 4 | 6 | 60 | Regular |
| SEMD98030 | R1.5 | 3.0 | 6 | 6 | 60 | Regular |
| SEMD98030080 | R1.5 | 3.0 | 6 | 6 | 80 | Long Shank |
| SEMD98030100 | R1.5 | 3.0 | 6 | 6 | 100 | Long Shank |
| SEMD98035 | R1.75 | 3.5 | 6 | 8 | 70 | - |
| SEMD98040050 | R2.0 | 4.0 | 6 | 6 | 50 | Short |
| SEMD980404S | R2.0 | 4.0 | 4 | 8 | 70 | Regular |
| SEMD98040 | R2.0 | 4.0 | 6 | 8 | 70 | Regular |
| SEMD9804010045 | R2.0 | 4.0 | 4 | 8 | 100 | Long Shank |
| SEMD9804012045 | R2.0 | 4.0 | 4 | 8 | 120 | Long Shank |
| SEMD98040100 | R2.0 | 4.0 | 6 | 8 | 100 | Long Shank |
| SEMD98040120 | R2.0 | 4.0 | 6 | 8 | 120 | Long Shank |
| SEMD98045 | R2.25 | 4.5 | 6 | 9 | 80 | - |
| SEMD98050060 | R2.5 | 5.0 | 6 | 7.5 | 60 | Short |
| SEMD98050 | R2.5 | 5.0 | 6 | 10 | 80 | Regular |
| SEMD980505S | R2.5 | 5.0 | 5 | 10 | 80 | 5mmShank |
| SEMD98055 | R2.75 | 5.5 | 6 | 11 | 90 | - |
| SEMD98060050 | R3.0 | 6.0 | 6 | 9 | 50 | Short |
| SEMD98060060 | R3.0 | 6.0 | 6 | 9 | 60 | Short |
| SEMD98060080 | R3.0 | 6.0 | 6 | 9 | 80 | Short |
| SEMD98060 | R3.0 | 6.0 | 6 | 12 | 90 | Regular |
| SEMD98060110 | R3.0 | 6.0 | 6 | 12 | 110 | Long Shank |
| SEMD98060130 | R3.0 | 6.0 | 6 | 12 | 130 | Long Shank |
| SEMD98060150 | R3.0 | 6.0 | 6 | 12 | 150 | Long Shank |
| SEMD98065 | R3.25 | 6.5 | 8 | 13 | 90 | - |
| SEMD98070 | R3.5 | 7.0 | 8 | 14 | 90 | - |
| SEMD98080050 | R4.0 | 8.0 | 8 | 12 | 50 | Short |
| SEMD98080060 | R4.0 | 8.0 | 8 | 12 | 60 | Short |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

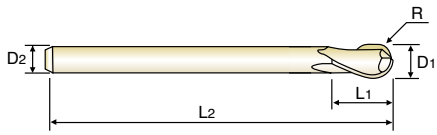
# 4G MILL END MILLS

**SEMD98 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.782

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD98080080 | R4.0 | 8.0 | 8 | 12 | 80 | Short |
| SEMD98080090 | R4.0 | 8.0 | 8 | 12 | 90 | Short |
| SEMD98080 | R4.0 | 8.0 | 8 | 14 | 100 | Regular |
| SEMD98080130 | R4.0 | 8.0 | 8 | 14 | 130 | Long Shank |
| SEMD98080150 | R4.0 | 8.0 | 8 | 14 | 150 | Long Shank |
| SEMD98085 | R4.25 | 8.5 | 10 | 16 | 100 | - |
| SEMD98090 | R4.5 | 9.0 | 10 | 18 | 100 | - |
| SEMD98100050 | R5.0 | 10.0 | 10 | 15 | 50 | Short |
| SEMD98100060 | R5.0 | 10.0 | 10 | 15 | 60 | Short |
| SEMD98100080 | R5.0 | 10.0 | 10 | 15 | 80 | Short |
| SEMD98100090 | R5.0 | 10.0 | 10 | 15 | 90 | Short |
| SEMD98100 | R5.0 | 10.0 | 10 | 18 | 100 | Regular |
| SEMD98100130 | R5.0 | 10.0 | 10 | 18 | 130 | Long Shank |
| SEMD98100150 | R5.0 | 10.0 | 10 | 18 | 150 | Long Shank |
| SEMD98100180 | R5.0 | 10.0 | 10 | 18 | 180 | Long Shank |
| SEMD98100200 | R5.0 | 10.0 | 10 | 18 | 200 | Long Shank |
| SEMD98110 | R5.5 | 11.0 | 12 | 20 | 100 | - |
| SEMD98120060 | R6.0 | 12.0 | 12 | 18 | 60 | Short |
| SEMD98120080 | R6.0 | 12.0 | 12 | 18 | 80 | Short |
| SEMD98120090 | R6.0 | 12.0 | 12 | 18 | 90 | Short |
| SEMD98120100 | R6.0 | 12.0 | 12 | 18 | 100 | Short |
| SEMD98120 | R6.0 | 12.0 | 12 | 22 | 110 | Regular |
| SEMD98120130 | R6.0 | 12.0 | 12 | 22 | 130 | Long Shank |
| SEMD98120150 | R6.0 | 12.0 | 12 | 22 | 150 | Long Shank |
| SEMD98120180 | R6.0 | 12.0 | 12 | 22 | 180 | Long Shank |
| SEMD98120220 | R6.0 | 12.0 | 12 | 22 | 200 | Long Shank |
| SEMD98130 | R6.5 | 13.0 | 12 | 24 | 100 | - |
| SEMD98140 | R7.0 | 14.0 | 12 | 26 | 100 | Regular |
| SEMD98140145 | R7.0 | 14.0 | 14 | 26 | 100 | - |
| SEMD98140165 | R7.0 | 14.0 | 16 | 26 | 100 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

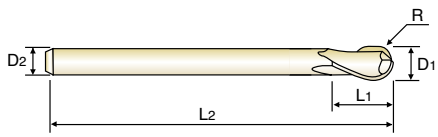
# 4G MILL END MILLS

**SEMD98 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.782

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD98150 | R7.5 | **15.0** | 16 | 28 | 140 | - |
| SEMD98160100 | R8.0 | **16.0** | 16 | 24 | 100 | Short |
| SEMD98160130 | R8.0 | **16.0** | 16 | 24 | 130 | Short |
| SEMD98160 | R8.0 | **16.0** | 16 | 30 | 150 | Regular |
| SEMD98160180 | R8.0 | **16.0** | 16 | 30 | 180 | Long Shank |
| SEMD98160200 | R8.0 | **16.0** | 16 | 30 | 200 | Long Shank |
| SEMD98180 | R9.0 | **18.0** | 16 | 34 | 150 | Regular |
| SEMD98180185 | R9.0 | **18.0** | 18 | 34 | 150 | - |
| SEMD98200100 | R10.0 | **20.0** | 20 | 30 | 100 | Short |
| SEMD98200130 | R10.0 | **20.0** | 20 | 30 | 130 | Short |
| SEMD98200 | R10.0 | **20.0** | 20 | 38 | 150 | Regular |
| SEMD98200200 | R10.0 | **20.0** | 20 | 38 | 200 | Long Shank |
| SEMD98250120 | R12.5 | **25.0** | 25 | 50 | 120 | Short |
| SEMD98250 | R12.5 | **25.0** | 25 | 50 | 180 | Regular |

| Size | Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to R3 | ±0.005 | 0~−0.012 | h6 |
| over R3 | ±0.010 | 0~−0 .015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

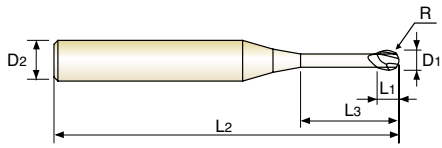
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




NG HM | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM846001002 | R0.05 | 0.1 | 4 | 0.1 | 0.2 | 40 |
| SEM846001003 | R0.05 | 0.1 | 4 | 0.1 | 0.3 | 40 |
| SEM846001005 | R0.05 | 0.1 | 4 | 0.1 | 0.5 | 40 |
| SEM84600101 | R0.05 | 0.1 | 4 | 0.1 | 1 | 40 |
| SEM846002005 | R0.1 | 0.2 | 4 | 0.2 | 0.5 | 40 |
| SEM84600201 | R0.1 | 0.2 | 4 | 0.2 | 1 | 40 |
| SEM846002015 | R0.1 | 0.2 | 4 | 0.2 | 1.5 | 40 |
| SEM84600202 | R0.1 | 0.2 | 4 | 0.2 | 2 | 40 |
| SEM84600203 | R0.1 | 0.2 | 4 | 0.2 | 3 | 40 |
| SEM84600301 | R0.15 | 0.3 | 4 | 0.3 | 1 | 40 |
| SEM846003015 | R0.15 | 0.3 | 4 | 0.3 | 1.5 | 40 |
| SEM84600302 | R0.15 | 0.3 | 4 | 0.3 | 2 | 40 |
| SEM846003025 | R0.15 | 0.3 | 4 | 0.3 | 2.5 | 40 |
| SEM84600303 | R0.15 | 0.3 | 4 | 0.3 | 3 | 40 |
| SEM84600304 | R0.15 | 0.3 | 4 | 0.3 | 4 | 40 |
| SEM84600305 | R0.15 | 0.3 | 4 | 0.3 | 5 | 40 |
| SEM84600401 | R0.2 | 0.4 | 4 | 0.4 | 1 | 40 |
| SEM846004015 | R0.2 | 0.4 | 4 | 0.4 | 1.5 | 40 |
| SEM84600402 | R0.2 | 0.4 | 4 | 0.4 | 2 | 40 |
| SEM846004025 | R0.2 | 0.4 | 4 | 0.4 | 2.5 | 40 |
| SEM84600403 | R0.2 | 0.4 | 4 | 0.4 | 3 | 40 |
| SEM84600404 | R0.2 | 0.4 | 4 | 0.4 | 4 | 40 |
| SEM84600405 | R0.2 | 0.4 | 4 | 0.4 | 5 | 40 |
| SEM84600406 | R0.2 | 0.4 | 4 | 0.4 | 6 | 40 |
| SEM84600408 | R0.2 | 0.4 | 4 | 0.4 | 8 | 40 |
| SEM84600410 | R0.2 | 0.4 | 4 | 0.4 | 10 | 40 |
| SEM84600501 | R0.25 | 0.5 | 4 | 0.5 | 1 | 45 |
| SEM846005015 | R0.25 | 0.5 | 4 | 0.5 | 1.5 | 45 |
| SEM84600502 | R0.25 | 0.5 | 4 | 0.5 | 2 | 45 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

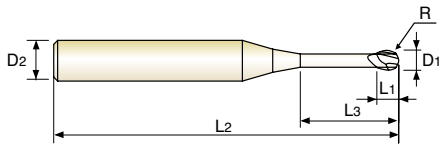
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




NG HM | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM846005025 | R0.25 | 0.5 | 4 | 0.5 | 2.5 | 45 |
| SEM84600503 | R0.25 | 0.5 | 4 | 0.5 | 3 | 45 |
| SEM84600504 | R0.25 | 0.5 | 4 | 0.5 | 4 | 45 |
| SEM84600505 | R0.25 | 0.5 | 4 | 0.5 | 5 | 45 |
| SEM84600506 | R0.25 | 0.5 | 4 | 0.5 | 6 | 45 |
| SEM84600508 | R0.25 | 0.5 | 4 | 0.5 | 8 | 45 |
| SEM84600510 | R0.25 | 0.5 | 4 | 0.5 | 10 | 45 |
| SEM84600512 | R0.25 | 0.5 | 4 | 0.5 | 12 | 45 |
| SEM84600514 | R0.25 | 0.5 | 4 | 0.5 | 14 | 45 |
| SEM84600516 | R0.25 | 0.5 | 4 | 0.5 | 16 | 45 |
| SEM84600601 | R0.3 | 0.6 | 4 | 0.6 | 1 | 45 |
| SEM84600602 | R0.3 | 0.6 | 4 | 0.6 | 2 | 45 |
| SEM84600603 | R0.3 | 0.6 | 4 | 0.6 | 3 | 45 |
| SEM84600604 | R0.3 | 0.6 | 4 | 0.6 | 4 | 45 |
| SEM84600605 | R0.3 | 0.6 | 4 | 0.6 | 5 | 45 |
| SEM84600606 | R0.3 | 0.6 | 4 | 0.6 | 6 | 45 |
| SEM84600608 | R0.3 | 0.6 | 4 | 0.6 | 8 | 45 |
| SEM84600610 | R0.3 | 0.6 | 4 | 0.6 | 10 | 45 |
| SEM84600612 | R0.3 | 0.6 | 4 | 0.6 | 12 | 45 |
| SEM84600614 | R0.3 | 0.6 | 4 | 0.6 | 14 | 45 |
| SEM84600616 | R0.3 | 0.6 | 4 | 0.6 | 16 | 45 |
| SEM84600702 | R0.35 | 0.7 | 4 | 0.7 | 2 | 45 |
| SEM84600704 | R0.35 | 0.7 | 4 | 0.7 | 4 | 45 |
| SEM84600706 | R0.35 | 0.7 | 4 | 0.7 | 6 | 45 |
| SEM84600708 | R0.35 | 0.7 | 4 | 0.7 | 8 | 45 |
| SEM84600710 | R0.35 | 0.7 | 4 | 0.7 | 10 | 45 |
| SEM84600712 | R0.35 | 0.7 | 4 | 0.7 | 12 | 45 |
| SEM84600801 | R0.4 | 0.8 | 4 | 0.8 | 1 | 45 |
| SEM84600802 | R0.4 | 0.8 | 4 | 0.8 | 2 | 45 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

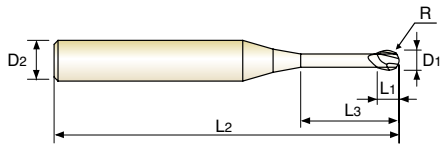
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




NG HM | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84600803 | R0.4 | 0.8 | 4 | 0.8 | 3 | 45 |
| SEM84600804 | R0.4 | 0.8 | 4 | 0.8 | 4 | 45 |
| SEM84600805 | R0.4 | 0.8 | 4 | 0.8 | 5 | 45 |
| SEM84600806 | R0.4 | 0.8 | 4 | 0.8 | 6 | 45 |
| SEM84600808 | R0.4 | 0.8 | 4 | 0.8 | 8 | 45 |
| SEM84600810 | R0.4 | 0.8 | 4 | 0.8 | 10 | 45 |
| SEM84600812 | R0.4 | 0.8 | 4 | 0.8 | 12 | 45 |
| SEM84600814 | R0.4 | 0.8 | 4 | 0.8 | 14 | 45 |
| SEM84600816 | R0.4 | 0.8 | 4 | 0.8 | 16 | 45 |
| SEM84600820 | R0.4 | 0.8 | 4 | 0.8 | 20 | 45 |
| SEM84600904 | R0.45 | 0.9 | 4 | 0.9 | 4 | 45 |
| SEM84600906 | R0.45 | 0.9 | 4 | 0.9 | 6 | 45 |
| SEM84600908 | R0.45 | 0.9 | 4 | 0.9 | 8 | 45 |
| SEM84600910 | R0.45 | 0.9 | 4 | 0.9 | 10 | 45 |
| SEM84601002 | R0.5 | 1.0 | 4 | 1 | 2 | 50 |
| SEM84601003 | R0.5 | 1.0 | 4 | 1 | 3 | 50 |
| SEM84601004 | R0.5 | 1.0 | 4 | 1 | 4 | 50 |
| SEM84601005 | R0.5 | 1.0 | 4 | 1 | 5 | 50 |
| SEM84601006 | R0.5 | 1.0 | 4 | 1 | 6 | 50 |
| SEM84601007 | R0.5 | 1.0 | 4 | 1 | 7 | 50 |
| SEM84601008 | R0.5 | 1.0 | 4 | 1 | 8 | 50 |
| SEM84601009 | R0.5 | 1.0 | 4 | 1 | 9 | 50 |
| SEM84601010 | R0.5 | 1.0 | 4 | 1 | 10 | 50 |
| SEM84601012 | R0.5 | 1.0 | 4 | 1 | 12 | 50 |
| SEM84601014 | R0.5 | 1.0 | 4 | 1 | 14 | 50 |
| SEM84601016 | R0.5 | 1.0 | 4 | 1 | 16 | 50 |
| SEM84601018 | R0.5 | 1.0 | 4 | 1 | 18 | 50 |
| SEM84601020 | R0.5 | 1.0 | 4 | 1 | 20 | 50 |
| SEM84601022 | R0.5 | 1.0 | 4 | 1 | 22 | 60 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

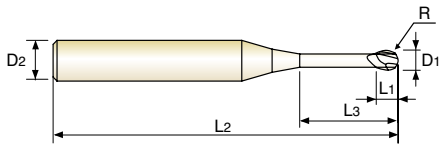
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




NG HM | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84601026 | R0.5 | 1.0 | 4 | 1 | 26 | 60 |
| SEM84601030 | R0.5 | 1.0 | 4 | 1 | 30 | 70 |
| SEM84601040 | R0.5 | 1.0 | 4 | 1 | 40 | 80 |
| SEM84601050 | R0.5 | 1.0 | 4 | 1 | 50 | 100 |
| SEM84601204 | R0.6 | 1.2 | 4 | 1.2 | 4 | 50 |
| SEM84601206 | R0.6 | 1.2 | 4 | 1.2 | 6 | 50 |
| SEM84601208 | R0.6 | 1.2 | 4 | 1.2 | 8 | 50 |
| SEM84601210 | R0.6 | 1.2 | 4 | 1.2 | 10 | 50 |
| SEM84601212 | R0.6 | 1.2 | 4 | 1.2 | 12 | 50 |
| SEM84601216 | R0.6 | 1.2 | 4 | 1.2 | 16 | 50 |
| SEM84601220 | R0.6 | 1.2 | 4 | 1.2 | 20 | 50 |
| SEM84601226 | R0.6 | 1.2 | 4 | 1.2 | 26 | 60 |
| SEM84601406 | R0.7 | 1.4 | 4 | 1.4 | 6 | 50 |
| SEM84601408 | R0.7 | 1.4 | 4 | 1.4 | 8 | 50 |
| SEM84601410 | R0.7 | 1.4 | 4 | 1.4 | 10 | 50 |
| SEM84601412 | R0.7 | 1.4 | 4 | 1.4 | 12 | 50 |
| SEM84601416 | R0.7 | 1.4 | 4 | 1.4 | 16 | 50 |
| SEM84601503 | R0.75 | 1.5 | 4 | 1.5 | 3 | 50 |
| SEM84601504 | R0.75 | 1.5 | 4 | 1.5 | 4 | 50 |
| SEM84601505 | R0.75 | 1.5 | 4 | 1.5 | 5 | 50 |
| SEM84601506 | R0.75 | 1.5 | 4 | 1.5 | 6 | 50 |
| SEM84601507 | R0.75 | 1.5 | 4 | 1.5 | 7 | 50 |
| SEM84601508 | R0.75 | 1.5 | 4 | 1.5 | 8 | 50 |
| SEM84601510 | R0.75 | 1.5 | 4 | 1.5 | 10 | 50 |
| SEM84601512 | R0.75 | 1.5 | 4 | 1.5 | 12 | 50 |
| SEM84601514 | R0.75 | 1.5 | 4 | 1.5 | 14 | 50 |
| SEM84601516 | R0.75 | 1.5 | 4 | 1.5 | 16 | 50 |
| SEM84601518 | R0.75 | 1.5 | 4 | 1.5 | 18 | 50 |
| SEM84601520 | R0.75 | 1.5 | 4 | 1.5 | 20 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

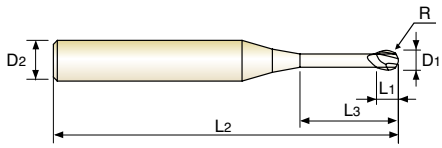
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84601522 | R0.75 | 1.5 | 4 | 1.5 | 22 | 60 |
| SEM84601526 | R0.75 | 1.5 | 4 | 1.5 | 26 | 60 |
| SEM84601530 | R0.75 | 1.5 | 4 | 1.5 | 30 | 70 |
| SEM84601535 | R0.75 | 1.5 | 4 | 1.5 | 35 | 70 |
| SEM84601540 | R0.75 | 1.5 | 4 | 1.5 | 40 | 80 |
| SEM84601604 | R0.8 | 1.6 | 4 | 1.6 | 4 | 50 |
| SEM84601606 | R0.8 | 1.6 | 4 | 1.6 | 6 | 50 |
| SEM84601608 | R0.8 | 1.6 | 4 | 1.6 | 8 | 50 |
| SEM84601610 | R0.8 | 1.6 | 4 | 1.6 | 10 | 50 |
| SEM84601612 | R0.8 | 1.6 | 4 | 1.6 | 12 | 50 |
| SEM84601616 | R0.8 | 1.6 | 4 | 1.6 | 16 | 50 |
| SEM84601620 | R0.8 | 1.6 | 4 | 1.6 | 20 | 50 |
| SEM84601804 | R0.9 | 1.8 | 4 | 1.8 | 4 | 50 |
| SEM84601806 | R0.9 | 1.8 | 4 | 1.8 | 6 | 50 |
| SEM84601808 | R0.9 | 1.8 | 4 | 1.8 | 8 | 50 |
| SEM84601810 | R0.9 | 1.8 | 4 | 1.8 | 10 | 50 |
| SEM84601812 | R0.9 | 1.8 | 4 | 1.8 | 12 | 50 |
| SEM84601816 | R0.9 | 1.8 | 4 | 1.8 | 16 | 50 |
| SEM84601820 | R0.9 | 1.8 | 4 | 1.8 | 20 | 50 |
| SEM84602004 | R1.0 | 2.0 | 4 | 2 | 4 | 50 |
| SEM84602006 | R1.0 | 2.0 | 4 | 2 | 6 | 50 |
| SEM84602008 | R1.0 | 2.0 | 4 | 2 | 8 | 50 |
| SEM84602010 | R1.0 | 2.0 | 4 | 2 | 10 | 50 |
| SEM84602012 | R1.0 | 2.0 | 4 | 2 | 12 | 50 |
| SEM84602014 | R1.0 | 2.0 | 4 | 2 | 14 | 50 |
| SEM84602016 | R1.0 | 2.0 | 4 | 2 | 16 | 50 |
| SEM84602018 | R1.0 | 2.0 | 4 | 2 | 18 | 50 |
| SEM84602020 | R1.0 | 2.0 | 4 | 2 | 20 | 50 |
| SEM84602022 | R1.0 | 2.0 | 4 | 2 | 22 | 60 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

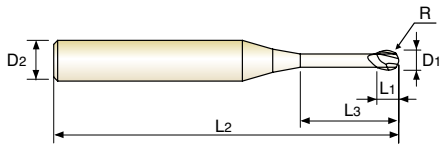
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84602026 | R1.0 | 2.0 | 4 | 2 | 26 | 60 |
| SEM84602030 | R1.0 | 2.0 | 4 | 2 | 30 | 70 |
| SEM84602035 | R1.0 | 2.0 | 4 | 2 | 35 | 70 |
| SEM84602040 | R1.0 | 2.0 | 4 | 2 | 40 | 80 |
| SEM84602045 | R1.0 | 2.0 | 4 | 2 | 45 | 90 |
| SEM84602050 | R1.0 | 2.0 | 4 | 2 | 50 | 100 |
| SEM84602060 | R1.0 | 2.0 | 4 | 2 | 60 | 110 |
| SEM84602508 | R1.25 | 2.5 | 4 | 2.5 | 8 | 50 |
| SEM84602510 | R1.25 | 2.5 | 4 | 2.5 | 10 | 50 |
| SEM84602512 | R1.25 | 2.5 | 4 | 2.5 | 12 | 50 |
| SEM84602516 | R1.25 | 2.5 | 4 | 2.5 | 16 | 50 |
| SEM84602520 | R1.25 | 2.5 | 4 | 2.5 | 20 | 50 |
| SEM84602522 | R1.25 | 2.5 | 4 | 2.5 | 22 | 60 |
| SEM84602526 | R1.25 | 2.5 | 4 | 2.5 | 26 | 60 |
| SEM84602530 | R1.25 | 2.5 | 4 | 2.5 | 30 | 70 |
| SEM84602535 | R1.25 | 2.5 | 4 | 2.5 | 35 | 70 |
| SEM84602540 | R1.25 | 2.5 | 4 | 2.5 | 40 | 80 |
| SEM84602545 | R1.25 | 2.5 | 4 | 2.5 | 45 | 90 |
| SEM84602550 | R1.25 | 2.5 | 4 | 2.5 | 50 | 100 |
| SEM84603006 | R1.5 | 3.0 | 6 | 3 | 6 | 50 |
| SEM84603008 | R1.5 | 3.0 | 6 | 3 | 8 | 50 |
| SEM84603010 | R1.5 | 3.0 | 6 | 3 | 10 | 50 |
| SEM84603012 | R1.5 | 3.0 | 6 | 3 | 12 | 50 |
| SEM84603014 | R1.5 | 3.0 | 6 | 3 | 14 | 60 |
| SEM84603016 | R1.5 | 3.0 | 6 | 3 | 16 | 60 |
| SEM84603018 | R1.5 | 3.0 | 6 | 3 | 18 | 60 |
| SEM84603020 | R1.5 | 3.0 | 6 | 3 | 20 | 60 |
| SEM84603022 | R1.5 | 3.0 | 6 | 3 | 22 | 65 |
| SEM84603026 | R1.5 | 3.0 | 6 | 3 | 26 | 65 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

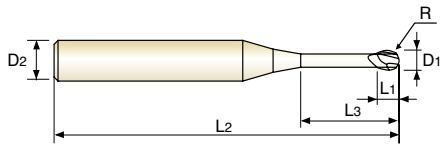
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84603030 | R1.5 | 3.0 | 6 | 3 | 30 | 70 |
| SEM84603035 | R1.5 | 3.0 | 6 | 3 | 35 | 70 |
| SEM84603040 | R1.5 | 3.0 | 6 | 3 | 40 | 80 |
| SEM84603045 | R1.5 | 3.0 | 6 | 3 | 45 | 90 |
| SEM84603050 | R1.5 | 3.0 | 6 | 3 | 50 | 100 |
| SEM84603060 | R1.5 | 3.0 | 6 | 3 | 60 | 100 |
| SEM84604008 | R2.0 | 4.0 | 6 | 4 | 8 | 50 |
| SEM84604010 | R2.0 | 4.0 | 6 | 4 | 10 | 50 |
| SEM84604012 | R2.0 | 4.0 | 6 | 4 | 12 | 50 |
| SEM84604014 | R2.0 | 4.0 | 6 | 4 | 14 | 60 |
| SEM84604016 | R2.0 | 4.0 | 6 | 4 | 16 | 60 |
| SEM84604018 | R2.0 | 4.0 | 6 | 4 | 18 | 60 |
| SEM84604020 | R2.0 | 4.0 | 6 | 4 | 20 | 60 |
| SEM84604022 | R2.0 | 4.0 | 6 | 4 | 22 | 65 |
| SEM84604026 | R2.0 | 4.0 | 6 | 4 | 26 | 65 |
| SEM84604030 | R2.0 | 4.0 | 6 | 4 | 30 | 70 |
| SEM84604035 | R2.0 | 4.0 | 6 | 4 | 35 | 70 |
| SEM84604040 | R2.0 | 4.0 | 6 | 4 | 40 | 80 |
| SEM84604045 | R2.0 | 4.0 | 6 | 4 | 45 | 90 |
| SEM84604050 | R2.0 | 4.0 | 6 | 4 | 50 | 100 |
| SEM84604055 | R2.0 | 4.0 | 6 | 4 | 55 | 100 |
| SEM84604060 | R2.0 | 4.0 | 6 | 4 | 60 | 100 |
| SEM84605015 | R2.5 | 5.0 | 6 | 6 | 15 | 60 |
| SEM84605020 | R2.5 | 5.0 | 6 | 6 | 20 | 60 |
| SEM84605026 | R2.5 | 5.0 | 6 | 6 | 26 | 65 |
| SEM84605030 | R2.5 | 5.0 | 6 | 6 | 30 | 70 |
| SEM84605035 | R2.5 | 5.0 | 6 | 6 | 35 | 70 |
| SEM84605040 | R2.5 | 5.0 | 6 | 6 | 40 | 80 |
| SEM84605045 | R2.5 | 5.0 | 6 | 6 | 45 | 90 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

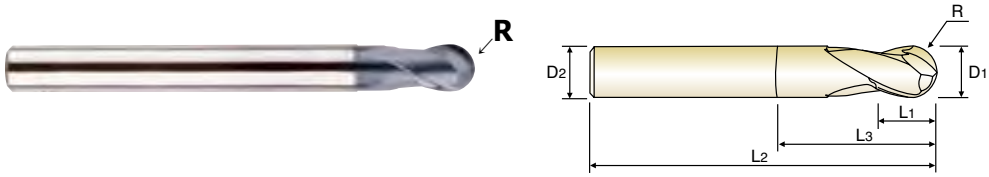
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 (R≤3) | R ±0.010 (R>3) | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM84605050 | R2.5 | 5.0 | 6 | 6 | 50 | 100 |
| SEM84605055 | R2.5 | 5.0 | 6 | 6 | 55 | 100 |
| SEM84605060 | R2.5 | 5.0 | 6 | 6 | 60 | 100 |
| SEM84606020 | R3.0 | 6.0 | 6 | 8 | 20 | 60 |
| SEM84606030 | R3.0 | 6.0 | 6 | 8 | 30 | 60 |
| SEM84606020090 | R3.0 | 6.0 | 6 | 12 | 20 | 90 |
| SEM84606030090 | R3.0 | 6.0 | 6 | 12 | 30 | 90 |
| SEM84608025 | R4.0 | 8.0 | 8 | 10 | 25 | 70 |
| SEM84608035 | R4.0 | 8.0 | 8 | 10 | 35 | 70 |
| SEM84608025100 | R4.0 | 8.0 | 8 | 14 | 25 | 100 |
| SEM84608035100 | R4.0 | 8.0 | 8 | 14 | 35 | 100 |
| SEM84610030 | R5.0 | 10.0 | 10 | 12 | 30 | 75 |
| SEM84610040 | R5.0 | 10.0 | 10 | 12 | 40 | 75 |
| SEM84610030100 | R5.0 | 10.0 | 10 | 18 | 30 | 100 |
| SEM84610040100 | R5.0 | 10.0 | 10 | 18 | 40 | 100 |
| SEM84612032 | R6.0 | 12.0 | 12 | 14 | 32 | 80 |
| SEM84612045 | R6.0 | 12.0 | 12 | 14 | 45 | 80 |
| SEM84612032110 | R6.0 | 12.0 | 12 | 22 | 32 | 110 |
| SEM84612045110 | R6.0 | 12.0 | 12 | 22 | 45 | 110 |

| Size | Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to R3 | ±0.005 | 0~−0.012 | h6 |
| over R3 | ±0.010 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

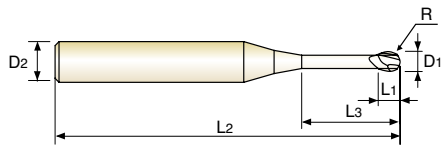
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM8460005016S | R0.25 | 0.5 | 6 | 0.5 | 1 | 45 |
| SEM8460005026S | R0.25 | 0.5 | 6 | 0.5 | 2 | 45 |
| SEM8460005046S | R0.25 | 0.5 | 6 | 0.5 | 4 | 45 |
| SEM8460006016S | R0.3 | 0.6 | 6 | 0.6 | 1 | 45 |
| SEM8460006026S | R0.3 | 0.6 | 6 | 0.6 | 2 | 45 |
| SEM8460006036S | R0.3 | 0.6 | 6 | 0.6 | 3 | 45 |
| SEM8460006046S | R0.3 | 0.6 | 6 | 0.6 | 4 | 45 |
| SEM8460006056S | R0.3 | 0.6 | 6 | 0.6 | 5 | 45 |
| SEM8460006066S | R0.3 | 0.6 | 6 | 0.6 | 6 | 45 |
| SEM8460006086S | R0.3 | 0.6 | 6 | 0.6 | 8 | 45 |
| SEM8460006106S | R0.3 | 0.6 | 6 | 0.6 | 10 | 45 |
| SEM8460006126S | R0.3 | 0.6 | 6 | 0.6 | 12 | 45 |
| SEM8460006146S | R0.3 | 0.6 | 6 | 0.6 | 14 | 45 |
| SEM8460006166S | R0.3 | 0.6 | 6 | 0.6 | 16 | 45 |
| SEM8460008016S | R0.4 | 0.8 | 6 | 0.8 | 1 | 45 |
| SEM8460008026S | R0.4 | 0.8 | 6 | 0.8 | 2 | 45 |
| SEM8460008036S | R0.4 | 0.8 | 6 | 0.8 | 3 | 45 |
| SEM8460008046S | R0.4 | 0.8 | 6 | 0.8 | 4 | 45 |
| SEM8460008056S | R0.4 | 0.8 | 6 | 0.8 | 5 | 45 |
| SEM8460008066S | R0.4 | 0.8 | 6 | 0.8 | 6 | 45 |
| SEM8460008086S | R0.4 | 0.8 | 6 | 0.8 | 8 | 45 |
| SEM8460008106S | R0.4 | 0.8 | 6 | 0.8 | 10 | 45 |
| SEM8460008126S | R0.4 | 0.8 | 6 | 0.8 | 12 | 45 |
| SEM8460008146S | R0.4 | 0.8 | 6 | 0.8 | 14 | 45 |
| SEM8460008166S | R0.4 | 0.8 | 6 | 0.8 | 16 | 45 |
| SEM8460008206S | R0.4 | 0.8 | 6 | 0.8 | 20 | 45 |
| SEM8460010026S | R0.5 | 1.0 | 6 | 1 | 2 | 50 |
| SEM8460010036S | R0.5 | 1.0 | 6 | 1 | 3 | 50 |
| SEM8460010046S | R0.5 | 1.0 | 6 | 1 | 4 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

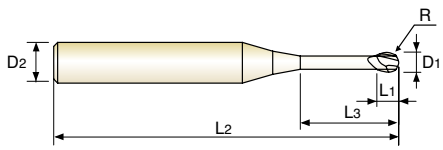
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM846010056S | R0.5 | 1.0 | 6 | 1 | 5 | 50 |
| SEM846010066S | R0.5 | 1.0 | 6 | 1 | 6 | 50 |
| SEM846010076S | R0.5 | 1.0 | 6 | 1 | 7 | 50 |
| SEM846010086S | R0.5 | 1.0 | 6 | 1 | 8 | 50 |
| SEM846010096S | R0.5 | 1.0 | 6 | 1 | 9 | 50 |
| SEM846010106S | R0.5 | 1.0 | 6 | 1 | 10 | 50 |
| SEM846010126S | R0.5 | 1.0 | 6 | 1 | 12 | 50 |
| SEM846010146S | R0.5 | 1.0 | 6 | 1 | 14 | 50 |
| SEM846010166S | R0.5 | 1.0 | 6 | 1 | 16 | 50 |
| SEM846010186S | R0.5 | 1.0 | 6 | 1 | 18 | 50 |
| SEM846010206S | R0.5 | 1.0 | 6 | 1 | 20 | 50 |
| SEM846010226S | R0.5 | 1.0 | 6 | 1 | 22 | 60 |
| SEM846010266S | R0.5 | 1.0 | 6 | 1 | 26 | 60 |
| SEM846010306S | R0.5 | 1.0 | 6 | 1 | 30 | 70 |
| SEM846015036S | R0.75 | 1.5 | 6 | 1.5 | 3 | 50 |
| SEM846015046S | R0.75 | 1.5 | 6 | 1.5 | 4 | 50 |
| SEM846015066S | R0.75 | 1.5 | 6 | 1.5 | 6 | 50 |
| SEM846015086S | R0.75 | 1.5 | 6 | 1.5 | 8 | 50 |
| SEM846015106S | R0.75 | 1.5 | 6 | 1.5 | 10 | 50 |
| SEM846015126S | R0.75 | 1.5 | 6 | 1.5 | 12 | 50 |
| SEM846015146S | R0.75 | 1.5 | 6 | 1.5 | 14 | 50 |
| SEM846015166S | R0.75 | 1.5 | 6 | 1.5 | 16 | 50 |
| SEM846015186S | R0.75 | 1.5 | 6 | 1.5 | 18 | 50 |
| SEM846015206S | R0.75 | 1.5 | 6 | 1.5 | 20 | 50 |
| SEM846015226S | R0.75 | 1.5 | 6 | 1.5 | 22 | 60 |
| SEM846015266S | R0.75 | 1.5 | 6 | 1.5 | 26 | 60 |
| SEM846015306S | R0.75 | 1.5 | 6 | 1.5 | 30 | 70 |
| SEM846015356S | R0.75 | 1.5 | 6 | 1.5 | 35 | 70 |
| SEM846015406S | R0.75 | 1.5 | 6 | 1.5 | 40 | 80 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

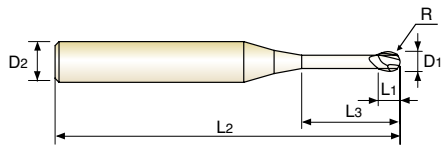
# 4G MILL END MILLS

**SEM846 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE (6mm shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Due to unique ball nose geometry and cutting edges, cutting force decreased, and wear resistance increased.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.




MG | 2 | 30° | R ±0.005 | PLAIN

P.783~787

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEM846020046S | R1.0 | 2.0 | 6 | 2 | 4 | 50 |
| SEM846020066S | R1.0 | 2.0 | 6 | 2 | 6 | 50 |
| SEM846020086S | R1.0 | 2.0 | 6 | 2 | 8 | 50 |
| SEM846020106S | R1.0 | 2.0 | 6 | 2 | 10 | 50 |
| SEM846020126S | R1.0 | 2.0 | 6 | 2 | 12 | 50 |
| SEM846020146S | R1.0 | 2.0 | 6 | 2 | 14 | 50 |
| SEM846020166S | R1.0 | 2.0 | 6 | 2 | 16 | 50 |
| SEM846020186S | R1.0 | 2.0 | 6 | 2 | 18 | 50 |
| SEM846020206S | R1.0 | 2.0 | 6 | 2 | 20 | 50 |
| SEM846020226S | R1.0 | 2.0 | 6 | 2 | 22 | 60 |
| SEM846020266S | R1.0 | 2.0 | 6 | 2 | 26 | 60 |
| SEM846020306S | R1.0 | 2.0 | 6 | 2 | 30 | 70 |
| SEM846020356S | R1.0 | 2.0 | 6 | 2 | 35 | 70 |
| SEM846020406S | R1.0 | 2.0 | 6 | 2 | 40 | 80 |
| SEM846020456S | R1.0 | 2.0 | 6 | 2 | 45 | 90 |
| SEM846020506S | R1.0 | 2.0 | 6 | 2 | 50 | 100 |

| Mill Dia. Tolerance (mm) | Radius Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|
| 0~−0.012 | ±0.005 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

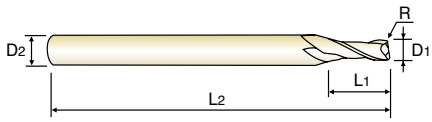
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available aashort, regular and long shank end mills.
- Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD99002002 | R0.02 | 0.2 | 4 | 0.4 | 40 | - |
| SEMD99002005 | R0.05 | 0.2 | 4 | 0.4 | 40 | - |
| SEMD99003002 | R0.02 | 0.3 | 4 | 0.6 | 40 | - |
| SEMD99003005 | R0.05 | 0.3 | 4 | 0.6 | 40 | - |
| SEMD99004005 | R0.05 | 0.4 | 4 | 0.8 | 40 | - |
| SEMD9900401 | R0.1 | 0.4 | 4 | 0.8 | 40 | - |
| SEMD99005005 | R0.05 | 0.5 | 4 | 1.0 | 40 | - |
| SEMD9900501 | R0.1 | 0.5 | 4 | 1.0 | 40 | - |
| SEMD99006005 | R0.05 | 0.6 | 4 | 1.2 | 40 | - |
| SEMD9900601 | R0.1 | 0.6 | 4 | 1.2 | 40 | - |
| SEMD9900602 | R0.2 | 0.6 | 4 | 1.2 | 40 | - |
| SEMD99007005 | R0.05 | 0.7 | 4 | 1.4 | 40 | - |
| SEMD9900701 | R0.1 | 0.7 | 4 | 1.4 | 40 | - |
| SEMD9900702 | R0.2 | 0.7 | 4 | 1.4 | 40 | - |
| SEMD99008005 | R0.05 | 0.8 | 4 | 1.6 | 40 | - |
| SEMD9900801 | R0.1 | 0.8 | 4 | 1.6 | 40 | - |
| SEMD9900802 | R0.2 | 0.8 | 4 | 1.6 | 40 | - |
| SEMD99009005 | R0.05 | 0.9 | 4 | 1.8 | 40 | - |
| SEMD9900901 | R0.1 | 0.9 | 4 | 1.8 | 40 | - |
| SEMD99010005 | R0.05 | 1.0 | 6 | 2.5 | 50 | - |
| SEMD9901001 | R0.1 | 1.0 | 6 | 2.5 | 50 | - |
| SEMD9901002 | R0.2 | 1.0 | 6 | 2.5 | 50 | - |
| SEMD9901003 | R0.3 | 1.0 | 6 | 2.5 | 50 | - |
| SEMD99012005 | R0.05 | 1.2 | 6 | 3 | 50 | - |
| SEMD9901201 | R0.1 | 1.2 | 6 | 3 | 50 | - |
| SEMD9901202 | R0.2 | 1.2 | 6 | 3 | 50 | - |
| SEMD9901203 | R0.3 | 1.2 | 6 | 3 | 50 | - |
| SEMD99015005 | R0.05 | 1.5 | 6 | 4 | 50 | - |
| SEMD9901501 | R0.1 | 1.5 | 6 | 4 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

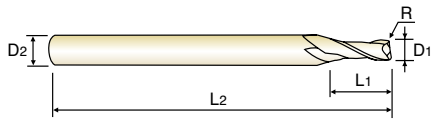
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶Available short, regular and long shank end mills.
▶Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|
| SEMD9901502 | R0.2 | 1.5 | 6 | 4 | 50 | - |
| SEMD9901503 | R0.3 | 1.5 | 6 | 4 | 50 | - |
| SEMD9901505 | R0.5 | 1.5 | 6 | 4 | 50 | - |
| SEMD9902001 | R0.1 | 2.0 | 6 | 6 | 50 | - |
| SEMD9902002 | R0.2 | 2.0 | 6 | 6 | 50 | - |
| SEMD9902003 | R0.3 | 2.0 | 6 | 6 | 50 | - |
| SEMD9902005 | R0.5 | 2.0 | 6 | 6 | 50 | - |
| SEMD9902501 | R0.1 | 2.5 | 6 | 7 | 60 | - |
| SEMD9902502 | R0.2 | 2.5 | 6 | 7 | 60 | - |
| SEMD9902503 | R0.3 | 2.5 | 6 | 7 | 60 | - |
| SEMD9902505 | R0.5 | 2.5 | 6 | 7 | 60 | - |
| SEMD9903001 | R0.1 | 3.0 | 6 | 8 | 60 | - |
| SEMD9903002 | R0.2 | 3.0 | 6 | 8 | 60 | - |
| SEMD9903003 | R0.3 | 3.0 | 6 | 8 | 60 | - |
| SEMD9903005 | R0.5 | 3.0 | 6 | 8 | 60 | - |
| SEMD9903010 | R1.0 | 3.0 | 6 | 8 | 60 | - |
| SEMD9903501 | R0.1 | 3.5 | 6 | 10 | 70 | - |
| SEMD9903502 | R0.2 | 3.5 | 6 | 10 | 70 | - |
| SEMD9903503 | R0.3 | 3.5 | 6 | 10 | 70 | - |
| SEMD9903505 | R0.5 | 3.5 | 6 | 10 | 70 | - |
| SEMD990400014S | R0.1 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEMD990400024S | R0.2 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEMD990400034S | R0.3 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEMD990400054S | R0.5 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEMD990401104S | R1.0 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEMD990400011004S | R0.1 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEMD990400021004S | R0.2 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEMD990400031004S | R0.3 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEMD990400051004S | R0.5 | 4.0 | 4 | 10 | 100 | 4mm Shank |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

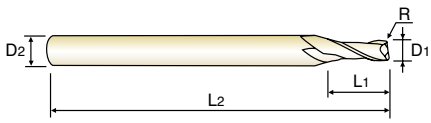
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available short, regular and long shank end mills.
- Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEMD99040101004S | R1.0 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEMD9904001 | R0.1 | 4.0 | 6 | 10 | 70 | Regular |
| SEMD9904002 | R0.2 | 4.0 | 6 | 10 | 70 | Regular |
| SEMD9904003 | R0.3 | 4.0 | 6 | 10 | 70 | Regular |
| SEMD9904005 | R0.5 | 4.0 | 6 | 10 | 70 | Regular |
| SEMD9904010 | R1.0 | 4.0 | 6 | 10 | 70 | Regular |
| SEMD9904501 | R0.1 | 4.5 | 6 | 11 | 80 | - |
| SEMD9904502 | R0.2 | 4.5 | 6 | 11 | 80 | - |
| SEMD9904503 | R0.3 | 4.5 | 6 | 11 | 80 | - |
| SEMD9904505 | R0.5 | 4.5 | 6 | 11 | 80 | - |
| SEMD9905001 | R0.1 | 5.0 | 6 | 13 | 90 | - |
| SEMD9905002 | R0.2 | 5.0 | 6 | 13 | 90 | - |
| SEMD9905003 | R0.3 | 5.0 | 6 | 13 | 90 | - |
| SEMD9905005 | R0.5 | 5.0 | 6 | 13 | 90 | - |
| SEMD9905010 | R1.0 | 5.0 | 6 | 13 | 90 | - |
| SEMD9905501 | R0.1 | 5.5 | 6 | 13 | 90 | - |
| SEMD9905502 | R0.2 | 5.5 | 6 | 13 | 90 | - |
| SEMD9905503 | R0.3 | 5.5 | 6 | 13 | 90 | - |
| SEMD9905505 | R0.5 | 5.5 | 6 | 13 | 90 | - |
| SEMD9905510 | R1.0 | 5.5 | 6 | 13 | 90 | - |
| SEMD9906002060 | R0.2 | 6.0 | 6 | 15 | 60 | Short |
| SEMD9906003060 | R0.3 | 6.0 | 6 | 15 | 60 | Short |
| SEMD9906005060 | R0.5 | 6.0 | 6 | 15 | 60 | Short |
| SEMD9906010060 | R1.0 | 6.0 | 6 | 15 | 60 | Short |
| SEMD9906001 | R0.1 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906002 | R0.2 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906003 | R0.3 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906005 | R0.5 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906010 | R1.0 | 6.0 | 6 | 15 | 90 | Regular |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

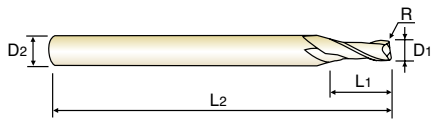
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available short, regular and long shank end mills.
- ▶Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEMD9906015 | R1.5 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906020 | R2.0 | 6.0 | 6 | 15 | 90 | Regular |
| SEMD9906005 | R0.5 | 6.0 | 6 | 15 | 110 | Long Shank |
| SEMD9906010110 | R1.0 | 6.0 | 6 | 15 | 110 | Long Shank |
| SEMD9906005130 | R0.5 | 6.0 | 6 | 15 | 130 | Long Shank |
| SEMD9906010130 | R1.0 | 6.0 | 6 | 15 | 130 | Long Shank |
| SEMD9907001 | R0.1 | 7.0 | 8 | 16 | 90 | - |
| SEMD9907002 | R0.2 | 7.0 | 8 | 16 | 90 | - |
| SEMD9907003 | R0.3 | 7.0 | 8 | 16 | 90 | - |
| SEMD9907005 | R0.5 | 7.0 | 8 | 16 | 90 | - |
| SEMD9907010 | R1.0 | 7.0 | 8 | 16 | 90 | - |
| SEMD9907020 | R2.0 | 7.0 | 8 | 16 | 90 | - |
| SEMD9908003070 | R0.3 | 8.0 | 8 | 20 | 70 | Short |
| SEMD9908005070 | R0.5 | 8.0 | 8 | 20 | 70 | Short |
| SEMD9908010070 | R1.0 | 8.0 | 8 | 20 | 70 | Short |
| SEMD9908001 | R0.1 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908002 | R0.2 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908003 | R0.3 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908005 | R0.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908010 | R1.0 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908015 | R1.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908020 | R2.0 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908025 | R2.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908030 | R3.0 | 8.0 | 8 | 20 | 100 | Regular |
| SEMD9908005120 | R0.5 | 8.0 | 8 | 20 | 120 | Long Shank |
| SEMD9908010120 | R1.0 | 8.0 | 8 | 20 | 120 | Long Shank |
| SEMD9908015150 | R0.5 | 8.0 | 8 | 20 | 150 | Long Shank |
| SEMD9908010150 | R1.0 | 8.0 | 8 | 20 | 150 | Long Shank |
| SEMD9910003075 | R0.3 | 10.0 | 10 | 25 | 75 | Short |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

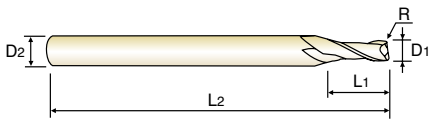
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available short, regular and long shank end mills.
- Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEMD9910005075 | R0.5 | 10.0 | 10 | 25 | 75 | Short |
| SEMD9910010075 | R1.0 | 10.0 | 10 | 25 | 75 | Short |
| SEMD9910001 | R0.1 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910002 | R0.2 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910003 | R0.3 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910005 | R0.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910010 | R1.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910015 | R1.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910020 | R2.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910025 | R2.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910030 | R3.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910040 | R4.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEMD9910005130 | R0.5 | 10.0 | 10 | 25 | 130 | Long Shank |
| SEMD9910010130 | R1.0 | 10.0 | 10 | 25 | 130 | Long Shank |
| SEMD9910005150 | R0.5 | 10.0 | 10 | 25 | 150 | Long Shank |
| SEMD9910010150 | R1.0 | 10.0 | 10 | 25 | 150 | Long Shank |
| SEMD9911002 | R0.2 | 11.0 | 12 | 25 | 110 | - |
| SEMD9911003 | R0.3 | 11.0 | 12 | 25 | 110 | - |
| SEMD9911005 | R0.5 | 11.0 | 12 | 25 | 110 | - |
| SEMD9911010 | R1.0 | 11.0 | 12 | 25 | 110 | - |
| SEMD9911020 | R2.0 | 11.0 | 12 | 25 | 110 | - |
| SEMD9912003080 | R0.3 | 12.0 | 12 | 30 | 80 | Short |
| SEMD9912005080 | R0.5 | 12.0 | 12 | 30 | 80 | Short |
| SEMD9912010080 | R1.0 | 12.0 | 12 | 30 | 80 | Short |
| SEMD9912001 | R0.1 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912002 | R0.2 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912003 | R0.3 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912005 | R0.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912010 | R1.0 | 12.0 | 12 | 30 | 110 | Regular |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

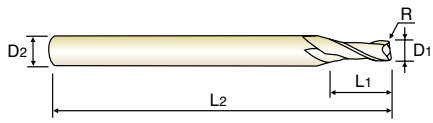
# 4G MILL END MILLS

**SEMD99 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶Available short, regular and long shank end mills.
▶Available various corner radius end mills, from 0.02 mm to 5.0mm corner radius.




MG | 2 | 30° | R ±0.010 (R≤6) | R ±0.015 (D>6) | PLAIN

P.788

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEMD9912015 | R1.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912020 | R2.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912025 | R2.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912030 | R3.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912040 | R4.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912050 | R5.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEMD9912005130 | R0.5 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEMD9912010130 | R1.0 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEMD9912005150 | R0.5 | 12.0 | 12 | 30 | 150 | Long Shank |
| SEMD9912010150 | R1.0 | 12.0 | 12 | 30 | 150 | Long Shank |
| SEMD9914005 | R0.5 | 14.0 | 16 | 35 | 150 | - |
| SEMD9914010 | R1.0 | 14.0 | 16 | 35 | 150 | - |
| SEMD9914020 | R2.0 | 14.0 | 16 | 35 | 150 | - |
| SEMD9916005 | R0.5 | 16.0 | 16 | 32 | 150 | - |
| SEMD9916010 | R1.0 | 16.0 | 16 | 32 | 150 | - |
| SEMD9916015 | R1.5 | 16.0 | 16 | 32 | 150 | - |
| SEMD9916020 | R2.0 | 16.0 | 16 | 32 | 150 | - |
| SEMD9920005 | R0.5 | 20.0 | 20 | 38 | 150 | - |
| SEMD9920010 | R1.0 | 20.0 | 20 | 38 | 150 | - |
| SEMD9920015 | R1.5 | 20.0 | 20 | 38 | 150 | - |
| SEMD9920020 | R2.0 | 20.0 | 20 | 38 | 150 | - |

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.012 | h6 |
| over Ø6 | ±0.015 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

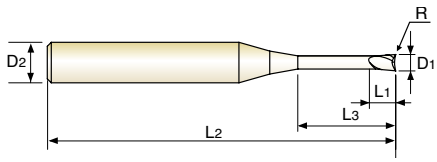
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME61002002005 | R0.02 | 0.2 | 4 | 0.3 | 0.5 | 40 | - |
| SEME6100200201 | R0.02 | 0.2 | 4 | 0.3 | 1 | 40 | - |
| SEME61002002015 | R0.02 | 0.2 | 4 | 0.3 | 1.5 | 40 | - |
| SEME6100200202 | R0.02 | 0.2 | 4 | 0.3 | 2 | 40 | - |
| SEME61002005005 | R0.05 | 0.2 | 4 | 0.3 | 0.5 | 40 | - |
| SEME6100200501 | R0.05 | 0.2 | 4 | 0.3 | 1 | 40 | - |
| SEME61002005015 | R0.05 | 0.2 | 4 | 0.3 | 1.5 | 40 | - |
| SEME6100200502 | R0.05 | 0.2 | 4 | 0.3 | 2 | 40 | - |
| SEME6100300201 | R0.02 | 0.3 | 4 | 0.5 | 1 | 40 | - |
| SEME6100300202 | R0.02 | 0.3 | 4 | 0.5 | 2 | 40 | - |
| SEME6100300203 | R0.02 | 0.3 | 4 | 0.5 | 3 | 40 | - |
| SEME6100300501 | R0.05 | 0.3 | 4 | 0.5 | 1 | 40 | - |
| SEME6100300502 | R0.05 | 0.3 | 4 | 0.5 | 2 | 40 | - |
| SEME6100300503 | R0.05 | 0.3 | 4 | 0.5 | 3 | 40 | - |
| SEME6100400501 | R0.05 | 0.4 | 4 | 0.6 | 1 | 40 | - |
| SEME61004005015 | R0.05 | 0.4 | 4 | 0.6 | 1.5 | 40 | - |
| SEME6100400502 | R0.05 | 0.4 | 4 | 0.6 | 2 | 40 | - |
| SEME61004005025 | R0.05 | 0.4 | 4 | 0.6 | 2.5 | 40 | - |
| SEME6100400503 | R0.05 | 0.4 | 4 | 0.6 | 3 | 40 | - |
| SEME6100400504 | R0.05 | 0.4 | 4 | 0.6 | 4 | 40 | - |
| SEME610040101 | R0.1 | 0.4 | 4 | 0.6 | 1 | 40 | - |
| SEME6100401015 | R0.1 | 0.4 | 4 | 0.6 | 1.5 | 40 | - |
| SEME610040102 | R0.1 | 0.4 | 4 | 0.6 | 2 | 40 | - |
| SEME6100401025 | R0.1 | 0.4 | 4 | 0.6 | 2.5 | 40 | - |
| SEME610040103 | R0.1 | 0.4 | 4 | 0.6 | 3 | 40 | - |
| SEME610040104 | R0.1 | 0.4 | 4 | 0.6 | 4 | 40 | - |
| SEME6100500501 | R0.05 | 0.5 | 4 | 0.7 | 1 | 45 | - |
| SEME61005005015 | R0.05 | 0.5 | 4 | 0.7 | 1.5 | 45 | - |
| SEME6100500502 | R0.05 | 0.5 | 4 | 0.7 | 2 | 45 | - |
| SEME61005005025 | R0.05 | 0.5 | 4 | 0.7 | 2.5 | 45 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

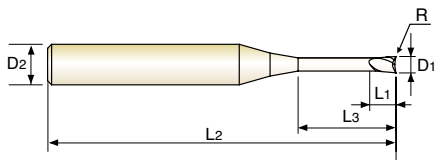
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6100500503 | R0.05 | 0.5 | 4 | 0.7 | 3 | 45 | - |
| SEME6100500504 | R0.05 | 0.5 | 4 | 0.7 | 4 | 45 | - |
| SEME6100500505 | R0.05 | 0.5 | 4 | 0.7 | 5 | 45 | - |
| SEME6100500506 | R0.05 | 0.5 | 4 | 0.7 | 6 | 45 | - |
| SEME610050101 | R0.1 | 0.5 | 4 | 0.7 | 1 | 45 | - |
| SEME6100501015 | R0.1 | 0.5 | 4 | 0.7 | 1.5 | 45 | - |
| SEME610050102 | R0.1 | 0.5 | 4 | 0.7 | 2 | 45 | - |
| SEME6100501025 | R0.1 | 0.5 | 4 | 0.7 | 2.5 | 45 | - |
| SEME610050103 | R0.1 | 0.5 | 4 | 0.7 | 3 | 45 | - |
| SEME610050104 | R0.1 | 0.5 | 4 | 0.7 | 4 | 45 | - |
| SEME610050105 | R0.1 | 0.5 | 4 | 0.7 | 5 | 45 | - |
| SEME610050106 | R0.1 | 0.5 | 4 | 0.7 | 6 | 45 | - |
| SEME6100600502 | R0.05 | 0.6 | 4 | 0.9 | 2 | 45 | - |
| SEME6100600503 | R0.05 | 0.6 | 4 | 0.9 | 3 | 45 | - |
| SEME6100600504 | R0.05 | 0.6 | 4 | 0.9 | 4 | 45 | - |
| SEME6100600506 | R0.05 | 0.6 | 4 | 0.9 | 6 | 45 | - |
| SEME6100600508 | R0.05 | 0.6 | 4 | 0.9 | 8 | 45 | - |
| SEME6100600510 | R0.05 | 0.6 | 4 | 0.9 | 10 | 45 | - |
| SEME610060102 | R0.1 | 0.6 | 4 | 0.9 | 2 | 45 | - |
| SEME610060103 | R0.1 | 0.6 | 4 | 0.9 | 3 | 45 | - |
| SEME610060104 | R0.1 | 0.6 | 4 | 0.9 | 4 | 45 | - |
| SEME610060106 | R0.1 | 0.6 | 4 | 0.9 | 6 | 45 | - |
| SEME610060108 | R0.1 | 0.6 | 4 | 0.9 | 8 | 45 | - |
| SEME610060110 | R0.1 | 0.6 | 4 | 0.9 | 10 | 45 | - |
| SEME610060202 | R0.2 | 0.6 | 4 | 0.9 | 2 | 45 | - |
| SEME610060203 | R0.2 | 0.6 | 4 | 0.9 | 3 | 45 | - |
| SEME610060204 | R0.2 | 0.6 | 4 | 0.9 | 4 | 45 | - |
| SEME610060206 | R0.2 | 0.6 | 4 | 0.9 | 6 | 45 | - |
| SEME610060208 | R0.2 | 0.6 | 4 | 0.9 | 8 | 45 | - |
| SEME610060210 | R0.2 | 0.6 | 4 | 0.9 | 10 | 45 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

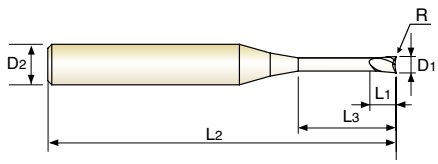
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6100700502 | R0.05 | 0.7 | 4 | 1.2 | 2 | 45 | - |
| SEME6100700504 | R0.05 | 0.7 | 4 | 1.2 | 4 | 45 | - |
| SEME6100700506 | R0.05 | 0.7 | 4 | 1.2 | 6 | 45 | - |
| SEME6100700508 | R0.05 | 0.7 | 4 | 1.2 | 8 | 45 | - |
| SEME6100700510 | R0.05 | 0.7 | 4 | 1.2 | 10 | 45 | - |
| SEME610070102 | R0.1 | 0.7 | 4 | 1.2 | 2 | 45 | - |
| SEME610070104 | R0.1 | 0.7 | 4 | 1.2 | 4 | 45 | - |
| SEME610070106 | R0.1 | 0.7 | 4 | 1.2 | 6 | 45 | - |
| SEME610070108 | R0.1 | 0.7 | 4 | 1.2 | 8 | 45 | - |
| SEME610070110 | R0.1 | 0.7 | 4 | 1.2 | 10 | 45 | - |
| SEME610070202 | R0.2 | 0.7 | 4 | 1.2 | 2 | 45 | - |
| SEME610070204 | R0.2 | 0.7 | 4 | 1.2 | 4 | 45 | - |
| SEME610070206 | R0.2 | 0.7 | 4 | 1.2 | 6 | 45 | - |
| SEME610070208 | R0.2 | 0.7 | 4 | 1.2 | 8 | 45 | - |
| SEME610070210 | R0.2 | 0.7 | 4 | 1.2 | 10 | 45 | - |
| SEME6100800502 | R0.05 | 0.8 | 4 | 1.2 | 2 | 45 | - |
| SEME6100800503 | R0.05 | 0.8 | 4 | 1.2 | 3 | 45 | - |
| SEME6100800504 | R0.05 | 0.8 | 4 | 1.2 | 4 | 45 | - |
| SEME6100800506 | R0.05 | 0.8 | 4 | 1.2 | 6 | 45 | - |
| SEME6100800508 | R0.05 | 0.8 | 4 | 1.2 | 8 | 45 | - |
| SEME6100800510 | R0.05 | 0.8 | 4 | 1.2 | 10 | 45 | - |
| SEME610080102 | R0.1 | 0.8 | 4 | 1.2 | 2 | 45 | - |
| SEME610080103 | R0.1 | 0.8 | 4 | 1.2 | 3 | 45 | - |
| SEME610080104 | R0.1 | 0.8 | 4 | 1.2 | 4 | 45 | - |
| SEME610080106 | R0.1 | 0.8 | 4 | 1.2 | 6 | 45 | - |
| SEME610080108 | R0.1 | 0.8 | 4 | 1.2 | 8 | 45 | - |
| SEME610080110 | R0.1 | 0.8 | 4 | 1.2 | 10 | 45 | - |
| SEME610080202 | R0.2 | 0.8 | 4 | 1.2 | 2 | 45 | - |
| SEME610080203 | R0.2 | 0.8 | 4 | 1.2 | 3 | 45 | - |
| SEME610080204 | R0.2 | 0.8 | 4 | 1.2 | 4 | 45 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

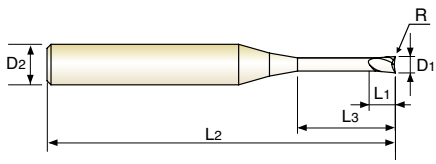
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610080206 | R0.2 | 0.8 | 4 | 1.2 | 6 | 45 | - |
| SEME610080208 | R0.2 | 0.8 | 4 | 1.2 | 8 | 45 | - |
| SEME610080210 | R0.2 | 0.8 | 4 | 1.2 | 10 | 45 | - |
| SEME6101000503 | R0.05 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME6101000504 | R0.05 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME6101000506 | R0.05 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME6101000508 | R0.05 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME6101000510 | R0.05 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME6101000512 | R0.05 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME6101000514 | R0.05 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME6101000516 | R0.05 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME6101000520 | R0.05 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME610100103 | R0.1 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME610100104 | R0.1 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME610100106 | R0.1 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME610100108 | R0.1 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME610100110 | R0.1 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME610100112 | R0.1 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME610100114 | R0.1 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME610100116 | R0.1 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME610100120 | R0.1 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME610100203 | R0.2 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME610100204 | R0.2 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME610100206 | R0.2 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME610100208 | R0.2 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME610100210 | R0.2 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME610100212 | R0.2 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME610100214 | R0.2 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME610100216 | R0.2 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME610100220 | R0.2 | 1.0 | 4 | 1.5 | 20 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

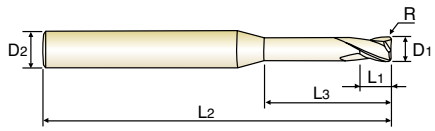
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610100303 | R0.3 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME610100304 | R0.3 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME610100306 | R0.3 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME610100308 | R0.3 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME610100310 | R0.3 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME610100312 | R0.3 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME610100314 | R0.3 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME610100316 | R0.3 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME610100320 | R0.3 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME6101200503 | R0.05 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME6101200504 | R0.05 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME6101200506 | R0.05 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME6101200508 | R0.05 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME6101200510 | R0.05 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME6101200512 | R0.05 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME6101200516 | R0.05 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME6101200520 | R0.05 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME610120103 | R0.1 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME610120104 | R0.1 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME610120106 | R0.1 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME610120108 | R0.1 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME610120110 | R0.1 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME610120112 | R0.1 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME610120116 | R0.1 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME610120120 | R0.1 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME610120203 | R0.2 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME610120204 | R0.2 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME610120206 | R0.2 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME610120208 | R0.2 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME610120210 | R0.2 | 1.2 | 4 | 1.8 | 10 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

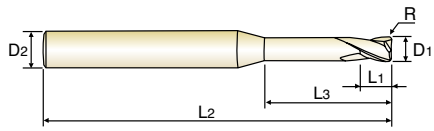
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Available various products like regular length and long shank end mills etc.
- ▶Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- ▶Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610120212 | R0.2 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME610120216 | R0.2 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME610120220 | R0.2 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME610120303 | R0.3 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME610120304 | R0.3 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME610120306 | R0.3 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME610120308 | R0.3 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME610120310 | R0.3 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME610120312 | R0.3 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME610120316 | R0.3 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME610120320 | R0.3 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME6101500504 | R0.05 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME6101500506 | R0.05 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME6101500508 | R0.05 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME6101500510 | R0.05 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME6101500512 | R0.05 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME6101500514 | R0.05 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME6101500516 | R0.05 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME6101500520 | R0.05 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME6101500522 | R0.05 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME6101500526 | R0.05 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME610150104 | R0.1 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME610150106 | R0.1 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME610150108 | R0.1 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME610150110 | R0.1 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME610150112 | R0.1 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME610150114 | R0.1 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME610150116 | R0.1 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME610150120 | R0.1 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME610150122 | R0.1 | 1.5 | 4 | 2.3 | 22 | 60 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

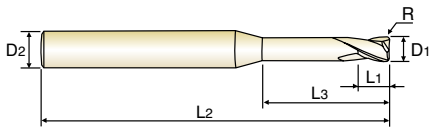
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
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- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610150126 | R0.1 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME610150204 | R0.2 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME610150206 | R0.2 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME610150208 | R0.2 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME610150210 | R0.2 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME610150212 | R0.2 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME610150214 | R0.2 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME610150216 | R0.2 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME610150220 | R0.2 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME610150222 | R0.2 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME610150226 | R0.2 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME610150304 | R0.3 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME610150306 | R0.3 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME610150308 | R0.3 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME610150310 | R0.3 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME610150312 | R0.3 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME610150314 | R0.3 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME610150316 | R0.3 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME610150320 | R0.3 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME610150322 | R0.3 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME610150326 | R0.3 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME610150504 | R0.5 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME610150506 | R0.5 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME610150508 | R0.5 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME610150510 | R0.5 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME610150512 | R0.5 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME610150514 | R0.5 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME610150516 | R0.5 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME610150520 | R0.5 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME610150522 | R0.5 | 1.5 | 4 | 2.3 | 22 | 60 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

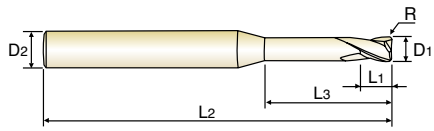
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
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NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610150526 | R0.5 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME610200106 | R0.1 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME610200108 | R0.1 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME610200110 | R0.1 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME610200112 | R0.1 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME610200114 | R0.1 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME610200116 | R0.1 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME610200120 | R0.1 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME610200122 | R0.1 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME610200126 | R0.1 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME610200130 | R0.1 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME610200206 | R0.2 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME610200208 | R0.2 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME610200210 | R0.2 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME610200212 | R0.2 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME610200214 | R0.2 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME610200216 | R0.2 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME610200220 | R0.2 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME610200222 | R0.2 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME610200226 | R0.2 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME610200230 | R0.2 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME610200306 | R0.3 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME610200308 | R0.3 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME610200310 | R0.3 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME610200312 | R0.3 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME610200314 | R0.3 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME610200316 | R0.3 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME610200320 | R0.3 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME610200322 | R0.3 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME610200326 | R0.3 | 2.0 | 4 | 3 | 26 | 60 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

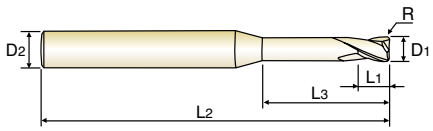
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610200330 | R0.3 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME610200506 | R0.5 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME610200508 | R0.5 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME610200510 | R0.5 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME610200512 | R0.5 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME610200514 | R0.5 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME610200516 | R0.5 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME610200520 | R0.5 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME610200522 | R0.5 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME610200526 | R0.5 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME610200530 | R0.5 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME610250108 | R0.1 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME610250110 | R0.1 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME610250112 | R0.1 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME610250114 | R0.1 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME610250116 | R0.1 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME610250120 | R0.1 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME610250126 | R0.1 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME610250130 | R0.1 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME610250208 | R0.2 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME610250210 | R0.2 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME610250212 | R0.2 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME610250214 | R0.2 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME610250216 | R0.2 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME610250220 | R0.2 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME610250226 | R0.2 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME610250230 | R0.2 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME610250308 | R0.3 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME610250310 | R0.3 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME610250312 | R0.3 | 2.5 | 4 | 4 | 12 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

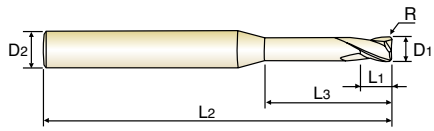
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610250314 | R0.3 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME610250316 | R0.3 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME610250320 | R0.3 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME610250326 | R0.3 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME610250330 | R0.3 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME610250508 | R0.5 | 2.5 | 6 | 4 | 8 | 50 | - |
| SEME610250510 | R0.5 | 2.5 | 6 | 4 | 10 | 50 | - |
| SEME610250512 | R0.5 | 2.5 | 6 | 4 | 12 | 50 | - |
| SEME610250514 | R0.5 | 2.5 | 6 | 4 | 14 | 50 | - |
| SEME610250516 | R0.5 | 2.5 | 6 | 4 | 16 | 50 | - |
| SEME610250520 | R0.5 | 2.5 | 6 | 4 | 20 | 50 | - |
| SEME610250526 | R0.5 | 2.5 | 6 | 4 | 26 | 60 | - |
| SEME610250530 | R0.5 | 2.5 | 6 | 4 | 30 | 70 | - |
| SEME610300108 | R0.1 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME610300110 | R0.1 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME610300112 | R0.1 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME610300114 | R0.1 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME610300116 | R0.1 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME610300120 | R0.1 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME610300126 | R0.1 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME610300130 | R0.1 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME610300135 | R0.1 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME610300140 | R0.1 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME610300208 | R0.2 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME610300210 | R0.2 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME610300212 | R0.2 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME610300214 | R0.2 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME610300216 | R0.2 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME610300220 | R0.2 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME610300226 | R0.2 | 3.0 | 6 | 4.5 | 26 | 65 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

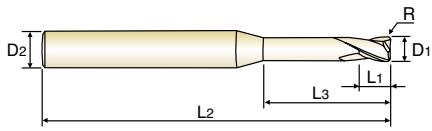
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610300230 | R0.2 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME610300235 | R0.2 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME610300240 | R0.2 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME610300308 | R0.3 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME610300310 | R0.3 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME610300312 | R0.3 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME610300314 | R0.3 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME610300316 | R0.3 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME610300320 | R0.3 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME610300326 | R0.3 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME610300330 | R0.3 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME610300335 | R0.3 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME610300340 | R0.3 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME610300508 | R0.5 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME610300510 | R0.5 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME610300512 | R0.5 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME610300514 | R0.5 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME610300516 | R0.5 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME610300520 | R0.5 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME610300526 | R0.5 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME610300530 | R0.5 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME610300535 | R0.5 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME610300540 | R0.5 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME610301008 | R1.0 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME610301010 | R1.0 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME610301012 | R1.0 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME610301014 | R1.0 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME610301016 | R1.0 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME610301020 | R1.0 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME610301026 | R1.0 | 3.0 | 6 | 4.5 | 26 | 65 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

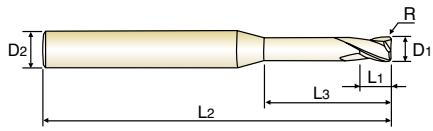
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610301030 | R1.0 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME610301035 | R1.0 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME610301040 | R1.0 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME610400110 | R0.1 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME610400112 | R0.1 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME610400114 | R0.1 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME610400116 | R0.1 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME610400120 | R0.1 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME610400126 | R0.1 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME610400130 | R0.1 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME610400135 | R0.1 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME610400140 | R0.1 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME610400145 | R0.1 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME610400150 | R0.1 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME610400210 | R0.2 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME610400212 | R0.2 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME610400214 | R0.2 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME610400216 | R0.2 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME610400220 | R0.2 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME610400226 | R0.2 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME610400230 | R0.2 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME610400235 | R0.2 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME610400240 | R0.2 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME610400245 | R0.2 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME610400250 | R0.2 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME610400310 | R0.3 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME610400312 | R0.3 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME610400314 | R0.3 | 4.0 | 6 | 6 | 14 | 50 | - |
| SEME610400316 | R0.3 | 4.0 | 6 | 6 | 16 | 50 | - |
| SEME610400320 | R0.3 | 4.0 | 6 | 6 | 20 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

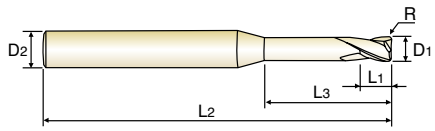
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME610400326 | R0.3 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME610400330 | R0.3 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME610400335 | R0.3 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME610400340 | R0.3 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME610400345 | R0.3 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME610400350 | R0.3 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME610400510 | R0.5 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME610400512 | R0.5 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME610400514 | R0.5 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME610400516 | R0.5 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME610400520 | R0.5 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME610400526 | R0.5 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME610400530 | R0.5 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME610400535 | R0.5 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME610400540 | R0.5 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME610400545 | R0.5 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME610400550 | R0.5 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME610401010 | R1.0 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME610401012 | R1.0 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME610401014 | R1.0 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME610401016 | R1.0 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME610401020 | R1.0 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME610401026 | R1.0 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME610401030 | R1.0 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME610401035 | R1.0 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME610401040 | R1.0 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME610401045 | R1.0 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME610401050 | R1.0 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME6105001 | R0.1 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6105002 | R0.2 | 5.0 | 6 | 8 | 15 | 60 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

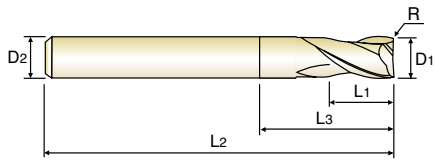
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6105003 | R0.3 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6105005 | R0.5 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6105010 | R1.0 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6105015 | R1.5 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6105020 | R2.0 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6106001 | R0.1 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106002 | R0.2 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106003 | R0.3 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106005 | R0.5 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106010 | R1.0 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106015 | R1.5 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106020 | R2.0 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6106003090 | R0.3 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6106005090 | R0.5 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6106010090 | R1.0 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6108001 | R0.1 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108002 | R0.2 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108003 | R0.3 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108005 | R0.5 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108010 | R1.0 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108015 | R1.5 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108020 | R2.0 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6108003100 | R0.3 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6108005100 | R0.5 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6108010100 | R1.0 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6110001 | R0.1 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110002 | R0.2 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110003 | R0.3 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110005 | R0.5 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110010 | R1.0 | 10.0 | 10 | 15 | 30 | 75 | Regular |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

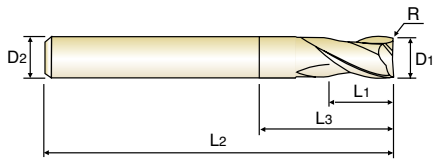
# 4G MILL END MILLS

**SEME61 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Available various products like regular length and long shank end mills etc.
- Available various corner radius end mills, from min. 0.02mm corner radius to max. 2.0 mm corner radius.
- Available more various effective length and overall length end mills than previous standard products.




NG | 2 | 30° | R ±0.005 (R≤6) | R ±0.010 (D>6) | PLAIN

P.789~791

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6110015 | R1.5 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110020 | R2.0 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6110003100 | R0.3 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |
| SEME6110005100 | R0.5 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |
| SEME6110010100 | R1.0 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |
| SEME6112002 | R0.2 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112003 | R0.3 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112005 | R0.5 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112010 | R1.0 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112015 | R1.5 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112020 | R2.0 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6112003110 | R0.3 | 12.0 | 12 | 30 | 50 | 110 | Long Shank |
| SEME6112005110 | R0.5 | 12.0 | 12 | 30 | 50 | 110 | Long Shank |
| SEME6112010110 | R1.0 | 12.0 | 12 | 30 | 50 | 110 | Long Shank |
| SEME6116005 | R0.5 | 16.0 | 16 | 20 | 35 | 100 | Regular |
| SEME6116010 | R1.0 | 16.0 | 16 | 20 | 35 | 100 | Regular |
| SEME6116005150 | R0.5 | 16.0 | 16 | 35 | 50 | 150 | Long Shank |
| SEME6116010150 | R1.0 | 16.0 | 16 | 35 | 50 | 150 | Long Shank |
| SEME6120005 | R0.5 | 20.0 | 20 | 25 | 40 | 100 | Regular |
| SEME6120010 | R1.0 | 20.0 | 20 | 25 | 40 | 100 | Regular |
| SEME6120005150 | R0.5 | 20.0 | 20 | 40 | 55 | 150 | Long Shank |
| SEME6120010150 | R1.0 | 20.0 | 20 | 40 | 55 | 150 | Long Shank |

| Size | Corner Radius Tolerance (mm) | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|---|
| up to Ø6 | ±0.010 | 0~−0.012 | h6 |
| over Ø6 | ±0.015 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

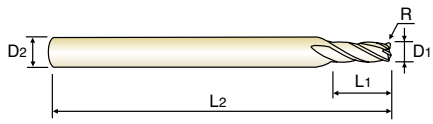
# 4G MILL END MILLS

**SEME01 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.792

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEME01010005 | R0.05 | 1.0 | 6 | 2.5 | 50 | - |
| SEME0101001 | R0.1 | 1.0 | 6 | 2.5 | 50 | - |
| SEME0101002 | R0.2 | 1.0 | 6 | 2.5 | 50 | - |
| SEME0101003 | R0.3 | 1.0 | 6 | 2.5 | 50 | - |
| SEME01012005 | R0.05 | 1.2 | 6 | 3 | 50 | - |
| SEME0101201 | R0.1 | 1.2 | 6 | 3 | 50 | - |
| SEME0101202 | R0.2 | 1.2 | 6 | 3 | 50 | - |
| SEME0101203 | R0.3 | 1.2 | 6 | 3 | 50 | - |
| SEME01015005 | R0.05 | 1.5 | 6 | 4 | 50 | - |
| SEME0101501 | R0.1 | 1.5 | 6 | 4 | 50 | - |
| SEME0101502 | R0.2 | 1.5 | 6 | 4 | 50 | - |
| SEME0101503 | R0.3 | 1.5 | 6 | 4 | 50 | - |
| SEME0101505 | R0.5 | 1.5 | 6 | 4 | 50 | - |
| SEME0102001 | R0.1 | 2.0 | 6 | 6 | 50 | - |
| SEME0102002 | R0.2 | 2.0 | 6 | 6 | 50 | - |
| SEME0102003 | R0.3 | 2.0 | 6 | 6 | 50 | - |
| SEME0102005 | R0.5 | 2.0 | 6 | 6 | 50 | - |
| SEME0102501 | R0.1 | 2.5 | 6 | 7 | 60 | - |
| SEME0102502 | R0.2 | 2.5 | 6 | 7 | 60 | - |
| SEME0102503 | R0.3 | 2.5 | 6 | 7 | 60 | - |
| SEME0102505 | R0.5 | 2.5 | 6 | 7 | 60 | - |
| SEME0103001 | R0.1 | 3.0 | 6 | 8 | 60 | - |
| SEME0103002 | R0.2 | 3.0 | 6 | 8 | 60 | - |
| SEME0103003 | R0.3 | 3.0 | 6 | 8 | 60 | - |
| SEME0103005 | R0.5 | 3.0 | 6 | 8 | 60 | - |
| SEME0103010 | R1.0 | 3.0 | 6 | 8 | 60 | - |
| SEME0103501 | R0.1 | 3.5 | 6 | 10 | 70 | - |
| SEME0103502 | R0.2 | 3.5 | 6 | 10 | 70 | - |
| SEME0103503 | R0.3 | 3.5 | 6 | 10 | 70 | - |
| SEME0103505 | R0.5 | 3.5 | 6 | 10 | 70 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

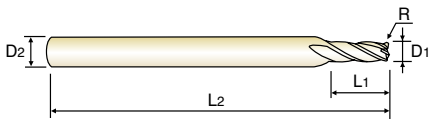
# 4G MILL END MILLS

**SEME01 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- Available various products like short, regular and long shank end millls etc.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.792

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEME10400014S | R0.1 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEME10400024S | R0.2 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEME10400034S | R0.3 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEME10400054S | R0.5 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEME10401044S | R1.0 | 4.0 | 4 | 10 | 70 | 4mm Shank |
| SEME10400011004S | R0.1 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEME10400021004S | R0.2 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEME10400031004S | R0.3 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEME10400051004S | R0.5 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEME10401011004S | R1.0 | 4.0 | 4 | 10 | 100 | 4mm Shank |
| SEME0104001 | R0.1 | 4.0 | 6 | 10 | 70 | Regular |
| SEME0104002 | R0.2 | 4.0 | 6 | 10 | 70 | Regular |
| SEME0104003 | R0.3 | 4.0 | 6 | 10 | 70 | Regular |
| SEME0104005 | R0.5 | 4.0 | 6 | 10 | 70 | Regular |
| SEME0104010 | R1.0 | 4.0 | 6 | 10 | 70 | Regular |
| SEME0104501 | R0.1 | 4.5 | 6 | 11 | 80 | - |
| SEME0104502 | R0.2 | 4.5 | 6 | 11 | 80 | - |
| SEME0104503 | R0.3 | 4.5 | 6 | 11 | 80 | - |
| SEME0104505 | R0.5 | 4.5 | 6 | 11 | 80 | - |
| SEME0105001 | R0.1 | 5.0 | 6 | 13 | 90 | - |
| SEME0105002 | R0.2 | 5.0 | 6 | 13 | 90 | - |
| SEME0105003 | R0.3 | 5.0 | 6 | 13 | 90 | - |
| SEME0105005 | R0.5 | 5.0 | 6 | 13 | 90 | - |
| SEME0105010 | R1.0 | 5.0 | 6 | 13 | 90 | - |
| SEME0105501 | R0.1 | 5.5 | 6 | 13 | 90 | - |
| SEME0105502 | R0.2 | 5.5 | 6 | 13 | 90 | - |
| SEME0105503 | R0.3 | 5.5 | 6 | 13 | 90 | - |
| SEME0105505 | R0.5 | 5.5 | 6 | 13 | 90 | - |
| SEME0105510 | R1.0 | 5.5 | 6 | 13 | 90 | - |
| SEME0106001060 | R0.1 | 6.0 | 6 | 15 | 60 | Short |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

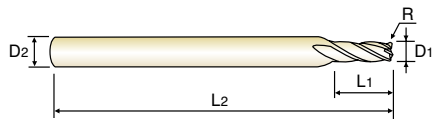
# 4G MILL END MILLS

**SEME01 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.792

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEME0106002060 | R0.2 | 6.0 | 6 | 15 | 60 | Short |
| SEME0106001 | R0.1 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106002 | R0.2 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106003 | R0.3 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106005 | R0.5 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106010 | R1.0 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106015 | R1.5 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106020 | R2.0 | 6.0 | 6 | 15 | 90 | Regular |
| SEME0106005110 | R0.5 | 6.0 | 6 | 15 | 110 | Long Shank |
| SEME0106010110 | R1.0 | 6.0 | 6 | 15 | 110 | Long Shank |
| SEME0106005130 | R0.5 | 6.0 | 6 | 15 | 130 | Long Shank |
| SEME0106010130 | R1.0 | 6.0 | 6 | 15 | 130 | Long Shank |
| SEME0107001 | R0.1 | 7.0 | 8 | 16 | 90 | - |
| SEME0107002 | R0.2 | 7.0 | 8 | 16 | 90 | - |
| SEME0107003 | R0.3 | 7.0 | 8 | 16 | 90 | - |
| SEME0107005 | R0.5 | 7.0 | 8 | 16 | 90 | - |
| SEME0107010 | R1.0 | 7.0 | 8 | 16 | 90 | - |
| SEME0107020 | R2.0 | 7.0 | 8 | 16 | 90 | - |
| SEME0108003070 | R0.3 | 8.0 | 8 | 20 | 70 | Short |
| SEME0108005070 | R0.5 | 8.0 | 8 | 20 | 70 | Short |
| SEME0108010070 | R1.0 | 8.0 | 8 | 20 | 70 | Short |
| SEME0108001 | R0.1 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108002 | R0.2 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108003 | R0.3 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108005 | R0.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108010 | R1.0 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108015 | R1.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108020 | R2.0 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108025 | R2.5 | 8.0 | 8 | 20 | 100 | Regular |
| SEME0108030 | R3.0 | 8.0 | 8 | 20 | 100 | Regular |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

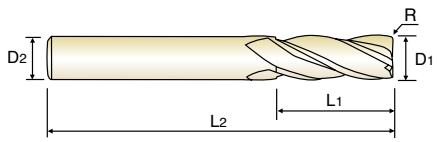
# 4G MILL END MILLS

**SEME01 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- Available various products like short, regular and long shank end millls etc.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.792

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEME0108005120 | R0.5 | 8.0 | 8 | 20 | 120 | Long Shank |
| SEME0108010120 | R1.0 | 8.0 | 8 | 20 | 120 | Long Shank |
| SEME0108005150 | R0.5 | 8.0 | 8 | 20 | 150 | Long Shank |
| SEME0108010150 | R1.0 | 8.0 | 8 | 20 | 150 | Long Shank |
| SEME0110003075 | R0.3 | 10.0 | 10 | 25 | 75 | Short |
| SEME0110005075 | R0.5 | 10.0 | 10 | 25 | 75 | Short |
| SEME0110010075 | R1.0 | 10.0 | 10 | 25 | 75 | Short |
| SEME0110001 | R0.1 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110002 | R0.2 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110003 | R0.3 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110005 | R0.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110010 | R1.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110015 | R1.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110020 | R2.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110025 | R2.5 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110030 | R3.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110040 | R4.0 | 10.0 | 10 | 25 | 100 | Regular |
| SEME0110005130 | R0.5 | 10.0 | 10 | 22 | 130 | Long Shank |
| SEME0110010130 | R1.0 | 10.0 | 10 | 22 | 130 | Long Shank |
| SEME0110005150 | R0.5 | 10.0 | 10 | 22 | 150 | Long Shank |
| SEME0110010150 | R1.0 | 10.0 | 10 | 22 | 150 | Long Shank |
| SEME0111002 | R0.2 | 11.0 | 12 | 25 | 110 | - |
| SEME0111003 | R0.3 | 11.0 | 12 | 25 | 110 | - |
| SEME0111005 | R0.5 | 11.0 | 12 | 25 | 110 | - |
| SEME0111010 | R1.0 | 11.0 | 12 | 25 | 110 | - |
| SEME0111020 | R2.0 | 11.0 | 12 | 25 | 110 | - |
| SEME0112003080 | R0.3 | 12.0 | 12 | 30 | 80 | Short |
| SEME0112005080 | R0.5 | 12.0 | 12 | 30 | 80 | Short |
| SEME0112010080 | R1.0 | 12.0 | 12 | 30 | 80 | Short |
| SEME0112001 | R0.1 | 12.0 | 12 | 30 | 110 | Regular |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

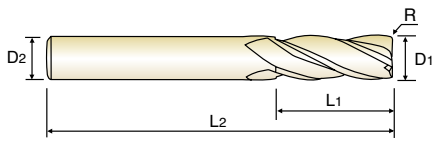
# 4G MILL END MILLS

**SEME01 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS (Short, Regular, Long Shank)

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
- ▶Available various products like short, regular and long shank end millls etc.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.792

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|---|
| SEME0112002 | R0.2 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112003 | R0.3 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112005 | R0.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112010 | R1.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112015 | R1.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112020 | R2.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112025 | R2.5 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112030 | R3.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112040 | R4.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112050 | R5.0 | 12.0 | 12 | 30 | 110 | Regular |
| SEME0112005130 | R0.5 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEME0112010130 | R1.0 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEME0112005150 | R0.5 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEME0112010150 | R1.0 | 12.0 | 12 | 30 | 130 | Long Shank |
| SEME0114005 | R0.5 | 14.0 | 16 | 35 | 150 | - |
| SEME0114010 | R1.0 | 14.0 | 16 | 35 | 150 | - |
| SEME0114020 | R2.0 | 14.0 | 16 | 35 | 150 | - |
| SEME0116005 | R0.5 | 16.0 | 16 | 32 | 150 | - |
| SEME0116010 | R1.0 | 16.0 | 16 | 32 | 150 | - |
| SEME0116015 | R1.5 | 16.0 | 16 | 32 | 150 | - |
| SEME0116020 | R2.0 | 16.0 | 16 | 32 | 150 | - |
| SEME0120005 | R0.5 | 20.0 | 20 | 38 | 150 | - |
| SEME0120010 | R1.0 | 20.0 | 20 | 38 | 150 | - |
| SEME0120015 | R1.5 | 20.0 | 20 | 38 | 150 | - |
| SEME0120020 | R2.0 | 20.0 | 20 | 38 | 150 | - |

| Mill Dia. Tolerance (mm) | Corner Radius Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|
| 0~−0.03 | ±0.02 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

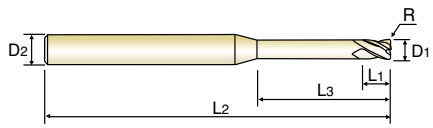
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6401000503 | R0.05 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME6401000504 | R0.05 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME6401000506 | R0.05 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME6401000508 | R0.05 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME6401000510 | R0.05 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME6401000512 | R0.05 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME6401000514 | R0.05 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME6401000516 | R0.05 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME6401000520 | R0.05 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME640100103 | R0.1 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME640100104 | R0.1 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME640100106 | R0.1 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME640100108 | R0.1 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME640100110 | R0.1 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME640100112 | R0.1 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME640100114 | R0.1 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME640100116 | R0.1 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME640100120 | R0.1 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME640100203 | R0.2 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME640100204 | R0.2 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME640100206 | R0.2 | 1.0 | 4 | 1.5 | 6 | 50 | - |
| SEME640100208 | R0.2 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME640100210 | R0.2 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME640100212 | R0.2 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME640100214 | R0.2 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME640100216 | R0.2 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME640100220 | R0.2 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME640100303 | R0.3 | 1.0 | 4 | 1.5 | 3 | 50 | - |
| SEME640100304 | R0.3 | 1.0 | 4 | 1.5 | 4 | 50 | - |
| SEME640100306 | R0.3 | 1.0 | 4 | 1.5 | 6 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

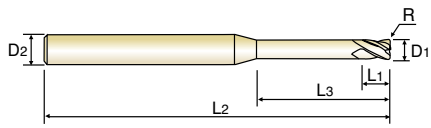
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640100308 | R0.3 | 1.0 | 4 | 1.5 | 8 | 50 | - |
| SEME640100310 | R0.3 | 1.0 | 4 | 1.5 | 10 | 50 | - |
| SEME640100312 | R0.3 | 1.0 | 4 | 1.5 | 12 | 50 | - |
| SEME640100314 | R0.3 | 1.0 | 4 | 1.5 | 14 | 50 | - |
| SEME640100316 | R0.3 | 1.0 | 4 | 1.5 | 16 | 50 | - |
| SEME640100320 | R0.3 | 1.0 | 4 | 1.5 | 20 | 50 | - |
| SEME6401200503 | R0.05 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME6401200504 | R0.05 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME6401200506 | R0.05 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME6401200508 | R0.05 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME6401200510 | R0.05 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME6401200512 | R0.05 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME6401200516 | R0.05 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME6401200520 | R0.05 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME640120103 | R0.1 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME640120104 | R0.1 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME640120106 | R0.1 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME640120108 | R0.1 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME640120110 | R0.1 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME640120112 | R0.1 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME640120116 | R0.1 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME640120120 | R0.1 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME640120203 | R0.2 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME640120204 | R0.2 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME640120206 | R0.2 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME640120208 | R0.2 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME640120210 | R0.2 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME640120212 | R0.2 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME640120216 | R0.2 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME640120220 | R0.2 | 1.2 | 4 | 1.8 | 20 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

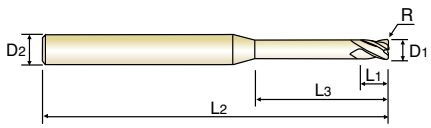
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640120303 | R0.3 | 1.2 | 4 | 1.8 | 3 | 50 | - |
| SEME640120304 | R0.3 | 1.2 | 4 | 1.8 | 4 | 50 | - |
| SEME640120306 | R0.3 | 1.2 | 4 | 1.8 | 6 | 50 | - |
| SEME640120308 | R0.3 | 1.2 | 4 | 1.8 | 8 | 50 | - |
| SEME640120310 | R0.3 | 1.2 | 4 | 1.8 | 10 | 50 | - |
| SEME640120312 | R0.3 | 1.2 | 4 | 1.8 | 12 | 50 | - |
| SEME640120316 | R0.3 | 1.2 | 4 | 1.8 | 16 | 50 | - |
| SEME640120320 | R0.3 | 1.2 | 4 | 1.8 | 20 | 50 | - |
| SEME6401500504 | R0.05 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME6401500506 | R0.05 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME6401500508 | R0.05 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME6401500510 | R0.05 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME6401500512 | R0.05 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME6401500514 | R0.05 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME6401500516 | R0.05 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME6401500520 | R0.05 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME6401500522 | R0.05 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME6401500526 | R0.05 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME640150104 | R0.1 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME640150106 | R0.1 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME640150108 | R0.1 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME640150110 | R0.1 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME640150112 | R0.1 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME640150114 | R0.1 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME640150116 | R0.1 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME640150120 | R0.1 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME640150122 | R0.1 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME640150126 | R0.1 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME640150204 | R0.2 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME640150206 | R0.2 | 1.5 | 4 | 2.3 | 6 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

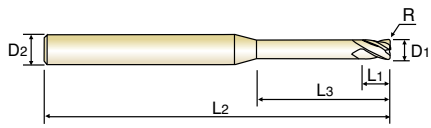
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640150208 | R0.2 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME640150210 | R0.2 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME640150212 | R0.2 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME640150214 | R0.2 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME640150216 | R0.2 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME640150220 | R0.2 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME640150222 | R0.2 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME640150226 | R0.2 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME640150304 | R0.3 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME640150306 | R0.3 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME640150308 | R0.3 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME640150310 | R0.3 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME640150312 | R0.3 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME640150314 | R0.3 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME640150316 | R0.3 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME640150320 | R0.3 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME640150322 | R0.3 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME640150326 | R0.3 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME640150504 | R0.5 | 1.5 | 4 | 2.3 | 4 | 50 | - |
| SEME640150506 | R0.5 | 1.5 | 4 | 2.3 | 6 | 50 | - |
| SEME640150508 | R0.5 | 1.5 | 4 | 2.3 | 8 | 50 | - |
| SEME640150510 | R0.5 | 1.5 | 4 | 2.3 | 10 | 50 | - |
| SEME640150512 | R0.5 | 1.5 | 4 | 2.3 | 12 | 50 | - |
| SEME640150514 | R0.5 | 1.5 | 4 | 2.3 | 14 | 50 | - |
| SEME640150516 | R0.5 | 1.5 | 4 | 2.3 | 16 | 50 | - |
| SEME640150520 | R0.5 | 1.5 | 4 | 2.3 | 20 | 50 | - |
| SEME640150522 | R0.5 | 1.5 | 4 | 2.3 | 22 | 60 | - |
| SEME640150526 | R0.5 | 1.5 | 4 | 2.3 | 26 | 60 | - |
| SEME640200106 | R0.1 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME640200108 | R0.1 | 2.0 | 4 | 3 | 8 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

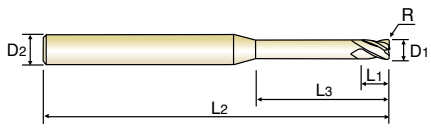
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640200110 | R0.1 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME640200112 | R0.1 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME640200114 | R0.1 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME640200116 | R0.1 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME640200120 | R0.1 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME640200122 | R0.1 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME640200126 | R0.1 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME640200130 | R0.1 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME640200206 | R0.2 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME640200208 | R0.2 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME640200210 | R0.2 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME640200212 | R0.2 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME640200214 | R0.2 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME640200216 | R0.2 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME640200220 | R0.2 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME640200222 | R0.2 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME640200226 | R0.2 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME640200230 | R0.2 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME640200306 | R0.3 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME640200308 | R0.3 | 2.0 | 4 | 3 | 8 | 50 | - |
| SEME640200310 | R0.3 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME640200312 | R0.3 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME640200314 | R0.3 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME640200316 | R0.3 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME640200320 | R0.3 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME640200322 | R0.3 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME640200326 | R0.3 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME640200330 | R0.3 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME640200506 | R0.5 | 2.0 | 4 | 3 | 6 | 50 | - |
| SEME640200508 | R0.5 | 2.0 | 4 | 3 | 8 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

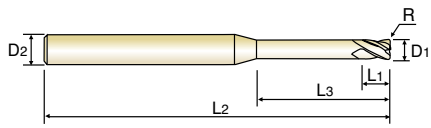
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640200510 | R0.5 | 2.0 | 4 | 3 | 10 | 50 | - |
| SEME640200512 | R0.5 | 2.0 | 4 | 3 | 12 | 50 | - |
| SEME640200514 | R0.5 | 2.0 | 4 | 3 | 14 | 50 | - |
| SEME640200516 | R0.5 | 2.0 | 4 | 3 | 16 | 50 | - |
| SEME640200520 | R0.5 | 2.0 | 4 | 3 | 20 | 50 | - |
| SEME640200522 | R0.5 | 2.0 | 4 | 3 | 22 | 60 | - |
| SEME640200526 | R0.5 | 2.0 | 4 | 3 | 26 | 60 | - |
| SEME640200530 | R0.5 | 2.0 | 4 | 3 | 30 | 70 | - |
| SEME640250108 | R0.1 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME640250110 | R0.1 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME640250112 | R0.1 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME640250114 | R0.1 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME640250116 | R0.1 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME640250120 | R0.1 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME640250126 | R0.1 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME640250130 | R0.1 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME640250208 | R0.2 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME640250210 | R0.2 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME640250212 | R0.2 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME640250214 | R0.2 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME640250216 | R0.2 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME640250220 | R0.2 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME640250226 | R0.2 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME640250230 | R0.2 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME640250308 | R0.3 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME640250310 | R0.3 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME640250312 | R0.3 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME640250314 | R0.3 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME640250316 | R0.3 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME640250320 | R0.3 | 2.5 | 4 | 4 | 20 | 50 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

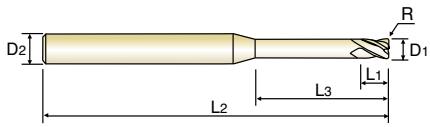
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640250326 | R0.3 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME640250330 | R0.3 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME640250508 | R0.5 | 2.5 | 4 | 4 | 8 | 50 | - |
| SEME640250510 | R0.5 | 2.5 | 4 | 4 | 10 | 50 | - |
| SEME640250512 | R0.5 | 2.5 | 4 | 4 | 12 | 50 | - |
| SEME640250514 | R0.5 | 2.5 | 4 | 4 | 14 | 50 | - |
| SEME640250516 | R0.5 | 2.5 | 4 | 4 | 16 | 50 | - |
| SEME640250520 | R0.5 | 2.5 | 4 | 4 | 20 | 50 | - |
| SEME640250526 | R0.5 | 2.5 | 4 | 4 | 26 | 60 | - |
| SEME640250530 | R0.5 | 2.5 | 4 | 4 | 30 | 70 | - |
| SEME640300108 | R0.1 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME640300110 | R0.1 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME640300112 | R0.1 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME640300114 | R0.1 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME640300116 | R0.1 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME640300120 | R0.1 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME640300126 | R0.1 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME640300130 | R0.1 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME640300135 | R0.1 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME640300140 | R0.1 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME640300208 | R0.2 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME640300210 | R0.2 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME640300212 | R0.2 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME640300214 | R0.2 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME640300216 | R0.2 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME640300220 | R0.2 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME640300226 | R0.2 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME640300230 | R0.2 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME640300235 | R0.2 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME640300240 | R0.2 | 3.0 | 6 | 4.5 | 40 | 80 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

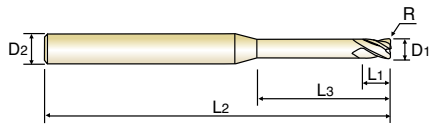
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640300308 | R0.3 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME640300310 | R0.3 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME640300312 | R0.3 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME640300314 | R0.3 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME640300316 | R0.3 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME640300320 | R0.3 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME640300326 | R0.3 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME640300330 | R0.3 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME640300335 | R0.3 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME640300340 | R0.3 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME640300508 | R0.5 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME640300510 | R0.5 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME640300512 | R0.5 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME640300514 | R0.5 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME640300516 | R0.5 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME640300520 | R0.5 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME640300526 | R0.5 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME640300530 | R0.5 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME640300535 | R0.5 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME640300540 | R0.5 | 3.0 | 6 | 4.5 | 40 | 80 | - |
| SEME640301008 | R1.0 | 3.0 | 6 | 4.5 | 8 | 50 | - |
| SEME640301010 | R1.0 | 3.0 | 6 | 4.5 | 10 | 50 | - |
| SEME640301012 | R1.0 | 3.0 | 6 | 4.5 | 12 | 50 | - |
| SEME640301014 | R1.0 | 3.0 | 6 | 4.5 | 14 | 60 | - |
| SEME640301016 | R1.0 | 3.0 | 6 | 4.5 | 16 | 60 | - |
| SEME640301020 | R1.0 | 3.0 | 6 | 4.5 | 20 | 60 | - |
| SEME640301026 | R1.0 | 3.0 | 6 | 4.5 | 26 | 65 | - |
| SEME640301030 | R1.0 | 3.0 | 6 | 4.5 | 30 | 70 | - |
| SEME640301035 | R1.0 | 3.0 | 6 | 4.5 | 35 | 70 | - |
| SEME640301040 | R1.0 | 3.0 | 6 | 4.5 | 40 | 80 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

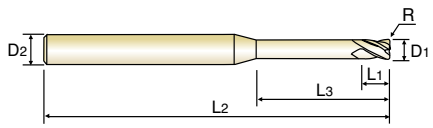
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640400110 | R0.1 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME640400112 | R0.1 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME640400114 | R0.1 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME640400116 | R0.1 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME640400120 | R0.1 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME640400126 | R0.1 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME640400130 | R0.1 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME640400135 | R0.1 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME640400140 | R0.1 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME640400145 | R0.1 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME640400150 | R0.1 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME640400210 | R0.2 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME640400212 | R0.2 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME640400214 | R0.2 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME640400216 | R0.2 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME640400220 | R0.2 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME640400226 | R0.2 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME640400230 | R0.2 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME640400235 | R0.2 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME640400240 | R0.2 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME640400245 | R0.2 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME640400250 | R0.2 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME640400310 | R0.3 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME640400312 | R0.3 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME640400314 | R0.3 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME640400316 | R0.3 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME640400320 | R0.3 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME640400326 | R0.3 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME640400330 | R0.3 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME640400335 | R0.3 | 4.0 | 6 | 6 | 35 | 70 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

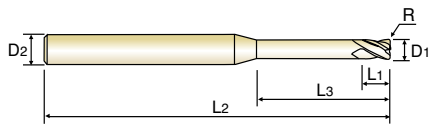
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME640400340 | R0.3 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME640400345 | R0.3 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME640400350 | R0.3 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME640400510 | R0.5 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME640400512 | R0.5 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME640400514 | R0.5 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME640400516 | R0.5 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME640400520 | R0.5 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME640400526 | R0.5 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME640400530 | R0.5 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME640400535 | R0.5 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME640400540 | R0.5 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME640400545 | R0.5 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME640400550 | R0.5 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME640401010 | R1.0 | 4.0 | 6 | 6 | 10 | 50 | - |
| SEME640401012 | R1.0 | 4.0 | 6 | 6 | 12 | 50 | - |
| SEME640401014 | R1.0 | 4.0 | 6 | 6 | 14 | 60 | - |
| SEME640401016 | R1.0 | 4.0 | 6 | 6 | 16 | 60 | - |
| SEME640401020 | R1.0 | 4.0 | 6 | 6 | 20 | 60 | - |
| SEME640401026 | R1.0 | 4.0 | 6 | 6 | 26 | 65 | - |
| SEME640401030 | R1.0 | 4.0 | 6 | 6 | 30 | 70 | - |
| SEME640401035 | R1.0 | 4.0 | 6 | 6 | 35 | 70 | - |
| SEME640401040 | R1.0 | 4.0 | 6 | 6 | 40 | 80 | - |
| SEME640401045 | R1.0 | 4.0 | 6 | 6 | 45 | 90 | - |
| SEME640401050 | R1.0 | 4.0 | 6 | 6 | 50 | 100 | - |
| SEME6405001 | R0.1 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6405002 | R0.2 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6405003 | R0.3 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6405005 | R0.5 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6405010 | R1.0 | 5.0 | 6 | 8 | 15 | 60 | - |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

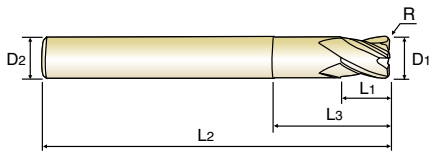
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6405015 | R1.5 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6405020 | R2.0 | 5.0 | 6 | 8 | 15 | 60 | - |
| SEME6406001 | R0.1 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406002 | R0.2 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406003 | R0.3 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406005 | R0.5 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406010 | R1.0 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406015 | R1.5 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406020 | R2.0 | 6.0 | 6 | 9 | 20 | 60 | Regular |
| SEME6406003090 | R0.3 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6406005090 | R0.5 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6406010090 | R1.0 | 6.0 | 6 | 15 | 30 | 90 | Long Shank |
| SEME6408001 | R0.1 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408002 | R0.2 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408003 | R0.3 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408005 | R0.5 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408010 | R1.0 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408015 | R1.5 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408020 | R2.0 | 8.0 | 8 | 12 | 25 | 70 | Regular |
| SEME6408003100 | R0.3 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6408005100 | R0.5 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6408010100 | R1.0 | 8.0 | 8 | 20 | 35 | 100 | Long Shank |
| SEME6410001 | R0.1 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410002 | R0.2 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410003 | R0.3 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410005 | R0.5 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410010 | R1.0 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410015 | R1.5 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410020 | R2.0 | 10.0 | 10 | 15 | 30 | 75 | Regular |
| SEME6410003100 | R0.3 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

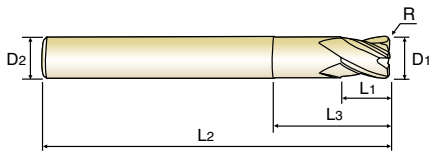
# 4G MILL END MILLS

**SEME64 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.




MG | 4 | M-Helix | R ±0.02 | PLAIN

P.793, 794

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Remark |
|---|---|---|---|---|---|---|---|
| SEME6410005100 | R0.5 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |
| SEME6410010100 | R1.0 | 10.0 | 10 | 25 | 40 | 100 | Long Shank |
| SEME6412002 | R0.2 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412003 | R0.3 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412005 | R0.5 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412010 | R1.0 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412015 | R1.5 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412020 | R2.0 | 12.0 | 12 | 18 | 32 | 80 | Regular |
| SEME6412003110 | R0.3 | 12.0 | 12 | 30 | 45 | 110 | Long Shank |
| SEME6412005110 | R0.5 | 12.0 | 12 | 30 | 45 | 110 | Long Shank |
| SEME6412010110 | R1.0 | 12.0 | 12 | 30 | 45 | 110 | Long Shank |
| SEME6416005 | R0.5 | 16.0 | 16 | 20 | 35 | 100 | Regular |
| SEME6416010 | R1.0 | 16.0 | 16 | 20 | 35 | 100 | Regular |
| SEME6416005150 | R0.5 | 16.0 | 20 | 35 | 50 | 150 | Long Shank |
| SEME6416010150 | R1.0 | 16.0 | 20 | 35 | 50 | 150 | Long Shank |
| SEME641600515020 | R0.5 | 16.0 | 20 | 35 | 50 | 150 | Long Shank |
| SEME641601015020 | R1.0 | 16.0 | 20 | 35 | 50 | 150 | Long Shank |
| SEME6420005 | R0.5 | 20.0 | 20 | 25 | 40 | 100 | Regular |
| SEME6420010 | R1.0 | 20.0 | 20 | 25 | 40 | 100 | Regular |
| SEME6420005150 | R0.5 | 20.0 | 20 | 40 | 55 | 150 | Long Shank |
| SEME6420010150 | R1.0 | 20.0 | 20 | 40 | 55 | 150 | Long Shank |

| Mill Dia. Tolerance (mm) | Corner Radius Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|
| 0~−0.03 | ±0.02 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

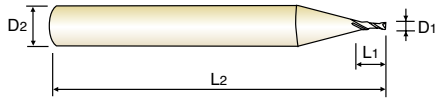
# 4G MILL END MILLS

**SEME35 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.






MG 2 30° PLAIN

P.795

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter $D_1$ | Shank Diameter $D_2$ | Length of Cut $L_1$ | Overall Length $L_2$ |
|---|---|---|---|---|
| SEME350003 | 0.03 | 4 | 0.04 | 40 |
| SEME350004 | 0.04 | 4 | 0.06 | 40 |
| SEME350005 | 0.05 | 4 | 0.07 | 40 |
| SEME350006 | 0.06 | 4 | 0.09 | 40 |
| SEME350007 | 0.07 | 4 | 0.1 | 40 |
| SEME35 0008 | 0.08 | 4 | 0.12 | 40 |
| SEME350009 | 0.09 | 4 | 0.13 | 40 |
| SEME35001 | 0.1 | 4 | 0.2 | 40 |
| SEME350015 | 0.15 | 4 | 0.3 | 40 |
| SEME35002 | 0.2 | 4 | 0.4 | 40 |
| SEME350025 | 0.25 | 4 | 0.5 | 40 |
| SEME35003 | 0.3 | 4 | 0.6 | 40 |
| SEME350035 | 0.35 | 4 | 0.7 | 40 |
| SEME35004 | 0.4 | 4 | 0.8 | 40 |
| SEME350045 | 0.45 | 4 | 0.9 | 40 |
| SEME35005 | 0.5 | 4 | 1.0 | 40 |
| SEME350055 | 0.55 | 4 | 1.1 | 40 |
| SEME35006 | 0.6 | 4 | 1.2 | 40 |
| SEME350065 | 0.65 | 4 | 1.3 | 40 |
| SEME35007 | 0.7 | 4 | 1.4 | 40 |
| SEME350075 | 0.75 | 4 | 1.5 | 40 |
| SEME35008 | 0.8 | 4 | 1.6 | 40 |
| SEME350085 | 0.85 | 4 | 1.7 | 40 |
| SEME35009 | 0.9 | 4 | 1.8 | 40 |
| SEME350095 | 0.95 | 4 | 2 | 40 |
| SEME35010 | 1.0 | 6 | 2.5 | 50 |
| SEME35012 | 1.2 | 6 | 3 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

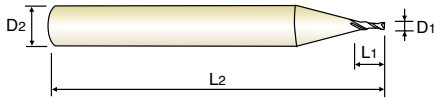
# 4G MILL END MILLS

**SEME35 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.






MG | 2 | 30° | PLAIN

P.795

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME35015 | 1.5 | 6 | 4 | 50 |
| SEME35020 | 2.0 | 6 | 6 | 50 |
| SEME35025 | 2.5 | 6 | 7 | 50 |
| SEME35030 | 3.0 | 6 | 8 | 50 |
| SEME35035 | 3.5 | 6 | 10 | 50 |
| SEME35040 | 4.0 | 6 | 10 | 50 |
| SEME35045 | 4.5 | 6 | 14 | 50 |
| SEME35050 | 5.0 | 6 | 15 | 60 |
| SEME35055 | 5.5 | 6 | 15 | 60 |
| SEME35060 | 6.0 | 6 | 15 | 60 |
| SEME35065 | 6.5 | 8 | 18 | 60 |
| SEME35070 | 7.0 | 8 | 20 | 60 |
| SEME35075 | 7.5 | 8 | 20 | 60 |
| SEME35080 | 8.0 | 8 | 20 | 70 |
| SEME35085 | 8.5 | 10 | 22 | 70 |
| SEME35090 | 9.0 | 10 | 22 | 70 |
| SEME35095 | 9.5 | 10 | 24 | 70 |
| SEME35100 | 10.0 | 10 | 25 | 75 |
| SEME35105 | 10.5 | 12 | 26 | 75 |
| SEME35110 | 11.0 | 12 | 30 | 75 |
| SEME35115 | 11.5 | 12 | 30 | 80 |
| SEME35120 | 12.0 | 12 | 30 | 80 |
| SEME35130 | 13.0 | 12 | 35 | 100 |
| SEME3514012S | 14.0 | 12 | 35 | 100 |
| SEME3514014S | 14.0 | 14 | 35 | 100 |
| SEME35140 | 14.0 | 16 | 35 | 100 |
| SEME35150 | 15.0 | 16 | 38 | 100 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

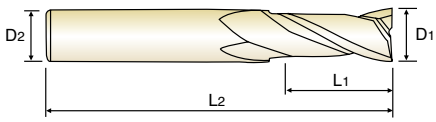
# 4G MILL END MILLS

**SEME35 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.






MG | 2 | 30° | PLAIN

P.795

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter $D_1$ | Shank Diameter $D_2$ | Length of Cut $L_1$ | Overall Length $L_2$ |
|---|---|---|---|---|
| SEME35160 | 16.0 | 16 | 40 | 100 |
| SEME35170 | 17.0 | 16 | 42 | 100 |
| SEME35180 | 18.0 | 16 | 45 | 100 |
| SEME3518018S | 18.0 | 18 | 45 | 100 |
| SEME35190 | 19.0 | 20 | 45 | 100 |
| SEME35200 | 20.0 | 20 | 45 | 100 |
| SEME35210 | 21.0 | 20 | 45 | 100 |
| SEME35220 | 22.0 | 20 | 45 | 100 |
| SEME35230 | 23.0 | 25 | 50 | 120 |
| SEME35240 | 24.0 | 25 | 50 | 120 |
| SEME35250 | 25.0 | 25 | 50 | 120 |

▶ NEXT PAGE

| Size | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|
| up to Ø6 | 0~−0.012 | h6 |
| over Ø6 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

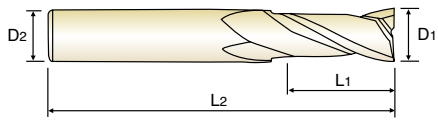
# 4G MILL END MILLS

**SEME35 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE (0.1mm a Unit / 4mm Shank)

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
▶Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶Due to sharp edge geometry at end tooth, cutting ability at working is increased.






MG | 2 | 30° | PLAIN

P.795

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME350104S | 1.0 | 1.0 | 2.5 | 50 |
| SEME350114S | 1.1 | 1.1 | 3 | 50 |
| SEME350124S | 1.2 | 1.2 | 3 | 50 |
| SEME350134S | 1.3 | 1.3 | 3 | 50 |
| SEME350144S | 1.4 | 1.4 | 4 | 50 |
| SEME350154S | 1.5 | 1.5 | 4 | 50 |
| SEME350164S | 1.6 | 1.6 | 4 | 50 |
| SEME350174S | 1.7 | 1.7 | 4 | 50 |
| SEME350184S | 1.8 | 1.8 | 5 | 50 |
| SEME350194S | 1.9 | 1.9 | 5 | 50 |
| SEME350204S | 2.0 | 2.0 | 6 | 50 |
| SEME350214S | 2.1 | 2.1 | 6 | 50 |
| SEME350224S | 2.2 | 2.2 | 6 | 50 |
| SEME350234S | 2.3 | 2.3 | 6 | 50 |
| SEME350244S | 2.4 | 2.4 | 6 | 50 |
| SEME350254S | 2.5 | 2.5 | 8 | 50 |
| SEME350264S | 2.6 | 2.6 | 8 | 50 |
| SEME350274S | 2.7 | 2.7 | 8 | 50 |
| SEME350284S | 2.8 | 2.8 | 8 | 50 |
| SEME350294S | 2.9 | 2.9 | 8 | 50 |
| SEME350304S | 3.0 | 3.0 | 8 | 50 |
| SEME350354S | 3.5 | 3.5 | 10 | 50 |
| SEME350404S | 4.0 | 4.0 | 10 | 50 |
| SEME350404S080 | 4.0 | 4.0 | 10 | 80 |

▶ NEXT PAGE

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

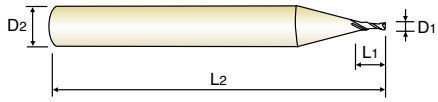
# 4G MILL END MILLS

**SEME35 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE (3mm Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resitance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to sharp edge geometry at end tooth, cutting ability at working is increased.






MG | 2 | 30° | PLAIN

P.795

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME350013S | 0.1 | 3 | 0.2 | 40 |
| SEME350023S | 0.2 | 3 | 0.4 | 40 |
| SEME350033S | 0.3 | 3 | 0.6 | 40 |
| SEME350043S | 0.4 | 3 | 0.8 | 40 |
| SEME350053S | 0.5 | 3 | 1.0 | 40 |
| SEME350063S | 0.6 | 3 | 1.2 | 40 |
| SEME350073S | 0.7 | 3 | 1.4 | 40 |
| SEME350083S | 0.8 | 3 | 1.6 | 40 |
| SEME350093S | 0.9 | 3 | 1.8 | 40 |
| SEME350103S | 1.0 | 3 | 2.5 | 50 |
| SEME350123S | 1.2 | 3 | 3 | 50 |
| SEME350153S | 1.5 | 3 | 4 | 50 |
| SEME350203S | 2.0 | 3 | 6 | 50 |
| SEME350253S | 2.5 | 3 | 7 | 50 |
| SEME350303S | 3.0 | 3 | 8 | 50 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

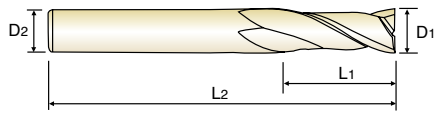
# 4G MILL END MILLS

**SEME70 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.796~798

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7001003 | 1.0 | 6 | 3 | 60 |
| SEME7001004 | 1.0 | 6 | 4 | 60 |
| SEME7001005 | 1.0 | 6 | 5 | 60 |
| SEME7001006 | 1.0 | 6 | 6 | 60 |
| SEME7001007 | 1.0 | 6 | 7 | 60 |
| SEME7001008 | 1.0 | 6 | 8 | 60 |
| SEME7001010 | 1.0 | 6 | 10 | 60 |
| SEME7001012 | 1.0 | 6 | 12 | 60 |
| SEME7001204 | 1.2 | 6 | 4 | 60 |
| SEME7001206 | 1.2 | 6 | 6 | 60 |
| SEME7001208 | 1.2 | 6 | 8 | 60 |
| SEME7001210 | 1.2 | 6 | 10 | 60 |
| SEME7001212 | 1.2 | 6 | 12 | 60 |
| SEME7001506 | 1.5 | 6 | 6 | 60 |
| SEME7001508 | 1.5 | 6 | 8 | 60 |
| SEME7001510 | 1.5 | 6 | 10 | 60 |
| SEME7001512 | 1.5 | 6 | 12 | 60 |
| SEME7001514 | 1.5 | 6 | 14 | 60 |
| SEME7001516 | 1.5 | 6 | 16 | 60 |
| SEME7002008 | 2.0 | 6 | 8 | 60 |
| SEME7002010 | 2.0 | 6 | 10 | 60 |
| SEME7002012 | 2.0 | 6 | 12 | 60 |
| SEME7002014 | 2.0 | 6 | 14 | 60 |
| SEME7002016 | 2.0 | 6 | 16 | 60 |
| SEME7002510 | 2.5 | 6 | 10 | 60 |
| SEME7002512 | 2.5 | 6 | 12 | 60 |
| SEME7002516 | 2.5 | 6 | 16 | 60 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

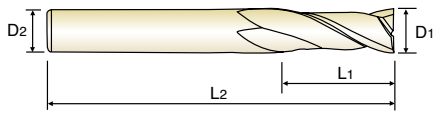
# 4G MILL END MILLS

**SEME70 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.796~798

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7002520 | 2.5 | 6 | 20 | 60 |
| SEME7002526 | 2.5 | 6 | 26 | 60 |
| SEME70030163S | 3.0 | 3 | 16 | 100 |
| SEME7003010 | 3.0 | 6 | 10 | 70 |
| SEME7003012 | 3.0 | 6 | 12 | 70 |
| SEME7003014 | 3.0 | 6 | 14 | 70 |
| SEME7003016 | 3.0 | 6 | 16 | 70 |
| SEME7003020 | 3.0 | 6 | 20 | 70 |
| SEME7003026 | 3.0 | 6 | 26 | 70 |
| SEME7003030 | 3.0 | 6 | 30 | 70 |
| SEME70040204S | 4.0 | 4 | 20 | 100 |
| SEME7004012 | 4.0 | 6 | 12 | 70 |
| SEME7004016 | 4.0 | 6 | 16 | 70 |
| SEME7004020 | 4.0 | 6 | 20 | 70 |
| SEME7004026 | 4.0 | 6 | 26 | 70 |
| SEME7004030 | 4.0 | 6 | 30 | 70 |
| SEME7005020 | 5.0 | 6 | 20 | 70 |
| SEME7005025 | 5.0 | 6 | 25 | 70 |
| SEME7005025100 | 5.0 | 6 | 25 | 100 |
| SEME7005030 | 5.0 | 6 | 30 | 80 |
| SEME7005035 | 5.0 | 6 | 35 | 90 |
| SEME7005040 | 5.0 | 6 | 40 | 100 |
| SEME7006015 | 6.0 | 6 | 15 | 60 |
| SEME7006015080 | 6.0 | 6 | 15 | 80 |
| SEME7006020 | 6.0 | 6 | 20 | 70 |
| SEME7006020090 | 6.0 | 6 | 20 | 90 |
| SEME7006025 | 6.0 | 6 | 25 | 75 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

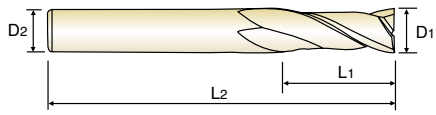
# 4G MILL END MILLS

**SEME70 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.796~798

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7006030 | 6.0 | 6 | 30 | 80 |
| SEME7006030100 | 6.0 | 6 | 30 | 100 |
| SEME7006030150 | 6.0 | 6 | 30 | 150 |
| SEME7006035 | 6.0 | 6 | 35 | 90 |
| SEME7006040 | 6.0 | 6 | 40 | 90 |
| SEME7006040120 | 6.0 | 6 | 40 | 120 |
| SEME7006045 | 6.0 | 6 | 45 | 150 |
| SEME7008025 | 8.0 | 8 | 25 | 80 |
| SEME7008030 | 8.0 | 8 | 30 | 80 |
| SEME7008030100 | 8.0 | 8 | 30 | 100 |
| SEME7008035 | 8.0 | 8 | 35 | 90 |
| SEME7008040 | 8.0 | 8 | 40 | 90 |
| SEME7008040120 | 8.0 | 8 | 40 | 120 |
| SEME7008040150 | 8.0 | 8 | 40 | 150 |
| SEME7008045 | 8.0 | 8 | 45 | 100 |
| SEME7008050 | 8.0 | 8 | 50 | 100 |
| SEME7008050150 | 8.0 | 8 | 50 | 150 |
| SEME7010030 | 10.0 | 10 | 30 | 80 |
| SEME7010030100 | 10.0 | 10 | 30 | 100 |
| SEME7010035 | 10.0 | 10 | 35 | 90 |
| SEME7010040 | 10.0 | 10 | 40 | 90 |
| SEME7010040120 | 10.0 | 10 | 40 | 120 |
| SEME7010045 | 10.0 | 10 | 45 | 100 |
| SEME7010050 | 10.0 | 10 | 50 | 100 |
| SEME7010050150 | 10.0 | 10 | 50 | 150 |
| SEME7010050200 | 10.0 | 10 | 50 | 200 |
| SEME7010055 | 10.0 | 10 | 55 | 150 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

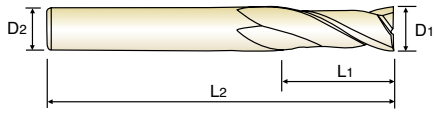
# 4G MILL END MILLS

**SEME70 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.796~798

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7010060 | 10.0 | 10 | 60 | 110 |
| SEME7010060200 | 10.0 | 10 | 60 | 200 |
| SEME7012035 | 12.0 | 12 | 35 | 90 |
| SEME7012040 | 12.0 | 12 | 40 | 100 |
| SEME7012040120 | 12.0 | 12 | 40 | 120 |
| SEME7012045 | 12.0 | 12 | 45 | 130 |
| SEME7012050 | 12.0 | 12 | 50 | 100 |
| SEME7012050150 | 12.0 | 12 | 50 | 150 |
| SEME7012055 | 12.0 | 12 | 55 | 110 |
| SEME7012060 | 12.0 | 12 | 60 | 110 |
| SEME7012060150 | 12.0 | 12 | 60 | 150 |
| SEME7012060200 | 12.0 | 12 | 60 | 200 |
| SEME7012065 | 12.0 | 12 | 65 | 150 |
| SEME7012070 | 12.0 | 12 | 70 | 120 |
| SEME7012070200 | 12.0 | 12 | 70 | 200 |
| SEME7014050 | 14.0 | 16 | 50 | 110 |
| SEME7014060 | 14.0 | 16 | 60 | 150 |
| SEME7016040 | 16.0 | 16 | 40 | 150 |
| SEME7016050 | 16.0 | 16 | 50 | 110 |
| SEME7016050150 | 16.0 | 16 | 50 | 150 |
| SEME7016060 | 16.0 | 16 | 60 | 120 |
| SEME7016070 | 16.0 | 16 | 70 | 130 |
| SEME7016070150 | 16.0 | 16 | 70 | 150 |
| SEME7016070200 | 16.0 | 16 | 70 | 200 |
| SEME7016080 | 16.0 | 16 | 80 | 150 |
| SEME7016090 | 16.0 | 16 | 90 | 150 |
| SEME70160110 | 16.0 | 16 | 110 | 200 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

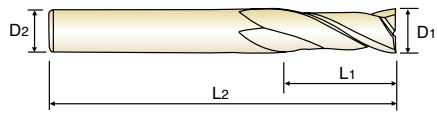
# 4G MILL END MILLS

**SEME70 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH

▶ Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶ Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
▶ Available various length of cut and overall length end mills.






MG | 2 | 30° | PLAIN

P.796~798

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME70160120 | 16.0 | 16 | 120 | 250 |
| SEME7018050 | 18.0 | 20 | 50 | 120 |
| SEME7018070 | 18.0 | 20 | 70 | 130 |
| SEME70180100 | 18.0 | 20 | 100 | 200 |
| SEME7020050 | 20.0 | 20 | 50 | 110 |
| SEME7020050150 | 20.0 | 20 | 50 | 150 |
| SEME7020060 | 20.0 | 20 | 60 | 130 |
| SEME7020070 | 20.0 | 20 | 70 | 130 |
| SEME7020080 | 20.0 | 20 | 80 | 150 |
| SEME7020090 | 20.0 | 20 | 90 | 150 |
| SEME7020090200 | 20.0 | 20 | 90 | 200 |
| SEME70200110 | 20.0 | 20 | 110 | 200 |
| SEME70200120 | 20.0 | 20 | 120 | 250 |
| SEME7022075 | 22.0 | 20 | 75 | 150 |
| SEME70220110 | 22.0 | 20 | 110 | 200 |
| SEME7025070 | 25.0 | 25 | 70 | 150 |
| SEME7025090 | 25.0 | 25 | 90 | 150 |
| SEME70250110 | 25.0 | 25 | 110 | 200 |
| SEME70250120 | 25.0 | 25 | 120 | 250 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

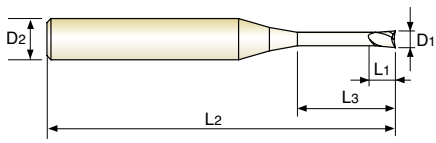
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.






MG 2 30° PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM845001003 | 0.1 | 4 | 0.15 | 0.3 | 40 |
| SEM845001005 | 0.1 | 4 | 0.15 | 0.5 | 40 |
| SEM84500101 | 0.1 | 4 | 0.15 | 1 | 40 |
| SEM845002005 | 0.2 | 4 | 0.3 | 0.5 | 40 |
| SEM84500201 | 0.2 | 4 | 0.3 | 1 | 40 |
| SEM845002015 | 0.2 | 4 | 0.3 | 1.5 | 40 |
| SEM84500202 | 0.2 | 4 | 0.3 | 2 | 40 |
| SEM84500301 | 0.3 | 4 | 0.5 | 1 | 40 |
| SEM845003015 | 0.3 | 4 | 0.5 | 1.5 | 40 |
| SEM84500302 | 0.3 | 4 | 0.5 | 2 | 40 |
| SEM845003025 | 0.3 | 4 | 0.5 | 2.5 | 40 |
| SEM84500303 | 0.3 | 4 | 0.5 | 3 | 40 |
| SEM84500304 | 0.3 | 4 | 0.5 | 4 | 40 |
| SEM84500305 | 0.3 | 4 | 0.5 | 5 | 40 |
| SEM84500401 | 0.4 | 4 | 0.6 | 1 | 40 |
| SEM845004015 | 0.4 | 4 | 0.6 | 1.5 | 40 |
| SEM84500402 | 0.4 | 4 | 0.6 | 2 | 40 |
| SEM845004025 | 0.4 | 4 | 0.6 | 2.5 | 40 |
| SEM84500403 | 0.4 | 4 | 0.6 | 3 | 40 |
| SEM84500404 | 0.4 | 4 | 0.6 | 4 | 40 |
| SEM84500405 | 0.4 | 4 | 0.6 | 5 | 40 |
| SEM84500406 | 0.4 | 4 | 0.6 | 6 | 40 |
| SEM84500408 | 0.4 | 4 | 0.6 | 8 | 40 |
| SEM84500410 | 0.4 | 4 | 0.6 | 10 | 40 |
| SEM84500501 | 0.5 | 4 | 0.7 | 1 | 45 |
| SEM845005015 | 0.5 | 4 | 0.7 | 1.5 | 45 |
| SEM84500502 | 0.5 | 4 | 0.7 | 2 | 45 |
| SEM845005025 | 0.5 | 4 | 0.7 | 2.5 | 45 |
| SEM84500503 | 0.5 | 4 | 0.7 | 3 | 45 |
| SEM84500504 | 0.5 | 4 | 0.7 | 4 | 45 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

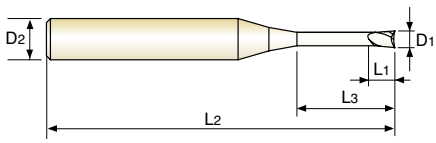
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶Available various rib processing due to supplying various effective length and overall length products.






MG | 2 | 30° | PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84500505 | 0.5 | 4 | 0.7 | 5 | 45 |
| SEM84500506 | 0.5 | 4 | 0.7 | 6 | 45 |
| SEM84500508 | 0.5 | 4 | 0.7 | 8 | 45 |
| SEM84500510 | 0.5 | 4 | 0.7 | 10 | 45 |
| SEM84500512 | 0.5 | 4 | 0.7 | 12 | 45 |
| SEM84500514 | 0.5 | 4 | 0.7 | 14 | 45 |
| SEM84500516 | 0.5 | 4 | 0.7 | 16 | 45 |
| SEM84500602 | 0.6 | 4 | 0.9 | 2 | 45 |
| SEM84500603 | 0.6 | 4 | 0.9 | 3 | 45 |
| SEM84500604 | 0.6 | 4 | 0.9 | 4 | 45 |
| SEM84500605 | 0.6 | 4 | 0.9 | 5 | 45 |
| SEM84500606 | 0.6 | 4 | 0.9 | 6 | 45 |
| SEM84500608 | 0.6 | 4 | 0.9 | 8 | 45 |
| SEM84500610 | 0.6 | 4 | 0.9 | 10 | 45 |
| SEM84500612 | 0.6 | 4 | 0.9 | 12 | 45 |
| SEM84500614 | 0.6 | 4 | 0.9 | 14 | 45 |
| SEM84500616 | 0.6 | 4 | 0.9 | 16 | 45 |
| SEM84500702 | 0.7 | 4 | 1.2 | 2 | 45 |
| SEM84500704 | 0.7 | 4 | 1.2 | 4 | 45 |
| SEM84500706 | 0.7 | 4 | 1.2 | 6 | 45 |
| SEM84500708 | 0.7 | 4 | 1.2 | 8 | 45 |
| SEM84500710 | 0.7 | 4 | 1.2 | 10 | 45 |
| SEM84500712 | 0.7 | 4 | 1.2 | 12 | 45 |
| SEM84500802 | 0.8 | 4 | 1.2 | 2 | 45 |
| SEM84500803 | 0.8 | 4 | 1.2 | 3 | 45 |
| SEM84500804 | 0.8 | 4 | 1.2 | 4 | 45 |
| SEM84500805 | 0.8 | 4 | 1.2 | 5 | 45 |
| SEM84500806 | 0.8 | 4 | 1.2 | 6 | 45 |
| SEM84500808 | 0.8 | 4 | 1.2 | 8 | 45 |
| SEM84500810 | 0.8 | 4 | 1.2 | 10 | 45 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

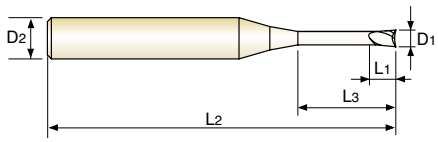
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.






MG | 2 | 30° | PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84500812 | 0.8 | 4 | 1.2 | 12 | 45 |
| SEM84500814 | 0.8 | 4 | 1.2 | 14 | 45 |
| SEM84500816 | 0.8 | 4 | 1.2 | 16 | 45 |
| SEM84500820 | 0.8 | 4 | 1.2 | 20 | 45 |
| SEM84500906 | 0.9 | 4 | 1.3 | 6 | 45 |
| SEM84500908 | 0.9 | 4 | 1.3 | 8 | 45 |
| SEM84500910 | 0.9 | 4 | 1.3 | 10 | 45 |
| SEM84501002 | 1.0 | 4 | 1.5 | 2 | 50 |
| SEM84501003 | 1.0 | 4 | 1.5 | 3 | 50 |
| SEM84501004 | 1.0 | 4 | 1.5 | 4 | 50 |
| SEM84501005 | 1.0 | 4 | 1.5 | 5 | 50 |
| SEM84501006 | 1.0 | 4 | 1.5 | 6 | 50 |
| SEM84501007 | 1.0 | 4 | 1.5 | 7 | 50 |
| SEM84501008 | 1.0 | 4 | 1.5 | 8 | 50 |
| SEM84501010 | 1.0 | 4 | 1.5 | 10 | 50 |
| SEM84501012 | 1.0 | 4 | 1.5 | 12 | 50 |
| SEM84501014 | 1.0 | 4 | 1.5 | 14 | 50 |
| SEM84501016 | 1.0 | 4 | 1.5 | 16 | 50 |
| SEM84501018 | 1.0 | 4 | 1.5 | 18 | 50 |
| SEM84501020 | 1.0 | 4 | 1.5 | 20 | 50 |
| SEM84501022 | 1.0 | 4 | 1.5 | 22 | 60 |
| SEM84501026 | 1.0 | 4 | 1.5 | 26 | 60 |
| SEM84501030 | 1.0 | 4 | 1.5 | 30 | 70 |
| SEM84501040 | 1.0 | 4 | 1.5 | 40 | 80 |
| SEM84501050 | 1.0 | 4 | 1.5 | 50 | 100 |
| SEM84501204 | 1.2 | 4 | 1.8 | 4 | 50 |
| SEM84501206 | 1.2 | 4 | 1.8 | 6 | 50 |
| SEM84501208 | 1.2 | 4 | 1.8 | 8 | 50 |
| SEM84501210 | 1.2 | 4 | 1.8 | 10 | 50 |
| SEM84501212 | 1.2 | 4 | 1.8 | 12 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

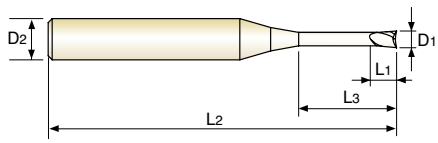
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
▶For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
▶Available various rib processing due to supplying various effective length and overall length products.






MG | 2 | 30° | PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84501214 | 1.2 | 4 | 1.8 | 14 | 50 |
| SEM84501216 | 1.2 | 4 | 1.8 | 16 | 50 |
| SEM84501220 | 1.2 | 4 | 1.8 | 20 | 50 |
| SEM84501226 | 1.2 | 4 | 1.8 | 26 | 60 |
| SEM84501230 | 1.2 | 4 | 1.8 | 30 | 70 |
| SEM84501406 | 1.4 | 4 | 2.1 | 6 | 50 |
| SEM84501408 | 1.4 | 4 | 2.1 | 8 | 50 |
| SEM84501410 | 1.4 | 4 | 2.1 | 10 | 50 |
| SEM84501414 | 1.4 | 4 | 2.1 | 14 | 50 |
| SEM84501416 | 1.4 | 4 | 2.1 | 16 | 50 |
| SEM84501420 | 1.4 | 4 | 2.1 | 20 | 50 |
| SEM84501504 | 1.5 | 4 | 2.3 | 4 | 50 |
| SEM84501505 | 1.5 | 4 | 2.3 | 5 | 50 |
| SEM84501506 | 1.5 | 4 | 2.3 | 6 | 50 |
| SEM84501507 | 1.5 | 4 | 2.3 | 7 | 50 |
| SEM84501508 | 1.5 | 4 | 2.3 | 8 | 50 |
| SEM84501510 | 1.5 | 4 | 2.3 | 10 | 50 |
| SEM84501512 | 1.5 | 4 | 2.3 | 12 | 50 |
| SEM84501514 | 1.5 | 4 | 2.3 | 14 | 50 |
| SEM84501516 | 1.5 | 4 | 2.3 | 16 | 50 |
| SEM84501518 | 1.5 | 4 | 2.3 | 18 | 50 |
| SEM84501520 | 1.5 | 4 | 2.3 | 20 | 50 |
| SEM84501522 | 1.5 | 4 | 2.3 | 22 | 60 |
| SEM84501526 | 1.5 | 4 | 2.3 | 26 | 60 |
| SEM84501530 | 1.5 | 4 | 2.3 | 30 | 70 |
| SEM84501608 | 1.6 | 4 | 2.3 | 8 | 50 |
| SEM84501610 | 1.6 | 4 | 2.3 | 10 | 50 |
| SEM84501612 | 1.6 | 4 | 2.3 | 12 | 50 |
| SEM84501616 | 1.6 | 4 | 2.3 | 16 | 50 |
| SEM84501620 | 1.6 | 4 | 2.3 | 20 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

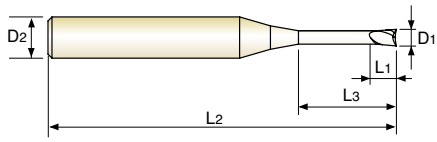
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- Available various rib processing due to supplying various effective length and overall length products.






MG 2 30° PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84501808 | 1.8 | 4 | 2.7 | 8 | 50 |
| SEM84501810 | 1.8 | 4 | 2.7 | 10 | 50 |
| SEM84501812 | 1.8 | 4 | 2.7 | 12 | 50 |
| SEM84501816 | 1.8 | 4 | 2.7 | 16 | 50 |
| SEM84501820 | 1.8 | 4 | 2.7 | 20 | 50 |
| SEM84502006 | 2.0 | 4 | 3 | 6 | 50 |
| SEM84502008 | 2.0 | 4 | 3 | 8 | 50 |
| SEM84502010 | 2.0 | 4 | 3 | 10 | 50 |
| SEM84502012 | 2.0 | 4 | 3 | 12 | 50 |
| SEM84502014 | 2.0 | 4 | 3 | 14 | 50 |
| SEM84502016 | 2.0 | 4 | 3 | 16 | 50 |
| SEM84502018 | 2.0 | 4 | 3 | 18 | 50 |
| SEM84502020 | 2.0 | 4 | 3 | 20 | 50 |
| SEM84502022 | 2.0 | 4 | 3 | 22 | 60 |
| SEM84502026 | 2.0 | 4 | 3 | 26 | 60 |
| SEM84502030 | 2.0 | 4 | 3 | 30 | 70 |
| SEM84502035 | 2.0 | 4 | 3 | 35 | 70 |
| SEM84502040 | 2.0 | 4 | 3 | 40 | 80 |
| SEM84502045 | 2.0 | 4 | 3 | 45 | 90 |
| SEM84502050 | 2.0 | 4 | 3 | 50 | 100 |
| SEM84502060 | 2.0 | 4 | 3 | 60 | 110 |
| SEM84502508 | 2.5 | 4 | 4 | 8 | 50 |
| SEM84502510 | 2.5 | 4 | 4 | 10 | 50 |
| SEM84502512 | 2.5 | 4 | 4 | 12 | 50 |
| SEM84502514 | 2.5 | 4 | 4 | 14 | 50 |
| SEM84502516 | 2.5 | 4 | 4 | 16 | 50 |
| SEM84502518 | 2.5 | 4 | 4 | 18 | 50 |
| SEM84502520 | 2.5 | 4 | 4 | 20 | 50 |
| SEM84502522 | 2.5 | 4 | 4 | 22 | 60 |
| SEM84502526 | 2.5 | 4 | 4 | 26 | 60 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

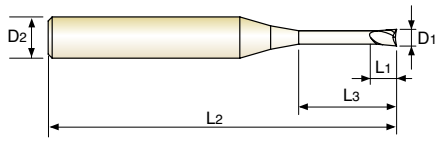
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶Available various rib processing due to supplying various effective length and overall length products.






MG | 2 | 30° | PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84502530 | 2.5 | 4 | 4 | 30 | 70 |
| SEM84502535 | 2.5 | 4 | 4 | 35 | 70 |
| SEM84502540 | 2.5 | 4 | 4 | 40 | 80 |
| SEM84502545 | 2.5 | 4 | 4 | 45 | 90 |
| SEM84502550 | 2.5 | 4 | 4 | 50 | 100 |
| SEM84503006 | 3.0 | 6 | 4.5 | 6 | 50 |
| SEM84503008 | 3.0 | 6 | 4.5 | 8 | 50 |
| SEM84503010 | 3.0 | 6 | 4.5 | 10 | 50 |
| SEM84503012 | 3.0 | 6 | 4.5 | 12 | 50 |
| SEM84503014 | 3.0 | 6 | 4.5 | 14 | 60 |
| SEM84503016 | 3.0 | 6 | 4.5 | 16 | 60 |
| SEM84503018 | 3.0 | 6 | 4.5 | 18 | 60 |
| SEM84503020 | 3.0 | 6 | 4.5 | 20 | 60 |
| SEM84503022 | 3.0 | 6 | 4.5 | 22 | 65 |
| SEM84503026 | 3.0 | 6 | 4.5 | 26 | 65 |
| SEM84503030 | 3.0 | 6 | 4.5 | 30 | 70 |
| SEM84503035 | 3.0 | 6 | 4.5 | 35 | 70 |
| SEM84503040 | 3.0 | 6 | 4.5 | 40 | 80 |
| SEM84503045 | 3.0 | 6 | 4.5 | 45 | 90 |
| SEM84503050 | 3.0 | 6 | 4.5 | 50 | 100 |
| SEM84503060 | 3.0 | 6 | 4.5 | 60 | 100 |
| SEM84504008 | 4.0 | 6 | 6 | 8 | 50 |
| SEM84504010 | 4.0 | 6 | 6 | 10 | 50 |
| SEM84504012 | 4.0 | 6 | 6 | 12 | 50 |
| SEM84504014 | 4.0 | 6 | 6 | 14 | 60 |
| SEM84504016 | 4.0 | 6 | 6 | 16 | 60 |
| SEM84504018 | 4.0 | 6 | 6 | 18 | 60 |
| SEM84504020 | 4.0 | 6 | 6 | 20 | 60 |
| SEM84504022 | 4.0 | 6 | 6 | 22 | 65 |
| SEM84504026 | 4.0 | 6 | 6 | 26 | 65 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

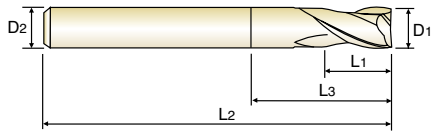
# 4G MILL END MILLS

**SEM845 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG NECK

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶For 1.0mm and under 1.0mm diameter sizes, designed double neck for increasing tool rigidity and minimizing vibration at working.
- ▶Available various rib processing due to supplying various effective length and overall length products.






MG 2 30° PLAIN

P.799~803

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEM84504030 | 4.0 | 6 | 6 | 30 | 70 |
| SEM84504035 | 4.0 | 6 | 6 | 35 | 70 |
| SEM84504040 | 4.0 | 6 | 6 | 40 | 80 |
| SEM84504045 | 4.0 | 6 | 6 | 45 | 90 |
| SEM84504050 | 4.0 | 6 | 6 | 50 | 100 |
| SEM84504060 | 4.0 | 6 | 6 | 60 | 100 |
| SEM84505016 | 5.0 | 6 | 8 | 16 | 60 |
| SEM84505020 | 5.0 | 6 | 8 | 20 | 60 |
| SEM84505026 | 5.0 | 6 | 8 | 26 | 65 |
| SEM84505030 | 5.0 | 6 | 8 | 30 | 70 |
| SEM84505035 | 5.0 | 6 | 8 | 35 | 75 |
| SEM84505040 | 5.0 | 6 | 8 | 40 | 80 |
| SEM84505050 | 5.0 | 6 | 8 | 50 | 90 |
| SEM84505060 | 5.0 | 6 | 8 | 60 | 100 |
| SEM84506015 | 6.0 | 6 | 9 | 15 | 60 |
| SEM84506020 | 6.0 | 6 | 9 | 20 | 60 |
| SEM84506030 | 6.0 | 6 | 9 | 30 | 70 |
| SEM84506032 | 6.0 | 6 | 9 | 32 | 90 |
| SEM84508025 | 8.0 | 8 | 12 | 25 | 70 |
| SEM84508030 | 8.0 | 8 | 12 | 30 | 80 |
| SEM84508042 | 8.0 | 8 | 12 | 42 | 100 |
| SEM84510030 | 10.0 | 10 | 15 | 30 | 75 |
| SEM84510035 | 10.0 | 10 | 15 | 35 | 80 |
| SEM84510045 | 10.0 | 10 | 15 | 45 | 100 |
| SEM84512035 | 12.0 | 12 | 20 | 35 | 80 |
| SEM84512040 | 12.0 | 12 | 20 | 40 | 90 |
| SEM84512050 | 12.0 | 12 | 20 | 50 | 110 |

| Size | Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|---|
| up to Ø6 | 0~−0.012 | h6 |
| over Ø6 | 0~−0.015 | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

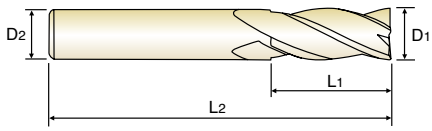
# 4G MILL END MILLS

**SEME36 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.






MG 4 M-Helix PLAIN P.804

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME36008 | 0.8 | 4 | 1.6 | 40 |
| SEME36009 | 0.9 | 4 | 1.8 | 40 |
| SEME36010 | 1.0 | 6 | 2.5 | 50 |
| SEME36012 | 1.2 | 6 | 3 | 50 |
| SEME36015 | 1.5 | 6 | 4 | 50 |
| SEME36020 | 2.0 | 6 | 6 | 50 |
| SEME36025 | 2.5 | 6 | 7 | 50 |
| SEME36030 | 3.0 | 6 | 8 | 50 |
| SEME36035 | 3.5 | 6 | 10 | 50 |
| SEME36040 | 4.0 | 6 | 10 | 50 |
| SEME36045 | 4.5 | 6 | 14 | 50 |
| SEME36050 | 5.0 | 6 | 15 | 60 |
| SEME36055 | 5.5 | 6 | 15 | 60 |
| SEME36060 | 6.0 | 6 | 15 | 60 |
| SEME36065 | 6.5 | 8 | 18 | 60 |
| SEME36070 | 7.0 | 8 | 20 | 60 |
| SEME36075 | 7.5 | 8 | 20 | 60 |
| SEME36080 | 8.0 | 8 | 20 | 70 |
| SEME36085 | 8.5 | 10 | 22 | 70 |
| SEME36090 | 9.0 | 10 | 22 | 70 |
| SEME36095 | 9.5 | 10 | 24 | 70 |
| SEME36100 | 10.0 | 10 | 25 | 75 |
| SEME36105 | 10.5 | 12 | 26 | 75 |
| SEME36110 | 11.0 | 12 | 30 | 75 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

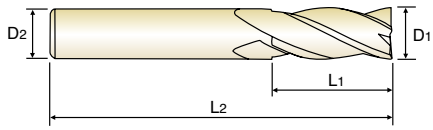
# 4G MILL END MILLS

**SEME36 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.






MG | 4 | M-Helix | PLAIN

P.804

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter $D_1$ | Shank Diameter $D_2$ | Length of Cut $L_1$ | Overall Length $L_2$ |
|---|---|---|---|---|
| SEME36115 | 11.5 | 12 | 30 | 80 |
| SEME36120 | 12.0 | 12 | 30 | 80 |
| SEME36130 | 13.0 | 12 | 35 | 100 |
| SEME3614012S | 14.0 | 12 | 35 | 100 |
| SEME3614014S | 14.0 | 14 | 35 | 100 |
| SEME36140 | 14.0 | 16 | 35 | 100 |
| SEME36150 | 15.0 | 16 | 38 | 100 |
| SEME36160 | 16.0 | 16 | 40 | 100 |
| SEME36170 | 17.0 | 16 | 42 | 100 |
| SEME36180 | 18.0 | 16 | 45 | 100 |
| SEME3618018S | 18.0 | 18 | 45 | 100 |
| SEME36190 | 19.0 | 20 | 45 | 100 |
| SEME36200 | 20.0 | 20 | 45 | 100 |
| SEME36210 | 21.0 | 20 | 45 | 100 |
| SEME36220 | 22.0 | 20 | 45 | 100 |
| SEME36230 | 23.0 | 25 | 50 | 120 |
| SEME36240 | 24.0 | 25 | 50 | 120 |
| SEME36250 | 25.0 | 25 | 50 | 120 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

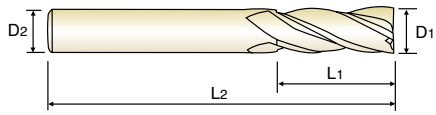
# 4G MILL END MILLS

**SEME71 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
  - Designed equal index flute for long length end mills.
- Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- Available various length products like short, regular and long length end mills etc.





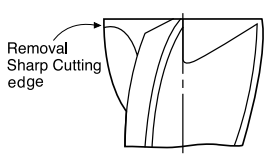

MG | 4 | M-Helix | PLAIN

P.804

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|
| SEME7101001 | 1.0 | 6 | 1 | 40 | Short |
| SEME7101002 | 1.0 | 6 | 2 | 40 | Short |
| SEME71010 | 1.0 | 6 | 2.5 | 50 | Regular |
| SEME7101003 | 1.0 | 6 | 3 | 50 | Long |
| SEME7101004 | 1.0 | 6 | 4 | 50 | Long |
| SEME7101006 | 1.0 | 6 | 6 | 50 | Long |
| SEME7101202 | 1.2 | 6 | 2 | 40 | Short |
| SEME71012 | 1.2 | 6 | 3 | 50 | Regular |
| SEME7101204 | 1.2 | 6 | 4 | 50 | Long |
| SEME7101206 | 1.2 | 6 | 6 | 50 | Long |
| SEME71015015 | 1.5 | 6 | 1.5 | 40 | Short |
| SEME7101503 | 1.5 | 6 | 3 | 40 | Short |
| SEME71015 | 1.5 | 6 | 4 | 50 | Regular |
| SEME7101506 | 1.5 | 6 | 6 | 50 | Long |
| SEME7101508 | 1.5 | 6 | 8 | 50 | Long |
| SEME7101510 | 1.5 | 6 | 10 | 50 | Long |
| SEME7102002 | 2.0 | 6 | 2 | 40 | Short |
| SEME7102004 | 2.0 | 6 | 4 | 40 | Short |
| SEME71020 | 2.0 | 6 | 6 | 50 | Regular |
| SEME7102008 | 2.0 | 6 | 8 | 50 | Long |
| SEME7102010 | 2.0 | 6 | 10 | 50 | Long |
| SEME7102012 | 2.0 | 6 | 12 | 50 | Long |
| SEME71025025 | 2.5 | 6 | 2.5 | 40 | Short |
| SEME7102505 | 2.5 | 6 | 5 | 40 | Short |
| SEME71025 | 2.5 | 6 | 7 | 50 | Regular |
| SEME7102510 | 2.5 | 6 | 10 | 50 | Long |




▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

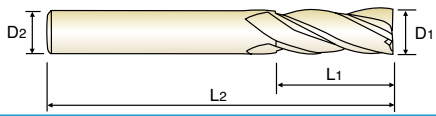
# 4G MILL END MILLS

**SEME71 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
  - Designed equal index flute for long length end mills.
- Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- Available various length products like short, regular and long length end mills etc.






MG | 4 | M-Helix | PLAIN

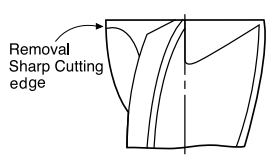
P.804

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|
| SEME7102512 | 2.5 | 6 | 12 | 50 | Long |
| SEME7103003 | 3.0 | 6 | 3 | 40 | Short |
| SEME7103006 | 3.0 | 6 | 6 | 40 | Short |
| SEME71030 | 3.0 | 6 | 8 | 50 | Regular |
| SEME7103010 | 3.0 | 6 | 10 | 50 | Long |
| SEME7103012 | 3.0 | 6 | 12 | 50 | Long |
| SEME7103014 | 3.0 | 6 | 14 | 50 | Long |
| SEME7104004 | 4.0 | 6 | 4 | 40 | Short |
| SEME7104008 | 4.0 | 6 | 8 | 40 | Short |
| SEME71040 | 4.0 | 6 | 10 | 50 | Regular |
| SEME7104012 | 4.0 | 6 | 12 | 50 | Long |
| SEME7104014 | 4.0 | 6 | 14 | 50 | Long |
| SEME7104016 | 4.0 | 6 | 16 | 50 | Long |
| SEME7105005 | 5.0 | 6 | 5 | 50 | Short |
| SEME7105010 | 5.0 | 6 | 10 | 50 | Short |
| SEME71050 | 5.0 | 6 | 15 | 60 | Regular |
| SEME7105020 | 5.0 | 6 | 20 | 60 | Long |
| SEME7105025 | 5.0 | 6 | 25 | 60 | Long |
| SEME7106006 | 6.0 | 6 | 6 | 50 | Short |
| SEME7106012 | 6.0 | 6 | 12 | 50 | Short |
| SEME71060 | 6.0 | 6 | 15 | 60 | Regular |
| SEME7106020 | 6.0 | 6 | 20 | 60 | Long |
| SEME7106025 | 6.0 | 6 | 25 | 60 | Long |
| SEME7108016 | 8.0 | 8 | 16 | 60 | Short |
| SEME71080 | 8.0 | 8 | 20 | 70 | Regular |
| SEME7108025 | 8.0 | 8 | 25 | 70 | Long |

▶ NEXT PAGE




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

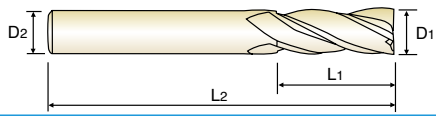
# 4G MILL END MILLS

**SEME71 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- ▶Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- ▶Excellent for cutting prehardened steels, carbon steels, alloy steels of molds and dies, up to HRc55 and machine parts.
- ▶Due to Multiple Helix for 3.0mm and over 3.0mm diameter end mills, vibration can be minimized at cutting, and wear of cutting tool can be decreased too.
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- ▶Due to gash land geometry used at end tooth, heavy duty cutting can be achieved.
- ▶Available various length products like short, regular and long length end mills etc.






MG | 4 | M-Helix | PLAIN

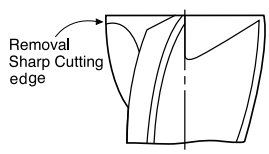
P.804

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|
| SEME7108030 | 8.0 | 8 | 30 | 70 | Long |
| SEME7110022 | 10.0 | 10 | 22 | 65 | Short |
| SEME71100 | 10.0 | 10 | 25 | 75 | Regular |
| SEME7110030 | 10.0 | 10 | 30 | 75 | Long |
| SEME7110035 | 10.0 | 10 | 35 | 75 | Long |
| SEME7112026 | 12.0 | 12 | 26 | 70 | Short |
| SEME71120 | 12.0 | 12 | 30 | 80 | Regular |
| SEME7112035 | 12.0 | 12 | 35 | 80 | Long |
| SEME7112040 | 12.0 | 12 | 40 | 80 | Long |
| SEME71140 | 14.0 | 16 | 35 | 100 | Regular |
| SEME7116032 | 16.0 | 16 | 32 | 100 | Short |
| SEME71160 | 16.0 | 16 | 40 | 100 | Regular |
| SEME71180 | 18.0 | 20 | 45 | 100 | Regular |
| SEME71200 | 20.0 | 20 | 45 | 100 | Regular |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

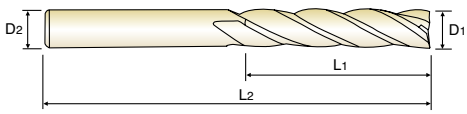
# 4G MILL END MILLS

**SEME72 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.






MG | 4 | 30° | PLAIN

P.805, 806

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7201003 | 1.0 | 6 | 3 | 60 |
| SEME7201004 | 1.0 | 6 | 4 | 60 |
| SEME7201005 | 1.0 | 6 | 5 | 60 |
| SEME7201006 | 1.0 | 6 | 6 | 60 |
| SEME7201007 | 1.0 | 6 | 7 | 60 |
| SEME7201008 | 1.0 | 6 | 8 | 60 |
| SEME7201010 | 1.0 | 6 | 10 | 60 |
| SEME7201012 | 1.0 | 6 | 12 | 60 |
| SEME7201204 | 1.2 | 6 | 4 | 60 |
| SEME7201206 | 1.2 | 6 | 6 | 60 |
| SEME7201208 | 1.2 | 6 | 8 | 60 |
| SEME7201210 | 1.2 | 6 | 10 | 60 |
| SEME7201212 | 1.2 | 6 | 12 | 60 |
| SEME7201506 | 1.5 | 6 | 6 | 60 |
| SEME7201508 | 1.5 | 6 | 8 | 60 |
| SEME7201510 | 1.5 | 6 | 10 | 60 |
| SEME7201512 | 1.5 | 6 | 12 | 60 |
| SEME7201514 | 1.5 | 6 | 14 | 60 |
| SEME7201516 | 1.5 | 6 | 16 | 60 |
| SEME7202008 | 2.0 | 6 | 8 | 60 |
| SEME7202010 | 2.0 | 6 | 10 | 60 |
| SEME7202012 | 2.0 | 6 | 12 | 60 |
| SEME7202014 | 2.0 | 6 | 14 | 60 |
| SEME7202016 | 2.0 | 6 | 16 | 60 |
| SEME7202510 | 2.5 | 6 | 10 | 60 |
| SEME7202512 | 2.5 | 6 | 12 | 60 |
| SEME7202516 | 2.5 | 6 | 16 | 60 |
| SEME7202520 | 2.5 | 6 | 20 | 60 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

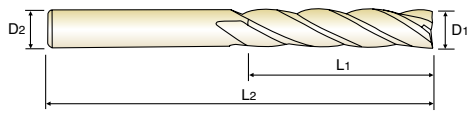
# 4G MILL END MILLS

**SEME72 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.






MG | 4 | 30° | PLAIN

P.805, 806

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7202526 | 2.5 | 6 | 26 | 60 |
| SEME720301635 | 3.0 | 3 | 16 | 100 |
| SEME7203010 | 3.0 | 6 | 10 | 70 |
| SEME7203012 | 3.0 | 6 | 12 | 70 |
| SEME7203014 | 3.0 | 6 | 14 | 70 |
| SEME7203016 | 3.0 | 6 | 16 | 70 |
| SEME7203020 | 3.0 | 6 | 20 | 70 |
| SEME7203026 | 3.0 | 6 | 26 | 70 |
| SEME7203030 | 3.0 | 6 | 30 | 70 |
| SEME720402045 | 4.0 | 4 | 20 | 100 |
| SEME7204012 | 4.0 | 6 | 12 | 70 |
| SEME7204016 | 4.0 | 6 | 16 | 70 |
| SEME7204020 | 4.0 | 6 | 20 | 70 |
| SEME7204026 | 4.0 | 6 | 26 | 70 |
| SEME7204030 | 4.0 | 6 | 30 | 70 |
| SEME7205020 | 5.0 | 6 | 20 | 70 |
| SEME7205025 | 5.0 | 6 | 25 | 70 |
| SEME7205025100 | 5.0 | 6 | 25 | 100 |
| SEME7205030 | 5.0 | 6 | 30 | 80 |
| SEME7205035 | 5.0 | 6 | 35 | 90 |
| SEME7205040 | 5.0 | 6 | 40 | 100 |
| SEME7206015 | 6.0 | 6 | 15 | 60 |
| SEME7206015080 | 6.0 | 6 | 15 | 80 |
| SEME7206020 | 6.0 | 6 | 20 | 70 |
| SEME7206020090 | 6.0 | 6 | 20 | 90 |
| SEME7206025 | 6.0 | 6 | 25 | 75 |
| SEME7206030 | 6.0 | 6 | 30 | 80 |
| SEME7206030100 | 6.0 | 6 | 30 | 100 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

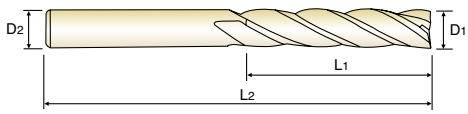
# 4G MILL END MILLS

**SEME72 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.






MG 4 30° PLAIN

P.805, 806

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7206030150 | 6.0 | 6 | 30 | 150 |
| SEME7206035 | 6.0 | 6 | 35 | 90 |
| SEME7206040 | 6.0 | 6 | 40 | 90 |
| SEME7206040120 | 6.0 | 6 | 40 | 120 |
| SEME7206045 | 6.0 | 6 | 45 | 150 |
| SEME7208025 | 8.0 | 8 | 25 | 80 |
| SEME7208030 | 8.0 | 8 | 30 | 80 |
| SEME7208030100 | 8.0 | 8 | 30 | 100 |
| SEME7208035 | 8.0 | 8 | 35 | 90 |
| SEME7208040 | 8.0 | 8 | 40 | 90 |
| SEME7208040120 | 8.0 | 8 | 40 | 120 |
| SEME7208040150 | 8.0 | 8 | 40 | 150 |
| SEME7208045 | 8.0 | 8 | 45 | 100 |
| SEME7208050 | 8.0 | 8 | 50 | 100 |
| SEME7208050150 | 8.0 | 8 | 50 | 150 |
| SEME7210030 | 10.0 | 10 | 30 | 80 |
| SEME7210030100 | 10.0 | 10 | 30 | 100 |
| SEME7210035 | 10.0 | 10 | 35 | 90 |
| SEME7210040 | 10.0 | 10 | 40 | 90 |
| SEME7210040120 | 10.0 | 10 | 40 | 120 |
| SEME7210045 | 10.0 | 10 | 45 | 100 |
| SEME7210050 | 10.0 | 10 | 50 | 100 |
| SEME7210050150 | 10.0 | 10 | 50 | 150 |
| SEME7210050200 | 10.0 | 10 | 50 | 200 |
| SEME7210055 | 10.0 | 10 | 55 | 150 |
| SEME7210060 | 10.0 | 10 | 60 | 110 |
| SEME7210060200 | 10.0 | 10 | 60 | 200 |
| SEME7212035 | 12.0 | 12 | 35 | 90 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

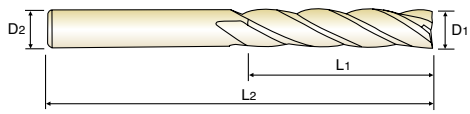
# 4G MILL END MILLS

**SEME72 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

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- Available various length of cut and overall length products.






MG | 4 | 30° | PLAIN

P.805, 806

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7212040 | 12.0 | 12 | 40 | 100 |
| SEME7212040120 | 12.0 | 12 | 40 | 120 |
| SEME7212045 | 12.0 | 12 | 45 | 130 |
| SEME7212050 | 12.0 | 12 | 50 | 100 |
| SEME7212050150 | 12.0 | 12 | 50 | 150 |
| SEME7212055 | 12.0 | 12 | 55 | 110 |
| SEME7212060 | 12.0 | 12 | 60 | 110 |
| SEME7212060150 | 12.0 | 12 | 60 | 150 |
| SEME7212060200 | 12.0 | 12 | 60 | 200 |
| SEME7212065 | 12.0 | 12 | 65 | 150 |
| SEME7212070 | 12.0 | 12 | 70 | 120 |
| SEME7212070200 | 12.0 | 12 | 70 | 200 |
| SEME7214050 | 14.0 | 16 | 50 | 110 |
| SEME7214060 | 14.0 | 16 | 60 | 150 |
| SEME7216040 | 16.0 | 16 | 40 | 150 |
| SEME7216050 | 16.0 | 16 | 50 | 110 |
| SEME7216050150 | 16.0 | 16 | 50 | 150 |
| SEME7216060 | 16.0 | 16 | 60 | 120 |
| SEME7216070 | 16.0 | 16 | 70 | 130 |
| SEME7216070150 | 16.0 | 16 | 70 | 150 |
| SEME7216070200 | 16.0 | 16 | 70 | 200 |
| SEME7216080 | 16.0 | 16 | 80 | 150 |
| SEME7216090 | 16.0 | 16 | 90 | 150 |
| SEME72160110 | 16.0 | 16 | 110 | 200 |
| SEME72160120 | 16.0 | 16 | 120 | 250 |
| SEME7218050 | 18.0 | 20 | 50 | 120 |
| SEME7218070 | 18.0 | 20 | 70 | 130 |
| SEME72180100 | 18.0 | 20 | 100 | 200 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

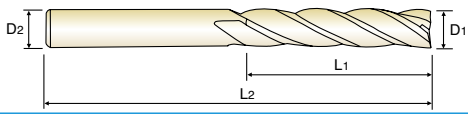
# 4G MILL END MILLS

**SEME72 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
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- Available various length of cut and overall length products.






MG | 4 | 30° | PLAIN

P.805, 806

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 |
|---|---|---|---|---|
| SEME7220050 | 20.0 | 20 | 50 | 110 |
| SEME7220050150 | 20.0 | 20 | 50 | 150 |
| SEME7220060 | 20.0 | 20 | 60 | 130 |
| SEME7220070 | 20.0 | 20 | 70 | 130 |
| SEME7220080 | 20.0 | 20 | 80 | 150 |
| SEME7220090 | 20.0 | 20 | 90 | 150 |
| SEME7220090200 | 20.0 | 20 | 90 | 200 |
| SEME72200110 | 20.0 | 20 | 110 | 200 |
| SEME72200120 | 20.0 | 20 | 120 | 250 |
| SEME7222075 | 22.0 | 20 | 75 | 150 |
| SEME72220110 | 22.0 | 20 | 110 | 200 |
| SEME7225070 | 25.0 | 25 | 70 | 150 |
| SEME7225090 | 25.0 | 25 | 90 | 150 |
| SEME72250110 | 25.0 | 25 | 110 | 200 |
| SEME72250120 | 25.0 | 25 | 120 | 250 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

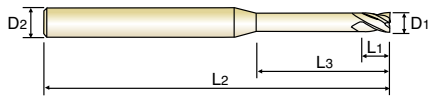
# 4G MILL END MILLS

**SEME73 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.






MG | 4 | 30° | PLAIN

P.807~809

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEME7301002 | 1.0 | 4 | 1.5 | 2 | 50 |
| SEME7301003 | 1.0 | 4 | 1.5 | 3 | 50 |
| SEME7301004 | 1.0 | 4 | 1.5 | 4 | 50 |
| SEME7301005 | 1.0 | 4 | 1.5 | 5 | 50 |
| SEME7301006 | 1.0 | 4 | 1.5 | 6 | 50 |
| SEME7301007 | 1.0 | 4 | 1.5 | 7 | 50 |
| SEME7301008 | 1.0 | 4 | 1.5 | 8 | 50 |
| SEME7301010 | 1.0 | 4 | 1.5 | 10 | 50 |
| SEME7301012 | 1.0 | 4 | 1.5 | 12 | 50 |
| SEME7301014 | 1.0 | 4 | 1.5 | 14 | 50 |
| SEME7301016 | 1.0 | 4 | 1.5 | 16 | 50 |
| SEME7301018 | 1.0 | 4 | 1.5 | 18 | 50 |
| SEME7301020 | 1.0 | 4 | 1.5 | 20 | 50 |
| SEME7301022 | 1.0 | 4 | 1.5 | 22 | 60 |
| SEME7301026 | 1.0 | 4 | 1.5 | 26 | 60 |
| SEME7301030 | 1.0 | 4 | 1.5 | 30 | 70 |
| SEME7301040 | 1.0 | 4 | 1.5 | 40 | 80 |
| SEME7301050 | 1.0 | 4 | 1.5 | 50 | 100 |
| SEME7301204 | 1.2 | 4 | 1.8 | 4 | 50 |
| SEME7301206 | 1.2 | 4 | 1.8 | 6 | 50 |
| SEME7301208 | 1.2 | 4 | 1.8 | 8 | 50 |
| SEME7301210 | 1.2 | 4 | 1.8 | 10 | 50 |
| SEME7301212 | 1.2 | 4 | 1.8 | 12 | 50 |
| SEME7301214 | 1.2 | 4 | 1.8 | 14 | 50 |
| SEME7301216 | 1.2 | 4 | 1.8 | 16 | 50 |
| SEME7301220 | 1.2 | 4 | 1.8 | 20 | 50 |
| SEME7301226 | 1.2 | 4 | 1.8 | 26 | 60 |
| SEME7301230 | 1.2 | 4 | 1.8 | 30 | 70 |
| SEME7301504 | 1.5 | 4 | 2.3 | 4 | 50 |
| SEME7301505 | 1.5 | 4 | 2.3 | 5 | 50 |
| SEME7301506 | 1.5 | 4 | 2.3 | 6 | 50 |
| SEME7301507 | 1.5 | 4 | 2.3 | 7 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

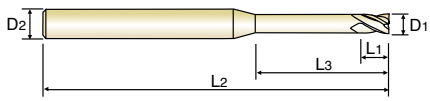
# 4G MILL END MILLS

**SEME73 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK

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MG 4 30° PLAIN

P.807~809

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter $D_1$ | Shank Diameter $D_2$ | Length of Cut $L_1$ | Length Below Shank $L_3$ | Overall Length $L_2$ |
|---|---|---|---|---|---|
| SEME7301508 | 1.5 | 4 | 2.3 | 8 | 50 |
| SEME7301510 | 1.5 | 4 | 2.3 | 10 | 50 |
| SEME7301512 | 1.5 | 4 | 2.3 | 12 | 50 |
| SEME7301514 | 1.5 | 4 | 2.3 | 14 | 50 |
| SEME7301516 | 1.5 | 4 | 2.3 | 16 | 50 |
| SEME7301518 | 1.5 | 4 | 2.3 | 18 | 50 |
| SEME7301520 | 1.5 | 4 | 2.3 | 20 | 50 |
| SEME7301522 | 1.5 | 4 | 2.3 | 22 | 60 |
| SEME7301526 | 1.5 | 4 | 2.3 | 26 | 60 |
| SEME7301530 | 1.5 | 4 | 2.3 | 30 | 70 |
| SEME7302006 | 2.0 | 4 | 3 | 6 | 50 |
| SEME7302008 | 2.0 | 4 | 3 | 8 | 50 |
| SEME7302010 | 2.0 | 4 | 3 | 10 | 50 |
| SEME7302012 | 2.0 | 4 | 3 | 12 | 50 |
| SEME7302014 | 2.0 | 4 | 3 | 14 | 50 |
| SEME7302016 | 2.0 | 4 | 3 | 16 | 50 |
| SEME7302018 | 2.0 | 4 | 3 | 18 | 50 |
| SEME7302020 | 2.0 | 4 | 3 | 20 | 50 |
| SEME7302022 | 2.0 | 4 | 3 | 22 | 60 |
| SEME7302026 | 2.0 | 4 | 3 | 26 | 60 |
| SEME7302030 | 2.0 | 4 | 3 | 30 | 70 |
| SEME7302035 | 2.0 | 4 | 3 | 35 | 70 |
| SEME7302040 | 2.0 | 4 | 3 | 40 | 80 |
| SEME7302045 | 2.0 | 4 | 3 | 45 | 90 |
| SEME7302050 | 2.0 | 4 | 3 | 50 | 100 |
| SEME7302060 | 2.0 | 4 | 3 | 60 | 110 |
| SEME7302508 | 2.5 | 4 | 4 | 8 | 50 |
| SEME7302510 | 2.5 | 4 | 4 | 10 | 50 |
| SEME7302512 | 2.5 | 4 | 4 | 12 | 50 |
| SEME7302514 | 2.5 | 4 | 4 | 14 | 50 |
| SEME7302516 | 2.5 | 4 | 4 | 16 | 50 |
| SEME7302518 | 2.5 | 4 | 4 | 18 | 50 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

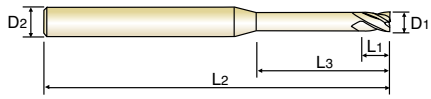
# 4G MILL END MILLS

**SEME73 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK

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MG | 4 | 30° | PLAIN

P.807~809

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEME7302520 | 2.5 | 4 | 4 | 20 | 50 |
| SEME7302522 | 2.5 | 4 | 4 | 22 | 60 |
| SEME7302526 | 2.5 | 4 | 4 | 26 | 60 |
| SEME7302530 | 2.5 | 4 | 4 | 30 | 70 |
| SEME7302535 | 2.5 | 4 | 4 | 35 | 70 |
| SEME7302540 | 2.5 | 4 | 4 | 40 | 80 |
| SEME7302545 | 2.5 | 4 | 4 | 45 | 90 |
| SEME7302550 | 2.5 | 4 | 4 | 50 | 100 |
| SEME7303006 | 3.0 | 6 | 4.5 | 6 | 50 |
| SEME7303008 | 3.0 | 6 | 4.5 | 8 | 50 |
| SEME7303010 | 3.0 | 6 | 4.5 | 10 | 50 |
| SEME7303012 | 3.0 | 6 | 4.5 | 12 | 50 |
| SEME7303014 | 3.0 | 6 | 4.5 | 14 | 60 |
| SEME7303016 | 3.0 | 6 | 4.5 | 16 | 60 |
| SEME7303018 | 3.0 | 6 | 4.5 | 18 | 60 |
| SEME7303020 | 3.0 | 6 | 4.5 | 20 | 60 |
| SEME7303022 | 3.0 | 6 | 4.5 | 22 | 65 |
| SEME7303026 | 3.0 | 6 | 4.5 | 26 | 65 |
| SEME7303030 | 3.0 | 6 | 4.5 | 30 | 70 |
| SEME7303035 | 3.0 | 6 | 4.5 | 35 | 70 |
| SEME7303040 | 3.0 | 6 | 4.5 | 40 | 80 |
| SEME7303045 | 3.0 | 6 | 4.5 | 45 | 90 |
| SEME7303050 | 3.0 | 6 | 4.5 | 50 | 100 |
| SEME7303060 | 3.0 | 6 | 4.5 | 60 | 100 |
| SEME7304008 | 4.0 | 6 | 6 | 8 | 50 |
| SEME7304010 | 4.0 | 6 | 6 | 10 | 50 |
| SEME7304012 | 4.0 | 6 | 6 | 12 | 50 |
| SEME7304014 | 4.0 | 6 | 6 | 14 | 60 |
| SEME7304016 | 4.0 | 6 | 6 | 16 | 60 |
| SEME7304018 | 4.0 | 6 | 6 | 18 | 60 |
| SEME7304020 | 4.0 | 6 | 6 | 20 | 60 |
| SEME7304022 | 4.0 | 6 | 6 | 22 | 65 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

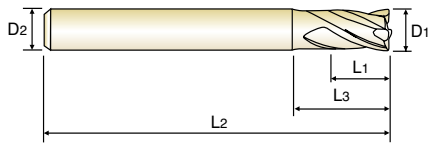
# 4G MILL END MILLS

**SEME73 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG NECK

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Available various length of cut and overall length products.






MG 4 30° PLAIN

P.807~809

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 |
|---|---|---|---|---|---|
| SEME7304026 | 4.0 | 6 | 6 | 26 | 65 |
| SEME7304030 | 4.0 | 6 | 6 | 30 | 70 |
| SEME7304035 | 4.0 | 6 | 6 | 35 | 70 |
| SEME7304040 | 4.0 | 6 | 6 | 40 | 80 |
| SEME7304045 | 4.0 | 6 | 6 | 45 | 90 |
| SEME7304050 | 4.0 | 6 | 6 | 50 | 100 |
| SEME7304060 | 4.0 | 6 | 6 | 60 | 100 |
| SEME7305016 | 5.0 | 6 | 8 | 16 | 60 |
| SEME7305020 | 5.0 | 6 | 8 | 20 | 60 |
| SEME7305026 | 5.0 | 6 | 8 | 26 | 65 |
| SEME7305030 | 5.0 | 6 | 8 | 30 | 70 |
| SEME7305035 | 5.0 | 6 | 8 | 35 | 75 |
| SEME7305040 | 5.0 | 6 | 8 | 40 | 80 |
| SEME7305050 | 5.0 | 6 | 8 | 50 | 90 |
| SEME7305060 | 5.0 | 6 | 8 | 60 | 100 |
| SEME7306015 | 6.0 | 6 | 9 | 15 | 60 |
| SEME7306020 | 6.0 | 6 | 9 | 20 | 60 |
| SEME7306030 | 6.0 | 6 | 9 | 30 | 70 |
| SEME7306032 | 6.0 | 6 | 9 | 32 | 90 |
| SEME7308025 | 8.0 | 8 | 12 | 25 | 70 |
| SEME7308030 | 8.0 | 8 | 12 | 30 | 80 |
| SEME7308042 | 8.0 | 8 | 12 | 42 | 100 |
| SEME7310030 | 10.0 | 10 | 15 | 30 | 75 |
| SEME7310035 | 10.0 | 10 | 15 | 35 | 80 |
| SEME7310045 | 10.0 | 10 | 15 | 45 | 100 |
| SEME7312035 | 12.0 | 12 | 20 | 35 | 80 |
| SEME7312040 | 12.0 | 12 | 20 | 40 | 90 |
| SEME7312050 | 12.0 | 12 | 20 | 50 | 110 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

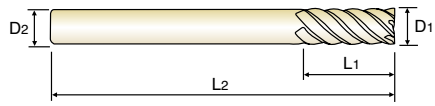
# 4G MILL END MILLS

**SEME75 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 45º HELIX (Regular, Long Shank)

- Due to new coating and new tool geometry, outstanding cutting ability and wear resistance.
- Excellent performance when cutting prehardened steels, up to HRc55 which are used for molds & dies.
- Due to 45 helix angle, better surface roughness can be achieved at side cutting.
- Available various effective length and overall length products.






MG | 6 | 45° | PLAIN

P.810, 811

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Overall Length L2 | Remark |
|---|---|---|---|---|---|
| SEME75060 | 6.0 | 6 | 15 | 60 | Regular |
| SEME7506020 | 6.0 | 6 | 20 | 70 | Long |
| SEME7506030 | 6.0 | 6 | 30 | 80 | Long |
| SEME7506030110 | 6.0 | 6 | 30 | 110 | Long |
| SEME75080 | 8.0 | 8 | 20 | 70 | Regular |
| SEME7508030 | 8.0 | 8 | 30 | 80 | Long |
| SEME7508035 | 8.0 | 8 | 35 | 90 | Long |
| SEME7508040 | 8.0 | 8 | 40 | 90 | Long |
| SEME7508040130 | 8.0 | 8 | 40 | 130 | Long |
| SEME75100 | 10.0 | 10 | 25 | 75 | Regular |
| SEME7510030 | 10.0 | 10 | 30 | 80 | Long |
| SEME7510040 | 10.0 | 10 | 40 | 90 | Long |
| SEME7510050 | 10.0 | 10 | 50 | 100 | Long |
| SEME7510050150 | 10.0 | 10 | 50 | 150 | Long |
| SEME75120 | 12.0 | 12 | 30 | 80 | Regular |
| SEME7512040 | 12.0 | 12 | 40 | 90 | Long |
| SEME7512050 | 12.0 | 12 | 50 | 100 | Long |
| SEME7512060 | 12.0 | 12 | 60 | 110 | Long |
| SEME7512060150 | 12.0 | 12 | 60 | 150 | Long |
| SEME75160 | 16.0 | 16 | 40 | 100 | Regular |
| SEME7516050 | 16.0 | 16 | 50 | 110 | Long |
| SEME7516060 | 16.0 | 16 | 60 | 120 | Long |
| SEME7516090 | 16.0 | 16 | 90 | 150 | Long |
| SEME75160110 | 16.0 | 16 | 110 | 200 | Long |
| SEME75160110250 | 16.0 | 16 | 110 | 250 | Long |
| SEME75200 | 20.0 | 20 | 45 | 100 | Regular |
| SEME7520060 | 20.0 | 20 | 60 | 120 | Long |
| SEME7520070 | 20.0 | 20 | 70 | 130 | Long |
| SEME75200110 | 20.0 | 20 | 110 | 200 | Long |
| SEME75200110250 | 20.0 | 20 | 110 | 250 | Long |
| SEME75200110300 | 20.0 | 20 | 110 | 300 | Long |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

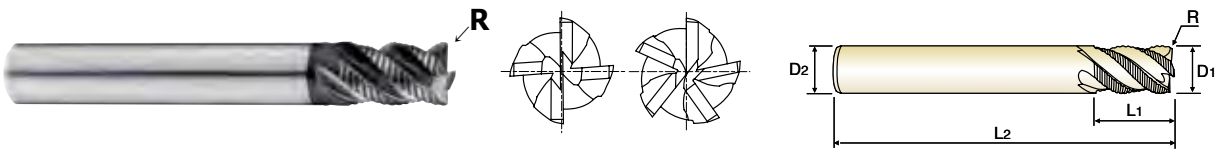
# 4G MILL END MILLS

X-SPEED ROUGHER

**G9D75 SERIES** PLAIN SHANK
**G9D67 SERIES** FLAT SHANK

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.




MG | 4&5 | M-Helix | PLAIN

P.812

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **G9D75060** | **G9D67060** | R0.5 | **6.0** | 6 | 9 | 57 | 4 |
| **G9D75080** | **G9D67080** | R0.5 | **8.0** | 8 | 12 | 63 | 4 |
| **G9D75100** | **G9D67100** | R0.5 | **10.0** | 10 | 15 | 72 | 4 |
| **G9D75120** | **G9D67120** | R0.5 | **12.0** | 12 | 18 | 83 | 4 |
| **G9D75160** | **G9D67160** | R1.0 | **16.0** | 16 | 24 | 92 | 5 |
| **G9D75200** | **G9D67200** | R1.0 | **20.0** | 20 | 30 | 104 | 5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.05 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

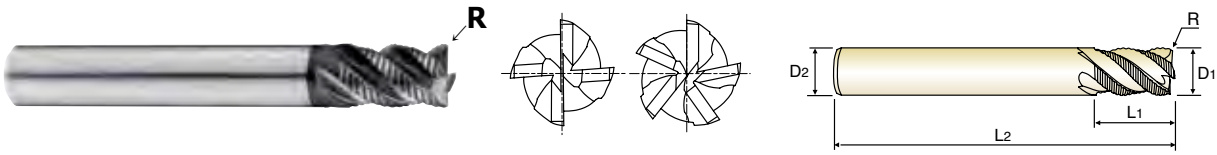
# 4G MILL END MILLS

X-SPEED ROUGHER

**G9D76 SERIES** PLAIN SHANK
**G9D68 SERIES** FLAT SHANK

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.




MG | 4&5 | M-Helix | PLAIN

P.812

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| G9D76060 | G9D68060 | R0.5 | 6.0 | 6 | 9 | 57 | 4 |
| G9D76080 | G9D68080 | R0.5 | 8.0 | 8 | 12 | 63 | 4 |
| G9D76100 | G9D68100 | R0.5 | 10.0 | 10 | 15 | 72 | 4 |
| G9D76120 | G9D68120 | R0.5 | 12.0 | 12 | 18 | 83 | 4 |
| G9D76160 | G9D68160 | R1.0 | 16.0 | 16 | 24 | 92 | 5 |
| G9D76200 | G9D68200 | R1.0 | 20.0 | 20 | 30 | 104 | 5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.05 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

# 4G MILL END MILLS

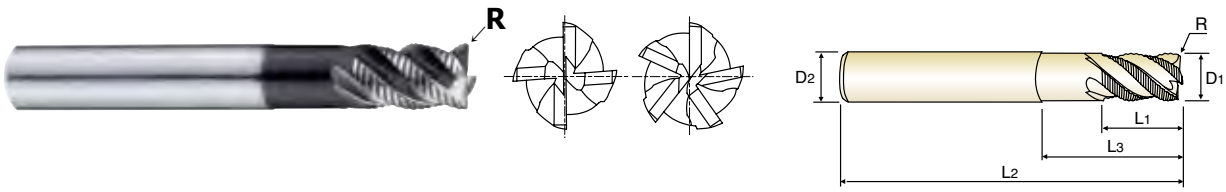
X-SPEED ROUGHER

G9D77 SERIES PLAIN SHANK

G9D69 SERIES FLAT SHANK

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX LONG REACH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.




MG 4&5 M-Helix PLAIN P.812

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | |
| G9D77060 | G9D69060 | R0.5 | 6.0 | 6 | 9 | 18 | 57 | 4 |
| G9D77080 | G9D69080 | R0.5 | 8.0 | 8 | 12 | 24 | 63 | 4 |
| G9D77100 | G9D69100 | R0.5 | 10.0 | 10 | 15 | 30 | 72 | 4 |
| G9D77120 | G9D69120 | R0.5 | 12.0 | 12 | 18 | 36 | 83 | 4 |
| G9D77160 | G9D69160 | R1.0 | 16.0 | 16 | 24 | 48 | 100 | 5 |
| G9D77200 | G9D69200 | R1.0 | 20.0 | 20 | 30 | 60 | 110 | 5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.05 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ◎ | ○ | | | | | | |

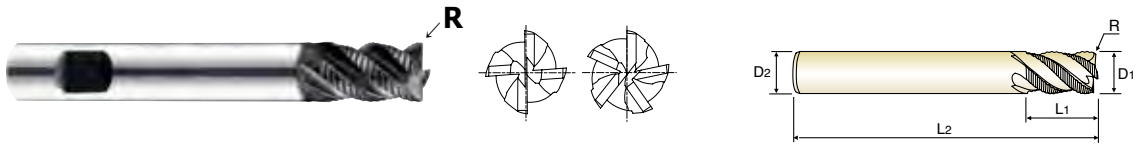
# 4G MILL END MILLS

X-SPEED ROUGHER

GAE53 SERIES FLAT SHANK

## HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH ROUGHING CORNER RADIUS

- Unique flute design for excellent chip evacuation and vibration reduction.
- Optimal roughing tooth profile to reduce cutting forces.
- Special tool geometry for high feed rate and heavy cutting.
- Strong end tooth design for plunge and pocket milling.
- Custom engineered coating to allow long tool life and excellent chip evacuation.




HSS PM | 4&5 | M-Helix | FLAT

P.813

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| FLAT | R | Metric D1(js12) | Inch D1(js12) | D2(h6) | L1 | L2 | |
| GAE53060 | R0.5 | 6.0 | .2362 | 6 | 13 | 57 | 4 |
| GAE53070 | R0.5 | 7.0 | .2756 | 10 | 16 | 66 | 4 |
| GAE53080 | R0.5 | 8.0 | .3150 | 10 | 19 | 69 | 4 |
| GAE53090 | R0.5 | 9.0 | .3543 | 10 | 19 | 69 | 4 |
| GAE53100 | R0.5 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| GAE53120 | R0.5 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| GAE53140 | R1.0 | 14.0 | .5512 | 16 | 26 | 83 | 5 |
| GAE53160 | R1.0 | 16.0 | .6299 | 16 | 32 | 92 | 5 |
| GAE53180 | R1.0 | 18.0 | .7087 | 20 | 32 | 92 | 5 |
| GAE53200 | R1.0 | 20.0 | .7874 | 20 | 38 | 104 | 5 |

Tolerances according to DIN 7160 & 7161

| Tolerance range in μm | | | | | | |
|---|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 | over 30 to 50 |
| js12 | ± 50 | ± 60 | ± 75 | ± 90 | ± 105 | ± 125 |
| h6 | 0 / − 6 | 0 / − 8 | 0 / − 9 | 0 / − 11 | 0 / − 13 | 0 / − 16 |

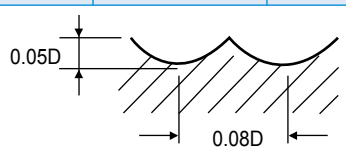
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | ◎ | ◎ | ○ | | | | | | |

## CARBIDE, 2 FLUTE BALL NOSE

### GMF15 SERIES

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | ~ 1100N/mm² | | 1110 ~ 1500N/mm² | | 1500 ~ 2000N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R.002 × .004 | 39400 | 21.3 | 39370 | 19.3 | 32480 | 15.6 |
| R.004 × .008 | 29530 | 28.0 | 29530 | 24.4 | 26570 | 22.2 |
| R.006 × .012 | 29530 | 34.8 | 29530 | 31.3 | 26570 | 28.0 |
| R.075 × .015 | 29490 | 44.1 | 31500 | 42.1 | 28350 | 37.2 |
| R.010 × .020 | 29530 | 55.7 | 29530 | 48.8 | 26570 | 44.1 |
| R.012 × .024 | 29530 | 67.5 | 29530 | 58.1 | 26570 | 51.2 |
| R.014 × .028 | 29530 | 79.1 | 29530 | 67.5 | 26570 | 60.4 |
| R.0155 × .031 | 30480 | 93.5 | 30480 | 79.1 | 27430 | 72.1 |
| R.0175 × .035 | 30370 | 103.9 | 30370 | 89.8 | 27330 | 81.3 |
| R.0234 × 3/64 | 30240 | 121.5 | 29030 | 102.4 | 26000 | 91.7 |
| R1/32 × 1/16 | 28350 | 120.5 | 27210 | 100.4 | 24380 | 89.4 |
| R.0391 × 5/64 | 30050 | 135.6 | 28910 | 114.4 | 24190 | 95.3 |
| R3/64 × 3/32 | 24990 | 145.1 | 24040 | 125.2 | 20160 | 99.2 |
| R1/16 × 1/8 | 18770 | 133.9 | 18030 | 118.3 | 15120 | 89.4 |
| R3/32 × 3/16 | 12310 | 131.7 | 11820 | 113.8 | 9920 | 86.4 |
| R.102 × 13/64 | 10820 | 132.9 | 10350 | 112.2 | 8720 | 85.8 |
| R1/8 × 1/4 | 7880 | 108.3 | 7600 | 91.5 | 6240 | 69.1 |
| R9/64 × 9/32 | 7070 | 102.2 | 6820 | 85.6 | 5680 | 65.6 |
| R5/32 × 5/16 | 6710 | 100.0 | 6470 | 83.3 | 5440 | 64.4 |
| R3/16 × 3/8 | 5860 | 91.7 | 5610 | 77.0 | 4720 | 59.5 |
| R1/4 × 1/2 | 3940 | 65.8 | 3780 | 55.7 | 3170 | 42.3 |
| R9/32 × 9/16 | 3670 | 64.8 | 3530 | 57.9 | 2970 | 41.7 |
| R5/16 × 5/8 | 3370 | 63.2 | 3240 | 52.4 | 2720 | 40.6 |
| R3/8 × 3/4 | 2800 | 58.3 | 2710 | 48.4 | 2270 | 37.2 |




RPM = rev./min.
FEED = inch/min.

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE WITH NECK

### GMF16 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| .008 | 1/64 | 49210 | 13.0 | .0007 | 49210 | 12.0 | .0006 | 42520 | 10.0 | .0004 |
| .008 | 3/64 | 44290 | 10.4 | .0003 | 44290 | 9.7 | .0002 | 38270 | 8.1 | .0002 |
| .012 | 3/64 | 49210 | 18.5 | .0007 | 49210 | 16.7 | .0006 | 42130 | 14.2 | .0004 |
| .012 | 5/64 | 44290 | 15.0 | .0004 | 44290 | 13.6 | .0004 | 37910 | 11.4 | .0002 |
| .012 | 1/8 | 39370 | 11.8 | .0003 | 39370 | 10.6 | .0002 | 33700 | 9.1 | .0002 |
| .015 | 3/64 | 43040 | 20.3 | .0009 | 40730 | 17.5 | .0008 | 35910 | 14.0 | .0005 |
| .015 | 5/64 | 38740 | 16.3 | .0006 | 36660 | 14.2 | .0004 | 32310 | 11.4 | .0003 |
| .015 | 1/8 | 38740 | 16.3 | .0004 | 36660 | 14.2 | .0003 | 32310 | 11.4 | .0002 |
| .015 | 5/32 | 34440 | 13.0 | .0004 | 32590 | 11.2 | .0003 | 28720 | 9.1 | .0002 |
| .020 | 3/64 | 33660 | 26.6 | .0018 | 31790 | 22.4 | .0015 | 28050 | 19.9 | .0010 |
| .020 | 5/64 | 33660 | 26.6 | .0013 | 31790 | 22.4 | .0011 | 28050 | 19.9 | .0007 |
| .020 | 1/8 | 30300 | 21.5 | .0007 | 28610 | 18.1 | .0006 | 25250 | 16.1 | .0004 |
| .020 | 5/32 | 30300 | 21.5 | .0007 | 28610 | 18.1 | .0006 | 25250 | 16.1 | .0004 |
| .020 | 3/16 | 30300 | 21.5 | .0004 | 28610 | 18.1 | .0004 | 25250 | 16.1 | .0002 |
| .020 | 1/4 | 26930 | 16.9 | .0004 | 25430 | 14.4 | .0004 | 22440 | 12.8 | .0002 |
| .020 | 5/16 | 20200 | 11.2 | .0003 | 19070 | 9.5 | .0002 | 16830 | 8.5 | .0002 |
| .020 | 3/8 | 20200 | 11.2 | .0002 | 19070 | 9.5 | .0002 | 16830 | 8.5 | .0001 |
| .024 | 5/64 | 33660 | 39.8 | .0015 | 31790 | 32.5 | .0013 | 28050 | 26.6 | .0008 |
| .024 | 1/8 | 30300 | 32.1 | .0009 | 28610 | 26.4 | .0007 | 25250 | 21.5 | .0005 |
| .024 | 5/32 | 30300 | 32.1 | .0009 | 28610 | 26.4 | .0007 | 25250 | 21.5 | .0005 |
| .024 | 3/16 | 30300 | 32.1 | .0009 | 28610 | 26.4 | .0007 | 25250 | 21.5 | .0005 |
| .024 | 1/4 | 26930 | 25.4 | .0006 | 25430 | 20.9 | .0004 | 22440 | 16.9 | .0003 |
| .024 | 5/16 | 26930 | 25.4 | .0003 | 25430 | 20.9 | .0003 | 22440 | 16.9 | .0002 |
| .024 | 3/8 | 20200 | 16.7 | .0003 | 19070 | 13.6 | .0003 | 16830 | 11.2 | .0002 |
| .024 | 1/2 | 10100 | 7.1 | .0002 | 9540 | 5.9 | .0002 | 8420 | 4.7 | .0001 |
| 1/32 | 5/64 | 34470 | 48.8 | .0028 | 32550 | 41.1 | .0024 | 28720 | 33.9 | .0016 |
| 1/32 | 1/8 | 34470 | 48.8 | .0020 | 32550 | 41.1 | .0017 | 28720 | 33.9 | .0011 |
| 1/32 | 5/32 | 34470 | 48.8 | .0020 | 32550 | 41.1 | .0017 | 28720 | 33.9 | .0011 |
| 1/32 | 3/16 | 31020 | 39.6 | .0011 | 29300 | 33.3 | .0009 | 25850 | 27.6 | .0006 |
| 1/32 | 1/4 | 31020 | 39.6 | .0011 | 29300 | 33.3 | .0009 | 25850 | 27.6 | .0006 |
| 1/32 | 5/16 | 31020 | 39.6 | .0007 | 29300 | 33.3 | .0006 | 25850 | 27.6 | .0004 |
| 1/32 | 3/8 | 27580 | 31.3 | .0007 | 26040 | 26.4 | .0006 | 22980 | 21.7 | .0004 |
| 3/64 | 1/8 | 26510 | 54.5 | .0042 | 25000 | 45.7 | .0035 | 22070 | 37.6 | .0024 |
| 3/64 | 5/32 | 26510 | 54.5 | .0030 | 25000 | 45.7 | .0025 | 22070 | 37.6 | .0017 |
| 3/64 | 3/16 | 26510 | 54.5 | .0030 | 25000 | 45.7 | .0025 | 22070 | 37.6 | .0017 |
| 3/64 | 1/4 | 23860 | 44.3 | .0017 | 22500 | 37.0 | .0014 | 19870 | 30.5 | .0009 |
| 3/64 | 5/16 | 23860 | 44.3 | .0017 | 22500 | 37.0 | .0014 | 19870 | 30.5 | .0009 |
| 3/64 | 3/8 | 23860 | 44.3 | .0017 | 22500 | 37.0 | .0014 | 19870 | 30.5 | .0009 |
| 3/64 | 1/2 | 21210 | 34.8 | .0011 | 20000 | 29.1 | .0009 | 17660 | 24.2 | .0006 |
| 3/64 | 9/16 | 21210 | 34.8 | .0011 | 20000 | 29.1 | .0009 | 17660 | 24.2 | .0006 |
| 3/64 | 5/8 | 21210 | 34.8 | .0006 | 20000 | 29.1 | .0005 | 17660 | 24.2 | .0004 |
| 3/64 | 3/4 | 15900 | 22.8 | .0006 | 15000 | 19.1 | .0005 | 13240 | 15.8 | .0004 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

## RECOMMENDED CUTTING CONDITIONS

# CARBIDE, 2 FLUTE BALL NOSE WITH NECK

## GMF16 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 1/16 | 5/32 | 22580 | 58.9 | .0056 | 21350 | 50.4 | .0047 | 18900 | 40.0 | .0031 |
| 1/16 | 1/4 | 22580 | 58.9 | .0039 | 21350 | 50.4 | .0033 | 18900 | 40.0 | .0022 |
| 1/16 | 5/16 | 22580 | 58.9 | .0039 | 21350 | 50.4 | .0033 | 18900 | 40.0 | .0022 |
| 1/16 | 3/8 | 20320 | 47.6 | .0022 | 19220 | 40.8 | .0019 | 17010 | 32.5 | .0013 |
| 1/16 | 1/2 | 20320 | 47.6 | .0022 | 19220 | 40.8 | .0019 | 17010 | 32.5 | .0013 |
| 1/16 | 9/16 | 20320 | 47.6 | .0014 | 19220 | 40.8 | .0012 | 17010 | 32.5 | .0008 |
| 1/16 | 5/8 | 20320 | 47.6 | .0014 | 19220 | 40.8 | .0012 | 17010 | 32.5 | .0008 |
| 1/16 | 3/4 | 18070 | 37.6 | .0014 | 17080 | 32.3 | .0012 | 15120 | 25.6 | .0008 |
| 5/64 | 1/4 | 18140 | 71.3 | .0049 | 17130 | 60.4 | .0041 | 15120 | 50.9 | .0027 |
| 5/64 | 5/16 | 18140 | 71.3 | .0049 | 17130 | 60.4 | .0041 | 15120 | 51.0 | .0027 |
| 5/64 | 3/8 | 18140 | 71.3 | .0049 | 17130 | 60.4 | .0041 | 15120 | 51.0 | .0027 |
| 5/64 | 1/2 | 16330 | 57.7 | .0028 | 15420 | 49.0 | .0024 | 13610 | 41.3 | .0016 |
| 5/64 | 9/16 | 16330 | 57.7 | .0028 | 15420 | 49.0 | .0024 | 13610 | 41.3 | .0016 |
| 5/64 | 5/8 | 16330 | 57.7 | .0028 | 15420 | 49.0 | .0024 | 13610 | 41.3 | .0016 |
| 5/64 | 11/16 | 16330 | 57.7 | .0018 | 15420 | 49.0 | .0015 | 13610 | 41.3 | .0010 |
| 5/64 | 3/4 | 16330 | 57.7 | .0018 | 15420 | 49.0 | .0015 | 13610 | 41.3 | .0010 |
| 5/64 | 1 | 14510 | 45.7 | .0018 | 13710 | 38.8 | .0015 | 12090 | 32.7 | .0010 |
| 5/64 | 1-3/16 | 10890 | 29.9 | .0011 | 10280 | 25.4 | .0009 | 9070 | 21.5 | .0006 |
| 3/32 | 3/8 | 16590 | 79.5 | .0059 | 15640 | 66.3 | .0049 | 13860 | 53.9 | .0033 |
| 3/32 | 3/4 | 14930 | 64.4 | .0034 | 14080 | 53.7 | .0028 | 12470 | 43.7 | .0019 |
| 1/8 | 5/16 | 12940 | 76.2 | .0113 | 12190 | 64.4 | .0094 | 10770 | 53.4 | .0063 |
| 1/8 | 3/8 | 12940 | 76.2 | .0113 | 12190 | 64.4 | .0094 | 10770 | 53.4 | .0063 |
| 1/8 | 1/2 | 12940 | 76.2 | .0079 | 12190 | 64.4 | .0066 | 10770 | 53.4 | .0044 |
| 1/8 | 9/16 | 12940 | 76.2 | .0079 | 12190 | 64.4 | .0066 | 10770 | 53.4 | .0044 |
| 1/8 | 5/8 | 12940 | 76.2 | .0079 | 12190 | 64.4 | .0066 | 10770 | 53.4 | .0044 |
| 1/8 | 11/16 | 11650 | 61.8 | .0045 | 10970 | 52.2 | .0037 | 9690 | 43.3 | .0025 |
| 1/8 | 3/4 | 11650 | 61.8 | .0045 | 10970 | 52.2 | .0037 | 9690 | 43.3 | .0025 |
| 1/8 | 1 | 11650 | 61.8 | .0045 | 10970 | 52.2 | .0037 | 9690 | 43.3 | .0025 |
| 1/8 | 1-3/16 | 11650 | 61.8 | .0028 | 10970 | 52.2 | .0024 | 9690 | 43.3 | .0016 |
| 1/8 | 1-3/8 | 10360 | 48.8 | .0028 | 9750 | 41.1 | .0024 | 8620 | 34.3 | .0016 |
| 3/16 | 3/8 | 8230 | 65.0 | .0169 | 7810 | 55.3 | .0141 | 6890 | 46.1 | .0094 |
| 3/16 | 1/2 | 8230 | 65.0 | .0169 | 7810 | 55.3 | .0141 | 6890 | 46.1 | .0094 |
| 3/16 | 9/16 | 8230 | 65.0 | .0169 | 7810 | 55.3 | .0141 | 6890 | 46.1 | .0094 |
| 3/16 | 5/8 | 8230 | 65.0 | .0118 | 7810 | 55.3 | .0098 | 6890 | 46.1 | .0066 |
| 3/16 | 11/16 | 8230 | 65.0 | .0118 | 7810 | 55.3 | .0098 | 6890 | 46.1 | .0066 |
| 3/16 | 3/4 | 8230 | 65.0 | .0118 | 7810 | 55.3 | .0098 | 6890 | 46.1 | .0066 |
| 3/16 | 1 | 7410 | 52.6 | .0067 | 7030 | 44.7 | .0056 | 6200 | 37.4 | .0037 |
| 3/16 | 1-3/16 | 7410 | 52.6 | .0067 | 7030 | 44.7 | .0056 | 6200 | 37.4 | .0037 |
| 3/16 | 1-3/8 | 7410 | 52.6 | .0067 | 7030 | 44.7 | .0056 | 6200 | 37.4 | .0037 |
| 3/16 | 1-1/2 | 7410 | 52.6 | .0067 | 7030 | 44.7 | .0056 | 6200 | 37.4 | .0037 |
| 13/64 | 13/64 | 6720 | 57.1 | .0073 | 6370 | 44.9 | .0061 | 5580 | 39.8 | .0041 |
| 1/4 | 3/4 | 6140 | 70.7 | .0225 | 5860 | 59.5 | .0187 | 5200 | 49.4 | .0125 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

# 4G MILL END MILLS

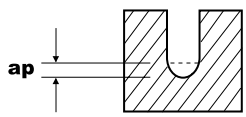
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE WITH NECK

### GMF16 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 1/4 | 1-3/16 | 6140 | 70.7 | .0157 | 5860 | 59.5 | .0131 | 5200 | 49.4 | .0087 |
| 5/16 | 1 | 4890 | 71.5 | .0197 | 4640 | 59.5 | .0164 | 4030 | 50.8 | .0109 |
| 5/16 | 1-3/8 | 4890 | 71.5 | .0197 | 4640 | 59.5 | .0164 | 4030 | 50.8 | .0109 |
| 3/8 | 1-3/16 | 4040 | 68.1 | .0236 | 3860 | 57.9 | .0197 | 3360 | 49.6 | .0131 |
| 3/8 | 1-3/16 | 4040 | 68.1 | .0236 | 3860 | 57.9 | .0197 | 3360 | 49.6 | .0131 |
| 3/8 | 1-1/2 | 4040 | 68.1 | .0236 | 3860 | 57.9 | .0197 | 3360 | 49.6 | .0131 |
| 1/2 | 1-1/4 | 3020 | 56.5 | .0450 | 2880 | 48.4 | .0375 | 2500 | 40.9 | .0250 |
| 1/2 | 1-1/4 | 3020 | 56.5 | .0450 | 2880 | 48.4 | .0375 | 2500 | 40.9 | .0250 |

(Depth of Cut per one pass)



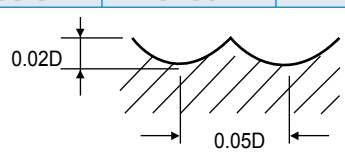

DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE BALL NOSE

### GMF17 SERIES

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | ~ 1100N/mm² | | 1110 ~ 1500N/mm² | | 1500 ~ 2000N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 22700 | 202.0 | 16540 | 144.3 | 15120 | 135.8 |
| R3/32 × 3/16 | 17600 | 224.4 | 13020 | 152.6 | 12250 | 143.5 |
| R1/8 × 1/4 | 14400 | 231.3 | 11530 | 167.3 | 10490 | 142.5 |
| R5/32 × 5/16 | 11400 | 208.3 | 9270 | 157.9 | 8390 | 132.9 |
| R3/16 × 3/8 | 9600 | 189.8 | 7720 | 142.5 | 6990 | 118.7 |
| R1/4 × 1/2 | 7200 | 158.5 | 5790 | 118.7 | 5230 | 89.4 |

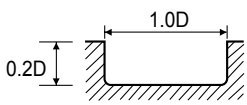



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE CORNER RADIUS

### GMF18 SERIES

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/64 | 25000 | 9.7 | 15870 | 4.1 | 9830 | 2.4 |
| 1/16 | 20800 | 9.3 | 12760 | 4.1 | 8030 | 2.2 |
| 5/64 | 18100 | 10.2 | 11650 | 4.7 | 7260 | 2.8 |
| 1/8 | 12500 | 10.4 | 8090 | 5.1 | 4990 | 2.6 |
| 9/64 | 11700 | 12.0 | 7540 | 5.9 | 4690 | 3.0 |
| 13/64 | 8900 | 15.9 | 5620 | 7.7 | 3680 | 3.7 |
| 1/4 | 7500 | 18.5 | 4760 | 9.3 | 3100 | 4.5 |
| 5/16 | 6000 | 21.5 | 3830 | 9.8 | 2540 | 4.7 |
| 3/8 | 5300 | 22.2 | 3440 | 10.2 | 2120 | 4.9 |
| 1/2 | 3900 | 15.6 | 2630 | 8.5 | 1590 | 3.7 |
| 9/16 | 3500 | 15.0 | 2390 | 7.7 | 1450 | 3.5 |
| 5/8 | 3100 | 14.4 | 2120 | 6.7 | 1290 | 3.2 |
| 3/4 | 2600 | 11.6 | 1720 | 4.9 | 1050 | 2.6 |




RPM = rev./min.
FEED = inch/min.

# 4G MILL END MILLS

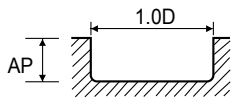
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

### GMF19 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| .008 | 3/64 | 44290 | 5.3 | .0006 | 30560 | 2.4 | .0005 | 18740 | 1.4 | .0004 |
| .012 | 3/64 | 49210 | 7.7 | .0017 | 31500 | 3.4 | .0013 | 19690 | 2.0 | .0010 |
| .012 | 5/64 | 44290 | 6.3 | .0009 | 28350 | 2.8 | .0007 | 17720 | 1.6 | .0006 |
| .015 | 3/64 | 52490 | 8.3 | .0021 | 33600 | 3.5 | .0016 | 21000 | 2.0 | .0013 |
| .015 | 1/16 | 52490 | 8.3 | .0021 | 33600 | 3.5 | .0016 | 21000 | 2.0 | .0013 |
| .015 | 5/64 | 47240 | 6.7 | .0012 | 30240 | 2.8 | .0009 | 18900 | 1.8 | .0007 |
| .015 | 3/32 | 47240 | 6.7 | .0012 | 30240 | 2.8 | .0009 | 18900 | 1.8 | .0007 |
| .020 | 3/64 | 42320 | 8.5 | .0040 | 27560 | 3.7 | .0030 | 16830 | 2.4 | .0024 |
| .020 | 1/16 | 42320 | 8.5 | .0028 | 27560 | 3.7 | .0021 | 16830 | 2.4 | .0017 |
| .020 | 5/64 | 42320 | 8.5 | .0028 | 27560 | 3.7 | .0021 | 16830 | 2.4 | .0017 |
| .020 | 1/8 | 38090 | 6.9 | .0016 | 24800 | 3.0 | .0012 | 15150 | 2.0 | .0009 |
| .020 | 5/32 | 38090 | 6.9 | .0016 | 24800 | 3.0 | .0012 | 15150 | 2.0 | .0009 |
| .024 | 5/64 | 35830 | 9.7 | .0033 | 23620 | 4.3 | .0025 | 14270 | 2.6 | .0020 |
| .024 | 1/8 | 32240 | 7.9 | .0019 | 21260 | 3.5 | .0015 | 12840 | 2.0 | .0011 |
| .024 | 5/32 | 32240 | 7.9 | .0019 | 21260 | 3.5 | .0015 | 12840 | 2.0 | .0011 |
| .024 | 1/4 | 28660 | 6.1 | .0012 | 18900 | 2.8 | .0009 | 11420 | 1.6 | .0007 |
| .031 | 5/64 | 36980 | 10.0 | .0062 | 24380 | 4.3 | .0046 | 14730 | 2.6 | .0037 |
| .031 | 5/32 | 33280 | 8.1 | .0025 | 21950 | 3.5 | .0019 | 13260 | 2.2 | .0015 |
| .031 | 1/4 | 33280 | 8.1 | .0015 | 21950 | 3.5 | .0012 | 13260 | 2.2 | .0009 |
| .031 | 5/16 | 29590 | 6.5 | .0015 | 19510 | 2.8 | .0012 | 11790 | 1.6 | .0009 |
| 3/64 | 1/8 | 27800 | 9.3 | .0094 | 18140 | 3.9 | .0070 | 11090 | 2.4 | .0056 |
| 3/64 | 5/32 | 27800 | 9.3 | .0066 | 18140 | 3.9 | .0049 | 11090 | 2.4 | .0039 |
| 3/64 | 1/4 | 25020 | 7.5 | .0037 | 16330 | 3.2 | .0028 | 9980 | 2.0 | .0022 |
| 3/64 | 5/16 | 25020 | 7.5 | .0037 | 16330 | 3.2 | .0028 | 9980 | 2.0 | .0022 |
| 3/64 | 3/8 | 25020 | 7.5 | .0037 | 16330 | 3.2 | .0028 | 9980 | 2.0 | .0022 |
| 1/16 | 5/32 | 24940 | 11.2 | .0125 | 15310 | 4.9 | .0094 | 9640 | 2.6 | .0075 |
| 1/16 | 1/4 | 24940 | 11.2 | .0087 | 15310 | 4.9 | .0066 | 9640 | 2.6 | .0052 |
| 1/16 | 5/16 | 24940 | 11.2 | .0087 | 15310 | 4.9 | .0066 | 9640 | 2.6 | .0052 |
| 1/16 | 3/8 | 22450 | 9.1 | .0050 | 13780 | 3.9 | .0037 | 8670 | 2.2 | .0030 |
| 1/16 | 1/2 | 22450 | 9.1 | .0050 | 13780 | 3.9 | .0037 | 8670 | 2.2 | .0030 |
| 5/64 | 1/4 | 21770 | 12.2 | .0109 | 13910 | 5.5 | .0082 | 8710 | 3.2 | .0066 |
| 5/64 | 5/16 | 21770 | 12.2 | .0109 | 13910 | 5.5 | .0082 | 8710 | 3.2 | .0066 |
| 5/64 | 3/8 | 21770 | 12.2 | .0109 | 13910 | 5.5 | .0082 | 8710 | 3.2 | .0066 |
| 5/64 | 1/2 | 19590 | 10.0 | .0063 | 12520 | 4.5 | .0047 | 7840 | 2.6 | .0037 |
| 5/64 | 9/16 | 19590 | 10.0 | .0063 | 12520 | 4.5 | .0047 | 7840 | 2.6 | .0037 |
| 5/64 | 5/8 | 19590 | 10.0 | .0063 | 12520 | 4.5 | .0047 | 7840 | 2.6 | .0037 |
| 1/8 | 5/16 | 15020 | 12.2 | .0250 | 9730 | 5.9 | .0187 | 5950 | 3.0 | .0150 |
| 1/8 | 3/8 | 15020 | 12.2 | .0250 | 9730 | 5.9 | .0187 | 5950 | 3.0 | .0150 |
| 1/8 | 1/2 | 15020 | 12.2 | .0175 | 9730 | 5.9 | .0131 | 5950 | 3.0 | .0105 |
| 1/8 | 5/8 | 15020 | 12.2 | .0175 | 9730 | 5.9 | .0131 | 5950 | 3.0 | .0105 |
| 1/8 | 3/4 | 13520 | 10.0 | .0100 | 8760 | 4.7 | .0075 | 5360 | 2.4 | .0060 |
| 1/8 | 1 | 13520 | 10.0 | .0100 | 8760 | 4.7 | .0075 | 5360 | 2.4 | .0060 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

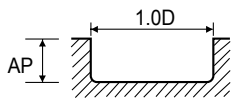


## CARBIDE, 2 FLUTE CORNER RADIUS WITH NECK

### GMF19 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 3/16 | 3/8 | 11550 | 20.7 | .0375 | 7350 | 9.8 | .0281 | 4790 | 4.9 | .0225 |
| 3/16 | 1/2 | 11550 | 20.7 | .0375 | 7350 | 9.8 | .0281 | 4790 | 4.9 | .0225 |
| 3/16 | 5/8 | 11550 | 20.7 | .0263 | 7350 | 9.8 | .0197 | 4790 | 4.9 | .0157 |
| 3/16 | 3/4 | 11550 | 20.7 | .0263 | 7350 | 9.8 | .0197 | 4790 | 4.9 | .0157 |
| 3/16 | 1 | 10390 | 16.7 | .0150 | 6610 | 8.1 | .0113 | 4310 | 3.9 | .0090 |
| 3/16 | 1-3/16 | 10390 | 16.7 | .0150 | 6610 | 8.1 | .0113 | 4310 | 3.9 | .0090 |
| 1/4 | 3/4 | 8980 | 22.2 | .0500 | 5670 | 11.2 | .0375 | 3710 | 5.1 | .0300 |
| 1/4 | 1-3/16 | 8980 | 22.2 | .0350 | 5670 | 11.2 | .0263 | 3710 | 5.1 | .0210 |
| 5/16 | 1 | 7260 | 25.4 | .0437 | 4590 | 11.8 | .0328 | 3040 | 5.5 | .0263 |
| 3/8 | 1-3/16 | 6300 | 26.4 | .0525 | 4200 | 12.4 | .0394 | 2540 | 5.7 | .0315 |
| 1/2 | 1-1/4 | 4720 | 18.5 | .1000 | 3160 | 10.0 | .0750 | 1890 | 4.5 | .0600 |
| 5/8 | 1-3/8 | 3750 | 17.9 | .1250 | 2540 | 8.3 | .0937 | 1550 | 3.7 | .0750 |
| 3/4 | 1-1/2 | 3150 | 13.6 | .1500 | 2050 | 5.7 | .1125 | 1260 | 3.0 | .0900 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

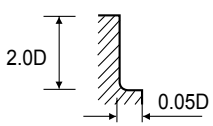



## CARBIDE, 4 FLUTE CORNER RADIUS

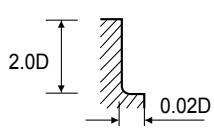
### GMF20 SERIES

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | ~ 1100N/mm² | | 1110 ~ 1500N/mm² | | 1500 ~ 2000N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/64 | 25000 | 12.0 | 15870 | 8.9 | 9830 | 4.7 |
| 5/64 | 18100 | 12.8 | 11650 | 9.5 | 7260 | 5.1 |
| 1/8 | 12500 | 12.6 | 8090 | 9.7 | 4990 | 4.9 |
| 3/16 | 9400 | 15.8 | 5960 | 12.2 | 3830 | 5.7 |
| 13/64 | 8900 | 16.3 | 5620 | 13.8 | 3680 | 6.5 |
| 1/4 | 7500 | 15.9 | 4760 | 13.4 | 3100 | 6.3 |
| 5/16 | 6000 | 18.3 | 3830 | 14.4 | 2540 | 6.7 |
| 3/8 | 5300 | 19.1 | 3440 | 15.0 | 2120 | 7.1 |
| 1/2 | 3900 | 13.4 | 2630 | 11.8 | 1590 | 5.1 |
| 5/8 | 3100 | 11.0 | 2120 | 9.1 | 1290 | 4.5 |
| 3/4 | 2600 | 9.5 | 1720 | 7.5 | 1050 | 3.7 |

1.5XD Axial cutting depth should be for DIA over5/8 inch




RPM = rev./min.
FEED = inch/min.



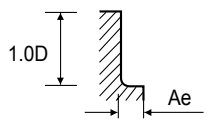
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE CORNER RADIUS WITH NECK

### GMF21 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 3/64 | 5/32 | 29980 | 14.6 | .0010 | 19050 | 10.4 | .0007 | 11790 | 5.5 | .0006 |
| 3/64 | 1/4 | 26990 | 11.8 | .0006 | 17140 | 8.5 | .0004 | 10610 | 4.5 | .0004 |
| 3/64 | 5/16 | 26990 | 11.8 | .0006 | 17140 | 8.5 | .0004 | 10610 | 4.5 | .0004 |
| 1/16 | 1/4 | 24940 | 13.8 | .0013 | 15310 | 10.0 | .0010 | 9640 | 5.1 | .0008 |
| 1/16 | 5/16 | 24940 | 13.8 | .0013 | 15310 | 10.0 | .0010 | 9640 | 5.1 | .0008 |
| 1/16 | 3/8 | 22450 | 11.2 | .0007 | 13780 | 8.1 | .0006 | 8670 | 4.1 | .0004 |
| 1/16 | 1/2 | 22450 | 11.2 | .0007 | 13780 | 8.1 | .0006 | 8670 | 4.1 | .0004 |
| 5/64 | 1/4 | 21770 | 15.2 | .0017 | 13910 | 11.0 | .0012 | 8710 | 5.9 | .0010 |
| 5/64 | 5/16 | 21770 | 15.2 | .0017 | 13910 | 11.0 | .0012 | 8710 | 5.9 | .0010 |
| 5/64 | 3/8 | 21770 | 15.2 | .0017 | 13910 | 11.0 | .0012 | 8710 | 5.9 | .0010 |
| 5/64 | 1/2 | 19590 | 12.2 | .0009 | 12520 | 9.1 | .0007 | 7840 | 4.7 | .0006 |
| 1/8 | 5/16 | 15020 | 15.0 | .0037 | 9730 | 11.6 | .0028 | 5950 | 5.5 | .0022 |
| 1/8 | 3/8 | 15020 | 15.0 | .0037 | 9730 | 11.6 | .0028 | 5950 | 5.5 | .0022 |
| 1/8 | 1/2 | 15020 | 15.0 | .0026 | 9730 | 11.6 | .0020 | 5950 | 5.5 | .0016 |
| 1/8 | 5/8 | 15020 | 15.0 | .0026 | 9730 | 11.6 | .0020 | 5950 | 5.5 | .0016 |
| 1/8 | 3/4 | 13520 | 12.0 | .0015 | 8760 | 9.3 | .0011 | 5360 | 4.5 | .0009 |
| 1/8 | 1 | 13520 | 12.0 | .0015 | 8760 | 9.3 | .0011 | 5360 | 4.5 | .0009 |
| 3/16 | 3/8 | 11550 | 21.1 | .0056 | 7350 | 17.7 | .0042 | 4790 | 8.3 | .0034 |
| 3/16 | 1/2 | 11550 | 21.1 | .0056 | 7350 | 17.7 | .0042 | 4790 | 8.3 | .0034 |
| 3/16 | 5/8 | 11550 | 21.1 | .0039 | 7350 | 17.7 | .0030 | 4790 | 8.3 | .0024 |
| 3/16 | 3/4 | 11550 | 21.1 | .0039 | 7350 | 17.7 | .0030 | 4790 | 8.3 | .0024 |
| 3/16 | 1 | 10390 | 17.1 | .0022 | 6610 | 14.4 | .0017 | 4310 | 6.7 | .0013 |
| 1/4 | 3/4 | 8980 | 18.9 | .0075 | 5670 | 15.9 | .0056 | 3710 | 7.5 | .0045 |
| 5/16 | 1 | 7260 | 21.9 | .0066 | 4590 | 17.1 | .0049 | 3040 | 7.9 | .0039 |
| 5/16 | 1-3/8 | 7260 | 21.9 | .0066 | 4590 | 17.1 | .0049 | 3040 | 7.9 | .0039 |
| 3/8 | 1-3/16 | 6300 | 22.6 | .0079 | 4200 | 17.7 | .0059 | 2540 | 8.3 | .0047 |
| 3/8 | 1-1/2 | 6300 | 22.6 | .0079 | 4200 | 17.7 | .0059 | 2540 | 8.3 | .0047 |
| 1/2 | 1-1/4 | 4720 | 15.9 | .0150 | 3160 | 14.2 | .0113 | 1890 | 5.9 | .0090 |
| 1/2 | 1-3/4 | 4720 | 15.9 | .0105 | 3160 | 14.2 | .0079 | 1890 | 5.9 | .0063 |
| 5/8 | 1-3/8 | 3750 | 13.2 | .0187 | 2540 | 11.0 | .0141 | 1550 | 5.3 | .0113 |
| 3/4 | 1-1/2 | 3150 | 11.2 | .0225 | 2050 | 8.7 | .0169 | 1260 | 4.1 | .0135 |




DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

# RECOMMENDED CUTTING CONDITIONS

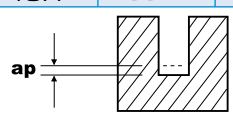
## CARBIDE, 2 FLUTE WITH NECK

### GMF22 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm² | | | 1110 ~ 1500N/mm² | | | 1500 ~ 2000N/mm² | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| .008 | 3/64 | 34100 | 12.0 | .0003 | 32160 | 8.5 | .0002 | 28440 | 6.3 | .0002 |
| .015 | 3/64 | 26930 | 12.0 | .0009 | 25430 | 8.5 | .0007 | 22440 | 7.1 | .0005 |
| .015 | 5/64 | 24240 | 9.8 | .0006 | 22890 | 6.7 | .0004 | 20200 | 5.7 | .0003 |
| .015 | 1/8 | 24240 | 9.8 | .0004 | 22890 | 6.7 | .0003 | 20200 | 5.7 | .0002 |
| .015 | 5/32 | 21540 | 7.7 | .0004 | 20350 | 5.3 | .0003 | 17950 | 4.5 | .0002 |
| .015 | 3/16 | 21540 | 7.7 | .0004 | 20350 | 5.3 | .0003 | 17950 | 4.5 | .0002 |
| .020 | 5/64 | 26970 | 20.9 | .0013 | 25390 | 16.5 | .0010 | 22440 | 11.0 | .0007 |
| .020 | 1/8 | 24270 | 16.9 | .0007 | 22850 | 13.4 | .0006 | 20200 | 8.9 | .0004 |
| .020 | 5/32 | 24270 | 16.9 | .0007 | 22850 | 13.4 | .0006 | 20200 | 8.9 | .0004 |
| .020 | 3/16 | 24270 | 16.9 | .0004 | 22850 | 13.4 | .0004 | 20200 | 8.9 | .0002 |
| .020 | 1/4 | 21570 | 13.4 | .0004 | 20310 | 10.6 | .0004 | 17950 | 7.1 | .0002 |
| .024 | 5/64 | 26970 | 30.1 | .0015 | 25390 | 21.1 | .0012 | 22440 | 15.8 | .0008 |
| .024 | 1/8 | 24270 | 24.4 | .0009 | 22850 | 17.1 | .0007 | 20200 | 12.8 | .0005 |
| .024 | 5/32 | 24270 | 24.4 | .0009 | 22850 | 17.1 | .0007 | 20200 | 12.8 | .0005 |
| .024 | 3/16 | 24270 | 24.4 | .0009 | 22850 | 17.1 | .0007 | 20200 | 12.8 | .0005 |
| .024 | 1/4 | 21570 | 19.3 | .0006 | 20310 | 13.6 | .0004 | 17950 | 10.0 | .0003 |
| .024 | 5/16 | 21570 | 19.3 | .0003 | 20310 | 13.6 | .0002 | 17950 | 10.0 | .0002 |
| .024 | 3/8 | 16180 | 12.6 | .0003 | 15240 | 8.9 | .0002 | 13460 | 6.5 | .0002 |
| 1/32 | 5/64 | 27620 | 30.7 | .0028 | 26000 | 24.0 | .0022 | 22980 | 17.9 | .0016 |
| 1/32 | 1/8 | 27620 | 30.7 | .0020 | 26000 | 24.0 | .0015 | 22980 | 17.9 | .0011 |
| 1/32 | 5/32 | 27620 | 30.7 | .0020 | 26000 | 24.0 | .0015 | 22980 | 17.9 | .0011 |
| 1/32 | 3/16 | 24850 | 25.0 | .0011 | 23400 | 19.5 | .0009 | 20680 | 14.4 | .0006 |
| 1/32 | 1/4 | 24850 | 25.0 | .0011 | 23400 | 19.5 | .0009 | 20680 | 14.4 | .0006 |
| 1/32 | 5/16 | 24850 | 25.0 | .0007 | 23400 | 19.5 | .0006 | 20680 | 14.4 | .0004 |
| 1/32 | 3/8 | 22090 | 19.7 | .0007 | 20800 | 15.4 | .0006 | 18380 | 11.4 | .0004 |
| 3/64 | 1/8 | 22070 | 36.8 | .0042 | 20860 | 28.5 | .0033 | 18340 | 19.3 | .0024 |
| 3/64 | 5/32 | 22070 | 36.8 | .0030 | 20860 | 28.5 | .0023 | 18340 | 19.3 | .0017 |
| 3/64 | 3/16 | 22070 | 36.8 | .0030 | 20860 | 28.5 | .0023 | 18340 | 19.3 | .0017 |
| 3/64 | 1/4 | 19870 | 29.9 | .0017 | 18780 | 23.2 | .0013 | 16510 | 15.6 | .0009 |
| 3/64 | 5/16 | 19870 | 29.9 | .0017 | 18780 | 23.2 | .0013 | 16510 | 15.6 | .0009 |
| 3/64 | 3/8 | 19870 | 29.9 | .0017 | 18780 | 23.2 | .0013 | 16510 | 15.6 | .0009 |
| 3/64 | 1/2 | 17660 | 23.6 | .0011 | 16690 | 18.3 | .0008 | 14670 | 12.4 | .0006 |
| 3/64 | 9/16 | 17660 | 23.6 | .0011 | 16690 | 18.3 | .0008 | 14670 | 12.4 | .0006 |
| 3/64 | 5/8 | 17660 | 23.6 | .0006 | 16690 | 18.3 | .0005 | 14670 | 12.4 | .0004 |
| 3/64 | 3/4 | 13240 | 15.6 | .0006 | 12520 | 12.0 | .0005 | 11010 | 8.1 | .0004 |
| 1/16 | 5/32 | 18140 | 33.7 | .0056 | 17100 | 23.6 | .0044 | 15120 | 17.7 | .0031 |
| 1/16 | 1/4 | 18140 | 33.7 | .0039 | 17100 | 23.6 | .0031 | 15120 | 17.7 | .0022 |
| 1/16 | 5/16 | 18140 | 33.7 | .0039 | 17100 | 23.6 | .0031 | 15120 | 17.7 | .0022 |
| 1/16 | 3/8 | 16330 | 27.4 | .0022 | 15390 | 19.1 | .0017 | 13610 | 14.4 | .0013 |
| 1/16 | 1/2 | 16330 | 27.4 | .0022 | 15390 | 19.1 | .0017 | 13610 | 14.4 | .0013 |
| 1/16 | 9/16 | 16330 | 27.4 | .0014 | 15390 | 19.1 | .0011 | 13610 | 14.4 | .0008 |
| 1/16 | 5/8 | 16330 | 27.4 | .0014 | 15390 | 19.1 | .0011 | 13610 | 14.4 | .0008 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

(Depth of Cut per one pass)



# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

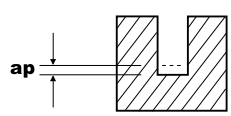
## CARBIDE, 2 FLUTE WITH NECK

### GMF22 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm$^2$ | | | 1110 ~ 1500N/mm$^2$ | | | 1500 ~ 2000N/mm$^2$ | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 1/16 | 3/4 | 14510 | 21.5 | .0014 | 13680 | 15.2 | .0011 | 12090 | 11.2 | .0008 |
| 5/64 | 1/4 | 14510 | 32.5 | .0049 | 13710 | 24.6 | .0038 | 12090 | 18.9 | .0027 |
| 5/64 | 5/16 | 14510 | 32.5 | .0049 | 13710 | 24.6 | .0038 | 12090 | 18.9 | .0027 |
| 5/64 | 3/8 | 14510 | 32.5 | .0049 | 13710 | 24.6 | .0038 | 12090 | 18.9 | .0027 |
| 5/64 | 1/2 | 13060 | 26.4 | .0028 | 12340 | 19.9 | .0022 | 10890 | 15.4 | .0016 |
| 5/64 | 9/16 | 13060 | 26.4 | .0028 | 12340 | 19.9 | .0022 | 10890 | 15.4 | .0016 |
| 5/64 | 5/8 | 13060 | 26.4 | .0028 | 12340 | 19.9 | .0022 | 10890 | 15.4 | .0016 |
| 5/64 | 3/4 | 13060 | 26.4 | .0018 | 12340 | 19.9 | .0014 | 10890 | 15.4 | .0010 |
| 3/32 | 5/16 | 12910 | 40.2 | .0059 | 12180 | 28.2 | .0046 | 10810 | 21.1 | .0033 |
| 3/32 | 1/2 | 11620 | 32.5 | .0034 | 10960 | 22.8 | .0026 | 9730 | 17.1 | .0019 |
| 3/32 | 5/8 | 11620 | 32.5 | .0034 | 10960 | 22.8 | .0026 | 9730 | 17.1 | .0019 |
| 3/32 | 3/4 | 11620 | 32.5 | .0034 | 10960 | 22.8 | .0026 | 9730 | 17.1 | .0019 |
| 1/8 | 5/16 | 10300 | 32.1 | .0113 | 9730 | 22.4 | .0087 | 6240 | 16.7 | .0063 |
| 1/8 | 3/8 | 10300 | 32.1 | .0113 | 9730 | 22.4 | .0087 | 6240 | 16.7 | .0063 |
| 1/8 | 1/2 | 10300 | 32.1 | .0079 | 9730 | 22.4 | .0061 | 6240 | 16.7 | .0044 |
| 1/8 | 9/16 | 10300 | 32.1 | .0079 | 9730 | 22.4 | .0061 | 6240 | 16.7 | .0044 |
| 1/8 | 5/8 | 10300 | 32.1 | .0079 | 9730 | 22.4 | .0061 | 6240 | 16.7 | .0044 |
| 1/8 | 11/16 | 9270 | 26.0 | .0045 | 8760 | 18.3 | .0035 | 5610 | 13.6 | .0025 |
| 1/8 | 3/4 | 9270 | 26.0 | .0045 | 8760 | 18.3 | .0035 | 5610 | 13.6 | .0025 |
| 1/8 | 1 | 9270 | 26.0 | .0045 | 8760 | 18.3 | .0035 | 5610 | 13.6 | .0025 |
| 3/16 | 3/8 | 6720 | 42.9 | .0169 | 6380 | 38.4 | .0131 | 5630 | 25.4 | .0094 |
| 3/16 | 1/2 | 6720 | 42.9 | .0169 | 6380 | 38.4 | .0131 | 5630 | 25.4 | .0094 |
| 3/16 | 5/8 | 6720 | 42.9 | .0118 | 6380 | 38.4 | .0092 | 5630 | 25.4 | .0066 |
| 3/16 | 11/16 | 6720 | 42.9 | .0118 | 6380 | 38.4 | .0092 | 5630 | 25.4 | .0066 |
| 3/16 | 3/4 | 6720 | 42.9 | .0118 | 6380 | 38.4 | .0092 | 5630 | 25.4 | .0066 |
| 3/16 | 1 | 6050 | 34.8 | .0067 | 5740 | 31.1 | .0052 | 5060 | 20.7 | .0037 |
| 3/16 | 1-3/16 | 6050 | 34.8 | .0067 | 5740 | 31.1 | .0052 | 5060 | 20.7 | .0037 |
| 13/64 | 3/4 | 6200 | 44.1 | .0128 | 5910 | 34.3 | .0100 | 5230 | 23.0 | .0071 |
| 13/64 | 1-3/16 | 5580 | 35.6 | .0073 | 5320 | 27.8 | .0057 | 4710 | 18.7 | .0041 |
| 13/64 | 1-3/8 | 5580 | 35.6 | .0073 | 5320 | 27.8 | .0057 | 4710 | 18.7 | .0041 |
| 13/64 | 1-1/2 | 5580 | 35.6 | .0073 | 5320 | 27.8 | .0057 | 4710 | 18.7 | .0041 |
| 13/64 | 2 | 5580 | 35.6 | .0046 | 5320 | 27.8 | .0035 | 4710 | 18.7 | .0025 |
| 1/4 | 5/8 | 5010 | 39.2 | .0225 | 4720 | 30.5 | .0175 | 4160 | 20.5 | .0125 |
| 1/4 | 3/4 | 5010 | 39.2 | .0225 | 4720 | 30.5 | .0175 | 4160 | 20.5 | .0125 |
| 1/4 | 1-3/16 | 5010 | 39.2 | .0157 | 4720 | 30.5 | .0122 | 4160 | 20.5 | .0087 |
| 5/16 | 1 | 4030 | 37.6 | .0197 | 3830 | 29.7 | .0153 | 3330 | 19.9 | .0109 |
| 3/8 | 1-3/16 | 3360 | 37.2 | .0236 | 3200 | 28.2 | .0184 | 2760 | 16.5 | .0131 |
| 3/8 | 1-3/4 | 3360 | 37.2 | .0236 | 3200 | 28.2 | .0184 | 2760 | 16.5 | .0131 |
| 1/2 | 1-3/8 | 2500 | 29.7 | .0450 | 2380 | 22.2 | .0350 | 2060 | 13.0 | .0250 |
| 1/2 | 2 | 2500 | 29.7 | .0315 | 2380 | 22.2 | .0245 | 2060 | 13.0 | .0175 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

(Depth of Cut per one pass)

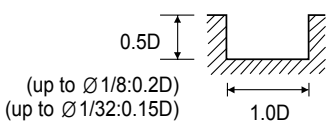


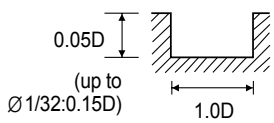
# RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE

### GMF23 SERIES

| MATERIAL | P | | | | | | M | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| .004 | 41300 | 3.5 | 24800 | 2.1 | 16540 | 0.7 | 20670 | 1.7 |
| .008 | 41300 | 3.8 | 24800 | 2.1 | 16540 | 0.7 | 20670 | 1.7 |
| .012 | 38400 | 4.0 | 23000 | 2.4 | 15350 | 0.7 | 19190 | 1.9 |
| .015 | 40900 | 4.5 | 24600 | 2.6 | 16380 | 1.0 | 20470 | 2.1 |
| .020 | 35400 | 5.0 | 21300 | 2.8 | 14170 | 1.0 | 17720 | 2.4 |
| .024 | 31500 | 5.7 | 18900 | 3.3 | 12600 | 1.2 | 15750 | 2.8 |
| .028 | 27600 | 6.4 | 16500 | 3.8 | 11020 | 1.2 | 13780 | 3.1 |
| .031 | 25400 | 7.1 | 15200 | 4.3 | 10160 | 1.4 | 12700 | 3.5 |
| .035 | 23800 | 7.3 | 14300 | 4.5 | 9520 | 1.4 | 11900 | 3.8 |
| .040 | 21200 | 7.3 | 12700 | 4.5 | 8460 | 1.4 | 10580 | 3.8 |
| .047 | 18100 | 7.8 | 10900 | 4.7 | 7240 | 1.7 | 9050 | 4.0 |
| 1/16 | 14200 | 7.6 | 8500 | 4.5 | 5670 | 1.4 | 7090 | 3.8 |
| 5/64 | 11700 | 8.2 | 7600 | 5.2 | 5080 | 1.5 | 6350 | 3.9 |
| 3/32 | 10800 | 9.1 | 6900 | 5.8 | 4410 | 1.7 | 5730 | 4.8 |
| 1/8 | 8400 | 8.7 | 5300 | 5.6 | 3170 | 1.7 | 4370 | 5.0 |
| 9/64 | 8100 | 10.8 | 5000 | 6.7 | 3090 | 1.7 | 4160 | 5.6 |
| 3/16 | 6500 | 12.8 | 4000 | 7.6 | 2490 | 2.0 | 3330 | 6.3 |
| 13/64 | 6100 | 13.4 | 3700 | 8.0 | 2250 | 2.2 | 3060 | 6.7 |
| 1/4 | 5300 | 14.3 | 3200 | 9.1 | 1890 | 2.2 | 2680 | 7.4 |
| 17/64 | 5000 | 14.4 | 3000 | 8.7 | 1850 | 2.5 | 2560 | 7.4 |
| 9/32 | 4800 | 14.9 | 2900 | 8.5 | 1800 | 2.7 | 2420 | 7.2 |
| 5/16 | 4200 | 15.9 | 2500 | 8.3 | 1690 | 3.1 | 2120 | 7.4 |
| 11/32 | 3900 | 14.7 | 2300 | 7.6 | 1560 | 2.9 | 1940 | 7.0 |
| 23/64 | 3700 | 14.5 | 2200 | 7.2 | 1500 | 2.7 | 1860 | 7.0 |
| 3/8 | 3400 | 14.3 | 2100 | 7.0 | 1430 | 2.7 | 1760 | 7.0 |
| 13/32 | 3200 | 13.2 | 2000 | 6.4 | 1330 | 2.5 | 1630 | 6.4 |
| 7/16 | 3000 | 12.4 | 1800 | 6.0 | 1250 | 2.3 | 1500 | 6.0 |
| 1/2 | 2600 | 11.2 | 1600 | 5.3 | 1100 | 2.1 | 1290 | 5.3 |
| 9/16 | 2400 | 10.1 | 1500 | 5.0 | 1010 | 1.9 | 1190 | 5.0 |
| 5/8 | 2200 | 9.1 | 1400 | 4.6 | 910 | 1.7 | 1070 | 4.6 |
| 3/4 | 1800 | 7.4 | 1100 | 3.5 | 710 | 1.2 | 880 | 3.5 |




RPM = rev./min.
FEED = inch/min.

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

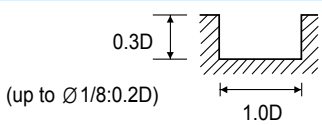
## CARBIDE, 2 FLUTE LONG

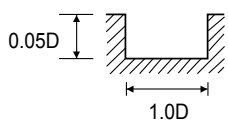
### GMF24 SERIES

| MATERIAL | | P | | | | | |
|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIA. | LOC | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/64 | 1/8 | 13710 | 3.0 | 10970 | 2.6 | 6860 | 1.2 |
| 3/64 | 5/32 | 13710 | 3.0 | 10970 | 2.6 | 6860 | 1.2 |
| 3/64 | 1/4 | 12340 | 2.8 | 9870 | 2.4 | 6170 | 1.0 |
| 3/64 | 5/16 | 12340 | 2.4 | 9870 | 2.2 | 6170 | 1.0 |
| 3/64 | 3/8 | 12340 | 2.2 | 9870 | 2.0 | 6170 | 0.8 |
| 1/16 | 1/4 | 10000 | 2.8 | 8000 | 2.4 | 5000 | 1.0 |
| 1/16 | 5/16 | 10000 | 2.8 | 8000 | 2.4 | 5000 | 1.0 |
| 1/16 | 3/8 | 9000 | 2.4 | 7200 | 2.0 | 4500 | 0.8 |
| 1/16 | 1/2 | 9000 | 2.0 | 7200 | 1.8 | 4500 | 0.8 |
| 1/16 | 5/8 | 9000 | 2.0 | 7200 | 1.8 | 4500 | 0.8 |
| 5/64 | 5/16 | 9210 | 3.4 | 7370 | 2.8 | 4610 | 1.4 |
| 5/64 | 3/8 | 9210 | 3.4 | 7370 | 2.8 | 4610 | 1.4 |
| 5/64 | 1/2 | 8290 | 2.8 | 6640 | 2.4 | 4150 | 1.2 |
| 5/64 | 5/8 | 8290 | 2.4 | 6640 | 2.0 | 4150 | 1.0 |
| 3/32 | 5/8 | 7640 | 3.4 | 6150 | 2.8 | 3820 | 1.4 |
| 1/8 | 3/8 | 5670 | 3.5 | 4600 | 3.0 | 2830 | 1.4 |
| 1/8 | 1/2 | 5670 | 3.5 | 4600 | 3.0 | 2830 | 1.4 |
| 1/8 | 5/8 | 5670 | 3.5 | 4600 | 3.0 | 2830 | 1.4 |
| 1/8 | 3/4 | 5100 | 2.8 | 4140 | 2.4 | 2550 | 1.2 |
| 1/8 | 1 | 5100 | 2.6 | 4140 | 2.2 | 2550 | 1.0 |
| 3/16 | 1/2 | 3630 | 3.4 | 2890 | 2.8 | 1820 | 1.4 |
| 3/16 | 5/8 | 3630 | 3.4 | 2890 | 2.8 | 1820 | 1.4 |
| 3/16 | 3/4 | 3630 | 3.4 | 2890 | 2.8 | 1820 | 1.4 |
| 3/16 | 1 | 3270 | 3.0 | 2600 | 2.6 | 1640 | 1.2 |
| 3/16 | 1-3/16 | 3270 | 2.8 | 2600 | 2.2 | 1640 | 1.2 |
| 13/64 | 3/4 | 4130 | 5.5 | 3270 | 4.5 | 2140 | 2.0 |
| 13/64 | 1 | 4130 | 5.5 | 3270 | 4.5 | 2140 | 2.0 |
| 13/64 | 1-3/16 | 3720 | 4.5 | 2940 | 3.7 | 1930 | 1.6 |
| 13/64 | 1-1/2 | 3720 | 4.5 | 2940 | 3.7 | 1930 | 1.6 |
| 1/4 | 5/8 | 3390 | 6.3 | 2720 | 5.3 | 1760 | 2.4 |
| 1/4 | 3/4 | 3390 | 6.3 | 2720 | 5.3 | 1760 | 2.4 |
| 1/4 | 1 | 3390 | 6.3 | 2720 | 5.3 | 1760 | 2.4 |
| 1/4 | 1-3/16 | 3390 | 5.3 | 2720 | 4.5 | 1760 | 2.2 |
| 1/4 | 1-3/8 | 3050 | 4.9 | 2450 | 3.9 | 1580 | 2.0 |
| 1/4 | 1-1/2 | 3050 | 4.3 | 2450 | 3.5 | 1580 | 1.6 |
| 1/4 | 1-3/4 | 3050 | 4.3 | 2450 | 3.5 | 1580 | 1.6 |
| 5/16 | 1 | 2930 | 7.7 | 2320 | 5.9 | 1530 | 2.8 |
| 5/16 | 1-3/16 | 2930 | 7.7 | 2320 | 5.9 | 1530 | 2.8 |
| 5/16 | 1-3/8 | 2930 | 7.7 | 2320 | 5.9 | 1530 | 2.8 |
| 5/16 | 1-1/2 | 2930 | 6.5 | 2320 | 5.1 | 1530 | 2.4 |

DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = inch/min.

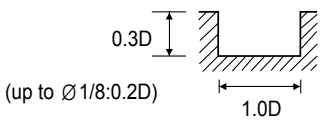


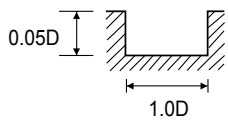



## CARBIDE, 2 FLUTE LONG

### GMF24 SERIES

| MATERIAL | | P | | | | | |
|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIA. | LOC | RPM | FEED | RPM | FEED | RPM | FEED |
| 5/16 | 1-3/4 | 2630 | 5.9 | 2080 | 4.5 | 1380 | 2.2 |
| 5/16 | 2 | 2630 | 5.1 | 2080 | 4.1 | 1380 | 2.0 |
| 3/8 | 1-3/16 | 2700 | 8.3 | 2200 | 6.5 | 1330 | 3.0 |
| 3/8 | 1-3/8 | 2700 | 8.3 | 2200 | 6.5 | 1330 | 3.0 |
| 3/8 | 1-1/2 | 2700 | 8.3 | 2200 | 6.5 | 1330 | 3.0 |
| 3/8 | 1-3/4 | 2700 | 7.1 | 2200 | 5.5 | 1330 | 2.6 |
| 3/8 | 2 | 2430 | 6.3 | 1980 | 4.9 | 1200 | 2.4 |
| 3/8 | 2-3/8 | 2430 | 5.5 | 1980 | 4.3 | 1200 | 2.0 |
| 1/2 | 1-3/8 | 1790 | 5.3 | 1490 | 4.7 | 900 | 2.0 |
| 1/2 | 1-1/2 | 1790 | 5.3 | 1490 | 4.7 | 900 | 2.0 |
| 1/2 | 1-3/4 | 1790 | 5.3 | 1490 | 4.7 | 900 | 2.0 |
| 1/2 | 2 | 1790 | 4.5 | 1490 | 3.9 | 900 | 1.6 |
| 1/2 | 2-1/8 | 1790 | 4.5 | 1490 | 3.9 | 900 | 1.6 |
| 1/2 | 2-3/8 | 1790 | 4.5 | 1490 | 3.9 | 900 | 1.6 |
| 5/8 | 1-1/2 | 1730 | 5.5 | 1300 | 4.1 | 810 | 2.0 |
| 3/4 | 3-1/2 | 1340 | 3.4 | 1050 | 2.4 | 660 | 1.2 |
| 3/4 | 4-1/4 | 1210 | 3.0 | 940 | 2.1 | 600 | 1.0 |




DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = inch/min.

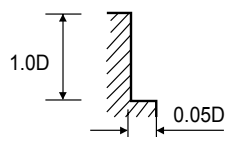
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE

### GMF25, GMF26 SERIES

| MATERIAL | P | | | | | | M | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | 1110 ~ 1500N/mm² | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/64 | 22680 | 11.8 | 13610 | 7.1 | 9070 | 2.1 | 11340 | 5.9 |
| 1/16 | 17720 | 11.3 | 10630 | 6.9 | 7090 | 2.1 | 8860 | 5.9 |
| 5/64 | 14560 | 12.1 | 9520 | 7.4 | 6350 | 2.2 | 7940 | 6.1 |
| 3/32 | 13440 | 13.6 | 8610 | 8.5 | 5510 | 2.6 | 7170 | 7.2 |
| 1/8 | 10540 | 13.0 | 6570 | 8.2 | 3970 | 2.4 | 5460 | 6.9 |
| 9/64 | 10090 | 18.8 | 6230 | 11.7 | 3860 | 2.6 | 5200 | 9.5 |
| 3/16 | 8180 | 24.0 | 4960 | 14.5 | 3110 | 2.6 | 4160 | 11.9 |
| 13/64 | 7640 | 25.1 | 4580 | 15.2 | 2810 | 3.0 | 3830 | 12.6 |
| 7/32 | 7330 | 27.1 | 4410 | 16.5 | 2670 | 3.3 | 3710 | 13.4 |
| 1/4 | 6570 | 27.1 | 3970 | 16.7 | 2360 | 3.3 | 3350 | 13.4 |
| 17/64 | 6290 | 27.5 | 3800 | 16.5 | 2310 | 3.6 | 3200 | 13.8 |
| 9/32 | 5980 | 27.7 | 3610 | 15.9 | 2250 | 3.9 | 3030 | 13.9 |
| 19/64 | 5650 | 28.7 | 3390 | 16.1 | 2190 | 4.3 | 2840 | 14.3 |
| 5/16 | 5290 | 29.6 | 3170 | 15.9 | 2120 | 4.6 | 2650 | 14.7 |
| 11/32 | 4830 | 27.5 | 2910 | 14.5 | 1950 | 4.1 | 2420 | 13.6 |
| 23/64 | 4590 | 26.9 | 2790 | 13.9 | 1870 | 4.1 | 2330 | 13.2 |
| 3/8 | 4280 | 26.5 | 2620 | 13.0 | 1780 | 3.9 | 2200 | 13.0 |
| 7/16 | 3710 | 23.2 | 2280 | 11.2 | 1560 | 3.5 | 1880 | 11.0 |
| 1/2 | 3240 | 20.7 | 1980 | 9.9 | 1370 | 3.2 | 1610 | 9.5 |
| 9/16 | 3030 | 18.8 | 1860 | 9.1 | 1260 | 2.9 | 1510 | 8.9 |
| 5/8 | 2770 | 17.6 | 1710 | 8.5 | 1140 | 2.5 | 1390 | 8.3 |
| 3/4 | 2200 | 13.9 | 1400 | 7.0 | 890 | 1.6 | 1100 | 6.4 |

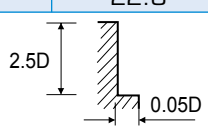


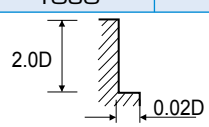

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE LONG

### GMF27 SERIES

| MATERIAL | | P | | | | | |
|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | ~ 1100N/mm² | | 1110 ~ 1500N/mm² | | 1500 ~ 2000N/mm² | |
| DIA. | LOC | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/64 | 1/8 | 16330 | 8.1 | 9310 | 3.2 | 5710 | 1.6 |
| 3/64 | 5/32 | 16330 | 8.1 | 9310 | 3.2 | 5710 | 1.6 |
| 3/64 | 3/16 | 16330 | 8.1 | 9310 | 3.2 | 5710 | 1.6 |
| 3/64 | 1/4 | 14690 | 7.3 | 8380 | 3.0 | 5140 | 1.4 |
| 1/16 | 1/4 | 13040 | 8.1 | 7430 | 3.2 | 4560 | 1.6 |
| 5/64 | 5/16 | 10670 | 9.5 | 6100 | 3.7 | 3810 | 2.2 |
| 5/64 | 3/8 | 10670 | 9.5 | 6100 | 3.7 | 3810 | 2.2 |
| 5/64 | 1/2 | 9600 | 7.7 | 5490 | 3.2 | 3430 | 1.8 |
| 5/64 | 9/16 | 9600 | 7.7 | 5490 | 3.2 | 3430 | 1.8 |
| 3/32 | 3/8 | 9440 | 10.6 | 5420 | 4.5 | 3370 | 2.6 |
| 3/32 | 1/2 | 8500 | 9.7 | 4880 | 3.9 | 3030 | 2.2 |
| 1/8 | 3/8 | 7000 | 10.2 | 4050 | 4.5 | 2490 | 2.4 |
| 1/8 | 1/2 | 7000 | 10.2 | 4050 | 4.5 | 2490 | 2.4 |
| 1/8 | 5/8 | 7000 | 10.2 | 4050 | 4.5 | 2490 | 2.4 |
| 1/8 | 3/4 | 6300 | 8.3 | 3640 | 3.5 | 2250 | 2.0 |
| 1/8 | 1 | 6300 | 7.5 | 3640 | 3.2 | 2250 | 1.8 |
| 1/8 | 1-3/16 | 6300 | 7.5 | 3640 | 3.2 | 2250 | 1.8 |
| 3/16 | 1/2 | 5040 | 11.0 | 2860 | 4.5 | 1800 | 2.4 |
| 3/16 | 5/8 | 5040 | 11.0 | 2860 | 4.5 | 1800 | 2.4 |
| 3/16 | 3/4 | 5040 | 11.0 | 2860 | 4.5 | 1800 | 2.4 |
| 3/16 | 1 | 4540 | 10.0 | 2580 | 4.1 | 1620 | 2.2 |
| 3/16 | 1-3/16 | 4540 | 9.1 | 2580 | 3.7 | 1620 | 2.0 |
| 13/64 | 3/4 | 4970 | 16.5 | 2810 | 6.5 | 1840 | 3.2 |
| 13/64 | 1 | 4970 | 16.5 | 2810 | 6.5 | 1840 | 3.2 |
| 13/64 | 1-3/16 | 4470 | 13.4 | 2530 | 5.1 | 1650 | 2.6 |
| 1/4 | 5/8 | 4170 | 19.3 | 2380 | 8.1 | 1550 | 3.9 |
| 1/4 | 3/4 | 4170 | 19.3 | 2380 | 8.1 | 1550 | 3.9 |
| 1/4 | 1 | 4170 | 19.3 | 2380 | 8.1 | 1550 | 3.9 |
| 1/4 | 1-3/16 | 4170 | 16.3 | 2380 | 6.9 | 1550 | 3.4 |
| 1/4 | 1-3/8 | 3760 | 14.8 | 2140 | 6.1 | 1400 | 3.2 |
| 1/4 | 1-1/2 | 3760 | 13.0 | 2140 | 5.5 | 1400 | 2.8 |
| 1/4 | 1-3/4 | 3760 | 13.0 | 2140 | 5.5 | 1400 | 2.8 |
| 5/16 | 1 | 3390 | 21.9 | 1910 | 8.7 | 1270 | 4.3 |
| 5/16 | 1-3/16 | 3390 | 21.9 | 1910 | 8.7 | 1270 | 4.3 |
| 5/16 | 1-3/8 | 3390 | 21.9 | 1910 | 8.7 | 1270 | 4.3 |
| 5/16 | 1-1/2 | 3390 | 18.7 | 1910 | 7.3 | 1270 | 3.7 |
| 5/16 | 1-3/4 | 3050 | 16.7 | 1720 | 6.5 | 1140 | 3.4 |
| 5/16 | 2 | 3050 | 14.8 | 1720 | 5.7 | 1140 | 3.0 |
| 3/8 | 1-3/16 | 2960 | 22.8 | 1730 | 8.9 | 1060 | 4.5 |
| 3/8 | 1-3/8 | 2960 | 22.8 | 1730 | 8.9 | 1060 | 4.5 |




DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = inch/min.

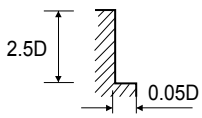
# 4G MILL END MILLS

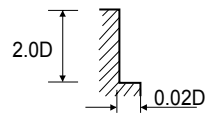
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG

### GMF27 SERIES

| MATERIAL | | P | | | | | |
|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIA. | LOC | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/8 | 1-1/2 | 2960 | 22.8 | 1730 | 8.9 | 1060 | 4.5 |
| 3/8 | 1-3/4 | 2960 | 19.5 | 1730 | 7.7 | 1060 | 3.7 |
| 3/8 | 2 | 2660 | 17.5 | 1550 | 6.9 | 950 | 3.4 |
| 1/2 | 1-3/8 | 2180 | 16.1 | 1320 | 7.1 | 790 | 3.2 |
| 1/2 | 1-1/2 | 2180 | 16.1 | 1320 | 7.1 | 790 | 3.2 |
| 1/2 | 1-3/4 | 2180 | 16.1 | 1320 | 7.1 | 790 | 3.2 |
| 1/2 | 2 | 2180 | 13.6 | 1320 | 6.1 | 790 | 2.6 |
| 1/2 | 2-1/8 | 2180 | 13.6 | 1320 | 6.1 | 790 | 2.6 |
| 1/2 | 2-3/8 | 2180 | 13.6 | 1320 | 6.1 | 790 | 2.6 |
| 9/16 | 2 | 2080 | 13.4 | 1210 | 5.5 | 740 | 2.6 |
| 5/8 | 2 | 1960 | 15.2 | 1080 | 5.9 | 680 | 3.0 |
| 5/8 | 2-3/8 | 1960 | 13.0 | 1080 | 5.1 | 680 | 2.4 |
| 5/8 | 2-3/4 | 1960 | 13.0 | 1080 | 5.1 | 680 | 2.4 |
| 3/4 | 2-3/8 | 1490 | 9.7 | 860 | 3.7 | 530 | 2.0 |
| 3/4 | 3-1/2 | 1490 | 8.5 | 860 | 3.4 | 530 | 1.8 |
| 1 | 3-1/2 | 1090 | 7.1 | 800 | 3.5 | 500 | 1.8 |



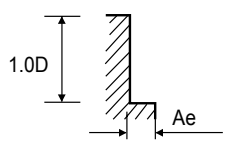




DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE WITH NECK

### GMF28 SERIES

| MATERIAL | | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | | ~ HRc35 | | | HRc35 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | | ~ 1100N/mm$^2$ | | | 1110 ~ 1500N/mm$^2$ | | | 1500 ~ 2000N/mm$^2$ | | |
| DIA. | LBS | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) | RPM | FEED | Ap(inch) |
| 3/64 | 5/32 | 19650 | 12.4 | .0007 | 12200 | 7.3 | .0005 | 7560 | 2.0 | .0004 |
| 3/64 | 3/16 | 19650 | 12.4 | .0007 | 12200 | 7.3 | .0005 | 7560 | 2.0 | .0004 |
| 3/64 | 1/4 | 17690 | 10.0 | .0004 | 10980 | 5.9 | .0003 | 6800 | 1.6 | .0002 |
| 3/64 | 5/16 | 17690 | 10.0 | .0004 | 10980 | 5.9 | .0003 | 6800 | 1.6 | .0002 |
| 1/16 | 1/4 | 16060 | 11.8 | .0009 | 10110 | 7.1 | .0007 | 6140 | 1.8 | .0006 |
| 1/16 | 5/16 | 16060 | 11.8 | .0009 | 10110 | 7.1 | .0007 | 6140 | 1.8 | .0006 |
| 1/16 | 3/8 | 14460 | 9.7 | .0005 | 9100 | 5.7 | .0004 | 5530 | 1.6 | .0003 |
| 1/16 | 1/2 | 14460 | 9.7 | .0005 | 9100 | 5.7 | .0004 | 5530 | 1.6 | .0003 |
| 1/16 | 5/8 | 14460 | 9.7 | .0003 | 9100 | 5.7 | .0002 | 5530 | 1.6 | .0002 |
| 5/64 | 5/16 | 14010 | 13.2 | .0011 | 9140 | 7.9 | .0009 | 6050 | 2.4 | .0007 |
| 5/64 | 3/8 | 14010 | 13.2 | .0011 | 9140 | 7.9 | .0009 | 6050 | 2.4 | .0007 |
| 5/64 | 1/2 | 12610 | 10.6 | .0007 | 8230 | 6.5 | .0005 | 5440 | 2.0 | .0004 |
| 5/64 | 5/8 | 12610 | 10.6 | .0007 | 8230 | 6.5 | .0005 | 5440 | 2.0 | .0004 |
| 1/8 | 3/8 | 10110 | 14.2 | .0026 | 6300 | 8.9 | .0020 | 3810 | 2.6 | .0016 |
| 1/8 | 1/2 | 10110 | 14.2 | .0019 | 6300 | 8.9 | .0014 | 3810 | 2.6 | .0011 |
| 1/8 | 5/8 | 10110 | 14.2 | .0019 | 6300 | 8.9 | .0014 | 3810 | 2.6 | .0011 |
| 1/8 | 3/4 | 9100 | 11.4 | .0011 | 5670 | 7.3 | .0008 | 3430 | 2.2 | .0006 |
| 1/8 | 1-3/16 | 9100 | 11.4 | .0007 | 5670 | 7.3 | .0005 | 3430 | 2.2 | .0004 |
| 3/16 | 1/2 | 7620 | 22.4 | .0039 | 4650 | 14.0 | .0030 | 2960 | 2.4 | .0024 |
| 3/16 | 5/8 | 7620 | 22.4 | .0028 | 4650 | 14.0 | .0021 | 2960 | 2.4 | .0017 |
| 3/16 | 3/4 | 7620 | 22.4 | .0028 | 4650 | 14.0 | .0021 | 2960 | 2.4 | .0017 |
| 3/16 | 1-3/16 | 6860 | 18.3 | .0016 | 4190 | 11.2 | .0012 | 2670 | 2.0 | .0009 |
| 3/16 | 1-1/2 | 6860 | 18.3 | .0016 | 4190 | 11.2 | .0012 | 2670 | 2.0 | .0009 |
| 13/64 | 3/4 | 7330 | 27.6 | .0030 | 4390 | 16.3 | .0022 | 2690 | 3.2 | .0018 |
| 13/64 | 1-1/2 | 6590 | 22.2 | .0017 | 3950 | 13.4 | .0013 | 2420 | 2.6 | .0010 |
| 1/4 | 5/8 | 6300 | 29.3 | .0052 | 3810 | 18.3 | .0039 | 2270 | 3.5 | .0031 |
| 1/4 | 1-3/16 | 6300 | 29.3 | .0037 | 3810 | 18.3 | .0028 | 2270 | 3.5 | .0022 |
| 5/16 | 1 | 5080 | 33.7 | .0046 | 3040 | 17.9 | .0035 | 2030 | 5.1 | .0028 |
| 5/16 | 1-5/8 | 4570 | 27.4 | .0026 | 2740 | 14.4 | .0020 | 1820 | 4.1 | .0016 |
| 3/8 | 1-3/16 | 4100 | 30.1 | .0055 | 2520 | 15.0 | .0041 | 1710 | 4.3 | .0033 |
| 3/8 | 1-3/4 | 4100 | 30.1 | .0055 | 2520 | 15.0 | .0041 | 1710 | 4.3 | .0033 |
| 1/2 | 1-3/8 | 3120 | 23.0 | .0105 | 1900 | 11.2 | .0079 | 1320 | 3.5 | .0063 |
| 1/2 | 2 | 3120 | 23.0 | .0074 | 1900 | 11.2 | .0055 | 1320 | 3.5 | .0044 |




DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = inch/min.

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

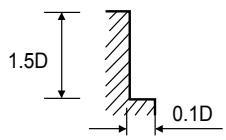
## CARBIDE, 6 FLUTE 45º HELIX

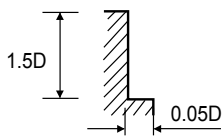
### GMF29 SERIES

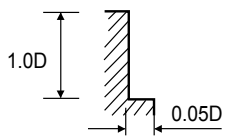
### - NORMAL SPEED

| MATERIAL | | P | | | | | |
|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | ~ HRc35 | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | ~ 1100N/mm$^2$ | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIA. | LOC | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 5/8 | 5775 | 81.9 | 4035 | 56.1 | 1640 | 8.7 |
| 1/4 | 1-3/16 | 5775 | 69.5 | 4035 | 47.6 | 1640 | 7.4 |
| 5/16 | 3/4 | 4440 | 83.3 | 3110 | 57.1 | 1230 | 8.7 |
| 5/16 | 1-1/2 | 4440 | 70.9 | 3110 | 48.6 | 1230 | 7.4 |
| 3/8 | 1 | 3705 | 86.8 | 2560 | 59.5 | 1105 | 9.1 |
| 3/8 | 1-1/2 | 3705 | 86.8 | 2560 | 59.5 | 1105 | 9.1 |
| 1/2 | 1-3/16 | 2950 | 68.6 | 2080 | 47.4 | 870 | 7.4 |
| 1/2 | 2 | 2950 | 58.5 | 2080 | 40.3 | 870 | 6.3 |
| 5/8 | 1-1/2 | 2225 | 52.5 | 1565 | 36.6 | 685 | 5.4 |
| 5/8 | 2-3/8 | 2225 | 44.7 | 1565 | 31.2 | 685 | 4.6 |
| 3/4 | 1-3/4 | 1850 | 43.8 | 1280 | 30.0 | 545 | 4.8 |
| 3/4 | 2-3/8 | 1850 | 37.2 | 1280 | 25.4 | 545 | 4.1 |

DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = inch/min.



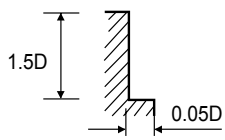



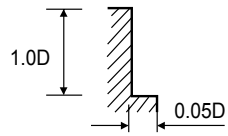




### - HIGH SPEED

| MATERIAL | | P | | | |
|---|---|---|---|---|---|
| | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | | HRc35 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | | 1110 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIAMETER | Length of Cut | RPM | FEED | RPM | FEED |
| 1/4 | 5/8 | 17455 | 249.2 | 8735 | 124.7 |
| 1/4 | 1-3/16 | 17455 | 211.8 | 8735 | 106.1 |
| 5/16 | 3/4 | 13335 | 253.8 | 6670 | 127.1 |
| 5/16 | 1-1/2 | 13335 | 215.6 | 6670 | 108.1 |
| 3/8 | 1 | 11005 | 260.0 | 5555 | 132.3 |
| 3/8 | 1-1/2 | 11005 | 260.0 | 5555 | 132.3 |
| 1/2 | 1-3/16 | 8735 | 206.1 | 4365 | 103.1 |
| 1/2 | 2 | 8735 | 175.4 | 4365 | 87.7 |
| 5/8 | 1-1/2 | 6670 | 157.5 | 3340 | 78.8 |
| 5/8 | 2-3/8 | 6670 | 133.9 | 3340 | 67.0 |
| 3/4 | 1-3/4 | 5555 | 132.3 | 2785 | 63.9 |
| 3/4 | 2-3/8 | 5555 | 112.4 | 2785 | 54.2 |

RPM = rev./min.
FEED = inch/min.

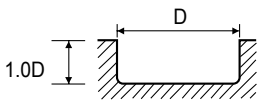


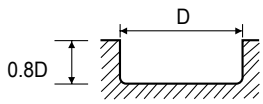



## CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SLOTTING

### G907, G928, G908, G929, G909, G930 SERIES

| MATERIAL | | P | | | |
|---|---|---|---|---|---|
| | | ALLOY STEELS, CARBON STEELS TOOL STEELS CAST IRON | | ALLOY STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS | |
| HARDNESS | | ~ HRc25 | | HRc25 ~ HRc40 | |
| DIAMETER | | RPM | FEED | RPM | FEED |
| INCH | METRIC | | | | |
| 1/4 | 6.0 | 12000 | 61.0 | 10600 | 43.3 |
| 5/16 | 8.0 | 9000 | 65.0 | 8100 | 46.5 |
| 3/8 | 10.0 | 7200 | 65.0 | 6400 | 46.5 |
| 1/2 | 12.0 | 6000 | 60.6 | 5400 | 44.9 |
| 5/8 | 16.0 | 4500 | 59.1 | 4100 | 41.3 |
| 3/4 | 20.0 | 3600 | 52.4 | 3200 | 35.4 |
| 1 | - | 2900 | 46.4 | 2600 | 32.5 |



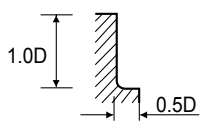



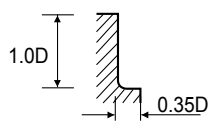

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SIDE CUTTING

### G907, G928, G908, G929, G909, G930 SERIES

| MATERIAL | | P | | | |
|---|---|---|---|---|---|
| | | ALLOY STEELS, CARBON STEELS TOOL STEELS CAST IRON | | ALLOY STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS | |
| HARDNESS | | ~ HRc25 | | HRc25 ~ HRc40 | |
| DIAMETER | | RPM | FEED | RPM | FEED |
| INCH | METRIC | | | | |
| 1/4 | 6.0 | 15800 | 101.2 | 14300 | 72.8 |
| 5/16 | 8.0 | 11900 | 106.3 | 10700 | 76.8 |
| 3/8 | 10.0 | 9500 | 106.3 | 8500 | 76.8 |
| 1/2 | 12.0 | 8000 | 101.2 | 7100 | 72.8 |
| 5/8 | 16.0 | 6000 | 96.5 | 5400 | 69.9 |
| 3/4 | 20.0 | 4800 | 84.3 | 4300 | 59.1 |
| 1 | - | 3800 | 75.3 | 3400 | 49.3 |




RPM = rev./min.
FEED = inch/min.

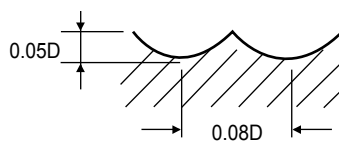
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE

### SEMD98 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm$^2$ | | | | 1110 ~ 1500N/mm$^2$ | | | | 1500 ~ 2000N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | Vc | Fz | RPM | FEED | Vc | Fz | RPM | FEED | Vc | Fz |
| R0.05× 0.1 | 40000 | 550 | 13 | 0.007 | 40000 | 500 | 13 | 0.006 | 33000 | 400 | 10 | 0.006 |
| R0.1 × 0.2 | 30000 | 720 | 19 | 0.012 | 30000 | 630 | 19 | 0.011 | 27000 | 575 | 17 | 0.011 |
| R0.15× 0.3 | 30000 | 900 | 28 | 0.015 | 30000 | 810 | 28 | 0.014 | 27000 | 720 | 25 | 0.013 |
| R0.2 × 0.4 | 30000 | 1140 | 38 | 0.019 | 30000 | 1020 | 38 | 0.017 | 27000 | 900 | 34 | 0.017 |
| R0.25× 0.5 | 30000 | 1440 | 47 | 0.024 | 30000 | 1260 | 47 | 0.021 | 27000 | 1140 | 42 | 0.021 |
| R0.3 × 0.6 | 30000 | 1740 | 57 | 0.029 | 30000 | 1500 | 57 | 0.025 | 27000 | 1320 | 51 | 0.024 |
| R0.35× 0.7 | 30000 | 2040 | 66 | 0.034 | 30000 | 1740 | 66 | 0.029 | 27000 | 1560 | 59 | 0.029 |
| R0.4 × 0.8 | 30000 | 2340 | 75 | 0.039 | 30000 | 1980 | 75 | 0.033 | 27000 | 1800 | 68 | 0.033 |
| R0.45× 0.9 | 30000 | 2610 | 85 | 0.044 | 30000 | 2250 | 85 | 0.038 | 27000 | 2040 | 76 | 0.038 |
| R0.5 × 1.0 | 30000 | 2880 | 94 | 0.048 | 30000 | 2520 | 94 | 0.042 | 27000 | 2280 | 85 | 0.042 |
| R0.6 × 1.2 | 30000 | 3060 | 113 | 0.051 | 28800 | 2580 | 109 | 0.045 | 25800 | 2310 | 97 | 0.045 |
| R0.75× 1.5 | 30000 | 3240 | 141 | 0.054 | 28800 | 2700 | 136 | 0.047 | 25800 | 2400 | 122 | 0.047 |
| R1.0 × 2.0 | 29820 | 3420 | 187 | 0.057 | 28680 | 2880 | 180 | 0.050 | 24000 | 2400 | 151 | 0.050 |
| R1.25× 2.5 | 23800 | 3510 | 187 | 0.074 | 22900 | 3030 | 180 | 0.066 | 19200 | 2400 | 151 | 0.063 |
| R1.5 × 3.0 | 19860 | 3600 | 187 | 0.091 | 19080 | 3180 | 180 | 0.083 | 16000 | 2400 | 151 | 0.075 |
| R1.75× 3.5 | 17000 | 3600 | 187 | 0.106 | 16400 | 3180 | 180 | 0.097 | 13700 | 2400 | 151 | 0.088 |
| R2.0 × 4.0 | 14900 | 3600 | 187 | 0.121 | 14340 | 3180 | 180 | 0.111 | 12000 | 2400 | 151 | 0.100 |
| R2.25× 4.5 | 13030 | 3540 | 184 | 0.136 | 12510 | 3060 | 177 | 0.122 | 10500 | 2325 | 148 | 0.111 |
| R2.5 × 5.0 | 11160 | 3480 | 175 | 0.156 | 10680 | 2940 | 168 | 0.138 | 9000 | 2250 | 141 | 0.125 |
| R2.75× 5.5 | 9750 | 3195 | 168 | 0.164 | 9360 | 2700 | 162 | 0.144 | 7800 | 2055 | 135 | 0.132 |
| R3.0 × 6.0 | 8340 | 2910 | 157 | 0.174 | 8040 | 2460 | 152 | 0.153 | 6600 | 1860 | 124 | 0.141 |
| R3.25× 6.5 | 7780 | 2780 | 159 | 0.179 | 7500 | 2340 | 153 | 0.156 | 6200 | 1780 | 127 | 0.144 |
| R3.5 × 7.0 | 7220 | 2650 | 159 | 0.184 | 6960 | 2220 | 153 | 0.159 | 5800 | 1700 | 128 | 0.147 |
| R4.0 × 8.0 | 6660 | 2520 | 167 | 0.189 | 6420 | 2100 | 161 | 0.164 | 5400 | 1620 | 136 | 0.150 |
| R4.25× 8.5 | 6300 | 2420 | 168 | 0.192 | 6060 | 2020 | 162 | 0.167 | 5100 | 1560 | 136 | 0.153 |
| R4.5 × 9.0 | 5940 | 2320 | 168 | 0.195 | 5700 | 1940 | 161 | 0.170 | 4800 | 1500 | 136 | 0.156 |
| R5.0 × 10.0 | 5580 | 2220 | 175 | 0.199 | 5340 | 1860 | 168 | 0.174 | 4500 | 1440 | 141 | 0.160 |
| R5.5 × 11.0 | 4875 | 1995 | 168 | 0.205 | 4670 | 1680 | 161 | 0.180 | 3930 | 1290 | 136 | 0.164 |
| R6.0 × 12.0 | 4170 | 1770 | 157 | 0.212 | 4000 | 1500 | 151 | 0.188 | 3360 | 1140 | 127 | 0.170 |
| R6.5 × 13.0 | 3960 | 1725 | 162 | 0.218 | 3800 | 1500 | 155 | 0.197 | 3200 | 1110 | 131 | 0.173 |
| R7.0 × 14.0 | 3750 | 1680 | 165 | 0.224 | 3600 | 1500 | 158 | 0.208 | 3030 | 1080 | 133 | 0.178 |
| R7.5 × 15.0 | 3550 | 1635 | 167 | 0.230 | 3400 | 1500 | 160 | 0.221 | 2870 | 1050 | 135 | 0.183 |
| R8.0 × 16.0 | 3340 | 1590 | 168 | 0.238 | 3210 | 1320 | 161 | 0.206 | 2700 | 1020 | 136 | 0.189 |
| R9.0 × 18.0 | 3005 | 1500 | 170 | 0.250 | 2895 | 1245 | 164 | 0.215 | 2430 | 960 | 137 | 0.198 |
| R10.0× 20.0 | 2670 | 1410 | 168 | 0.264 | 2580 | 1170 | 162 | 0.227 | 2160 | 900 | 136 | 0.208 |
| R12.5× 25.0 | 2130 | 1150 | 167 | 0.270 | 2060 | 950 | 162 | 0.231 | 1730 | 730 | 136 | 0.211 |




RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/t

## RECOMMENDED CUTTING CONDITIONS

# CARBIDE, 2 FLUTE LONG NECK BALL NOSE

## SEM846 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 0.1 | 0.2 | 50000 | 240 | 16 | 0.002 | 0.009 | 50000 | 215 | 16 | 0.002 | 0.007 | 50000 | 190 | 16 | 0.002 | 0.005 |
| 0.1 | 0.3 | 50000 | 240 | 16 | 0.002 | 0.009 | 50000 | 215 | 16 | 0.002 | 0.007 | 50000 | 190 | 16 | 0.002 | 0.005 |
| 0.1 | 0.5 | 50000 | 240 | 16 | 0.002 | 0.006 | 50000 | 215 | 16 | 0.002 | 0.005 | 50000 | 190 | 16 | 0.002 | 0.004 |
| 0.1 | 1 | 45000 | 195 | 14 | 0.002 | 0.002 | 45000 | 175 | 14 | 0.002 | 0.002 | 45000 | 155 | 14 | 0.002 | 0.001 |
| 0.2 | 0.5 | 50000 | 335 | 31 | 0.003 | 0.018 | 50000 | 310 | 31 | 0.003 | 0.014 | 43200 | 260 | 27 | 0.003 | 0.010 |
| 0.2 | 1 | 50000 | 335 | 31 | 0.003 | 0.013 | 50000 | 310 | 31 | 0.003 | 0.010 | 43200 | 260 | 27 | 0.003 | 0.007 |
| 0.2 | 1.5 | 45000 | 270 | 28 | 0.003 | 0.007 | 45000 | 250 | 28 | 0.003 | 0.006 | 38880 | 210 | 24 | 0.003 | 0.004 |
| 0.2 | 2 | 45000 | 270 | 28 | 0.003 | 0.005 | 45000 | 250 | 28 | 0.003 | 0.004 | 38880 | 210 | 24 | 0.003 | 0.003 |
| 0.2 | 3 | 45000 | 270 | 28 | 0.003 | 0.003 | 45000 | 250 | 28 | 0.003 | 0.003 | 38880 | 210 | 24 | 0.003 | 0.002 |
| 0.3 | 1 | 50000 | 475 | 47 | 0.005 | 0.019 | 50000 | 430 | 47 | 0.004 | 0.015 | 42800 | 365 | 40 | 0.004 | 0.011 |
| 0.3 | 1.5 | 50000 | 475 | 47 | 0.005 | 0.019 | 50000 | 430 | 47 | 0.004 | 0.015 | 42800 | 365 | 40 | 0.004 | 0.011 |
| 0.3 | 2 | 45000 | 385 | 42 | 0.004 | 0.011 | 45000 | 350 | 42 | 0.004 | 0.008 | 38520 | 295 | 36 | 0.004 | 0.006 |
| 0.3 | 2.5 | 45000 | 385 | 42 | 0.004 | 0.007 | 45000 | 350 | 42 | 0.004 | 0.005 | 38520 | 295 | 36 | 0.004 | 0.004 |
| 0.3 | 3 | 45000 | 385 | 42 | 0.004 | 0.007 | 45000 | 350 | 42 | 0.004 | 0.005 | 38520 | 295 | 36 | 0.004 | 0.004 |
| 0.3 | 4 | 40000 | 305 | 38 | 0.004 | 0.004 | 40000 | 275 | 38 | 0.003 | 0.003 | 34240 | 235 | 32 | 0.003 | 0.002 |
| 0.3 | 5 | 30000 | 200 | 28 | 0.003 | 0.003 | 30000 | 180 | 28 | 0.003 | 0.002 | 25680 | 155 | 24 | 0.003 | 0.002 |
| 0.4 | 1 | 41000 | 490 | 52 | 0.006 | 0.036 | 38800 | 425 | 49 | 0.005 | 0.028 | 34200 | 340 | 43 | 0.005 | 0.020 |
| 0.4 | 1.5 | 41000 | 490 | 52 | 0.006 | 0.025 | 38800 | 425 | 49 | 0.005 | 0.020 | 34200 | 340 | 43 | 0.005 | 0.014 |
| 0.4 | 2 | 41000 | 490 | 52 | 0.006 | 0.025 | 38800 | 425 | 49 | 0.005 | 0.020 | 34200 | 340 | 43 | 0.005 | 0.014 |
| 0.4 | 2.5 | 36900 | 395 | 46 | 0.005 | 0.014 | 34920 | 345 | 44 | 0.005 | 0.011 | 30780 | 275 | 39 | 0.004 | 0.008 |
| 0.4 | 3 | 36900 | 395 | 46 | 0.005 | 0.014 | 34920 | 345 | 44 | 0.005 | 0.011 | 30780 | 275 | 39 | 0.004 | 0.008 |
| 0.4 | 4 | 36900 | 395 | 46 | 0.005 | 0.009 | 34920 | 345 | 44 | 0.005 | 0.007 | 30780 | 275 | 39 | 0.004 | 0.005 |
| 0.4 | 5 | 32800 | 315 | 41 | 0.005 | 0.009 | 31040 | 270 | 39 | 0.004 | 0.007 | 27360 | 220 | 34 | 0.004 | 0.005 |
| 0.4 | 6 | 32800 | 315 | 41 | 0.005 | 0.005 | 31040 | 270 | 39 | 0.004 | 0.004 | 27360 | 220 | 34 | 0.004 | 0.003 |
| 0.4 | 8 | 24600 | 205 | 31 | 0.004 | 0.004 | 23280 | 180 | 29 | 0.004 | 0.003 | 20520 | 145 | 26 | 0.004 | 0.002 |
| 0.4 | 10 | 12300 | 90 | 15 | 0.004 | 0.004 | 11640 | 75 | 15 | 0.003 | 0.003 | 10260 | 60 | 13 | 0.003 | 0.002 |
| 0.5 | 1 | 34200 | 685 | 54 | 0.010 | 0.045 | 32300 | 580 | 51 | 0.009 | 0.035 | 28500 | 515 | 45 | 0.009 | 0.025 |
| 0.5 | 1.5 | 34200 | 685 | 54 | 0.010 | 0.045 | 32300 | 580 | 51 | 0.009 | 0.035 | 28500 | 515 | 45 | 0.009 | 0.025 |
| 0.5 | 2 | 34200 | 685 | 54 | 0.010 | 0.032 | 32300 | 580 | 51 | 0.009 | 0.025 | 28500 | 515 | 45 | 0.009 | 0.018 |
| 0.5 | 2.5 | 34200 | 685 | 54 | 0.010 | 0.032 | 32300 | 580 | 51 | 0.009 | 0.025 | 28500 | 515 | 45 | 0.009 | 0.018 |
| 0.5 | 3 | 30780 | 555 | 48 | 0.009 | 0.018 | 29070 | 470 | 46 | 0.008 | 0.014 | 25650 | 415 | 40 | 0.008 | 0.010 |
| 0.5 | 4 | 30780 | 555 | 48 | 0.009 | 0.018 | 29070 | 470 | 46 | 0.008 | 0.014 | 25650 | 415 | 40 | 0.008 | 0.010 |
| 0.5 | 5 | 30780 | 555 | 48 | 0.009 | 0.011 | 29070 | 470 | 46 | 0.008 | 0.009 | 25650 | 415 | 40 | 0.008 | 0.006 |
| 0.5 | 6 | 27360 | 440 | 43 | 0.008 | 0.011 | 25840 | 370 | 41 | 0.007 | 0.009 | 22800 | 330 | 36 | 0.007 | 0.006 |
| 0.5 | 8 | 20520 | 290 | 32 | 0.007 | 0.007 | 19380 | 245 | 30 | 0.006 | 0.005 | 17100 | 215 | 27 | 0.006 | 0.004 |
| 0.5 | 10 | 20520 | 290 | 32 | 0.007 | 0.005 | 19380 | 245 | 30 | 0.006 | 0.004 | 17100 | 215 | 27 | 0.006 | 0.003 |
| 0.5 | 12 | 10260 | 125 | 16 | 0.006 | 0.005 | 9690 | 105 | 15 | 0.005 | 0.004 | 8550 | 95 | 13 | 0.006 | 0.003 |
| 0.5 | 14 | 10260 | 125 | 16 | 0.006 | 0.005 | 9690 | 105 | 15 | 0.005 | 0.004 | 8550 | 95 | 13 | 0.006 | 0.003 |
| 0.5 | 16 | 3420 | 35 | 5 | 0.005 | 0.005 | 3230 | 30 | 5 | 0.005 | 0.004 | 2850 | 25 | 4 | 0.004 | 0.003 |
| 0.6 | 1 | 34200 | 1025 | 64 | 0.015 | 0.038 | 32300 | 840 | 61 | 0.013 | 0.029 | 28500 | 685 | 54 | 0.012 | 0.021 |
| 0.6 | 2 | 34200 | 1025 | 64 | 0.015 | 0.038 | 32300 | 840 | 61 | 0.013 | 0.029 | 28500 | 685 | 54 | 0.012 | 0.021 |
| 0.6 | 3 | 34200 | 1025 | 64 | 0.015 | 0.038 | 32300 | 840 | 61 | 0.013 | 0.029 | 28500 | 685 | 54 | 0.012 | 0.021 |
| 0.6 | 4 | 30780 | 830 | 58 | 0.013 | 0.022 | 29070 | 680 | 55 | 0.012 | 0.017 | 25650 | 555 | 48 | 0.011 | 0.012 |
| 0.6 | 5 | 30780 | 830 | 58 | 0.013 | 0.014 | 29070 | 680 | 55 | 0.012 | 0.011 | 25650 | 555 | 48 | 0.011 | 0.008 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

### SEM846 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 0.6 | 6 | 30780 | 830 | 58 | 0.013 | 0.014 | 29070 | 680 | 55 | 0.012 | 0.011 | 25650 | 555 | 48 | 0.011 | 0.008 |
| 0.6 | 8 | 27360 | 655 | 52 | 0.012 | 0.008 | 25840 | 540 | 49 | 0.010 | 0.006 | 22800 | 440 | 43 | 0.010 | 0.005 |
| 0.6 | 10 | 20520 | 430 | 39 | 0.010 | 0.005 | 19380 | 355 | 37 | 0.009 | 0.004 | 17100 | 290 | 32 | 0.008 | 0.003 |
| 0.6 | 12 | 20520 | 430 | 39 | 0.010 | 0.005 | 19380 | 355 | 37 | 0.009 | 0.004 | 17100 | 290 | 32 | 0.008 | 0.003 |
| 0.6 | 14 | 10260 | 185 | 19 | 0.009 | 0.005 | 9690 | 150 | 18 | 0.008 | 0.004 | 8550 | 125 | 16 | 0.007 | 0.003 |
| 0.6 | 16 | 10260 | 185 | 19 | 0.009 | 0.005 | 9690 | 150 | 18 | 0.008 | 0.004 | 8550 | 125 | 16 | 0.007 | 0.003 |
| 0.7 | 2 | 34200 | 1130 | 75 | 0.017 | 0.063 | 32300 | 930 | 71 | 0.014 | 0.049 | 28500 | 765 | 63 | 0.013 | 0.035 |
| 0.7 | 4 | 30780 | 915 | 68 | 0.015 | 0.025 | 29070 | 755 | 64 | 0.013 | 0.020 | 25650 | 620 | 56 | 0.012 | 0.014 |
| 0.7 | 6 | 30780 | 915 | 68 | 0.015 | 0.016 | 29070 | 755 | 64 | 0.013 | 0.012 | 25650 | 620 | 56 | 0.012 | 0.009 |
| 0.7 | 8 | 27360 | 725 | 60 | 0.013 | 0.016 | 25840 | 595 | 57 | 0.012 | 0.012 | 22800 | 490 | 50 | 0.011 | 0.009 |
| 0.7 | 10 | 27360 | 725 | 60 | 0.013 | 0.009 | 25840 | 595 | 57 | 0.012 | 0.007 | 22800 | 490 | 50 | 0.011 | 0.005 |
| 0.7 | 12 | 20520 | 475 | 45 | 0.012 | 0.006 | 19380 | 390 | 43 | 0.010 | 0.005 | 17100 | 320 | 38 | 0.009 | 0.004 |
| 0.8 | 2 | 34200 | 1230 | 86 | 0.018 | 0.072 | 32300 | 1035 | 81 | 0.016 | 0.056 | 28500 | 855 | 72 | 0.015 | 0.040 |
| 0.8 | 3 | 34200 | 1230 | 86 | 0.018 | 0.050 | 32300 | 1035 | 81 | 0.016 | 0.039 | 28500 | 855 | 72 | 0.015 | 0.028 |
| 0.8 | 4 | 34200 | 1230 | 86 | 0.018 | 0.050 | 32300 | 1035 | 81 | 0.016 | 0.039 | 28500 | 855 | 72 | 0.015 | 0.028 |
| 0.8 | 5 | 30780 | 995 | 77 | 0.016 | 0.029 | 29070 | 840 | 73 | 0.014 | 0.022 | 25650 | 695 | 64 | 0.014 | 0.016 |
| 0.8 | 6 | 30780 | 995 | 77 | 0.016 | 0.029 | 29070 | 840 | 73 | 0.014 | 0.022 | 25650 | 695 | 64 | 0.014 | 0.016 |
| 0.8 | 8 | 30780 | 995 | 77 | 0.016 | 0.018 | 29070 | 840 | 73 | 0.014 | 0.014 | 25650 | 695 | 64 | 0.014 | 0.010 |
| 0.8 | 10 | 27360 | 785 | 69 | 0.014 | 0.018 | 25840 | 660 | 65 | 0.013 | 0.014 | 22800 | 545 | 57 | 0.012 | 0.010 |
| 0.8 | 12 | 27360 | 785 | 69 | 0.014 | 0.011 | 25840 | 660 | 65 | 0.013 | 0.008 | 22800 | 545 | 57 | 0.012 | 0.006 |
| 0.8 | 14 | 20520 | 515 | 52 | 0.013 | 0.007 | 19380 | 435 | 49 | 0.011 | 0.006 | 17100 | 360 | 43 | 0.011 | 0.004 |
| 0.8 | 16 | 20520 | 515 | 52 | 0.013 | 0.007 | 19380 | 435 | 49 | 0.011 | 0.006 | 17100 | 360 | 43 | 0.011 | 0.004 |
| 0.8 | 20 | 10260 | 220 | 26 | 0.011 | 0.007 | 9690 | 185 | 24 | 0.010 | 0.006 | 8550 | 155 | 21 | 0.009 | 0.004 |
| 0.9 | 4 | 29250 | 1120 | 83 | 0.019 | 0.032 | 27630 | 935 | 78 | 0.017 | 0.025 | 24390 | 775 | 69 | 0.016 | 0.018 |
| 0.9 | 6 | 29250 | 1120 | 83 | 0.019 | 0.032 | 27630 | 935 | 78 | 0.017 | 0.025 | 24390 | 775 | 69 | 0.016 | 0.018 |
| 0.9 | 8 | 29250 | 1120 | 83 | 0.019 | 0.020 | 27630 | 935 | 78 | 0.017 | 0.016 | 24390 | 775 | 69 | 0.016 | 0.011 |
| 0.9 | 10 | 26000 | 885 | 74 | 0.017 | 0.020 | 24560 | 740 | 69 | 0.015 | 0.016 | 21680 | 610 | 61 | 0.014 | 0.011 |
| 1.0 | 2 | 30800 | 1540 | 97 | 0.025 | 0.090 | 29100 | 1310 | 91 | 0.023 | 0.070 | 25700 | 1075 | 81 | 0.021 | 0.050 |
| 1.0 | 3 | 30800 | 1540 | 97 | 0.025 | 0.090 | 29100 | 1310 | 91 | 0.023 | 0.070 | 25700 | 1075 | 81 | 0.021 | 0.050 |
| 1.0 | 4 | 30800 | 1540 | 97 | 0.025 | 0.063 | 29100 | 1310 | 91 | 0.023 | 0.049 | 25700 | 1075 | 81 | 0.021 | 0.035 |
| 1.0 | 5 | 30800 | 1540 | 97 | 0.025 | 0.063 | 29100 | 1310 | 91 | 0.023 | 0.049 | 25700 | 1075 | 81 | 0.021 | 0.035 |
| 1.0 | 6 | 27720 | 1245 | 87 | 0.022 | 0.036 | 26190 | 1060 | 82 | 0.020 | 0.028 | 23130 | 870 | 73 | 0.019 | 0.020 |
| 1.0 | 7 | 27720 | 1245 | 87 | 0.022 | 0.036 | 26190 | 1060 | 82 | 0.020 | 0.028 | 23130 | 870 | 73 | 0.019 | 0.020 |
| 1.0 | 8 | 27720 | 1245 | 87 | 0.022 | 0.036 | 26190 | 1060 | 82 | 0.020 | 0.028 | 23130 | 870 | 73 | 0.019 | 0.020 |
| 1.0 | 10 | 27720 | 1245 | 87 | 0.022 | 0.023 | 26190 | 1060 | 82 | 0.020 | 0.018 | 23130 | 870 | 73 | 0.019 | 0.013 |
| 1.0 | 12 | 24640 | 985 | 77 | 0.020 | 0.023 | 23280 | 840 | 73 | 0.018 | 0.018 | 20560 | 690 | 65 | 0.017 | 0.013 |
| 1.0 | 14 | 24640 | 985 | 77 | 0.020 | 0.014 | 23280 | 840 | 73 | 0.018 | 0.011 | 20560 | 690 | 65 | 0.017 | 0.008 |
| 1.0 | 16 | 18480 | 645 | 58 | 0.017 | 0.014 | 17460 | 550 | 55 | 0.016 | 0.011 | 15420 | 450 | 48 | 0.015 | 0.008 |
| 1.0 | 18 | 18480 | 645 | 58 | 0.017 | 0.009 | 17460 | 550 | 55 | 0.016 | 0.007 | 15420 | 450 | 48 | 0.015 | 0.005 |
| 1.0 | 20 | 18480 | 645 | 58 | 0.017 | 0.009 | 17460 | 550 | 55 | 0.016 | 0.007 | 15420 | 450 | 48 | 0.015 | 0.005 |
| 1.0 | 22 | 9240 | 275 | 29 | 0.015 | 0.009 | 8730 | 235 | 27 | 0.013 | 0.007 | 7710 | 195 | 24 | 0.013 | 0.005 |
| 1.0 | 26 | 9240 | 275 | 29 | 0.015 | 0.009 | 8730 | 235 | 27 | 0.013 | 0.007 | 7710 | 195 | 24 | 0.013 | 0.005 |
| 1.0 | 30 | 9240 | 275 | 29 | 0.015 | 0.009 | 8730 | 235 | 27 | 0.013 | 0.007 | 7710 | 195 | 24 | 0.013 | 0.005 |
| 1.0 | 40 | 3080 | 75 | 10 | 0.012 | 0.009 | 2910 | 65 | 9 | 0.011 | 0.007 | 2570 | 55 | 8 | 0.011 | 0.005 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

### SEM846 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 1.0 | 50 | 3080 | 75 | 10 | 0.012 | 0.006 | 2910 | 65 | 9 | 0.011 | 0.005 | 2570 | 55 | 8 | 0.011 | 0.003 |
| 1.2 | 4 | 26300 | 1375 | 99 | 0.026 | 0.076 | 24800 | 1150 | 93 | 0.023 | 0.059 | 21900 | 950 | 83 | 0.022 | 0.042 |
| 1.2 | 6 | 26300 | 1375 | 99 | 0.026 | 0.076 | 24800 | 1150 | 93 | 0.023 | 0.059 | 21900 | 950 | 83 | 0.022 | 0.042 |
| 1.2 | 8 | 23670 | 1115 | 89 | 0.024 | 0.043 | 22320 | 930 | 84 | 0.021 | 0.034 | 19710 | 770 | 74 | 0.020 | 0.024 |
| 1.2 | 10 | 23670 | 1115 | 89 | 0.024 | 0.027 | 22320 | 930 | 84 | 0.021 | 0.021 | 19710 | 770 | 74 | 0.020 | 0.015 |
| 1.2 | 12 | 23670 | 1115 | 89 | 0.024 | 0.027 | 22320 | 930 | 84 | 0.021 | 0.021 | 19710 | 770 | 74 | 0.020 | 0.015 |
| 1.2 | 16 | 21040 | 880 | 79 | 0.021 | 0.016 | 19840 | 735 | 75 | 0.019 | 0.013 | 17520 | 610 | 66 | 0.017 | 0.009 |
| 1.2 | 20 | 15780 | 580 | 59 | 0.018 | 0.011 | 14880 | 485 | 56 | 0.016 | 0.008 | 13140 | 400 | 50 | 0.015 | 0.006 |
| 1.2 | 26 | 7890 | 245 | 30 | 0.016 | 0.011 | 7440 | 205 | 28 | 0.014 | 0.008 | 6570 | 170 | 25 | 0.013 | 0.006 |
| 1.4 | 6 | 21500 | 1295 | 95 | 0.030 | 0.088 | 20300 | 1100 | 89 | 0.027 | 0.069 | 18000 | 935 | 79 | 0.026 | 0.049 |
| 1.4 | 8 | 19350 | 1050 | 85 | 0.027 | 0.050 | 18270 | 890 | 80 | 0.024 | 0.039 | 16200 | 755 | 71 | 0.023 | 0.028 |
| 1.4 | 10 | 19350 | 1050 | 85 | 0.027 | 0.050 | 18270 | 890 | 80 | 0.024 | 0.039 | 16200 | 755 | 71 | 0.023 | 0.028 |
| 1.4 | 16 | 17200 | 830 | 76 | 0.024 | 0.032 | 16240 | 705 | 71 | 0.022 | 0.025 | 14400 | 600 | 63 | 0.021 | 0.018 |
| 1.5 | 4 | 23900 | 1580 | 113 | 0.033 | 0.135 | 22600 | 1355 | 106 | 0.030 | 0.105 | 20000 | 1075 | 94 | 0.027 | 0.075 |
| 1.5 | 5 | 23900 | 1580 | 113 | 0.033 | 0.095 | 22600 | 1355 | 106 | 0.030 | 0.074 | 20000 | 1075 | 94 | 0.027 | 0.053 |
| 1.5 | 6 | 23900 | 1580 | 113 | 0.033 | 0.095 | 22600 | 1355 | 106 | 0.030 | 0.074 | 20000 | 1075 | 94 | 0.027 | 0.053 |
| 1.5 | 7 | 23900 | 1580 | 113 | 0.033 | 0.095 | 22600 | 1355 | 106 | 0.030 | 0.074 | 20000 | 1075 | 94 | 0.027 | 0.053 |
| 1.5 | 8 | 21510 | 1280 | 101 | 0.030 | 0.054 | 20340 | 1100 | 96 | 0.027 | 0.042 | 18000 | 870 | 85 | 0.024 | 0.030 |
| 1.5 | 10 | 21510 | 1280 | 101 | 0.030 | 0.054 | 20340 | 1100 | 96 | 0.027 | 0.042 | 18000 | 870 | 85 | 0.024 | 0.030 |
| 1.5 | 12 | 21510 | 1280 | 101 | 0.030 | 0.054 | 20340 | 1100 | 96 | 0.027 | 0.042 | 18000 | 870 | 85 | 0.024 | 0.030 |
| 1.5 | 14 | 21510 | 1280 | 101 | 0.030 | 0.034 | 20340 | 1100 | 96 | 0.027 | 0.026 | 18000 | 870 | 85 | 0.024 | 0.019 |
| 1.5 | 16 | 19120 | 1010 | 90 | 0.026 | 0.034 | 18080 | 865 | 85 | 0.024 | 0.026 | 16000 | 690 | 75 | 0.022 | 0.019 |
| 1.5 | 18 | 19120 | 1010 | 90 | 0.026 | 0.034 | 18080 | 865 | 85 | 0.024 | 0.026 | 16000 | 690 | 75 | 0.022 | 0.019 |
| 1.5 | 20 | 19120 | 1010 | 90 | 0.026 | 0.02 | 18080 | 865 | 85 | 0.024 | 0.016 | 16000 | 690 | 75 | 0.022 | 0.011 |
| 1.5 | 22 | 19120 | 1010 | 90 | 0.026 | 0.02 | 18080 | 865 | 85 | 0.024 | 0.016 | 16000 | 690 | 75 | 0.022 | 0.011 |
| 1.5 | 26 | 14340 | 665 | 68 | 0.023 | 0.014 | 13560 | 570 | 64 | 0.021 | 0.011 | 12000 | 450 | 57 | 0.019 | 0.008 |
| 1.5 | 30 | 14340 | 665 | 68 | 0.023 | 0.014 | 13560 | 570 | 64 | 0.021 | 0.011 | 12000 | 450 | 57 | 0.019 | 0.008 |
| 1.5 | 35 | 7170 | 285 | 34 | 0.020 | 0.010 | 6780 | 245 | 32 | 0.018 | 0.008 | 6000 | 195 | 28 | 0.016 | 0.005 |
| 1.5 | 40 | 7170 | 285 | 34 | 0.020 | 0.010 | 6780 | 245 | 32 | 0.018 | 0.008 | 6000 | 195 | 28 | 0.016 | 0.005 |
| 1.6 | 4 | 22200 | 1555 | 112 | 0.035 | 0.101 | 21000 | 1300 | 106 | 0.031 | 0.078 | 18500 | 1110 | 93 | 0.030 | 0.056 |
| 1.6 | 6 | 22200 | 1555 | 112 | 0.035 | 0.101 | 21000 | 1300 | 106 | 0.031 | 0.078 | 18500 | 1110 | 93 | 0.030 | 0.056 |
| 1.6 | 8 | 22200 | 1555 | 112 | 0.035 | 0.101 | 21000 | 1300 | 106 | 0.031 | 0.078 | 18500 | 1110 | 93 | 0.030 | 0.056 |
| 1.6 | 10 | 19980 | 1260 | 100 | 0.032 | 0.058 | 18900 | 1055 | 95 | 0.028 | 0.045 | 16650 | 900 | 84 | 0.027 | 0.032 |
| 1.6 | 12 | 19980 | 1260 | 100 | 0.032 | 0.058 | 18900 | 1055 | 95 | 0.028 | 0.045 | 16650 | 900 | 84 | 0.027 | 0.032 |
| 1.6 | 16 | 19980 | 1260 | 100 | 0.032 | 0.036 | 18900 | 1055 | 95 | 0.028 | 0.028 | 16650 | 900 | 84 | 0.027 | 0.020 |
| 1.6 | 20 | 17760 | 995 | 89 | 0.028 | 0.036 | 16800 | 830 | 84 | 0.025 | 0.028 | 14800 | 710 | 74 | 0.024 | 0.020 |
| 1.8 | 4 | 22200 | 1780 | 126 | 0.040 | 0.113 | 21000 | 1470 | 119 | 0.035 | 0.088 | 18500 | 1225 | 105 | 0.033 | 0.063 |
| 1.8 | 6 | 22200 | 1780 | 126 | 0.040 | 0.113 | 21000 | 1470 | 119 | 0.035 | 0.088 | 18500 | 1225 | 105 | 0.033 | 0.063 |
| 1.8 | 8 | 22200 | 1780 | 126 | 0.040 | 0.113 | 21000 | 1470 | 119 | 0.035 | 0.088 | 18500 | 1225 | 105 | 0.033 | 0.063 |
| 1.8 | 10 | 19980 | 1440 | 113 | 0.036 | 0.065 | 18900 | 1190 | 107 | 0.031 | 0.050 | 16650 | 990 | 94 | 0.030 | 0.036 |
| 1.8 | 12 | 19980 | 1440 | 113 | 0.036 | 0.065 | 18900 | 1190 | 107 | 0.031 | 0.050 | 16650 | 990 | 94 | 0.030 | 0.036 |
| 1.8 | 16 | 19980 | 1440 | 113 | 0.036 | 0.041 | 18900 | 1190 | 107 | 0.031 | 0.032 | 16650 | 990 | 94 | 0.030 | 0.023 |
| 1.8 | 20 | 17760 | 1140 | 100 | 0.032 | 0.041 | 16800 | 940 | 95 | 0.028 | 0.032 | 14800 | 785 | 84 | 0.027 | 0.023 |
| 2.0 | 6 | 18000 | 1795 | 113 | 0.050 | 0.180 | 17000 | 1525 | 107 | 0.045 | 0.140 | 15000 | 1285 | 94 | 0.043 | 0.100 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK BALL NOSE

### SEM846 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 2.0 | 8 | 18000 | 1795 | 113 | 0.050 | 0.126 | 17000 | 1525 | 107 | 0.045 | 0.098 | 15000 | 1285 | 94 | 0.043 | 0.070 |
| 2.0 | 10 | 18000 | 1795 | 113 | 0.050 | 0.126 | 17000 | 1525 | 107 | 0.045 | 0.098 | 15000 | 1285 | 94 | 0.043 | 0.070 |
| 2.0 | 12 | 16200 | 1455 | 102 | 0.045 | 0.072 | 15300 | 1235 | 96 | 0.040 | 0.056 | 13500 | 1040 | 85 | 0.039 | 0.040 |
| 2.0 | 14 | 16200 | 1455 | 102 | 0.045 | 0.072 | 15300 | 1235 | 96 | 0.040 | 0.056 | 13500 | 1040 | 85 | 0.039 | 0.040 |
| 2.0 | 16 | 16200 | 1455 | 102 | 0.045 | 0.072 | 15300 | 1235 | 96 | 0.040 | 0.056 | 13500 | 1040 | 85 | 0.039 | 0.040 |
| 2.0 | 18 | 16200 | 1455 | 102 | 0.045 | 0.045 | 15300 | 1235 | 96 | 0.040 | 0.035 | 13500 | 1040 | 85 | 0.039 | 0.025 |
| 2.0 | 20 | 16200 | 1455 | 102 | 0.045 | 0.045 | 15300 | 1235 | 96 | 0.040 | 0.035 | 13500 | 1040 | 85 | 0.039 | 0.025 |
| 2.0 | 22 | 14400 | 1150 | 90 | 0.040 | 0.045 | 13600 | 975 | 85 | 0.036 | 0.035 | 12000 | 820 | 75 | 0.034 | 0.025 |
| 2.0 | 26 | 14400 | 1150 | 90 | 0.040 | 0.045 | 13600 | 975 | 85 | 0.036 | 0.035 | 12000 | 820 | 75 | 0.034 | 0.025 |
| 2.0 | 30 | 14400 | 1150 | 90 | 0.040 | 0.027 | 13600 | 975 | 85 | 0.036 | 0.021 | 12000 | 820 | 75 | 0.034 | 0.015 |
| 2.0 | 35 | 10800 | 755 | 68 | 0.035 | 0.018 | 10200 | 640 | 64 | 0.031 | 0.014 | 9000 | 540 | 57 | 0.030 | 0.010 |
| 2.0 | 40 | 10800 | 755 | 68 | 0.035 | 0.018 | 10200 | 640 | 64 | 0.031 | 0.014 | 9000 | 540 | 57 | 0.030 | 0.010 |
| 2.0 | 45 | 5400 | 325 | 34 | 0.030 | 0.018 | 5100 | 275 | 32 | 0.027 | 0.014 | 4500 | 230 | 28 | 0.026 | 0.010 |
| 2.0 | 50 | 5400 | 325 | 34 | 0.030 | 0.018 | 5100 | 275 | 32 | 0.027 | 0.014 | 4500 | 230 | 28 | 0.026 | 0.010 |
| 2.0 | 60 | 5400 | 325 | 34 | 0.030 | 0.018 | 5100 | 275 | 32 | 0.027 | 0.014 | 4500 | 230 | 28 | 0.026 | 0.010 |
| 2.5 | 8 | 15800 | 1925 | 124 | 0.061 | 0.158 | 14900 | 1605 | 117 | 0.054 | 0.123 | 13200 | 1305 | 104 | 0.049 | 0.088 |
| 2.5 | 10 | 15800 | 1925 | 124 | 0.061 | 0.158 | 14900 | 1605 | 117 | 0.054 | 0.123 | 13200 | 1305 | 104 | 0.049 | 0.088 |
| 2.5 | 12 | 15800 | 1925 | 124 | 0.061 | 0.158 | 14900 | 1605 | 117 | 0.054 | 0.123 | 13200 | 1305 | 104 | 0.049 | 0.088 |
| 2.5 | 16 | 14220 | 1560 | 112 | 0.055 | 0.090 | 13410 | 1300 | 105 | 0.048 | 0.070 | 11880 | 1055 | 93 | 0.044 | 0.050 |
| 2.5 | 20 | 14220 | 1560 | 112 | 0.055 | 0.090 | 13410 | 1300 | 105 | 0.048 | 0.070 | 11880 | 1055 | 93 | 0.044 | 0.050 |
| 2.5 | 22 | 14220 | 1560 | 112 | 0.055 | 0.056 | 13410 | 1300 | 105 | 0.048 | 0.044 | 11880 | 1055 | 93 | 0.044 | 0.031 |
| 2.5 | 26 | 12640 | 1230 | 99 | 0.049 | 0.056 | 11920 | 1025 | 94 | 0.043 | 0.044 | 10560 | 835 | 83 | 0.040 | 0.031 |
| 2.5 | 30 | 12640 | 1230 | 99 | 0.049 | 0.056 | 11920 | 1025 | 94 | 0.043 | 0.044 | 10560 | 835 | 83 | 0.040 | 0.031 |
| 2.5 | 35 | 12640 | 1230 | 99 | 0.049 | 0.034 | 11920 | 1025 | 94 | 0.043 | 0.026 | 10560 | 835 | 83 | 0.040 | 0.019 |
| 2.5 | 40 | 9480 | 810 | 74 | 0.043 | 0.034 | 8940 | 675 | 70 | 0.038 | 0.026 | 7920 | 550 | 62 | 0.035 | 0.019 |
| 2.5 | 45 | 9480 | 810 | 74 | 0.043 | 0.023 | 8940 | 675 | 70 | 0.038 | 0.018 | 7920 | 550 | 62 | 0.035 | 0.013 |
| 2.5 | 50 | 9480 | 810 | 74 | 0.043 | 0.023 | 8940 | 675 | 70 | 0.038 | 0.018 | 7920 | 550 | 62 | 0.035 | 0.013 |
| 3.0 | 6 | 13700 | 2050 | 129 | 0.075 | 0.270 | 12900 | 1730 | 122 | 0.067 | 0.210 | 11400 | 1435 | 107 | 0.063 | 0.150 |
| 3.0 | 8 | 13700 | 2050 | 129 | 0.075 | 0.270 | 12900 | 1730 | 122 | 0.067 | 0.210 | 11400 | 1435 | 107 | 0.063 | 0.150 |
| 3.0 | 10 | 13700 | 2050 | 129 | 0.075 | 0.189 | 12900 | 1730 | 122 | 0.067 | 0.147 | 11400 | 1435 | 107 | 0.063 | 0.105 |
| 3.0 | 12 | 13700 | 2050 | 129 | 0.075 | 0.189 | 12900 | 1730 | 122 | 0.067 | 0.147 | 11400 | 1435 | 107 | 0.063 | 0.105 |
| 3.0 | 14 | 13700 | 2050 | 129 | 0.075 | 0.189 | 12900 | 1730 | 122 | 0.067 | 0.147 | 11400 | 1435 | 107 | 0.063 | 0.105 |
| 3.0 | 16 | 12330 | 1660 | 116 | 0.067 | 0.108 | 11610 | 1400 | 109 | 0.060 | 0.084 | 10260 | 1160 | 97 | 0.057 | 0.060 |
| 3.0 | 18 | 12330 | 1660 | 116 | 0.067 | 0.108 | 11610 | 1400 | 109 | 0.060 | 0.084 | 10260 | 1160 | 97 | 0.057 | 0.060 |
| 3.0 | 20 | 12330 | 1660 | 116 | 0.067 | 0.108 | 11610 | 1400 | 109 | 0.060 | 0.084 | 10260 | 1160 | 97 | 0.057 | 0.060 |
| 3.0 | 22 | 12330 | 1660 | 116 | 0.067 | 0.108 | 11610 | 1400 | 109 | 0.060 | 0.084 | 10260 | 1160 | 97 | 0.057 | 0.060 |
| 3.0 | 26 | 12330 | 1660 | 116 | 0.067 | 0.068 | 11610 | 1400 | 109 | 0.060 | 0.053 | 10260 | 1160 | 97 | 0.057 | 0.038 |
| 3.0 | 30 | 12330 | 1660 | 116 | 0.067 | 0.068 | 11610 | 1400 | 109 | 0.060 | 0.053 | 10260 | 1160 | 97 | 0.057 | 0.038 |
| 3.0 | 35 | 10960 | 1310 | 103 | 0.060 | 0.068 | 10320 | 1105 | 97 | 0.054 | 0.053 | 9120 | 920 | 86 | 0.050 | 0.038 |
| 3.0 | 40 | 10960 | 1310 | 103 | 0.060 | 0.041 | 10320 | 1105 | 97 | 0.054 | 0.032 | 9120 | 920 | 86 | 0.050 | 0.023 |
| 3.0 | 45 | 10960 | 1310 | 103 | 0.060 | 0.041 | 10320 | 1105 | 97 | 0.054 | 0.032 | 9120 | 920 | 86 | 0.050 | 0.023 |
| 3.0 | 50 | 8220 | 860 | 77 | 0.052 | 0.027 | 7740 | 725 | 73 | 0.047 | 0.021 | 6840 | 605 | 64 | 0.044 | 0.015 |
| 3.0 | 60 | 8220 | 860 | 77 | 0.052 | 0.027 | 7740 | 725 | 73 | 0.047 | 0.021 | 6840 | 605 | 64 | 0.044 | 0.015 |
| 4.0 | 8 | 9800 | 1965 | 123 | 0.100 | 0.360 | 9300 | 1670 | 117 | 0.090 | 0.280 | 8200 | 1395 | 103 | 0.085 | 0.200 |

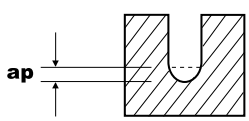
DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# CARBIDE, 2 FLUTE LONG NECK BALL NOSE

## SEM846 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 4.0 | 10 | 9800 | 1965 | 123 | 0.100 | 0.360 | 9300 | 1670 | 117 | 0.090 | 0.280 | 8200 | 1395 | 103 | 0.085 | 0.200 |
| 4.0 | 12 | 9800 | 1965 | 123 | 0.100 | 0.360 | 9300 | 1670 | 117 | 0.090 | 0.280 | 8200 | 1395 | 103 | 0.085 | 0.200 |
| 4.0 | 14 | 9800 | 1965 | 123 | 0.100 | 0.252 | 9300 | 1670 | 117 | 0.090 | 0.196 | 8200 | 1395 | 103 | 0.085 | 0.140 |
| 4.0 | 16 | 9800 | 1965 | 123 | 0.100 | 0.252 | 9300 | 1670 | 117 | 0.090 | 0.196 | 8200 | 1395 | 103 | 0.085 | 0.140 |
| 4.0 | 18 | 9800 | 1965 | 123 | 0.100 | 0.252 | 9300 | 1670 | 117 | 0.090 | 0.196 | 8200 | 1395 | 103 | 0.085 | 0.140 |
| 4.0 | 20 | 9800 | 1965 | 123 | 0.100 | 0.252 | 9300 | 1670 | 117 | 0.090 | 0.196 | 8200 | 1395 | 103 | 0.085 | 0.140 |
| 4.0 | 22 | 8820 | 1590 | 111 | 0.090 | 0.144 | 8370 | 1355 | 105 | 0.081 | 0.112 | 7380 | 1130 | 93 | 0.077 | 0.080 |
| 4.0 | 26 | 8820 | 1590 | 111 | 0.090 | 0.144 | 8370 | 1355 | 105 | 0.081 | 0.112 | 7380 | 1130 | 93 | 0.077 | 0.080 |
| 4.0 | 30 | 8820 | 1590 | 111 | 0.090 | 0.144 | 8370 | 1355 | 105 | 0.081 | 0.112 | 7380 | 1130 | 93 | 0.077 | 0.080 |
| 4.0 | 35 | 8820 | 1590 | 111 | 0.090 | 0.090 | 8370 | 1355 | 105 | 0.081 | 0.070 | 7380 | 1130 | 93 | 0.077 | 0.050 |
| 4.0 | 40 | 8820 | 1590 | 111 | 0.090 | 0.090 | 8370 | 1355 | 105 | 0.081 | 0.070 | 7380 | 1130 | 93 | 0.077 | 0.050 |
| 4.0 | 45 | 7840 | 1260 | 99 | 0.080 | 0.090 | 7440 | 1070 | 93 | 0.072 | 0.070 | 6560 | 895 | 82 | 0.068 | 0.050 |
| 4.0 | 50 | 7840 | 1260 | 99 | 0.080 | 0.090 | 7440 | 1070 | 93 | 0.072 | 0.070 | 6560 | 895 | 82 | 0.068 | 0.050 |
| 4.0 | 60 | 7840 | 1260 | 99 | 0.080 | 0.054 | 7440 | 1070 | 93 | 0.072 | 0.042 | 6560 | 895 | 82 | 0.068 | 0.030 |
| 5.0 | 15 | 7700 | 1845 | 121 | 0.120 | 0.315 | 7300 | 1455 | 115 | 0.100 | 0.245 | 6400 | 1285 | 101 | 0.100 | 0.175 |
| 5.0 | 20 | 7700 | 1845 | 121 | 0.120 | 0.315 | 7300 | 1455 | 115 | 0.100 | 0.245 | 6400 | 1285 | 101 | 0.100 | 0.175 |
| 5.0 | 26 | 6930 | 1495 | 109 | 0.108 | 0.180 | 6570 | 1180 | 103 | 0.090 | 0.140 | 5760 | 1040 | 90 | 0.090 | 0.100 |
| 5.0 | 30 | 6930 | 1495 | 109 | 0.108 | 0.180 | 6570 | 1180 | 103 | 0.090 | 0.140 | 5760 | 1040 | 90 | 0.090 | 0.100 |
| 5.0 | 35 | 6930 | 1495 | 109 | 0.108 | 0.180 | 6570 | 1180 | 103 | 0.090 | 0.140 | 5760 | 1040 | 90 | 0.090 | 0.100 |
| 5.0 | 40 | 6930 | 1495 | 109 | 0.108 | 0.180 | 6570 | 1180 | 103 | 0.090 | 0.140 | 5760 | 1040 | 90 | 0.090 | 0.100 |
| 5.0 | 50 | 6930 | 1495 | 109 | 0.108 | 0.113 | 6570 | 1180 | 103 | 0.090 | 0.088 | 5760 | 1040 | 90 | 0.090 | 0.063 |
| 5.0 | 60 | 6160 | 1180 | 97 | 0.096 | 0.113 | 5840 | 930 | 92 | 0.080 | 0.088 | 5120 | 820 | 80 | 0.080 | 0.063 |
| 6.0 | 20 | 6500 | 1900 | 123 | 0.146 | 0.378 | 6200 | 1600 | 117 | 0.129 | 0.294 | 5500 | 1330 | 104 | 0.121 | 0.210 |
| 6.0 | 30 | 6500 | 1900 | 123 | 0.146 | 0.378 | 6200 | 1600 | 117 | 0.129 | 0.294 | 5500 | 1330 | 104 | 0.121 | 0.210 |
| 8.0 | 25 | 4850 | 1800 | 122 | 0.186 | 0.504 | 4600 | 1500 | 116 | 0.163 | 0.392 | 4000 | 1280 | 101 | 0.160 | 0.280 |
| 8.0 | 30 | 4850 | 1800 | 122 | 0.186 | 0.504 | 4600 | 1500 | 116 | 0.163 | 0.392 | 4000 | 1280 | 101 | 0.160 | 0.280 |
| 10.0 | 30 | 3850 | 1650 | 121 | 0.214 | 0.900 | 3680 | 1400 | 116 | 0.190 | 0.700 | 3200 | 1200 | 101 | 0.188 | 0.500 |
| 10.0 | 40 | 3850 | 1650 | 121 | 0.214 | 0.630 | 3680 | 1400 | 116 | 0.190 | 0.490 | 3200 | 1200 | 101 | 0.188 | 0.350 |
| 12.0 | 32 | 3200 | 1520 | 121 | 0.238 | 1.080 | 3050 | 1300 | 115 | 0.213 | 0.840 | 2650 | 1100 | 100 | 0.208 | 0.600 |
| 12.0 | 45 | 3200 | 1520 | 121 | 0.238 | 0.756 | 3050 | 1300 | 115 | 0.213 | 0.588 | 2650 | 1100 | 100 | 0.208 | 0.420 |

(Depth of Cut per one pass)




DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

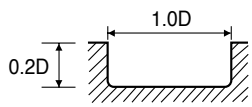
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE CORNER RADIUS

### SEMD99 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 0.2 | 44000 | 145 | 28 | 0.002 | 28800 | 60 | 18 | 0.001 | 17600 | 40 | 11 | 0.001 |
| 0.3 | 41000 | 170 | 39 | 0.002 | 27000 | 70 | 25 | 0.001 | 16500 | 45 | 16 | 0.001 |
| 0.4 | 41000 | 170 | 52 | 0.002 | 27000 | 70 | 34 | 0.001 | 16500 | 45 | 21 | 0.001 |
| 0.5 | 36000 | 190 | 57 | 0.003 | 23400 | 80 | 37 | 0.002 | 14300 | 50 | 22 | 0.002 |
| 0.6 | 30000 | 210 | 57 | 0.004 | 19800 | 90 | 37 | 0.002 | 12100 | 55 | 23 | 0.002 |
| 0.7 | 30000 | 210 | 66 | 0.004 | 19800 | 90 | 44 | 0.002 | 12100 | 55 | 27 | 0.002 |
| 0.8 | 30000 | 210 | 75 | 0.004 | 19800 | 90 | 50 | 0.002 | 12100 | 55 | 30 | 0.002 |
| 0.9 | 30000 | 225 | 85 | 0.004 | 18900 | 90 | 53 | 0.002 | 11550 | 55 | 33 | 0.002 |
| 1.0 | 27600 | 240 | 87 | 0.004 | 18000 | 100 | 57 | 0.003 | 11000 | 60 | 35 | 0.003 |
| 1.2 | 24800 | 245 | 93 | 0.005 | 15750 | 105 | 59 | 0.003 | 9750 | 60 | 37 | 0.003 |
| 1.5 | 22000 | 250 | 104 | 0.006 | 13500 | 110 | 64 | 0.004 | 8500 | 60 | 40 | 0.004 |
| 2.0 | 18000 | 260 | 113 | 0.007 | 11560 | 120 | 73 | 0.005 | 7200 | 70 | 45 | 0.005 |
| 2.5 | 15000 | 270 | 118 | 0.009 | 9500 | 130 | 75 | 0.007 | 6100 | 70 | 48 | 0.006 |
| 3.0 | 13240 | 280 | 125 | 0.011 | 8560 | 140 | 81 | 0.008 | 5280 | 70 | 50 | 0.007 |
| 3.5 | 11980 | 310 | 132 | 0.013 | 7690 | 155 | 85 | 0.010 | 4790 | 75 | 53 | 0.008 |
| 4.0 | 10720 | 340 | 135 | 0.016 | 6820 | 170 | 86 | 0.012 | 4300 | 80 | 54 | 0.009 |
| 4.5 | 9940 | 380 | 141 | 0.019 | 6310 | 185 | 89 | 0.015 | 4300 | 90 | 61 | 0.010 |
| 5.0 | 9160 | 420 | 144 | 0.023 | 5800 | 200 | 91 | 0.017 | 3800 | 100 | 60 | 0.013 |
| 5.5 | 8530 | 460 | 147 | 0.027 | 5420 | 225 | 94 | 0.021 | 3540 | 110 | 61 | 0.016 |
| 6.0 | 7900 | 500 | 149 | 0.032 | 5040 | 250 | 95 | 0.025 | 3280 | 120 | 62 | 0.018 |
| 7.0 | 6950 | 520 | 153 | 0.037 | 4420 | 250 | 97 | 0.028 | 2900 | 120 | 64 | 0.021 |
| 8.0 | 6000 | 540 | 151 | 0.045 | 3800 | 250 | 96 | 0.033 | 2520 | 120 | 63 | 0.024 |
| 10.0 | 5040 | 540 | 158 | 0.054 | 3280 | 250 | 103 | 0.038 | 2020 | 120 | 63 | 0.030 |
| 11.0 | 4580 | 480 | 158 | 0.052 | 3030 | 240 | 105 | 0.040 | 1850 | 110 | 64 | 0.030 |
| 12.0 | 4120 | 420 | 155 | 0.051 | 2780 | 230 | 105 | 0.041 | 1680 | 100 | 63 | 0.030 |
| 14.0 | 3610 | 390 | 159 | 0.054 | 2440 | 200 | 107 | 0.041 | 1480 | 90 | 65 | 0.030 |
| 16.0 | 3100 | 360 | 156 | 0.058 | 2100 | 170 | 106 | 0.040 | 1280 | 80 | 64 | 0.031 |
| 20.0 | 2520 | 280 | 158 | 0.056 | 1640 | 120 | 103 | 0.037 | 1000 | 60 | 63 | 0.030 |




RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

### SEME61 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 0.2 | 0.5 | 50000 | 170 | 31 | 0.002 | 0.040 | 34500 | 75 | 22 | 0.001 | 0.030 | 21150 | 45 | 13 | 0.001 | 0.024 |
| 0.2 | 1 | 50000 | 170 | 31 | 0.002 | 0.028 | 34500 | 75 | 22 | 0.001 | 0.021 | 21150 | 45 | 13 | 0.001 | 0.017 |
| 0.2 | 1.5 | 45000 | 140 | 28 | 0.002 | 0.016 | 31050 | 60 | 20 | 0.001 | 0.012 | 19040 | 35 | 12 | 0.001 | 0.010 |
| 0.2 | 2 | 45000 | 140 | 28 | 0.002 | 0.010 | 31050 | 60 | 20 | 0.001 | 0.008 | 19040 | 35 | 12 | 0.001 | 0.006 |
| 0.3 | 1 | 50000 | 200 | 47 | 0.002 | 0.042 | 32000 | 85 | 30 | 0.001 | 0.032 | 20000 | 50 | 19 | 0.001 | 0.025 |
| 0.3 | 2 | 45000 | 160 | 42 | 0.002 | 0.024 | 28800 | 70 | 27 | 0.001 | 0.018 | 18000 | 40 | 17 | 0.001 | 0.014 |
| 0.3 | 3 | 45000 | 160 | 42 | 0.002 | 0.015 | 28800 | 70 | 27 | 0.001 | 0.011 | 18000 | 40 | 17 | 0.001 | 0.009 |
| 0.4 | 1 | 50000 | 200 | 63 | 0.002 | 0.080 | 32000 | 85 | 40 | 0.001 | 0.060 | 20000 | 50 | 25 | 0.001 | 0.048 |
| 0.4 | 1.5 | 50000 | 200 | 63 | 0.002 | 0.056 | 32000 | 85 | 40 | 0.001 | 0.042 | 20000 | 50 | 25 | 0.001 | 0.034 |
| 0.4 | 2 | 50000 | 200 | 63 | 0.002 | 0.056 | 32000 | 85 | 40 | 0.001 | 0.042 | 20000 | 50 | 25 | 0.001 | 0.034 |
| 0.4 | 2.5 | 45000 | 160 | 57 | 0.002 | 0.032 | 28800 | 70 | 36 | 0.001 | 0.024 | 18000 | 40 | 23 | 0.001 | 0.019 |
| 0.4 | 3 | 45000 | 160 | 57 | 0.002 | 0.032 | 28800 | 70 | 36 | 0.001 | 0.024 | 18000 | 40 | 23 | 0.001 | 0.019 |
| 0.4 | 4 | 45000 | 160 | 57 | 0.002 | 0.020 | 28800 | 70 | 36 | 0.001 | 0.015 | 18000 | 40 | 23 | 0.001 | 0.012 |
| 0.5 | 1 | 43000 | 220 | 68 | 0.003 | 0.100 | 28000 | 95 | 44 | 0.002 | 0.075 | 17100 | 60 | 27 | 0.002 | 0.060 |
| 0.5 | 1.5 | 43000 | 220 | 68 | 0.003 | 0.100 | 28000 | 95 | 44 | 0.002 | 0.075 | 17100 | 60 | 27 | 0.002 | 0.060 |
| 0.5 | 2 | 43000 | 220 | 68 | 0.003 | 0.070 | 28000 | 95 | 44 | 0.002 | 0.053 | 17100 | 60 | 27 | 0.002 | 0.042 |
| 0.5 | 2.5 | 43000 | 220 | 68 | 0.003 | 0.070 | 28000 | 95 | 44 | 0.002 | 0.053 | 17100 | 60 | 27 | 0.002 | 0.042 |
| 0.5 | 3 | 38700 | 180 | 61 | 0.002 | 0.040 | 25200 | 75 | 40 | 0.001 | 0.030 | 15390 | 50 | 24 | 0.002 | 0.024 |
| 0.5 | 4 | 38700 | 180 | 61 | 0.002 | 0.040 | 25200 | 75 | 40 | 0.001 | 0.030 | 15390 | 50 | 24 | 0.002 | 0.024 |
| 0.5 | 5 | 38700 | 180 | 61 | 0.002 | 0.025 | 25200 | 75 | 40 | 0.001 | 0.019 | 15390 | 50 | 24 | 0.002 | 0.015 |
| 0.5 | 6 | 34400 | 140 | 54 | 0.002 | 0.025 | 22400 | 60 | 35 | 0.001 | 0.019 | 13680 | 40 | 21 | 0.001 | 0.015 |
| 0.6 | 2 | 36400 | 250 | 69 | 0.003 | 0.084 | 24000 | 110 | 45 | 0.002 | 0.063 | 14500 | 65 | 27 | 0.002 | 0.050 |
| 0.6 | 3 | 36400 | 250 | 69 | 0.003 | 0.084 | 24000 | 110 | 45 | 0.002 | 0.063 | 14500 | 65 | 27 | 0.002 | 0.050 |
| 0.6 | 4 | 32760 | 205 | 62 | 0.003 | 0.048 | 21600 | 90 | 41 | 0.002 | 0.036 | 13050 | 55 | 25 | 0.002 | 0.029 |
| 0.6 | 6 | 32760 | 205 | 62 | 0.003 | 0.030 | 21600 | 90 | 41 | 0.002 | 0.023 | 13050 | 55 | 25 | 0.002 | 0.018 |
| 0.6 | 8 | 29120 | 160 | 55 | 0.003 | 0.018 | 19200 | 70 | 36 | 0.002 | 0.014 | 11600 | 40 | 22 | 0.002 | 0.011 |
| 0.6 | 10 | 21840 | 105 | 41 | 0.002 | 0.012 | 14400 | 45 | 27 | 0.002 | 0.009 | 8700 | 25 | 16 | 0.001 | 0.007 |
| 0.7 | 2 | 36400 | 250 | 80 | 0.003 | 0.140 | 24000 | 110 | 53 | 0.002 | 0.105 | 14500 | 65 | 32 | 0.002 | 0.084 |
| 0.7 | 4 | 32760 | 205 | 72 | 0.003 | 0.056 | 21600 | 90 | 48 | 0.002 | 0.042 | 13050 | 55 | 29 | 0.002 | 0.034 |
| 0.7 | 6 | 32760 | 205 | 72 | 0.003 | 0.035 | 21600 | 90 | 48 | 0.002 | 0.026 | 13050 | 55 | 29 | 0.002 | 0.021 |
| 0.7 | 8 | 29120 | 160 | 64 | 0.003 | 0.035 | 19200 | 70 | 42 | 0.002 | 0.026 | 11600 | 40 | 26 | 0.002 | 0.021 |
| 0.7 | 10 | 29120 | 160 | 64 | 0.003 | 0.021 | 19200 | 70 | 42 | 0.002 | 0.016 | 11600 | 40 | 26 | 0.002 | 0.013 |
| 0.8 | 2 | 36400 | 250 | 91 | 0.003 | 0.160 | 24000 | 110 | 60 | 0.002 | 0.120 | 14500 | 65 | 36 | 0.002 | 0.096 |
| 0.8 | 3 | 36400 | 250 | 91 | 0.003 | 0.112 | 24000 | 110 | 60 | 0.002 | 0.084 | 14500 | 65 | 36 | 0.002 | 0.067 |
| 0.8 | 4 | 36400 | 250 | 91 | 0.003 | 0.112 | 24000 | 110 | 60 | 0.002 | 0.084 | 14500 | 65 | 36 | 0.002 | 0.067 |
| 0.8 | 6 | 32760 | 205 | 82 | 0.003 | 0.064 | 21600 | 90 | 54 | 0.002 | 0.048 | 13050 | 55 | 33 | 0.002 | 0.038 |
| 0.8 | 8 | 32760 | 205 | 82 | 0.003 | 0.040 | 21600 | 90 | 54 | 0.002 | 0.030 | 13050 | 55 | 33 | 0.002 | 0.024 |
| 0.8 | 10 | 29120 | 160 | 73 | 0.003 | 0.040 | 19200 | 70 | 48 | 0.002 | 0.030 | 11600 | 40 | 29 | 0.002 | 0.024 |
| 1.0 | 3 | 33100 | 280 | 104 | 0.004 | 0.200 | 21600 | 120 | 68 | 0.003 | 0.150 | 13200 | 70 | 41 | 0.003 | 0.120 |
| 1.0 | 4 | 33100 | 280 | 104 | 0.004 | 0.140 | 21600 | 120 | 68 | 0.003 | 0.105 | 13200 | 70 | 41 | 0.003 | 0.084 |
| 1.0 | 6 | 29790 | 225 | 94 | 0.004 | 0.080 | 19440 | 95 | 61 | 0.002 | 0.060 | 11880 | 55 | 37 | 0.002 | 0.048 |
| 1.0 | 8 | 29790 | 225 | 94 | 0.004 | 0.080 | 19440 | 95 | 61 | 0.002 | 0.060 | 11880 | 55 | 37 | 0.002 | 0.048 |
| 1.0 | 10 | 29790 | 225 | 94 | 0.004 | 0.050 | 19440 | 95 | 61 | 0.002 | 0.038 | 11880 | 55 | 37 | 0.002 | 0.030 |
| 1.0 | 12 | 26480 | 180 | 83 | 0.003 | 0.050 | 17280 | 75 | 54 | 0.002 | 0.038 | 10560 | 45 | 33 | 0.002 | 0.030 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

### SEME61 SERIES

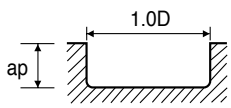
| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 1.0 | 14 | 26480 | 180 | 83 | 0.003 | 0.030 | 17280 | 75 | 54 | 0.002 | 0.023 | 10560 | 45 | 33 | 0.002 | 0.018 |
| 1.0 | 16 | 19860 | 120 | 62 | 0.003 | 0.030 | 12960 | 50 | 41 | 0.002 | 0.023 | 7920 | 30 | 25 | 0.002 | 0.018 |
| 1.0 | 20 | 19860 | 120 | 62 | 0.003 | 0.020 | 12960 | 50 | 41 | 0.002 | 0.015 | 7920 | 30 | 25 | 0.002 | 0.012 |
| 1.2 | 3 | 29750 | 290 | 112 | 0.005 | 0.240 | 18900 | 125 | 71 | 0.003 | 0.180 | 11700 | 70 | 44 | 0.003 | 0.144 |
| 1.2 | 4 | 29750 | 290 | 112 | 0.005 | 0.168 | 18900 | 125 | 71 | 0.003 | 0.126 | 11700 | 70 | 44 | 0.003 | 0.101 |
| 1.2 | 6 | 29750 | 290 | 112 | 0.005 | 0.168 | 18900 | 125 | 71 | 0.003 | 0.126 | 11700 | 70 | 44 | 0.003 | 0.101 |
| 1.2 | 8 | 26780 | 235 | 101 | 0.004 | 0.096 | 17010 | 100 | 64 | 0.003 | 0.072 | 10530 | 55 | 40 | 0.003 | 0.058 |
| 1.2 | 10 | 26780 | 235 | 101 | 0.004 | 0.060 | 17010 | 100 | 64 | 0.003 | 0.045 | 10530 | 55 | 40 | 0.003 | 0.036 |
| 1.2 | 12 | 26780 | 235 | 101 | 0.004 | 0.060 | 17010 | 100 | 64 | 0.003 | 0.045 | 10530 | 55 | 40 | 0.003 | 0.036 |
| 1.2 | 16 | 23800 | 185 | 90 | 0.004 | 0.036 | 15120 | 80 | 57 | 0.003 | 0.027 | 9360 | 45 | 35 | 0.002 | 0.022 |
| 1.2 | 20 | 17850 | 120 | 67 | 0.003 | 0.024 | 11340 | 55 | 43 | 0.002 | 0.018 | 7020 | 30 | 26 | 0.002 | 0.014 |
| 1.5 | 4 | 26400 | 300 | 124 | 0.006 | 0.300 | 16200 | 130 | 76 | 0.004 | 0.225 | 10200 | 70 | 48 | 0.003 | 0.180 |
| 1.5 | 6 | 26400 | 300 | 124 | 0.006 | 0.210 | 16200 | 130 | 76 | 0.004 | 0.158 | 10200 | 70 | 48 | 0.003 | 0.126 |
| 1.5 | 8 | 23760 | 245 | 112 | 0.005 | 0.120 | 14580 | 105 | 69 | 0.004 | 0.090 | 9180 | 55 | 43 | 0.003 | 0.072 |
| 1.5 | 10 | 23760 | 245 | 112 | 0.005 | 0.120 | 14580 | 105 | 69 | 0.004 | 0.090 | 9180 | 55 | 43 | 0.003 | 0.072 |
| 1.5 | 12 | 23760 | 245 | 112 | 0.005 | 0.120 | 14580 | 105 | 69 | 0.004 | 0.090 | 9180 | 55 | 43 | 0.003 | 0.072 |
| 1.5 | 14 | 23760 | 245 | 112 | 0.005 | 0.075 | 14580 | 105 | 69 | 0.004 | 0.056 | 9180 | 55 | 43 | 0.003 | 0.045 |
| 1.5 | 16 | 21120 | 190 | 100 | 0.004 | 0.075 | 12960 | 85 | 61 | 0.003 | 0.056 | 8160 | 45 | 38 | 0.003 | 0.045 |
| 1.5 | 20 | 21120 | 190 | 100 | 0.004 | 0.045 | 12960 | 85 | 61 | 0.003 | 0.034 | 8160 | 45 | 38 | 0.003 | 0.027 |
| 1.5 | 22 | 21120 | 190 | 100 | 0.004 | 0.045 | 12960 | 85 | 61 | 0.003 | 0.034 | 8160 | 45 | 38 | 0.003 | 0.027 |
| 1.5 | 26 | 15840 | 125 | 75 | 0.004 | 0.030 | 9720 | 55 | 46 | 0.003 | 0.023 | 6120 | 30 | 29 | 0.002 | 0.018 |
| 2.0 | 6 | 21600 | 310 | 136 | 0.007 | 0.400 | 13800 | 140 | 87 | 0.005 | 0.300 | 8640 | 80 | 54 | 0.005 | 0.240 |
| 2.0 | 8 | 21600 | 310 | 136 | 0.007 | 0.280 | 13800 | 140 | 87 | 0.005 | 0.210 | 8640 | 80 | 54 | 0.005 | 0.168 |
| 2.0 | 10 | 21600 | 310 | 136 | 0.007 | 0.280 | 13800 | 140 | 87 | 0.005 | 0.210 | 8640 | 80 | 54 | 0.005 | 0.168 |
| 2.0 | 12 | 19440 | 250 | 122 | 0.006 | 0.160 | 12420 | 115 | 78 | 0.005 | 0.120 | 7780 | 65 | 49 | 0.004 | 0.096 |
| 2.0 | 14 | 19440 | 250 | 122 | 0.006 | 0.160 | 12420 | 115 | 78 | 0.005 | 0.120 | 7780 | 65 | 49 | 0.004 | 0.096 |
| 2.0 | 16 | 19440 | 250 | 122 | 0.006 | 0.160 | 12420 | 115 | 78 | 0.005 | 0.120 | 7780 | 65 | 49 | 0.004 | 0.096 |
| 2.0 | 20 | 19440 | 250 | 122 | 0.006 | 0.100 | 12420 | 115 | 78 | 0.005 | 0.075 | 7780 | 65 | 49 | 0.004 | 0.060 |
| 2.0 | 22 | 17280 | 200 | 109 | 0.006 | 0.100 | 11040 | 90 | 69 | 0.004 | 0.075 | 6910 | 50 | 43 | 0.004 | 0.060 |
| 2.0 | 26 | 17280 | 200 | 109 | 0.006 | 0.100 | 11040 | 90 | 69 | 0.004 | 0.075 | 6910 | 50 | 43 | 0.004 | 0.060 |
| 2.0 | 30 | 17280 | 200 | 109 | 0.006 | 0.060 | 11040 | 90 | 69 | 0.004 | 0.045 | 6910 | 50 | 43 | 0.004 | 0.036 |
| 2.5 | 8 | 18000 | 320 | 141 | 0.009 | 0.350 | 11400 | 150 | 90 | 0.007 | 0.263 | 7320 | 80 | 57 | 0.005 | 0.210 |
| 2.5 | 10 | 18000 | 320 | 141 | 0.009 | 0.350 | 11400 | 150 | 90 | 0.007 | 0.263 | 7320 | 80 | 57 | 0.005 | 0.210 |
| 2.5 | 12 | 18000 | 320 | 141 | 0.009 | 0.350 | 11400 | 150 | 90 | 0.007 | 0.263 | 7320 | 80 | 57 | 0.005 | 0.210 |
| 2.5 | 14 | 16200 | 260 | 127 | 0.008 | 0.200 | 10260 | 120 | 81 | 0.006 | 0.150 | 6590 | 65 | 52 | 0.005 | 0.120 |
| 2.5 | 16 | 16200 | 260 | 127 | 0.008 | 0.200 | 10260 | 120 | 81 | 0.006 | 0.150 | 6590 | 65 | 52 | 0.005 | 0.120 |
| 2.5 | 20 | 16200 | 260 | 127 | 0.008 | 0.200 | 10260 | 120 | 81 | 0.006 | 0.150 | 6590 | 65 | 52 | 0.005 | 0.120 |
| 2.5 | 26 | 14400 | 205 | 113 | 0.007 | 0.125 | 9120 | 95 | 72 | 0.005 | 0.094 | 5860 | 50 | 46 | 0.004 | 0.075 |
| 2.5 | 30 | 14400 | 205 | 113 | 0.007 | 0.125 | 9120 | 95 | 72 | 0.005 | 0.094 | 5860 | 50 | 46 | 0.004 | 0.075 |
| 3.0 | 8 | 15900 | 330 | 150 | 0.010 | 0.600 | 10300 | 160 | 97 | 0.008 | 0.450 | 6300 | 80 | 59 | 0.006 | 0.360 |
| 3.0 | 10 | 15900 | 330 | 150 | 0.010 | 0.420 | 10300 | 160 | 97 | 0.008 | 0.315 | 6300 | 80 | 59 | 0.006 | 0.252 |
| 3.0 | 12 | 15900 | 330 | 150 | 0.010 | 0.420 | 10300 | 160 | 97 | 0.008 | 0.315 | 6300 | 80 | 59 | 0.006 | 0.252 |
| 3.0 | 14 | 15900 | 330 | 150 | 0.010 | 0.420 | 10300 | 160 | 97 | 0.008 | 0.315 | 6300 | 80 | 59 | 0.006 | 0.252 |
| 3.0 | 16 | 14310 | 265 | 135 | 0.009 | 0.240 | 9270 | 130 | 87 | 0.007 | 0.180 | 5670 | 65 | 53 | 0.006 | 0.144 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# CARBIDE, 2 FLUTE LONG NECK CORNER RADIUS

## SEME61 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 3.0 | 20 | 14310 | 265 | 135 | 0.009 | 0.240 | 9270 | 130 | 87 | 0.007 | 0.180 | 5670 | 65 | 53 | 0.006 | 0.144 |
| 3.0 | 26 | 14310 | 265 | 135 | 0.009 | 0.150 | 9270 | 130 | 87 | 0.007 | 0.113 | 5670 | 65 | 53 | 0.006 | 0.090 |
| 3.0 | 30 | 14310 | 265 | 135 | 0.009 | 0.150 | 9270 | 130 | 87 | 0.007 | 0.113 | 5670 | 65 | 53 | 0.006 | 0.090 |
| 3.0 | 35 | 12720 | 210 | 120 | 0.008 | 0.150 | 8240 | 100 | 78 | 0.006 | 0.113 | 5040 | 50 | 48 | 0.005 | 0.090 |
| 3.0 | 40 | 12720 | 210 | 120 | 0.008 | 0.090 | 8240 | 100 | 78 | 0.006 | 0.068 | 5040 | 50 | 48 | 0.005 | 0.054 |
| 4.0 | 10 | 12800 | 400 | 161 | 0.016 | 0.800 | 8200 | 200 | 103 | 0.012 | 0.600 | 5150 | 95 | 65 | 0.009 | 0.480 |
| 4.0 | 12 | 12800 | 400 | 161 | 0.016 | 0.800 | 8200 | 200 | 103 | 0.012 | 0.600 | 5150 | 95 | 65 | 0.009 | 0.480 |
| 4.0 | 14 | 12800 | 400 | 161 | 0.016 | 0.560 | 8200 | 200 | 103 | 0.012 | 0.420 | 5150 | 95 | 65 | 0.009 | 0.336 |
| 4.0 | 16 | 12800 | 400 | 161 | 0.016 | 0.560 | 8200 | 200 | 103 | 0.012 | 0.420 | 5150 | 95 | 65 | 0.009 | 0.336 |
| 4.0 | 20 | 12800 | 400 | 161 | 0.016 | 0.560 | 8200 | 200 | 103 | 0.012 | 0.420 | 5150 | 95 | 65 | 0.009 | 0.336 |
| 4.0 | 26 | 11520 | 325 | 145 | 0.014 | 0.320 | 7380 | 160 | 93 | 0.011 | 0.240 | 4640 | 75 | 58 | 0.008 | 0.192 |
| 4.0 | 30 | 11520 | 325 | 145 | 0.014 | 0.320 | 7380 | 160 | 93 | 0.011 | 0.240 | 4640 | 75 | 58 | 0.008 | 0.192 |
| 4.0 | 35 | 11520 | 325 | 145 | 0.014 | 0.200 | 7380 | 160 | 93 | 0.011 | 0.150 | 4640 | 75 | 58 | 0.008 | 0.120 |
| 4.0 | 40 | 11520 | 325 | 145 | 0.014 | 0.200 | 7380 | 160 | 93 | 0.011 | 0.150 | 4640 | 75 | 58 | 0.008 | 0.120 |
| 4.0 | 45 | 10240 | 255 | 129 | 0.012 | 0.200 | 6560 | 130 | 82 | 0.010 | 0.150 | 4120 | 60 | 52 | 0.007 | 0.120 |
| 4.0 | 50 | 10240 | 255 | 129 | 0.012 | 0.200 | 6560 | 130 | 82 | 0.010 | 0.150 | 4120 | 60 | 52 | 0.007 | 0.120 |
| 5.0 | 15 | 11000 | 500 | 173 | 0.023 | 1.000 | 7000 | 240 | 110 | 0.017 | 0.750 | 4560 | 120 | 72 | 0.013 | 0.600 |
| 6.0 | 20 | 9500 | 600 | 179 | 0.032 | 0.840 | 6000 | 300 | 113 | 0.025 | 0.630 | 3930 | 140 | 74 | 0.018 | 0.504 |
| 6.0 | 30 | 9500 | 600 | 179 | 0.032 | 0.840 | 6000 | 300 | 113 | 0.025 | 0.630 | 3930 | 140 | 74 | 0.018 | 0.504 |
| 8.0 | 25 | 7200 | 640 | 181 | 0.044 | 1.120 | 4550 | 300 | 114 | 0.033 | 0.840 | 3020 | 140 | 76 | 0.023 | 0.672 |
| 8.0 | 35 | 7200 | 640 | 181 | 0.044 | 1.120 | 4550 | 300 | 114 | 0.033 | 0.840 | 3020 | 140 | 76 | 0.023 | 0.672 |
| 10.0 | 30 | 6000 | 640 | 188 | 0.053 | 2.000 | 4000 | 300 | 126 | 0.038 | 1.500 | 2420 | 140 | 76 | 0.029 | 1.200 |
| 10.0 | 40 | 6000 | 640 | 188 | 0.053 | 1.400 | 4000 | 300 | 126 | 0.038 | 1.050 | 2420 | 140 | 76 | 0.029 | 0.840 |
| 12.0 | 32 | 5000 | 500 | 188 | 0.050 | 2.400 | 3340 | 270 | 126 | 0.040 | 1.800 | 2000 | 120 | 75 | 0.030 | 1.440 |
| 12.0 | 45 | 5000 | 500 | 188 | 0.050 | 1.680 | 3340 | 270 | 126 | 0.040 | 1.260 | 2000 | 120 | 75 | 0.030 | 1.008 |
| 16.0 | 35 | 3720 | 450 | 187 | 0.060 | 3.200 | 2520 | 210 | 127 | 0.042 | 2.400 | 1540 | 95 | 77 | 0.031 | 1.920 |
| 16.0 | 50 | 3720 | 450 | 187 | 0.060 | 2.240 | 2520 | 210 | 127 | 0.042 | 1.680 | 1540 | 95 | 77 | 0.031 | 1.344 |
| 20.0 | 40 | 3000 | 330 | 188 | 0.055 | 4.000 | 1950 | 140 | 123 | 0.036 | 3.000 | 1200 | 70 | 75 | 0.029 | 2.400 |
| 20.0 | 55 | 3000 | 330 | 188 | 0.055 | 4.000 | 1950 | 140 | 123 | 0.036 | 3.000 | 1200 | 70 | 75 | 0.029 | 2.400 |




DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

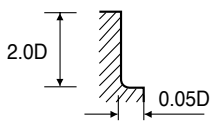
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

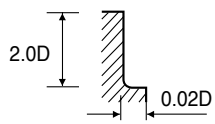
## CARBIDE, 4 FLUTE CORNER RADIUS

### SEME01 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 1.0 | 27600 | 300 | 87 | 0.003 | 18000 | 220 | 57 | 0.003 | 11000 | 120 | 35 | 0.003 |
| 1.2 | 24800 | 305 | 93 | 0.003 | 15750 | 225 | 59 | 0.004 | 9750 | 120 | 37 | 0.003 |
| 1.5 | 22000 | 310 | 104 | 0.004 | 13500 | 230 | 64 | 0.004 | 8500 | 120 | 40 | 0.004 |
| 2.0 | 18000 | 320 | 113 | 0.004 | 11560 | 240 | 73 | 0.005 | 7200 | 130 | 45 | 0.005 |
| 2.5 | 15000 | 330 | 118 | 0.006 | 9500 | 250 | 75 | 0.007 | 6100 | 130 | 48 | 0.005 |
| 3.0 | 13240 | 340 | 125 | 0.006 | 8560 | 260 | 81 | 0.008 | 5280 | 130 | 50 | 0.006 |
| 3.5 | 11980 | 380 | 132 | 0.008 | 7690 | 280 | 85 | 0.009 | 4790 | 135 | 53 | 0.007 |
| 4.0 | 10720 | 420 | 135 | 0.010 | 6820 | 300 | 86 | 0.011 | 4300 | 140 | 54 | 0.008 |
| 4.5 | 9940 | 425 | 141 | 0.011 | 6310 | 330 | 89 | 0.013 | 4050 | 155 | 57 | 0.010 |
| 5.0 | 9160 | 430 | 144 | 0.012 | 5800 | 360 | 91 | 0.016 | 3800 | 170 | 60 | 0.011 |
| 5.5 | 8530 | 430 | 147 | 0.013 | 5420 | 360 | 94 | 0.017 | 3540 | 170 | 61 | 0.012 |
| 6.0 | 7900 | 430 | 149 | 0.014 | 5040 | 360 | 95 | 0.018 | 3280 | 170 | 62 | 0.013 |
| 7.0 | 6950 | 445 | 153 | 0.016 | 4420 | 360 | 97 | 0.020 | 2900 | 170 | 64 | 0.015 |
| 8.0 | 6000 | 460 | 151 | 0.019 | 3800 | 360 | 96 | 0.024 | 2520 | 170 | 63 | 0.017 |
| 10.0 | 5040 | 460 | 158 | 0.023 | 3280 | 360 | 103 | 0.027 | 2020 | 170 | 63 | 0.021 |
| 11.0 | 4580 | 410 | 158 | 0.022 | 3030 | 340 | 105 | 0.028 | 1850 | 155 | 64 | 0.021 |
| 12.0 | 4120 | 360 | 155 | 0.022 | 2780 | 320 | 105 | 0.029 | 1680 | 140 | 63 | 0.021 |
| 14.0 | 3610 | 320 | 159 | 0.022 | 2440 | 275 | 107 | 0.028 | 1480 | 125 | 65 | 0.021 |
| 16.0 | 3100 | 280 | 156 | 0.023 | 2100 | 230 | 106 | 0.027 | 1280 | 115 | 64 | 0.022 |
| 20.0 | 2520 | 230 | 158 | 0.023 | 1640 | 180 | 103 | 0.027 | 1000 | 90 | 63 | 0.023 |




* 1.5XD Axial cutting depth should be for diameter over 16mm




RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

## SEME64 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 1.0 | 4 | 33100 | 360 | 104 | 0.003 | 0.021 | 21600 | 260 | 68 | 0.003 | 0.016 | 13200 | 140 | 41 | 0.003 | 0.013 |
| 1.0 | 6 | 29790 | 290 | 94 | 0.002 | 0.012 | 19440 | 210 | 61 | 0.003 | 0.009 | 11880 | 115 | 37 | 0.002 | 0.007 |
| 1.0 | 8 | 29790 | 290 | 94 | 0.002 | 0.012 | 19440 | 210 | 61 | 0.003 | 0.009 | 11880 | 115 | 37 | 0.002 | 0.007 |
| 1.0 | 10 | 29790 | 290 | 94 | 0.002 | 0.008 | 19440 | 210 | 61 | 0.003 | 0.006 | 11880 | 115 | 37 | 0.002 | 0.005 |
| 1.0 | 12 | 26480 | 230 | 83 | 0.002 | 0.008 | 17280 | 165 | 54 | 0.002 | 0.006 | 10560 | 90 | 33 | 0.002 | 0.005 |
| 1.0 | 16 | 19860 | 150 | 62 | 0.002 | 0.005 | 12960 | 110 | 41 | 0.002 | 0.003 | 7920 | 60 | 25 | 0.002 | 0.003 |
| 1.0 | 20 | 19860 | 150 | 62 | 0.002 | 0.003 | 12960 | 110 | 41 | 0.002 | 0.002 | 7920 | 60 | 25 | 0.002 | 0.002 |
| 1.0 | 22 | 9930 | 65 | 31 | 0.002 | 0.003 | 6480 | 45 | 20 | 0.002 | 0.002 | 3960 | 25 | 12 | 0.002 | 0.002 |
| 1.0 | 26 | 9930 | 65 | 31 | 0.002 | 0.003 | 6480 | 45 | 20 | 0.002 | 0.002 | 3960 | 25 | 12 | 0.002 | 0.002 |
| 1.2 | 3 | 29750 | 365 | 112 | 0.003 | 0.036 | 18900 | 265 | 71 | 0.004 | 0.027 | 11700 | 140 | 44 | 0.003 | 0.022 |
| 1.2 | 4 | 29750 | 365 | 112 | 0.003 | 0.025 | 18900 | 265 | 71 | 0.004 | 0.019 | 11700 | 140 | 44 | 0.003 | 0.015 |
| 1.2 | 6 | 29750 | 365 | 112 | 0.003 | 0.025 | 18900 | 265 | 71 | 0.004 | 0.019 | 11700 | 140 | 44 | 0.003 | 0.015 |
| 1.2 | 8 | 26780 | 295 | 101 | 0.003 | 0.014 | 17010 | 215 | 64 | 0.003 | 0.011 | 10530 | 115 | 40 | 0.003 | 0.009 |
| 1.2 | 10 | 26780 | 295 | 101 | 0.003 | 0.009 | 17010 | 215 | 64 | 0.003 | 0.007 | 10530 | 115 | 40 | 0.003 | 0.005 |
| 1.2 | 12 | 26780 | 295 | 101 | 0.003 | 0.009 | 17010 | 215 | 64 | 0.003 | 0.007 | 10530 | 115 | 40 | 0.003 | 0.005 |
| 1.2 | 16 | 23800 | 235 | 90 | 0.002 | 0.005 | 15120 | 170 | 57 | 0.003 | 0.004 | 9360 | 90 | 35 | 0.002 | 0.003 |
| 1.2 | 20 | 17850 | 155 | 67 | 0.002 | 0.004 | 11340 | 110 | 43 | 0.002 | 0.003 | 7020 | 60 | 26 | 0.002 | 0.002 |
| 1.5 | 4 | 26400 | 370 | 124 | 0.004 | 0.045 | 16200 | 270 | 76 | 0.004 | 0.034 | 10200 | 140 | 48 | 0.003 | 0.027 |
| 1.5 | 6 | 26400 | 370 | 124 | 0.004 | 0.032 | 16200 | 270 | 76 | 0.004 | 0.024 | 10200 | 140 | 48 | 0.003 | 0.019 |
| 1.5 | 8 | 23760 | 300 | 112 | 0.003 | 0.018 | 14580 | 220 | 69 | 0.004 | 0.014 | 9180 | 115 | 43 | 0.003 | 0.011 |
| 1.5 | 10 | 23760 | 300 | 112 | 0.003 | 0.018 | 14580 | 220 | 69 | 0.004 | 0.014 | 9180 | 115 | 43 | 0.003 | 0.011 |
| 1.5 | 12 | 23760 | 300 | 112 | 0.003 | 0.018 | 14580 | 220 | 69 | 0.004 | 0.014 | 9180 | 115 | 43 | 0.003 | 0.011 |
| 1.5 | 14 | 23760 | 300 | 112 | 0.003 | 0.011 | 14580 | 220 | 69 | 0.004 | 0.008 | 9180 | 115 | 43 | 0.003 | 0.007 |
| 1.5 | 16 | 21120 | 235 | 100 | 0.003 | 0.011 | 12960 | 175 | 61 | 0.003 | 0.008 | 8160 | 90 | 38 | 0.003 | 0.007 |
| 1.5 | 20 | 21120 | 235 | 100 | 0.003 | 0.007 | 12960 | 175 | 61 | 0.003 | 0.005 | 8160 | 90 | 38 | 0.003 | 0.004 |
| 1.5 | 22 | 21120 | 235 | 100 | 0.003 | 0.007 | 12960 | 175 | 61 | 0.003 | 0.005 | 8160 | 90 | 38 | 0.003 | 0.004 |
| 1.5 | 26 | 15840 | 155 | 75 | 0.002 | 0.005 | 9720 | 115 | 46 | 0.003 | 0.003 | 6120 | 60 | 29 | 0.002 | 0.003 |
| 2.0 | 6 | 21600 | 380 | 136 | 0.004 | 0.060 | 13800 | 280 | 87 | 0.005 | 0.045 | 8640 | 150 | 54 | 0.004 | 0.036 |
| 2.0 | 8 | 21600 | 380 | 136 | 0.004 | 0.042 | 13800 | 280 | 87 | 0.005 | 0.032 | 8640 | 150 | 54 | 0.004 | 0.025 |
| 2.0 | 10 | 21600 | 380 | 136 | 0.004 | 0.042 | 13800 | 280 | 87 | 0.005 | 0.032 | 8640 | 150 | 54 | 0.004 | 0.025 |
| 2.0 | 12 | 19440 | 310 | 122 | 0.004 | 0.024 | 12420 | 225 | 78 | 0.005 | 0.018 | 7780 | 120 | 49 | 0.004 | 0.014 |
| 2.0 | 14 | 19440 | 310 | 122 | 0.004 | 0.024 | 12420 | 225 | 78 | 0.005 | 0.018 | 7780 | 120 | 49 | 0.004 | 0.014 |
| 2.0 | 16 | 19440 | 310 | 122 | 0.004 | 0.024 | 12420 | 225 | 78 | 0.005 | 0.018 | 7780 | 120 | 49 | 0.004 | 0.014 |
| 2.0 | 20 | 19440 | 310 | 122 | 0.004 | 0.015 | 12420 | 225 | 78 | 0.005 | 0.011 | 7780 | 120 | 49 | 0.004 | 0.009 |
| 2.0 | 22 | 17280 | 245 | 109 | 0.004 | 0.015 | 11040 | 180 | 69 | 0.004 | 0.011 | 6910 | 95 | 43 | 0.003 | 0.009 |
| 2.0 | 26 | 17280 | 245 | 109 | 0.004 | 0.015 | 11040 | 180 | 69 | 0.004 | 0.011 | 6910 | 95 | 43 | 0.003 | 0.009 |
| 2.0 | 30 | 17280 | 245 | 109 | 0.004 | 0.009 | 11040 | 180 | 69 | 0.004 | 0.007 | 6910 | 95 | 43 | 0.003 | 0.005 |
| 2.5 | 8 | 18000 | 390 | 141 | 0.005 | 0.053 | 11400 | 300 | 90 | 0.007 | 0.039 | 7320 | 150 | 57 | 0.005 | 0.032 |
| 2.5 | 10 | 18000 | 390 | 141 | 0.005 | 0.053 | 11400 | 300 | 90 | 0.007 | 0.039 | 7320 | 150 | 57 | 0.005 | 0.032 |
| 2.5 | 12 | 18000 | 390 | 141 | 0.005 | 0.053 | 11400 | 300 | 90 | 0.007 | 0.039 | 7320 | 150 | 57 | 0.005 | 0.032 |
| 2.5 | 14 | 16200 | 315 | 127 | 0.005 | 0.030 | 10260 | 245 | 81 | 0.006 | 0.023 | 6590 | 120 | 52 | 0.005 | 0.018 |
| 2.5 | 16 | 16200 | 315 | 127 | 0.005 | 0.030 | 10260 | 245 | 81 | 0.006 | 0.023 | 6590 | 120 | 52 | 0.005 | 0.018 |
| 2.5 | 20 | 16200 | 315 | 127 | 0.005 | 0.030 | 10260 | 245 | 81 | 0.006 | 0.023 | 6590 | 120 | 52 | 0.005 | 0.018 |
| 2.5 | 26 | 14400 | 250 | 113 | 0.004 | 0.019 | 9120 | 190 | 72 | 0.005 | 0.014 | 5860 | 95 | 46 | 0.004 | 0.011 |

DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

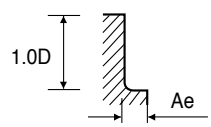
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG NECK CORNER RADIUS

### SEME64 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 2.5 | 30 | 14400 | 250 | 113 | 0.004 | 0.019 | 9120 | 190 | 72 | 0.005 | 0.014 | 5860 | 95 | 46 | 0.004 | 0.011 |
| 3.0 | 8 | 15900 | 400 | 150 | 0.006 | 0.090 | 10300 | 310 | 97 | 0.008 | 0.068 | 6300 | 150 | 59 | 0.006 | 0.054 |
| 3.0 | 10 | 15900 | 400 | 150 | 0.006 | 0.063 | 10300 | 310 | 97 | 0.008 | 0.047 | 6300 | 150 | 59 | 0.006 | 0.038 |
| 3.0 | 12 | 15900 | 400 | 150 | 0.006 | 0.063 | 10300 | 310 | 97 | 0.008 | 0.047 | 6300 | 150 | 59 | 0.006 | 0.038 |
| 3.0 | 14 | 15900 | 400 | 150 | 0.006 | 0.063 | 10300 | 310 | 97 | 0.008 | 0.047 | 6300 | 150 | 59 | 0.006 | 0.038 |
| 3.0 | 16 | 14310 | 325 | 135 | 0.006 | 0.036 | 9270 | 250 | 87 | 0.007 | 0.027 | 5670 | 120 | 53 | 0.005 | 0.022 |
| 3.0 | 20 | 14310 | 325 | 135 | 0.006 | 0.036 | 9270 | 250 | 87 | 0.007 | 0.027 | 5670 | 120 | 53 | 0.005 | 0.022 |
| 3.0 | 26 | 14310 | 325 | 135 | 0.006 | 0.023 | 9270 | 250 | 87 | 0.007 | 0.017 | 5670 | 120 | 53 | 0.005 | 0.014 |
| 3.0 | 30 | 14310 | 325 | 135 | 0.006 | 0.023 | 9270 | 250 | 87 | 0.007 | 0.017 | 5670 | 120 | 53 | 0.005 | 0.014 |
| 3.0 | 35 | 12720 | 255 | 120 | 0.005 | 0.023 | 8240 | 200 | 78 | 0.006 | 0.017 | 5040 | 95 | 48 | 0.005 | 0.014 |
| 3.0 | 40 | 12720 | 255 | 120 | 0.005 | 0.014 | 8240 | 200 | 78 | 0.006 | 0.010 | 5040 | 95 | 48 | 0.005 | 0.008 |
| 4.0 | 10 | 12800 | 500 | 161 | 0.010 | 0.120 | 8200 | 360 | 103 | 0.011 | 0.090 | 5150 | 160 | 65 | 0.008 | 0.072 |
| 4.0 | 12 | 12800 | 500 | 161 | 0.010 | 0.120 | 8200 | 360 | 103 | 0.011 | 0.090 | 5150 | 160 | 65 | 0.008 | 0.072 |
| 4.0 | 14 | 12800 | 500 | 161 | 0.010 | 0.084 | 8200 | 360 | 103 | 0.011 | 0.063 | 5150 | 160 | 65 | 0.008 | 0.050 |
| 4.0 | 16 | 12800 | 500 | 161 | 0.010 | 0.084 | 8200 | 360 | 103 | 0.011 | 0.063 | 5150 | 160 | 65 | 0.008 | 0.050 |
| 4.0 | 20 | 12800 | 500 | 161 | 0.010 | 0.084 | 8200 | 360 | 103 | 0.011 | 0.063 | 5150 | 160 | 65 | 0.008 | 0.050 |
| 4.0 | 26 | 11520 | 405 | 145 | 0.009 | 0.048 | 7380 | 290 | 93 | 0.010 | 0.036 | 4640 | 130 | 58 | 0.007 | 0.029 |
| 4.0 | 30 | 11520 | 405 | 145 | 0.009 | 0.048 | 7380 | 290 | 93 | 0.010 | 0.036 | 4640 | 130 | 58 | 0.007 | 0.029 |
| 4.0 | 35 | 11520 | 405 | 145 | 0.009 | 0.030 | 7380 | 290 | 93 | 0.010 | 0.023 | 4640 | 130 | 58 | 0.007 | 0.018 |
| 4.0 | 40 | 11520 | 405 | 145 | 0.009 | 0.030 | 7380 | 290 | 93 | 0.010 | 0.023 | 4640 | 130 | 58 | 0.007 | 0.018 |
| 4.0 | 45 | 10240 | 320 | 129 | 0.008 | 0.030 | 6560 | 230 | 82 | 0.009 | 0.023 | 4120 | 100 | 52 | 0.006 | 0.018 |
| 4.0 | 50 | 10240 | 320 | 129 | 0.008 | 0.030 | 6560 | 230 | 82 | 0.009 | 0.023 | 4120 | 100 | 52 | 0.006 | 0.018 |
| 5.0 | 15 | 11000 | 510 | 173 | 0.012 | 0.150 | 7000 | 430 | 110 | 0.015 | 0.113 | 4560 | 200 | 72 | 0.011 | 0.090 |
| 6.0 | 20 | 9500 | 510 | 179 | 0.013 | 0.126 | 6000 | 430 | 113 | 0.018 | 0.095 | 3930 | 200 | 74 | 0.013 | 0.076 |
| 6.0 | 30 | 9500 | 510 | 179 | 0.013 | 0.126 | 6000 | 430 | 113 | 0.018 | 0.095 | 3930 | 200 | 74 | 0.013 | 0.076 |
| 8.0 | 25 | 7200 | 550 | 181 | 0.019 | 0.168 | 4550 | 430 | 114 | 0.024 | 0.126 | 3020 | 200 | 76 | 0.017 | 0.101 |
| 8.0 | 35 | 7200 | 550 | 181 | 0.019 | 0.168 | 4550 | 430 | 114 | 0.024 | 0.126 | 3020 | 200 | 76 | 0.017 | 0.101 |
| 10.0 | 30 | 6000 | 550 | 188 | 0.023 | 0.300 | 4000 | 430 | 126 | 0.027 | 0.225 | 2420 | 200 | 76 | 0.021 | 0.180 |
| 10.0 | 40 | 6000 | 550 | 188 | 0.023 | 0.210 | 4000 | 430 | 126 | 0.027 | 0.158 | 2420 | 200 | 76 | 0.021 | 0.126 |
| 12.0 | 32 | 5000 | 430 | 188 | 0.022 | 0.360 | 3340 | 380 | 126 | 0.028 | 0.270 | 2000 | 160 | 75 | 0.020 | 0.216 |
| 12.0 | 45 | 5000 | 430 | 188 | 0.022 | 0.252 | 3340 | 380 | 126 | 0.028 | 0.189 | 2000 | 160 | 75 | 0.020 | 0.151 |
| 16.0 | 35 | 3720 | 330 | 187 | 0.022 | 0.480 | 2520 | 280 | 127 | 0.028 | 0.360 | 1540 | 135 | 77 | 0.022 | 0.288 |
| 16.0 | 50 | 3720 | 330 | 187 | 0.022 | 0.336 | 2520 | 280 | 127 | 0.028 | 0.252 | 1540 | 135 | 77 | 0.022 | 0.202 |
| 20.0 | 40 | 3000 | 270 | 188 | 0.023 | 0.600 | 1950 | 210 | 123 | 0.027 | 0.450 | 1200 | 100 | 75 | 0.021 | 0.360 |
| 20.0 | 55 | 3000 | 270 | 188 | 0.023 | 0.600 | 1950 | 210 | 123 | 0.027 | 0.450 | 1200 | 100 | 75 | 0.021 | 0.360 |




DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

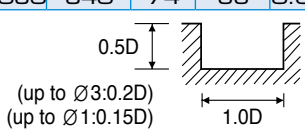
# 4G MILL END MILLS

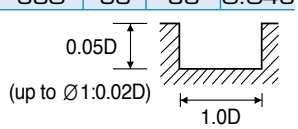
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE

### SEME35 SERIES

| MATERIAL | P | | | | | | | | | | | | M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | | STAINLESS STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | | | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | | | | | |
| DIA. | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 0.1 | 42000 | 80 | 13 | 0.001 | 25200 | 47 | 8 | 0.001 | 16800 | 16 | 5 | 0.000 | 21000 | 40 | 7 | 0.001 |
| 0.2 | 42000 | 85 | 26 | 0.001 | 25200 | 50 | 16 | 0.001 | 16800 | 17 | 11 | 0.001 | 21000 | 39 | 13 | 0.001 |
| 0.3 | 39000 | 90 | 37 | 0.001 | 23400 | 54 | 22 | 0.001 | 15600 | 18 | 15 | 0.001 | 19500 | 45 | 18 | 0.001 |
| 0.4 | 39000 | 95 | 49 | 0.001 | 23400 | 57 | 29 | 0.001 | 15600 | 19 | 20 | 0.001 | 19500 | 47 | 25 | 0.001 |
| 0.5 | 36000 | 110 | 57 | 0.002 | 21600 | 66 | 34 | 0.002 | 14400 | 22 | 23 | 0.001 | 18000 | 55 | 28 | 0.002 |
| 0.6 | 32000 | 125 | 60 | 0.002 | 19200 | 76 | 36 | 0.002 | 12800 | 25 | 24 | 0.001 | 16000 | 63 | 30 | 0.002 |
| 0.7 | 28000 | 140 | 62 | 0.003 | 16800 | 85 | 37 | 0.003 | 11200 | 28 | 25 | 0.001 | 14000 | 70 | 31 | 0.003 |
| 0.8 | 25000 | 155 | 63 | 0.003 | 15000 | 95 | 38 | 0.003 | 10000 | 32 | 25 | 0.002 | 12500 | 79 | 31 | 0.003 |
| 0.9 | 23500 | 165 | 66 | 0.004 | 14100 | 98 | 40 | 0.003 | 9400 | 33 | 27 | 0.002 | 11750 | 81 | 33 | 0.003 |
| 1.0 | 21500 | 170 | 68 | 0.004 | 12900 | 101 | 41 | 0.004 | 8600 | 34 | 27 | 0.002 | 10750 | 84 | 34 | 0.004 |
| 1.2 | 18000 | 175 | 68 | 0.005 | 10800 | 104 | 41 | 0.005 | 7200 | 35 | 27 | 0.002 | 9000 | 87 | 34 | 0.005 |
| 1.5 | 15000 | 180 | 71 | 0.006 | 9000 | 107 | 42 | 0.006 | 6000 | 36 | 28 | 0.003 | 7500 | 89 | 35 | 0.006 |
| 2.0 | 11560 | 200 | 73 | 0.009 | 7560 | 125 | 48 | 0.008 | 5040 | 37 | 32 | 0.004 | 6300 | 95 | 40 | 0.008 |
| 2.5 | 10240 | 210 | 80 | 0.010 | 6560 | 135 | 52 | 0.010 | 4200 | 39 | 33 | 0.005 | 5460 | 110 | 43 | 0.010 |
| 3.0 | 8920 | 220 | 84 | 0.012 | 5560 | 145 | 52 | 0.013 | 3360 | 42 | 32 | 0.006 | 4620 | 125 | 44 | 0.014 |
| 3.5 | 8240 | 270 | 91 | 0.016 | 5090 | 170 | 56 | 0.017 | 3150 | 42 | 35 | 0.007 | 4250 | 140 | 47 | 0.016 |
| 4.0 | 7560 | 315 | 95 | 0.021 | 4620 | 190 | 58 | 0.021 | 2940 | 42 | 37 | 0.007 | 3880 | 160 | 49 | 0.021 |
| 4.5 | 6930 | 325 | 98 | 0.023 | 4200 | 195 | 59 | 0.023 | 2630 | 47 | 37 | 0.009 | 3520 | 165 | 50 | 0.023 |
| 5.0 | 6300 | 335 | 99 | 0.027 | 3780 | 200 | 59 | 0.026 | 2320 | 53 | 36 | 0.011 | 3160 | 170 | 50 | 0.027 |
| 5.5 | 5930 | 350 | 102 | 0.030 | 3570 | 215 | 62 | 0.030 | 2160 | 55 | 37 | 0.013 | 3000 | 180 | 52 | 0.030 |
| 6.0 | 5560 | 370 | 105 | 0.033 | 3360 | 230 | 63 | 0.034 | 2000 | 58 | 38 | 0.015 | 2840 | 190 | 54 | 0.033 |
| 6.5 | 5220 | 375 | 107 | 0.036 | 3150 | 225 | 64 | 0.036 | 1920 | 63 | 39 | 0.016 | 2655 | 190 | 54 | 0.036 |
| 7.0 | 4880 | 385 | 107 | 0.039 | 2940 | 220 | 65 | 0.037 | 1840 | 68 | 40 | 0.018 | 2470 | 190 | 54 | 0.038 |
| 7.5 | 4540 | 390 | 107 | 0.043 | 2730 | 215 | 64 | 0.039 | 1760 | 74 | 41 | 0.021 | 2285 | 190 | 54 | 0.042 |
| 8.0 | 4200 | 400 | 106 | 0.048 | 2520 | 210 | 63 | 0.042 | 1680 | 79 | 42 | 0.024 | 2100 | 190 | 53 | 0.045 |
| 8.5 | 3965 | 385 | 106 | 0.049 | 2390 | 200 | 64 | 0.042 | 1600 | 74 | 43 | 0.023 | 1995 | 185 | 53 | 0.046 |
| 9.0 | 3730 | 375 | 105 | 0.050 | 2260 | 190 | 64 | 0.042 | 1520 | 68 | 43 | 0.022 | 1890 | 180 | 53 | 0.048 |
| 9.5 | 3495 | 355 | 104 | 0.051 | 2130 | 180 | 64 | 0.042 | 1440 | 63 | 43 | 0.022 | 1785 | 175 | 53 | 0.049 |
| 10.0 | 3260 | 345 | 102 | 0.053 | 2000 | 170 | 63 | 0.043 | 1360 | 63 | 43 | 0.023 | 1680 | 170 | 53 | 0.051 |
| 10.5 | 3130 | 330 | 103 | 0.053 | 1920 | 160 | 63 | 0.042 | 1310 | 61 | 43 | 0.023 | 1600 | 160 | 53 | 0.050 |
| 11.0 | 3000 | 320 | 104 | 0.053 | 1840 | 150 | 64 | 0.041 | 1260 | 58 | 44 | 0.023 | 1520 | 150 | 53 | 0.049 |
| 11.5 | 2870 | 305 | 104 | 0.053 | 1760 | 140 | 64 | 0.040 | 1210 | 58 | 44 | 0.024 | 1440 | 140 | 52 | 0.049 |
| 12.0 | 2740 | 295 | 103 | 0.054 | 1680 | 135 | 63 | 0.040 | 1160 | 58 | 44 | 0.025 | 1360 | 135 | 51 | 0.050 |
| 13.0 | 2605 | 280 | 106 | 0.054 | 1600 | 130 | 65 | 0.041 | 1095 | 55 | 45 | 0.025 | 1285 | 130 | 52 | 0.051 |
| 14.0 | 2470 | 265 | 109 | 0.054 | 1520 | 125 | 67 | 0.041 | 1030 | 49 | 45 | 0.024 | 1210 | 125 | 53 | 0.052 |
| 15.0 | 2335 | 245 | 110 | 0.052 | 1440 | 120 | 68 | 0.042 | 965 | 45 | 45 | 0.023 | 1135 | 120 | 53 | 0.053 |
| 16.0 | 2200 | 230 | 111 | 0.052 | 1360 | 115 | 68 | 0.042 | 900 | 42 | 45 | 0.023 | 1060 | 115 | 53 | 0.054 |
| 17.0 | 2070 | 215 | 111 | 0.052 | 1285 | 105 | 69 | 0.041 | 845 | 39 | 45 | 0.023 | 1005 | 105 | 54 | 0.052 |
| 18.0 | 1940 | 205 | 110 | 0.053 | 1210 | 100 | 68 | 0.041 | 790 | 37 | 45 | 0.023 | 950 | 100 | 54 | 0.053 |
| 19.0 | 1810 | 190 | 108 | 0.052 | 1135 | 90 | 68 | 0.040 | 735 | 34 | 44 | 0.023 | 895 | 90 | 53 | 0.050 |
| 20.0 | 1680 | 180 | 106 | 0.054 | 1060 | 84 | 67 | 0.040 | 680 | 32 | 43 | 0.024 | 840 | 84 | 53 | 0.050 |
| 21.0 | 1615 | 170 | 107 | 0.053 | 1015 | 82 | 67 | 0.040 | 650 | 29 | 43 | 0.022 | 800 | 80 | 53 | 0.050 |
| 22.0 | 1550 | 165 | 107 | 0.053 | 970 | 80 | 67 | 0.041 | 620 | 27 | 43 | 0.022 | 775 | 76 | 54 | 0.049 |
| 23.0 | 1480 | 150 | 107 | 0.051 | 925 | 78 | 67 | 0.042 | 600 | 25 | 43 | 0.021 | 745 | 71 | 54 | 0.048 |
| 24.0 | 1425 | 140 | 107 | 0.049 | 885 | 76 | 67 | 0.043 | 570 | 23 | 43 | 0.020 | 715 | 67 | 54 | 0.047 |
| 25.0 | 1360 | 135 | 107 | 0.050 | 840 | 74 | 66 | 0.044 | 540 | 21 | 42 | 0.019 | 680 | 63 | 53 | 0.046 |




RPM = rev./min. Vc = m/min.
FEED = mm/min. fz = mm/tooth

# 4G MILL END MILLS

**RECOMMENDED CUTTING CONDITIONS**

## CARBIDE, 2 FLUTE LONG LENGTH

### SEME70 SERIES

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 1.0 | 3 | 16000 | 70 | 50 | 0.002 | 12800 | 60 | 40 | 0.002 | 8000 | 30 | 25 | 0.002 |
| 1.0 | 4 | 16000 | 70 | 50 | 0.002 | 12800 | 60 | 40 | 0.002 | 8000 | 30 | 25 | 0.002 |
| 1.0 | 5 | 16000 | 70 | 50 | 0.002 | 12800 | 60 | 40 | 0.002 | 8000 | 30 | 25 | 0.002 |
| 1.0 | 6 | 14400 | 55 | 45 | 0.002 | 11520 | 50 | 36 | 0.002 | 7200 | 25 | 23 | 0.002 |
| 1.0 | 7 | 14400 | 55 | 45 | 0.002 | 11520 | 50 | 36 | 0.002 | 7200 | 25 | 23 | 0.002 |
| 1.0 | 8 | 14400 | 50 | 45 | 0.002 | 11520 | 45 | 36 | 0.002 | 7200 | 20 | 23 | 0.001 |
| 1.0 | 10 | 14400 | 50 | 45 | 0.002 | 11520 | 45 | 36 | 0.002 | 7200 | 20 | 23 | 0.001 |
| 1.0 | 12 | 12800 | 40 | 40 | 0.002 | 10240 | 35 | 32 | 0.002 | 6400 | 15 | 20 | 0.001 |
| 1.2 | 4 | 13500 | 75 | 51 | 0.003 | 10800 | 65 | 41 | 0.003 | 6750 | 30 | 25 | 0.002 |
| 1.2 | 6 | 13500 | 75 | 51 | 0.003 | 10800 | 65 | 41 | 0.003 | 6750 | 30 | 25 | 0.002 |
| 1.2 | 8 | 12150 | 60 | 46 | 0.002 | 9720 | 50 | 37 | 0.003 | 6080 | 25 | 23 | 0.002 |
| 1.2 | 10 | 12150 | 55 | 46 | 0.002 | 9720 | 45 | 37 | 0.002 | 6080 | 20 | 23 | 0.002 |
| 1.2 | 12 | 12150 | 55 | 46 | 0.002 | 9720 | 45 | 37 | 0.002 | 6080 | 20 | 23 | 0.002 |
| 1.5 | 6 | 11200 | 80 | 53 | 0.004 | 8960 | 70 | 42 | 0.004 | 5600 | 30 | 26 | 0.003 |
| 1.5 | 8 | 10080 | 70 | 48 | 0.003 | 8060 | 60 | 38 | 0.004 | 5040 | 30 | 24 | 0.003 |
| 1.5 | 10 | 10080 | 65 | 48 | 0.003 | 8060 | 55 | 38 | 0.003 | 5040 | 25 | 24 | 0.002 |
| 1.5 | 12 | 10080 | 60 | 48 | 0.003 | 8060 | 50 | 38 | 0.003 | 5040 | 25 | 24 | 0.002 |
| 1.5 | 14 | 10080 | 60 | 48 | 0.003 | 8060 | 50 | 38 | 0.003 | 5040 | 25 | 24 | 0.002 |
| 1.5 | 16 | 8960 | 45 | 42 | 0.003 | 7170 | 40 | 34 | 0.003 | 4480 | 20 | 21 | 0.002 |
| 2.0 | 8 | 9070 | 85 | 57 | 0.005 | 7260 | 70 | 46 | 0.005 | 4540 | 35 | 29 | 0.004 |
| 2.0 | 10 | 9070 | 85 | 57 | 0.005 | 7260 | 70 | 46 | 0.005 | 4540 | 35 | 29 | 0.004 |
| 2.0 | 12 | 8160 | 70 | 51 | 0.004 | 6530 | 60 | 41 | 0.005 | 4090 | 30 | 26 | 0.004 |
| 2.0 | 14 | 8160 | 70 | 51 | 0.004 | 6530 | 60 | 41 | 0.005 | 4090 | 30 | 26 | 0.004 |
| 2.0 | 16 | 8160 | 60 | 51 | 0.004 | 6530 | 50 | 41 | 0.004 | 4090 | 25 | 26 | 0.003 |
| 2.5 | 10 | 7700 | 95 | 60 | 0.006 | 6200 | 80 | 49 | 0.006 | 3850 | 40 | 30 | 0.005 |
| 2.5 | 12 | 7700 | 95 | 60 | 0.006 | 6200 | 80 | 49 | 0.006 | 3850 | 40 | 30 | 0.005 |
| 2.5 | 16 | 6930 | 75 | 54 | 0.005 | 5580 | 65 | 44 | 0.006 | 3470 | 30 | 27 | 0.004 |
| 2.5 | 20 | 6930 | 70 | 54 | 0.005 | 5580 | 55 | 44 | 0.005 | 3470 | 30 | 27 | 0.004 |
| 2.5 | 26 | 6160 | 55 | 48 | 0.004 | 4960 | 45 | 39 | 0.005 | 3080 | 20 | 24 | 0.003 |
| 3.0 | 10 | 6350 | 100 | 60 | 0.008 | 5150 | 85 | 49 | 0.008 | 3170 | 40 | 30 | 0.006 |
| 3.0 | 12 | 6350 | 100 | 60 | 0.008 | 5150 | 85 | 49 | 0.008 | 3170 | 40 | 30 | 0.006 |
| 3.0 | 14 | 6350 | 100 | 60 | 0.008 | 5150 | 85 | 49 | 0.008 | 3170 | 40 | 30 | 0.006 |
| 3.0 | 16 | 5720 | 90 | 54 | 0.008 | 4640 | 75 | 44 | 0.008 | 2850 | 40 | 27 | 0.007 |
| 3.0 | 20 | 5720 | 80 | 54 | 0.007 | 4640 | 70 | 44 | 0.008 | 2850 | 35 | 27 | 0.006 |
| 3.0 | 26 | 5720 | 70 | 54 | 0.006 | 4640 | 60 | 44 | 0.006 | 2850 | 30 | 27 | 0.005 |
| 3.0 | 30 | 5720 | 70 | 54 | 0.006 | 4640 | 60 | 44 | 0.006 | 2850 | 30 | 27 | 0.005 |
| 4.0 | 12 | 5150 | 120 | 65 | 0.012 | 4100 | 100 | 52 | 0.012 | 2580 | 50 | 32 | 0.010 |
| 4.0 | 16 | 5150 | 120 | 65 | 0.012 | 4100 | 100 | 52 | 0.012 | 2580 | 50 | 32 | 0.010 |
| 4.0 | 20 | 5150 | 120 | 65 | 0.012 | 4100 | 100 | 52 | 0.012 | 2580 | 50 | 32 | 0.010 |
| 4.0 | 26 | 4640 | 95 | 58 | 0.010 | 3690 | 85 | 46 | 0.012 | 2320 | 40 | 29 | 0.009 |
| 4.0 | 30 | 4640 | 95 | 58 | 0.010 | 3690 | 85 | 46 | 0.012 | 2320 | 40 | 29 | 0.009 |
| 5.0 | 20 | 4400 | 150 | 69 | 0.017 | 3480 | 125 | 55 | 0.018 | 2280 | 55 | 36 | 0.012 |

DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG LENGTH

### SEME70 SERIES

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 5.0 | 25 | 4400 | 150 | 69 | 0.017 | 3480 | 125 | 55 | 0.018 | 2280 | 55 | 36 | 0.012 |
| 5.0 | 30 | 3960 | 120 | 62 | 0.015 | 3130 | 100 | 49 | 0.016 | 2050 | 45 | 32 | 0.011 |
| 5.0 | 35 | 3960 | 120 | 62 | 0.015 | 3130 | 100 | 49 | 0.016 | 2050 | 45 | 32 | 0.011 |
| 5.0 | 40 | 3960 | 110 | 62 | 0.014 | 3130 | 90 | 49 | 0.014 | 2050 | 40 | 32 | 0.010 |
| 6.0 | 15 | 3800 | 180 | 72 | 0.024 | 3050 | 150 | 57 | 0.025 | 1970 | 70 | 37 | 0.018 |
| 6.0 | 20 | 3800 | 180 | 72 | 0.024 | 3050 | 150 | 57 | 0.025 | 1970 | 70 | 37 | 0.018 |
| 6.0 | 25 | 3800 | 180 | 72 | 0.024 | 3050 | 150 | 57 | 0.025 | 1970 | 70 | 37 | 0.018 |
| 6.0 | 30 | 3800 | 155 | 72 | 0.020 | 3050 | 130 | 57 | 0.021 | 1970 | 60 | 37 | 0.015 |
| 6.0 | 35 | 3420 | 140 | 64 | 0.020 | 2750 | 115 | 52 | 0.021 | 1770 | 55 | 33 | 0.016 |
| 6.0 | 40 | 3420 | 120 | 64 | 0.018 | 2750 | 100 | 52 | 0.018 | 1770 | 50 | 33 | 0.014 |
| 6.0 | 45 | 3420 | 120 | 64 | 0.018 | 2750 | 100 | 52 | 0.018 | 1770 | 50 | 33 | 0.014 |
| 8.0 | 25 | 2880 | 190 | 72 | 0.033 | 2280 | 150 | 57 | 0.033 | 1510 | 70 | 38 | 0.023 |
| 8.0 | 30 | 2880 | 190 | 72 | 0.033 | 2280 | 150 | 57 | 0.033 | 1510 | 70 | 38 | 0.023 |
| 8.0 | 35 | 2880 | 190 | 72 | 0.033 | 2280 | 150 | 57 | 0.033 | 1510 | 70 | 38 | 0.023 |
| 8.0 | 40 | 2880 | 160 | 72 | 0.028 | 2280 | 125 | 57 | 0.027 | 1510 | 60 | 38 | 0.020 |
| 8.0 | 45 | 2590 | 145 | 65 | 0.028 | 2050 | 115 | 52 | 0.028 | 1360 | 55 | 34 | 0.020 |
| 8.0 | 50 | 2590 | 130 | 65 | 0.025 | 2050 | 100 | 52 | 0.024 | 1360 | 50 | 34 | 0.018 |
| 10.0 | 30 | 2450 | 190 | 77 | 0.039 | 2000 | 150 | 63 | 0.038 | 1210 | 70 | 38 | 0.029 |
| 10.0 | 35 | 2450 | 190 | 77 | 0.039 | 2000 | 150 | 63 | 0.038 | 1210 | 70 | 38 | 0.029 |
| 10.0 | 40 | 2450 | 190 | 77 | 0.039 | 2000 | 150 | 63 | 0.038 | 1210 | 70 | 38 | 0.029 |
| 10.0 | 45 | 2450 | 160 | 77 | 0.033 | 2000 | 125 | 63 | 0.031 | 1210 | 60 | 38 | 0.025 |
| 10.0 | 50 | 2450 | 160 | 77 | 0.033 | 2000 | 125 | 63 | 0.031 | 1210 | 60 | 38 | 0.025 |
| 10.0 | 55 | 2210 | 145 | 69 | 0.033 | 1800 | 115 | 57 | 0.032 | 1090 | 55 | 34 | 0.025 |
| 10.0 | 60 | 2210 | 130 | 69 | 0.029 | 1800 | 100 | 57 | 0.028 | 1090 | 50 | 34 | 0.023 |
| 12.0 | 35 | 2000 | 150 | 75 | 0.038 | 1670 | 135 | 63 | 0.040 | 1010 | 55 | 38 | 0.027 |
| 12.0 | 40 | 2000 | 150 | 75 | 0.038 | 1670 | 135 | 63 | 0.040 | 1010 | 55 | 38 | 0.027 |
| 12.0 | 45 | 2000 | 130 | 75 | 0.033 | 1670 | 115 | 63 | 0.034 | 1010 | 45 | 38 | 0.022 |
| 12.0 | 50 | 2000 | 130 | 75 | 0.033 | 1670 | 115 | 63 | 0.034 | 1010 | 45 | 38 | 0.022 |
| 12.0 | 55 | 2000 | 130 | 75 | 0.033 | 1670 | 115 | 63 | 0.034 | 1010 | 45 | 38 | 0.022 |
| 12.0 | 60 | 2000 | 110 | 75 | 0.028 | 1670 | 100 | 63 | 0.030 | 1010 | 40 | 38 | 0.020 |
| 12.0 | 65 | 1800 | 100 | 68 | 0.028 | 1500 | 90 | 57 | 0.030 | 910 | 35 | 34 | 0.019 |
| 12.0 | 70 | 1800 | 100 | 68 | 0.028 | 1500 | 90 | 57 | 0.030 | 910 | 35 | 34 | 0.019 |
| 14.0 | 50 | 1850 | 125 | 81 | 0.034 | 1480 | 100 | 65 | 0.034 | 910 | 45 | 40 | 0.025 |
| 14.0 | 60 | 1850 | 125 | 81 | 0.034 | 1480 | 100 | 65 | 0.034 | 910 | 45 | 40 | 0.025 |
| 16.0 | 40 | 1700 | 140 | 85 | 0.041 | 1280 | 105 | 64 | 0.041 | 800 | 50 | 40 | 0.031 |
| 16.0 | 50 | 1700 | 140 | 85 | 0.041 | 1280 | 105 | 64 | 0.041 | 800 | 50 | 40 | 0.031 |
| 16.0 | 60 | 1700 | 120 | 85 | 0.035 | 1280 | 90 | 64 | 0.035 | 800 | 40 | 40 | 0.025 |
| 16.0 | 70 | 1700 | 120 | 85 | 0.035 | 1280 | 90 | 64 | 0.035 | 800 | 40 | 40 | 0.025 |
| 16.0 | 80 | 1700 | 105 | 85 | 0.031 | 1280 | 80 | 64 | 0.031 | 800 | 35 | 40 | 0.022 |
| 16.0 | 90 | 1530 | 95 | 77 | 0.031 | 1150 | 70 | 58 | 0.030 | 720 | 30 | 36 | 0.021 |
| 16.0 | 110 | 1530 | 95 | 77 | 0.031 | 1150 | 70 | 58 | 0.030 | 720 | 30 | 36 | 0.021 |
| 16.0 | 120 | 1530 | 95 | 77 | 0.031 | 1150 | 70 | 58 | 0.030 | 720 | 30 | 36 | 0.021 |

DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

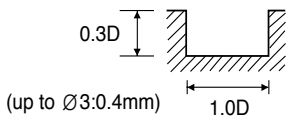
# 4G MILL END MILLS

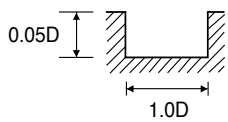
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG LENGTH

### SEME70 SERIES

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 18.0 | 50 | 1450 | 120 | 82 | 0.041 | 1120 | 90 | 63 | 0.040 | 700 | 40 | 40 | 0.029 |
| 18.0 | 70 | 1450 | 100 | 82 | 0.034 | 1120 | 75 | 63 | 0.033 | 700 | 35 | 40 | 0.025 |
| 18.0 | 100 | 1310 | 80 | 74 | 0.031 | 1000 | 60 | 57 | 0.030 | 630 | 30 | 36 | 0.024 |
| 20.0 | 50 | 1220 | 100 | 77 | 0.041 | 950 | 75 | 60 | 0.039 | 600 | 35 | 38 | 0.029 |
| 20.0 | 60 | 1220 | 100 | 77 | 0.041 | 950 | 75 | 60 | 0.039 | 600 | 35 | 38 | 0.029 |
| 20.0 | 70 | 1220 | 85 | 77 | 0.035 | 950 | 65 | 60 | 0.034 | 600 | 30 | 38 | 0.025 |
| 20.0 | 80 | 1220 | 85 | 77 | 0.035 | 950 | 65 | 60 | 0.034 | 600 | 30 | 38 | 0.025 |
| 20.0 | 90 | 1220 | 75 | 77 | 0.031 | 950 | 55 | 60 | 0.029 | 600 | 25 | 38 | 0.021 |
| 20.0 | 110 | 1100 | 70 | 69 | 0.032 | 860 | 50 | 54 | 0.029 | 540 | 25 | 34 | 0.023 |
| 20.0 | 120 | 1100 | 70 | 69 | 0.032 | 860 | 50 | 54 | 0.029 | 540 | 25 | 34 | 0.023 |
| 22.0 | 75 | 1100 | 75 | 76 | 0.034 | 840 | 55 | 58 | 0.033 | 550 | 30 | 38 | 0.027 |
| 22.0 | 110 | 1100 | 70 | 76 | 0.032 | 840 | 50 | 58 | 0.030 | 550 | 25 | 38 | 0.023 |
| 25.0 | 70 | 980 | 80 | 77 | 0.041 | 750 | 60 | 59 | 0.040 | 480 | 30 | 38 | 0.031 |
| 25.0 | 90 | 980 | 70 | 77 | 0.036 | 750 | 50 | 59 | 0.033 | 480 | 25 | 38 | 0.026 |
| 25.0 | 110 | 980 | 70 | 77 | 0.036 | 750 | 50 | 59 | 0.033 | 480 | 25 | 38 | 0.026 |
| 25.0 | 120 | 980 | 60 | 77 | 0.031 | 750 | 45 | 59 | 0.030 | 480 | 25 | 38 | 0.026 |




DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

# RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK

### SEM845 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 0.1 | 0.3 | 50000 | 315 | 16 | 0.003 | 0.009 | 46200 | 230 | 15 | 0.002 | 0.007 | 40600 | 170 | 13 | 0.002 | 0.005 |
| 0.1 | 0.5 | 50000 | 315 | 16 | 0.003 | 0.006 | 46200 | 230 | 15 | 0.002 | 0.005 | 40600 | 170 | 13 | 0.002 | 0.004 |
| 0.1 | 1 | 45000 | 255 | 14 | 0.003 | 0.002 | 41580 | 185 | 13 | 0.002 | 0.002 | 36540 | 140 | 11 | 0.002 | 0.001 |
| 0.2 | 0.5 | 38500 | 380 | 24 | 0.005 | 0.018 | 36300 | 270 | 23 | 0.004 | 0.014 | 32100 | 200 | 20 | 0.003 | 0.010 |
| 0.2 | 1 | 38500 | 380 | 24 | 0.005 | 0.013 | 36300 | 270 | 23 | 0.004 | 0.010 | 32100 | 200 | 20 | 0.003 | 0.007 |
| 0.2 | 1.5 | 34650 | 310 | 22 | 0.004 | 0.007 | 32670 | 220 | 21 | 0.003 | 0.006 | 28890 | 160 | 18 | 0.003 | 0.004 |
| 0.2 | 2 | 34650 | 310 | 22 | 0.004 | 0.005 | 32670 | 220 | 21 | 0.003 | 0.004 | 28890 | 160 | 18 | 0.003 | 0.003 |
| 0.3 | 1 | 34200 | 390 | 32 | 0.006 | 0.019 | 32300 | 270 | 30 | 0.004 | 0.015 | 28500 | 230 | 27 | 0.004 | 0.011 |
| 0.3 | 1.5 | 34200 | 390 | 32 | 0.006 | 0.019 | 32300 | 270 | 30 | 0.004 | 0.015 | 28500 | 230 | 27 | 0.004 | 0.011 |
| 0.3 | 2 | 30780 | 315 | 29 | 0.005 | 0.011 | 29070 | 220 | 27 | 0.004 | 0.008 | 25650 | 185 | 24 | 0.004 | 0.006 |
| 0.3 | 2.5 | 30780 | 315 | 29 | 0.005 | 0.007 | 29070 | 220 | 27 | 0.004 | 0.005 | 25650 | 185 | 24 | 0.004 | 0.004 |
| 0.3 | 3 | 30780 | 315 | 29 | 0.005 | 0.007 | 29070 | 220 | 27 | 0.004 | 0.005 | 25650 | 185 | 24 | 0.004 | 0.004 |
| 0.3 | 4 | 27360 | 250 | 26 | 0.005 | 0.004 | 25840 | 175 | 24 | 0.003 | 0.003 | 22800 | 145 | 21 | 0.003 | 0.002 |
| 0.3 | 5 | 20520 | 165 | 19 | 0.004 | 0.003 | 19380 | 115 | 18 | 0.003 | 0.002 | 17100 | 95 | 16 | 0.003 | 0.002 |
| 0.4 | 1 | 27400 | 540 | 34 | 0.010 | 0.036 | 25800 | 380 | 32 | 0.007 | 0.028 | 22800 | 280 | 29 | 0.006 | 0.02 |
| 0.4 | 1.5 | 27400 | 540 | 34 | 0.010 | 0.025 | 25800 | 380 | 32 | 0.007 | 0.020 | 22800 | 280 | 29 | 0.006 | 0.014 |
| 0.4 | 2 | 27400 | 540 | 34 | 0.010 | 0.025 | 25800 | 380 | 32 | 0.007 | 0.020 | 22800 | 280 | 29 | 0.006 | 0.014 |
| 0.4 | 2.5 | 24660 | 435 | 31 | 0.009 | 0.014 | 23220 | 310 | 29 | 0.007 | 0.011 | 20520 | 225 | 26 | 0.005 | 0.008 |
| 0.4 | 3 | 24660 | 435 | 31 | 0.009 | 0.014 | 23220 | 310 | 29 | 0.007 | 0.011 | 20520 | 225 | 26 | 0.005 | 0.008 |
| 0.4 | 4 | 24660 | 435 | 31 | 0.009 | 0.009 | 23220 | 310 | 29 | 0.007 | 0.007 | 20520 | 225 | 26 | 0.005 | 0.005 |
| 0.4 | 5 | 21920 | 345 | 28 | 0.008 | 0.009 | 20640 | 245 | 26 | 0.006 | 0.007 | 18240 | 180 | 23 | 0.005 | 0.005 |
| 0.4 | 6 | 21920 | 345 | 28 | 0.008 | 0.005 | 20640 | 245 | 26 | 0.006 | 0.004 | 18240 | 180 | 23 | 0.005 | 0.003 |
| 0.4 | 8 | 16440 | 225 | 21 | 0.007 | 0.004 | 15480 | 160 | 19 | 0.005 | 0.003 | 13680 | 120 | 17 | 0.004 | 0.002 |
| 0.4 | 10 | 8220 | 95 | 10 | 0.006 | 0.004 | 7740 | 70 | 10 | 0.005 | 0.003 | 6840 | 50 | 9 | 0.004 | 0.002 |
| 0.5 | 1 | 27400 | 540 | 43 | 0.010 | 0.045 | 25800 | 425 | 41 | 0.008 | 0.035 | 22800 | 285 | 36 | 0.006 | 0.025 |
| 0.5 | 1.5 | 27400 | 540 | 43 | 0.010 | 0.045 | 25800 | 425 | 41 | 0.008 | 0.035 | 22800 | 285 | 36 | 0.006 | 0.025 |
| 0.5 | 2 | 27400 | 540 | 43 | 0.010 | 0.032 | 25800 | 425 | 41 | 0.008 | 0.025 | 22800 | 285 | 36 | 0.006 | 0.018 |
| 0.5 | 2.5 | 27400 | 540 | 43 | 0.010 | 0.032 | 25800 | 425 | 41 | 0.008 | 0.025 | 22800 | 285 | 36 | 0.006 | 0.018 |
| 0.5 | 3 | 24660 | 435 | 39 | 0.009 | 0.018 | 23220 | 345 | 36 | 0.007 | 0.014 | 20520 | 230 | 32 | 0.006 | 0.010 |
| 0.5 | 4 | 24660 | 435 | 39 | 0.009 | 0.018 | 23220 | 345 | 36 | 0.007 | 0.014 | 20520 | 230 | 32 | 0.006 | 0.010 |
| 0.5 | 5 | 24660 | 435 | 39 | 0.009 | 0.011 | 23220 | 345 | 36 | 0.007 | 0.009 | 20520 | 230 | 32 | 0.006 | 0.006 |
| 0.5 | 6 | 21920 | 345 | 34 | 0.008 | 0.011 | 20640 | 270 | 32 | 0.007 | 0.009 | 18240 | 180 | 29 | 0.005 | 0.006 |
| 0.5 | 8 | 16440 | 225 | 26 | 0.007 | 0.007 | 15480 | 180 | 24 | 0.006 | 0.005 | 13680 | 120 | 21 | 0.004 | 0.004 |
| 0.5 | 10 | 16440 | 225 | 26 | 0.007 | 0.005 | 15480 | 180 | 24 | 0.006 | 0.004 | 13680 | 120 | 21 | 0.004 | 0.003 |
| 0.5 | 12 | 8220 | 95 | 13 | 0.006 | 0.005 | 7740 | 75 | 12 | 0.005 | 0.004 | 6840 | 50 | 11 | 0.004 | 0.003 |
| 0.5 | 14 | 8220 | 95 | 13 | 0.006 | 0.005 | 7740 | 75 | 12 | 0.005 | 0.004 | 6840 | 50 | 11 | 0.004 | 0.003 |
| 0.5 | 16 | 2740 | 25 | 4 | 0.005 | 0.005 | 2580 | 20 | 4 | 0.004 | 0.004 | 2280 | 15 | 4 | 0.003 | 0.003 |
| 0.6 | 2 | 27400 | 775 | 52 | 0.014 | 0.038 | 25800 | 545 | 49 | 0.011 | 0.029 | 22800 | 405 | 43 | 0.009 | 0.021 |
| 0.6 | 3 | 27400 | 775 | 52 | 0.014 | 0.038 | 25800 | 545 | 49 | 0.011 | 0.029 | 22800 | 405 | 43 | 0.009 | 0.021 |
| 0.6 | 4 | 24660 | 630 | 46 | 0.013 | 0.022 | 23220 | 440 | 44 | 0.009 | 0.017 | 20520 | 330 | 39 | 0.008 | 0.012 |
| 0.6 | 5 | 24660 | 630 | 46 | 0.013 | 0.014 | 23220 | 440 | 44 | 0.009 | 0.011 | 20520 | 330 | 39 | 0.008 | 0.008 |
| 0.6 | 6 | 24660 | 630 | 46 | 0.013 | 0.014 | 23220 | 440 | 44 | 0.009 | 0.011 | 20520 | 330 | 39 | 0.008 | 0.008 |
| 0.6 | 8 | 21920 | 495 | 41 | 0.011 | 0.008 | 20640 | 350 | 39 | 0.008 | 0.006 | 18240 | 260 | 34 | 0.007 | 0.005 |
| 0.6 | 10 | 16440 | 325 | 31 | 0.010 | 0.005 | 15480 | 230 | 29 | 0.007 | 0.004 | 13680 | 170 | 26 | 0.006 | 0.003 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK

### SEM845 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 0.6 | 12 | 16440 | 325 | 31 | 0.010 | 0.005 | 15480 | 230 | 29 | 0.007 | 0.004 | 13680 | 170 | 26 | 0.006 | 0.003 |
| 0.6 | 14 | 8220 | 140 | 15 | 0.009 | 0.005 | 7740 | 100 | 15 | 0.006 | 0.004 | 6840 | 75 | 13 | 0.005 | 0.003 |
| 0.6 | 16 | 8220 | 140 | 15 | 0.009 | 0.005 | 7740 | 100 | 15 | 0.006 | 0.004 | 6840 | 75 | 13 | 0.005 | 0.003 |
| 0.7 | 2 | 27400 | 775 | 60 | 0.014 | 0.063 | 25800 | 545 | 57 | 0.011 | 0.049 | 22800 | 405 | 50 | 0.009 | 0.035 |
| 0.7 | 4 | 24660 | 630 | 54 | 0.013 | 0.025 | 23220 | 440 | 51 | 0.009 | 0.020 | 20520 | 330 | 45 | 0.008 | 0.014 |
| 0.7 | 6 | 24660 | 630 | 54 | 0.013 | 0.016 | 23220 | 440 | 51 | 0.009 | 0.012 | 20520 | 330 | 45 | 0.008 | 0.009 |
| 0.7 | 8 | 21920 | 495 | 48 | 0.011 | 0.016 | 20640 | 350 | 45 | 0.008 | 0.012 | 18240 | 260 | 40 | 0.007 | 0.009 |
| 0.7 | 10 | 21920 | 495 | 48 | 0.011 | 0.009 | 20640 | 350 | 45 | 0.008 | 0.007 | 18240 | 260 | 40 | 0.007 | 0.005 |
| 0.7 | 12 | 16440 | 325 | 36 | 0.010 | 0.006 | 15480 | 230 | 34 | 0.007 | 0.005 | 13680 | 170 | 30 | 0.006 | 0.004 |
| 0.8 | 2 | 27400 | 775 | 69 | 0.014 | 0.072 | 25800 | 605 | 65 | 0.012 | 0.056 | 22800 | 450 | 57 | 0.010 | 0.040 |
| 0.8 | 3 | 27400 | 775 | 69 | 0.014 | 0.050 | 25800 | 605 | 65 | 0.012 | 0.039 | 22800 | 450 | 57 | 0.010 | 0.028 |
| 0.8 | 4 | 27400 | 775 | 69 | 0.014 | 0.050 | 25800 | 605 | 65 | 0.012 | 0.039 | 22800 | 450 | 57 | 0.010 | 0.028 |
| 0.8 | 5 | 24660 | 630 | 62 | 0.013 | 0.029 | 23220 | 490 | 58 | 0.011 | 0.022 | 20520 | 365 | 52 | 0.009 | 0.016 |
| 0.8 | 6 | 24660 | 630 | 62 | 0.013 | 0.029 | 23220 | 490 | 58 | 0.011 | 0.022 | 20520 | 365 | 52 | 0.009 | 0.016 |
| 0.8 | 8 | 24660 | 630 | 62 | 0.013 | 0.018 | 23220 | 490 | 58 | 0.011 | 0.014 | 20520 | 365 | 52 | 0.009 | 0.010 |
| 0.8 | 10 | 21920 | 495 | 55 | 0.011 | 0.018 | 20640 | 385 | 52 | 0.009 | 0.014 | 18240 | 290 | 46 | 0.008 | 0.010 |
| 0.8 | 12 | 21920 | 495 | 55 | 0.011 | 0.011 | 20640 | 385 | 52 | 0.009 | 0.008 | 18240 | 290 | 46 | 0.008 | 0.006 |
| 0.8 | 14 | 16440 | 325 | 41 | 0.010 | 0.007 | 15480 | 255 | 39 | 0.008 | 0.006 | 13680 | 190 | 34 | 0.007 | 0.004 |
| 0.8 | 16 | 16440 | 325 | 41 | 0.010 | 0.007 | 15480 | 255 | 39 | 0.008 | 0.006 | 13680 | 190 | 34 | 0.007 | 0.004 |
| 0.8 | 20 | 8220 | 140 | 21 | 0.009 | 0.007 | 7740 | 110 | 19 | 0.007 | 0.006 | 6840 | 80 | 17 | 0.006 | 0.004 |
| 0.9 | 6 | 22140 | 575 | 63 | 0.013 | 0.032 | 20970 | 440 | 59 | 0.010 | 0.025 | 18450 | 330 | 52 | 0.009 | 0.018 |
| 0.9 | 8 | 22140 | 575 | 63 | 0.013 | 0.020 | 20970 | 440 | 59 | 0.010 | 0.016 | 18450 | 330 | 52 | 0.009 | 0.011 |
| 0.9 | 10 | 19680 | 455 | 56 | 0.012 | 0.020 | 18640 | 350 | 53 | 0.009 | 0.016 | 16400 | 260 | 46 | 0.008 | 0.011 |
| 1.0 | 2 | 24600 | 1045 | 77 | 0.021 | 0.090 | 23300 | 890 | 73 | 0.019 | 0.070 | 20500 | 665 | 64 | 0.016 | 0.050 |
| 1.0 | 3 | 24600 | 1045 | 77 | 0.021 | 0.090 | 23300 | 890 | 73 | 0.019 | 0.070 | 20500 | 665 | 64 | 0.016 | 0.050 |
| 1.0 | 4 | 24600 | 1045 | 77 | 0.021 | 0.063 | 23300 | 890 | 73 | 0.019 | 0.049 | 20500 | 665 | 64 | 0.016 | 0.035 |
| 1.0 | 5 | 24600 | 1045 | 77 | 0.021 | 0.063 | 23300 | 890 | 73 | 0.019 | 0.049 | 20500 | 665 | 64 | 0.016 | 0.035 |
| 1.0 | 6 | 22140 | 845 | 70 | 0.019 | 0.036 | 20970 | 720 | 66 | 0.017 | 0.028 | 18450 | 540 | 58 | 0.015 | 0.020 |
| 1.0 | 7 | 22140 | 845 | 70 | 0.019 | 0.036 | 20970 | 720 | 66 | 0.017 | 0.028 | 18450 | 540 | 58 | 0.015 | 0.020 |
| 1.0 | 8 | 22140 | 845 | 70 | 0.019 | 0.036 | 20970 | 720 | 66 | 0.017 | 0.028 | 18450 | 540 | 58 | 0.015 | 0.020 |
| 1.0 | 10 | 22140 | 845 | 70 | 0.019 | 0.023 | 20970 | 720 | 66 | 0.017 | 0.018 | 18450 | 540 | 58 | 0.015 | 0.013 |
| 1.0 | 12 | 19680 | 670 | 62 | 0.017 | 0.023 | 18640 | 570 | 59 | 0.015 | 0.018 | 16400 | 425 | 52 | 0.013 | 0.013 |
| 1.0 | 14 | 19680 | 670 | 62 | 0.017 | 0.014 | 18640 | 570 | 59 | 0.015 | 0.011 | 16400 | 425 | 52 | 0.013 | 0.008 |
| 1.0 | 16 | 14760 | 440 | 46 | 0.015 | 0.014 | 13980 | 375 | 44 | 0.013 | 0.011 | 12300 | 280 | 39 | 0.011 | 0.008 |
| 1.0 | 18 | 14760 | 440 | 46 | 0.015 | 0.009 | 13980 | 375 | 44 | 0.013 | 0.007 | 12300 | 280 | 39 | 0.011 | 0.005 |
| 1.0 | 20 | 14760 | 440 | 46 | 0.015 | 0.009 | 13980 | 375 | 44 | 0.013 | 0.007 | 12300 | 280 | 39 | 0.011 | 0.005 |
| 1.0 | 22 | 7380 | 190 | 23 | 0.013 | 0.009 | 6990 | 160 | 22 | 0.011 | 0.007 | 6150 | 120 | 19 | 0.010 | 0.005 |
| 1.0 | 26 | 7380 | 190 | 23 | 0.013 | 0.009 | 6990 | 160 | 22 | 0.011 | 0.007 | 6150 | 120 | 19 | 0.010 | 0.005 |
| 1.0 | 30 | 7380 | 190 | 23 | 0.013 | 0.009 | 6990 | 160 | 22 | 0.011 | 0.007 | 6150 | 120 | 19 | 0.010 | 0.005 |
| 1.0 | 40 | 2460 | 50 | 8 | 0.010 | 0.009 | 2330 | 45 | 7 | 0.010 | 0.007 | 2050 | 35 | 6 | 0.009 | 0.005 |
| 1.0 | 50 | 2460 | 50 | 8 | 0.010 | 0.006 | 2330 | 45 | 7 | 0.010 | 0.005 | 2050 | 35 | 6 | 0.009 | 0.003 |
| 1.2 | 4 | 21900 | 930 | 83 | 0.021 | 0.076 | 20700 | 720 | 78 | 0.017 | 0.059 | 18200 | 485 | 69 | 0.013 | 0.042 |
| 1.2 | 6 | 21900 | 930 | 83 | 0.021 | 0.076 | 20700 | 720 | 78 | 0.017 | 0.059 | 18200 | 485 | 69 | 0.013 | 0.042 |
| 1.2 | 8 | 19710 | 755 | 74 | 0.019 | 0.043 | 18630 | 585 | 70 | 0.016 | 0.034 | 16380 | 395 | 62 | 0.012 | 0.024 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK

### SEM845 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 1.2 | 10 | 19710 | 755 | 74 | 0.019 | 0.027 | 18630 | 585 | 70 | 0.016 | 0.021 | 16380 | 395 | 62 | 0.012 | 0.015 |
| 1.2 | 12 | 19710 | 755 | 74 | 0.019 | 0.027 | 18630 | 585 | 70 | 0.016 | 0.021 | 16380 | 395 | 62 | 0.012 | 0.015 |
| 1.2 | 14 | 17520 | 595 | 66 | 0.017 | 0.027 | 16560 | 460 | 62 | 0.014 | 0.021 | 14560 | 310 | 55 | 0.011 | 0.015 |
| 1.2 | 16 | 17520 | 595 | 66 | 0.017 | 0.016 | 16560 | 460 | 62 | 0.014 | 0.013 | 14560 | 310 | 55 | 0.011 | 0.009 |
| 1.2 | 20 | 13140 | 390 | 50 | 0.015 | 0.011 | 12420 | 300 | 47 | 0.012 | 0.008 | 10920 | 205 | 41 | 0.009 | 0.006 |
| 1.2 | 26 | 6570 | 165 | 25 | 0.013 | 0.011 | 6210 | 130 | 23 | 0.010 | 0.008 | 5460 | 85 | 21 | 0.008 | 0.006 |
| 1.2 | 30 | 6570 | 165 | 25 | 0.013 | 0.011 | 6210 | 130 | 23 | 0.010 | 0.008 | 5460 | 85 | 21 | 0.008 | 0.006 |
| 1.4 | 6 | 19200 | 815 | 84 | 0.021 | 0.088 | 18100 | 570 | 80 | 0.016 | 0.069 | 16000 | 425 | 70 | 0.013 | 0.049 |
| 1.4 | 8 | 17280 | 660 | 76 | 0.019 | 0.050 | 16290 | 460 | 72 | 0.014 | 0.039 | 14400 | 345 | 63 | 0.012 | 0.028 |
| 1.4 | 10 | 17280 | 660 | 76 | 0.019 | 0.050 | 16290 | 460 | 72 | 0.014 | 0.039 | 14400 | 345 | 63 | 0.012 | 0.028 |
| 1.4 | 14 | 17280 | 660 | 76 | 0.019 | 0.032 | 16290 | 460 | 72 | 0.014 | 0.025 | 14400 | 345 | 63 | 0.012 | 0.018 |
| 1.4 | 16 | 15360 | 520 | 68 | 0.017 | 0.032 | 14480 | 365 | 64 | 0.013 | 0.025 | 12800 | 270 | 56 | 0.011 | 0.018 |
| 1.4 | 20 | 15360 | 520 | 68 | 0.017 | 0.019 | 14480 | 365 | 64 | 0.013 | 0.015 | 12800 | 270 | 56 | 0.011 | 0.011 |
| 1.5 | 4 | 19200 | 905 | 90 | 0.024 | 0.135 | 18100 | 635 | 85 | 0.018 | 0.105 | 16000 | 475 | 75 | 0.015 | 0.075 |
| 1.5 | 5 | 19200 | 905 | 90 | 0.024 | 0.095 | 18100 | 635 | 85 | 0.018 | 0.074 | 16000 | 475 | 75 | 0.015 | 0.053 |
| 1.5 | 6 | 19200 | 905 | 90 | 0.024 | 0.095 | 18100 | 635 | 85 | 0.018 | 0.074 | 16000 | 475 | 75 | 0.015 | 0.053 |
| 1.5 | 7 | 19200 | 905 | 90 | 0.024 | 0.095 | 18100 | 635 | 85 | 0.018 | 0.074 | 16000 | 475 | 75 | 0.015 | 0.053 |
| 1.5 | 8 | 17280 | 735 | 81 | 0.021 | 0.054 | 16290 | 515 | 77 | 0.016 | 0.042 | 14400 | 385 | 68 | 0.013 | 0.030 |
| 1.5 | 10 | 17280 | 735 | 81 | 0.021 | 0.054 | 16290 | 515 | 77 | 0.016 | 0.042 | 14400 | 385 | 68 | 0.013 | 0.030 |
| 1.5 | 12 | 17280 | 735 | 81 | 0.021 | 0.054 | 16290 | 515 | 77 | 0.016 | 0.042 | 14400 | 385 | 68 | 0.013 | 0.030 |
| 1.5 | 14 | 17280 | 735 | 81 | 0.021 | 0.034 | 16290 | 515 | 77 | 0.016 | 0.026 | 14400 | 385 | 68 | 0.013 | 0.019 |
| 1.5 | 16 | 15360 | 580 | 72 | 0.019 | 0.034 | 14480 | 405 | 68 | 0.014 | 0.026 | 12800 | 305 | 60 | 0.012 | 0.019 |
| 1.5 | 18 | 15360 | 580 | 72 | 0.019 | 0.034 | 14480 | 405 | 68 | 0.014 | 0.026 | 12800 | 305 | 60 | 0.012 | 0.019 |
| 1.5 | 20 | 15360 | 580 | 72 | 0.019 | 0.020 | 14480 | 405 | 68 | 0.014 | 0.016 | 12800 | 305 | 60 | 0.012 | 0.011 |
| 1.5 | 22 | 15360 | 580 | 72 | 0.019 | 0.020 | 14480 | 405 | 68 | 0.014 | 0.016 | 12800 | 305 | 60 | 0.012 | 0.011 |
| 1.5 | 26 | 11520 | 380 | 54 | 0.016 | 0.014 | 10860 | 265 | 51 | 0.012 | 0.011 | 9600 | 200 | 45 | 0.010 | 0.008 |
| 1.5 | 30 | 11520 | 380 | 54 | 0.016 | 0.014 | 10860 | 265 | 51 | 0.012 | 0.011 | 9600 | 200 | 45 | 0.010 | 0.008 |
| 1.6 | 8 | 17800 | 840 | 89 | 0.024 | 0.101 | 16800 | 655 | 84 | 0.019 | 0.078 | 14800 | 490 | 74 | 0.017 | 0.056 |
| 1.6 | 10 | 16020 | 680 | 81 | 0.021 | 0.058 | 15120 | 530 | 76 | 0.018 | 0.045 | 13320 | 395 | 67 | 0.015 | 0.032 |
| 1.6 | 12 | 16020 | 680 | 81 | 0.021 | 0.058 | 15120 | 530 | 76 | 0.018 | 0.045 | 13320 | 395 | 67 | 0.015 | 0.032 |
| 1.6 | 16 | 16020 | 680 | 81 | 0.021 | 0.036 | 15120 | 530 | 76 | 0.018 | 0.028 | 13320 | 395 | 67 | 0.015 | 0.020 |
| 1.6 | 20 | 14240 | 540 | 72 | 0.019 | 0.036 | 13440 | 420 | 68 | 0.016 | 0.028 | 11840 | 315 | 60 | 0.013 | 0.020 |
| 1.8 | 8 | 17800 | 840 | 101 | 0.024 | 0.113 | 16800 | 655 | 95 | 0.019 | 0.088 | 14800 | 490 | 84 | 0.017 | 0.063 |
| 1.8 | 10 | 16020 | 680 | 91 | 0.021 | 0.065 | 15120 | 530 | 86 | 0.018 | 0.050 | 13320 | 395 | 75 | 0.015 | 0.036 |
| 1.8 | 12 | 16020 | 680 | 91 | 0.021 | 0.065 | 15120 | 530 | 86 | 0.018 | 0.050 | 13320 | 395 | 75 | 0.015 | 0.036 |
| 1.8 | 16 | 16020 | 680 | 91 | 0.021 | 0.041 | 15120 | 530 | 86 | 0.018 | 0.032 | 13320 | 395 | 75 | 0.015 | 0.023 |
| 1.8 | 20 | 14240 | 540 | 81 | 0.019 | 0.041 | 13440 | 420 | 76 | 0.016 | 0.032 | 11840 | 315 | 67 | 0.013 | 0.023 |
| 2.0 | 6 | 14400 | 820 | 90 | 0.028 | 0.180 | 13600 | 620 | 85 | 0.023 | 0.140 | 12000 | 475 | 75 | 0.020 | 0.100 |
| 2.0 | 8 | 14400 | 820 | 90 | 0.028 | 0.126 | 13600 | 620 | 85 | 0.023 | 0.098 | 12000 | 475 | 75 | 0.020 | 0.070 |
| 2.0 | 10 | 14400 | 820 | 90 | 0.028 | 0.126 | 13600 | 620 | 85 | 0.023 | 0.098 | 12000 | 475 | 75 | 0.020 | 0.070 |
| 2.0 | 12 | 12960 | 665 | 81 | 0.026 | 0.072 | 12240 | 500 | 77 | 0.020 | 0.056 | 10800 | 385 | 68 | 0.018 | 0.040 |
| 2.0 | 14 | 12960 | 665 | 81 | 0.026 | 0.072 | 12240 | 500 | 77 | 0.020 | 0.056 | 10800 | 385 | 68 | 0.018 | 0.040 |
| 2.0 | 16 | 12960 | 665 | 81 | 0.026 | 0.072 | 12240 | 500 | 77 | 0.020 | 0.056 | 10800 | 385 | 68 | 0.018 | 0.040 |
| 2.0 | 18 | 12960 | 665 | 81 | 0.026 | 0.045 | 12240 | 500 | 77 | 0.020 | 0.035 | 10800 | 385 | 68 | 0.018 | 0.025 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK

### SEM845 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 2.0 | 20 | 12960 | 665 | 81 | 0.026 | 0.045 | 12240 | 500 | 77 | 0.020 | 0.035 | 10800 | 385 | 68 | 0.018 | 0.025 |
| 2.0 | 22 | 11520 | 525 | 72 | 0.023 | 0.045 | 10880 | 395 | 68 | 0.018 | 0.035 | 9600 | 305 | 60 | 0.016 | 0.025 |
| 2.0 | 26 | 11520 | 525 | 72 | 0.023 | 0.045 | 10880 | 395 | 68 | 0.018 | 0.035 | 9600 | 305 | 60 | 0.016 | 0.025 |
| 2.0 | 30 | 11520 | 525 | 72 | 0.023 | 0.027 | 10880 | 395 | 68 | 0.018 | 0.021 | 9600 | 305 | 60 | 0.016 | 0.015 |
| 2.0 | 35 | 8640 | 345 | 54 | 0.020 | 0.018 | 8160 | 260 | 51 | 0.016 | 0.014 | 7200 | 200 | 45 | 0.014 | 0.010 |
| 2.0 | 40 | 8640 | 345 | 54 | 0.020 | 0.018 | 8160 | 260 | 51 | 0.016 | 0.014 | 7200 | 200 | 45 | 0.014 | 0.010 |
| 2.0 | 45 | 4320 | 150 | 27 | 0.017 | 0.018 | 4080 | 110 | 26 | 0.013 | 0.014 | 3600 | 85 | 23 | 0.012 | 0.010 |
| 2.0 | 50 | 4320 | 150 | 27 | 0.017 | 0.018 | 4080 | 110 | 26 | 0.013 | 0.014 | 3600 | 85 | 23 | 0.012 | 0.010 |
| 2.0 | 60 | 4320 | 150 | 27 | 0.017 | 0.018 | 4080 | 110 | 26 | 0.013 | 0.014 | 3600 | 85 | 23 | 0.012 | 0.010 |
| 2.5 | 8 | 12300 | 970 | 97 | 0.039 | 0.158 | 11600 | 680 | 91 | 0.029 | 0.123 | 10300 | 510 | 81 | 0.025 | 0.088 |
| 2.5 | 10 | 12300 | 970 | 97 | 0.039 | 0.158 | 11600 | 680 | 91 | 0.029 | 0.123 | 10300 | 510 | 81 | 0.025 | 0.088 |
| 2.5 | 12 | 12300 | 970 | 97 | 0.039 | 0.158 | 11600 | 680 | 91 | 0.029 | 0.123 | 10300 | 510 | 81 | 0.025 | 0.088 |
| 2.5 | 14 | 11070 | 785 | 87 | 0.035 | 0.090 | 10440 | 550 | 82 | 0.026 | 0.070 | 9270 | 415 | 73 | 0.022 | 0.050 |
| 2.5 | 16 | 11070 | 785 | 87 | 0.035 | 0.090 | 10440 | 550 | 82 | 0.026 | 0.070 | 9270 | 415 | 73 | 0.022 | 0.050 |
| 2.5 | 18 | 11070 | 785 | 87 | 0.035 | 0.090 | 10440 | 550 | 82 | 0.026 | 0.070 | 9270 | 415 | 73 | 0.022 | 0.050 |
| 2.5 | 20 | 11070 | 785 | 87 | 0.035 | 0.090 | 10440 | 550 | 82 | 0.026 | 0.070 | 9270 | 415 | 73 | 0.022 | 0.050 |
| 2.5 | 22 | 11070 | 785 | 87 | 0.035 | 0.056 | 10440 | 550 | 82 | 0.026 | 0.044 | 9270 | 415 | 73 | 0.022 | 0.031 |
| 2.5 | 26 | 9840 | 620 | 77 | 0.032 | 0.056 | 9280 | 435 | 73 | 0.023 | 0.044 | 8240 | 325 | 65 | 0.020 | 0.031 |
| 2.5 | 30 | 9840 | 620 | 77 | 0.032 | 0.056 | 9280 | 435 | 73 | 0.023 | 0.044 | 8240 | 325 | 65 | 0.020 | 0.031 |
| 2.5 | 35 | 9840 | 620 | 77 | 0.032 | 0.034 | 9280 | 435 | 73 | 0.023 | 0.026 | 8240 | 325 | 65 | 0.020 | 0.019 |
| 2.5 | 40 | 7380 | 405 | 58 | 0.027 | 0.034 | 6960 | 285 | 55 | 0.020 | 0.026 | 6180 | 215 | 49 | 0.017 | 0.019 |
| 2.5 | 45 | 7380 | 405 | 58 | 0.027 | 0.023 | 6960 | 285 | 55 | 0.020 | 0.018 | 6180 | 215 | 49 | 0.017 | 0.013 |
| 2.5 | 50 | 7380 | 405 | 58 | 0.027 | 0.023 | 6960 | 285 | 55 | 0.020 | 0.018 | 6180 | 215 | 49 | 0.017 | 0.013 |
| 3.0 | 6 | 10900 | 860 | 103 | 0.039 | 0.270 | 10300 | 605 | 97 | 0.029 | 0.210 | 6600 | 450 | 62 | 0.034 | 0.150 |
| 3.0 | 8 | 10900 | 860 | 103 | 0.039 | 0.270 | 10300 | 605 | 97 | 0.029 | 0.210 | 6600 | 450 | 62 | 0.034 | 0.150 |
| 3.0 | 10 | 10900 | 860 | 103 | 0.039 | 0.189 | 10300 | 605 | 97 | 0.029 | 0.147 | 6600 | 450 | 62 | 0.034 | 0.105 |
| 3.0 | 12 | 10900 | 860 | 103 | 0.039 | 0.189 | 10300 | 605 | 97 | 0.029 | 0.147 | 6600 | 450 | 62 | 0.034 | 0.105 |
| 3.0 | 14 | 10900 | 860 | 103 | 0.039 | 0.189 | 10300 | 605 | 97 | 0.029 | 0.147 | 6600 | 450 | 62 | 0.034 | 0.105 |
| 3.0 | 16 | 9810 | 695 | 92 | 0.035 | 0.108 | 9270 | 490 | 87 | 0.026 | 0.084 | 5940 | 365 | 56 | 0.031 | 0.060 |
| 3.0 | 18 | 9810 | 695 | 92 | 0.035 | 0.108 | 9270 | 490 | 87 | 0.026 | 0.084 | 5940 | 365 | 56 | 0.031 | 0.060 |
| 3.0 | 20 | 9810 | 695 | 92 | 0.035 | 0.108 | 9270 | 490 | 87 | 0.026 | 0.084 | 5940 | 365 | 56 | 0.031 | 0.060 |
| 3.0 | 22 | 9810 | 695 | 92 | 0.035 | 0.108 | 9270 | 490 | 87 | 0.026 | 0.084 | 5940 | 365 | 56 | 0.031 | 0.060 |
| 3.0 | 26 | 9810 | 695 | 92 | 0.035 | 0.068 | 9270 | 490 | 87 | 0.026 | 0.053 | 5940 | 365 | 56 | 0.031 | 0.038 |
| 3.0 | 30 | 9810 | 695 | 92 | 0.035 | 0.068 | 9270 | 490 | 87 | 0.026 | 0.053 | 5940 | 365 | 56 | 0.031 | 0.038 |
| 3.0 | 35 | 8720 | 550 | 82 | 0.032 | 0.068 | 8240 | 385 | 78 | 0.023 | 0.053 | 5280 | 290 | 50 | 0.027 | 0.038 |
| 3.0 | 40 | 8720 | 550 | 82 | 0.032 | 0.041 | 8240 | 385 | 78 | 0.023 | 0.032 | 5280 | 290 | 50 | 0.027 | 0.023 |
| 3.0 | 45 | 8720 | 550 | 82 | 0.032 | 0.041 | 8240 | 385 | 78 | 0.023 | 0.032 | 5280 | 290 | 50 | 0.027 | 0.023 |
| 3.0 | 50 | 6540 | 360 | 62 | 0.028 | 0.027 | 6180 | 255 | 58 | 0.021 | 0.021 | 3960 | 190 | 37 | 0.024 | 0.015 |
| 3.0 | 60 | 6540 | 360 | 62 | 0.028 | 0.027 | 6180 | 255 | 58 | 0.021 | 0.021 | 3960 | 190 | 37 | 0.024 | 0.015 |
| 4.0 | 8 | 8000 | 1300 | 101 | 0.081 | 0.360 | 7600 | 1160 | 96 | 0.076 | 0.280 | 6700 | 770 | 84 | 0.057 | 0.200 |
| 4.0 | 10 | 8000 | 1300 | 101 | 0.081 | 0.360 | 7600 | 1160 | 96 | 0.076 | 0.280 | 6700 | 770 | 84 | 0.057 | 0.200 |
| 4.0 | 12 | 8000 | 1300 | 101 | 0.081 | 0.360 | 7600 | 1160 | 96 | 0.076 | 0.280 | 6700 | 770 | 84 | 0.057 | 0.200 |
| 4.0 | 14 | 8000 | 1300 | 101 | 0.081 | 0.252 | 7600 | 1160 | 96 | 0.076 | 0.196 | 6700 | 770 | 84 | 0.057 | 0.140 |
| 4.0 | 16 | 8000 | 1300 | 101 | 0.081 | 0.252 | 7600 | 1160 | 96 | 0.076 | 0.196 | 6700 | 770 | 84 | 0.057 | 0.140 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

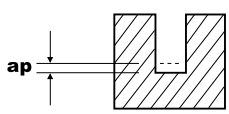
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE LONG NECK

### SEM845 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 4.0 | 18 | 8000 | 1300 | 101 | 0.081 | 0.252 | 7600 | 1160 | 96 | 0.076 | 0.196 | 6700 | 770 | 84 | 0.057 | 0.140 |
| 4.0 | 20 | 8000 | 1300 | 101 | 0.081 | 0.252 | 7600 | 1160 | 96 | 0.076 | 0.196 | 6700 | 770 | 84 | 0.057 | 0.140 |
| 4.0 | 22 | 7200 | 1055 | 90 | 0.073 | 0.144 | 6840 | 940 | 86 | 0.069 | 0.112 | 6030 | 625 | 76 | 0.052 | 0.080 |
| 4.0 | 26 | 7200 | 1055 | 90 | 0.073 | 0.144 | 6840 | 940 | 86 | 0.069 | 0.112 | 6030 | 625 | 76 | 0.052 | 0.080 |
| 4.0 | 30 | 7200 | 1055 | 90 | 0.073 | 0.144 | 6840 | 940 | 86 | 0.069 | 0.112 | 6030 | 625 | 76 | 0.052 | 0.080 |
| 4.0 | 35 | 7200 | 1055 | 90 | 0.073 | 0.090 | 6840 | 940 | 86 | 0.069 | 0.070 | 6030 | 625 | 76 | 0.052 | 0.050 |
| 4.0 | 40 | 7200 | 1055 | 90 | 0.073 | 0.090 | 6840 | 940 | 86 | 0.069 | 0.070 | 6030 | 625 | 76 | 0.052 | 0.050 |
| 4.0 | 45 | 6400 | 830 | 80 | 0.065 | 0.090 | 6080 | 740 | 76 | 0.061 | 0.070 | 5360 | 495 | 67 | 0.046 | 0.050 |
| 4.0 | 50 | 6400 | 830 | 80 | 0.065 | 0.090 | 6080 | 740 | 76 | 0.061 | 0.070 | 5360 | 495 | 67 | 0.046 | 0.050 |
| 4.0 | 60 | 6400 | 830 | 80 | 0.065 | 0.054 | 6080 | 740 | 76 | 0.061 | 0.042 | 5360 | 495 | 67 | 0.046 | 0.030 |
| 5.0 | 16 | 6400 | 1155 | 101 | 0.090 | 0.315 | 6100 | 900 | 96 | 0.074 | 0.245 | 5400 | 605 | 85 | 0.056 | 0.175 |
| 5.0 | 20 | 6400 | 1155 | 101 | 0.090 | 0.315 | 6100 | 900 | 96 | 0.074 | 0.245 | 5400 | 605 | 85 | 0.056 | 0.175 |
| 5.0 | 26 | 5760 | 935 | 90 | 0.081 | 0.180 | 5490 | 730 | 86 | 0.066 | 0.140 | 4860 | 490 | 76 | 0.050 | 0.100 |
| 5.0 | 30 | 5760 | 935 | 90 | 0.081 | 0.180 | 5490 | 730 | 86 | 0.066 | 0.140 | 4860 | 490 | 76 | 0.050 | 0.100 |
| 5.0 | 35 | 5760 | 935 | 90 | 0.081 | 0.180 | 5490 | 730 | 86 | 0.066 | 0.140 | 4860 | 490 | 76 | 0.050 | 0.100 |
| 5.0 | 40 | 5760 | 935 | 90 | 0.081 | 0.180 | 5490 | 730 | 86 | 0.066 | 0.140 | 4860 | 490 | 76 | 0.050 | 0.100 |
| 5.0 | 50 | 5760 | 935 | 90 | 0.081 | 0.113 | 5490 | 730 | 86 | 0.066 | 0.088 | 4860 | 490 | 76 | 0.050 | 0.063 |
| 5.0 | 60 | 5120 | 740 | 80 | 0.072 | 0.113 | 4880 | 575 | 77 | 0.059 | 0.088 | 4320 | 385 | 68 | 0.045 | 0.063 |
| 6.0 | 15 | 5300 | 1055 | 100 | 0.100 | 0.540 | 5000 | 820 | 94 | 0.082 | 0.420 | 4400 | 550 | 83 | 0.063 | 0.300 |
| 6.0 | 20 | 5300 | 1055 | 100 | 0.100 | 0.378 | 5000 | 820 | 94 | 0.082 | 0.294 | 4400 | 550 | 83 | 0.063 | 0.210 |
| 6.0 | 30 | 5300 | 1055 | 100 | 0.100 | 0.378 | 5000 | 820 | 94 | 0.082 | 0.294 | 4400 | 550 | 83 | 0.063 | 0.210 |
| 6.0 | 32 | 4770 | 855 | 90 | 0.090 | 0.216 | 4500 | 665 | 85 | 0.074 | 0.168 | 3960 | 445 | 75 | 0.056 | 0.120 |
| 8.0 | 25 | 4000 | 950 | 101 | 0.119 | 0.504 | 3800 | 750 | 96 | 0.099 | 0.392 | 3300 | 500 | 83 | 0.076 | 0.280 |
| 8.0 | 30 | 4000 | 950 | 101 | 0.119 | 0.504 | 3800 | 750 | 96 | 0.099 | 0.392 | 3300 | 500 | 83 | 0.076 | 0.280 |
| 8.0 | 42 | 3600 | 770 | 90 | 0.107 | 0.288 | 3400 | 605 | 85 | 0.089 | 0.224 | 2950 | 405 | 74 | 0.069 | 0.160 |
| 10.0 | 30 | 3200 | 900 | 101 | 0.141 | 0.900 | 3050 | 680 | 96 | 0.111 | 0.700 | 2630 | 400 | 83 | 0.076 | 0.500 |
| 10.0 | 35 | 3200 | 900 | 101 | 0.141 | 0.630 | 3050 | 680 | 96 | 0.111 | 0.490 | 2630 | 400 | 83 | 0.076 | 0.350 |
| 10.0 | 45 | 3200 | 900 | 101 | 0.141 | 0.630 | 3050 | 680 | 96 | 0.111 | 0.490 | 2630 | 400 | 83 | 0.076 | 0.350 |
| 12.0 | 35 | 2650 | 800 | 100 | 0.151 | 1.080 | 2520 | 600 | 95 | 0.119 | 0.840 | 2180 | 350 | 82 | 0.080 | 0.600 |
| 12.0 | 40 | 2650 | 800 | 100 | 0.151 | 0.756 | 2520 | 600 | 95 | 0.119 | 0.588 | 2180 | 350 | 82 | 0.080 | 0.420 |
| 12.0 | 50 | 2650 | 800 | 100 | 0.151 | 0.756 | 2520 | 600 | 95 | 0.119 | 0.588 | 2180 | 350 | 82 | 0.080 | 0.420 |

(Depth of Cut per one pass)




DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

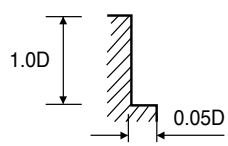
# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE

## SEME36, SEME71 SERIES

| MATERIAL | P | | | | | | | | | | | | M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | | STAINLESS STEELS | | | |
| HARDNESS | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | | | | | |
| STRENGTH | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | | | | | |
| DIA. | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 0.8 | 31250 | 235 | 79 | 0.002 | 18750 | 140 | 47 | 0.002 | 12500 | 42 | 31 | 0.001 | 15630 | 120 | 39 | 0.002 |
| 0.9 | 29300 | 245 | 83 | 0.002 | 17580 | 145 | 50 | 0.002 | 11720 | 42 | 33 | 0.001 | 14650 | 120 | 41 | 0.002 |
| 1.0 | 26800 | 250 | 84 | 0.002 | 16080 | 150 | 51 | 0.002 | 10720 | 47 | 34 | 0.001 | 13400 | 125 | 42 | 0.002 |
| 1.2 | 22500 | 265 | 85 | 0.003 | 13500 | 160 | 51 | 0.003 | 9000 | 47 | 34 | 0.001 | 11250 | 130 | 42 | 0.003 |
| 1.5 | 18750 | 270 | 88 | 0.004 | 11250 | 165 | 53 | 0.004 | 7500 | 47 | 35 | 0.002 | 9380 | 135 | 44 | 0.004 |
| 2.0 | 14450 | 295 | 91 | 0.005 | 9450 | 180 | 59 | 0.005 | 6300 | 53 | 40 | 0.002 | 7880 | 145 | 50 | 0.005 |
| 2.5 | 12800 | 315 | 101 | 0.006 | 8200 | 195 | 64 | 0.006 | 5250 | 58 | 41 | 0.003 | 6830 | 165 | 54 | 0.006 |
| 3.0 | 11150 | 335 | 105 | 0.008 | 6950 | 210 | 66 | 0.008 | 4200 | 63 | 40 | 0.004 | 5780 | 180 | 54 | 0.008 |
| 3.5 | 10300 | 465 | 113 | 0.011 | 6360 | 290 | 70 | 0.011 | 3940 | 63 | 43 | 0.004 | 5310 | 235 | 58 | 0.011 |
| 4.0 | 9450 | 600 | 119 | 0.016 | 5780 | 370 | 73 | 0.016 | 3680 | 63 | 46 | 0.004 | 4850 | 295 | 61 | 0.015 |
| 4.5 | 8660 | 615 | 122 | 0.018 | 5250 | 375 | 74 | 0.018 | 3290 | 70 | 47 | 0.005 | 4400 | 305 | 62 | 0.017 |
| 5.0 | 7880 | 630 | 124 | 0.020 | 4730 | 380 | 74 | 0.020 | 2900 | 75 | 46 | 0.006 | 3950 | 315 | 62 | 0.020 |
| 5.5 | 7410 | 660 | 128 | 0.022 | 4460 | 405 | 77 | 0.023 | 2700 | 80 | 47 | 0.007 | 3750 | 330 | 65 | 0.022 |
| 6.0 | 6950 | 695 | 131 | 0.025 | 4200 | 430 | 79 | 0.026 | 2500 | 85 | 47 | 0.009 | 3550 | 345 | 67 | 0.024 |
| 6.5 | 6530 | 710 | 133 | 0.027 | 3940 | 425 | 80 | 0.027 | 2400 | 95 | 49 | 0.010 | 3320 | 350 | 68 | 0.026 |
| 7.0 | 6100 | 720 | 134 | 0.030 | 3680 | 415 | 81 | 0.028 | 2300 | 100 | 51 | 0.011 | 3090 | 355 | 68 | 0.029 |
| 7.5 | 5680 | 735 | 134 | 0.032 | 3410 | 410 | 80 | 0.030 | 2200 | 110 | 52 | 0.013 | 2860 | 360 | 67 | 0.031 |
| 8.0 | 5250 | 745 | 132 | 0.035 | 3150 | 400 | 79 | 0.032 | 2100 | 115 | 53 | 0.014 | 2630 | 370 | 66 | 0.035 |
| 8.5 | 4960 | 720 | 132 | 0.036 | 2990 | 380 | 80 | 0.032 | 2000 | 110 | 53 | 0.014 | 2490 | 355 | 66 | 0.036 |
| 9.0 | 4660 | 695 | 132 | 0.037 | 2830 | 355 | 80 | 0.031 | 1900 | 105 | 54 | 0.014 | 2360 | 340 | 67 | 0.036 |
| 9.5 | 4370 | 665 | 130 | 0.038 | 2660 | 335 | 79 | 0.031 | 1800 | 100 | 54 | 0.014 | 2230 | 330 | 67 | 0.037 |
| 10.0 | 4080 | 640 | 128 | 0.039 | 2500 | 315 | 79 | 0.032 | 1700 | 95 | 53 | 0.014 | 2100 | 315 | 66 | 0.038 |
| 10.5 | 3910 | 620 | 129 | 0.040 | 2400 | 305 | 79 | 0.032 | 1640 | 95 | 54 | 0.014 | 2000 | 300 | 66 | 0.038 |
| 11.0 | 3750 | 595 | 130 | 0.040 | 2300 | 290 | 79 | 0.032 | 1580 | 90 | 55 | 0.014 | 1900 | 285 | 66 | 0.038 |
| 11.5 | 3590 | 570 | 130 | 0.040 | 2200 | 280 | 79 | 0.032 | 1510 | 90 | 55 | 0.015 | 1800 | 270 | 65 | 0.038 |
| 12.0 | 3430 | 545 | 129 | 0.040 | 2100 | 265 | 79 | 0.032 | 1450 | 85 | 55 | 0.015 | 1700 | 250 | 64 | 0.037 |
| 13.0 | 3260 | 520 | 133 | 0.040 | 2000 | 250 | 82 | 0.031 | 1370 | 80 | 56 | 0.015 | 1620 | 240 | 66 | 0.037 |
| 14.0 | 3090 | 490 | 136 | 0.040 | 1900 | 235 | 84 | 0.031 | 1290 | 75 | 57 | 0.015 | 1540 | 230 | 68 | 0.037 |
| 15.0 | 2920 | 460 | 138 | 0.039 | 1800 | 225 | 85 | 0.031 | 1210 | 70 | 57 | 0.014 | 1460 | 220 | 69 | 0.038 |
| 16.0 | 2750 | 440 | 138 | 0.040 | 1700 | 215 | 85 | 0.032 | 1130 | 65 | 57 | 0.014 | 1380 | 210 | 69 | 0.038 |
| 17.0 | 2590 | 410 | 138 | 0.040 | 1610 | 200 | 86 | 0.031 | 1060 | 60 | 57 | 0.014 | 1290 | 200 | 69 | 0.039 |
| 18.0 | 2430 | 385 | 137 | 0.040 | 1510 | 190 | 85 | 0.031 | 990 | 55 | 56 | 0.014 | 1210 | 185 | 68 | 0.038 |
| 19.0 | 2260 | 360 | 135 | 0.040 | 1420 | 180 | 85 | 0.032 | 920 | 47 | 55 | 0.013 | 1130 | 175 | 67 | 0.039 |
| 20.0 | 2100 | 335 | 132 | 0.040 | 1330 | 170 | 84 | 0.032 | 850 | 42 | 53 | 0.012 | 1050 | 160 | 66 | 0.038 |
| 21.0 | 2020 | 320 | 133 | 0.040 | 1270 | 165 | 84 | 0.032 | 820 | 42 | 54 | 0.013 | 1010 | 150 | 67 | 0.037 |
| 22.0 | 1940 | 310 | 134 | 0.040 | 1220 | 160 | 84 | 0.033 | 780 | 39 | 54 | 0.013 | 970 | 145 | 67 | 0.037 |
| 23.0 | 1860 | 295 | 134 | 0.040 | 1160 | 145 | 84 | 0.031 | 750 | 37 | 54 | 0.012 | 930 | 140 | 67 | 0.038 |
| 24.0 | 1780 | 280 | 134 | 0.039 | 1110 | 140 | 84 | 0.032 | 710 | 32 | 54 | 0.011 | 890 | 130 | 67 | 0.037 |
| 25.0 | 1700 | 265 | 134 | 0.039 | 1050 | 135 | 82 | 0.032 | 680 | 32 | 53 | 0.012 | 850 | 125 | 67 | 0.037 |




RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG LENGTH

### SEME72 SERIES

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 1.0 | 3 | 19200 | 180 | 60 | 0.002 | 10940 | 70 | 34 | 0.002 | 6720 | 35 | 21 | 0.001 |
| 1.0 | 4 | 19200 | 180 | 60 | 0.002 | 10940 | 70 | 34 | 0.002 | 6720 | 35 | 21 | 0.001 |
| 1.0 | 5 | 19200 | 180 | 60 | 0.002 | 10940 | 70 | 34 | 0.002 | 6720 | 35 | 21 | 0.001 |
| 1.0 | 6 | 17280 | 145 | 54 | 0.002 | 9850 | 60 | 31 | 0.002 | 6050 | 30 | 19 | 0.001 |
| 1.0 | 7 | 17280 | 145 | 54 | 0.002 | 9850 | 60 | 31 | 0.002 | 6050 | 30 | 19 | 0.001 |
| 1.0 | 8 | 17280 | 130 | 54 | 0.002 | 9850 | 50 | 31 | 0.001 | 6050 | 25 | 19 | 0.001 |
| 1.0 | 10 | 17280 | 130 | 54 | 0.002 | 9850 | 50 | 31 | 0.001 | 6050 | 25 | 19 | 0.001 |
| 1.0 | 12 | 15360 | 100 | 48 | 0.002 | 8760 | 40 | 28 | 0.001 | 5380 | 20 | 17 | 0.001 |
| 1.2 | 4 | 16200 | 205 | 61 | 0.003 | 9230 | 80 | 35 | 0.002 | 5670 | 40 | 21 | 0.002 |
| 1.2 | 6 | 16200 | 205 | 61 | 0.003 | 9230 | 80 | 35 | 0.002 | 5670 | 40 | 21 | 0.002 |
| 1.2 | 8 | 14580 | 165 | 55 | 0.003 | 8310 | 65 | 31 | 0.002 | 5100 | 35 | 19 | 0.002 |
| 1.2 | 10 | 14580 | 145 | 55 | 0.002 | 8310 | 60 | 31 | 0.002 | 5100 | 30 | 19 | 0.001 |
| 1.2 | 12 | 14580 | 145 | 55 | 0.002 | 8310 | 60 | 31 | 0.002 | 5100 | 30 | 19 | 0.001 |
| 1.5 | 6 | 13800 | 215 | 65 | 0.004 | 7870 | 85 | 37 | 0.003 | 4830 | 45 | 23 | 0.002 |
| 1.5 | 8 | 12420 | 195 | 59 | 0.004 | 7080 | 80 | 33 | 0.003 | 4350 | 40 | 20 | 0.002 |
| 1.5 | 10 | 12420 | 175 | 59 | 0.004 | 7080 | 70 | 33 | 0.002 | 4350 | 35 | 20 | 0.002 |
| 1.5 | 12 | 12420 | 155 | 59 | 0.003 | 7080 | 60 | 33 | 0.002 | 4350 | 30 | 20 | 0.002 |
| 1.5 | 14 | 12420 | 155 | 59 | 0.003 | 7080 | 60 | 33 | 0.002 | 4350 | 30 | 20 | 0.002 |
| 1.5 | 16 | 11040 | 120 | 52 | 0.003 | 6290 | 50 | 30 | 0.002 | 3860 | 25 | 18 | 0.002 |
| 2.0 | 8 | 10580 | 240 | 66 | 0.006 | 6050 | 95 | 38 | 0.004 | 3780 | 55 | 24 | 0.004 |
| 2.0 | 10 | 10580 | 240 | 66 | 0.006 | 6050 | 95 | 38 | 0.004 | 3780 | 55 | 24 | 0.004 |
| 2.0 | 12 | 9530 | 195 | 60 | 0.005 | 5440 | 80 | 34 | 0.004 | 3400 | 45 | 21 | 0.003 |
| 2.0 | 14 | 9530 | 195 | 60 | 0.005 | 5440 | 80 | 34 | 0.004 | 3400 | 45 | 21 | 0.003 |
| 2.0 | 16 | 9530 | 175 | 60 | 0.005 | 5440 | 70 | 34 | 0.003 | 3400 | 40 | 21 | 0.003 |
| 2.5 | 10 | 8990 | 260 | 71 | 0.007 | 5170 | 110 | 41 | 0.005 | 3210 | 60 | 25 | 0.005 |
| 2.5 | 12 | 8990 | 260 | 71 | 0.007 | 5170 | 110 | 41 | 0.005 | 3210 | 60 | 25 | 0.005 |
| 2.5 | 16 | 8090 | 210 | 64 | 0.006 | 4650 | 85 | 37 | 0.005 | 2890 | 50 | 23 | 0.004 |
| 2.5 | 20 | 8090 | 185 | 64 | 0.006 | 4650 | 80 | 37 | 0.004 | 2890 | 45 | 23 | 0.004 |
| 2.5 | 26 | 7200 | 145 | 57 | 0.005 | 4130 | 60 | 32 | 0.004 | 2570 | 35 | 20 | 0.003 |
| 3.0 | 10 | 7400 | 275 | 70 | 0.009 | 4280 | 120 | 40 | 0.007 | 2640 | 65 | 25 | 0.006 |
| 3.0 | 12 | 7400 | 275 | 70 | 0.009 | 4280 | 120 | 40 | 0.007 | 2640 | 65 | 25 | 0.006 |
| 3.0 | 14 | 7400 | 275 | 70 | 0.009 | 4280 | 120 | 40 | 0.007 | 2640 | 65 | 25 | 0.006 |
| 3.0 | 16 | 6660 | 250 | 63 | 0.009 | 3860 | 110 | 36 | 0.007 | 2380 | 60 | 22 | 0.006 |
| 3.0 | 20 | 6660 | 225 | 63 | 0.008 | 3860 | 95 | 36 | 0.006 | 2380 | 55 | 22 | 0.006 |
| 3.0 | 26 | 6660 | 200 | 63 | 0.008 | 3860 | 85 | 36 | 0.006 | 2380 | 50 | 22 | 0.005 |
| 3.0 | 30 | 6660 | 200 | 63 | 0.008 | 3860 | 85 | 36 | 0.006 | 2380 | 50 | 22 | 0.005 |
| 4.0 | 12 | 6000 | 335 | 75 | 0.014 | 3410 | 140 | 43 | 0.010 | 2150 | 70 | 27 | 0.008 |
| 4.0 | 16 | 6000 | 335 | 75 | 0.014 | 3410 | 140 | 43 | 0.010 | 2150 | 70 | 27 | 0.008 |
| 4.0 | 20 | 6000 | 335 | 75 | 0.014 | 3410 | 140 | 43 | 0.010 | 2150 | 70 | 27 | 0.008 |
| 4.0 | 26 | 5400 | 270 | 68 | 0.013 | 3070 | 110 | 39 | 0.009 | 1930 | 60 | 24 | 0.008 |
| 4.0 | 30 | 5400 | 270 | 68 | 0.013 | 3070 | 110 | 39 | 0.009 | 1930 | 60 | 24 | 0.008 |
| 5.0 | 20 | 5120 | 430 | 80 | 0.021 | 2900 | 170 | 46 | 0.015 | 1900 | 85 | 30 | 0.011 |
| 5.0 | 25 | 5120 | 430 | 80 | 0.021 | 2900 | 170 | 46 | 0.015 | 1900 | 85 | 30 | 0.011 |
| 5.0 | 30 | 4610 | 350 | 72 | 0.019 | 2610 | 135 | 41 | 0.013 | 1710 | 70 | 27 | 0.010 |
| 5.0 | 35 | 4610 | 350 | 72 | 0.019 | 2610 | 135 | 41 | 0.013 | 1710 | 70 | 27 | 0.010 |
| 5.0 | 40 | 4610 | 310 | 72 | 0.017 | 2610 | 120 | 41 | 0.011 | 1710 | 60 | 27 | 0.009 |
| 6.0 | 15 | 4420 | 515 | 83 | 0.029 | 2520 | 215 | 48 | 0.021 | 1640 | 110 | 31 | 0.017 |
| 6.0 | 20 | 4420 | 515 | 83 | 0.029 | 2520 | 215 | 48 | 0.021 | 1640 | 110 | 31 | 0.017 |
| 6.0 | 25 | 4420 | 515 | 83 | 0.029 | 2520 | 215 | 48 | 0.021 | 1640 | 110 | 31 | 0.017 |
| 6.0 | 30 | 4420 | 440 | 83 | 0.025 | 2520 | 185 | 48 | 0.018 | 1640 | 90 | 31 | 0.014 |
| 6.0 | 35 | 3970 | 395 | 75 | 0.025 | 2270 | 165 | 43 | 0.018 | 1480 | 85 | 28 | 0.014 |
| 6.0 | 40 | 3970 | 350 | 75 | 0.022 | 2270 | 145 | 43 | 0.016 | 1480 | 75 | 28 | 0.013 |
| 6.0 | 45 | 3970 | 350 | 75 | 0.022 | 2270 | 145 | 43 | 0.016 | 1480 | 75 | 28 | 0.013 |
| 8.0 | 25 | 3360 | 550 | 84 | 0.041 | 1900 | 215 | 48 | 0.028 | 1260 | 110 | 32 | 0.022 |

DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

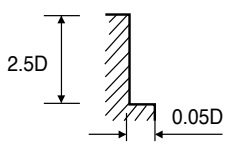
# 4G MILL END MILLS

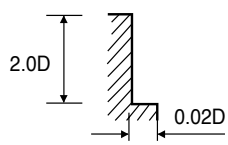
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG LENGTH

### SEME72 SERIES

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 8.0 | 30 | 3360 | 550 | 84 | 0.041 | 1900 | 215 | 48 | 0.028 | 1260 | 110 | 32 | 0.022 |
| 8.0 | 35 | 3360 | 550 | 84 | 0.041 | 1900 | 215 | 48 | 0.028 | 1260 | 110 | 32 | 0.022 |
| 8.0 | 40 | 3360 | 470 | 84 | 0.035 | 1900 | 185 | 48 | 0.024 | 1260 | 90 | 32 | 0.018 |
| 8.0 | 45 | 3020 | 420 | 76 | 0.035 | 1710 | 165 | 43 | 0.024 | 1130 | 85 | 28 | 0.019 |
| 8.0 | 50 | 3020 | 375 | 76 | 0.031 | 1710 | 145 | 43 | 0.021 | 1130 | 75 | 28 | 0.017 |
| 10.0 | 30 | 2820 | 550 | 89 | 0.049 | 1640 | 215 | 52 | 0.033 | 1010 | 110 | 32 | 0.027 |
| 10.0 | 35 | 2820 | 550 | 89 | 0.049 | 1640 | 215 | 52 | 0.033 | 1010 | 110 | 32 | 0.027 |
| 10.0 | 40 | 2820 | 550 | 89 | 0.049 | 1640 | 215 | 52 | 0.033 | 1010 | 110 | 32 | 0.027 |
| 10.0 | 45 | 2820 | 470 | 89 | 0.042 | 1640 | 185 | 52 | 0.028 | 1010 | 90 | 32 | 0.022 |
| 10.0 | 50 | 2820 | 470 | 89 | 0.042 | 1640 | 185 | 52 | 0.028 | 1010 | 90 | 32 | 0.022 |
| 10.0 | 55 | 2540 | 420 | 80 | 0.041 | 1480 | 165 | 46 | 0.028 | 910 | 85 | 29 | 0.023 |
| 10.0 | 60 | 2540 | 375 | 80 | 0.037 | 1480 | 145 | 46 | 0.024 | 910 | 75 | 29 | 0.021 |
| 12.0 | 35 | 2300 | 430 | 87 | 0.047 | 1390 | 190 | 52 | 0.034 | 840 | 85 | 32 | 0.025 |
| 12.0 | 40 | 2300 | 430 | 87 | 0.047 | 1390 | 190 | 52 | 0.034 | 840 | 85 | 32 | 0.025 |
| 12.0 | 45 | 2300 | 365 | 87 | 0.040 | 1390 | 165 | 52 | 0.030 | 840 | 70 | 32 | 0.021 |
| 12.0 | 50 | 2300 | 365 | 87 | 0.040 | 1390 | 165 | 52 | 0.030 | 840 | 70 | 32 | 0.021 |
| 12.0 | 55 | 2300 | 365 | 87 | 0.040 | 1390 | 165 | 52 | 0.030 | 840 | 70 | 32 | 0.021 |
| 12.0 | 60 | 2300 | 325 | 87 | 0.035 | 1390 | 145 | 52 | 0.026 | 840 | 65 | 32 | 0.019 |
| 12.0 | 65 | 2070 | 290 | 78 | 0.035 | 1250 | 130 | 47 | 0.026 | 760 | 55 | 29 | 0.018 |
| 12.0 | 70 | 2070 | 290 | 78 | 0.035 | 1250 | 130 | 47 | 0.026 | 760 | 55 | 29 | 0.018 |
| 14.0 | 50 | 2120 | 345 | 93 | 0.041 | 1230 | 145 | 54 | 0.029 | 760 | 65 | 33 | 0.021 |
| 14.0 | 60 | 2120 | 345 | 93 | 0.041 | 1230 | 145 | 54 | 0.029 | 760 | 65 | 33 | 0.021 |
| 16.0 | 40 | 1940 | 385 | 98 | 0.050 | 1070 | 150 | 54 | 0.035 | 670 | 70 | 34 | 0.026 |
| 16.0 | 50 | 1940 | 385 | 98 | 0.050 | 1070 | 150 | 54 | 0.035 | 670 | 70 | 34 | 0.026 |
| 16.0 | 60 | 1940 | 325 | 98 | 0.042 | 1070 | 130 | 54 | 0.030 | 670 | 60 | 34 | 0.022 |
| 16.0 | 70 | 1940 | 325 | 98 | 0.042 | 1070 | 130 | 54 | 0.030 | 670 | 60 | 34 | 0.022 |
| 16.0 | 80 | 1940 | 290 | 98 | 0.037 | 1070 | 115 | 54 | 0.027 | 670 | 55 | 34 | 0.021 |
| 16.0 | 90 | 1750 | 260 | 88 | 0.037 | 960 | 100 | 48 | 0.026 | 600 | 50 | 30 | 0.021 |
| 16.0 | 110 | 1750 | 260 | 88 | 0.037 | 960 | 100 | 48 | 0.026 | 600 | 50 | 30 | 0.021 |
| 16.0 | 120 | 1750 | 260 | 88 | 0.037 | 960 | 100 | 48 | 0.026 | 600 | 50 | 30 | 0.021 |
| 18.0 | 50 | 1680 | 330 | 95 | 0.049 | 940 | 130 | 53 | 0.035 | 590 | 65 | 33 | 0.028 |
| 18.0 | 70 | 1680 | 280 | 95 | 0.042 | 940 | 110 | 53 | 0.029 | 590 | 55 | 33 | 0.023 |
| 18.0 | 100 | 1510 | 225 | 85 | 0.037 | 850 | 85 | 48 | 0.025 | 530 | 45 | 30 | 0.021 |
| 20.0 | 50 | 1420 | 275 | 89 | 0.048 | 820 | 110 | 52 | 0.034 | 500 | 55 | 31 | 0.028 |
| 20.0 | 60 | 1420 | 275 | 89 | 0.048 | 820 | 110 | 52 | 0.034 | 500 | 55 | 31 | 0.028 |
| 20.0 | 70 | 1420 | 235 | 89 | 0.041 | 820 | 90 | 52 | 0.027 | 500 | 45 | 31 | 0.023 |
| 20.0 | 80 | 1420 | 235 | 89 | 0.041 | 820 | 90 | 52 | 0.027 | 500 | 45 | 31 | 0.023 |
| 20.0 | 90 | 1420 | 205 | 89 | 0.036 | 820 | 80 | 52 | 0.024 | 500 | 40 | 31 | 0.020 |
| 20.0 | 110 | 1270 | 185 | 80 | 0.036 | 730 | 75 | 46 | 0.026 | 450 | 35 | 28 | 0.019 |
| 20.0 | 120 | 1270 | 185 | 80 | 0.036 | 730 | 75 | 46 | 0.026 | 450 | 35 | 28 | 0.019 |
| 22.0 | 75 | 1260 | 205 | 87 | 0.041 | 820 | 90 | 57 | 0.027 | 500 | 45 | 35 | 0.023 |
| 22.0 | 110 | 1260 | 180 | 87 | 0.036 | 820 | 80 | 57 | 0.024 | 500 | 40 | 35 | 0.020 |
| 25.0 | 70 | 1100 | 215 | 86 | 0.049 | 820 | 110 | 64 | 0.034 | 500 | 55 | 39 | 0.028 |
| 25.0 | 90 | 1100 | 185 | 86 | 0.042 | 820 | 90 | 64 | 0.027 | 500 | 45 | 39 | 0.023 |
| 25.0 | 110 | 1100 | 185 | 86 | 0.042 | 820 | 90 | 64 | 0.027 | 500 | 45 | 39 | 0.023 |
| 25.0 | 120 | 1100 | 160 | 86 | 0.036 | 820 | 80 | 64 | 0.024 | 500 | 40 | 39 | 0.020 |




DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG NECK

### SEME73 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) | RPM | FEED | Vc | fz | Ap(mm) |
| 1.0 | 2 | 22000 | 310 | 69 | 0.004 | 0.021 | 13500 | 180 | 42 | 0.003 | 0.016 | 8500 | 50 | 27 | 0.001 | 0.013 |
| 1.0 | 3 | 22000 | 310 | 69 | 0.004 | 0.021 | 13500 | 180 | 42 | 0.003 | 0.016 | 8500 | 50 | 27 | 0.001 | 0.013 |
| 1.0 | 4 | 22000 | 310 | 69 | 0.004 | 0.015 | 13500 | 180 | 42 | 0.003 | 0.011 | 8500 | 50 | 27 | 0.001 | 0.009 |
| 1.0 | 5 | 22000 | 310 | 69 | 0.004 | 0.015 | 13500 | 180 | 42 | 0.003 | 0.011 | 8500 | 50 | 27 | 0.001 | 0.009 |
| 1.0 | 6 | 19800 | 250 | 62 | 0.003 | 0.008 | 12150 | 145 | 38 | 0.003 | 0.006 | 7650 | 40 | 24 | 0.001 | 0.005 |
| 1.0 | 7 | 19800 | 250 | 62 | 0.003 | 0.008 | 12150 | 145 | 38 | 0.003 | 0.006 | 7650 | 40 | 24 | 0.001 | 0.005 |
| 1.0 | 8 | 19800 | 250 | 62 | 0.003 | 0.008 | 12150 | 145 | 38 | 0.003 | 0.006 | 7650 | 40 | 24 | 0.001 | 0.005 |
| 1.0 | 10 | 19800 | 250 | 62 | 0.003 | 0.005 | 12150 | 145 | 38 | 0.003 | 0.004 | 7650 | 40 | 24 | 0.001 | 0.003 |
| 1.0 | 12 | 17600 | 200 | 55 | 0.003 | 0.005 | 10800 | 115 | 34 | 0.003 | 0.004 | 6800 | 30 | 21 | 0.001 | 0.003 |
| 1.0 | 14 | 17600 | 200 | 55 | 0.003 | 0.003 | 10800 | 115 | 34 | 0.003 | 0.002 | 6800 | 30 | 21 | 0.001 | 0.002 |
| 1.0 | 16 | 13200 | 130 | 41 | 0.002 | 0.003 | 8100 | 75 | 25 | 0.002 | 0.002 | 5100 | 20 | 16 | 0.001 | 0.002 |
| 1.0 | 18 | 13200 | 130 | 41 | 0.002 | 0.002 | 8100 | 75 | 25 | 0.002 | 0.002 | 5100 | 20 | 16 | 0.001 | 0.001 |
| 1.0 | 20 | 13200 | 130 | 41 | 0.002 | 0.002 | 8100 | 75 | 25 | 0.002 | 0.002 | 5100 | 20 | 16 | 0.001 | 0.001 |
| 1.0 | 22 | 6600 | 55 | 21 | 0.002 | 0.002 | 4050 | 30 | 13 | 0.002 | 0.002 | 2550 | 10 | 8 | 0.001 | 0.001 |
| 1.0 | 26 | 6600 | 55 | 21 | 0.002 | 0.002 | 4050 | 30 | 13 | 0.002 | 0.002 | 2550 | 10 | 8 | 0.001 | 0.001 |
| 1.0 | 30 | 6600 | 55 | 21 | 0.002 | 0.002 | 4050 | 30 | 13 | 0.002 | 0.002 | 2550 | 10 | 8 | 0.001 | 0.001 |
| 1.0 | 40 | 2200 | 15 | 7 | 0.002 | 0.002 | 1350 | 10 | 4 | 0.002 | 0.002 | 850 | 5 | 3 | 0.001 | 0.001 |
| 1.0 | 50 | 2200 | 15 | 7 | 0.002 | 0.002 | 1350 | 10 | 4 | 0.002 | 0.002 | 850 | 5 | 3 | 0.001 | 0.001 |
| 1.2 | 4 | 19500 | 315 | 74 | 0.004 | 0.018 | 12100 | 185 | 46 | 0.004 | 0.013 | 7500 | 50 | 28 | 0.002 | 0.011 |
| 1.2 | 6 | 19500 | 315 | 74 | 0.004 | 0.018 | 12100 | 185 | 46 | 0.004 | 0.013 | 7500 | 50 | 28 | 0.002 | 0.011 |
| 1.2 | 8 | 17550 | 255 | 66 | 0.004 | 0.010 | 10890 | 150 | 41 | 0.003 | 0.008 | 6750 | 40 | 25 | 0.001 | 0.006 |
| 1.2 | 10 | 17550 | 255 | 66 | 0.004 | 0.006 | 10890 | 150 | 41 | 0.003 | 0.005 | 6750 | 40 | 25 | 0.001 | 0.004 |
| 1.2 | 12 | 17550 | 255 | 66 | 0.004 | 0.006 | 10890 | 150 | 41 | 0.003 | 0.005 | 6750 | 40 | 25 | 0.001 | 0.004 |
| 1.2 | 14 | 15600 | 200 | 59 | 0.003 | 0.006 | 9680 | 120 | 36 | 0.003 | 0.005 | 6000 | 30 | 23 | 0.001 | 0.004 |
| 1.2 | 16 | 15600 | 200 | 59 | 0.003 | 0.004 | 9680 | 120 | 36 | 0.003 | 0.003 | 6000 | 30 | 23 | 0.001 | 0.002 |
| 1.2 | 20 | 11700 | 130 | 44 | 0.003 | 0.003 | 7260 | 80 | 27 | 0.003 | 0.002 | 4500 | 20 | 17 | 0.001 | 0.002 |
| 1.2 | 26 | 5850 | 55 | 22 | 0.002 | 0.003 | 3630 | 35 | 14 | 0.002 | 0.002 | 2250 | 10 | 8 | 0.001 | 0.002 |
| 1.2 | 30 | 5850 | 55 | 22 | 0.002 | 0.003 | 3630 | 35 | 14 | 0.002 | 0.002 | 2250 | 10 | 8 | 0.001 | 0.002 |
| 1.5 | 4 | 17000 | 320 | 80 | 0.005 | 0.032 | 10700 | 190 | 50 | 0.004 | 0.024 | 6500 | 50 | 31 | 0.002 | 0.019 |
| 1.5 | 5 | 17000 | 320 | 80 | 0.005 | 0.022 | 10700 | 190 | 50 | 0.004 | 0.017 | 6500 | 50 | 31 | 0.002 | 0.013 |
| 1.5 | 6 | 17000 | 320 | 80 | 0.005 | 0.022 | 10700 | 190 | 50 | 0.004 | 0.017 | 6500 | 50 | 31 | 0.002 | 0.013 |
| 1.5 | 7 | 17000 | 320 | 80 | 0.005 | 0.022 | 10700 | 190 | 50 | 0.004 | 0.017 | 6500 | 50 | 31 | 0.002 | 0.013 |
| 1.5 | 8 | 15300 | 260 | 72 | 0.004 | 0.013 | 9630 | 155 | 45 | 0.004 | 0.009 | 5850 | 40 | 28 | 0.002 | 0.008 |
| 1.5 | 10 | 15300 | 260 | 72 | 0.004 | 0.013 | 9630 | 155 | 45 | 0.004 | 0.009 | 5850 | 40 | 28 | 0.002 | 0.008 |
| 1.5 | 12 | 15300 | 260 | 72 | 0.004 | 0.013 | 9630 | 155 | 45 | 0.004 | 0.009 | 5850 | 40 | 28 | 0.002 | 0.008 |
| 1.5 | 14 | 15300 | 260 | 72 | 0.004 | 0.008 | 9630 | 155 | 45 | 0.004 | 0.006 | 5850 | 40 | 28 | 0.002 | 0.005 |
| 1.5 | 16 | 13600 | 205 | 64 | 0.004 | 0.008 | 8560 | 120 | 40 | 0.004 | 0.006 | 5200 | 30 | 25 | 0.001 | 0.005 |
| 1.5 | 18 | 13600 | 205 | 64 | 0.004 | 0.008 | 8560 | 120 | 40 | 0.004 | 0.006 | 5200 | 30 | 25 | 0.001 | 0.005 |
| 1.5 | 20 | 13600 | 205 | 64 | 0.004 | 0.005 | 8560 | 120 | 40 | 0.004 | 0.004 | 5200 | 30 | 25 | 0.001 | 0.003 |
| 1.5 | 22 | 13600 | 205 | 64 | 0.004 | 0.005 | 8560 | 120 | 40 | 0.004 | 0.004 | 5200 | 30 | 25 | 0.001 | 0.003 |
| 1.5 | 26 | 10200 | 135 | 48 | 0.003 | 0.003 | 6420 | 80 | 30 | 0.003 | 0.002 | 3900 | 20 | 18 | 0.001 | 0.002 |
| 1.5 | 30 | 10200 | 135 | 48 | 0.003 | 0.003 | 6420 | 80 | 30 | 0.003 | 0.002 | 3900 | 20 | 18 | 0.001 | 0.002 |
| 2.0 | 6 | 13900 | 330 | 87 | 0.006 | 0.042 | 9070 | 200 | 57 | 0.006 | 0.032 | 6000 | 60 | 38 | 0.003 | 0.025 |
| 2.0 | 8 | 13900 | 330 | 87 | 0.006 | 0.029 | 9070 | 200 | 57 | 0.006 | 0.022 | 6000 | 60 | 38 | 0.003 | 0.018 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE LONG NECK

### SEME73 SERIES

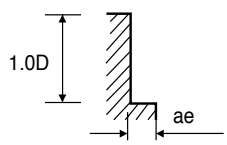
| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | ae(mm) | RPM | FEED | Vc | fz | ae(mm) | RPM | FEED | Vc | fz | ae(mm) |
| 2.0 | 10 | 13900 | 330 | 87 | 0.006 | 0.029 | 9070 | 200 | 57 | 0.006 | 0.022 | 6000 | 60 | 38 | 0.003 | 0.018 |
| 2.0 | 12 | 12510 | 265 | 79 | 0.005 | 0.017 | 8160 | 160 | 51 | 0.005 | 0.013 | 5400 | 50 | 34 | 0.002 | 0.010 |
| 2.0 | 16 | 12510 | 265 | 79 | 0.005 | 0.017 | 8160 | 160 | 51 | 0.005 | 0.013 | 5400 | 50 | 34 | 0.002 | 0.010 |
| 2.0 | 18 | 12510 | 265 | 79 | 0.005 | 0.011 | 8160 | 160 | 51 | 0.005 | 0.008 | 5400 | 50 | 34 | 0.002 | 0.006 |
| 2.0 | 20 | 12510 | 265 | 79 | 0.005 | 0.011 | 8160 | 160 | 51 | 0.005 | 0.008 | 5400 | 50 | 34 | 0.002 | 0.006 |
| 2.0 | 22 | 11120 | 210 | 70 | 0.005 | 0.011 | 7260 | 130 | 46 | 0.004 | 0.008 | 4800 | 40 | 30 | 0.002 | 0.006 |
| 2.0 | 26 | 11120 | 210 | 70 | 0.005 | 0.011 | 7260 | 130 | 46 | 0.004 | 0.008 | 4800 | 40 | 30 | 0.002 | 0.006 |
| 2.0 | 30 | 11120 | 210 | 70 | 0.005 | 0.006 | 7260 | 130 | 46 | 0.004 | 0.005 | 4800 | 40 | 30 | 0.002 | 0.004 |
| 2.0 | 35 | 8340 | 140 | 52 | 0.004 | 0.004 | 5440 | 85 | 34 | 0.004 | 0.003 | 3600 | 25 | 23 | 0.002 | 0.003 |
| 2.0 | 40 | 8340 | 140 | 52 | 0.004 | 0.004 | 5440 | 85 | 34 | 0.004 | 0.003 | 3600 | 25 | 23 | 0.002 | 0.003 |
| 2.0 | 45 | 4170 | 60 | 26 | 0.004 | 0.004 | 2720 | 35 | 17 | 0.003 | 0.003 | 1800 | 10 | 11 | 0.001 | 0.003 |
| 2.0 | 50 | 4170 | 60 | 26 | 0.004 | 0.004 | 2720 | 35 | 17 | 0.003 | 0.003 | 1800 | 10 | 11 | 0.001 | 0.003 |
| 2.0 | 60 | 4170 | 60 | 26 | 0.004 | 0.004 | 2720 | 35 | 17 | 0.003 | 0.003 | 1800 | 10 | 11 | 0.001 | 0.003 |
| 2.5 | 8 | 12000 | 350 | 94 | 0.007 | 0.037 | 7600 | 220 | 60 | 0.007 | 0.028 | 4500 | 60 | 35 | 0.003 | 0.022 |
| 2.5 | 10 | 12000 | 350 | 94 | 0.007 | 0.037 | 7600 | 220 | 60 | 0.007 | 0.028 | 4500 | 60 | 35 | 0.003 | 0.022 |
| 2.5 | 12 | 12000 | 350 | 94 | 0.007 | 0.037 | 7600 | 220 | 60 | 0.007 | 0.028 | 4500 | 60 | 35 | 0.003 | 0.022 |
| 2.5 | 14 | 10800 | 285 | 85 | 0.007 | 0.021 | 6840 | 180 | 54 | 0.007 | 0.016 | 4050 | 50 | 32 | 0.003 | 0.013 |
| 2.5 | 16 | 10800 | 285 | 85 | 0.007 | 0.021 | 6840 | 180 | 54 | 0.007 | 0.016 | 4050 | 50 | 32 | 0.003 | 0.013 |
| 2.5 | 18 | 10800 | 285 | 85 | 0.007 | 0.021 | 6840 | 180 | 54 | 0.007 | 0.016 | 4050 | 50 | 32 | 0.003 | 0.013 |
| 2.5 | 20 | 10800 | 285 | 85 | 0.007 | 0.021 | 6840 | 180 | 54 | 0.007 | 0.016 | 4050 | 50 | 32 | 0.003 | 0.013 |
| 2.5 | 22 | 10800 | 285 | 85 | 0.007 | 0.013 | 6840 | 180 | 54 | 0.007 | 0.010 | 4050 | 50 | 32 | 0.003 | 0.008 |
| 2.5 | 26 | 9600 | 225 | 75 | 0.006 | 0.013 | 6080 | 140 | 48 | 0.006 | 0.010 | 3600 | 40 | 28 | 0.003 | 0.008 |
| 2.5 | 30 | 9600 | 225 | 75 | 0.006 | 0.013 | 6080 | 140 | 48 | 0.006 | 0.010 | 3600 | 40 | 28 | 0.003 | 0.008 |
| 2.5 | 35 | 9600 | 225 | 75 | 0.006 | 0.008 | 6080 | 140 | 48 | 0.006 | 0.006 | 3600 | 40 | 28 | 0.003 | 0.005 |
| 2.5 | 40 | 7200 | 145 | 57 | 0.005 | 0.008 | 4560 | 90 | 36 | 0.005 | 0.006 | 2700 | 25 | 21 | 0.002 | 0.005 |
| 2.5 | 45 | 7200 | 145 | 57 | 0.005 | 0.005 | 4560 | 90 | 36 | 0.005 | 0.004 | 2700 | 25 | 21 | 0.002 | 0.003 |
| 2.5 | 50 | 7200 | 145 | 57 | 0.005 | 0.005 | 4560 | 90 | 36 | 0.005 | 0.004 | 2700 | 25 | 21 | 0.002 | 0.003 |
| 3.0 | 6 | 10700 | 380 | 101 | 0.009 | 0.063 | 6670 | 240 | 63 | 0.009 | 0.047 | 4030 | 70 | 38 | 0.004 | 0.038 |
| 3.0 | 8 | 10700 | 380 | 101 | 0.009 | 0.063 | 6670 | 240 | 63 | 0.009 | 0.047 | 4030 | 70 | 38 | 0.004 | 0.038 |
| 3.0 | 10 | 10700 | 380 | 101 | 0.009 | 0.044 | 6670 | 240 | 63 | 0.009 | 0.033 | 4030 | 70 | 38 | 0.004 | 0.026 |
| 3.0 | 12 | 10700 | 380 | 101 | 0.009 | 0.044 | 6670 | 240 | 63 | 0.009 | 0.033 | 4030 | 70 | 38 | 0.004 | 0.026 |
| 3.0 | 14 | 10700 | 380 | 101 | 0.009 | 0.044 | 6670 | 240 | 63 | 0.009 | 0.033 | 4030 | 70 | 38 | 0.004 | 0.026 |
| 3.0 | 16 | 9630 | 310 | 91 | 0.008 | 0.025 | 6000 | 195 | 57 | 0.008 | 0.019 | 3630 | 55 | 34 | 0.004 | 0.015 |
| 3.0 | 18 | 9630 | 310 | 91 | 0.008 | 0.025 | 6000 | 195 | 57 | 0.008 | 0.019 | 3630 | 55 | 34 | 0.004 | 0.015 |
| 3.0 | 20 | 9630 | 310 | 91 | 0.008 | 0.025 | 6000 | 195 | 57 | 0.008 | 0.019 | 3630 | 55 | 34 | 0.004 | 0.015 |
| 3.0 | 22 | 9630 | 310 | 91 | 0.008 | 0.025 | 6000 | 195 | 57 | 0.008 | 0.019 | 3630 | 55 | 34 | 0.004 | 0.015 |
| 3.0 | 26 | 9630 | 310 | 91 | 0.008 | 0.016 | 6000 | 195 | 57 | 0.008 | 0.012 | 3630 | 55 | 34 | 0.004 | 0.009 |
| 3.0 | 30 | 9630 | 310 | 91 | 0.008 | 0.016 | 6000 | 195 | 57 | 0.008 | 0.012 | 3630 | 55 | 34 | 0.004 | 0.009 |
| 3.0 | 35 | 8560 | 245 | 81 | 0.007 | 0.016 | 5340 | 155 | 50 | 0.007 | 0.012 | 3220 | 45 | 30 | 0.003 | 0.009 |
| 3.0 | 40 | 8560 | 245 | 81 | 0.007 | 0.009 | 5340 | 155 | 50 | 0.007 | 0.007 | 3220 | 45 | 30 | 0.003 | 0.006 |
| 3.0 | 45 | 8560 | 245 | 81 | 0.007 | 0.009 | 5340 | 155 | 50 | 0.007 | 0.007 | 3220 | 45 | 30 | 0.003 | 0.006 |
| 3.0 | 50 | 6420 | 160 | 61 | 0.006 | 0.006 | 4000 | 100 | 38 | 0.006 | 0.005 | 2420 | 30 | 23 | 0.003 | 0.004 |
| 3.0 | 60 | 6420 | 160 | 61 | 0.006 | 0.006 | 4000 | 100 | 38 | 0.006 | 0.005 | 2420 | 30 | 23 | 0.003 | 0.004 |
| 4.0 | 8 | 9070 | 680 | 114 | 0.019 | 0.084 | 5540 | 420 | 70 | 0.019 | 0.063 | 3530 | 70 | 44 | 0.005 | 0.050 |

DIA. = Diameter
LBS = Length Below Shank
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# CARBIDE, 4 FLUTE LONG NECK

## SEME73 SERIES

| MATERIAL | | P | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | | HARDENED STEELS | | | | |
| HARDNESS | | ~ HRc35 | | | | | HRc35 ~ HRc45 | | | | | HRc45 ~ HRc55 | | | | |
| STRENGTH | | ~ 1100N/mm² | | | | | 1110 ~ 1500N/mm² | | | | | 1500 ~ 2000N/mm² | | | | |
| DIA. | LBS | RPM | FEED | Vc | fz | ae(mm) | RPM | FEED | Vc | fz | ae(mm) | RPM | FEED | Vc | fz | ae(mm) |
| 4.0 | 10 | 9070 | 680 | 114 | 0.019 | 0.084 | 5540 | 420 | 70 | 0.019 | 0.063 | 3530 | 70 | 44 | 0.005 | 0.050 |
| 4.0 | 12 | 9070 | 680 | 114 | 0.019 | 0.084 | 5540 | 420 | 70 | 0.019 | 0.063 | 3530 | 70 | 44 | 0.005 | 0.050 |
| 4.0 | 14 | 9070 | 680 | 114 | 0.019 | 0.059 | 5540 | 420 | 70 | 0.019 | 0.044 | 3530 | 70 | 44 | 0.005 | 0.035 |
| 4.0 | 16 | 9070 | 680 | 114 | 0.019 | 0.059 | 5540 | 420 | 70 | 0.019 | 0.044 | 3530 | 70 | 44 | 0.005 | 0.035 |
| 4.0 | 18 | 9070 | 680 | 114 | 0.019 | 0.059 | 5540 | 420 | 70 | 0.019 | 0.044 | 3530 | 70 | 44 | 0.005 | 0.035 |
| 4.0 | 20 | 9070 | 680 | 114 | 0.019 | 0.059 | 5540 | 420 | 70 | 0.019 | 0.044 | 3530 | 70 | 44 | 0.005 | 0.035 |
| 4.0 | 22 | 8160 | 550 | 103 | 0.017 | 0.034 | 4990 | 340 | 63 | 0.017 | 0.025 | 3180 | 55 | 40 | 0.004 | 0.020 |
| 4.0 | 26 | 8160 | 550 | 103 | 0.017 | 0.034 | 4990 | 340 | 63 | 0.017 | 0.025 | 3180 | 55 | 40 | 0.004 | 0.020 |
| 4.0 | 30 | 8160 | 550 | 103 | 0.017 | 0.034 | 4990 | 340 | 63 | 0.017 | 0.025 | 3180 | 55 | 40 | 0.004 | 0.020 |
| 4.0 | 35 | 8160 | 550 | 103 | 0.017 | 0.021 | 4990 | 340 | 63 | 0.017 | 0.016 | 3180 | 55 | 40 | 0.004 | 0.013 |
| 4.0 | 40 | 8160 | 550 | 103 | 0.017 | 0.021 | 4990 | 340 | 63 | 0.017 | 0.016 | 3180 | 55 | 40 | 0.004 | 0.013 |
| 4.0 | 45 | 7260 | 435 | 91 | 0.015 | 0.021 | 4430 | 270 | 56 | 0.015 | 0.016 | 2820 | 45 | 35 | 0.004 | 0.013 |
| 4.0 | 50 | 7260 | 435 | 91 | 0.015 | 0.021 | 4430 | 270 | 56 | 0.015 | 0.016 | 2820 | 45 | 35 | 0.004 | 0.013 |
| 4.0 | 60 | 7260 | 435 | 91 | 0.015 | 0.013 | 4430 | 270 | 56 | 0.015 | 0.009 | 2820 | 45 | 35 | 0.004 | 0.008 |
| 5.0 | 16 | 7560 | 720 | 119 | 0.024 | 0.074 | 4530 | 430 | 71 | 0.024 | 0.055 | 2780 | 85 | 44 | 0.008 | 0.044 |
| 5.0 | 20 | 7560 | 720 | 119 | 0.024 | 0.074 | 4530 | 430 | 71 | 0.024 | 0.055 | 2780 | 85 | 44 | 0.008 | 0.044 |
| 5.0 | 26 | 6800 | 585 | 107 | 0.022 | 0.042 | 4080 | 350 | 64 | 0.021 | 0.032 | 2500 | 70 | 39 | 0.007 | 0.025 |
| 5.0 | 30 | 6800 | 585 | 107 | 0.022 | 0.042 | 4080 | 350 | 64 | 0.021 | 0.032 | 2500 | 70 | 39 | 0.007 | 0.025 |
| 5.0 | 35 | 6800 | 585 | 107 | 0.022 | 0.042 | 4080 | 350 | 64 | 0.021 | 0.032 | 2500 | 70 | 39 | 0.007 | 0.025 |
| 5.0 | 40 | 6800 | 585 | 107 | 0.022 | 0.042 | 4080 | 350 | 64 | 0.021 | 0.032 | 2500 | 70 | 39 | 0.007 | 0.025 |
| 5.0 | 50 | 6800 | 585 | 107 | 0.022 | 0.026 | 4080 | 350 | 64 | 0.021 | 0.020 | 2500 | 70 | 39 | 0.007 | 0.016 |
| 5.0 | 60 | 6050 | 460 | 95 | 0.019 | 0.026 | 3620 | 275 | 57 | 0.019 | 0.020 | 2220 | 55 | 35 | 0.006 | 0.016 |
| 6.0 | 15 | 6670 | 790 | 126 | 0.030 | 0.126 | 4030 | 490 | 76 | 0.030 | 0.095 | 2400 | 95 | 45 | 0.010 | 0.076 |
| 6.0 | 20 | 6670 | 790 | 126 | 0.030 | 0.088 | 4030 | 490 | 76 | 0.030 | 0.066 | 2400 | 95 | 45 | 0.010 | 0.053 |
| 6.0 | 30 | 6670 | 790 | 126 | 0.030 | 0.088 | 4030 | 490 | 76 | 0.030 | 0.066 | 2400 | 95 | 45 | 0.010 | 0.053 |
| 6.0 | 32 | 6000 | 640 | 113 | 0.027 | 0.050 | 3630 | 395 | 68 | 0.027 | 0.038 | 2160 | 75 | 41 | 0.009 | 0.030 |
| 8.0 | 25 | 5040 | 850 | 127 | 0.042 | 0.118 | 3020 | 450 | 76 | 0.037 | 0.088 | 2010 | 130 | 51 | 0.016 | 0.071 |
| 8.0 | 30 | 5040 | 850 | 127 | 0.042 | 0.118 | 3020 | 450 | 76 | 0.037 | 0.088 | 2010 | 130 | 51 | 0.016 | 0.071 |
| 8.0 | 42 | 4540 | 690 | 114 | 0.038 | 0.067 | 2720 | 365 | 68 | 0.034 | 0.050 | 1810 | 105 | 45 | 0.015 | 0.040 |
| 10.0 | 30 | 3910 | 730 | 123 | 0.047 | 0.210 | 2400 | 360 | 75 | 0.038 | 0.158 | 1630 | 105 | 51 | 0.016 | 0.126 |
| 10.0 | 35 | 3910 | 730 | 123 | 0.047 | 0.147 | 2400 | 360 | 75 | 0.038 | 0.110 | 1630 | 105 | 51 | 0.016 | 0.088 |
| 10.0 | 45 | 3910 | 730 | 123 | 0.047 | 0.147 | 2400 | 360 | 75 | 0.038 | 0.110 | 1630 | 105 | 51 | 0.016 | 0.088 |
| 12.0 | 35 | 3300 | 620 | 124 | 0.047 | 0.252 | 2010 | 300 | 76 | 0.037 | 0.189 | 1400 | 95 | 53 | 0.017 | 0.151 |
| 12.0 | 40 | 3300 | 620 | 124 | 0.047 | 0.176 | 2010 | 300 | 76 | 0.037 | 0.132 | 1400 | 95 | 53 | 0.017 | 0.106 |
| 12.0 | 50 | 3300 | 620 | 124 | 0.047 | 0.176 | 2010 | 300 | 76 | 0.037 | 0.132 | 1400 | 95 | 53 | 0.017 | 0.106 |




DIA. = Diameter
LBS = Length Below Shank

RPM = rev./min.
FEED = mm/min.

Vc = m/min.
fz = mm/tooth

# 4G MILL END MILLS

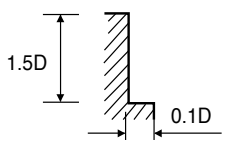
## RECOMMENDED CUTTING CONDITIONS

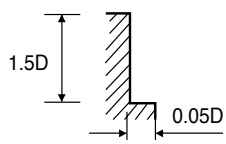
## CARBIDE, 6 FLUTE 45° HELIX

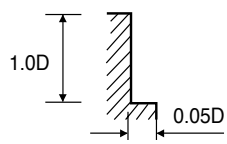
### SEME75 SERIES

### ■ NORMAL SPEED

| MATERIAL | | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | ALLOY STEELS HEAT RESISTANT STEELS | | | | HARDENED STEELS | | | |
| HARDNESS | | ~ HRc35 | | | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | ~ 1100N/mm² | | | | 1110 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 15 | 5840 | 2100 | 110 | 0.060 | 4075 | 1440 | 77 | 0.059 | 1660 | 220 | 31 | 0.022 |
| 6.0 | 20 | 5840 | 2100 | 110 | 0.060 | 4075 | 1440 | 77 | 0.059 | 1660 | 220 | 31 | 0.022 |
| 6.0 | 30 | 5840 | 1785 | 110 | 0.051 | 4075 | 1225 | 77 | 0.050 | 1660 | 190 | 31 | 0.019 |
| 8.0 | 20 | 4410 | 2100 | 111 | 0.079 | 3085 | 1440 | 78 | 0.078 | 1220 | 220 | 31 | 0.030 |
| 8.0 | 30 | 4410 | 2100 | 111 | 0.079 | 3085 | 1440 | 78 | 0.078 | 1220 | 220 | 31 | 0.030 |
| 8.0 | 35 | 4410 | 2100 | 111 | 0.079 | 3085 | 1440 | 78 | 0.078 | 1220 | 220 | 31 | 0.030 |
| 8.0 | 40 | 4410 | 1785 | 111 | 0.067 | 3085 | 1225 | 78 | 0.066 | 1220 | 190 | 31 | 0.026 |
| 10.0 | 25 | 3530 | 2100 | 111 | 0.099 | 2435 | 1440 | 76 | 0.099 | 1050 | 220 | 33 | 0.035 |
| 10.0 | 30 | 3530 | 2100 | 111 | 0.099 | 2435 | 1440 | 76 | 0.099 | 1050 | 220 | 33 | 0.035 |
| 10.0 | 40 | 3530 | 2100 | 111 | 0.099 | 2435 | 1440 | 76 | 0.099 | 1050 | 220 | 33 | 0.035 |
| 10.0 | 50 | 3530 | 1785 | 111 | 0.084 | 2435 | 1225 | 76 | 0.084 | 1050 | 190 | 33 | 0.030 |
| 12.0 | 30 | 2980 | 1765 | 112 | 0.099 | 2100 | 1220 | 79 | 0.097 | 880 | 190 | 33 | 0.036 |
| 12.0 | 40 | 2980 | 1765 | 112 | 0.099 | 2100 | 1220 | 79 | 0.097 | 880 | 190 | 33 | 0.036 |
| 12.0 | 50 | 2980 | 1500 | 112 | 0.084 | 2100 | 1035 | 79 | 0.082 | 880 | 165 | 33 | 0.031 |
| 12.0 | 60 | 2980 | 1325 | 112 | 0.074 | 2100 | 915 | 79 | 0.073 | 880 | 140 | 33 | 0.027 |
| 16.0 | 40 | 2205 | 1325 | 111 | 0.100 | 1555 | 925 | 78 | 0.099 | 670 | 135 | 34 | 0.034 |
| 16.0 | 50 | 2205 | 1325 | 111 | 0.100 | 1555 | 925 | 78 | 0.099 | 670 | 135 | 34 | 0.034 |
| 16.0 | 60 | 2205 | 1125 | 111 | 0.085 | 1555 | 790 | 78 | 0.085 | 670 | 115 | 34 | 0.029 |
| 16.0 | 90 | 1985 | 895 | 100 | 0.075 | 1395 | 625 | 70 | 0.075 | 610 | 95 | 31 | 0.026 |
| 16.0 | 110 | 1985 | 895 | 100 | 0.075 | 1395 | 625 | 70 | 0.075 | 610 | 95 | 31 | 0.026 |
| 20.0 | 45 | 1765 | 1060 | 111 | 0.100 | 1220 | 725 | 77 | 0.099 | 525 | 115 | 33 | 0.037 |
| 20.0 | 60 | 1765 | 1060 | 111 | 0.100 | 1220 | 725 | 77 | 0.099 | 525 | 115 | 33 | 0.037 |
| 20.0 | 70 | 1765 | 905 | 111 | 0.085 | 1220 | 615 | 77 | 0.084 | 525 | 100 | 33 | 0.032 |
| 20.0 | 110 | 1585 | 715 | 100 | 0.075 | 1090 | 490 | 68 | 0.075 | 475 | 80 | 30 | 0.028 |




DIA. = Diameter
LOC = Length of Cut

RPM = rev./min.
FEED = mm/min.

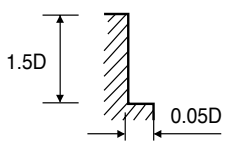
Vc = m/min.
fz = mm/tooth

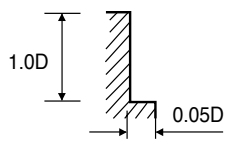
# CARBIDE, 6 FLUTE 45° HELIX

## SEME75 SERIES

### ■ HIGH SPEED

| MATERIAL | | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | | HARDENED STEELS | | | |
| HARDNESS | | HRc35 ~ HRc45 | | | | HRc45 ~ HRc55 | | | |
| STRENGTH | | 1100 ~ 1500N/mm² | | | | 1500 ~ 2000N/mm² | | | |
| DIA. | LOC | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 15 | 17640 | 6395 | 333 | 0.060 | 8820 | 3205 | 166 | 0.061 |
| 6.0 | 20 | 17640 | 6395 | 333 | 0.060 | 8820 | 3205 | 166 | 0.061 |
| 6.0 | 30 | 17640 | 5435 | 333 | 0.051 | 8820 | 2720 | 166 | 0.051 |
| 8.0 | 20 | 13230 | 6395 | 333 | 0.081 | 6615 | 3205 | 166 | 0.081 |
| 8.0 | 30 | 13230 | 6395 | 333 | 0.081 | 6615 | 3205 | 166 | 0.081 |
| 8.0 | 35 | 13230 | 6395 | 333 | 0.081 | 6615 | 3205 | 166 | 0.081 |
| 8.0 | 40 | 13230 | 5435 | 333 | 0.068 | 6615 | 2725 | 166 | 0.069 |
| 10.0 | 25 | 10480 | 6290 | 329 | 0.100 | 5290 | 3205 | 166 | 0.101 |
| 10.0 | 30 | 10480 | 6290 | 329 | 0.100 | 5290 | 3205 | 166 | 0.101 |
| 10.0 | 40 | 10480 | 6290 | 329 | 0.100 | 5290 | 3205 | 166 | 0.101 |
| 10.0 | 50 | 10480 | 5345 | 329 | 0.085 | 5290 | 2720 | 166 | 0.086 |
| 12.0 | 30 | 8820 | 5290 | 333 | 0.100 | 4410 | 2645 | 166 | 0.100 |
| 12.0 | 40 | 8820 | 5290 | 333 | 0.100 | 4410 | 2645 | 166 | 0.100 |
| 12.0 | 50 | 8820 | 4500 | 333 | 0.085 | 4410 | 2245 | 166 | 0.085 |
| 12.0 | 60 | 8820 | 3970 | 333 | 0.075 | 4410 | 1985 | 166 | 0.075 |
| 16.0 | 40 | 6615 | 3970 | 333 | 0.100 | 3320 | 1985 | 167 | 0.100 |
| 16.0 | 50 | 6615 | 3970 | 333 | 0.100 | 3320 | 1985 | 167 | 0.100 |
| 16.0 | 60 | 6615 | 3375 | 333 | 0.085 | 3320 | 1685 | 167 | 0.085 |
| 16.0 | 90 | 5955 | 2680 | 299 | 0.075 | 2980 | 1340 | 150 | 0.075 |
| 16.0 | 110 | 5955 | 2680 | 299 | 0.075 | 2980 | 1340 | 150 | 0.075 |
| 20.0 | 45 | 5290 | 3205 | 332 | 0.101 | 2645 | 1545 | 166 | 0.097 |
| 20.0 | 60 | 5290 | 3205 | 332 | 0.101 | 2645 | 1545 | 166 | 0.097 |
| 20.0 | 70 | 5290 | 2720 | 332 | 0.086 | 2645 | 1315 | 166 | 0.083 |
| 20.0 | 110 | 4765 | 2165 | 299 | 0.076 | 2385 | 1040 | 150 | 0.073 |




DIA. = Diameter
LOC = Length of Cut
RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

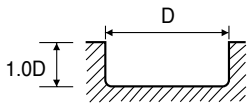
# 4G MILL END MILLS

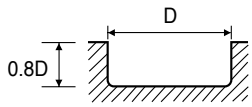
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SLOTTING

### G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALLOYED STEELS CARBON STEELS TOOL STEELS, CAST IRON | | | | ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS | | | |
| HARDNESS | ~ HRc 25 | | | | HRc 25 ~ HRc 40 | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 12000 | 1550 | 225 | 0.032 | 10600 | 1100 | 200 | 0.026 |
| 8.0 | 9000 | 1650 | 225 | 0.046 | 8100 | 1180 | 205 | 0.036 |
| 10.0 | 7200 | 1650 | 225 | 0.057 | 6400 | 1180 | 200 | 0.046 |
| 12.0 | 6000 | 1540 | 225 | 0.064 | 5400 | 1140 | 205 | 0.053 |
| 16.0 | 4500 | 1500 | 225 | 0.067 | 4100 | 1050 | 205 | 0.051 |
| 20.0 | 3600 | 1330 | 225 | 0.074 | 3200 | 900 | 200 | 0.056 |



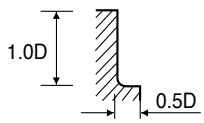



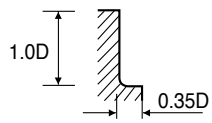

RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

## CARBIDE, 4&5 FLUTE MULTIPLE HELIX CORNER RADIUS - SIDE CUTTING

### G9D75, G9D67, G9D76, G9D68, G9D77, G9D69 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALLOYED STEELS CARBON STEELS TOOL STEELS, CAST IRON | | | | ALLOYED STEELS, CARBON STEELS TOOL STEELS, CAST IRON PREHARDENED STEELS | | | |
| HARDNESS | ~ HRc 25 | | | | HRc 25 ~ HRc 40 | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 15800 | 2570 | 300 | 0.041 | 14300 | 1850 | 270 | 0.032 |
| 8.0 | 11900 | 2700 | 300 | 0.057 | 10700 | 1950 | 270 | 0.046 |
| 10.0 | 9500 | 2700 | 300 | 0.071 | 8500 | 1950 | 265 | 0.057 |
| 12.0 | 8000 | 2570 | 300 | 0.080 | 7100 | 1850 | 270 | 0.065 |
| 16.0 | 6000 | 2450 | 300 | 0.082 | 5400 | 1750 | 270 | 0.065 |
| 20.0 | 4800 | 2140 | 300 | 0.089 | 4300 | 1500 | 270 | 0.070 |



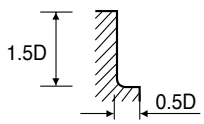

RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

# HSS-PM, 4&5 FLUTE MULTIPLE HELIX SHORT LENGTH CORNER RADIUS

## GAE53 SERIES

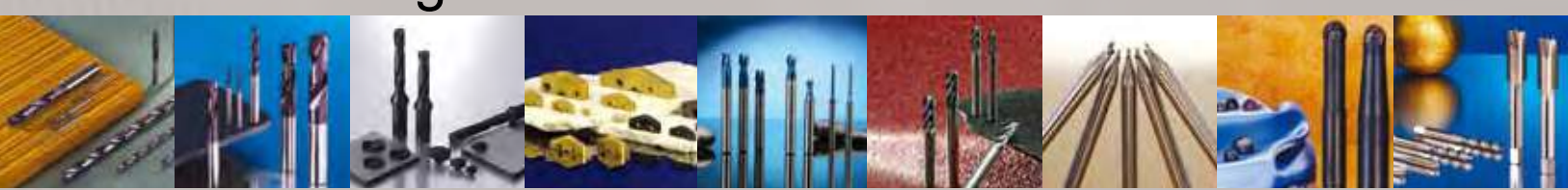
| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | | | STRUCTURAL STEELS CARBON STEELS, CAST IRONS | | | | CARBON STEELS ALLOY STEELS, TOOL STELLS | | | |
| HARDNESS | | | | | ~ HRc 20 | | | | HRc 20 ~ 30 | | | |
| STRENGTH | ~ 500N/mm² | | | | 500 ~ 800N/mm² | | | | 800 ~ 1000N/mm² | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 3250 | 240 | 60 | 0.019 | 2500 | 185 | 48 | 0.018 | 1800 | 120 | 34 | 0.017 |
| 8.0 | 2750 | 300 | 70 | 0.027 | 2150 | 240 | 54 | 0.028 | 1550 | 170 | 38 | 0.027 |
| 10.0 | 2150 | 430 | 70 | 0.050 | 1700 | 330 | 54 | 0.049 | 1200 | 205 | 38 | 0.043 |
| 12.0 | 1800 | 430 | 70 | 0.060 | 1400 | 350 | 54 | 0.063 | 1000 | 240 | 38 | 0.059 |
| 14.0 | 1550 | 430 | 70 | 0.055 | 1200 | 350 | 54 | 0.073 | 850 | 240 | 38 | 0.069 |
| 16.0 | 1400 | 430 | 70 | 0.063 | 1100 | 350 | 54 | 0.081 | 750 | 240 | 38 | 0.080 |
| 18.0 | 1200 | 430 | 70 | 0.072 | 1000 | 350 | 54 | 0.085 | 700 | 240 | 38 | 0.086 |
| 20.0 | 1100 | 445 | 70 | 0.080 | 850 | 350 | 54 | 0.101 | 600 | 240 | 38 | 0.100 |

| MATERIAL | P | | | | M | | | |
|---|---|---|---|---|---|---|---|---|
| | PREHARDENED STEELS ALLOY STEELS, TOOL STEELS | | | | STAINLESS STEELS | | | |
| HARDNESS | HRc 30 ~ 40 | | | | | | | |
| STRENGTH | 1000 ~ 1300N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | Vc | fz | RPM | FEED | Vc | fz |
| 6.0 | 1500 | 110 | 28 | 0.018 | 1750 | 130 | 33 | 0.019 |
| 8.0 | 1200 | 130 | 32 | 0.028 | 1450 | 170 | 36 | 0.029 |
| 10.0 | 1000 | 170 | 32 | 0.041 | 1150 | 200 | 36 | 0.045 |
| 12.0 | 850 | 190 | 32 | 0.055 | 950 | 245 | 36 | 0.064 |
| 14.0 | 700 | 190 | 32 | 0.065 | 850 | 245 | 36 | 0.074 |
| 16.0 | 600 | 190 | 32 | 0.075 | 700 | 245 | 36 | 0.085 |
| 18.0 | 550 | 190 | 32 | 0.082 | 650 | 245 | 36 | 0.093 |
| 20.0 | 500 | 190 | 32 | 0.092 | 600 | 245 | 36 | 0.107 |




RPM = rev./min.
FEED = mm/min.
Vc = m/min.
fz = mm/tooth

Global Cutting Tool Leader **YG-1**



# CARBIDE

Being the best through innovation



# X-POWER END MILLS

- Medium Steels to High Hardened Steels up to HRc70

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **EM154** |  | CARBIDE, 2 FLUTE REGULAR LENGTH ◆ | D1/16 | D1 | **824** |
| **EM206** |  | CARBIDE, 2 FLUTE LONG LENGTH ◆ | D1/8 | D1 | **824** |
| **EM959** |  | CARBIDE, 2 FLUTE MINIATURE ◆ | D.016 | D.062 | **825** |
| **EM153** |  | CARBIDE, 4 FLUTE REGULAR LENGTH ◆ | D1/16 | D1 | **826** |
| **EM207** |  | CARBIDE, 4 FLUTE LONG LENGTH ◆ | D1/8 | D1 | **826** |
| **EM636** |  | CARBIDE, 2 FLUTE STUB LENGTH CORNER RADIUS ◆ | D1/16 | D1/2 | **827** |
| **EM639** |  | CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS ◆ | D1/16 | D1/2 | **827** |
| **EM637** |  | CARBIDE, 2 FLUTE REGULAR LENGTH CORNER RADIUS ◆ | D1/16 | D1/2 | **828** |
| **EM649** |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS ◆ | D1/16 | D1/2 | **828** |
| **EM211** |  | CARBIDE, 2 FLUTE LONG LENGTH CORNER RADIUS ◆ | D1/4 | D1/2 | **829** |
| **EM212** |  | CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS ◆ | D1/4 | D1/2 | **829** |
| **EM102** |  | CARBIDE, 4 FLUTE 45° HELIX LONG LENGTH ◆ | D3/8 | D7/8 | **830** |
| **EM103** |  | CARBIDE, 4 FLUTE 45° HELIX LONG REACH CORNER RADIUS ◆ | D3/8 | D7/8 | **831** |
| **EM965** |  | CARBIDE, 4 FLUTE 55° HELIX STUB LENGTH CORNER RADIUS ◆ | D1/4 | D1/2 | **832** |
| **EM208** |  | CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH ◆ | D1/4 | D1 | **833** |
| **EM218** |  | CARBIDE, 6&8 FLUTE 45° HELIX EXTRA LONG LENGTH ◆ | D1/4 | D1 | **833** |
| **EM668** |  | CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS ◆ | D1/4 | D3/4 | **834** |

◆ U.S.A Stock

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | | | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
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| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **EM209** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE ◆ | R1/64 | R1/2 | **835** |
| **EM210** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE ◆ | R1/16 | R1/2 | **835** |
| **EM961** |  | CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE ◆ | R1/16 | R1/2 | **836** |
| **EM962** |  | CARBIDE, 2 FLUTE LONG REACH BALL NOSE ◆ | R3/64 | R3/8 | **837** |
| **EM960** |  | CARBIDE, 2 FLUTE MINIATURE BALL NOSE ◆ | R.012 | R.031 | **838** |
| **EM109** |  | CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE for OVER HRc55 ◆ | R1/64 | R1/4 | **839** |
| **EM963** |  | CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK ◆ | R1/32 | R1/4 | **840** |
| **EM979** |  | CARBIDE, 2 FLUTE BALL NOSE with PENCIL NECK ◆ | R3/32 | R1/4 | **841** |
| **EM084** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE) ◆ | R1/16 | R5/16 | **843** |
| **EM093** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE) ◆ | R1/16 | R5/16 | **844** |
| **EM096** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE) ◆ | R1/16 | R5/16 | **845** |
| **EM097** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE) ◆ | R1/16 | R5/16 | **846** |
| **EM666** |  | CARBIDE, MULTI FLUTE 20° HELIX STUB LENGTH FINE PITCH ROUGHING ◆ | D1/4 | D1 | **847** |
| **EM156** |  | CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING ◆ | D1/4 | D1 | **847** |
| **EM662** |  | CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING BALL NOSE ◆ | R1/8 | R1/2 | **848** |
| **EM966** |  | CARBIDE, 2 FLUTE for RIB PROCESSING ◆ | D1/32 | D1/8 | **849** |
| **EM967** |  | CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING ◆ | R1/64 | R1/16 | **850** |

◆ U.S.A Stock

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| | | | ○ | ◎ | ◎ | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **METRIC** | | | | | |
| **EM810** |  | CARBIDE, 2 FLUTE SHORT LENGTH ◇ | D1.0 | D25.0 | **851** |
| **EM816** |  | CARBIDE, 2 FLUTE LONG LENGTH ◇ | D2.0 | D25.0 | **852** |
| **EM811** |  | CARBIDE, 4 FLUTE SHORT LENGTH ◇ | D2.0 | D25.0 | **853** |
| **EM817** |  | CARBIDE, 4 FLUTE LONG LENGTH ◇ | D2.0 | D25.0 | **854** |
| **EM895** |  | CARBIDE, 3 FLUTE 38° HELIX SHORT LENGTH ◇ | D1.0 | D20.0 | **855** |
| **EM810** |  | CARBIDE, 2 FLUTE MINIATURE ◇ | D0.4 | D1.5 | **856** |
| **EM818** |  | CARBIDE, 2 FLUTE LONG LENGTH CORNER RADIUS ◇ | D3.0 | D20.0 | **857** |
| **EM819** |  | CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS ◇ | D3.0 | D20.0 | **857** |
| **EM905** |  | CARBIDE, 4 FLUTE 45° HELIX SHORT LENGTH CORNER RADIUS ◇ | D10.0 | D22.0 | **858** |
| **EM839** |  | CARBIDE, 4 FLUTE STUB CUT LENGTH CORNER RADIUS ◇ | D2.0 | D16.0 | **859** |
| **EM812** |  | CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH ◇ | D6.0 | D25.0 | **860** |
| **EM834** |  | CARBIDE, 6&8 FLUTE 45° HELIX EXTRA LONG LENGTH ◇ | D6.0 | D25.0 | **860** |
| **EM835** |  | CARBIDE, 6 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS ◇ | D6.0 | D20.0 | **861** |
| **EM897** |  | CARBIDE, 6 FLUTE 45° HELIX STUB CUT LENGTH CORNER RADIUS ◇ | D6.0 | D12.0 | **862** |
| **EM876** |  | CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE ◇ | R0.5 | R12.5 | **863** |
| **EM813 EM823** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE ◇ | R0.5 | R12.5 | **864** |
| **EM815 EM825** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE ◇ | R0.5 | R12.5 | **864** |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **METRIC** | | | | | |
| **EM899** |  | CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE ◇ | R1.5 | R12.5 | **865** |
| **EM838** |  | CARBIDE, 2 FLUTE LONG REACH BALL NOSE ◇ | R1.0 | R10.0 | **866** |
| **EM865** |  | CARBIDE, 2 FLUTE MINIATURE BALL NOSE ◇ | R0.3 | R0.75 | **867** |
| **EM868** |  | CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE for OVER HRc55 ◇ | R0.5 | R12.5 | **868** |
| **EM902** |  | CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK ◇ | R0.5 | R6.0 | **869** |
| **EM669** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE) ◇ | R1.5 | R8.0 | **870** |
| **EM673** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE) ◇ | R2.5 | R8.0 | **871** |
| **EM863** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC- SPHERE TYPE) ◇ | R1.5 | R8.0 | **872** |
| **EM864** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC- SPHERE TYPE) ◇ | R2.5 | R8.0 | **873** |
| **EM832** |  | CARBIDE, MULTI FLUTE 20° HELIX SHORT LENGTH FINE PITCH ROUGHING ◇ | D6.0 | D25.0 | **874** |
| **EM814** |  | CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING ◇ | D6.0 | D25.0 | **875** |
| **EM833** |  | CARBIDE, 3&4 FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING BALL NOSE ◇ | R3.0 | R10.0 | **876** |
| **EM837** |  | CARBIDE, 2 FLUTE TAPER ◇ | D2.0 | D8.0 | **877** |
| **EM883** |  | CARBIDE, 2 FLUTE for RIB PROCESSING ◇ | D0.8 | D3.0 | **878** |
| **EM886** |  | CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING ◇ | R0.3 | R2.0 | **879** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **880** |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| | | | ○ | ◎ | ◎ | | | | | | | | | |
| ○ | ○ | ◎ | ◎ | ○ | | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |
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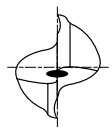
# X-POWER END MILLS

**EM154 SERIES** PLAIN SHANK
**EM206 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR & LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.





MG | 2 | 30° | PLAIN

P.880

◆ U.S.A Stock

**EM154 Series** ■ REGULAR LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 93074 | 1/16 | 1/8 | 3/16 | 1-1/2 |
| 93075 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 93076 | 3/16 | 3/16 | 5/8 | 2 |
| 93077 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 93078 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 93079 | 3/8 | 3/8 | 1 | 2-1/2 |
| 93080 | 1/2 | 1/2 | 1 | 3 |
| 93081 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 93082 | 3/4 | 3/4 | 1-1/2 | 4 |
| 93083 | 1 | 1 | 1-1/2 | 4 |

**EM206 Series** ■ LONG LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 93084 | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 93085 | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 93086 | 1/4 | 1/4 | 1-1/8 | 3 |
| 93087 | 5/16 | 5/16 | 1-1/8 | 3 |
| 93088 | 3/8 | 3/8 | 1-1/8 | 3 |
| 93089 | 1/2 | 1/2 | 2 | 4 |
| 93090 | 5/8 | 5/8 | 2-1/4 | 5 |
| 93091 | 3/4 | 3/4 | 2-1/4 | 5 |
| 93092 | 1 | 1 | 2-1/4 | 5 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM959 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE MINIATURE

- High precision milling in medical, optical, electronics and aero space industries.
- Excellent performance on high hardened steel(HRc70).



MG | 2 | 30° | PLAIN

P.882

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 93495 | .016 | 1/8 | .031 | 1-1/2 |
| 93496 | .020 | 1/8 | .040 | 1-1/2 |
| 93497 | .024 | 1/8 | .047 | 1-1/2 |
| 93498 | .028 | 1/8 | .055 | 1-1/2 |
| 93499 | .031 | 1/8 | .063 | 1-1/2 |
| 93500 | .035 | 1/8 | .080 | 1-1/2 |
| 93501 | .040 | 1/8 | .100 | 1-1/2 |
| 93502 | .043 | 1/8 | .100 | 1-1/2 |
| 93503 | .047 | 1/8 | .157 | 1-1/2 |
| 93504 | .052 | 1/8 | .157 | 1-1/2 |
| 93505 | .055 | 1/8 | .157 | 1-1/2 |
| 93506 | .062 | 1/8 | .157 | 1-1/2 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| ±.0005 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM153 SERIES** PLAIN SHANK
**EM207 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR & LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased production.



MG | 4 | 30° | PLAIN

P.881

◆ U.S.A Stock

**EM153 Series** ■ REGULAR LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 93093 | 1/16 | 1/8 | 3/16 | 1-1/2 |
| 93094 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 93095 | 3/16 | 3/16 | 5/8 | 2 |
| 93096 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 93097 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 93098 | 3/8 | 3/8 | 1 | 2-1/2 |
| 93594 | 7/16 | 7/16 | 1 | 2-3/4 |
| 93099 | 1/2 | 1/2 | 1 | 3 |
| 93100 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 93101 | 3/4 | 3/4 | 1-1/2 | 4 |
| 93102 | 1 | 1 | 1-1/2 | 4 |

**EM207 Series** ■ LONG LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 93103 | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 93104 | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 93105 | 1/4 | 1/4 | 1-1/8 | 3 |
| 93106 | 5/16 | 5/16 | 1-1/8 | 3 |
| 93107 | 3/8 | 3/8 | 1-1/8 | 3 |
| 93108 | 1/2 | 1/2 | 2 | 4 |
| 93109 | 5/8 | 5/8 | 2-1/4 | 5 |
| 93110 | 3/4 | 3/4 | 2-1/4 | 5 |
| 93111 | 1 | 1 | 2-1/4 | 5 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM153 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| EM207 | ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

YG X-POWER END MILLS

EM636 SERIES PLAIN SHANK
EM639 SERIES PLAIN SHANK

# CARBIDE, 2&4 FLUTE STUB LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.




MG | 2&4 | 30° | R ±.001 | PLAIN

P.882, 883

◆ U.S.A Stock

## EM636(2 FLUTE), EM639(4 FLUTE) Series

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 2 FLUTE | 4 FLUTE | R (±.001) | | | | |
| 93172 | 93216 | R.008 | 1/16 | 1/4 | 1/8 | 2-1/4 |
| 93173 | 93217 | R.010 | 1/8 | 1/4 | 1/4 | 2-1/4 |
| 93174 | 93218 | R.020 | 1/8 | 1/4 | 1/4 | 2-1/4 |
| 93175 | - | R.030 | 1/8 | 1/4 | 1/4 | 2-1/4 |
| 93176 | 93220 | R.010 | 3/16 | 1/4 | 3/8 | 2-1/2 |
| 93177 | 93221 | R.020 | 3/16 | 1/4 | 3/8 | 2-1/2 |
| 93178 | 93222 | R.030 | 3/16 | 1/4 | 3/8 | 2-1/2 |
| 93179 | 93223 | R.010 | 1/4 | 1/4 | 1/2 | 3 |
| 93180 | 93224 | R.020 | 1/4 | 1/4 | 1/2 | 3 |
| 93181 | 93225 | R.030 | 1/4 | 1/4 | 1/2 | 3 |
| 93182 | 93226 | R.020 | 5/16 | 5/16 | 1/2 | 3 |
| 93183 | 93227 | R.030 | 5/16 | 5/16 | 1/2 | 3 |
| 93184 | 93228 | R.060 | 5/16 | 5/16 | 1/2 | 3 |
| 93185 | 93229 | R.090 | 5/16 | 5/16 | 1/2 | 3 |
| 93186 | 93230 | R.020 | 3/8 | 3/8 | 5/8 | 3 |
| 93187 | 93231 | R.030 | 3/8 | 3/8 | 5/8 | 3 |
| 93188 | 93232 | R.060 | 3/8 | 3/8 | 5/8 | 3 |
| 93189 | 93233 | R.090 | 3/8 | 3/8 | 5/8 | 3 |
| 93190 | 93234 | R.020 | 1/2 | 1/2 | 5/8 | 4 |
| 93191 | 93235 | R.030 | 1/2 | 1/2 | 5/8 | 4 |
| 93192 | 93236 | R.060 | 1/2 | 1/2 | 5/8 | 4 |
| 93193 | 93237 | R.090 | 1/2 | 1/2 | 5/8 | 4 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM636 | ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| EM639 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# YG X-POWER END MILLS

**EM637 SERIES** PLAIN SHANK
**EM649 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE REGULAR LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.




MG | 2&4 | 30° | R ±.001 | PLAIN

P.882, 883

◆ U.S.A Stock

**EM637 (2 FLUTE), EM649 (4 FLUTE) Series**

Unit : Inch

| EDP No. 2 FLUTE | EDP No. 4 FLUTE | Corner Radius R (±.001) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 93194 | 93238 | R.008 | 1/16 | 1/4 | 3/16 | 2-1/4 |
| 93195 | 93239 | R.010 | 1/8 | 1/4 | 1/2 | 2-1/4 |
| 93196 | 93240 | R.020 | 1/8 | 1/4 | 1/2 | 2-1/4 |
| 93197 | - | R.030 | 1/8 | 1/4 | 1/2 | 2-1/4 |
| 93198 | 93242 | R.010 | 3/16 | 1/4 | 5/8 | 2-1/2 |
| 93199 | 93243 | R.020 | 3/16 | 1/4 | 5/8 | 2-1/2 |
| 93200 | 93244 | R.030 | 3/16 | 1/4 | 5/8 | 2-1/2 |
| 93201 | 93245 | R.010 | 1/4 | 1/4 | 3/4 | 3 |
| 93202 | 93246 | R.020 | 1/4 | 1/4 | 3/4 | 3 |
| 93203 | 93247 | R.030 | 1/4 | 1/4 | 3/4 | 3 |
| 93204 | 93248 | R.020 | 5/16 | 5/16 | 13/16 | 3 |
| 93205 | 93249 | R.030 | 5/16 | 5/16 | 13/16 | 3 |
| 93206 | 93250 | R.060 | 5/16 | 5/16 | 13/16 | 3 |
| 93207 | 93251 | R.090 | 5/16 | 5/16 | 13/16 | 3 |
| 93208 | 93252 | R.020 | 3/8 | 3/8 | 1 | 3 |
| 93209 | 93253 | R.030 | 3/8 | 3/8 | 1 | 3 |
| 93210 | 93254 | R.060 | 3/8 | 3/8 | 1 | 3 |
| 93211 | 93255 | R.090 | 3/8 | 3/8 | 1 | 3 |
| 93600 | 93595 | R.020 | 7/16 | 7/16 | 1 | 4 |
| 93601 | 93597 | R.030 | 7/16 | 7/16 | 1 | 4 |
| 93602 | 93598 | R.060 | 7/16 | 7/16 | 1 | 4 |
| 93603 | 93599 | R.090 | 7/16 | 7/16 | 1 | 4 |
| 93212 | 93256 | R.020 | 1/2 | 1/2 | 1 | 4 |
| 93213 | 93257 | R.030 | 1/2 | 1/2 | 1 | 4 |
| 93214 | 93258 | R.060 | 1/2 | 1/2 | 1 | 4 |
| 93215 | 93259 | R.090 | 1/2 | 1/2 | 1 | 4 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM637 | ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| EM649 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM211 SERIES** PLAIN SHANK
**EM212 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE LONG LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.




MG | 2&4 | 30° | R ±.001 | PLAIN

P.882, 883

◆ U.S.A Stock

### EM211 (2 FLUTE), EM212 (4 FLUTE) Series

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 2 FLUTE | 4 FLUTE | R (±.001) | | | | |
| **93143** | **93157** | R.020 | **1/4** | 1/4 | 1-1/8 | 3 |
| **93144** | **93158** | R.030 | **1/4** | 1/4 | 1-1/8 | 3 |
| **93145** | **93159** | R.020 | **5/16** | 5/16 | 1-1/8 | 3 |
| **93146** | **93160** | R.030 | **5/16** | 5/16 | 1-1/8 | 3 |
| **93147** | **93161** | R.060 | **5/16** | 5/16 | 1-1/8 | 3 |
| **93148** | **93162** | R.090 | **5/16** | 5/16 | 1-1/8 | 3 |
| **93149** | **93163** | R.020 | **3/8** | 3/8 | 1-1/8 | 3 |
| **93150** | **93164** | R.030 | **3/8** | 3/8 | 1-1/8 | 3 |
| **93151** | **93165** | R.060 | **3/8** | 3/8 | 1-1/8 | 3 |
| **93152** | **93166** | R.090 | **3/8** | 3/8 | 1-1/8 | 3 |
| **93153** | **93167** | R.020 | **1/2** | 1/2 | 2 | 4 |
| **93154** | **93168** | R.030 | **1/2** | 1/2 | 2 | 4 |
| **93155** | **93169** | R.060 | **1/2** | 1/2 | 2 | 4 |
| **93156** | **93170** | R.090 | **1/2** | 1/2 | 2 | 4 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM211 | ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| EM212 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM102 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE 45º HELIX LONG LENGTH

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased production.



MG | 4 | 45° | PLAIN

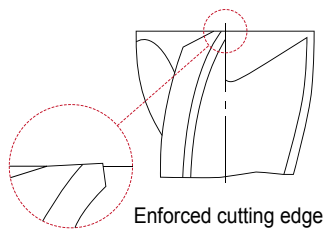
P.883

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| **93395** | **3/8** | 5/16 | 5/8 | 5 |
| **93396** | **1/2** | 3/8 | 3/4 | 6 |
| **93397** | **5/8** | 1/2 | 7/8 | 6-1/2 |
| **93398** | **3/4** | 5/8 | 1 | 7 |
| **93399** | **7/8** | 3/4 | 1-1/4 | 8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



Enforced cutting edge

◎ : Excellent ○ : Good

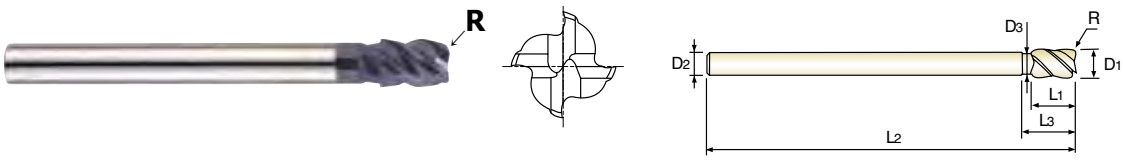
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM103 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE 45º HELIX LONG REACH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Superior workpiece finishes.
- Increased feed rate.




MG | 4 | 45° | R ±.001 | PLAIN

P.884

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.001) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93400** | R.020 | **3/8** | 5/16 | 5/8 | .750 | 5 | .293 |
| **93405** | R.040 | **3/8** | 5/16 | 5/8 | .750 | 5 | .293 |
| **93401** | R.020 | **1/2** | 3/8 | 3/4 | .875 | 6 | .355 |
| **93406** | R.040 | **1/2** | 3/8 | 3/4 | .875 | 6 | .355 |
| **93402** | R.020 | **5/8** | 1/2 | 7/8 | 1.000 | 6-1/2 | .480 |
| **93407** | R.040 | **5/8** | 1/2 | 7/8 | 1.000 | 6-1/2 | .480 |
| **93403** | R.020 | **3/4** | 5/8 | 1 | 1.125 | 7 | .605 |
| **93408** | R.040 | **3/4** | 5/8 | 1 | 1.125 | 7 | .605 |
| **93404** | R.020 | **7/8** | 3/4 | 1-1/4 | 1.375 | 8 | .730 |
| **93409** | R.040 | **7/8** | 3/4 | 1-1/4 | 1.375 | 8 | .730 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

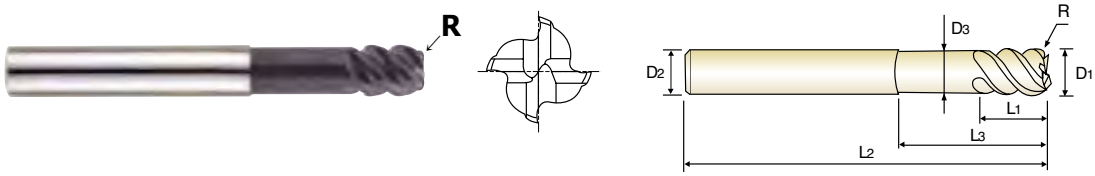
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

YG X-POWER END MILLS

EM965 SERIES PLAIN SHANK

# CARBIDE, 4 FLUTE 55° HELIX STUB LENGTH CORNER RADIUS

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- Corner radius and corner protection against chipping.




MG | 4 | 55° | R ±.001 | PLAIN

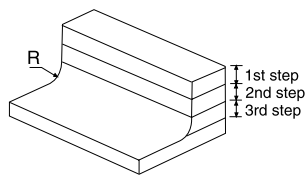
P.885

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.001) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93544** | R.063 | **1/4** | 1/4 | 5/16 | 7/8 | 2-1/4 | .230 |
| **93545** | R.078 | **5/16** | 5/16 | 3/8 | 1 | 2-1/2 | .289 |
| **93546** | R.094 | **3/8** | 3/8 | 7/16 | 1-1/4 | 3 | .344 |
| **93596** | R.109 | **7/16** | 7/16 | 1/2 | 1-1/2 | 3-1/4 | .395 |
| **93547** | R.125 | **1/2** | 1/2 | 1/2 | 1-1/2 | 3-1/4 | .461 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

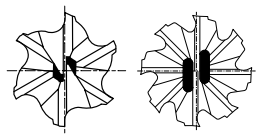
# X-POWER END MILLS

**EM208 SERIES** PLAIN SHANK
**EM218 SERIES** PLAIN SHANK

## CARBIDE, 6&8 FLUTE 45° HELIX LONG & EXTRA LONG LENGTH

- Designed to machine high hardened materials.
- High speed cutting and finish milling with high feed rate.
- Superior workpiece finishes.
- Superior wear resistant.
- Suitable for dry milling.
- Corner Protection against chipping.





MG | 6&8 | 45° | PLAIN

P.886, 887

◆ U.S.A Stock

**EM208 Series** ■ LONG LENGTH

Unit : Inch

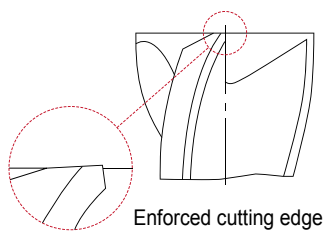
| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 93119 | 1/4 | 1/4 | 1/2 | 2-1/4 | 6 |
| 93120 | 5/16 | 5/16 | 3/4 | 2-1/2 | 6 |
| 93121 | 3/8 | 3/8 | 7/8 | 2-7/8 | 6 |
| 93122 | 1/2 | 1/2 | 1 | 3-1/4 | 6 |
| 93123 | 5/8 | 5/8 | 1-1/4 | 3-5/8 | 6 |
| 93124 | 3/4 | 3/4 | 1-1/2 | 4-1/8 | 8 |
| 93171 | 1 | 1 | 1-3/4 | 4-1/4 | 8 |

**EM218 Series** ■ EXTRA LONG LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 99666 | 1/4 | 1/4 | 1 | 2-3/4 | 6 |
| 99667 | 5/16 | 5/16 | 1-1/2 | 3-5/8 | 6 |
| 99668 | 3/8 | 3/8 | 1-3/4 | 4 | 6 |
| 99669 | 1/2 | 1/2 | 2-3/16 | 4-3/8 | 6 |
| 99670 | 5/8 | 5/8 | 2-5/8 | 5-1/8 | 6 |
| 99588 | 3/4 | 3/4 | 2-1/4 | 5 | 8 |
| 99589 | 3/4 | 3/4 | 3-1/4 | 6 | 8 |
| 99590 | 3/4 | 3/4 | 4-1/8 | 7 | 8 |
| 99591 | 1 | 1 | 4-1/8 | 7 | 8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM668 SERIES** PLAIN SHANK

## CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

- Designed to machine high hardened materials.
- High speed cutting and finish milling with high feed rates.
- Superior workpiece finishes.
- Superior wear resistant.
- Suitable for dry milling.




MG 6&8 45° PLAIN P.887

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| **93277** | R.020 | **1/4** | 1/4 | 1/2 | 2-1/4 | 6 |
| **93278** | R.020 | **5/16** | 5/16 | 3/4 | 2-1/2 | 6 |
| **93279** | R.020 | **3/8** | 3/8 | 7/8 | 2-7/8 | 6 |
| **93280** | R.030 | **3/8** | 3/8 | 7/8 | 2-7/8 | 6 |
| **93281** | R.020 | **1/2** | 1/2 | 1 | 3-1/4 | 6 |
| **93282** | R.030 | **1/2** | 1/2 | 1 | 3-1/4 | 6 |
| **93283** | R.030 | **5/8** | 5/8 | 1-1/4 | 3-5/8 | 6 |
| **93284** | R.060 | **5/8** | 5/8 | 1-1/4 | 3-5/8 | 6 |
| **93285** | R.030 | **3/4** | 3/4 | 1-1/2 | 4-1/8 | 8 |
| **93286** | R.060 | **3/4** | 3/4 | 1-1/2 | 4-1/8 | 8 |
| **93287** | R.090 | **3/4** | 3/4 | 1-1/2 | 4-1/8 | 8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM209 SERIES** PLAIN SHANK
**EM210 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE LONG LENGTH BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- For copy-milling machines.




MG | 2&4 | 30° | R ±.001 | PLAIN

P.888, 889

◆ U.S.A Stock

**EM209(2 FLUTE), EM210(4 FLUTE) Series**

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 2 FLUTE | 4 FLUTE | R (±.001) | | | | |
| **93260** | - | R 1/64 | **1/32** | 1/4 | 1/32 | 2-1/2 |
| **93261** | - | R 1/32 | **1/16** | 1/4 | 1/16 | 2-1/2 |
| **93262** | - | R 3/64 | **3/32** | 1/4 | 3/32 | 2-1/2 |
| **93125** | **93134** | R 1/16 | **1/8** | 1/8 | 5/16 | 2-3/8 |
| **93126** | **93135** | R 3/32 | **3/16** | 3/16 | 3/8 | 3-1/8 |
| **93127** | **93136** | R 1/8 | **1/4** | 1/4 | 1/2 | 3-1/2 |
| **93128** | **93137** | R 5/32 | **5/16** | 5/16 | 9/16 | 4 |
| **93129** | **93138** | R 3/16 | **3/8** | 3/8 | 3/4 | 4 |
| **93130** | **93139** | R 1/4 | **1/2** | 1/2 | 7/8 | 4-1/4 |
| **93131** | **93140** | R 5/16 | **5/8** | 5/8 | 1-1/4 | 5-1/2 |
| **93132** | **93141** | R 3/8 | **3/4** | 3/4 | 1-1/2 | 6-1/4 |
| **93133** | **93142** | R 1/2 | **1** | 1 | 2 | 7-1/8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |

◎ : Excellent ○ : Good

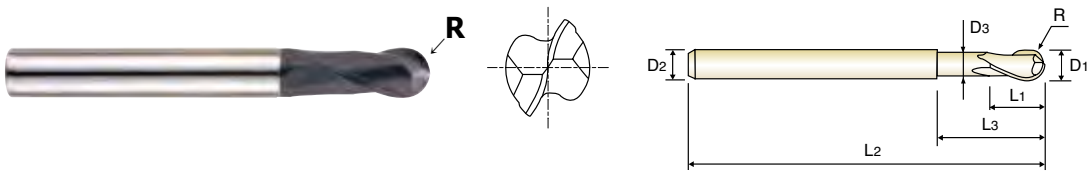
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM961 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE

- Deep slotting milling is possible by reduced neck.
- High efficiency milling is possible in deep slotting with projection of the end mill being long.




MG | 2 | 30° | R ±.001 | PLAIN

P.890

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.001) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93517** | R1/16 | **1/8** | 1/4 | 5/16 | - | 2-3/4 | - |
| **93518** | R3/32 | **3/16** | 1/4 | 1/2 | - | 3-1/8 | - |
| **93519** | R1/8 | **1/4** | 1/4 | 1/2 | 7/8 | 3-1/8 | .242 |
| **93520** | R5/32 | **5/16** | 5/16 | 9/16 | 1-1/16 | 3-1/2 | .305 |
| **93521** | R3/16 | **3/8** | 3/8 | 3/4 | 1-1/4 | 4 | .367 |
| **93522** | R1/4 | **1/2** | 1/2 | 7/8 | 1-3/8 | 4-1/4 | .492 |
| **93523** | R5/16 | **5/8** | 5/8 | 1-1/4 | 2 | 5-1/2 | .617 |
| **93524** | R3/8 | **3/4** | 3/4 | 1-1/2 | 2-1/4 | 6-1/4 | .742 |
| **93525** | R1/2 | **1** | 1 | 2-1/8 | 3 | 7 | .992 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM962 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG REACH BALL NOSE

▶ Longer overall length than EM209, EM210, type and suitable for machining deeply located area.




MG | 2 | 30° | R ±.001 | PLAIN

P.891

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose R (±.001) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| **93578** | R3/64 | **3/32** | 1/8 | 1/4 | 3-1/8 |
| **93579** | R1/16 | **1/8** | 1/8 | 5/16 | 4 |
| **93580** | R3/32 | **3/16** | 3/16 | 3/8 | 4-3/4 |
| **93581** | R1/8 | **1/4** | 1/4 | 3/8 | 4-3/4 |
| **93582** | R5/32 | **5/16** | 5/16 | 9/16 | 5-1/2 |
| **93583** | R3/16 | **3/8** | 3/8 | 3/4 | 7 |
| **93584** | R1/4 | **1/2** | 1/2 | 7/8 | 8 |
| **93585** | R5/16 | **5/8** | 5/8 | 1-1/4 | 10 |
| **93586** | R3/8 | **3/4** | 3/4 | 1-1/2 | 10 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

YG X-POWER END MILLS

EM960 SERIES PLAIN SHANK

# CARBIDE, 2 FLUTE MINIATURE BALL NOSE

- High precision milling in medical, optical, electronics and aerospace industrials.
- Excellent performance at dry cutting conditon.
- Excellent performance on high hardened steel up to HRc70.




MG | 2 | 30° | R ±.0005 | PLAIN

P.897

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose R (±.0005) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| **93507** | R.012 | **.024** | 1/8 | .043 | 1-1/2 |
| **93508** | R.014 | **.028** | 1/8 | .060 | 1-1/2 |
| **93509** | R.0155 | **.031** | 1/8 | .080 | 1-1/2 |
| **93510** | R.0175 | **.035** | 1/8 | .087 | 1-1/2 |
| **93511** | R.020 | **.040** | 1/8 | .100 | 1-1/2 |
| **93512** | R.0215 | **.043** | 1/8 | .118 | 1-1/2 |
| **93513** | R.0235 | **.047** | 1/8 | .118 | 1-1/2 |
| **93514** | R.026 | **.052** | 1/8 | .138 | 1-1/2 |
| **93515** | R.0275 | **.055** | 1/8 | .138 | 1-1/2 |
| **93516** | R.031 | **.062** | 1/8 | .157 | 1-1/2 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

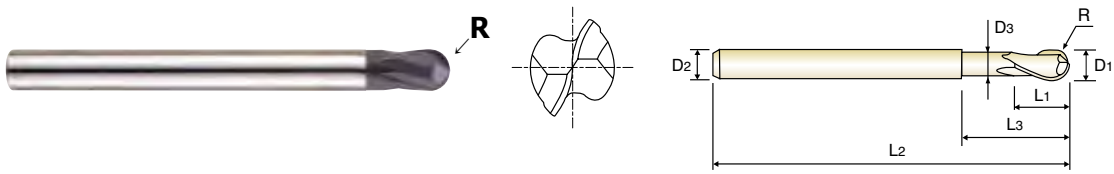
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM109 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE for OVER HRc55

- Suitable for HRc55~HRc70 high hardened materials.
- Strong cutting edges and higher tool rigidity.




MG | 2 | 15° | R ±.0005 | PLAIN

P.892

**HRc55 ~ HRc70**
◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93485** | R1/64 | **1/32** | 1/4 | 1/32 | 1/16 | 2 | .029 |
| **93486** | R1/32 | **1/16** | 1/4 | 1/16 | 1/8 | 2 | .059 |
| **93487** | R3/64 | **3/32** | 1/4 | 3/32 | 3/16 | 2 | .090 |
| **93488** | R1/16 | **1/8** | 1/4 | 1/8 | 1/4 | 2-1/2 | .121 |
| **93489** | R3/32 | **3/16** | 1/4 | 3/16 | 3/8 | 3 | .184 |
| **93490** | R1/8 | **1/4** | 1/4 | 1/4 | 1/2 | 3-1/2 | .246 |
| **93491** | R5/32 | **5/16** | 5/16 | 5/16 | 5/8 | 4 | .309 |
| **93492** | R3/16 | **3/8** | 3/8 | 3/8 | 3/4 | 4 | .371 |
| **93493** | R1/4 | **1/2** | 1/2 | 1/2 | 1 | 4-1/2 | .496 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

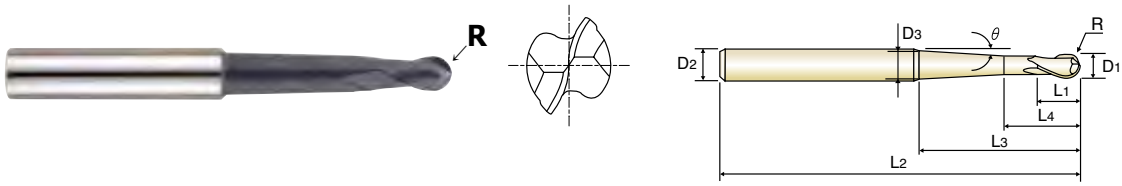
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | ○ | ◎ | ◎ | | | | | | | | | |

# X-POWER END MILLS

EM963 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.




MG | 2 | 30° | R ±.0005 | PLAIN

P.893

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Under Neck Parallel Length | Length Below Shank | Overall Length | Neck Diameter | Neck Taper Angle |
|---|---|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L4 | L3 | L2 | D3 | θ |
| **93526** | R1/32 | **1/16** | 1/4 | 5/32 | 15/64 | 7/8 | 2-3/8 | .096 | 1° 30′ |
| **93527** | R1/32 | **1/16** | 1/4 | 5/32 | 15/64 | 1-5/8 | 3-1/8 | .208 | 3° |
| **93528** | R1/16 | **1/8** | 1/4 | 1/4 | 21/64 | 2-1/16 | 3-5/8 | .216 | 1° 30′ |
| **93529** | R3/32 | **3/16** | 3/8 | 3/8 | 29/64 | 2-3/8 | 4-3/8 | .288 | 1° 30′ |
| **93530** | R1/8 | **1/4** | 3/8 | 1/2 | 5/8 | 2-1/16 | 4-3/8 | .325 | 1° 30′ |
| **93531** | R5/32 | **5/16** | 1/2 | 9/16 | 11/16 | 2-1/16 | 4-3/4 | .385 | 1° 30′ |
| **93532** | R3/16 | **3/8** | 1/2 | 11/16 | 13/16 | 2-3/8 | 5-1/16 | .458 | 1° 30′ |
| **93533** | R1/4 | **1/2** | 3/4 | 7/8 | 1 | 3-1/4 | 6-3/8 | .618 | 1° 30′ |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

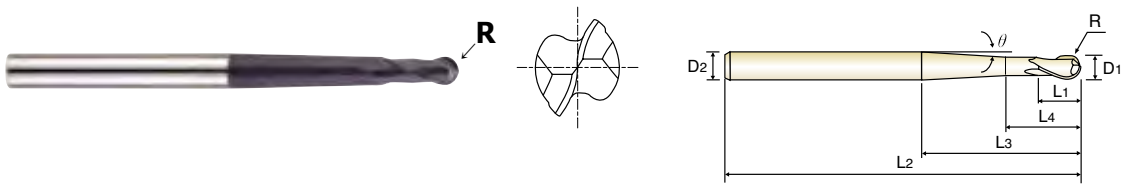
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM979 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE with PENCIL NECK

▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.




MG | 2 | 30° | R ±.0005 | PLAIN

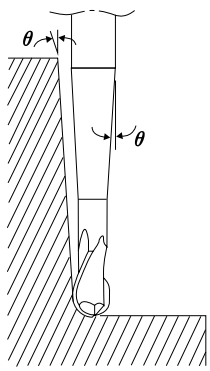
P.894

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Under Neck Parallel Length | Length Below Shank | Overall Length | Neck Taper Angle |
|---|---|---|---|---|---|---|---|---|
| | R (±.0005) | $D_1$ | $D_2$ | $L_1$ | $L_4$ | $L_3$ | $L_2$ | θ |
| **93534** | R3/32 | **3/16** | 3/8 | 9/16 | .659 | 3-11/32 | 7-3/4 | 2° |
| **93535** | R3/32 | **3/16** | 3/8 | 9/16 | .666 | 2-13/16 | 6 | 2° 30′ |
| **93536** | R1/8 | **1/4** | 1/2 | 3/4 | .859 | 4-7/16 | 7-3/4 | 2° |
| **93537** | R1/8 | **1/4** | 1/2 | 3/4 | .856 | 3-23/32 | 6 | 2° 30′ |
| **93538** | R5/32 | **5/16** | 1/2 | 3/4 | .868 | 4-29/32 | 7-3/4 | 1° 20′ |
| **93539** | R5/32 | **5/16** | 1/2 | 3/4 | .870 | 3-15/16 | 6 | 1° 45′ |
| **93540** | R3/16 | **3/8** | 5/8 | 1-3/16 | 1.326 | 4-29/32 | 7-3/4 | 2° |
| **93541** | R3/16 | **3/8** | 5/8 | 1-3/16 | 1.325 | 4-3/16 | 6 | 2° 30′ |
| **93542** | R1/4 | **1/2** | 5/8 | 1-3/16 | 1.309 | 4 | 7-3/4 | 1° 20′ |
| **93543** | R1/4 | **1/2** | 5/8 | 1-3/16 | 1.329 | 3-3/8 | 6 | 1° 45′ |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |




MILLING ON TAPERED WALL

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

YG X-POWER END MILLS

# X-POWER BALL NOSE END MILLS - MMC

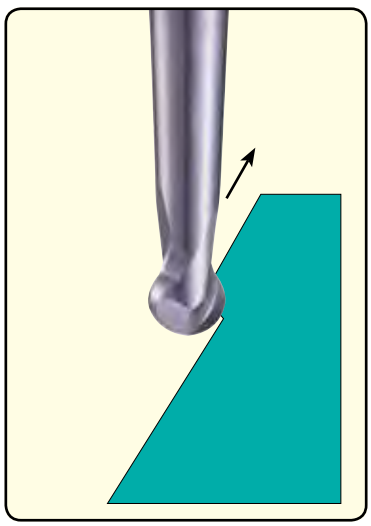
## Useful Field Area

- Die & Mold making, Turbine manufacturing and Aircraft Industry, etc.
- Difficult 3-D Forms.
- Profiling of up to HRc 65 high hardened steels and Alloy steels, Nickelbase alloys, Titanium alloys.

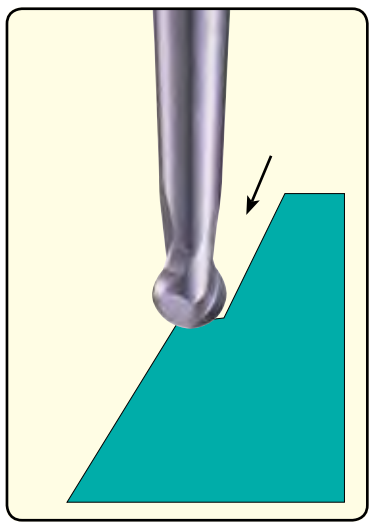
## Characteristics

- Ultra micro grain carbide which increase both toughness and hardness.
- YG-1's unique X-POWER coating suitable for dry cutting and high speed cutting.
- Oustanding tool geometry and sphere shape ball enables more increased tool life and higher speed and feed operation.

## Surpassing Milling Operation

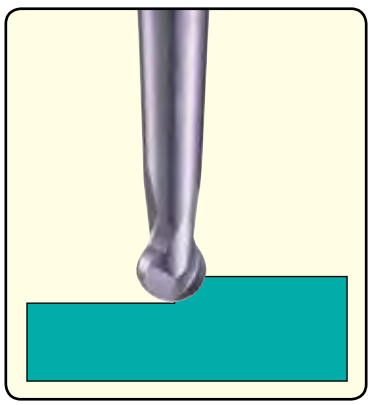


Favorable Back Milling

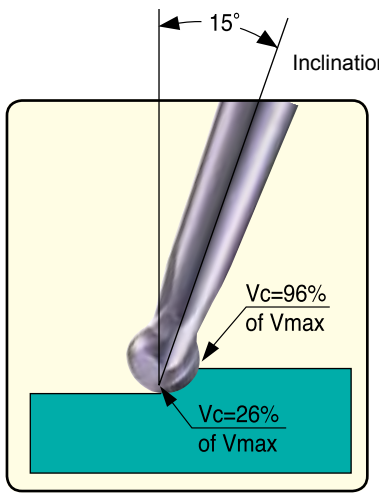


Unfavorable Drilling

- Operating angle 14° ~ 16°, higher speed and feed are possible by decreased cutting resistance at the cutting edges contacting the workpiece.
- Excellent surface finish and faster milling process.
- Enable to milling with higher speed and feed when Back Milling.



Unfavorable Profiling




Favorable Profiling

- When 15° inclination milling operation, more productivity and higher speed and feed are possible.
- Decreased cutting force.
- Excellent surface roughness and brightness.

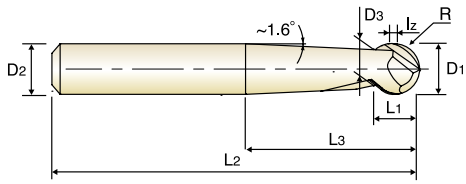
# X-POWER END MILLS

**EM084 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Easy to regrind.




MG | 2 | 30° | R ±.0005 | PLAIN

P.895

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Iz |
|---|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 | |
| **93288** | R1/16 | **1/8** | 1/4 | 5/32 | 1-1/4 | 3-1/4 | .100 | .060 |
| **93289** | R3/32 | **3/16** | 1/4 | 7/32 | 1-1/4 | 3-1/4 | .150 | .080 |
| **93290** | R1/8 | **1/4** | 1/4 | 9/32 | 1-1/4 | 4 | .200 | .080 |
| **93291** | R5/32 | **5/16** | 5/16 | 3/8 | 1-1/2 | 4 | .250 | .120 |
| **93292** | R3/16 | **3/8** | 3/8 | 13/32 | 1-3/4 | 4 | .300 | .120 |
| **93293** | R1/4 | **1/2** | 1/2 | 17/32 | 2-1/4 | 4-1/4 | .400 | .120 |
| **93294** | R5/16 | **5/8** | 5/8 | 5/8 | 2-3/4 | 6-1/4 | .500 | .120 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

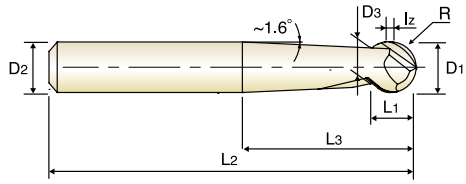
# X-POWER END MILLS

**EM093 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Easy to regrind.




MG | 4 | 30° | R ±.0005 | PLAIN

P.896

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Iz |
|---|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 | |
| **93295** | R1/16 | **1/8** | 1/4 | 5/32 | 1-1/4 | 3-1/4 | .100 | .060 |
| **93296** | R3/32 | **3/16** | 1/4 | 7/32 | 1-1/4 | 3-1/4 | .150 | .080 |
| **93297** | R1/8 | **1/4** | 1/4 | 9/32 | 1-1/4 | 4 | .200 | .080 |
| **93298** | R5/32 | **5/16** | 5/16 | 3/8 | 1-1/2 | 4 | .250 | .120 |
| **93299** | R3/16 | **3/8** | 3/8 | 13/32 | 1-3/4 | 4 | .300 | .120 |
| **93300** | R1/4 | **1/2** | 1/2 | 17/32 | 2-1/4 | 4-1/4 | .400 | .120 |
| **93301** | R5/16 | **5/8** | 5/8 | 5/8 | 2-3/4 | 6-1/4 | .500 | .120 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

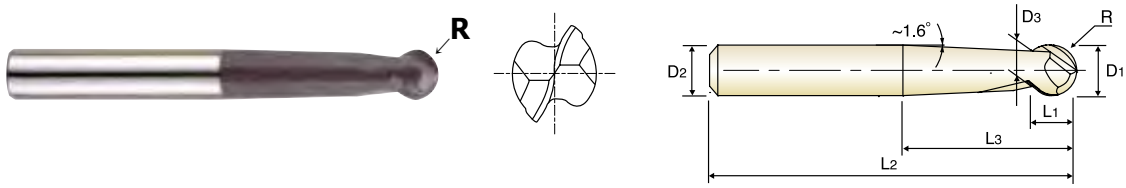
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM096 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°




MG | 2 | 30° | R ±.0005 | PLAIN

P.895

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93410** | R1/16 | **1/8** | 1/4 | .100 | 1-1/4 | 3-1/4 | .100 |
| **93411** | R3/32 | **3/16** | 1/4 | .150 | 1-1/4 | 3-1/4 | .150 |
| **93412** | R1/8 | **1/4** | 1/4 | .200 | 1-1/8 | 4 | .200 |
| **93413** | R5/32 | **5/16** | 5/16 | .250 | 1-3/8 | 4 | .250 |
| **93414** | R3/16 | **3/8** | 3/8 | .300 | 1-5/8 | 4 | .300 |
| **93415** | R1/4 | **1/2** | 1/2 | .400 | 2-3/16 | 4-1/4 | .400 |
| **93416** | R5/16 | **5/8** | 5/8 | .500 | 2-3/4 | 6-1/4 | .500 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

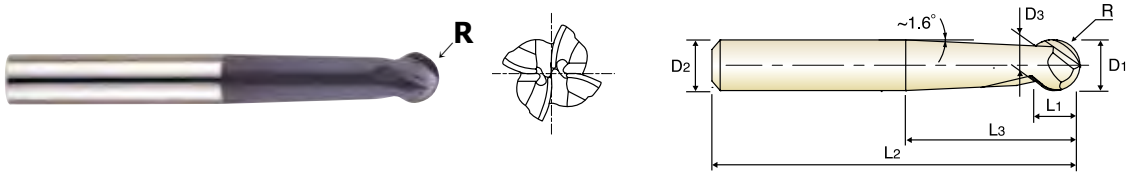
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM097 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°




MG | 4 | 30° | R ±.0005 | PLAIN

P.896

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0005) | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **93417** | R1/16 | **1/8** | 1/4 | .100 | 1-1/4 | 3-1/4 | .100 |
| **93418** | R3/32 | **3/16** | 1/4 | .150 | 1-1/4 | 3-1/4 | .150 |
| **93419** | R1/8 | **1/4** | 1/4 | .200 | 1-1/8 | 4 | .200 |
| **93420** | R5/32 | **5/16** | 5/16 | .250 | 1-3/8 | 4 | .250 |
| **93421** | R3/16 | **3/8** | 3/8 | .300 | 1-5/8 | 4 | .300 |
| **93422** | R1/4 | **1/2** | 1/2 | .400 | 2-3/16 | 4-1/4 | .400 |
| **93423** | R5/16 | **5/8** | 5/8 | .500 | 2-3/4 | 6-1/4 | .500 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

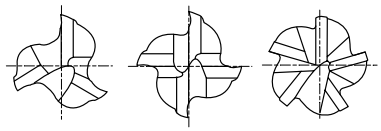
# X-POWER END MILLS

**EM666 SERIES** PLAIN SHANK
**EM156 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 20° HELIX STUB & LONG LENGTH FINE PITCH ROUGHING

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.





MG | FINE | 3-5 | 20° | PLAIN

P.897

◆ U.S.A Stock

**EM666 Series** ■ STUB LENGTH

Unit : Inch

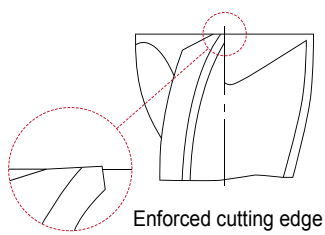
| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 93270 | 1/4 | 1/4 | 5/16 | 2-1/8 | 3 |
| 93271 | 5/16 | 5/16 | 3/8 | 2-1/4 | 3 |
| 93272 | 3/8 | 3/8 | 9/16 | 2-1/2 | 3 |
| 93273 | 1/2 | 1/2 | 5/8 | 3 | 4 |
| 93274 | 5/8 | 5/8 | 7/8 | 3-1/4 | 4 |
| 93275 | 3/4 | 3/4 | 1 | 3-3/4 | 4 |
| 93276 | 1 | 1 | 1 | 4 | 5 |

**EM156 Series** ■ LONG LENGTH

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 93112 | 1/4 | 1/4 | 3/4 | 2-1/2 | 3 |
| 93113 | 5/16 | 5/16 | 3/4 | 2-1/2 | 3 |
| 93114 | 3/8 | 3/8 | 7/8 | 2-1/2 | 3 |
| 93115 | 1/2 | 1/2 | 1 | 3 | 4 |
| 93116 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | 4 |
| 93117 | 3/4 | 3/4 | 1-5/8 | 4 | 4 |
| 93118 | 1 | 1 | 1-3/4 | 4 | 5 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 1/4~3/8 | 0 ~ −.0022 | 0 ~ −.0003 |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |



Enforced cutting edge

◎ : Excellent ○ : Good

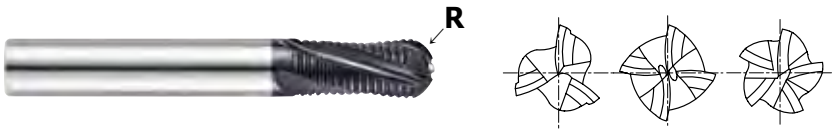
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM662 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.




MG | FINE | 3-5 | 20° | R ±.001 | PLAIN

P.898

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose R (±.001) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| **93263** | R1/8 | **1/4** | 1/4 | 3/4 | 2-1/2 | 3 |
| **93264** | R5/32 | **5/16** | 5/16 | 3/4 | 2-1/2 | 3 |
| **93265** | R3/16 | **3/8** | 3/8 | 7/8 | 2-1/2 | 3 |
| **93266** | R1/4 | **1/2** | 1/2 | 1 | 3 | 4 |
| **93267** | R5/16 | **5/8** | 5/8 | 1-1/4 | 3-1/2 | 4 |
| **93268** | R3/8 | **3/4** | 3/4 | 1-5/8 | 4 | 4 |
| **93269** | R1/2 | **1** | 1 | 1-3/4 | 4 | 5 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 1/4~3/8 | 0 ~ −.0022 | 0 ~ −.0003 |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |

◎ : Excellent ○ : Good

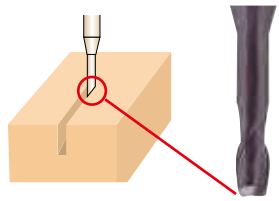
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

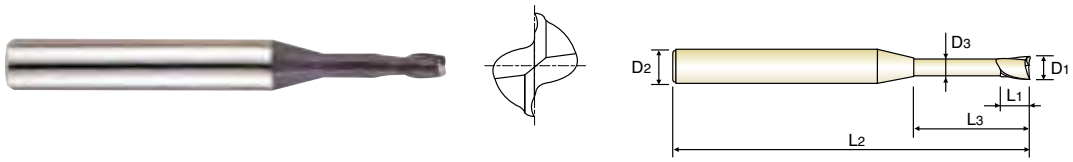
# X-POWER END MILLS

**EM966 SERIES**

## CARBIDE, 2 FLUTE for RIB PROCESSING

- For deep slotting & pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.






MG | 2 | 30° | PLAIN

P.898

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|
| | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **93548** | **1/32** | 1/8 | 3/64 | 7/32 | 2 | .029 |
| **93549** | **1/32** | 1/8 | 3/64 | 5/16 | 2 | .029 |
| **93550** | **3/64** | 1/8 | 1/16 | 7/32 | 2 | .045 |
| **93551** | **3/64** | 1/8 | 1/16 | 9/32 | 2 | .045 |
| **93552** | **3/64** | 1/8 | 1/16 | 1/2 | 2 | .045 |
| **93553** | **1/16** | 1/8 | 3/32 | 5/16 | 2 | .060 |
| **93554** | **1/16** | 1/8 | 3/32 | 3/8 | 2 | .060 |
| **93555** | **1/16** | 1/8 | 3/32 | 1/2 | 2 | .060 |
| **93556** | **1/16** | 1/8 | 3/32 | 5/8 | 2 | .060 |
| **93557** | **5/64** | 1/8 | 1/8 | 1/2 | 2 | .076 |
| **93558** | **5/64** | 1/8 | 1/8 | 5/8 | 2 | .076 |
| **93559** | **3/32** | 1/8 | 9/64 | 1/2 | 2 | .090 |
| **93560** | **3/32** | 1/8 | 9/64 | 5/8 | 2 | .090 |
| **93561** | **1/8** | 1/4 | 3/16 | 9/16 | 2-1/4 | .120 |
| **93562** | **1/8** | 1/4 | 3/16 | 3/4 | 2-1/4 | .120 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0006 | 0~−.0003 |

◎ : Excellent ○ : Good

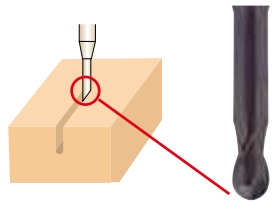
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

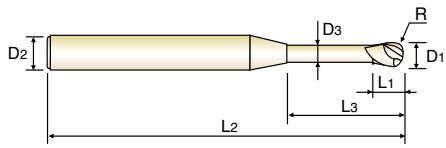
**EM967 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- For 3-D milling, deep slotting and pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.






MG | 2 | 30° | R ±.0005 | PLAIN

P.899

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 |
| **93563** | R1/64 | **1/32** | 1/8 | 3/64 | 7/32 | 2 | .029 |
| **93564** | R1/64 | **1/32** | 1/8 | 3/64 | 5/16 | 2 | .029 |
| **93565** | R.0234 | **3/64** | 1/8 | 1/16 | 7/32 | 2 | .045 |
| **93566** | R.0234 | **3/64** | 1/8 | 1/16 | 9/32 | 2 | .045 |
| **93567** | R.0234 | **3/64** | 1/8 | 1/16 | 1/2 | 2 | .045 |
| **93568** | R1/32 | **1/16** | 1/8 | 3/32 | 5/16 | 2 | .060 |
| **93569** | R1/32 | **1/16** | 1/8 | 3/32 | 1/2 | 2 | .060 |
| **93570** | R1/32 | **1/16** | 1/8 | 3/32 | 5/8 | 2 | .060 |
| **93571** | R.0391 | **5/64** | 1/8 | 1/8 | 5/16 | 2 | .076 |
| **93572** | R.0391 | **5/64** | 1/8 | 1/8 | 5/8 | 2 | .076 |
| **93573** | R.0391 | **5/64** | 1/8 | 1/8 | 3/4 | 2 | .076 |
| **93574** | R3/64 | **3/32** | 1/8 | 9/64 | 5/8 | 2 | .090 |
| **93575** | R3/64 | **3/32** | 1/8 | 9/64 | 3/4 | 2 | .090 |
| **93576** | R1/16 | **1/8** | 1/4 | 3/16 | 5/8 | 2-1/4 | .120 |
| **93577** | R1/16 | **1/8** | 1/4 | 3/16 | 3/4 | 2-1/4 | .120 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0006 | 0~−.0003 |

◎ : Excellent ○ : Good

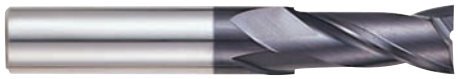
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

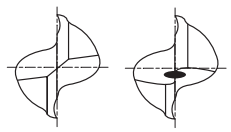
# X-POWER END MILLS

**EM810 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE SHORT LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.





up to Ø3mm over Ø3mm

MG 2 30° PLAIN P.880, 882

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM810901 | 1.0 | .0394 | 6 | 2.5 | 40 |
| EM810902 | 1.5 | .0591 | 6 | 4 | 40 |
| EM810020 | 2.0 | .0787 | 4 | 6 | 40 |
| EM810903 | 2.0 | .0787 | 6 | 6 | 40 |
| EM810025 | 2.5 | .0984 | 4 | 8 | 40 |
| EM810904 | 2.5 | .0984 | 6 | 8 | 40 |
| EM810030 | 3.0 | .1181 | 6 | 8 | 45 |
| EM810035 | 3.5 | .1378 | 6 | 10 | 45 |
| EM810040 | 4.0 | .1575 | 6 | 11 | 45 |
| EM810045 | 4.5 | .1772 | 6 | 11 | 45 |
| EM810050 | 5.0 | .1969 | 6 | 13 | 50 |
| EM810055 | 5.5 | .2165 | 6 | 13 | 50 |
| EM810060 | 6.0 | .2362 | 6 | 13 | 50 |
| EM810065 | 6.5 | .2559 | 8 | 16 | 60 |
| EM810070 | 7.0 | .2756 | 8 | 16 | 60 |
| EM810075 | 7.5 | .2953 | 8 | 16 | 60 |
| EM810080 | 8.0 | .3150 | 8 | 19 | 60 |
| EM810085 | 8.5 | .3346 | 10 | 19 | 70 |
| EM810090 | 9.0 | .3543 | 10 | 19 | 70 |
| EM810095 | 9.5 | .3740 | 10 | 19 | 70 |
| EM810100 | 10.0 | .3937 | 10 | 22 | 70 |
| EM810105 | 10.5 | .4134 | 12 | 22 | 75 |
| EM810110 | 11.0 | .4330 | 12 | 22 | 75 |
| EM810115 | 11.5 | .4527 | 12 | 22 | 75 |
| EM810120 | 12.0 | .4724 | 12 | 26 | 75 |
| EM810906 | 13.0 | .5118 | 12 | 26 | 85 |
| EM810140 | 14.0 | .5512 | 14 | 26 | 85 |
| EM810905 | 14.0 | .5512 | 16 | 26 | 85 |
| EM810908 | 15.0 | .5905 | 16 | 26 | 90 |

◎ : Excellent ○ : Good

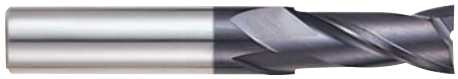
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

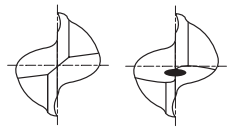
# X-POWER END MILLS

**EM810 SERIES** PLAIN SHANK
**EM816 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE SHORT& LONG LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.





up to Ø3mm over Ø3mm

MG | 2 | 30° | PLAIN

P.880

◇ Call for Availability

### EM810 Series ■ SHORT LENGTH

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM810160 | 16.0 | .6299 | 16 | 32 | 100 |
| EM810909 | 17.0 | .6692 | 16 | 32 | 100 |
| EM810180 | 18.0 | .7087 | 18 | 32 | 100 |
| EM810911 | 19.0 | .7480 | 20 | 32 | 100 |
| EM810200 | 20.0 | .7874 | 20 | 38 | 105 |
| EM810220 | 22.0 | .8661 | 20 | 38 | 105 |
| EM810240 | 24.0 | .9449 | 25 | 45 | 120 |
| EM810250 | 25.0 | .9843 | 25 | 45 | 120 |

### EM816 Series ■ LONG LENGTH

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM816020 | 2.0 | .0787 | 4 | 8 | 40 |
| EM816030 | 3.0 | .1181 | 6 | 12 | 50 |
| EM816040 | 4.0 | .1575 | 6 | 15 | 50 |
| EM816050 | 5.0 | .1969 | 6 | 20 | 60 |
| EM816060 | 6.0 | .2362 | 6 | 20 | 60 |
| EM816080 | 8.0 | .3150 | 8 | 25 | 70 |
| EM816100 | 10.0 | .3937 | 10 | 30 | 90 |
| EM816120 | 12.0 | .4724 | 12 | 30 | 90 |
| EM816140 | 14.0 | .5512 | 16 | 40 | 110 |
| EM816160 | 16.0 | .6299 | 16 | 50 | 110 |
| EM816180 | 18.0 | .7087 | 20 | 50 | 110 |
| EM816200 | 20.0 | .7874 | 20 | 55 | 110 |
| EM816250 | 25.0 | .9843 | 25 | 75 | 140 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

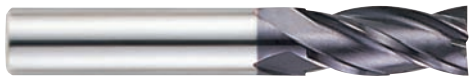
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM811 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE SHORT LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased production.





MG | 4 | 30° | PLAIN

P.881

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM811020 | 2.0 | .0787 | 4 | 6 | 40 |
| EM811901 | 2.0 | .0787 | 6 | 6 | 40 |
| EM811025 | 2.5 | .0984 | 4 | 8 | 40 |
| EM811902 | 2.5 | .0984 | 6 | 8 | 40 |
| EM811030 | 3.0 | .1181 | 6 | 8 | 45 |
| EM811035 | 3.5 | .1378 | 6 | 10 | 45 |
| EM811040 | 4.0 | .1575 | 6 | 11 | 45 |
| EM811045 | 4.5 | .1772 | 6 | 11 | 45 |
| EM811050 | 5.0 | .1969 | 6 | 13 | 50 |
| EM811055 | 5.5 | .2165 | 6 | 13 | 50 |
| EM811060 | 6.0 | .2362 | 6 | 13 | 50 |
| EM811065 | 6.5 | .2559 | 8 | 16 | 60 |
| EM811070 | 7.0 | .2756 | 8 | 16 | 60 |
| EM811075 | 7.5 | .2953 | 8 | 16 | 60 |
| EM811080 | 8.0 | .3150 | 8 | 19 | 60 |
| EM811085 | 8.5 | .3346 | 10 | 19 | 70 |
| EM811090 | 9.0 | .3543 | 10 | 19 | 70 |
| EM811095 | 9.5 | .3740 | 10 | 19 | 70 |
| EM811100 | 10.0 | .3937 | 10 | 22 | 70 |
| EM811105 | 10.5 | .4134 | 12 | 22 | 75 |
| EM811110 | 11.0 | .4330 | 12 | 22 | 75 |
| EM811115 | 11.5 | .4527 | 12 | 22 | 75 |
| EM811120 | 12.0 | .4724 | 12 | 26 | 75 |
| EM811904 | 13.0 | .5118 | 12 | 26 | 85 |
| EM811140 | 14.0 | .5512 | 14 | 26 | 85 |
| EM811905 | 14.0 | .5512 | 12 | 26 | 85 |
| EM811903 | 14.0 | .5512 | 16 | 26 | 85 |
| EM811906 | 15.0 | .5905 | 16 | 26 | 90 |
| EM811160 | 16.0 | .6299 | 16 | 32 | 100 |

◎ : Excellent ○ : Good

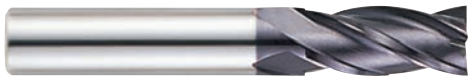
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

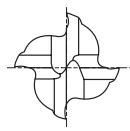
# X-POWER END MILLS

**EM811 SERIES** PLAIN SHANK
**EM817 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE SHORT& LONG LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- 4 flute allows for better workpiece finishes.
- Increased production.





MG HM | 4 | 30° | PLAIN

P.881

◇ Call for Availability

### EM811 Series ■ SHORT LENGTH

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM811907 | 17.0 | .6692 | 16 | 32 | 100 |
| EM811180 | 18.0 | .7087 | 18 | 32 | 100 |
| EM811908 | 18.0 | .7087 | 16 | 32 | 100 |
| EM811909 | 19.0 | .7480 | 20 | 32 | 100 |
| EM811200 | 20.0 | .7874 | 20 | 38 | 105 |
| EM811220 | 22.0 | .8661 | 20 | 38 | 105 |
| EM811240 | 24.0 | .9449 | 25 | 45 | 120 |
| EM811250 | 25.0 | .9843 | 25 | 45 | 120 |

### EM817 Series ■ LONG LENGTH

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM817020 | 2.0 | .0787 | 4 | 8 | 40 |
| EM817030 | 3.0 | .1181 | 6 | 12 | 50 |
| EM817040 | 4.0 | .1575 | 6 | 15 | 50 |
| EM817050 | 5.0 | .1969 | 6 | 20 | 60 |
| EM817060 | 6.0 | .2362 | 6 | 20 | 60 |
| EM817080 | 8.0 | .3150 | 8 | 25 | 70 |
| EM817100 | 10.0 | .3937 | 10 | 30 | 90 |
| EM817120 | 12.0 | .4724 | 12 | 30 | 90 |
| EM817140 | 14.0 | .5512 | 16 | 40 | 110 |
| EM817160 | 16.0 | .6299 | 16 | 50 | 110 |
| EM817180 | 18.0 | .7087 | 20 | 50 | 110 |
| EM817200 | 20.0 | .7874 | 20 | 55 | 110 |
| EM817250 | 25.0 | .9843 | 25 | 75 | 140 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM811 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |
| EM817 | ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

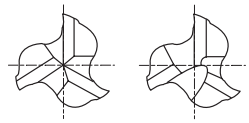
# X-POWER END MILLS

**EM895 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 38° HELIX SHORT LENGTH

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Possesses the advantage of 2 flute and 4 flute end mill.
- Superior workpiece finishes.





under Ø3mm from Ø3mm

MG HM | 3 | 38° | PLAIN

P.900

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM895010 | 1.0 | .0394 | 3 | 2.5 | 38 |
| EM895015 | 1.5 | .0591 | 4 | 5 | 50 |
| EM895025 | 2.5 | .0984 | 3 | 7 | 38 |
| EM895030 | 3.0 | .1181 | 3 | 10 | 38 |
| EM895901 | 3.0 | .1181 | 6 | 10 | 50 |
| EM895035 | 3.5 | .1378 | 4 | 12 | 50 |
| EM895902 | 3.5 | .1378 | 6 | 12 | 50 |
| EM895040 | 4.0 | .1575 | 4 | 12 | 50 |
| EM895903 | 4.0 | .1575 | 6 | 12 | 50 |
| EM895045 | 4.5 | .1772 | 6 | 14 | 57 |
| EM895050 | 5.0 | .1969 | 5 | 14 | 50 |
| EM895904 | 5.0 | .1969 | 6 | 14 | 57 |
| EM895060 | 6.0 | .2362 | 6 | 16 | 57 |
| EM895080 | 8.0 | .3150 | 8 | 20 | 63 |
| EM895100 | 10.0 | .3937 | 10 | 22 | 72 |
| EM895120 | 12.0 | .4724 | 12 | 25 | 73 |
| EM895140 | 14.0 | .5512 | 14 | 25 | 75 |
| EM895160 | 16.0 | .6299 | 16 | 32 | 82 |
| EM895180 | 18.0 | .7087 | 18 | 32 | 92 |
| EM895200 | 20.0 | .7874 | 20 | 38 | 92 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

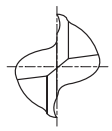
YG X-POWER END MILLS

EM810 SERIES PLAIN SHANK

# CARBIDE, 2 FLUTE MINIATURE

- High precision milling in medical, optical, electronics and aero space industries.
- Excellent performance on hardened steel





MG HM | 2 | 30° | PLAIN

P.882

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| EM810004 | 0.4 | .0157 | 3 | 0.8 | 40 |
| EM810005 | 0.5 | .0197 | 3 | 1 | 40 |
| EM810006 | 0.6 | .0236 | 3 | 1.2 | 40 |
| EM810007 | 0.7 | .0276 | 3 | 1.4 | 40 |
| EM810008 | 0.8 | .0315 | 3 | 1.6 | 40 |
| EM810009 | 0.9 | .0354 | 3 | 2 | 40 |
| EM810010 | 1.0 | .0394 | 4 | 2.5 | 40 |
| EM810011 | 1.1 | .0433 | 4 | 2.5 | 40 |
| EM810012 | 1.2 | .0472 | 4 | 4 | 40 |
| EM810013 | 1.3 | .0512 | 4 | 4 | 40 |
| EM810014 | 1.4 | .0551 | 4 | 4 | 40 |
| EM810015 | 1.5 | .0591 | 4 | 4 | 40 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

YG X-POWER END MILLS

**EM818 SERIES** PLAIN SHANK
**EM819 SERIES** PLAIN SHANK

# CARBIDE, 2&4 FLUTE LONG LENGTH CORNER RADIUS

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.




MG HM | 2&4 | 30° | PLAIN

P.901

◇ Call for Availability

## EM818(2 FLUTE), EM819(4 FLUTE) Series

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|
| 2 FLUTE | 4 FLUTE | R | Metric | Inch | | | |
| EM818030 | EM819030 | R0.3 | 3.0 | .1181 | 6 | 12 | 50 |
| EM818040 | EM819040 | R0.3 | 4.0 | .1575 | 6 | 15 | 50 |
| EM818911 | EM819911 | R0.5 | 4.0 | .1575 | 6 | 15 | 50 |
| EM818050 | EM819050 | R0.3 | 5.0 | .1969 | 6 | 20 | 60 |
| EM818912 | EM819912 | R0.5 | 5.0 | .1969 | 6 | 20 | 60 |
| EM818913 | EM819913 | R0.3 | 6.0 | .2362 | 6 | 20 | 60 |
| EM818060 | EM819060 | R0.5 | 6.0 | .2362 | 6 | 20 | 60 |
| EM818901 | EM819901 | R1.0 | 6.0 | .2362 | 6 | 20 | 60 |
| EM818914 | EM819914 | R0.3 | 8.0 | .3150 | 8 | 25 | 70 |
| EM818080 | EM819080 | R0.5 | 8.0 | .3150 | 8 | 25 | 70 |
| EM818902 | EM819902 | R1.0 | 8.0 | .3150 | 8 | 25 | 70 |
| EM818903 | EM819903 | R1.5 | 8.0 | .3150 | 8 | 25 | 70 |
| EM818904 | EM819904 | R2.0 | 8.0 | .3150 | 8 | 25 | 70 |
| EM818915 | EM819915 | R0.3 | 10.0 | .3937 | 10 | 30 | 90 |
| EM818100 | EM819100 | R0.5 | 10.0 | .3937 | 10 | 30 | 90 |
| EM818905 | EM819905 | R1.0 | 10.0 | .3937 | 10 | 30 | 90 |
| EM818906 | EM819906 | R1.5 | 10.0 | .3937 | 10 | 30 | 90 |
| EM818907 | EM819907 | R2.0 | 10.0 | .3937 | 10 | 30 | 90 |
| EM818120 | EM819120 | R0.5 | 12.0 | .4724 | 12 | 30 | 90 |
| EM818908 | EM819908 | R1.0 | 12.0 | .4724 | 12 | 30 | 90 |
| EM818909 | EM819909 | R1.5 | 12.0 | .4724 | 12 | 30 | 90 |
| EM818910 | EM819910 | R2.0 | 12.0 | .4724 | 12 | 30 | 90 |
| EM818160 | EM819160 | R0.5 | 16.0 | .6299 | 16 | 50 | 110 |
| EM818916 | EM819916 | R1.0 | 16.0 | .6299 | 16 | 50 | 110 |
| EM818917 | EM819917 | R1.5 | 16.0 | .6299 | 16 | 50 | 110 |
| EM818918 | EM819918 | R2.0 | 16.0 | .6299 | 16 | 50 | 110 |
| EM818200 | EM819200 | R0.5 | 20.0 | .7874 | 20 | 55 | 110 |
| EM818919 | EM819919 | R1.0 | 20.0 | .7874 | 20 | 55 | 110 |
| EM818920 | EM819920 | R1.5 | 20.0 | .7874 | 20 | 55 | 110 |
| EM818921 | EM819921 | R2.0 | 20.0 | .7874 | 20 | 55 | 110 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| EM811 | ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |
| EM817 | ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM905 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE 45° HELIX SHORT LENGTH CORNER RADIUS

- No line is marked on the boundary section during step milling because this tool has radius on the end faces of the shank
- High speed cutting in wide deep wall with step milling
- Suitable for deep side milling, Helical Milling, Contour Milling




MG HM | 4 | 45° | PLAIN

P.884

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | $D_1$ | | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **EM905100** | R0.5 | **10.0** | **.3937** | 8 | 15 | 19.2 | 130 | 7.5 |
| **EM905901** | R1.0 | **10.0** | **.3937** | 8 | 15 | 19.2 | 130 | 7.5 |
| **EM905120** | R0.5 | **12.0** | **.4724** | 10 | 18 | 22.2 | 150 | 9.5 |
| **EM905902** | R1.0 | **12.0** | **.4724** | 10 | 18 | 22.2 | 150 | 9.5 |
| **EM905140** | R0.5 | **14.0** | **.5512** | 12 | 21 | 25.2 | 160 | 11.5 |
| **EM905903** | R1.0 | **14.0** | **.5512** | 12 | 21 | 25.2 | 160 | 11.5 |
| **EM905180** | R0.5 | **18.0** | **.7087** | 16 | 27 | 31.2 | 180 | 15.5 |
| **EM905904** | R1.0 | **18.0** | **.7087** | 16 | 27 | 31.2 | 180 | 15.5 |
| **EM905220** | R0.5 | **22.0** | **.8661** | 20 | 33 | 37.2 | 200 | 19.5 |
| **EM905905** | R1.0 | **22.0** | **.8661** | 20 | 33 | 37.2 | 200 | 19.5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

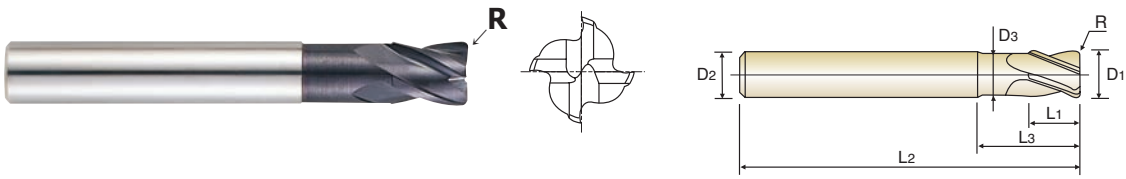
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM839 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- Designed to machine tool steels, alloy steels, mold steels and other hardened materials.
- Superior workpiece finishes.
- Increased feed rates.




MG HM | 4 | 30° | PLAIN

P.902

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| EM839020 | R0.2 | 2.0 | .0787 | 6 | 2.5 | 5 | 50 | 1.9 |
| EM839025 | R0.25 | 2.5 | .0984 | 6 | 3 | 6 | 50 | 2.4 |
| EM839030 | R0.3 | 3.0 | .1181 | 6 | 4 | 7 | 50 | 2.8 |
| EM839035 | R0.35 | 3.5 | .1378 | 6 | 4.5 | 8 | 50 | 3.2 |
| EM839040 | R0.4 | 4.0 | .1575 | 6 | 5 | 9 | 50 | 3.7 |
| EM839050 | R0.5 | 5.0 | .1969 | 6 | 6 | 12 | 50 | 4.6 |
| EM839060 | R0.6 | 6.0 | .2362 | 6 | 7 | 14 | 55 | 5.6 |
| EM839080 | R0.8 | 8.0 | .3150 | 8 | 10 | 18 | 60 | 7.4 |
| EM839100 | R1.0 | 10.0 | .3937 | 10 | 12 | 25 | 70 | 9.4 |
| EM839120 | R1.2 | 12.0 | .4724 | 12 | 15 | 30 | 80 | 11.4 |
| EM839160 | R1.6 | 16.0 | .6299 | 16 | 18 | 35 | 90 | 15.4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

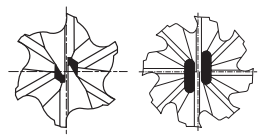
# X-POWER END MILLS

**EM812 SERIES** PLAIN SHANK
**EM834 SERIES** PLAIN SHANK

## CARBIDE, 6&8 FLUTE 45° HELIX LONG & EXTRA LONG LENGTH

- Designed to machine hardened materials.
- High speed cutting and finish milling with high feed rates.
- Superior workpiece finishes.
- Superior wear resistant.
- Suitable for dry milling.





MG HM | 6&8 | 45° | PLAIN

P.886, 887

◇ Call for Availability

### EM812 Series ■ LONG LENGTH

Unit : mm

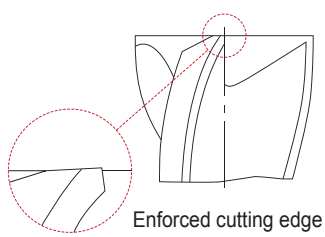
| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| EM812060 | 6.0 | .2362 | 6 | 13 | 57 | 6 |
| EM812070 | 7.0 | .2756 | 8 | 16 | 63 | 6 |
| EM812080 | 8.0 | .3150 | 8 | 19 | 63 | 6 |
| EM812090 | 9.0 | .3543 | 10 | 19 | 72 | 6 |
| EM812100 | 10.0 | .3937 | 10 | 22 | 72 | 6 |
| EM812120 | 12.0 | .4724 | 12 | 26 | 83 | 6 |
| EM812140 | 14.0 | .5512 | 14 | 26 | 83 | 6 |
| EM812901 | 14.0 | .5512 | 16 | 26 | 83 | 6 |
| EM812160 | 16.0 | .6299 | 16 | 32 | 92 | 6 |
| EM812180 | 18.0 | .7087 | 18 | 32 | 92 | 8 |
| EM812200 | 20.0 | .7874 | 20 | 38 | 104 | 8 |
| EM812250 | 25.0 | .9843 | 25 | 44 | 104 | 8 |

### EM834 Series ■ EXTRA LONG LENGTH

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| EM834060 | 6.0 | .2362 | 6 | 26 | 70 | 6 |
| EM834080 | 8.0 | .3150 | 8 | 36 | 90 | 6 |
| EM834100 | 10.0 | .3937 | 10 | 46 | 100 | 6 |
| EM834120 | 12.0 | .4724 | 12 | 56 | 110 | 6 |
| EM834160 | 16.0 | .6299 | 16 | 66 | 130 | 6 |
| EM834200 | 20.0 | .7874 | 20 | 76 | 140 | 6 |
| EM834250 | 25.0 | .9843 | 25 | 92 | 180 | 6 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM835 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS

- Designed to machine hardened materials.
- High speed cutting and finish milling with high feed rates.
- Superior workpiece finishes.
- Superior wear resistant.
- Suitable for dry milling.




MG HM | 6 | 45° | PLAIN

P.887

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius R | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| EM835060 | R0.5 | 6.0 | .2362 | 6 | 13 | 70 |
| EM835080 | R0.5 | 8.0 | .3150 | 8 | 19 | 90 |
| EM835100 | R0.5 | 10.0 | .3937 | 10 | 22 | 100 |
| EM835901 | R1.0 | 10.0 | .3937 | 10 | 22 | 100 |
| EM835120 | R0.5 | 12.0 | .4724 | 12 | 26 | 110 |
| EM835902 | R1.0 | 12.0 | .4724 | 12 | 26 | 110 |
| EM835160 | R1.0 | 16.0 | .6299 | 16 | 32 | 130 |
| EM835903 | R1.5 | 16.0 | .6299 | 16 | 32 | 130 |
| EM835200 | R1.0 | 20.0 | .7874 | 20 | 38 | 140 |
| EM835904 | R1.5 | 20.0 | .7874 | 20 | 38 | 140 |
| EM835905 | R2.0 | 20.0 | .7874 | 20 | 38 | 140 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

**EM897 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 45° HELIX STUB LENGTH CORNER RADIUS

- High speed cutting
- Excellent performance in dry cutting
- Cutting up to three times length of the cutting diameter due to reduced neck.






MG HM | 6 | 45° | PLAIN

P.902

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | R | D1 | | D2 | L1 | L3 | L2 | D3 |
| EM897060 | R0.5 | 6.0 | .2362 | 6 | 6 | 14 | 50 | 5.7 |
| EM897080 | R0.5 | 8.0 | .3150 | 8 | 8 | 24 | 60 | 7.65 |
| EM897100 | R1.0 | 10.0 | .3937 | 10 | 10 | 30 | 70 | 9.65 |
| EM897120 | R1.0 | 12.0 | .4724 | 12 | 12 | 30 | 75 | 11.6 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE

- Economic type with short overall length.
- Radius tolerance ±0.02mm & short length of cut.






MG HM | 2 | 30° | R ±0.02 | PLAIN

P.888

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | R (±0.02) | Metric | Inch | | | |
| EM876010 | R0.5 | 1.0 | .0394 | 3 | 3 | 38 |
| EM876012 | R0.6 | 1.2 | .0472 | 3 | 3 | 38 |
| EM876015 | R0.75 | 1.5 | .0591 | 3 | 3 | 38 |
| EM876020 | R1.0 | 2.0 | .0787 | 6 | 3 | 50 |
| EM876030 | R1.5 | 3.0 | .1181 | 6 | 4 | 50 |
| EM876040 | R2.0 | 4.0 | .1575 | 6 | 5 | 54 |
| EM876050 | R2.5 | 5.0 | .1969 | 6 | 6 | 54 |
| EM876060 | R3.0 | 6.0 | .2362 | 6 | 7 | 54 |
| EM876070 | R3.5 | 7.0 | .2756 | 8 | 8 | 58 |
| EM876080 | R4.0 | 8.0 | .3150 | 8 | 9 | 58 |
| EM876090 | R4.5 | 9.0 | .3543 | 10 | 10 | 66 |
| EM876100 | R5.0 | 10.0 | .3937 | 10 | 11 | 66 |
| EM876120 | R6.0 | 12.0 | .4724 | 12 | 12 | 73 |
| EM876140 | R7.0 | 14.0 | .5512 | 14 | 14 | 75 |
| EM876160 | R8.0 | 16.0 | .6299 | 16 | 16 | 82 |
| EM876180 | R9.0 | 18.0 | .7087 | 18 | 18 | 84 |
| EM876200 | R10.0 | 20.0 | .7874 | 20 | 20 | 92 |
| EM876250 | R12.5 | 25.0 | .9843 | 25 | 25 | 104 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM813 / EM815 SERIES** PLAIN SHANK
**EM823 / EM825 SERIES** FLAT SHANK

## CARBIDE, 2&4 FLUTE LONG LENGTH BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- For copy - milling machines.




MG HM | 2&4 | 30° | R ±0.02 | PLAIN | FLAT

P.888, 889

◇ Call for Availability

### EM813, EM823(2 FLUTE), EM815, EM825(4 FLUTE) Series

Unit : mm

| EDP No. | | | | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| 2 FLUTE | | 4 FLUTE | | | | | | | |
| PLAIN | FLAT | PLAIN | FLAT | R (±0.02) | Metric | Inch | | | |
| 93302 | — | 93335 | — | R0.5 | 1.0 | .0394 | 4 | 2.5 | 50 |
| 93303 | — | — | — | R0.6 | 1.2 | .0472 | 4 | 3 | 50 |
| 93304 | — | 93336 | — | R0.75 | 1.5 | .0591 | 4 | 4 | 50 |
| 93305 | 93320 | 93337 | 93352 | R1.0 | 2.0 | .0787 | 6 | 5 | 50 |
| 93306 | 93321 | 93338 | 93353 | R1.5 | 3.0 | .1181 | 6 | 8 | 60 |
| 93307 | 93322 | 93339 | 93354 | R2.0 | 4.0 | .1575 | 6 | 8 | 70 |
| 93308 | 93323 | 93340 | 93355 | R2.5 | 5.0 | .1969 | 6 | 10 | 80 |
| 93309 | 93324 | 93341 | 93356 | R3.0 | 6.0 | .2362 | 6 | 12 | 90 |
| 93310 | 93325 | 93342 | 93357 | R3.5 | 7.0 | .2756 | 8 | 14 | 90 |
| 93311 | 93326 | 93343 | 93358 | R4.0 | 8.0 | .3150 | 8 | 14 | 100 |
| 93312 | 93327 | 93344 | 93359 | R4.5 | 9.0 | .3543 | 10 | 18 | 100 |
| 93313 | 93328 | 93345 | 93360 | R5.0 | 10.0 | .3937 | 10 | 18 | 100 |
| 93314 | 93329 | 93346 | 93361 | R6.0 | 12.0 | .4724 | 12 | 22 | 110 |
| 93315 | 93330 | 93347 | 93362 | R7.0 | 14.0 | .5512 | 14 | 26 | 110 |
| 93316 | 93331 | 93348 | 93363 | R8.0 | 16.0 | .6299 | 16 | 30 | 140 |
| 93317 | 93332 | 93349 | 93364 | R9.0 | 18.0 | .7087 | 18 | 34 | 140 |
| 93318 | 93333 | 93350 | 93365 | R10.0 | 20.0 | .7874 | 20 | 38 | 160 |
| 93319 | 93334 | 93351 | 93366 | R12.5 | 25.0 | .9843 | 25 | 50 | 180 |

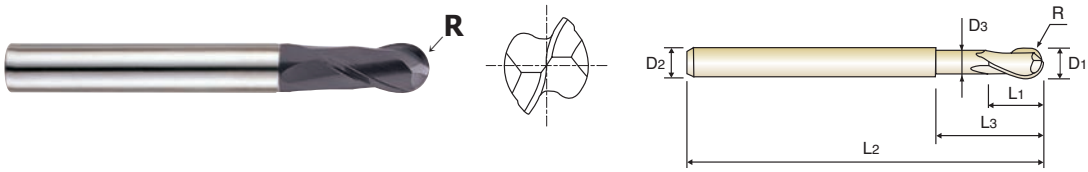
| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE

- Deep slotting milling is possible by reduced neck.
- High efficiency milling is possible in deep slotting with projection of the end mill being long.




MG HM | 2 | 30° | R ±0.01 | PLAIN

P.890

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EM899030 | R1.5 | 3.0 | .1181 | 6 | 8 | — | 70 | — |
| EM899040 | R2.0 | 4.0 | .1575 | 6 | 8 | — | 70 | — |
| EM899050 | R2.5 | 5.0 | .1969 | 6 | 12 | — | 80 | — |
| EM899060 | R3.0 | 6.0 | .2362 | 6 | 12 | 22 | 80 | 5.8 |
| EM899070 | R3.5 | 7.0 | .2756 | 8 | 14 | — | 90 | — |
| EM899080 | R4.0 | 8.0 | .3150 | 8 | 14 | 27 | 90 | 7.8 |
| EM899100 | R5.0 | 10.0 | .3937 | 10 | 18 | 31 | 100 | 9.8 |
| EM899120 | R6.0 | 12.0 | .4724 | 12 | 22 | 35 | 110 | 11.8 |
| EM899140 | R7.0 | 14.0 | .5512 | 12 | 26 | — | 120 | — |
| EM899160 | R8.0 | 16.0 | .6299 | 16 | 30 | 50 | 140 | 15.8 |
| EM899180 | R9.0 | 18.0 | .7087 | 16 | 34 | — | 140 | — |
| EM899200 | R10.0 | 20.0 | .7874 | 20 | 38 | 58 | 160 | 19.8 |
| EM899250 | R12.5 | 25.0 | .9843 | 25 | 55 | 75 | 180 | 24.8 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM838 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG REACH BALL NOSE

▶ Longer overall length than EM813 types and suitable for machining deeply located area.




MG HM | 2 | 30° | R ±0.02 | PLAIN

P.891

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | R (±0.02) | Metric | Inch | | | |
| EM838020 | R1.0 | 2.0 | .0787 | 3 | 6 | 80 |
| EM838030 | R1.5 | 3.0 | .1181 | 3 | 8 | 100 |
| EM838040 | R2.0 | 4.0 | .1575 | 4 | 8 | 100 |
| EM838050 | R2.5 | 5.0 | .1969 | 6 | 10 | 120 |
| EM838060 | R3.0 | 6.0 | .2362 | 6 | 10 | 120 |
| EM838080 | R4.0 | 8.0 | .3150 | 8 | 14 | 140 |
| EM838100 | R5.0 | 10.0 | .3937 | 10 | 18 | 180 |
| EM838120 | R6.0 | 12.0 | .4724 | 12 | 22 | 200 |
| EM838160 | R8.0 | 16.0 | .6299 | 16 | 30 | 250 |
| EM838200 | R10.0 | 20.0 | .7874 | 20 | 38 | 250 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# CARBIDE, 2 FLUTE MINIATURE BALL NOSE

- High precision milling in medical, optical, electronics and aerospace industrials.
- Excellent performance at dry cutting conditon.
- Excellent performance on hardened steel.




MG HM | 2 | 30° | R ±0.01 | PLAIN

P.897

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose R (±0.01) | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 93424 | R0.30 | 0.6 | .0236 | 3 | 1.1 | 40 |
| 93425 | R0.35 | 0.7 | .0276 | 3 | 1.5 | 40 |
| 93426 | R0.40 | 0.8 | .0315 | 3 | 2.0 | 40 |
| 93427 | R0.45 | 0.9 | .0354 | 3 | 2.2 | 40 |
| 93428 | R0.50 | 1.0 | .0394 | 3 | 2.5 | 40 |
| 93429 | R0.55 | 1.1 | .0433 | 3 | 3.0 | 40 |
| 93430 | R0.60 | 1.2 | .0472 | 3 | 3.0 | 40 |
| 93431 | R0.65 | 1.3 | .0512 | 3 | 3.5 | 40 |
| 93432 | R0.70 | 1.4 | .0551 | 3 | 3.5 | 40 |
| 93433 | R0.75 | 1.5 | .0591 | 3 | 4.0 | 40 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

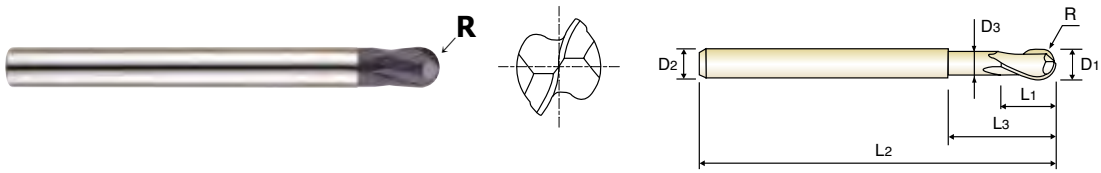
YG X-POWER END MILLS

EM868 SERIES PLAIN SHANK

# CARBIDE, 2 FLUTE 15° HELIX STUB CUT LENGTH BALL NOSE for OVER HRc55

## *HRc55 ~ HRc70*

- Suitable for HRc55~HRc70 high hardened materials.
- Strong cutting edges and higher tool rigidity.




MG HM | 2 | 15° | R ±0.01 | PLAIN

P.892

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EM868010 | R0.5 | **1.0** | **.0394** | 4 | 1 | 2.2 | 50 | 0.95 |
| EM868901 | R0.5 | **1.0** | **.0394** | 6 | 1 | 2.2 | 50 | 0.95 |
| EM868012 | R0.6 | **1.2** | **.0472** | 4 | 1.2 | 2.6 | 50 | 1.1 |
| EM868015 | R0.75 | **1.5** | **.0591** | 4 | 1.5 | 3 | 50 | 1.4 |
| EM868020 | R1.0 | **2.0** | **.0787** | 6 | 2 | 4 | 50 | 1.9 |
| EM868030 | R1.5 | **3.0** | **.1181** | 6 | 3 | 6 | 60 | 2.9 |
| EM868040 | R2.0 | **4.0** | **.1575** | 6 | 4 | 8 | 70 | 3.9 |
| EM868050 | R2.5 | **5.0** | **.1969** | 6 | 5 | 10 | 80 | 4.9 |
| EM868060 | R3.0 | **6.0** | **.2362** | 6 | 6 | 12 | 90 | 5.9 |
| EM868070 | R3.5 | **7.0** | **.2756** | 8 | 7 | 14 | 90 | 6.9 |
| EM868080 | R4.0 | **8.0** | **.3150** | 8 | 8 | 16 | 100 | 7.9 |
| EM868090 | R4.5 | **9.0** | **.3543** | 10 | 9 | 18 | 100 | 8.9 |
| EM868100 | R5.0 | **10.0** | **.3937** | 10 | 10 | 20 | 100 | 9.9 |
| EM868120 | R6.0 | **12.0** | **.4724** | 12 | 12 | 24 | 110 | 11.9 |
| EM868140 | R7.0 | **14.0** | **.5512** | 14 | 14 | 28 | 110 | 13.8 |
| EM868160 | R8.0 | **16.0** | **.6299** | 16 | 16 | 32 | 140 | 15.8 |
| EM868180 | R9.0 | **18.0** | **.7087** | 18 | 18 | 36 | 140 | 17.8 |
| EM868200 | R10.0 | **20.0** | **.7874** | 20 | 20 | 40 | 160 | 19.8 |
| EM868250 | R12.5 | **25.0** | **.9843** | 25 | 25 | 50 | 180 | 24.8 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

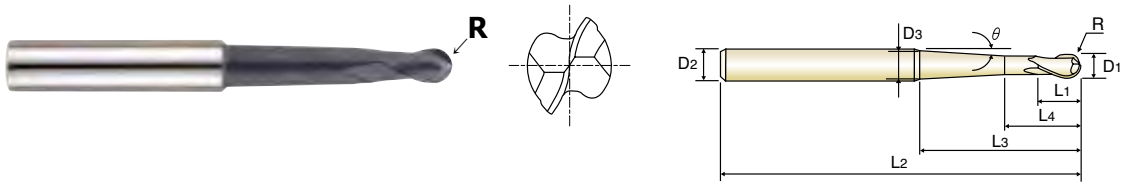
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | ○ | ◎ | ◎ | | | | | | | | | |

# X-POWER END MILLS

**EM902 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

▶ High efficiency milling is possible in deep slotting with projection of the end mill being long.




MG HM | 2 | 30° | R ±0.01 | PLAIN

P.893

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter Metric | Mill Diameter Inch | Shank Diameter | Length of Cut | Under Neck Parallel Length | Length Below Shank | Overall Length | Neck Diameter | Neck Taper Angle |
|---|---|---|---|---|---|---|---|---|---|---|
| | R (±0.01) | D1 | | D2 | L1 | L4 | L3 | L2 | D3 | θ |
| EM902010 | R0.5 | 1.0 | .0394 | 6 | 2 | 4 | 23 | 60 | 2.0 | 1° 30′ |
| EM902901 | R0.5 | 1.0 | .0394 | 6 | 2 | 4 | 23 | 60 | 4.3 | 5° |
| EM902902 | R0.5 | 1.0 | .0394 | 6 | 2 | 4 | 42 | 80 | 5.0 | 3° |
| EM902020 | R1.0 | 2.0 | .0787 | 6 | 4 | 6 | 23 | 60 | 2.9 | 1° 30′ |
| EM902903 | R1.0 | 2.0 | .0787 | 6 | 4 | 6 | 23 | 60 | 5.0 | 5° |
| EM902904 | R1.0 | 2.0 | .0787 | 6 | 4 | 6 | 41 | 80 | 5.7 | 3° |
| EM902030 | R1.5 | 3.0 | .1181 | 6 | 6 | 8 | 32 | 70 | 5.6 | 3° |
| EM902905 | R1.5 | 3.0 | .1181 | 6 | 6 | 8 | 52 | 90 | 5.3 | 1° 30′ |
| EM902040 | R2.0 | 4.0 | .1575 | 6 | 8 | 10 | 28 | 70 | 6.0 | 3° |
| EM902906 | R2.0 | 4.0 | .1575 | 6 | 8 | 10 | 49 | 90 | 6.0 | 1° 30′ |
| EM902050 | R2.5 | 5.0 | .1969 | 8 | 10 | 12 | 41 | 90 | 8.0 | 3° |
| EM902907 | R2.5 | 5.0 | .1969 | 8 | 10 | 12 | 61 | 110 | 7.6 | 1° 30′ |
| EM902060 | R3.0 | 6.0 | .2362 | 8 | 12 | 15 | 34 | 90 | 8.0 | 3° |
| EM902908 | R3.0 | 6.0 | .2362 | 8 | 12 | 15 | 53 | 110 | 8.0 | 1° 30′ |
| EM902080 | R4.0 | 8.0 | .3150 | 10 | 14 | 17 | 36 | 100 | 10.0 | 3° |
| EM902909 | R4.0 | 8.0 | .3150 | 10 | 14 | 17 | 55 | 120 | 10.0 | 1° 30′ |
| EM902100 | R5.0 | 10.0 | .3937 | 12 | 18 | 21 | 40 | 110 | 12.0 | 3° |
| EM902910 | R5.0 | 10.0 | .3937 | 12 | 18 | 21 | 59 | 130 | 12.0 | 1° 30′ |
| EM902120 | R6.0 | 12.0 | .4724 | 16 | 22 | 25 | 63 | 140 | 16.0 | 3° |
| EM902911 | R6.0 | 12.0 | .4724 | 16 | 22 | 25 | 83 | 160 | 15.0 | 1° 30′ |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | | | | | | | | |

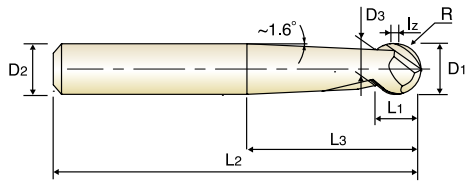
# X-POWER END MILLS

**EM669 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Easy to regrind.




MG HM | 2 | 30° | R ±0.01 | PLAIN

P.895

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | Iz |
|---|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 | |
| EM669030 | R1.5 | 3.0 | .1181 | 6 | 4 | 30 | 80 | 2.5 | 1.5 |
| EM669040 | R2.0 | 4.0 | .1575 | 6 | 5 | 30 | 80 | 3.3 | 1.5 |
| EM669050 | R2.5 | 5.0 | .1969 | 6 | 6 | 43 | 80 | 4.1 | 2.0 |
| EM669060 | R3.0 | 6.0 | .2362 | 6 | 7 | 30 | 100 | 4.7 | 2.0 |
| EM669080 | R4.0 | 8.0 | .3150 | 8 | 9 | 36 | 100 | 6.5 | 3.0 |
| EM669100 | R5.0 | 10.0 | .3937 | 10 | 11 | 43 | 100 | 8.2 | 3.0 |
| EM669120 | R6.0 | 12.0 | .4724 | 12 | 13 | 52 | 100 | 9.8 | 3.0 |
| EM669160 | R8.0 | 16.0 | .6299 | 16 | 15 | 61 | 150 | 13.4 | 3.0 |

※ ECONOMIC TYPE HAS MORE ADVANTAGE IN RESHARPENING THAN SPHERE TYPE.

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

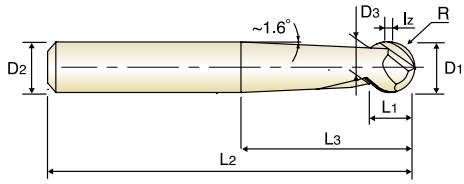
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-ECONOMY TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Easy to regrind.




MG HM | 4 | 30° | R ±0.01 | PLAIN

P.896

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter | lz |
|---|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 | |
| EM673050 | R2.5 | 5.0 | .1969 | 6 | 6 | 43 | 80 | 4.1 | 2.0 |
| EM673060 | R3.0 | 6.0 | .2362 | 6 | 7 | 30 | 100 | 4.7 | 2.0 |
| EM673080 | R4.0 | 8.0 | .3150 | 8 | 9 | 36 | 100 | 6.5 | 3.0 |
| EM673100 | R5.0 | 10.0 | .3937 | 10 | 11 | 43 | 100 | 8.2 | 3.0 |
| EM673120 | R6.0 | 12.0 | .4724 | 12 | 13 | 52 | 100 | 9.8 | 3.0 |
| EM673160 | R8.0 | 16.0 | .6299 | 16 | 15 | 61 | 150 | 13.4 | 3.0 |

※ ECONOMIC TYPE HAS MORE ADVANTAGE IN RESHARPENING THAN SPHERE TYPE.

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

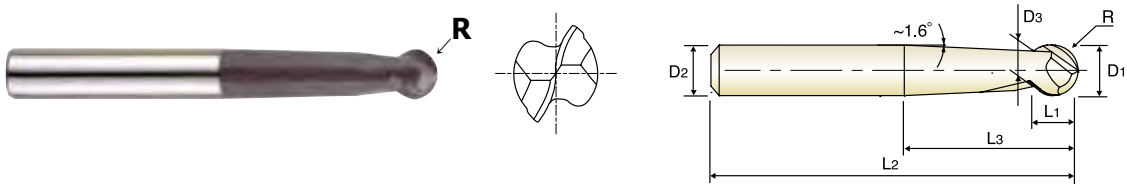
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM863 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°




MG HM | 2 | 30° | R ±0.01 | PLAIN

P.895

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| **EM863030** | R1.5 | **3.0** | **.1181** | 6 | 2.3 | 30 | 80 | 2.5 |
| **EM863040** | R2.0 | **4.0** | **.1575** | 6 | 3.1 | 30 | 80 | 3.3 |
| **EM863050** | R2.5 | **5.0** | **.1969** | 6 | 3.9 | 38 | 80 | 4.1 |
| **EM863060** | R3.0 | **6.0** | **.2362** | 6 | 4.9 | 28 | 100 | 4.7 |
| **EM863080** | R4.0 | **8.0** | **.3150** | 8 | 6.3 | 33 | 100 | 6.5 |
| **EM863100** | R5.0 | **10.0** | **.3937** | 10 | 7.9 | 40 | 100 | 8.2 |
| **EM863120** | R6.0 | **12.0** | **.4724** | 12 | 9.5 | 49 | 100 | 9.8 |
| **EM863160** | R8.0 | **16.0** | **.6299** | 16 | 12.4 | 59 | 150 | 13.4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

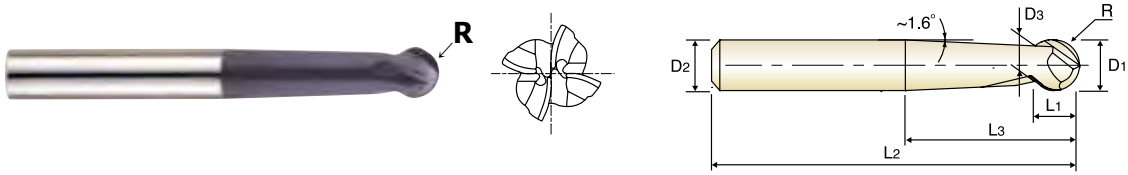
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

# X-POWER END MILLS

**EM864 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE (MMC-SPHERE TYPE)

- Designed for copy milling.
- Increased feed rates.
- 15° inclination.
- Sphere Angle : 250°




MG HM | 4 | 30° | R ±0.01 | PLAIN

P.896

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| **EM864050** | R2.5 | **5.0** | **.1969** | 6 | 3.9 | 38 | 80 | 4.1 |
| **EM864060** | R3.0 | **6.0** | **.2362** | 6 | 4.9 | 28 | 100 | 4.7 |
| **EM864080** | R4.0 | **8.0** | **.3150** | 8 | 6.3 | 33 | 100 | 6.5 |
| **EM864100** | R5.0 | **10.0** | **.3937** | 10 | 7.9 | 40 | 100 | 8.2 |
| **EM864120** | R6.0 | **12.0** | **.4724** | 12 | 9.5 | 49 | 100 | 9.8 |
| **EM864160** | R8.0 | **16.0** | **.6299** | 16 | 12.4 | 59 | 150 | 13.4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | ○ | | ○ | | | | | | | |

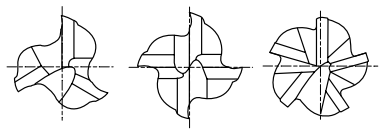
# X-POWER END MILLS

**EM832 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 20° HELIX SHORT LENGTH FINE PITCH ROUGHING

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.





MG HM | FINE | 3-5 | 20° | PLAIN

P.897

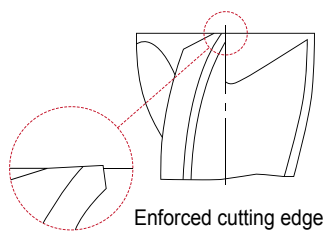
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| | h10 | | h6 | | | |
| EM832060 | 6.0 | .2362 | 6 | 7 | 54 | 3 |
| EM832070 | 7.0 | .2756 | 8 | 8 | 58 | 3 |
| EM832080 | 8.0 | .3150 | 8 | 9 | 58 | 3 |
| EM832090 | 9.0 | .3543 | 10 | 13 | 66 | 4 |
| EM832100 | 10.0 | .3937 | 10 | 14 | 66 | 4 |
| EM832120 | 12.0 | .4724 | 12 | 16 | 73 | 4 |
| EM832140 | 14.0 | .5512 | 14 | 18 | 75 | 4 |
| EM832160 | 16.0 | .6299 | 16 | 22 | 82 | 4 |
| EM832180 | 18.0 | .7087 | 18 | 24 | 84 | 4 |
| EM832200 | 20.0 | .7874 | 20 | 26 | 92 | 4 |
| EM832250 | 25.0 | .9843 | 25 | 25 | 110 | 5 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

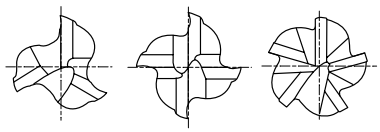
# X-POWER END MILLS

**EM814 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.





MG HM | FINE | 3-5 | 20° | PLAIN

P.897

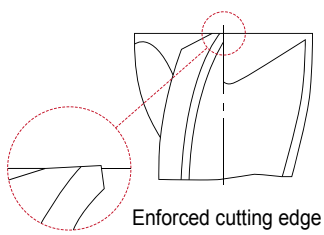
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter Metric h10 | Mill Diameter Inch h10 | Shank Diameter h6 | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| EM814060 | 6.0 | .2362 | 6 | 16 | 57 | 3 |
| EM814070 | 7.0 | .2756 | 8 | 16 | 63 | 3 |
| EM814080 | 8.0 | .3150 | 8 | 16 | 63 | 3 |
| EM814090 | 9.0 | .3543 | 10 | 19 | 72 | 4 |
| EM814100 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| EM814120 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| EM814140 | 14.0 | .5512 | 14 | 26 | 83 | 4 |
| EM814901 | 14.0 | .5512 | 16 | 26 | 83 | 4 |
| EM814160 | 16.0 | .6299 | 16 | 32 | 92 | 4 |
| EM814180 | 18.0 | .7087 | 18 | 32 | 92 | 4 |
| EM814200 | 20.0 | .7874 | 20 | 38 | 104 | 4 |
| EM814250 | 25.0 | .9843 | 25 | 45 | 121 | 5 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM833 SERIES** PLAIN SHANK

## CARBIDE, 3&4 FLUTE 20° HELIX LONG LENGTH FINE PITCH ROUGHING BALL NOSE

- Designed to machine tool steel, alloy steel, mold steel and other high hardened materials.
- High velocity milling of hardened steels.
- For dry and wet milling.
- Fast chip ejection.




MG HM | FINE | 3&4 | 20° | R ±0.02 | PLAIN

P.898

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | |
| | R (±0.02) | h10 | | h6 | | | |
| EM833060 | R3.0 | 6.0 | .2362 | 6 | 16 | 57 | 3 |
| EM833080 | R4.0 | 8.0 | .3150 | 8 | 16 | 63 | 3 |
| EM833100 | R5.0 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| EM833120 | R6.0 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| EM833140 | R7.0 | 14.0 | .5512 | 14 | 26 | 83 | 4 |
| EM833160 | R8.0 | 16.0 | .6299 | 16 | 32 | 92 | 4 |
| EM833180 | R9.0 | 18.0 | .7087 | 18 | 32 | 92 | 4 |
| EM833200 | R10.0 | 20.0 | .7874 | 20 | 38 | 104 | 4 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | ○ | ○ | | | | | | | |

# X-POWER END MILLS

**EM837 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE TAPER

- Designed for milling die cavity.
- Suitable for machining tool steels, alloy steels, mold steels and other hardened materials.



MG HM | 2 | 30° | PLAIN

P.899

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | Taper Angle |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| EM837913 | 2.0 | .0787 | 4 | 6 | 45 | 30′ |
| EM837020 | 2.0 | .0787 | 4 | 6 | 45 | 1° |
| EM837901 | 2.0 | .0787 | 4 | 6 | 45 | 2° |
| EM837902 | 2.0 | .0787 | 4 | 6 | 45 | 3° |
| EM837914 | 3.0 | .1181 | 6 | 10 | 55 | 30′ |
| EM837030 | 3.0 | .1181 | 6 | 10 | 55 | 1° |
| EM837903 | 3.0 | .1181 | 6 | 10 | 55 | 2° |
| EM837904 | 3.0 | .1181 | 6 | 10 | 55 | 3° |
| EM837915 | 4.0 | .1575 | 6 | 15 | 55 | 30′ |
| EM837040 | 4.0 | .1575 | 6 | 15 | 55 | 1° |
| EM837905 | 4.0 | .1575 | 6 | 15 | 55 | 2° |
| EM837906 | 4.0 | .1575 | 6 | 15 | 55 | 3° |
| EM837916 | 5.0 | .1969 | 6 | 15 | 60 | 30′ |
| EM837050 | 5.0 | .1969 | 6 | 15 | 60 | 1° |
| EM837907 | 5.0 | .1969 | 6 | 15 | 60 | 2° |
| EM837908 | 5.0 | .1969 | 6 | 15 | 60 | 3° |
| EM837917 | 6.0 | .2362 | 6 | 20 | 60 | 30′ |
| EM837060 | 6.0 | .2362 | 6 | 20 | 60 | 1° |
| EM837909 | 6.0 | .2362 | 6 | 20 | 60 | 2° |
| EM837910 | 6.0 | .2362 | 8 | 20 | 65 | 3° |
| EM837918 | 8.0 | .3150 | 8 | 25 | 70 | 30′ |
| EM837080 | 8.0 | .3150 | 8 | 25 | 70 | 1° |
| EM837911 | 8.0 | .3150 | 8 | 25 | 70 | 2° |
| EM837912 | 8.0 | .3150 | 10 | 25 | 75 | 3° |

▶ We can supply various sizes and taper angles.

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance | Taper Angle Tolerance |
|---|---|---|
| 0~−0.03 | h6 | ±5′ |

◎ : Excellent ○ : Good

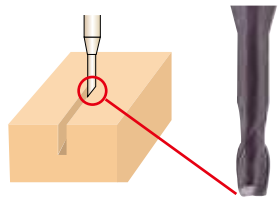
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

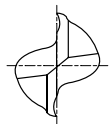
**EM883 SERIES** PLAIN SHANK

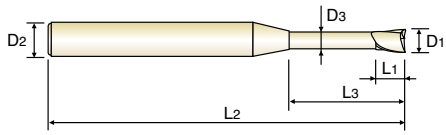
## CARBIDE, 2 FLUTE for RIB PROCESSING

- For deep slotting & pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.










MG HM | 2 | 30° | PLAIN

P.898

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter Metric D1 | Mill Diameter Inch D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 |
|---|---|---|---|---|---|---|---|
| EM883908 | 0.8 | .0315 | 4 | 1.2 | 6 | 45 | 0.75 |
| EM883909 | 0.8 | .0315 | 4 | 1.2 | 8 | 45 | 0.75 |
| EM883010 | 1.0 | .0394 | 4 | 1.5 | 6 | 45 | 0.97 |
| EM883912 | 1.0 | .0394 | 4 | 1.5 | 8 | 45 | 0.95 |
| EM883914 | 1.0 | .0394 | 4 | 1.5 | 12 | 45 | 0.93 |
| EM883915 | 1.2 | .0472 | 4 | 1.8 | 8 | 45 | 1.15 |
| EM883917 | 1.2 | .0472 | 4 | 1.8 | 12 | 45 | 1.13 |
| EM883920 | 1.4 | .0551 | 4 | 2.1 | 12 | 45 | 1.33 |
| EM883923 | 1.5 | .0591 | 4 | 2.3 | 8 | 45 | 1.45 |
| EM883924 | 1.5 | .0591 | 4 | 2.3 | 10 | 45 | 1.45 |
| EM883925 | 1.5 | .0591 | 4 | 2.3 | 12 | 45 | 1.43 |
| EM883927 | 1.5 | .0591 | 4 | 2.3 | 16 | 50 | 1.41 |
| EM883932 | 1.6 | .0630 | 4 | 2.4 | 12 | 45 | 1.53 |
| EM883946 | 1.8 | .0709 | 4 | 2.7 | 12 | 45 | 1.73 |
| EM883960 | 2.0 | .0787 | 4 | 3.0 | 12 | 45 | 1.93 |
| EM883962 | 2.0 | .0787 | 4 | 3.0 | 16 | 50 | 1.91 |
| EM883968 | 2.5 | .0984 | 4 | 3.7 | 12 | 45 | 2.40 |
| EM883970 | 2.5 | .0984 | 4 | 3.7 | 16 | 55 | 2.40 |
| EM883977 | 3.0 | .1181 | 6 | 4.5 | 14 | 50 | 2.85 |
| EM883979 | 3.0 | .1181 | 6 | 4.5 | 18 | 55 | 2.85 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.015 | h6 |

◎ : Excellent ○ : Good

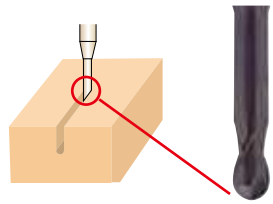
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

# X-POWER END MILLS

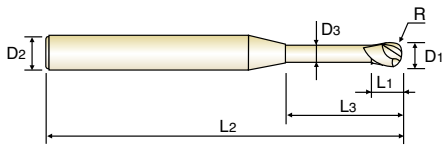
**EM886 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

- For 3-D milling, deep slotting and pocketing.
- For depths of 6 to 10X cutting diameter.
- Machine carbon steel, alloy steel, tool steel, die and mold steels.
- Suitable for high speed cutting and high precision machining.
- Designed with reinforced shank for higher stability and rigidity.
- Long neck design for deep machining near walls.






MG HM | 2 | 30° | R ±0.01 | PLAIN

P.899

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EM886006 | R0.3 | 0.6 | .0236 | 3 | 0.9 | 6 | 35 | 0.55 |
| EM886008 | R0.4 | 0.8 | .0315 | 4 | 1.2 | 6 | 45 | 0.75 |
| EM886901 | R0.4 | 0.8 | .0315 | 4 | 1.2 | 8 | 45 | 0.75 |
| EM886010 | R0.5 | 1.0 | .0394 | 4 | 1.5 | 6 | 45 | 0.97 |
| EM886902 | R0.5 | 1.0 | .0394 | 4 | 1.5 | 8 | 45 | 0.95 |
| EM886904 | R0.5 | 1.0 | .0394 | 4 | 1.5 | 12 | 45 | 0.93 |
| EM886012 | R0.6 | 1.2 | .0472 | 4 | 1.8 | 8 | 45 | 1.15 |
| EM886905 | R0.6 | 1.2 | .0472 | 4 | 1.8 | 12 | 45 | 1.13 |
| EM886014 | R0.7 | 1.4 | .0551 | 4 | 2.1 | 12 | 45 | 1.33 |
| EM886015 | R0.75 | 1.5 | .0591 | 4 | 2.3 | 8 | 45 | 1.45 |
| EM886906 | R0.75 | 1.5 | .0591 | 4 | 2.3 | 12 | 45 | 1.43 |
| EM886907 | R0.75 | 1.5 | .0591 | 4 | 2.3 | 16 | 50 | 1.41 |
| EM886016 | R0.8 | 1.6 | .0630 | 4 | 2.4 | 16 | 50 | 1.51 |
| EM886018 | R0.9 | 1.8 | .0709 | 4 | 2.7 | 16 | 50 | 1.71 |
| EM886020 | R1.0 | 2.0 | .0787 | 4 | 3.0 | 8 | 45 | 1.95 |
| EM886909 | R1.0 | 2.0 | .0787 | 4 | 3.0 | 16 | 50 | 1.91 |
| EM886910 | R1.0 | 2.0 | .0787 | 4 | 3.0 | 20 | 55 | 1.89 |
| EM886030 | R1.5 | 3.0 | .1181 | 6 | 4.5 | 16 | 55 | 2.85 |
| EM886911 | R1.5 | 3.0 | .1181 | 6 | 4.5 | 20 | 60 | 2.85 |
| EM886040 | R2.0 | 4.0 | .1575 | 6 | 6.0 | 16 | 60 | 3.85 |
| EM886912 | R2.0 | 4.0 | .1575 | 6 | 6.0 | 20 | 65 | 3.85 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.02 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ◎ | ○ | | | ○ | | | | | | | |

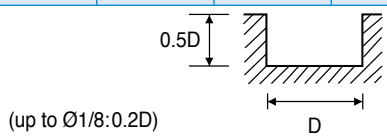
# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

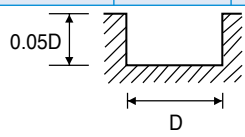
## CARBIDE, 2 FLUTE FINISH - SLOTTING

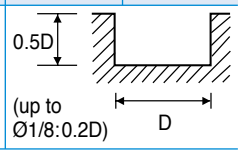
### EM154, EM810 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/16 | 11560 | 7.5 | 7560 | 4.7 | 5040 | 1.4 | | | 6300 | 3.6 |
| 1/8 | 8920 | 8.3 | 5560 | 5.5 | 3360 | 1.6 | 1900 | 1.6 | 4620 | 4.7 |
| 3/16 | 6300 | 12.6 | 3780 | 7.5 | 2320 | 2.0 | 1260 | 1.6 | 3160 | 6.3 |
| 1/4 | 5560 | 13.8 | 3360 | 8.7 | 2000 | 2.2 | 1100 | 1.6 | 2840 | 7.1 |
| 5/16 | 4200 | 15.0 | 2520 | 7.9 | 1680 | 3.0 | 840 | 1.6 | 2100 | 7.1 |
| 3/8 | 3260 | 13.0 | 2000 | 6.3 | 1360 | 2.4 | 680 | 1.4 | 1680 | 6.3 |
| 1/2 | 2740 | 11.0 | 1680 | 5.1 | 1160 | 2.2 | 560 | 1.4 | 1360 | 5.1 |
| 5/8 | 2200 | 8.7 | 1360 | 4.3 | 900 | 1.6 | 440 | 0.8 | 1060 | 4.3 |
| 3/4 | 1680 | 6.7 | 1060 | 3.2 | 680 | 1.2 | 320 | 0.8 | 840 | 3.2 |
| 1 | 1360 | 5.1 | 840 | 2.8 | 540 | 0.8 | 260 | 0.6 | 680 | 2.4 |



(up to Ø1/8:0.2D)



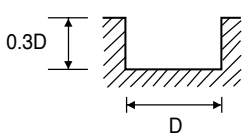
(up to Ø1/8:0.2D)

RPM = rev./min.
FEED = inch/min.

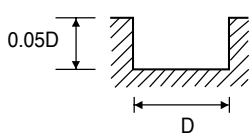
## CARBIDE, 2 FLUTE LONG LENGTH FINISH - SLOTTING

### EM206, EM816 SERIES

| Material | P | | | | | |
|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4410 | 2.8 | 3570 | 2.4 | 2200 | 1.2 |
| 3/16 | 3050 | 4.1 | 2420 | 3.3 | 1580 | 1.6 |
| 1/4 | 2630 | 4.9 | 2100 | 4.1 | 1370 | 2.0 |
| 5/16 | 2000 | 5.3 | 1580 | 4.1 | 1050 | 2.0 |
| 3/8 | 1680 | 5.3 | 1370 | 4.1 | 840 | 2.0 |
| 1/2 | 1370 | 4.1 | 1160 | 3.7 | 700 | 1.6 |
| 5/8 | 1160 | 3.7 | 890 | 3.0 | 560 | 1.4 |
| 3/4 | 840 | 2.8 | 680 | 2.0 | 420 | 1.0 |
| 1 | 610 | 2.0 | 540 | 1.6 | 330 | 0.7 |



(up to Ø1/8: .0016")



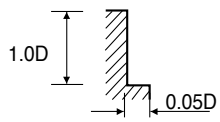

RPM = rev./min.
FEED = inch/min.

# RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE FINISH - SIDE CUTTING

### EM153, EM811 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/16 | 11560 | 11.0 | 7560 | 6.7 | 5040 | 2.0 | | | 6300 | 5.5 |
| 1/8 | 8920 | 12.6 | 5560 | 7.9 | 3360 | 2.4 | 1900 | 2.4 | 4620 | 6.7 |
| 3/16 | 6300 | 23.6 | 3780 | 14.2 | 2320 | 2.8 | 1260 | 2.4 | 3160 | 11.8 |
| 1/4 | 5560 | 26.0 | 3360 | 16.2 | 2000 | 3.2 | 1100 | 2.4 | 2840 | 13.0 |
| 5/16 | 4200 | 28.0 | 2520 | 15.0 | 1680 | 4.3 | 840 | 2.4 | 2100 | 13.8 |
| 3/8 | 3260 | 24.0 | 2000 | 11.8 | 1360 | 3.6 | 680 | 2.0 | 1680 | 11.8 |
| 1/2 | 2740 | 20.5 | 1680 | 9.9 | 1160 | 3.2 | 560 | 2.0 | 1360 | 9.5 |
| 5/8 | 2200 | 16.2 | 1360 | 7.9 | 900 | 2.4 | 440 | 1.2 | 1060 | 7.9 |
| 3/4 | 1680 | 12.6 | 1060 | 6.3 | 680 | 1.6 | 320 | 1.2 | 840 | 5.9 |
| 1 | 1360 | 9.9 | 840 | 5.1 | 540 | 1.2 | 260 | 0.8 | 680 | 4.7 |

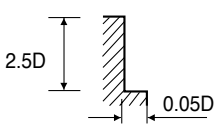


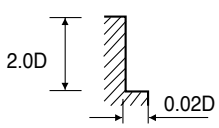

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE LONG LENGTH FINISH - SIDE CUTTING

### EM207, EM817 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4410 | 4.5 | 3570 | 3.9 | 2200 | 2.2 | 1890 | 1.2 |
| 3/16 | 3050 | 7.1 | 2420 | 5.5 | 1580 | 2.8 | 1260 | 1.6 |
| 1/4 | 2630 | 8.5 | 2100 | 7.1 | 1370 | 3.5 | 1160 | 2.0 |
| 5/16 | 2000 | 9.1 | 1580 | 7.1 | 1050 | 3.5 | 840 | 2.0 |
| 3/8 | 1680 | 9.1 | 1370 | 7.1 | 840 | 3.5 | 670 | 2.0 |
| 1/2 | 1370 | 7.1 | 1160 | 6.3 | 700 | 2.8 | 560 | 1.6 |
| 5/8 | 1160 | 6.3 | 890 | 4.9 | 560 | 2.4 | 440 | 1.4 |
| 3/4 | 840 | 4.5 | 680 | 3.5 | 420 | 1.8 | 340 | 1.0 |
| 1 | 670 | 4.5 | 540 | 3.5 | 340 | 1.8 | 270 | 1.0 |




RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

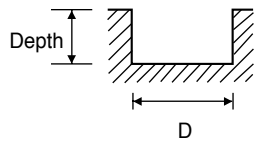
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE MINIATURE - SLOTTING

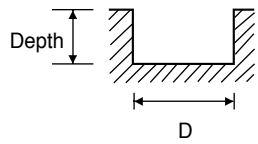
### EM959, EM810 SERIES

| MATERIAL | P | | | |
|---|---|---|---|---|
| | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | |
| HARDNESS | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| .016 | 30000 | 7.1 | 23000 | 3.9 |
| .031 | 24000 | 11.8 | 18000 | 5.1 |
| .040 | 20000 | 12.6 | 15000 | 5.9 |
| .047 | 16000 | 12.6 | 12000 | 5.9 |
| .062 | 12000 | 11.8 | 9000 | 5.5 |

D < .040
Depth=0.15×D
D≧.040
Depth=0.25×D




D < .040
Depth=0.02×D
D≧.040
Depth=0.05×D

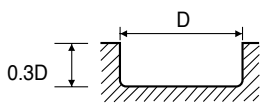


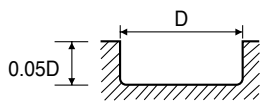

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE CORNER RADIUS - SLOTTING

### EM636, EM637, EM211 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2630 | 4.9 | 2100 | 4.2 | 1370 | 2.0 | 1160 | 1.4 |
| 5/16 | 2000 | 5.3 | 1580 | 4.2 | 1050 | 2.0 | 840 | 1.4 |
| 3/8 | 1680 | 5.3 | 1370 | 4.2 | 840 | 2.0 | 670 | 1.4 |
| 1/2 | 1370 | 4.2 | 1160 | 3.8 | 700 | 1.5 | 550 | 1.0 |



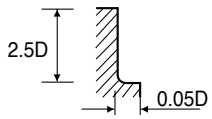



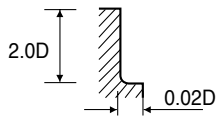

RPM = rev./min.
FEED = inch/min.

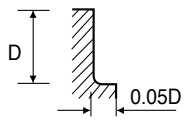
## CARBIDE, 4 FLUTE CORNER RADIUS - SIDE CUTTING

### EM639, EM649, EM212 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2630 | 8.5 | 2100 | 7.1 | 1370 | 3.3 | 1160 | 2.0 |
| 5/16 | 2000 | 9.0 | 1580 | 7.1 | 1050 | 3.3 | 840 | 2.0 |
| 3/8 | 1680 | 9.0 | 1370 | 7.1 | 840 | 3.3 | 670 | 2.0 |
| 1/2 | 1370 | 7.1 | 1160 | 6.3 | 700 | 2.8 | 550 | 1.5 |



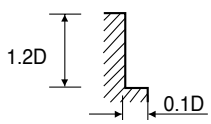



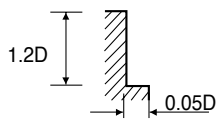

RPM = rev./min.
FEED = inch/min.

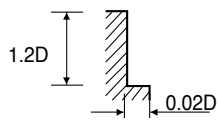
## CARBIDE, 4 FLUTE 45° HELIX - SIDE CUTTING

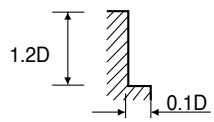
### EM102 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc60 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/8 | 3010 | 31.5 | 2610 | 14.3 | 1400 | 5.3 | 1000 | 2.6 | 1600 | 7.7 |
| 1/2 | 2260 | 27.0 | 1950 | 12.3 | 1050 | 4.6 | 750 | 2.0 | 1200 | 6.3 |
| 5/8 | 1800 | 22.6 | 1560 | 10.1 | 840 | 4.1 | 600 | 1.7 | 960 | 5.1 |
| 3/4 | 1500 | 19.0 | 1300 | 8.5 | 700 | 3.9 | 500 | 1.6 | 800 | 4.5 |
| 7/8 | 1290 | 16.1 | 1120 | 7.6 | 600 | 3.9 | 430 | 1.6 | 690 | 4.5 |



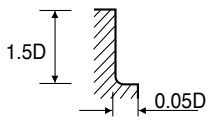
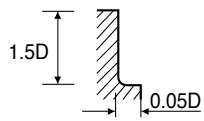

RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE 45° HELIX CORNER RADIUS - SIDE CUTTING

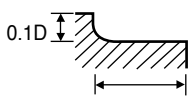
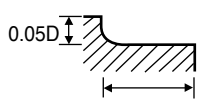
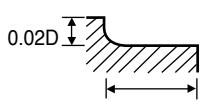
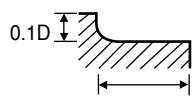
### EM103, EM905 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/8 | 7690 | 79.0 | 7690 | 48.0 | 5680 | 29.0 | 3840 | 19.0 | 5680 | 36.0 |
| 1/2 | 5760 | 79.0 | 5760 | 48.0 | 4260 | 29.0 | 2880 | 19.0 | 4260 | 36.0 |
| 5/8 | 4600 | 71.0 | 4600 | 48.0 | 3410 | 29.0 | 2300 | 19.0 | 3410 | 36.0 |
| 3/4 | 3850 | 60.0 | 3850 | 48.0 | 2840 | 29.0 | 1920 | 19.0 | 2840 | 36.0 |
| 7/8 | 3300 | 51.0 | 3300 | 48.0 | 2430 | 29.0 | 1650 | 19.0 | 2430 | 36.0 |
| |  | | | | | | | |  | |

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE 45° HELIX CORNER RADIUS - CONTOURING

### EM103, EM905 SERIES

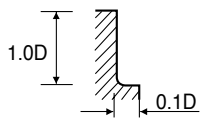
| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/8 | 7690 | 45.0 | 5680 | 36.0 | 5680 | 18.0 | 3840 | 11.0 | 5680 | 31.0 |
| 1/2 | 5760 | 45.0 | 4260 | 36.0 | 4260 | 18.0 | 2880 | 11.0 | 4260 | 31.0 |
| 5/8 | 4600 | 45.0 | 3410 | 36.0 | 3410 | 18.0 | 2300 | 11.0 | 3410 | 31.0 |
| 3/4 | 4850 | 45.0 | 2840 | 36.0 | 2840 | 18.0 | 1920 | 11.0 | 2840 | 31.0 |
| 7/8 | 3300 | 45.0 | 2430 | 36.0 | 2430 | 18.0 | 1650 | 11.0 | 2430 | 31.0 |
| |  | | | |  | |  | |  | |

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE 55° HELIX CORNER RADIUS - SIDE CUTTING

### EM965 SERIES

| MATERIAL | P | | | | | | M | |
|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc65 | | | |
| STRENGTH | 1000 ~ 1250N/mm$^2$ | | 1250 ~ 1700N/mm$^2$ | | 1500N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 21000 | 32.0 | 13000 | 9.5 | 7300 | 9.5 | 13000 | 21.0 |
| 3/16 | 18000 | 56.0 | 11000 | 9.5 | 4800 | 9.5 | 11000 | 33.0 |
| 1/4 | 13000 | 66.0 | 7500 | 13.0 | 4200 | 9.5 | 7500 | 40.0 |
| 5/16 | 9500 | 61.0 | 6500 | 17.0 | 3200 | 9.5 | 6500 | 39.0 |
| 3/8 | 7700 | 48.0 | 5700 | 22.0 | 3850 | 12.0 | 5700 | 39.0 |
| 1/2 | 5800 | 48.0 | 4260 | 25.0 | 2900 | 15.0 | 4260 | 39.0 |
| 5/8 | 4200 | 48.0 | 3100 | 29.0 | 2100 | 19.0 | 3100 | 39.0 |

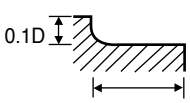


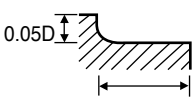

RPM = rev./min.
FEED = inch/min.

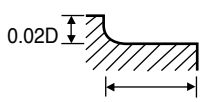
## CARBIDE, 4 FLUTE 55° HELIX CORNER RADIUS - CONTOURING

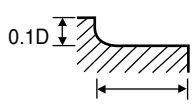
### EM965 SERIES

| MATERIAL | P | | | | | | M | |
|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | HRc30 ~ HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc65 | | | |
| STRENGTH | 1000 ~ 1250N/mm$^2$ | | 1250 ~ 1700N/mm$^2$ | | 1500N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 21000 | 24 | 13000 | 6 | 7300 | 5.5 | 13000 | 18 |
| 3/16 | 18000 | 42 | 11000 | 6 | 4800 | 5.5 | 11000 | 29 |
| 1/4 | 13000 | 50 | 7500 | 8 | 4200 | 5.5 | 7500 | 35 |
| 5/16 | 9500 | 46 | 6500 | 10 | 3200 | 5.5 | 6500 | 34 |
| 3/8 | 7700 | 36 | 5700 | 12 | 3850 | 7.5 | 5700 | 34 |
| 1/2 | 5800 | 36 | 4260 | 15 | 2900 | 9.5 | 4260 | 34 |
| 5/8 | 4200 | 36 | 3100 | 18 | 2100 | 11.5 | 3100 | 34 |




RPM = rev./min.
FEED = inch/min.

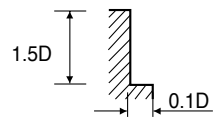
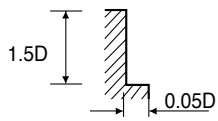
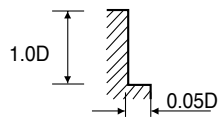
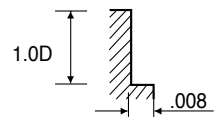
# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 6&8 FLUTE 45° HELIX LONG LENGTH - SIDE CUTTING

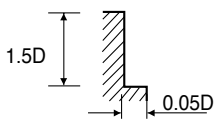
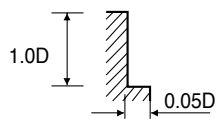
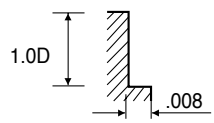
### EM208, EM812 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc50 | | HRc50 ~ HRc55 | | HRc60 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1750N/mm$^2$ | | 1750 ~ 2080N/mm$^2$ | | 2080N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 5560 | 79.0 | 3880 | 54.0 | 1580 | 8.3 | 1100 | 5.1 |
| 5/16 | 4200 | 79.0 | 2940 | 54.0 | 1160 | 8.3 | 840 | 5.1 |
| 3/8 | 3360 | 79.0 | 2320 | 54.0 | 1000 | 8.3 | 680 | 5.1 |
| 1/2 | 2840 | 66.0 | 2000 | 46.0 | 840 | 7.1 | 560 | 4.4 |
| 5/8 | 2100 | 50.0 | 1480 | 35.0 | 640 | 5.1 | 420 | 2.8 |
| 3/4 | 1680 | 40.0 | 1160 | 27.0 | 500 | 4.4 | 320 | 2.4 |
| 1 | 1260 | 25.0 | 870 | 17.5 | 375 | 3.0 | 240 | 1.5 |
| |  | |  | |  | |  | |

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | CARBON STEELS TOOL STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc50 | | HRc50 ~ HRc60 | | HRc60 ~ | |
| STRENGTH | ~1750N/mm$^2$ | | 1750N/mm$^2$ | | 1750N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 16800 | 240.0 | 8400 | 120.0 | 4200 | 58.0 |
| 5/16 | 12600 | 240.0 | 6300 | 120.0 | 3160 | 58.0 |
| 3/8 | 9980 | 235.0 | 5040 | 120.0 | 2520 | 58.0 |
| 1/2 | 8400 | 199.0 | 4200 | 100.0 | 2100 | 50.0 |
| 5/8 | 6300 | 149.0 | 3160 | 75.0 | 1580 | 37.0 |
| 3/4 | 5040 | 120.0 | 2520 | 58.0 | 1260 | 30.0 |
| 1 | 3790 | 75.0 | 1890 | 38.0 | 950 | 19.0 |
| |  | |  | |  | |

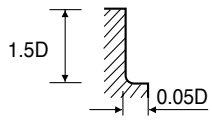
RPM = rev./min.
FEED = inch/min.

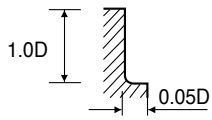
## CARBIDE, 6&8 FLUTE 45° HELIX CORNER RADIUS - SIDE CUTTING

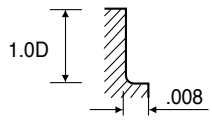
### EM668, EM835 SERIES

■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc50 | | HRc50 ~ HRc60 | | HRc60 ~ HRc65 | |
| STRENGTH | ~ 1750N/mm$^2$ | | 1750 ~ 2080N/mm$^2$ | | 2080N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 16800 | 240.0 | 8400 | 120.0 | 4200 | 58.0 |
| 5/16 | 12600 | 240.0 | 6300 | 120.0 | 3200 | 58.0 |
| 3/8 | 10000 | 235.0 | 5000 | 120.0 | 2500 | 58.0 |
| 1/2 | 8400 | 200.0 | 4200 | 100.0 | 2100 | 50.0 |
| 5/8 | 6300 | 150.0 | 3150 | 75.0 | 1600 | 37.0 |
| 3/4 | 5000 | 120.0 | 2500 | 58.0 | 1260 | 30.0 |



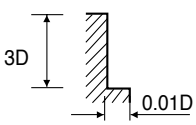



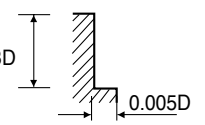

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 6&8 FLUTE 45° HELIX EXTRA LONG LENGTH - SIDE CUTTING

### EM218, EM812, EM834 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc40 | | HRc40 ~ HRc50 | | HRc50 ~ HRc60 | | HRc60 ~ HRc65 | |
| STRENGTH | ~1250N/mm$^2$ | | 1250 ~ 1750N/mm$^2$ | | 1750 ~ 2080N/mm$^2$ | | 2080N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2230 | 19.0 | 1670 | 14.0 | 1390 | 10.0 | 1110 | 8.0 |
| 5/16 | 1670 | 18.0 | 1250 | 13.0 | 1050 | 9.5 | 840 | 7.0 |
| 3/8 | 1330 | 17.0 | 1000 | 12.0 | 840 | 9.0 | 680 | 6.3 |
| 1/2 | 1110 | 16.0 | 840 | 11.0 | 690 | 8.5 | 560 | 6.0 |
| 5/8 | 840 | 13.0 | 630 | 9.0 | 530 | 6.5 | 420 | 5.0 |
| 3/4 | 670 | 11.0 | 500 | 8.0 | 420 | 6.0 | 320 | 4.7 |
| 1 | 540 | 9.5 | 400 | 6.5 | 340 | 5.0 | 270 | 3.7 |




RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

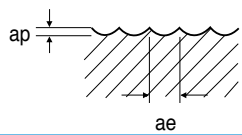
## CARBIDE, 2 FLUTE BALL NOSE

## EM209, EM876, EM813, EM823 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/64 × 1/32 | 15760 | 9.8 | 12720 | 7.8 | 5800 | 3.5 |
| R1/32 × 1/16 | 15760 | 13.8 | 12140 | 10.6 | 5320 | 4.7 |
| R3/64 × 3/32 | 14400 | 29.5 | 10700 | 19.3 | 4680 | 5.9 |
| R1/16 × 1/8 | 13100 | 26.7 | 10000 | 18.1 | 4520 | 5.9 |
| R3/32 × 3/16 | 9140 | 32.3 | 7300 | 22.8 | 3680 | 7.1 |
| R1/8 × 1/4 | 7780 | 33.0 | 6300 | 24.8 | 3160 | 7.5 |
| R5/32 × 5/16 | 5260 | 37.5 | 4420 | 26.0 | 2100 | 7.5 |
| R3/16 × 3/8 | 4620 | 40.1 | 3780 | 28.0 | 1780 | 7.5 |
| R1/4 × 1/2 | 3780 | 35.4 | 2940 | 26.0 | 1360 | 7.5 |
| R5/16 × 5/8 | 2740 | 36.2 | 2320 | 26.0 | 1160 | 7.5 |
| R3/8 × 3/4 | 2100 | 33.0 | 1900 | 25.0 | 840 | 7.5 |

ap: D1/32~D1/4 =.008″
D5/16~D3/4=.012″
ae: 0.2×D



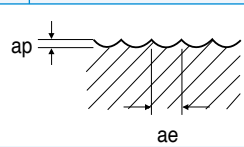

ap: D1/32~D1/4 =.008″
D5/16~D3/4 =.012″
ae: 0.1×D

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | |
|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | HARDENED STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1500N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R1/64 × 1/32 | 25000 | 25.6 | 25000 | 15.7 |
| R1/32 × 1/16 | 23000 | 27.5 | 23000 | 16.9 |
| R3/64 × 3/32 | 21000 | 34.6 | 19000 | 19.3 |
| R1/16 × 1/8 | 21000 | 39.4 | 17000 | 20.5 |
| R3/32 × 3/16 | 21000 | 70.9 | 12000 | 23.6 |
| R1/8 × 1/4 | 21000 | 90.9 | 10500 | 24.8 |
| R5/32 × 5/16 | 15760 | 111.8 | 7880 | 29.1 |
| R3/16 × 3/8 | 13660 | 120.0 | 6300 | 33.0 |
| R1/4 × 1/2 | 10500 | 103.5 | 5260 | 33.0 |
| R5/16 × 5/8 | 8200 | 103.5 | 3780 | 28.0 |
| R3/8 × 3/4 | 6300 | 99.0 | 2940 | 20.8 |

ap: D1/32~D1/4 =.008″
D5/16~D3/4=.012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

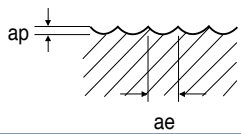
## CARBIDE, 4 FLUTE BALL NOSE

## EM210, EM815, EM825 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 13100 | 40.1 | 10000 | 27.0 | 4520 | 8.9 |
| R3/32 × 3/16 | 9140 | 48.5 | 7300 | 34.0 | 3680 | 10.5 |
| R1/8 × 1/4 | 7780 | 49.5 | 6300 | 37.0 | 3160 | 11.3 |
| R5/32 × 5/16 | 5260 | 56.0 | 4420 | 39.0 | 2100 | 11.3 |
| R3/16 × 3/8 | 4620 | 60.0 | 3780 | 42.0 | 1780 | 11.3 |
| R1/4 × 1/2 | 3780 | 53.0 | 2940 | 39.0 | 1360 | 11.3 |
| R5/16 × 5/8 | 2740 | 54.5 | 2320 | 38.5 | 1160 | 11.3 |

ap: D1/8~D1/4 =.008″
D5/16~D5/8=.012″
ae: 0.2×D



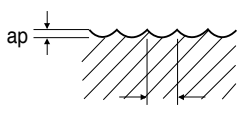

ap: D1/8~D1/4 =.008″
D5/16~D5/8 =.012″
ae: 0.1×D

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | |
|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS TOOL STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1500N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 21000 | 59.0 | 17000 | 30.5 |
| R3/32 × 3/16 | 21000 | 106.3 | 12000 | 35.5 |
| R1/8 × 1/4 | 21000 | 136.5 | 10500 | 37.0 |
| R5/32 × 5/16 | 15760 | 167.5 | 7880 | 43.5 |
| R3/16 × 3/8 | 13660 | 180.0 | 6300 | 49.5 |
| R1/4 × 1/2 | 10500 | 155.5 | 5260 | 49.5 |
| R5/16 × 5/8 | 8200 | 155.5 | 3780 | 42.0 |

ap: D1/8~D1/4 =.008″
D5/16~D5/8=.012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE MEDIUM LENGTH BALL NOSE

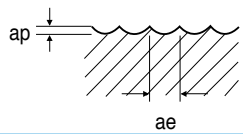
### EM961, EM899 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | HRc30 ~ HRc40 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1000 ~ 1250N/mm$^2$ | | 1500 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 10000 | 18.1 | 12700 | 43.3 | 12300 | 41.3 |
| R3/32 × 3/16 | 7300 | 22.8 | 9400 | 43.3 | 9050 | 41.3 |
| R1/8 × 1/4 | 6300 | 24.8 | 8600 | 45.3 | 8250 | 43.3 |
| R5/32 × 5/16 | 4420 | 26.0 | 7000 | 41.3 | 6700 | 39.4 |
| R3/16 × 3/8 | 3780 | 28.0 | 6050 | 39.4 | 5800 | 37.8 |
| R1/4 × 1/2 | 2940 | 26.0 | 5450 | 39.4 | 5200 | 37.8 |
| R5/16 × 5/8 | 2320 | 26.0 | 4350 | 34.3 | 4150 | 32.7 |
| R3/8 × 3/4 | 1900 | 25.0 | 3500 | 27.2 | 3300 | 25.6 |
| R1/2 × 1 | 1520 | 25.0 | 2800 | 27.2 | 2650 | 25.6 |

ap: D1/8~D1/4 =.008″
D5/16~D1 =.012″
ae: 0.2×D

ap: D1/8 = .006″
D3/16~D5/16 = .010″
D3/8~D1 = .012″
ae: 0.1×D



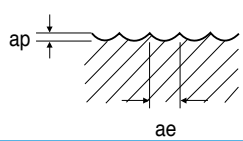

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1000 ~ 1250N/mm$^2$ | | 1500 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 21000 | 39.4 | 12700 | 68.9 | 12300 | 65.7 |
| R3/32 × 3/16 | 21000 | 70.9 | 9400 | 65.0 | 9050 | 61.8 |
| R1/8 × 1/4 | 21000 | 90.9 | 8600 | 69.0 | 8250 | 65.7 |
| R5/32 × 5/16 | 15760 | 111.8 | 7000 | 61.0 | 6700 | 57.5 |
| R3/16 × 3/8 | 13660 | 120.1 | 6050 | 57.1 | 5800 | 53.5 |
| R1/4 × 1/2 | 10500 | 103.5 | 5450 | 55.9 | 5200 | 52.4 |
| R5/16 × 5/8 | 8200 | 103.5 | 4350 | 48.4 | 4150 | 44.5 |
| R3/8 × 3/4 | 6300 | 99.2 | 3500 | 39.4 | 3300 | 35.4 |
| R1/2 × 1 | 5040 | 99.2 | 2800 | 39.4 | 2650 | 35.4 |

ap: D1/8~D1/4 =.008″
D5/16~D1 =.012″
ae: 0.05×D

ap: D1/8 = .006″
D3/16~D5/16 = .010″
D3/8~D1 = .012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

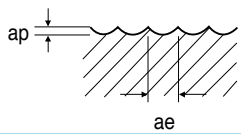
# CARBIDE, 2 FLUTE LONG REACH BALL NOSE

## EM962, EM838 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R3/64 × 3/32 | 12600 | 16.5 | 9250 | 10.2 | 3870 | 3.5 |
| R1/16 × 1/8 | 10500 | 21.3 | 8000 | 14.6 | 3620 | 4.7 |
| R3/32 × 3/16 | 7310 | 26.0 | 5840 | 18.1 | 2940 | 5.5 |
| R1/8 × 1/4 | 6220 | 26.4 | 5040 | 19.7 | 2530 | 5.9 |
| R5/32 × 5/16 | 4210 | 29.9 | 3540 | 20.7 | 1680 | 5.9 |
| R3/16 × 3/8 | 3700 | 32.3 | 3020 | 22.4 | 1420 | 5.9 |
| R1/4 × 1/2 | 3020 | 28.3 | 2350 | 20.9 | 1090 | 5.9 |
| R5/16 × 5/8 | 2190 | 29.1 | 1860 | 20.5 | 930 | 5.9 |
| R3/8 × 3/4 | 1680 | 26.4 | 1520 | 19.7 | 670 | 5.9 |

ap: D3/32~D1/4 =.008″
D5/16~D3/4=.012″
ae: 0.2×D



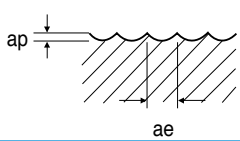

ap: D3/32~D1/4 =.008″
D5/16~D3/4 =.012″
ae: 0.1×D

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | |
|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | HARDENED STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc65 | |
| STRENGTH | ~ 1500N/mm$^2$ | | 1500N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R3/64 × 3/32 | 16800 | 23.2 | 16800 | 15.0 |
| R1/16 × 1/8 | 16800 | 31.5 | 13600 | 16.5 |
| R3/32 × 3/16 | 16800 | 56.7 | 9600 | 18.9 |
| R1/8 × 1/4 | 16800 | 72.8 | 8400 | 19.7 |
| R5/32 × 5/16 | 12610 | 89.4 | 6300 | 23.2 |
| R3/16 × 3/8 | 10930 | 96.1 | 5040 | 26.4 |
| R1/4 × 1/2 | 8400 | 82.7 | 4210 | 26.4 |
| R5/16 × 5/8 | 6560 | 82.7 | 3020 | 22.4 |
| R3/8 × 3/4 | 5040 | 79.5 | 2350 | 16.5 |

ap: D3/32~D1/4 =.008″
D5/16~D3/4=.012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

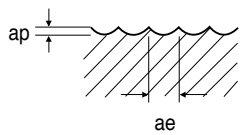
## CARBIDE, 2 FLUTE BALL NOSE for OVER HRc55

## EM109, EM868 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | HARDENED STEELS | | HARDENED STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc60 | | HRc60 ~ HRc70 | |
| STRENGTH | 1500 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | | 2000 ~ 2080N/mm$^2$ | | 2080N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 12700 | 43.3 | 12300 | 41.3 | 11800 | 39.4 | 8400 | 26.0 |
| R3/32 × 3/16 | 9400 | 43.3 | 9050 | 41.3 | 8600 | 37.4 | 5600 | 26.8 |
| R1/8 × 1/4 | 8600 | 45.3 | 8250 | 43.3 | 7850 | 37.4 | 4850 | 27.6 |
| R5/32 × 5/16 | 7000 | 41.3 | 6700 | 39.4 | 6350 | 37.4 | 3800 | 25.6 |
| R3/16 × 3/8 | 6050 | 39.4 | 5800 | 37.8 | 5450 | 35.4 | 3200 | 24.4 |
| R1/4 × 1/2 | 5450 | 39.4 | 5200 | 37.8 | 4900 | 35.4 | 2750 | 24.0 |
| R5/16 × 5/8 | 4350 | 34.3 | 4150 | 32.7 | 3900 | 32.3 | 2150 | 10.4 |
| R3/8 × 3/4 | 3500 | 27.2 | 3300 | 25.6 | 3150 | 24.8 | 1700 | 8.7 |
| R1/2 × 1 | 2800 | 27.2 | 2650 | 25.6 | 2520 | 24.8 | 1360 | 8.7 |

ap: D1/8 =.006″
D3/16 ~ D5/16=.010″
D3/8 ~ D1=.012″
ae: 0.1 × D

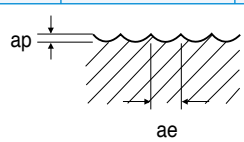



RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | HARDENED STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | | HRc55 ~ HRc70 | |
| STRENGTH | 1500 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | | 2000 ~ 2080N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 12700 | 68.9 | 12300 | 65.7 | 11800 | 33.9 |
| R3/32 × 3/16 | 9400 | 65.0 | 9050 | 61.8 | 8600 | 29.5 |
| R1/8 × 1/4 | 8600 | 68.9 | 8250 | 65.7 | 7850 | 27.6 |
| R5/32 × 5/16 | 7000 | 61.0 | 6700 | 57.5 | 6350 | 25.6 |
| R3/16 × 3/8 | 6050 | 57.1 | 5800 | 53.5 | 5450 | 24.4 |
| R1/4 × 1/2 | 5450 | 55.9 | 5200 | 52.4 | 4900 | 24.0 |
| R5/16 × 5/8 | 4350 | 48.4 | 4150 | 44.5 | 3900 | 10.4 |
| R3/8 × 3/4 | 3500 | 39.4 | 3300 | 35.4 | 3150 | 8.7 |
| R1/2 × 1 | 2800 | 39.4 | 2640 | 35.4 | 2520 | 8.7 |

ap: D1/8 = .006″
D3/16~D5/16 = .010″
D3/8~D1 = .012″
ae: 0.05 × D




RPM = rev./min.
FEED = inch/min.

# CARBIDE, 2 FLUTE BALL NOSE with TAPER NECK

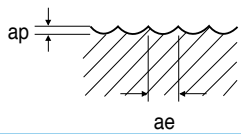
## EM963, EM902 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | HRc30 ~ HRc40 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1000 ~ 1250N/mm² | | 1250 ~ 1750N/mm² | | 1750 ~ 2000N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/32 × 1/16 | 9700 | 8.3 | 13800 | 19.9 | 13600 | 17.9 |
| R1/16 × 1/8 | 8000 | 14.6 | 10200 | 34.6 | 9800 | 33.5 |
| R3/32 × 3/16 | 5840 | 18.1 | 7500 | 34.6 | 7200 | 33.5 |
| R1/8 × 1/4 | 5040 | 19.7 | 6900 | 36.2 | 6500 | 34.6 |
| R5/32 × 5/16 | 3540 | 20.9 | 5600 | 33.1 | 5300 | 31.5 |
| R3/16 × 3/8 | 3020 | 22.4 | 4850 | 31.5 | 4650 | 30.3 |
| R1/4 × 1/2 | 2350 | 20.9 | 4350 | 31.5 | 4150 | 30.3 |

ap: D1/16~D1/4 =.008″
D5/16~D1/2 =.012″
ae: 0.2×D

ap: D1/16~D1/8 = 0.05″×D
D3/16~D5/16 = .010″
D3/8~D1/2 = .012″
ae: 0.1×D



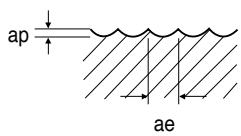

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1500N/mm² | | 1250 ~ 1750N/mm² | | 1750 ~ 2000N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/32 × 1/16 | 18400 | 21.9 | 13800 | 28.9 | 13600 | 30.1 |
| R1/16 × 1/8 | 16800 | 31.5 | 10200 | 55.1 | 9800 | 51.2 |
| R3/32 × 3/16 | 16800 | 56.7 | 7500 | 52.0 | 7200 | 49.2 |
| R1/8 × 1/4 | 16800 | 72.8 | 6900 | 55.1 | 6500 | 53.1 |
| R5/32 × 5/16 | 12600 | 89.4 | 5600 | 49.2 | 5300 | 45.3 |
| R3/16 × 3/8 | 10930 | 96.1 | 4850 | 45.3 | 4650 | 43.3 |
| R1/4 × 1/2 | 8400 | 82.7 | 4350 | 44.5 | 4150 | 41.3 |

ap: D1/16~D1/4 =.008″
D5/16~D1/2 =.012″
ae: 0.05×D

ap: D1/16~D1/8 = 0.05″×D
D3/16~D5/16 = .010″
D3/8~D1/2 = .012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE BALL NOSE with PENCIL NECK

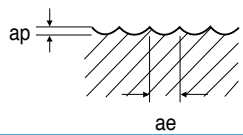
### EM979 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | HRc30 ~ HRc40 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1000 ~ 1250N/mm$^2$ | | 1250 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R3/32 × 3/16 | 4670 | 14.5 | 6000 | 27.7 | 5760 | 26.8 |
| R1/8 × 1/4 | 4030 | 15.8 | 5520 | 29.0 | 5200 | 27.7 |
| R5/32 × 5/16 | 2830 | 16.7 | 4480 | 26.5 | 4240 | 25.2 |
| R3/16 × 3/8 | 2420 | 17.9 | 3880 | 25.2 | 3720 | 24.2 |
| R1/4 × 1/2 | 1880 | 16.7 | 3480 | 25.2 | 3320 | 24.2 |

ap: D3/16~D1/4 =.008″
D5/16~D1/2 =.012″
ae: 0.2×D

ap: D3/16~D5/16 = .010″
D3/8~D1/2 = .012″
ae: 0.1×D



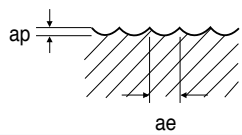

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc45 | | HRc45 ~ HRc50 | | HRc50 ~ HRc55 | |
| STRENGTH | 1500N/mm$^2$ | | 1250 ~ 1750N/mm$^2$ | | 1750 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R3/32 × 3/16 | 13440 | 45.4 | 6000 | 41.6 | 5760 | 39.4 |
| R1/8 × 1/4 | 13440 | 58.2 | 5520 | 44.1 | 5200 | 42.5 |
| R5/32 × 5/16 | 10080 | 71.5 | 4480 | 39.4 | 4240 | 36.2 |
| R3/16 × 3/8 | 8740 | 76.9 | 3880 | 36.3 | 3720 | 34.6 |
| R1/4 × 1/2 | 6720 | 66.2 | 3480 | 35.6 | 3320 | 33.0 |

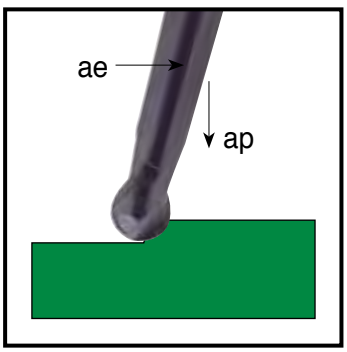
ap: D3/16~D1/4 =.008″
D5/16~D1/2 =.012″
ae: 0.05×D

ap: D3/16~D5/16 = .010″
D3/8~D1/2 = .012″
ae: 0.05×D




RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE - MMC




# RECOMMENDED CUTTING CONDITIONS

- ap=0.02×D1
- ae=0.05×D1

## EM084, EM096, EM669, EM863 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOYED STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 35000 | 110.2 | 33000 | 102.4 | 12000 | 35.4 |
| R5/64 × 5/32 | 26000 | 90.6 | 25000 | 86.6 | 9000 | 31.5 |
| R3/32 × 3/16 | 21000 | 82.7 | 20000 | 78.7 | 7000 | 27.6 |
| R1/8 × 1/4 | 17000 | 74.8 | 16000 | 70.9 | 6000 | 25.6 |
| R5/32 × 5/16 | 13000 | 66.9 | 12000 | 63.0 | 4500 | 21.7 |
| R3/16 × 3/8 | 10500 | 57.1 | 10000 | 55.1 | 3500 | 19.7 |
| R1/4 × 1/2 | 9000 | 55.1 | 8000 | 51.2 | 3000 | 17.7 |
| R5/16 × 5/8 | 6000 | 47.2 | 5500 | 43.3 | 2000 | 15.8 |

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

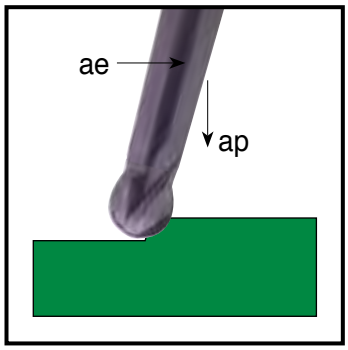
| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOYED STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 47000 | 145.7 | 44000 | 137.8 | 17000 | 55.1 |
| R5/64 × 5/32 | 35000 | 126.0 | 33000 | 118.1 | 13000 | 47.2 |
| R3/32 × 3/16 | 28000 | 110.2 | 27000 | 102.4 | 10000 | 43.3 |
| R1/8 × 1/4 | 23000 | 102.4 | 22000 | 94.5 | 8000 | 37.4 |
| R5/32 × 5/16 | 18000 | 90.6 | 17000 | 82.7 | 6000 | 33.5 |
| R3/16 × 3/8 | 14000 | 78.7 | 13000 | 74.8 | 5000 | 29.5 |
| R1/4 × 1/2 | 12000 | 70.9 | 11000 | 70.9 | 4000 | 27.6 |
| R5/16 × 5/8 | 9000 | 63.0 | 8000 | 59.1 | 3300 | 23.6 |

RPM = rev./min.
FEED = inch/min.

# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE BALL NOSE - MMC




# RECOMMENDED CUTTING CONDITIONS

- ap=0.02×D1
- ae=0.05×D1

## EM093, EM097, EM673, EM864 SERIES

### ■ NORMAL SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOYED STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R3/32 × 3/16 | 21000 | 157.5 | 20000 | 157.5 | 7000 | 55.1 |
| R1/8 × 1/4 | 17000 | 157.5 | 16000 | 137.8 | 6000 | 51.2 |
| R5/32 × 5/16 | 13000 | 137.8 | 12000 | 118.1 | 4500 | 43.3 |
| R3/16 × 3/8 | 10500 | 118.1 | 10000 | 98.4 | 3500 | 39.4 |
| R1/4 × 1/2 | 9000 | 110.2 | 8000 | 98.4 | 3000 | 37.4 |
| R5/16 × 5/8 | 6000 | 110.2 | 5500 | 86.6 | 2000 | 31.5 |

RPM = rev./min.
FEED = inch/min.

### ■ HIGH SPEED

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOYED STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc40 | | HRc45 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1250N/mm$^2$ | | 1500N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| R3/32 × 3/16 | 28000 | 220.5 | 27000 | 208.7 | 11000 | 82.7 |
| R1/8 × 1/4 | 23000 | 200.1 | 22000 | 192.9 | 9000 | 74.8 |
| R5/32 × 5/16 | 18000 | 181.1 | 17000 | 169.3 | 7000 | 66.9 |
| R3/16 × 3/8 | 14000 | 153.5 | 13000 | 145.7 | 5000 | 55.1 |
| R1/4 × 1/2 | 12000 | 145.7 | 11000 | 137.8 | 4500 | 51.2 |
| R5/16 × 5/8 | 9000 | 122.0 | 8000 | 118.1 | 3300 | 43.3 |

RPM = rev./min.
FEED = inch/min.

# RECOMMENDED CUTTING CONDITIONS

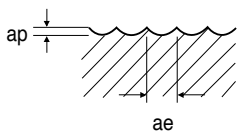
## CARBIDE, 2 FLUTE MINIATURE BALL NOSE

### EM960, EM865 SERIES

| MATERIAL | P | | | |
|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | HARDENED STEELS | |
| HARDNESS | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | |
| STRENGTH | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R.012 × .024 | 30000 | 23.6 | 30000 | 11.8 |
| R.0155 × .031 | 27000 | 25.6 | 27000 | 15.0 |
| R.020 × .040 | 25000 | 25.6 | 25000 | 15.7 |
| R.0235 × .047 | 24000 | 26.4 | 24000 | 16.5 |
| R.031 × .062 | 23000 | 27.6 | 23000 | 16.9 |

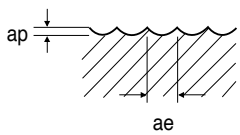
D < .040
ap=0.05 × D
ae=0.15 × D

D ≧ .040
ap=0.075 × D
ae=0.15 × D




D < .040
ap=0.05 × D
ae=0.1 × D

D ≧ .040
ap=0.05 × D
ae=0.15 × D

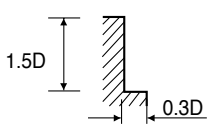


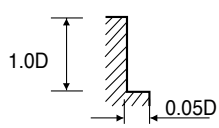

RPM = rev./min.
FEED = inch/min.

## CARBIDE, MULTI FLUTE ROUGHING - SIDE CUTTING

### EM666, EM156, EM832, EM814 SERIES

| MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc38 | | HRc38 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1200N/mm$^2$ | | 1200` ~ 1400N/mm$^2$ | | 1400 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 15600 | 91.4 | 12400 | 33.1 | 8400 | 22.5 | 3400 | 10.3 | 2400 | 7.5 |
| 5/16 | 11600 | 91.4 | 9200 | 33.1 | 6300 | 22.5 | 2400 | 9.5 | 1800 | 7.1 |
| 3/8 | 9200 | 91.4 | 7600 | 33.1 | 5100 | 22.5 | 2000 | 11.4 | 1300 | 7.5 |
| 1/2 | 8000 | 94.5 | 6000 | 31.5 | 4200 | 22.5 | 1680 | 10.3 | 1200 | 7.5 |
| 5/8 | 6000 | 94.5 | 4800 | 29.9 | 3300 | 20.1 | 1200 | 6.3 | 800 | 4.4 |
| 3/4 | 5200 | 91.4 | 4400 | 28.4 | 2700 | 16.6 | 1100 | 5.9 | 700 | 4.0 |
| 1 | 4800 | 85.1 | 3600 | 22.1 | 2400 | 14.2 | 1000 | 5.9 | 660 | 4.0 |




RPM = rev./min.
FEED = inch/min.

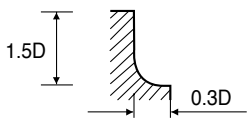
# X-POWER END MILLS

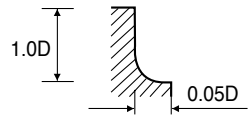
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, MULTI FLUTE ROUGHING BALL NOSE - SIDE CUTTING

### EM662, EM833 SERIES

| MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc38 | | HRc38 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1200N/mm$^2$ | | 1200 ~ 1400N/mm$^2$ | | 1400 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/8 × 1/4 | 15600 | 91.3 | 12400 | 33.0 | 8400 | 22.4 | 3400 | 10.2 | 2400 | 7.5 |
| R5/32 × 5/16 | 11600 | 91.3 | 9200 | 33.0 | 6300 | 22.4 | 2400 | 9.4 | 1800 | 7.1 |
| R3/16 × 3/8 | 9200 | 91.3 | 7600 | 33.0 | 5100 | 22.4 | 2000 | 11.4 | 1300 | 7.5 |
| R1/4 × 1/2 | 8000 | 94.5 | 6000 | 31.5 | 4200 | 22.4 | 1680 | 10.2 | 1200 | 7.5 |
| R5/16 × 5/8 | 6000 | 94.5 | 4800 | 29.9 | 3300 | 20.1 | 1200 | 6.3 | 800 | 4.3 |
| R3/8 × 3/4 | 4800 | 85.0 | 3600 | 22.0 | 2400 | 14.1 | 1000 | 5.9 | 660 | 3.9 |



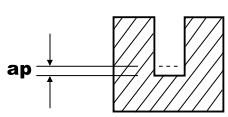

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE FINISH for RIB PROCESSING

### EM966, EM883 SERIES

| MATERIAL | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | ~ HRc30 | | | HRc30 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | ~ 1000N/mm$^2$ | | | 1000 ~ 1500N/mm$^2$ | | | 1500 ~ 2000N/mm$^2$ | | |
| DIAMETER | RPM | FEED | ap | RPM | FEED | ap | RPM | FEED | ap |
| 1/32 | 27000~35000 | 7.5~16.5 | .0006~.0014 | 19500~24500 | 2.4~9.5 | .0006~.0014 | 12500~14800 | 1.4~3.7 | .0003~.0006 |
| 3/64 | 18500~23500 | 7.5~23.6 | .0022~.0039 | 13000~16500 | 3.7~11.8 | .0022~.0039 | 8300~10500 | 2.0~3.9 | .0004~.0009 |
| 1/16 | 14000~18000 | 7.5~23.6 | .0030~.0057 | 10200~12800 | 3.7~11.8 | .0030~.0057 | 6400~8000 | 2.0~3.9 | .0006~.0012 |
| 5/64 | 12000~14500 | 7.5~23.6 | .0035~.0071 | 8300~10500 | 3.7~11.8 | .0035~.0071 | 5300~6600 | 2.0~3.9 | .0007~.0014 |
| 3/32 | 9500~12000 | 7.5~23.6 | .0044~.0093 | 6700~8500 | 3.7~11.8 | .0044~.0093 | 4300~5300 | 2.0~3.9 | .0009~.0018 |
| 1/8 | 8000~10000 | 7.5~23.6 | .0053~.0106 | 5500~7000 | 3.7~11.8 | .0053~.0106 | 3500~4400 | 2.0~3.9 | .0011~.0022 |

(Depth of Cut per one pass)



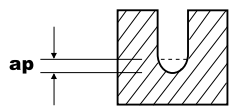

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE for RIB PROCESSING

### EM967, EM886 SERIES

| MATERIAL | P | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | | ALLOY STEELS HEAT RESISTANT STEELS | | | HARDENED STEELS | | |
| HARDNESS | ~ HRc30 | | | HRc30 ~ HRc45 | | | HRc45 ~ HRc55 | | |
| STRENGTH | ~ 1000N/mm$^2$ | | | 1000 ~ 1500N/mm$^2$ | | | 1500 ~ 2000N/mm$^2$ | | |
| DIAMETER | RPM | FEED | ap | RPM | FEED | ap | RPM | FEED | ap |
| R1/64 x 1/32 | 27000~35000 | 7.5~16.5 | .0006~.0014 | 19500~24500 | 2.4~9.5 | .0006~.0014 | 12500~14800 | 1.4~3.7 | .0003~.0006 |
| R.0234 x 3/64 | 18500~23500 | 7.5~23.6 | .0022~.0039 | 13000~16500 | 3.7~11.8 | .0022~.0039 | 8300~10500 | 2.0~3.9 | .0004~.0009 |
| R1/32 x 1/16 | 14000~18000 | 7.5~23.6 | .0030~.0057 | 10200~12800 | 3.7~11.8 | .0030~.0057 | 6400~8000 | 2.0~3.9 | .0006~.0012 |
| R.0391 x 5/64 | 12000~14500 | 7.5~23.6 | .0035~.0071 | 8300~10500 | 3.7~11.8 | .0035~.0071 | 5300~6600 | 2.0~3.9 | .0007~.0014 |
| R3/64 x 3/32 | 9500~12000 | 7.5~23.6 | .0044~.0093 | 6700~8500 | 3.7~11.8 | .0044~.0093 | 4300~5300 | 2.0~3.9 | .0009~.0018 |
| R1/16 x 1/8 | 8000~10000 | 7.5~23.6 | .0053~.0106 | 5500~7000 | 3.7~11.8 | .0053~.0106 | 3500~4400 | 2.0~3.9 | .0011~.0022 |

(Depth of Cut per one pass)

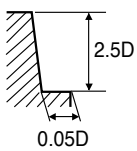



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE TAPER - SIDE CUTTING

### EM837 SERIES

| MATERIAL | P | | | |
|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS | | ALLOY STEELS HEAT RESISTANT STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 2.0 | 8400 | 6.7 | 6300 | 4.9 |
| 3.0 | 4410 | 4.7 | 3570 | 3.9 |
| 4.0 | 3570 | 5.5 | 2840 | 4.5 |
| 5.0 | 3050 | 7.1 | 2410 | 5.7 |
| 6.0 | 2630 | 8.3 | 2100 | 6.7 |
| 8.0 | 2000 | 9.8 | 1580 | 7.1 |




RPM = rev./min.
FEED = inch/min.

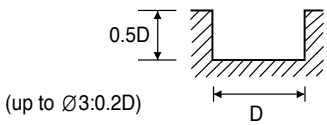
# X-POWER END MILLS

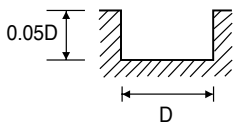
## RECOMMENDED CUTTING CONDITIONS

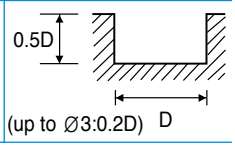
## CARBIDE, 3 FLUTE - SLOTTING

### EM895 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 | 11560 | 6.7 | 7560 | 4.3 | 5040 | 1.2 | | | 6300 | 3.2 |
| 3.0 | 8920 | 7.5 | 5560 | 5.1 | 3360 | 1.4 | 1900 | 1.6 | 4620 | 4.3 |
| 4.0 | 7560 | 10.6 | 4620 | 6.3 | 2940 | 1.4 | 1480 | 1.4 | 3880 | 5.1 |
| 5.0 | 6300 | 11.0 | 3780 | 6.7 | 2320 | 1.8 | 1260 | 1.4 | 3160 | 5.5 |
| 6.0 | 5560 | 12.2 | 3360 | 7.9 | 2000 | 2.0 | 1100 | 1.4 | 2840 | 6.3 |
| 8.0 | 4200 | 13.4 | 2520 | 7.1 | 1680 | 2.6 | 840 | 1.4 | 2100 | 6.3 |
| 10.0 | 3260 | 11.8 | 2000 | 5.5 | 1360 | 2.2 | 680 | 1.2 | 1680 | 5.7 |
| 12.0 | 2740 | 9.8 | 1680 | 4.7 | 1160 | 2.0 | 560 | 1.2 | 1360 | 4.7 |
| 16.0 | 2200 | 7.9 | 1360 | 3.9 | 900 | 1.4 | 440 | 0.8 | 1060 | 3.9 |
| 18.0 | 1940 | 6.9 | 1210 | 3.4 | 790 | 1.2 | 380 | 0.8 | 950 | 3.4 |
| 20.0 | 1680 | 5.9 | 1060 | 2.8 | 680 | 1.0 | 320 | 0.8 | 840 | 2.8 |



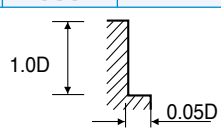




RPM = rev./min. FEED = inch/min.

## CARBIDE, 3 FLUTE - SIDE CUTTING

### EM895 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | | | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 | 11560 | 8.3 | 7560 | 5.5 | 5040 | 1.2 | | | 6300 | 4.5 |
| 3.0 | 8920 | 9.5 | 5560 | 5.9 | 3360 | 1.6 | 1900 | 1.8 | 4620 | 4.9 |
| 4.0 | 7560 | 16.9 | 4620 | 10.2 | 2940 | 1.8 | 1480 | 1.8 | 3880 | 8.3 |
| 5.0 | 6300 | 17.7 | 3780 | 10.6 | 2320 | 2.2 | 1260 | 1.8 | 3160 | 9.1 |
| 6.0 | 5560 | 19.7 | 3360 | 12.2 | 2000 | 2.4 | 1100 | 1.8 | 2840 | 9.8 |
| 8.0 | 4200 | 20.9 | 2520 | 11.4 | 1680 | 3.2 | 840 | 1.8 | 2100 | 10.4 |
| 10.0 | 3260 | 18.1 | 2000 | 9.1 | 1360 | 2.8 | 680 | 1.4 | 1680 | 9.1 |
| 12.0 | 2740 | 15.4 | 1680 | 7.5 | 1160 | 2.4 | 560 | 1.4 | 1360 | 7.1 |
| 16.0 | 2200 | 12.2 | 1360 | 5.9 | 900 | 1.8 | 440 | 0.8 | 1060 | 5.9 |
| 18.0 | 1940 | 11.0 | 1210 | 5.3 | 790 | 1.4 | 380 | 0.8 | 950 | 5.1 |
| 20.0 | 1680 | 9.5 | 1060 | 4.7 | 680 | 1.2 | 320 | 0.8 | 840 | 4.5 |

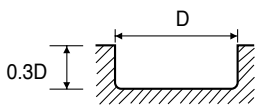


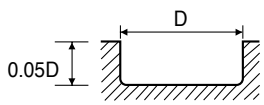

RPM = rev./min. FEED = inch/min.

## CARBIDE, 2 FLUTE LONG CORNER RADIUS - SLOTTING

### EM818 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3.0 | 6620 | 5.5 | 4280 | 2.8 | 2640 | 1.4 | 1870 | 0.7 |
| 4.0 | 5360 | 6.7 | 3410 | 3.4 | 2150 | 1.6 | 1470 | 0.8 |
| 5.0 | 4580 | 8.3 | 2900 | 3.9 | 1900 | 2.0 | 1260 | 1.0 |
| 6.0 | 3950 | 9.8 | 2520 | 4.9 | 1640 | 2.4 | 1160 | 1.4 |
| 8.0 | 3000 | 10.6 | 1900 | 4.9 | 1260 | 2.4 | 840 | 1.4 |
| 10.0 | 2520 | 10.6 | 1640 | 4.9 | 1010 | 2.4 | 670 | 1.4 |
| 12.0 | 2060 | 8.3 | 1390 | 4.5 | 840 | 2.0 | 550 | 1.0 |
| 16.0 | 1740 | 7.5 | 1070 | 3.5 | 670 | 1.6 | 440 | 0.8 |
| 20.0 | 1260 | 5.5 | 820 | 2.4 | 500 | 1.2 | 340 | 0.6 |



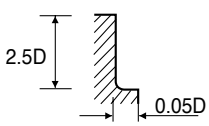



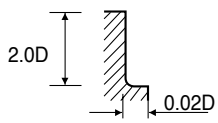

RPM = rev./min.
FEED = inch/min.

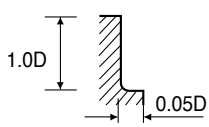
## CARBIDE, 4 FLUTE LONG CORNER RADIUS - SIDE CUTTING

### EM819 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3.0 | 6620 | 6.7 | 4280 | 5.1 | 2640 | 2.6 | 1870 | 1.2 |
| 4.0 | 5360 | 8.3 | 3410 | 5.9 | 2150 | 2.8 | 1470 | 1.4 |
| 5.0 | 4580 | 8.5 | 2900 | 7.1 | 1900 | 3.4 | 1260 | 1.6 |
| 6.0 | 3950 | 8.5 | 2520 | 7.1 | 1640 | 3.4 | 1160 | 2.0 |
| 8.0 | 3000 | 9.1 | 1900 | 7.1 | 1260 | 3.4 | 840 | 2.0 |
| 10.0 | 2520 | 9.1 | 1640 | 7.1 | 1010 | 3.4 | 670 | 2.0 |
| 12.0 | 2060 | 7.1 | 1390 | 6.3 | 840 | 2.8 | 550 | 1.6 |
| 16.0 | 1740 | 6.3 | 1070 | 4.9 | 670 | 2.4 | 440 | 1.4 |
| 20.0 | 1260 | 4.5 | 820 | 3.5 | 500 | 1.8 | 340 | 1.0 |




RPM = rev./min.
FEED = inch/min.

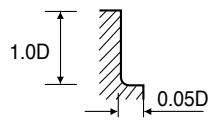
# X-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE STUB CORNER RADIUS - SIDE CUTTING

### EM839 SERIES

| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 | 13870 | 13.4 | 9070 | 8.1 | 6050 | 2.4 | | |
| 2.5 | 12290 | 14.2 | 7870 | 8.7 | 5040 | 2.6 | | |
| 3.0 | 10700 | 15.2 | 6670 | 9.5 | 4030 | 2.8 | 2280 | 2.8 |
| 3.5 | 9890 | 21.1 | 6100 | 13.0 | 3780 | 2.8 | 2030 | 2.8 |
| 4.0 | 9070 | 27.0 | 5540 | 16.5 | 3530 | 2.8 | 1780 | 2.8 |
| 5.0 | 7560 | 28.4 | 4540 | 16.9 | 2780 | 3.4 | 1510 | 2.8 |
| 6.0 | 6670 | 31.1 | 4030 | 19.3 | 2400 | 3.7 | 1320 | 2.8 |
| 8.0 | 5040 | 33.5 | 3020 | 17.9 | 2020 | 5.1 | 1010 | 2.8 |
| 10.0 | 3910 | 28.7 | 2400 | 14.2 | 1630 | 4.3 | 820 | 2.4 |
| 12.0 | 3290 | 24.6 | 2020 | 11.8 | 1390 | 3.7 | 670 | 2.4 |
| 16.0 | 2640 | 19.3 | 1630 | 9.5 | 1080 | 2.8 | 530 | 1.4 |

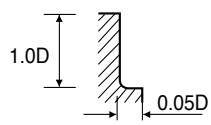



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 6 FLUTE STUB CORNER RADIUS - SIDE CUTTING

### EM897 SERIES

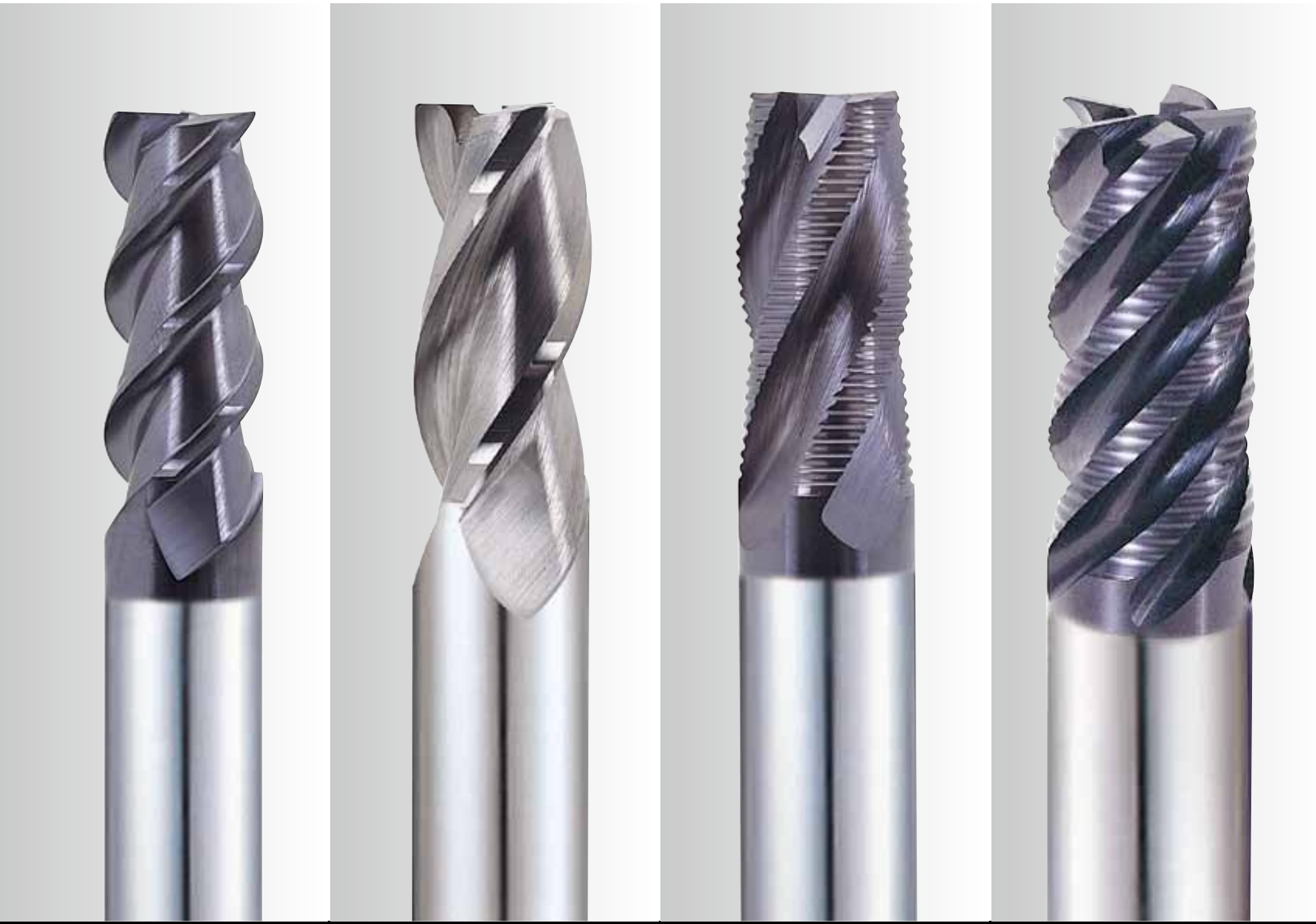
| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALLOY STEELS HEAT RESISTANT STEELS | | HARDENED STEELS | | HARDENED STEELS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | HRc45 ~ HRc55 | | HRc55 ~ HRc65 | |
| STRENGTH | ~ 1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | 1500 ~ 2000N/mm$^2$ | | 2000N/mm$^2$ ~ | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6.0 | 6670 | 31.1 | 4030 | 19.3 | 2400 | 3.7 | 1320 | 2.8 |
| 8.0 | 5040 | 33.5 | 3020 | 17.9 | 2020 | 5.1 | 1010 | 2.8 |
| 10.0 | 3910 | 28.7 | 2400 | 14.2 | 1630 | 4.3 | 820 | 2.4 |
| 12.0 | 3290 | 24.6 | 2020 | 11.8 | 1390 | 3.7 | 670 | 2.4 |




RPM = rev./min.
FEED = inch/min.

# CARBIDE & HSS

Being the best through innovation



# JET-POWER END MILLS

- Exotic materials like Stainless Steels, Nickel alloys and Titanium

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **EH108** |  | CARBIDE, 3&4 FLUTE 50° HELIX REGULAR LENGTH ◆ | D1/8 | D1 | **906** |
| **EE882** |  | YPM, 6 FLUTE 35° HELIX REGULAR LENGTH ◆ | D3/4 | D1-1/2 | **907** |
| **E5075 E5105** |  | CARBIDE, 3 FLUTE 35° HELIX STUB LENGTH CORNER RADIUS - "HOSS" ◆ | D1/8 | D1 | **908** |
| **E5074 E5104** |  | CARBIDE, 3 FLUTE 35° HELIX REGULAR LENGTH CORNER RADIUS - "HOSS" ◆ | D1/8 | D1 | **909** |
| **EH094** |  | CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING ◆ | D1/4 | D1 | **910** |
| **EH095** |  | CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING ◆ | D1/4 | D1 | **911** |
| **EH969** |  | CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING ◆ | D3/16 | D1 | **912** |
| **EH970** |  | CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING ◆ | D1/4 | D3/4 | **913** |

◆ U.S.A Stock

| | | | | | |
|---|---|---|---|---|---|
| **METRIC** | | | | | |
| **EH830** |  | CARBIDE, 3&4 FLUTE 50° HELIX LONG LENGTH ◇ | D6.0 | D25.0 | **914** |
| **EE515** |  | PREMIUM HSS-PM, 4&6 FLUTE SHORT LENGTH ◇ | D3.0 | D25.0 | **915** |
| **EH852** |  | CARBIDE, MULTI FLUTE SHORT FINE PITCH ROUGHING ◇ | D6.0 | D25.0 | **916** |
| **EH831** |  | CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING ◇ | D6.0 | D25.0 | **917** |
| **EH917** |  | CARBIDE, MULTI FLUTE 45° HELIX SHORT LENGTH FINE PITCH ROUGHING ◇ | D6.0 | D20.0 | **918** |
| **EH919** |  | CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING ◇ | D4.0 | D25.0 | **919** |
| **EH921** |  | CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING ◇ | D6.0 | D20.0 | **920** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **921** |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | ○ | | | | | | ○ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ○ | | | | ◎ | ○ | | | | | | | |
| ○ | ◎ | ○ | | | | ◎ | ○ | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

# JET-POWER END MILLS

**EH108 SERIES** PLAIN SHANK FLAT SHANK

## CARBIDE, 3&4 FLUTE 50° HELIX REGULAR LENGTH

- Suitable for low hardness materials (under HRc 45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, inconel, nimonic, etc.
- Corner Protection against chipping.



MG | 3&4 | 50° | PLAIN | FLAT

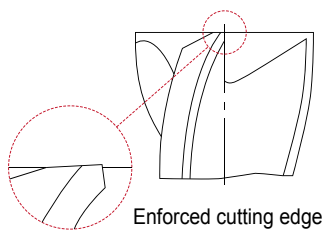
P.921

◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| 95063 | — | 1/8 | 1/8 | 1/2 | 1-1/2 | 3 |
| 95064 | — | 3/16 | 3/16 | 5/8 | 2 | 3 |
| 95065 | — | 1/4 | 1/4 | 3/4 | 2-1/2 | 3 |
| 95066 | — | 5/16 | 5/16 | 13/16 | 2-1/2 | 3 |
| — | 95067 | 3/8 | 3/8 | 1 | 2-1/2 | 3 |
| 95115 | — | 7/16 | 7/16 | 1 | 2-3/4 | 3 |
| — | 95068 | 1/2 | 1/2 | 1 | 3 | 3 |
| — | 95069 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | 3 |
| — | 95070 | 3/4 | 3/4 | 1-1/2 | 4 | 4 |
| — | 95071 | 1 | 1 | 1-1/2 | 4 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



Enforced cutting edge

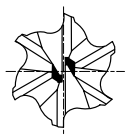
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | ○ | | | | | | ○ | ○ |

# YPM, 6 FLUTE 35° HELIX REGULAR LENGTH

▶ Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
▶ High velocity milling operation and good surface finishes.





YPM | 6 | 35° | FLAT

P.922

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 95094 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 95095 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 95096 | 1 | 1 | 2 | 4-1/2 |
| 95097 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 95098 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~+.0010 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

# JET-POWER END MILLS

**E5075 SERIES** PLAIN SHANK Ø1/8~Ø5/16
**E5105 SERIES** FLAT SHANK Ø11/32~Ø1

## CARBIDE, 3 FLUTE 35° HELIX STUB LENGTH CORNER RADIUS - "HOSS"

- #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRc35.
- Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).




MG | 3 | 35° | PLAIN | FLAT

Ø1/8~Ø5/16 Ø11/32~Ø1

◆ U.S.A Stock

Unit : Inch

| EDP No. | | | | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R | | | | |
| 57558 | 57558TN | 57558TC | 57558TF | 57558TE | .008~.010 | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 57561 | 57561TN | 57561TC | 57561TF | 57561TE | .008~.010 | 5/32 | 3/16 | 5/16 | 2 |
| 57565 | 57565TN | 57565TC | 57565TF | 57565TE | .008~.010 | 3/16 | 3/16 | 5/16 | 2 |
| 57570 | 57570TN | 57570TC | 57570TF | 57570TE | .015~.020 | 7/32 | 1/4 | 3/8 | 2 |
| 57573 | 57573TN | 57573TC | 57573TF | 57573TE | .015~.020 | 1/4 | 1/4 | 3/8 | 2 |
| 57576 | 57576TN | 57576TC | 57576TF | 57576TE | .015~.020 | 9/32 | 5/16 | 7/16 | 2 |
| 57579 | 57579TN | 57579TC | 57579TF | 57579TE | .015~.020 | 5/16 | 5/16 | 7/16 | 2 |
| 57582 | 57582TN | 57582TC | 57582TF | 57582TE | .015~.020 | 11/32 | 3/8 | 1/2 | 2 |
| 57584 | 57584TN | 57584TC | 57584TF | 57584TE | .015~.020 | 3/8 | 3/8 | 1/2 | 2 |
| 57588 | 57588TN | 57588TC | 57588TF | 57588TE | .015~.020 | 7/16 | 7/16 | 9/16 | 2-1/2 |
| 57593 | 57593TN | 57593TC | 57593TF | 57593TE | .030~.035 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 57595 | 57595TN | 57595TC | 57595TF | 57595TE | .030~.035 | 5/8 | 5/8 | 3/4 | 3 |
| 57598 | 57598TN | 57598TC | 57598TF | 57598TE | .030~.035 | 3/4 | 3/4 | 1 | 3 |
| 57600 | 57600TN | 57600TC | 57600TF | 57600TE | .030~.035 | 1 | 1 | 1-1/4 | 3 |

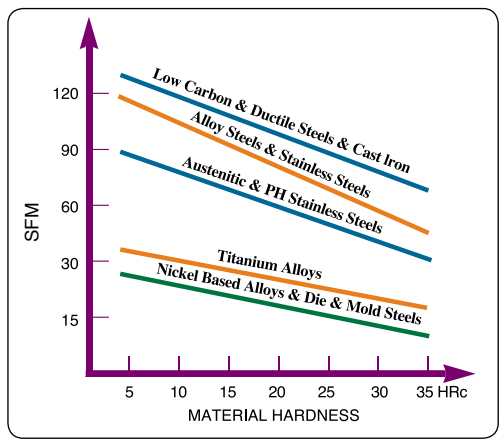
| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |

## RECOMMENDED CUTTING CONDITIONS

- Use stub length whenever possible
- Hardslick coating is recommended on soft gummy material Especially on tools 3/16 and under

### CUTTING TOOL DIAMETER

| | | | | | |
|---|---|---|---|---|---|
| 1/8 | .0003~.0015 | 3/8 | .0015~.0035 | 3/4 | .003~.006 |
| 3/16 | .0004~.002 | 7/16 | .002~.004 | 1 | .003~.007 |
| 1/4 | .001~.0025 | 1/2 | .0025~.0045 | | |
| 5/16 | .0015~.003 | 5/8 | .0025~.005 | | |




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ○ | | | | ◎ | ○ | | | | | | | |

# JET-POWER END MILLS

**E5074 SERIES** PLAIN SHANK Ø1/8~Ø5/16
**E5104 SERIES** FLAT SHANK Ø11/32~Ø1

## CARBIDE, 3 FLUTE 35° HELIX REGULAR LENGTH CORNER RADIUS - "HOSS"

- #1 Choice for slotting, ramping & pocket work on stainless, monel & other alloys up to HRc35.
- Dry milling is recommended on steel alloys to reduce thermal shock and increase the life (YG:TYLON F or E COATING).




MG | 3 | 35° | PLAIN | FLAT

P.908

◆ U.S.A Stock

aØ1/8~Ø5/16 Ø11/32~Ø1

Unit : Inch

| EDP No. | | | | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R | | | | |
| **56558** | **56558TN** | **56558TC** | **56558TF** | **56558TE** | .008~.010 | **1/8** | 1/8 | 1/2 | 1-1/2 |
| **56561** | **56561TN** | **56561TC** | **56561TF** | **56561TE** | .008~.010 | **5/32** | 3/16 | 9/16 | 2 |
| **56565** | **56565TN** | **56565TC** | **56565TF** | **56565TE** | .008~.010 | **3/16** | 3/16 | 9/16 | 2 |
| **56570** | **56570TN** | **56570TC** | **56570TF** | **56570TE** | .015~.020 | **7/32** | 1/4 | 3/4 | 2-1/2 |
| **56573** | **56573TN** | **56573TC** | **56573TF** | **56573TE** | .015~.020 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **56576** | **56576TN** | **56576TC** | **56576TF** | **56576TE** | .015~.020 | **9/32** | 5/16 | 13/16 | 2-1/2 |
| **56579** | **56579TN** | **56579TC** | **56579TF** | **56579TE** | .015~.020 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **56582** | **56582TN** | **56582TC** | **56582TF** | **56582TE** | .015~.020 | **11/32** | 3/8 | 1 | 2-1/2 |
| **56584** | **56584TN** | **56584TC** | **56584TF** | **56584TE** | .015~.020 | **3/8** | 3/8 | 1 | 2-1/2 |
| **56588** | **56588TN** | **56588TC** | **56588TF** | **56588TE** | .015~.020 | **7/16** | 7/16 | 1 | 2-3/4 |
| **56593** | **56593TN** | **56593TC** | **56593TF** | **56593TE** | .030~.035 | **1/2** | 1/2 | 1-1/4 | 3 |
| **56595** | **56595TN** | **56595TC** | **56595TF** | **56595TE** | .030~.035 | **5/8** | 5/8 | 1-5/8 | 3-1/2 |
| **56598** | **56598TN** | **56598TC** | **56598TF** | **56598TE** | .030~.035 | **3/4** | 3/4 | 1-5/8 | 4 |
| **56600** | **56600TN** | **56600TC** | **56600TF** | **56600TE** | .030~.035 | **1** | 1 | 2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ○ | | | | ◎ | ○ | | | | | | | |

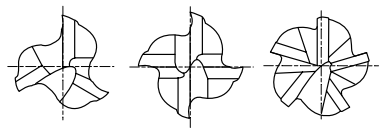
# JET-POWER END MILLS

**EH094 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.





MG | FINE | 3-5 | 30° | PLAIN

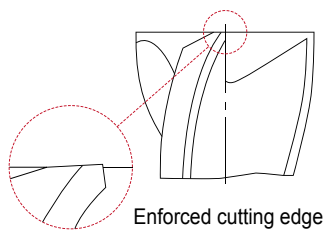
P.923

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| **95072** | **1/4** | 1/4 | 5/16 | 2-1/8 | 3 |
| **95073** | **5/16** | 5/16 | 3/8 | 2-1/4 | 3 |
| **95074** | **3/8** | 3/8 | 9/16 | 2-1/2 | 3 |
| **95075** | **1/2** | 1/2 | 5/8 | 3 | 4 |
| **95076** | **5/8** | 5/8 | 7/8 | 3-1/4 | 4 |
| **95077** | **3/4** | 3/4 | 1 | 3-3/4 | 4 |
| **95078** | **1** | 1 | 1 | 4 | 5 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 1/4~3/8 | 0 ~ −.0022 | 0 ~ −.0003 |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

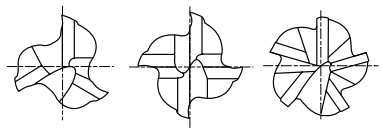
# JET-POWER END MILLS

**EH095 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- ▶ High velocity milling operation.
- ▶ Fast chip ejection.





MG | FINE | 3-5 | 30° | PLAIN

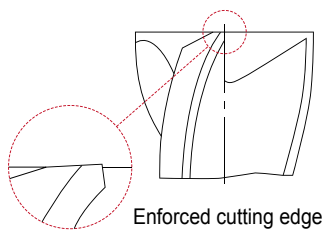
P.923

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 95079 | 1/4 | 1/4 | 3/4 | 2-1/2 | 3 |
| 95080 | 5/16 | 5/16 | 3/4 | 2-1/2 | 3 |
| 95081 | 3/8 | 3/8 | 7/8 | 2-1/2 | 3 |
| 95082 | 1/2 | 1/2 | 1 | 3 | 4 |
| 95083 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | 4 |
| 95084 | 3/4 | 3/4 | 1-5/8 | 4 | 4 |
| 95085 | 1 | 1 | 1-3/4 | 4 | 5 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 1/4~3/8 | 0 ~ −.0022 | 0 ~ −.0003 |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

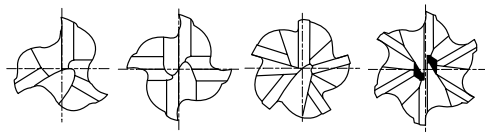
# JET-POWER END MILLS

**EH969 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.





MG | FINE | 3-6 | 45° | PLAIN

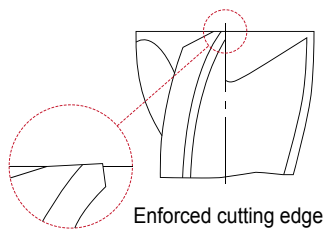
P.923

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| 95107 | 3/16 | 1/4 | 1/2 | 2-1/4 | 3 |
| 95108 | 1/4 | 1/4 | 3/4 | 2-1/2 | 4 |
| 95109 | 5/16 | 5/16 | 3/4 | 2-1/2 | 4 |
| 95110 | 3/8 | 3/8 | 7/8 | 2-1/2 | 4 |
| 95111 | 1/2 | 1/2 | 1 | 3 | 4 |
| 95112 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | 5 |
| 95113 | 3/4 | 3/4 | 1-5/8 | 4 | 6 |
| 95114 | 1 | 1 | 1-3/4 | 4 | 6 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 3/16 | 0 ~ −.0019 | 0 ~ −.0003 |
| 1/4~3/8 | 0 ~ −.0022 | |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |



Enforced cutting edge

◎ : Excellent ○ : Good

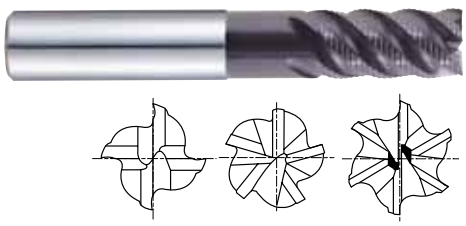
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

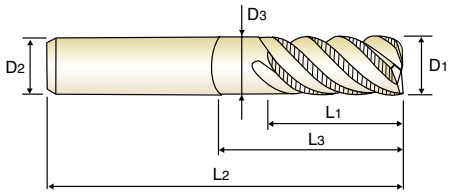
# JET-POWER END MILLS

**EH970 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING

- ▶ Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- ▶ High chip removed and minimizing breakages of cutting edges.
- ▶ Corner Protection against chipping.






MG | FINE | 4-6 | 45° | PLAIN

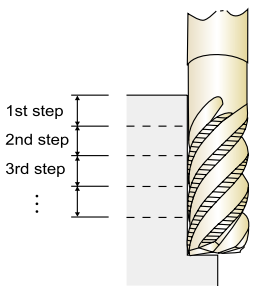
P.923

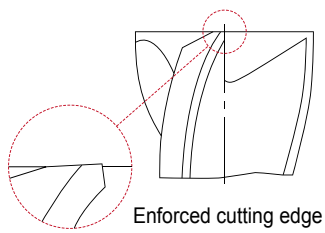
◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | No. of Flute |
|---|---|---|---|---|---|---|---|
| **95101** | **1/4** | 1/4 | 3/4 | 7/8 | 2-1/2 | .230 | 4 |
| **95102** | **5/16** | 5/16 | 3/4 | 1 | 2-1/2 | .292 | 4 |
| **95103** | **3/8** | 3/8 | 7/8 | 1-1/4 | 2-1/2 | .355 | 4 |
| **95104** | **1/2** | 1/2 | 1 | 1-1/2 | 3 | .480 | 4 |
| **95105** | **5/8** | 5/8 | 1-1/4 | 2 | 4 | .605 | 5 |
| **95106** | **3/4** | 3/4 | 1-5/8 | 2-3/8 | 4-3/8 | .719 | 6 |

| Mill Dia. (inch) | Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|---|
| 1/4~3/8 | 0 ~ −.0022 | 0 ~ −.0003 |
| 1/2~5/8 | 0 ~ −.0027 | |
| 3/4~1 | 0 ~ −.0033 | |




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

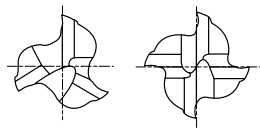
# JET-POWER END MILLS

**EH830 SERIES** PLAIN SHANK

## CARBIDE, 3&4 FLUTE 50° HELIX LONG LENGTH

- Reduces chipping of corner edges
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc





MG | 3&4 | 50° | PLAIN

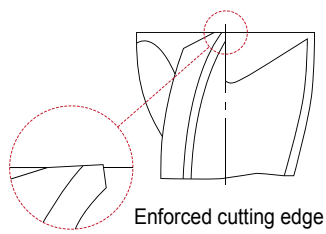
P.921

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| EH830060 | 6.0 | .2362 | 6 | 13 | 50 | 3 |
| EH830901 | 6.0 | .2362 | 6 | 13 | 50 | 4 |
| EH830080 | 8.0 | .3150 | 8 | 19 | 60 | 3 |
| EH830100 | 10.0 | .3937 | 10 | 22 | 70 | 3 |
| EH830120 | 12.0 | .4724 | 12 | 25 | 75 | 3 |
| EH830160 | 16.0 | .6299 | 16 | 32 | 90 | 3 |
| EH830180 | 18.0 | .7087 | 18 | 32 | 90 | 3 |
| EH830200 | 20.0 | .7874 | 20 | 38 | 100 | 4 |
| EH830250 | 25.0 | .9843 | 25 | 45 | 120 | 4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced cutting edge

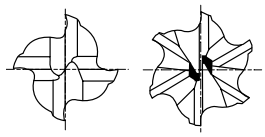
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

# PREMIUM HSS-PM, 4&6 FLUTE SHORT LENGTH

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic, etc.
- High velocity milling operation and good surface finishes.





YPM | 4&6 | 30° | FLAT

P.922

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| EE515030 | 3.0 | .1181 | 6 | 8 | 52 | 4 |
| EE515040 | 4.0 | .1575 | 6 | 11 | 55 | 4 |
| EE515050 | 5.0 | .1969 | 6 | 13 | 57 | 4 |
| EE515060 | 6.0 | .2362 | 6 | 13 | 57 | 4 |
| EE515080 | 8.0 | .3150 | 10 | 19 | 69 | 4 |
| EE515100 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| EE515120 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| EE515140 | 14.0 | .5512 | 12 | 26 | 83 | 4 |
| EE515160 | 16.0 | .6299 | 16 | 32 | 92 | 6 |
| EE515180 | 18.0 | .7087 | 16 | 32 | 92 | 6 |
| EE515200 | 20.0 | .7874 | 20 | 38 | 104 | 6 |
| EE515250 | 25.0 | .9843 | 25 | 45 | 121 | 6 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~+0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

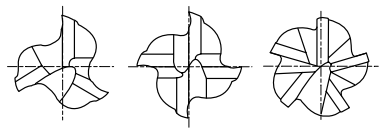
# JET-POWER END MILLS

**EH852 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE SHORT LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.





MG | FINE | 3-5 | 30° | PLAIN

P.923

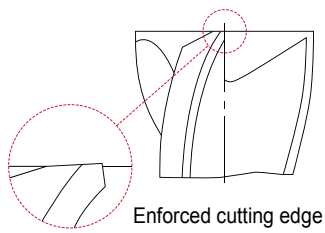
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter Metric h10 | Mill Diameter Inch h10 | Shank Diameter h6 | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| EH852060 | 6.0 | .2362 | 6 | 7 | 54 | 3 |
| EH852070 | 7.0 | .2756 | 8 | 8 | 58 | 3 |
| EH852080 | 8.0 | .3150 | 8 | 9 | 58 | 3 |
| EH852090 | 9.0 | .3543 | 10 | 13 | 66 | 4 |
| EH852100 | 10.0 | .3937 | 10 | 14 | 66 | 4 |
| EH852120 | 12.0 | .4724 | 12 | 16 | 73 | 4 |
| EH852140 | 14.0 | .5512 | 14 | 18 | 75 | 4 |
| EH852160 | 16.0 | .6299 | 16 | 22 | 82 | 4 |
| EH852180 | 18.0 | .7087 | 18 | 24 | 84 | 4 |
| EH852200 | 20.0 | .7874 | 20 | 26 | 92 | 4 |
| EH852250 | 25.0 | .9843 | 25 | 25 | 110 | 5 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

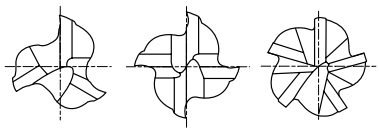
# JET-POWER END MILLS

**EH831 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

- Designed to machine low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, inconel, nimonic.
- High velocity milling operation.
- Fast chip ejection.





MG | FINE | 3-5 | 30° | PLAIN

P.923

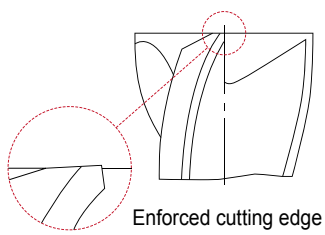
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| | h10 | | h6 | | | |
| EH831060 | 6.0 | .2362 | 6 | 16 | 57 | 3 |
| EH831070 | 7.0 | .2756 | 8 | 16 | 63 | 3 |
| EH831080 | 8.0 | .3150 | 8 | 16 | 63 | 3 |
| EH831090 | 9.0 | .3543 | 10 | 19 | 72 | 4 |
| EH831100 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| EH831120 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| EH831140 | 14.0 | .5512 | 14 | 26 | 83 | 4 |
| EH831160 | 16.0 | .6299 | 16 | 32 | 92 | 4 |
| EH831180 | 18.0 | .7087 | 18 | 32 | 92 | 4 |
| EH831200 | 20.0 | .7874 | 20 | 38 | 104 | 4 |
| EH831250 | 25.0 | .9843 | 25 | 45 | 121 | 5 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

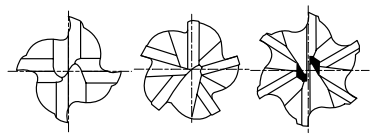
# JET-POWER END MILLS

**EH917 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 45° HELIX SHORT LENGTH FINE PITCH ROUGHING

- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc





MG | FINE | 4-6 | 45° | PLAIN

P.923

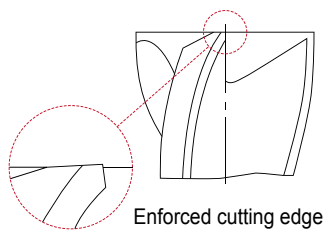
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| | h10 | | h6 | | | |
| EH917060 | 6.0 | .2362 | 6 | 7 | 54 | 4 |
| EH917080 | 8.0 | .3150 | 8 | 9 | 58 | 4 |
| EH917100 | 10.0 | .3937 | 10 | 14 | 66 | 4 |
| EH917120 | 12.0 | .4724 | 12 | 16 | 73 | 4 |
| EH917160 | 16.0 | .6299 | 16 | 22 | 82 | 5 |
| EH917200 | 20.0 | .7874 | 20 | 26 | 92 | 6 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

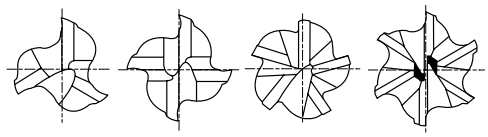
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

# CARBIDE, MULTI FLUTE 45° HELIX LONG LENGTH FINE PITCH ROUGHING

- High chip removal and minimizing breakages of cutting edges.
- Suitable for low hardness materials(under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steels, Inconel, nimonic, etc





MG | FINE | 3-6 | 45° | PLAIN

P.923

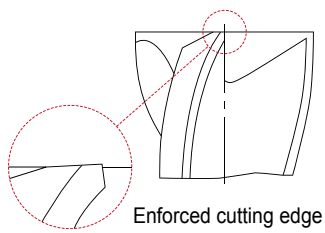
◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | Metric | Inch | | | | |
| | h10 | | h6 | | | |
| EH919040 | 4.0 | .1575 | 6 | 11 | 57 | 3 |
| EH919050 | 5.0 | .1969 | 6 | 13 | 57 | 4 |
| EH919060 | 6.0 | .2362 | 6 | 16 | 57 | 4 |
| EH919070 | 7.0 | .2756 | 8 | 16 | 63 | 4 |
| EH919080 | 8.0 | .3150 | 8 | 16 | 63 | 4 |
| EH919090 | 9.0 | .3543 | 10 | 19 | 72 | 4 |
| EH919100 | 10.0 | .3937 | 10 | 22 | 72 | 4 |
| EH919120 | 12.0 | .4724 | 12 | 26 | 83 | 4 |
| EH919140 | 14.0 | .5512 | 14 | 26 | 83 | 5 |
| EH919160 | 16.0 | .6299 | 16 | 32 | 92 | 5 |
| EH919200 | 20.0 | .7874 | 20 | 38 | 104 | 6 |
| EH919250 | 25.0 | .9843 | 25 | 45 | 121 | 6 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



Enforced cutting edge

◎ : Excellent ○ : Good

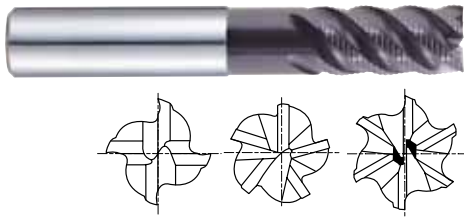
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

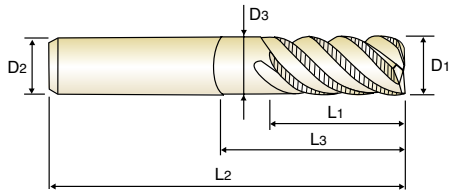
# JET-POWER END MILLS

**EH921 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE 45° HELIX LONG REACH FINE PITCH ROUGHING

- Suitable for low hardness materials (under HRc45), alloy steels, tool steels, carbon steels, prehardened steels, stainless steel, titanium, inconel, nimonic, etc.
- High chip removed and minimizing breakages of cutting edges.
- Corner Protection against chipping.






MG | FINE | 4-6 | 45° | PLAIN

P.923

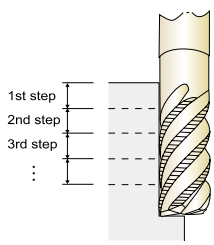
◇ Call for Availability

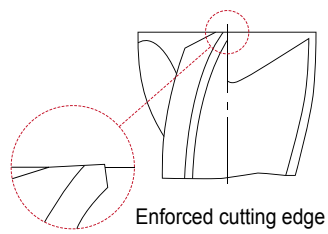
Unit : mm

| EDP No. | Mill Diameter Metric D1 | Mill Diameter Inch D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 | No. of Flute |
|---|---|---|---|---|---|---|---|---|
| EH921060 | 6.0 | .2362 | 6 | 16 | 20 | 57 | 5.5 | 4 |
| EH921080 | 8.0 | .3150 | 8 | 16 | 26 | 63 | 7.5 | 4 |
| EH921100 | 10.0 | .3937 | 10 | 22 | 31 | 72 | 9.5 | 4 |
| EH921120 | 12.0 | .4724 | 12 | 26 | 37 | 83 | 11.5 | 4 |
| EH921160 | 16.0 | .6299 | 16 | 32 | 51 | 100 | 15.5 | 5 |
| EH921200 | 20.0 | .7874 | 20 | 38 | 59 | 110 | 19.2 | 6 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |



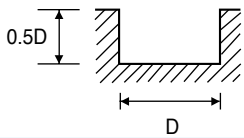

◎ : Excellent ○ : Good

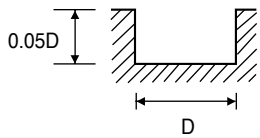
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ◎ | ○ |

## CARBIDE, 3&4 FLUTE FINISH - SLOTTING

### EH108, EH830 SERIES

| MATERIAL | P | | | | M | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | | TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc45 | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 5560 | 12.2 | 3360 | 7.9 | 2840 | 6.3 | 1500 | 2.2 | 1160 | 1.6 |
| 5/16 | 4200 | 13.4 | 2520 | 7.1 | 2100 | 6.3 | 1090 | 2.2 | 840 | 1.6 |
| 3/8 | 3260 | 11.8 | 2000 | 5.5 | 1680 | 5.5 | 870 | 2.2 | 670 | 1.6 |
| 1/2 | 2740 | 9.8 | 1680 | 4.7 | 1370 | 4.7 | 730 | 1.8 | 560 | 1.2 |
| 5/8 | 2200 | 7.9 | 1360 | 3.9 | 1050 | 4.0 | 550 | 1.4 | 420 | 1.0 |
| 3/4 | 1750 | 6.9 | 1100 | 3.4 | 880 | 3.4 | 480 | 1.2 | 350 | 1.2 |
| 1 | 1360 | 4.5 | 840 | 2.4 | 670 | 2.4 | 350 | 0.8 | 270 | 0.6 |



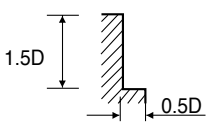

※ The Feed, in long & extra long types, should be reduced by around 50%.

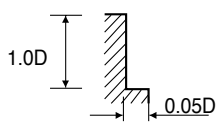
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3&4 FLUTE FINISH - SIDE CUTTING

### EH108, EH830 SERIES

| MATERIAL | P | | | | M | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | | TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc45 | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 5560 | 15.8 | 3360 | 9.9 | 2840 | 8.3 | 1360 | 3.0 | 1050 | 2.2 |
| 5/16 | 4200 | 16.5 | 2520 | 9.1 | 2100 | 8.7 | 1090 | 2.8 | 840 | 2.0 |
| 3/8 | 3260 | 14.6 | 2000 | 7.1 | 1680 | 8.7 | 880 | 2.8 | 680 | 2.0 |
| 1/2 | 2740 | 12.2 | 1680 | 5.9 | 1370 | 7.1 | 730 | 2.6 | 560 | 1.8 |
| 5/8 | 2200 | 9.9 | 1360 | 4.7 | 1050 | 5.3 | 550 | 2.0 | 420 | 1.4 |
| 3/4 | 1750 | 8.7 | 1100 | 4.4 | 880 | 5.4 | 480 | 1.6 | 350 | 1.2 |
| 1 | 1360 | 5.9 | 840 | 3.0 | 670 | 4.5 | 350 | 1.4 | 270 | 1.0 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

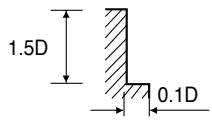
# JET-POWER END MILLS

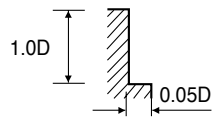
## RECOMMENDED CUTTING CONDITIONS

## YPM, 6 FLUTE - SIDE CUTTING

### EE882 SERIES

| MATERIAL | P | | | | M | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | | TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc45 | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/4 | 960 | 8.0 | 215 | 0.8 | 480 | 4.8 | 220 | 1.4 | 170 | 1.0 |
| 7/8 | 730 | 7.3 | 180 | 0.7 | 365 | 4.4 | 190 | 1.1 | 145 | 0.8 |
| 1 | 640 | 6.6 | 165 | 0.6 | 320 | 4.0 | 170 | 1.0 | 130 | 0.7 |
| 1-1/4 | 520 | 5.3 | 130 | 0.5 | 260 | 3.2 | 140 | 0.8 | 105 | 0.6 |
| 1-1/2 | 430 | 4.4 | 105 | 0.4 | 215 | 2.6 | 110 | 0.6 | 85 | 0.5 |



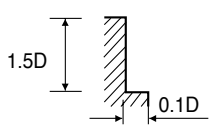

※ The Feed, in long & extra long types, should be reduced by around 50%.

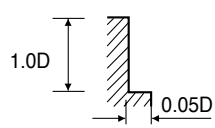
RPM = rev./min.
FEED = inch/min.

## PREMIUM HSS-PM, 4&6 FLUTE SHORT- SIDE CUTTING

### EE515 SERIES

| MATERIAL | P | | | | M | | S | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc45 | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3.0 | 4400 | 7.3 | 1100 | 0.9 | 2200 | 4.3 | 880 | 1.1 |
| 4.0 | 3600 | 8.3 | 900 | 1.2 | 1800 | 4.9 | 720 | 1.5 |
| 5.0 | 3000 | 8.9 | 750 | 1.2 | 1500 | 5.3 | 600 | 1.4 |
| 6.0 | 2600 | 9.3 | 600 | 1.1 | 1300 | 5.5 | 480 | 1.4 |
| 8.0 | 2000 | 9.8 | 500 | 1.1 | 1000 | 5.9 | 400 | 1.3 |
| 10.0 | 1600 | 11.2 | 410 | 1.2 | 800 | 6.7 | 330 | 1.4 |
| 12.0 | 1320 | 9.8 | 340 | 1.1 | 660 | 5.9 | 270 | 1.4 |
| 14.0 | 1160 | 9.3 | 290 | 1.1 | 580 | 5.5 | 230 | 1.3 |
| 16.0 | 1000 | 8.9 | 250 | 1.0 | 500 | 5.3 | 200 | 1.2 |
| 18.0 | 900 | 8.3 | 225 | 0.9 | 450 | 4.9 | 180 | 1.1 |
| 20.0 | 800 | 7.9 | 200 | 0.7 | 400 | 4.7 | 160 | 0.8 |
| 25.0 | 640 | 6.5 | 165 | 0.6 | 320 | 3.9 | 130 | 0.7 |



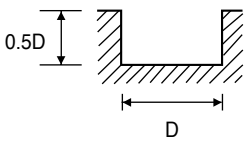




RPM = rev./min.
FEED = inch/min.

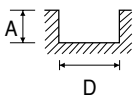
## CARBIDE, MULTI FLUTE ROUGHING - SLOTTING

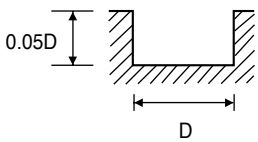
### EH094, EH095, EH969, EH970, EH852, EH831, EH917, EH919, EH921 SERIES

| MATERIAL | P | | | | M | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | | TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc45 | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 15600 | 91.4 | 12400 | 33.1 | 8400 | 22.5 | 3150 | 10.6 | 2400 | 7.5 |
| 5/16 | 11600 | 91.4 | 9200 | 33.1 | 6300 | 22.5 | 2350 | 9.8 | 1800 | 7.1 |
| 3/8 | 9200 | 91.4 | 7600 | 33.1 | 5100 | 22.5 | 1700 | 10.2 | 1300 | 7.5 |
| 1/2 | 8000 | 94.5 | 6000 | 31.5 | 4200 | 22.5 | 1560 | 10.2 | 1200 | 7.5 |
| 5/8 | 6000 | 94.5 | 4800 | 29.9 | 3300 | 20.1 | 1040 | 5.8 | 800 | 4.3 |
| 3/4 | 5200 | 91.4 | 4400 | 28.4 | 2500 | 16.6 | 910 | 5.5 | 675 | 4.0 |
| 1 | 4300 | 84.7 | 3200 | 24.4 | 2160 | 16.2 | 780 | 5.1 | 600 | 4.3 |




A: D1/4-D3/8:0.25×D
D1/2-D5/8:0.15×D
D3/4-D1:0.10×D



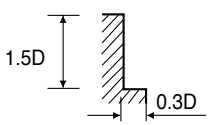

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

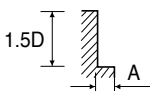
## CARBIDE, MULTI FLUTE ROUGHING - SIDE CUTTING

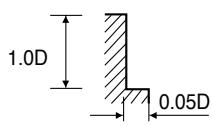
### EH094, EH095, EH969, EH970, EH852, EH831, EH917, EH919, EH921 SERIES

| MATERIAL | P | | | | M | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | | TITANIUM ALLOY | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc30 | | HRc30 ~ HRc45 | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | 1000 ~ 1500N/mm$^2$ | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 15600 | 91.4 | 12400 | 33.1 | 8400 | 22.5 | 3150 | 10.6 | 2400 | 7.5 |
| 5/16 | 11600 | 91.4 | 9200 | 33.1 | 6300 | 22.5 | 2350 | 9.8 | 1800 | 7.1 |
| 3/8 | 9200 | 91.4 | 7600 | 33.1 | 5100 | 22.5 | 1700 | 10.2 | 1300 | 7.5 |
| 1/2 | 8000 | 94.5 | 6000 | 31.5 | 4200 | 22.5 | 1560 | 10.2 | 1200 | 7.5 |
| 5/8 | 6000 | 94.5 | 4800 | 29.9 | 3300 | 22.1 | 1040 | 5.9 | 800 | 4.3 |
| 3/4 | 5200 | 91.4 | 4400 | 28.4 | 2700 | 16.6 | 910 | 5.5 | 700 | 4.0 |
| 1 | 4300 | 84.7 | 3200 | 24.4 | 2160 | 16.2 | 780 | 5.1 | 600 | 4.3 |




A: D1/4-D3/8:0.15×D
D1/2-D5/8:0.10×D
D3/4-D1:0.05×D

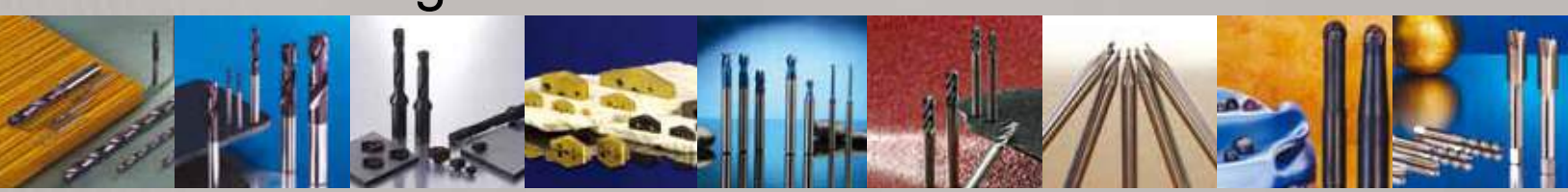



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

Global Cutting Tool Leader **YG-1**



# CARBIDE

Being the best through innovation





# TitaNox-POWER END MILLS

- High Speed Machining for Exotic Materials:
  Titanium, Inconel and Stainless Steels

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| UGMG42 |  | CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE ◆ | D1/4 | D1 | 928 |
| UGMG34 |  | CARBIDE, 5 FLUTE CORNER RADIUS ◆ | D1/8 | D1 | 930 |
| UGMG32 |  | CARBIDE, 5 FLUTE ◆ | D1/8 | D1 | 933 |
| **METRIC** | | | | | |
| GMG40 |  | CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE ◇ | D6.0 | D25.0 | 934 |
| GMG24 |  | CARBIDE, 5 FLUTE SHORT LENGTH ◇ | D6.0 | D25.0 | 936 |
| GMG26 |  | CARBIDE, 5 FLUTE LONG LENGTH ◇ | D6.0 | D25.0 | 937 |
| GMG28 |  | CARBIDE, 5 FLUTE SHORT LENGTH CORNER RADIUS ◇ | D6.0 | D25.0 | 938 |
| GMG30 |  | CARBIDE, 5 FLUTE LONG LENGTH CORNER RADIUS ◇ | D6.0 | D25.0 | 939 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 941 |

◆ U.S.A Stock

◇ Call for Availability

◎ : Excellent ○ : Good

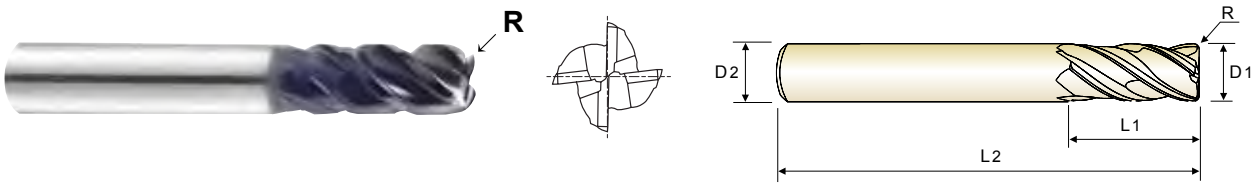
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~352 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**UGMG42 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

- Double Core E/M has a Unique Flute Design for excellent chip evacuation and higher rigidity
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy




MG | 4 | M-Helix | PLAIN

P.941, 942

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | D1 | D2 | L1 | L2 |
| **UGMG42016** | R.015 | **1/4** | 1/4 | 9/16 | 2-1/2 |
| **UGMG42901** | R.030 | **1/4** | 1/4 | 9/16 | 2-1/2 |
| **UGMG42902** | R.060 | **1/4** | 1/4 | 9/16 | 2-1/2 |
| **UGMG42020** | R.015 | **5/16** | 5/16 | 11/16 | 2-1/2 |
| **UGMG42903** | R.030 | **5/16** | 5/16 | 11/16 | 2-1/2 |
| **UGMG42904** | R.060 | **5/16** | 5/16 | 11/16 | 2-1/2 |
| **UGMG42024** | R.020 | **3/8** | 3/8 | 13/16 | 2-1/2 |
| **UGMG42905** | R.030 | **3/8** | 3/8 | 13/16 | 2-1/2 |
| **UGMG42906** | R.060 | **3/8** | 3/8 | 13/16 | 2-1/2 |
| **UGMG42907** | R.090 | **3/8** | 3/8 | 13/16 | 2-1/2 |
| **UGMG42032** | R.020 | **1/2** | 1/2 | 1 | 3 |
| **UGMG42908** | R.030 | **1/2** | 1/2 | 1 | 3 |
| **UGMG42909** | R.060 | **1/2** | 1/2 | 1 | 3 |
| **UGMG42910** | R.090 | **1/2** | 1/2 | 1 | 3 |
| **UGMG42911** | R.125 | **1/2** | 1/2 | 1 | 3 |
| **UGMG42912** | R.030 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG42040** | R.030 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG42913** | R.060 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG42914** | R.090 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG42915** | R.125 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG42048** | R.030 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG42916** | R.060 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG42917** | R.090 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG42918** | R.125 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG42919** | R.190 | **3/4** | 3/4 | 1-1/2 | 4 |

▶ NEXT PAGE

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

▶ Other shank types are available on your request.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

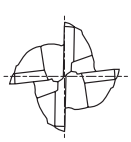
# TitaNox-POWER END MILLS

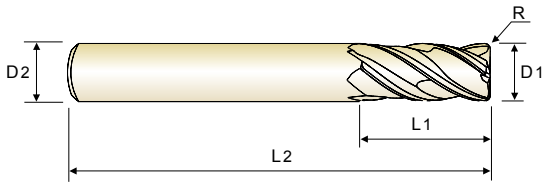
**UGMG42 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

- Double Core E/M has a Unique Flute Design for excellent chip evacuation and higher rigidity
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy






MG | 4 | M-Helix | PLAIN

P.941, 942

MADE IN USA ◆ U.S.A Stock

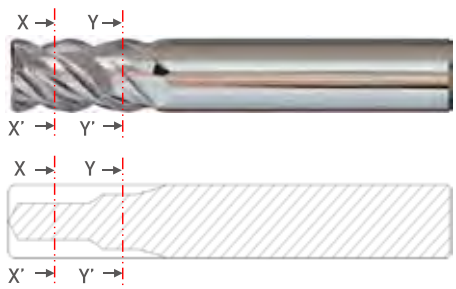
Unit : Inch

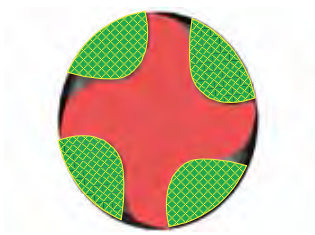
| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | D1 | D2 | L1 | L2 |
| **UGMG42064** | R.030 | **1** | 1 | 2 | 5 |
| **UGMG42920** | R.060 | **1** | 1 | 2 | 5 |
| **UGMG42921** | R.090 | **1** | 1 | 2 | 5 |
| **UGMG42922** | R.125 | **1** | 1 | 2 | 5 |
| **UGMG42923** | R.190 | **1** | 1 | 2 | 5 |

▶ Other shank types are available on your request.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◆ **2 STEP CORE**



**<SECTION X-X'>**
**Excellent chip evacuation**



**<SECTION Y-Y'>**
**Higher rigidity**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

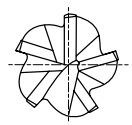
# TitaNox-POWER END MILLS

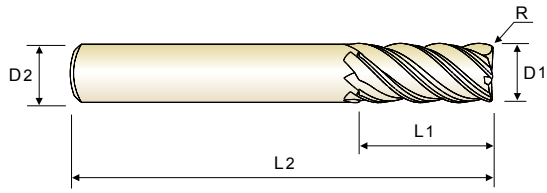
**UGMG34 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted






MG | 5 | M-Helix | PLAIN

P.943

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **UGMG34008** | R.015 | **1/8** | 1/8 | 1/4 | 1-1/2 |
| **UGMG34901** | R.015 | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **UGMG34012** | R.015 | **3/ 16** | 3/16 | 5/16 | 2 |
| **UGMG34902** | R.015 | **3/ 16** | 3/16 | 9/16 | 2 |
| **UGMG34016** | R.030 | **1/4** | 1/4 | 3/8 | 2 |
| **UGMG34903** | R.015 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **UGMG34904** | R.030 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **UGMG34905** | R.060 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **UGMG34020** | R.030 | **5/16** | 5/16 | 7/16 | 2 |
| **UGMG34906** | R.015 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **UGMG34907** | R.030 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **UGMG34908** | R.060 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **UGMG34024** | R.030 | **3/8** | 3/8 | 1/2 | 2-1/2 |
| **UGMG34909** | R.060 | **3/8** | 3/8 | 1/2 | 2-1/2 |
| **UGMG34910** | R.015 | **3/8** | 3/8 | 1 | 3 |
| **UGMG34911** | R.030 | **3/8** | 3/8 | 1 | 3 |
| **UGMG34912** | R.060 | **3/8** | 3/8 | 1 | 3 |
| **UGMG34032** | R.015 | **1/2** | 1/2 | 5/8 | 2-1/2 |
| **UGMG34913** | R.030 | **1/2** | 1/2 | 5/8 | 2-1/2 |
| **UGMG34914** | R.060 | **1/2** | 1/2 | 5/8 | 2-1/2 |
| **UGMG34915** | R.015 | **1/2** | 1/2 | 1 | 3 |
| **UGMG34916** | R.030 | **1/2** | 1/2 | 1 | 3 |
| **UGMG34917** | R.060 | **1/2** | 1/2 | 1 | 3 |
| **UGMG34918** | R.090 | **1/2** | 1/2 | 1 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

◎ : Excellent ○ : Good

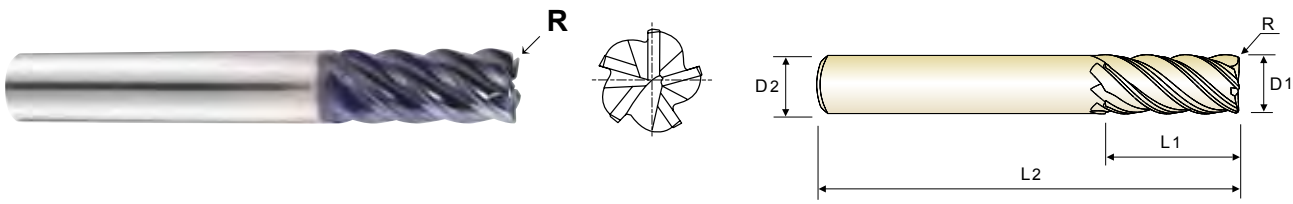
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**UGMG34 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted




MG | 5 | M-Helix | PLAIN

P.943

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **UGMG34919** | R.125 | **1/2** | 1/2 | 1 | 3 |
| **UGMG34920** | R.015 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG34921** | R.030 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG34922** | R.060 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG34923** | R.090 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG34924** | R.125 | **1/2** | 1/2 | 1-1/4 | 3-1/2 |
| **UGMG34040** | R.030 | **5/8** | 5/8 | 3/4 | 3 |
| **UGMG34925** | R.060 | **5/8** | 5/8 | 3/4 | 3 |
| **UGMG34926** | R.015 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG34927** | R.030 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG34928** | R.060 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG34929** | R.090 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG34930** | R.125 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG34048** | R.030 | **3/4** | 3/4 | 1 | 3-1/2 |
| **UGMG34931** | R.060 | **3/4** | 3/4 | 1 | 3-1/2 |
| **UGMG34932** | R.090 | **3/4** | 3/4 | 1 | 3-1/2 |
| **UGMG34933** | R.015 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG34934** | R.030 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG34935** | R.060 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG34936** | R.090 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG34937** | R.125 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG34938** | R.190 | **3/4** | 3/4 | 1-1/2 | 4 |

▶ Other shank types are available on your request.

▶ NEXT PAGE

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

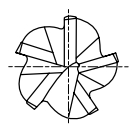
# TitaNox-POWER END MILLS

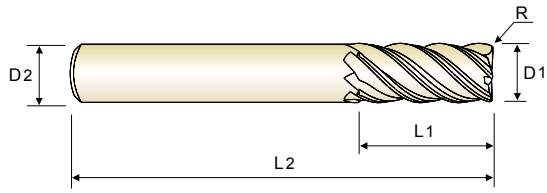
**UGMG34 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted






MG | 5 | M-Helix | PLAIN

P.943

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **UGMG34064** | R.030 | **1** | 1 | 1-1/8 | 4 |
| **UGMG34939** | R.060 | **1** | 1 | 1-1/8 | 4 |
| **UGMG34940** | R.090 | **1** | 1 | 1-1/8 | 4 |
| **UGMG34941** | R.015 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34942** | R.030 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34943** | R.060 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34944** | R.090 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34945** | R.125 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34946** | R.190 | **1** | 1 | 1-1/2 | 4 |
| **UGMG34947** | R.030 | **1** | 1 | 2 | 5 |
| **UGMG34948** | R.060 | **1** | 1 | 2 | 5 |
| **UGMG34949** | R.090 | **1** | 1 | 2 | 5 |

- Other shank types are available on your request.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

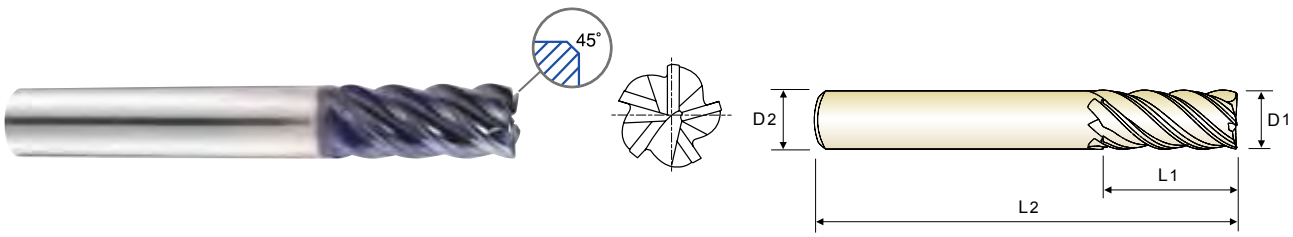
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**UGMG32 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted




MG | 5 | M-Helix | PLAIN | C x 45° | P.943

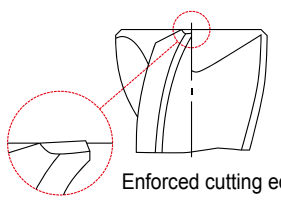
MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | Chamfer Size |
|---|---|---|---|---|---|
| Y-COATED | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **UGMG32008** | 1/8 | 1/8 | 1/4 | 1-1/2 | .004 |
| **UGMG32901** | 1/8 | 1/8 | 3/8 | 1-1/2 | .004 |
| **UGMG32012** | 3/16 | 3/16 | 5/16 | 2 | .006 |
| **UGMG32902** | 3/16 | 3/16 | 9/16 | 2 | .006 |
| **UGMG32016** | 1/4 | 1/4 | 3/8 | 2 | .007 |
| **UGMG32903** | 1/4 | 1/4 | 3/4 | 2-1/2 | .007 |
| **UGMG32020** | 5/16 | 5/16 | 7/16 | 2 | .007 |
| **UGMG32904** | 5/16 | 5/16 | 13/16 | 2-1/2 | .007 |
| **UGMG32024** | 3/8 | 3/8 | 1/2 | 2-1/2 | .011 |
| **UGMG32905** | 3/8 | 3/8 | 1 | 3 | .011 |
| **UGMG32032** | 1/2 | 1/2 | 5/8 | 2-1/2 | .013 |
| **UGMG32906** | 1/2 | 1/2 | 1 | 3 | .013 |
| **UGMG32907** | 1/2 | 1/2 | 1-1/4 | 3-1/2 | .013 |
| **UGMG32040** | 5/8 | 5/8 | 3/4 | 3 | .015 |
| **UGMG32908** | 1/2 | 5/8 | 1-1/4 | 3-1/2 | .015 |
| **UGMG32048** | 3/4 | 3/4 | 1 | 3-1/2 | .019 |
| **UGMG32909** | 3/4 | 3/4 | 1-1/2 | 4 | .019 |
| **UGMG32064** | 1 | 1 | 1-1/8 | 4 | .019 |
| **UGMG32910** | 1 | 1 | 1-1/2 | 4 | .019 |
| **UGMG32911** | 1 | 1 | 2 | 5 | .019 |

▶ Other shank types are available on your request.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |


Enforced cutting edge

◎ : Excellent ○ : Good

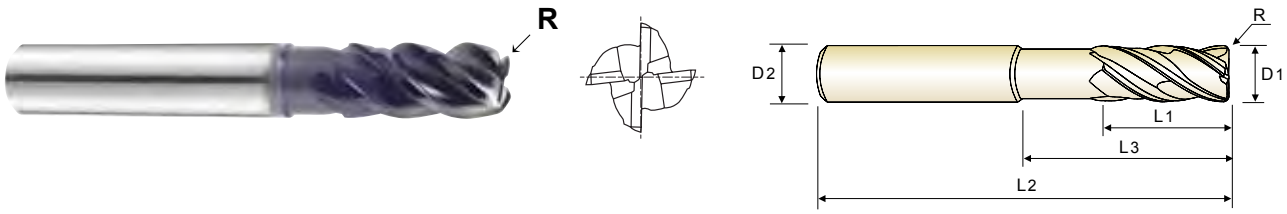
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG40 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

- Double Core E/M has a Unique Flute Design for excellent chip evacuation and higher rigidity
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy




MG | 4 | M-Helix | PLAIN

P.944, 945

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| Y-COATED | R | METRIC / INCH D1 | | $D_2$ | $L_1$ | $L_3$ | $L_2$ |
| **GMG40060** | R0.5 | **6.0** | **.2362** | 6 | 13 | 20 | 57 |
| **GMG40901** | R1.0 | **6.0** | **.2362** | 6 | 13 | 20 | 57 |
| **GMG40080** | R0.5 | **8.0** | **.3150** | 8 | 19 | 25 | 63 |
| **GMG40902** | R1.0 | **8.0** | **.3150** | 8 | 19 | 25 | 63 |
| **GMG40903** | R1.5 | **8.0** | **.3150** | 8 | 19 | 25 | 63 |
| **GMG40904** | R2.0 | **8.0** | **.3150** | 8 | 19 | 25 | 63 |
| **GMG40100** | R0.5 | **10.0** | **.3937** | 10 | 22 | 30 | 72 |
| **GMG40905** | R1.0 | **10.0** | **.3937** | 10 | 22 | 30 | 72 |
| **GMG40906** | R1.5 | **10.0** | **.3937** | 10 | 22 | 30 | 72 |
| **GMG40907** | R2.0 | **10.0** | **.3937** | 10 | 22 | 30 | 72 |
| **GMG40120** | R0.5 | **12.0** | **.4724** | 12 | 26 | 35 | 83 |
| **GMG40908** | R1.0 | **12.0** | **.4724** | 12 | 26 | 35 | 83 |
| **GMG40909** | R1.5 | **12.0** | **.4724** | 12 | 26 | 35 | 83 |
| **GMG40910** | R2.0 | **12.0** | **.4724** | 12 | 26 | 35 | 83 |
| **GMG40911** | R3.0 | **12.0** | **.4724** | 12 | 26 | 35 | 83 |
| **GMG40140** | R1.0 | **14.0** | **.5512** | 14 | 26 | 35 | 83 |
| **GMG40912** | R2.0 | **14.0** | **.5512** | 14 | 26 | 35 | 83 |
| **GMG40160** | R1.0 | **16.0** | **.6299** | 16 | 35 | 43 | 92 |
| **GMG40913** | R1.5 | **16.0** | **.6299** | 16 | 35 | 43 | 92 |
| **GMG40914** | R2.0 | **16.0** | **.6299** | 16 | 35 | 43 | 92 |
| **GMG40915** | R3.0 | **16.0** | **.6299** | 16 | 35 | 43 | 92 |
| **GMG40916** | R4.0 | **16.0** | **.6299** | 16 | 35 | 43 | 92 |

▶ NEXT PAGE

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

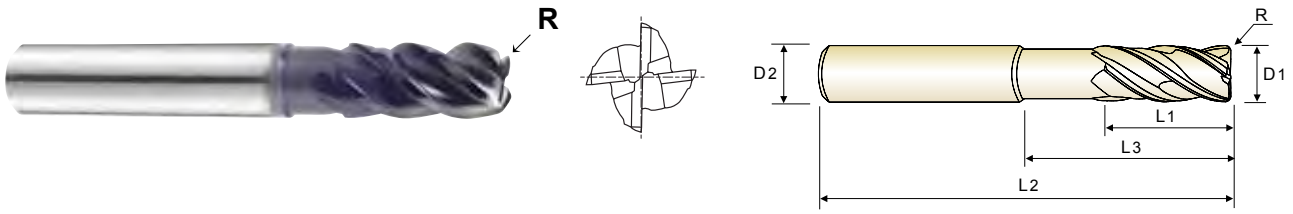
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG40 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE

- Double Core E/M has a Unique Flute Design for excellent chip evacuation and higher rigidity
- The double core adds stability and aids chip flow, reducing tool deflection, improving dimensional stability and workpiece accuracy




MG | 4 | M-Helix | PLAIN

P.944, 945

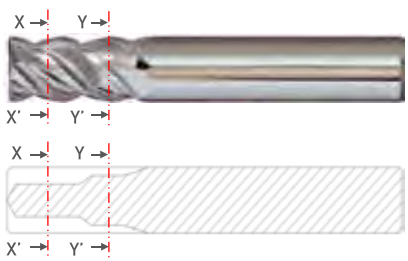
◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| Y-COATED | R | METRIC | INCH | $D_2$ | $L_1$ | $L_3$ | $L_2$ |
| | | $D_1$ | | | | | |
| **GMG40200** | R1.0 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40917** | R1.5 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40918** | R2.0 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40919** | R3.0 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40920** | R3.5 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40921** | R4.0 | **20.0** | **.7874** | 20 | 44 | 56 | 110 |
| **GMG40250** | R1.0 | **25.0** | **.9843** | 25 | 55 | 70 | 130 |
| **GMG40922** | R1.5 | **25.0** | **.9843** | 25 | 55 | 70 | 130 |
| **GMG40923** | R2.0 | **25.0** | **.9843** | 25 | 55 | 70 | 130 |
| **GMG40924** | R3.0 | **25.0** | **.9843** | 25 | 55 | 70 | 130 |
| **GMG40925** | R4.0 | **25.0** | **.9843** | 25 | 55 | 70 | 130 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◆ **2 STEP CORE**






**<SECTION X-X'>**
**Excellent chip evacuation**

**<SECTION Y-Y'>**
**Higher rigidity**

◎ : Excellent ○ : Good

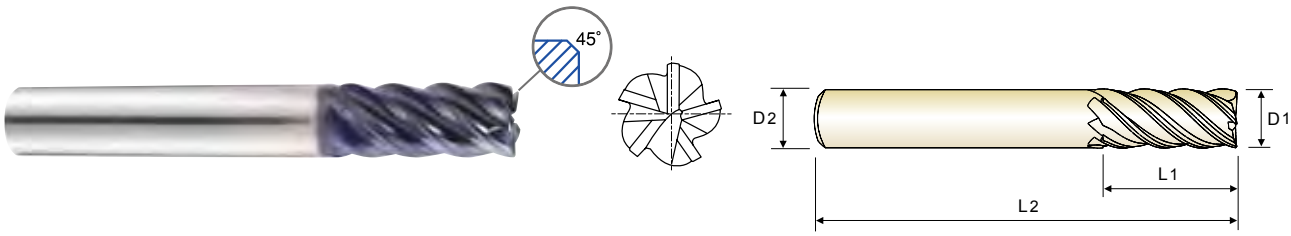
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG24 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE SHORT LENGTH

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted



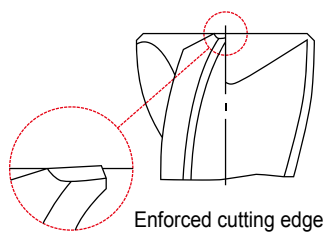

MG | 5 | M-Helix | PLAIN | C x 45° | P.946

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | Chamfer Size |
|---|---|---|---|---|---|---|
| Y-COATED | METRIC | INCH | $D_2$ | $L_1$ | $L_2$ | |
| | $D_1$ | | | | | |
| **GMG24060** | **6.0** | **.2362** | 6 | 10 | 54 | 0.2 |
| **GMG24080** | **8.0** | **.3150** | 8 | 12 | 58 | 0.2 |
| **GMG24100** | **10.0** | **.3937** | 10 | 14 | 66 | 0.3 |
| **GMG24120** | **12.0** | **.4724** | 12 | 16 | 73 | 0.35 |
| **GMG24160** | **16.0** | **.6299** | 16 | 22 | 82 | 0.4 |
| **GMG24200** | **20.0** | **.7874** | 20 | 26 | 92 | 0.5 |
| **GMG24250** | **25.0** | **.9843** | 25 | 29 | 100 | 0.5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

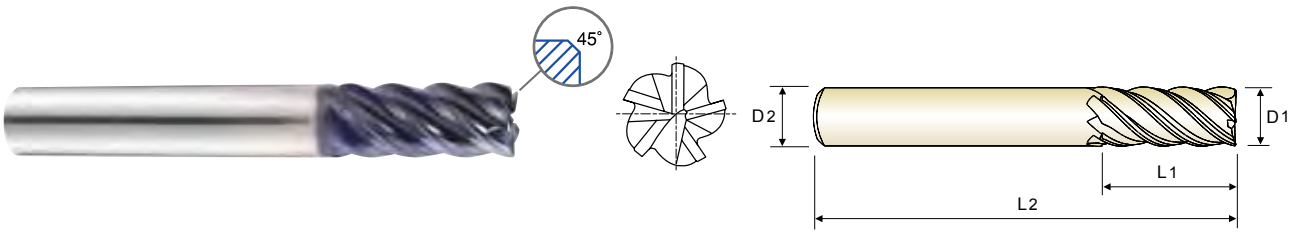
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG26 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE LONG LENGTH

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted



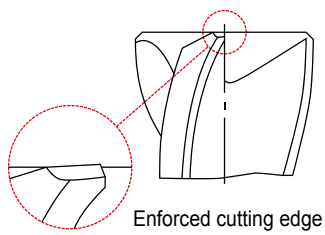

MG | 5 | M-Helix | PLAIN | C x 45° | P.946

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length | Chamfer Size |
|---|---|---|---|---|---|---|
| Y-COATED | METRIC | INCH | $D_2$ | $L_1$ | $L_2$ | |
| | $D_1$ | | | | | |
| GMG26060 | 6.0 | .2362 | 6 | 13 | 57 | 0.2 |
| GMG26080 | 8.0 | .3150 | 8 | 19 | 63 | 0.2 |
| GMG26100 | 10.0 | .3937 | 10 | 22 | 72 | 0.3 |
| GMG26120 | 12.0 | .4724 | 12 | 26 | 83 | 0.35 |
| GMG26160 | 16.0 | .6299 | 16 | 36 | 92 | 0.4 |
| GMG26200 | 20.0 | .7874 | 20 | 44 | 104 | 0.5 |
| GMG26250 | 25.0 | .9843 | 25 | 54 | 121 | 0.5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |


Enforced cutting edge

◎ : Excellent ○ : Good

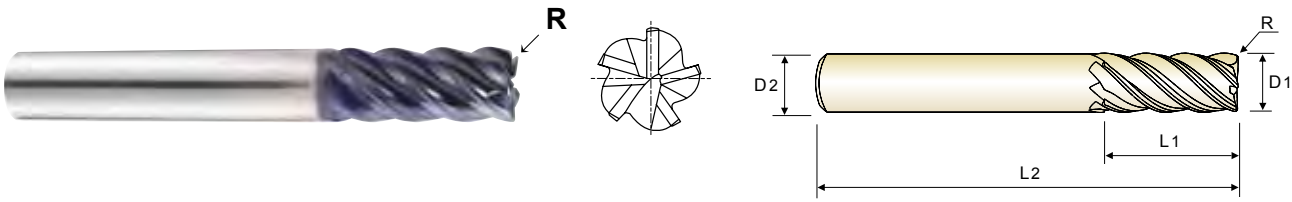
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG28 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE SHORT LENGTH CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted




MG | 5 | M-Helix | PLAIN

P.946

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| Y-COATED | R | METRIC | INCH | $D_2$ | $L_1$ | $L_2$ |
| | | $D_1$ | | | | |
| **GMG28060** | R0.5 | **6.0** | **.2362** | 6 | 10 | 54 |
| **GMG28080** | R0.5 | **8.0** | **.3150** | 8 | 12 | 58 |
| **GMG28100** | R0.5 | **10.0** | **.3937** | 10 | 14 | 66 |
| **GMG28120** | R0.5 | **12.0** | **.4724** | 12 | 16 | 73 |
| **GMG28160** | R1.0 | **16.0** | **.6299** | 16 | 22 | 82 |
| **GMG28200** | R1.0 | **20.0** | **.7874** | 20 | 26 | 92 |
| **GMG28250** | R1.0 | **25.0** | **.9843** | 25 | 29 | 100 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

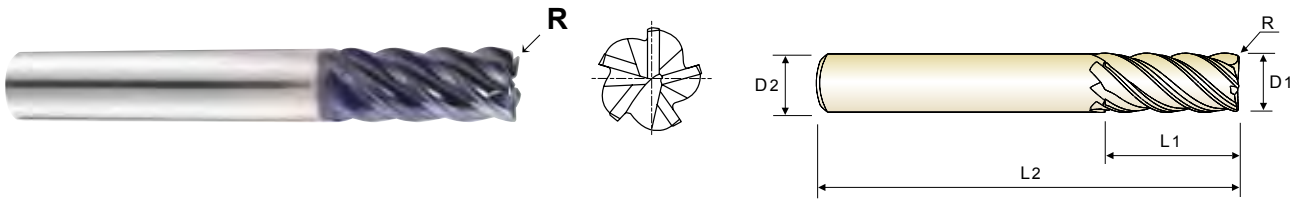
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# TitaNox-POWER END MILLS

**GMG30 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE LONG LENGTH CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted




MG | 5 | M-Helix | PLAIN

P.946

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| Y-COATED | R | METRIC D1 | INCH D1 | D2 | L1 | L2 |
| GMG30060 | R0.3 | 6.0 | .2362 | 6 | 13 | 57 |
| GMG30901 | R0.5 | 6.0 | .2362 | 6 | 13 | 57 |
| GMG30902 | R1.0 | 6.0 | .2362 | 6 | 13 | 57 |
| GMG30080 | R0.5 | 8.0 | .3150 | 8 | 19 | 63 |
| GMG30903 | R1.0 | 8.0 | .3150 | 8 | 19 | 63 |
| GMG30904 | R1.5 | 8.0 | .3150 | 8 | 19 | 63 |
| GMG30905 | R2.0 | 8.0 | .3150 | 8 | 19 | 63 |
| GMG30100 | R0.5 | 10.0 | .3937 | 10 | 22 | 72 |
| GMG30906 | R1.0 | 10.0 | .3937 | 10 | 22 | 72 |
| GMG30907 | R1.5 | 10.0 | .3937 | 10 | 22 | 72 |
| GMG30908 | R2.0 | 10.0 | .3937 | 10 | 22 | 72 |
| GMG30120 | R0.5 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30909 | R1.0 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30910 | R1.5 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30911 | R2.0 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30912 | R2.5 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30913 | R3.0 | 12.0 | .4724 | 12 | 26 | 83 |
| GMG30160 | R1.0 | 16.0 | .6299 | 16 | 36 | 92 |
| GMG30914 | R1.5 | 16.0 | .6299 | 16 | 36 | 92 |
| GMG30915 | R2.0 | 16.0 | .6299 | 16 | 36 | 92 |
| GMG30916 | R2.5 | 16.0 | .6299 | 16 | 36 | 92 |
| GMG30917 | R3.0 | 16.0 | .6299 | 16 | 36 | 92 |
| GMG30918 | R4.0 | 16.0 | .6299 | 16 | 36 | 92 |

▶ NEXT PAGE

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

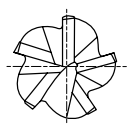
# TitaNox-POWER END MILLS

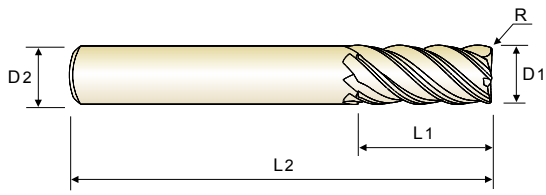
**GMG30 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE LONG LENGTH CORNER RADIUS

- Excellent performance results and long tool life when machining Titanium and other tough materials
- This tool has high rigidity of flute so that is possible to use for heavy profile and high speed milling
- For protecting Corner chipping of end teeth, Corner Radius & Chamfer are adopted






MG | 5 | M-Helix | PLAIN

P.946

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| Y-COATED | R | METRIC D1 | INCH D1 | D2 | L1 | L2 |
| GMG30200 | R1.0 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30919 | R1.5 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30920 | R2.0 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30921 | R2.5 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30922 | R3.0 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30923 | R4.0 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30924 | R5.0 | 20.0 | .7874 | 20 | 44 | 104 |
| GMG30250 | R1.0 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30925 | R1.5 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30926 | R2.0 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30927 | R2.5 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30928 | R3.0 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30929 | R4.0 | 25.0 | .9843 | 25 | 54 | 121 |
| GMG30930 | R5.0 | 25.0 | .9843 | 25 | 54 | 121 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

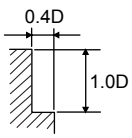
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE - SIDE CUTTING

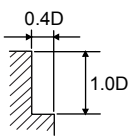
## UGMG42 SERIES

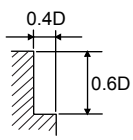
| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 8021 | 34.11 | 525 | .0011 | 7520 | 29.61 | 492 | .0010 | 7520 | 31.97 | 492 | .0011 |
| 5/16 | 6417 | 35.37 | 525 | .0014 | 6016 | 33.16 | 492 | .0014 | 6016 | 33.16 | 492 | .0014 |
| 3/8 | 5347 | 35.37 | 525 | .0017 | 5013 | 33.16 | 492 | .0017 | 5013 | 36.32 | 492 | .0018 |
| 1/2 | 4010 | 33.47 | 525 | .0021 | 3760 | 29.01 | 492 | .0019 | 3760 | 31.38 | 492 | .0021 |
| 5/8 | 3208 | 31.83 | 525 | .0025 | 3008 | 29.84 | 492 | .0025 | 3008 | 31.74 | 492 | .0026 |
| 3/4 | 2674 | 32.42 | 525 | .0030 | 2507 | 27.63 | 492 | .0028 | 2507 | 30.39 | 492 | .0030 |
| 1 | 2005 | 26.53 | 525 | .0033 | 1880 | 24.87 | 492 | .0033 | 1880 | 24.87 | 492 | .0033 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

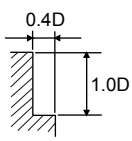
| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 5264 | 20.47 | 344 | .0010 | 7770 | 41.85 | 509 | .0013 | 2206 | 5.61 | 144 | .0006 |
| 5/16 | 4211 | 22.68 | 344 | .0013 | 6216 | 44.64 | 509 | .0018 | 1765 | 5.81 | 144 | .0008 |
| 3/8 | 3509 | 23.10 | 344 | .0016 | 5180 | 46.50 | 509 | .0022 | 1471 | 6.16 | 144 | .0010 |
| 1/2 | 2632 | 19.69 | 344 | .0019 | 3885 | 40.69 | 509 | .0026 | 1103 | 5.61 | 144 | .0013 |
| 5/8 | 2106 | 20.47 | 344 | .0024 | 3108 | 41.85 | 509 | .0034 | 882 | 5.54 | 144 | .0016 |
| 3/4 | 1755 | 19.69 | 344 | .0028 | 2590 | 38.75 | 509 | .0037 | 735 | 5.28 | 144 | .0018 |
| 1 | 1316 | 16.73 | 344 | .0032 | 1943 | 34.87 | 509 | .0045 | 551 | 4.54 | 144 | .0021 |

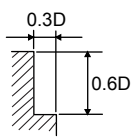



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 8773 | 29.01 | 574 | .0008 | 3509 | 18.90 | 230 | .0013 | 1604 | 5.05 | 105 | .0008 |
| 5/16 | 7018 | 30.95 | 574 | .0011 | 2807 | 21.00 | 230 | .0019 | 1283 | 5.25 | 105 | .0010 |
| 3/8 | 5849 | 32.24 | 574 | .0014 | 2339 | 21.00 | 230 | .0022 | 1069 | 5.39 | 105 | .0013 |
| 1/2 | 4386 | 29.01 | 574 | .0017 | 1755 | 18.37 | 230 | .0026 | 802 | 4.80 | 105 | .0015 |
| 5/8 | 3509 | 29.29 | 574 | .0021 | 1404 | 18.90 | 230 | .0034 | 642 | 4.85 | 105 | .0019 |
| 3/4 | 2924 | 27.63 | 574 | .0024 | 1170 | 17.50 | 230 | .0037 | 535 | 4.63 | 105 | .0022 |
| 1 | 2193 | 24.18 | 574 | .0028 | 877 | 15.75 | 230 | .0045 | 401 | 4.11 | 105 | .0026 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

# TitaNox-POWER END MILLS

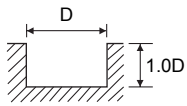
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE - SLOTTING

### UGMG42 SERIES

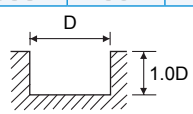
| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 6266 | 24.67 | 410 | .0010 | 6016 | 23.68 | 394 | .0010 | 6016 | 25.58 | 394 | .0011 |
| 5/16 | 5013 | 26.84 | 410 | .0013 | 4813 | 25.77 | 394 | .0013 | 4813 | 26.53 | 394 | .0014 |
| 3/8 | 4178 | 27.63 | 410 | .0017 | 4010 | 26.53 | 394 | .0017 | 4010 | 26.53 | 394 | .0017 |
| 1/2 | 3133 | 24.18 | 410 | .0019 | 3008 | 23.21 | 394 | .0019 | 3008 | 25.11 | 394 | .0021 |
| 5/8 | 2507 | 24.87 | 410 | .0025 | 2406 | 23.87 | 394 | .0025 | 2406 | 23.87 | 394 | .0025 |
| 3/4 | 2089 | 23.03 | 410 | .0028 | 2005 | 22.11 | 394 | .0028 | 2005 | 24.32 | 394 | .0030 |
| 1 | 1567 | 20.72 | 410 | .0033 | 1504 | 18.24 | 394 | .0030 | 1504 | 19.89 | 394 | .0033 |

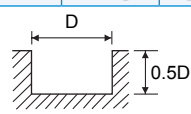
RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth




| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 4261 | 16.57 | 279 | .0010 | 6266 | 33.75 | 410 | .0013 | 1805 | 4.59 | 118 | .0006 |
| 5/16 | 3409 | 18.36 | 279 | .0013 | 5013 | 36.00 | 410 | .0018 | 1444 | 4.75 | 118 | .0008 |
| 3/8 | 2841 | 18.70 | 279 | .0016 | 4178 | 37.50 | 410 | .0022 | 1203 | 5.04 | 118 | .0010 |
| 1/2 | 2131 | 15.94 | 279 | .0019 | 3133 | 32.81 | 410 | .0026 | 902 | 4.59 | 118 | .0013 |
| 5/8 | 1704 | 16.57 | 279 | .0024 | 2507 | 31.87 | 410 | .0032 | 722 | 4.54 | 118 | .0016 |
| 3/4 | 1420 | 15.94 | 279 | .0028 | 2089 | 31.25 | 410 | .0037 | 602 | 4.32 | 118 | .0018 |
| 1 | 1065 | 13.55 | 279 | .0032 | 1567 | 25.78 | 410 | .0041 | 451 | 3.71 | 118 | .0021 |

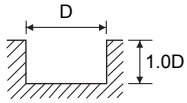
RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

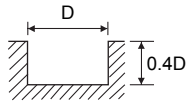



| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 900N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 7018 | 23.21 | 459 | .0008 | 2757 | 14.85 | 181 | .0013 | 1253 | 3.55 | 82 | .0007 |
| 5/16 | 5615 | 24.76 | 459 | .0011 | 2206 | 15.84 | 181 | .0018 | 1003 | 3.79 | 82 | .0009 |
| 3/8 | 4679 | 25.79 | 459 | .0014 | 1838 | 16.50 | 181 | .0022 | 836 | 3.95 | 82 | .0012 |
| 1/2 | 3509 | 23.21 | 459 | .0017 | 1379 | 14.44 | 181 | .0026 | 627 | 3.55 | 82 | .0014 |
| 5/8 | 2807 | 23.43 | 459 | .0021 | 1103 | 14.85 | 181 | .0034 | 501 | 3.47 | 82 | .0017 |
| 3/4 | 2339 | 22.11 | 459 | .0024 | 919 | 13.75 | 181 | .0037 | 418 | 3.29 | 82 | .0020 |
| 1 | 1755 | 18.51 | 459 | .0026 | 689 | 11.34 | 181 | .0041 | 313 | 2.71 | 82 | .0022 |

RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth



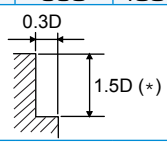



# CARBIDE, 5 FLUTE - SIDE CUTTING

## UGMG34, UGMG32 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 7197 | 46.78 | 471 | .0013 | 5042 | 32.78 | 330 | .0013 | 3025 | 13.61 | 198 | .0009 |
| 5/16 | 5758 | 43.18 | 471 | .0015 | 4034 | 30.25 | 330 | .0015 | 2420 | 13.31 | 198 | .0011 |
| 3/8 | 4798 | 47.98 | 471 | .0020 | 3362 | 33.62 | 330 | .0020 | 2017 | 14.12 | 198 | .0014 |
| 1/2 | 3598 | 44.98 | 471 | .0025 | 2521 | 31.52 | 330 | .0025 | 1513 | 12.86 | 198 | .0017 |
| 9/16 | 3199 | 43.18 | 471 | .0027 | 2241 | 30.25 | 330 | .0027 | 1345 | 12.77 | 198 | .0019 |
| 5/8 | 2879 | 43.18 | 471 | .0030 | 2017 | 30.25 | 330 | .0030 | 1210 | 12.71 | 198 | .0021 |
| 11/16 | 2617 | 43.18 | 471 | .0033 | 1834 | 30.25 | 330 | .0033 | 1100 | 12.65 | 198 | .0023 |
| 3/4 | 2399 | 41.98 | 471 | .0035 | 1681 | 29.41 | 330 | .0035 | 1008 | 12.61 | 198 | .0025 |
| 1 | 1799 | 35.98 | 471 | .0040 | 1261 | 25.21 | 330 | .0040 | 756 | 10.59 | 198 | .0028 |

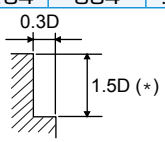
(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 4110 | 24.66 | 269 | .0012 | 5868 | 29.34 | 384 | .0010 | 2934 | 17.60 | 192 | .0012 |
| 5/16 | 3288 | 19.73 | 269 | .0012 | 4694 | 23.47 | 384 | .0010 | 2347 | 14.08 | 192 | .0012 |
| 3/8 | 2740 | 20.55 | 269 | .0015 | 3912 | 23.47 | 384 | .0012 | 1956 | 14.67 | 192 | .0015 |
| 1/2 | 2055 | 25.69 | 269 | .0025 | 2934 | 26.40 | 384 | .0018 | 1467 | 18.34 | 192 | .0025 |
| 9/16 | 1827 | 23.75 | 269 | .0026 | 2608 | 26.08 | 384 | .0020 | 1304 | 16.95 | 192 | .0026 |
| 5/8 | 1644 | 22.20 | 269 | .0027 | 2347 | 24.64 | 384 | .0021 | 1174 | 15.84 | 192 | .0027 |
| 11/16 | 1495 | 20.93 | 269 | .0028 | 2134 | 23.47 | 384 | .0022 | 1067 | 14.94 | 192 | .0028 |
| 3/4 | 1370 | 20.55 | 269 | .0030 | 1956 | 23.47 | 384 | .0024 | 978 | 14.67 | 192 | .0030 |
| 1 | 1028 | 17.98 | 269 | .0035 | 1467 | 20.54 | 384 | .0028 | 733 | 12.84 | 192 | .0035 |

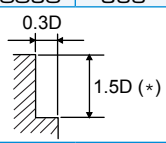
(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.

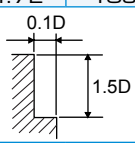



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 900N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/4 | 5302 | 45.07 | 347 | .0017 | 3453 | 18.99 | 226 | .0011 | 1574 | 6.30 | 103 | .0008 |
| 5/16 | 4242 | 40.30 | 347 | .0019 | 2763 | 15.19 | 226 | .0011 | 1259 | 5.67 | 103 | .0009 |
| 3/8 | 3535 | 44.18 | 347 | .0025 | 2302 | 14.96 | 226 | .0013 | 1049 | 5.25 | 103 | .0010 |
| 1/2 | 2651 | 41.09 | 347 | .0031 | 1727 | 18.99 | 226 | .0022 | 787 | 6.69 | 103 | .0017 |
| 9/16 | 2357 | 40.06 | 347 | .0034 | 1535 | 17.65 | 226 | .0023 | 699 | 6.30 | 103 | .0018 |
| 5/8 | 2121 | 40.30 | 347 | .0038 | 1381 | 16.58 | 226 | .0024 | 630 | 5.98 | 103 | .0019 |
| 11/16 | 1928 | 39.53 | 347 | .0041 | 1256 | 15.70 | 226 | .0025 | 572 | 5.44 | 103 | .0019 |
| 3/4 | 1767 | 38.88 | 347 | .0044 | 1151 | 15.54 | 226 | .0027 | 525 | 5.51 | 103 | .0021 |
| 1 | 1326 | 33.14 | 347 | .0050 | 863 | 13.38 | 226 | .0031 | 393 | 4.72 | 103 | .0024 |

(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

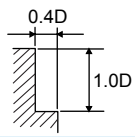
# TitaNox-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE - SIDE CUTTING

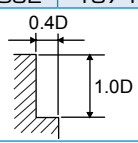
### GMG40 SERIES

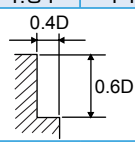
| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 8488 | 36.09 | 525 | .0011 | 7958 | 31.33 | 492 | .0010 | 7958 | 33.84 | 492 | .0011 |
| 8.0 | 6366 | 35.09 | 525 | .0014 | 5968 | 32.90 | 492 | .0014 | 5968 | 32.90 | 492 | .0014 |
| 10.0 | 5093 | 33.69 | 525 | .0017 | 4775 | 31.58 | 492 | .0017 | 4775 | 34.59 | 492 | .0018 |
| 12.0 | 4244 | 35.42 | 525 | .0021 | 3979 | 30.70 | 492 | .0019 | 3979 | 33.21 | 492 | .0021 |
| 14.0 | 3638 | 33.23 | 525 | .0023 | 3410 | 30.08 | 492 | .0022 | 3410 | 32.22 | 492 | .0024 |
| 16.0 | 3183 | 31.58 | 525 | .0025 | 2984 | 29.61 | 492 | .0025 | 2984 | 31.49 | 492 | .0026 |
| 20.0 | 2546 | 30.88 | 525 | .0030 | 2387 | 26.32 | 492 | .0028 | 2387 | 28.95 | 492 | .0030 |
| 25.0 | 2037 | 26.95 | 525 | .0033 | 1910 | 25.26 | 492 | .0033 | 1910 | 25.26 | 492 | .0033 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

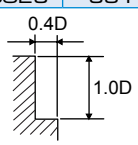
| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 5570 | 21.67 | 344 | .0010 | 8223 | 44.29 | 509 | .0013 | 2334 | 5.94 | 144 | .0006 |
| 8.0 | 4178 | 22.50 | 344 | .0013 | 6167 | 44.29 | 509 | .0018 | 1751 | 5.76 | 144 | .0008 |
| 10.0 | 3342 | 22.00 | 344 | .0016 | 4934 | 44.29 | 509 | .0022 | 1401 | 5.87 | 144 | .0010 |
| 12.0 | 2785 | 20.83 | 344 | .0019 | 4112 | 43.06 | 509 | .0026 | 1167 | 5.94 | 144 | .0013 |
| 14.0 | 2387 | 20.68 | 344 | .0022 | 3524 | 42.18 | 509 | .0030 | 1000 | 5.67 | 144 | .0014 |
| 16.0 | 2089 | 20.31 | 344 | .0024 | 3084 | 41.52 | 509 | .0034 | 875 | 5.50 | 144 | .0016 |
| 20.0 | 1671 | 18.75 | 344 | .0028 | 2467 | 36.91 | 509 | .0037 | 700 | 5.03 | 144 | .0018 |
| 25.0 | 1337 | 17.00 | 344 | .0032 | 1974 | 35.43 | 509 | .0045 | 560 | 4.61 | 144 | .0021 |

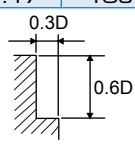



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 900N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 9284 | 30.70 | 574 | .0008 | 3714 | 20.00 | 230 | .0013 | 1698 | 5.35 | 105 | .0008 |
| 8.0 | 6963 | 30.70 | 574 | .0011 | 2785 | 20.83 | 230 | .0019 | 1273 | 5.21 | 105 | .0010 |
| 10.0 | 5570 | 30.70 | 574 | .0014 | 2228 | 20.00 | 230 | .0022 | 1019 | 5.13 | 105 | .0013 |
| 12.0 | 4642 | 30.70 | 574 | .0017 | 1857 | 19.45 | 230 | .0026 | 849 | 5.08 | 105 | .0015 |
| 14.0 | 3979 | 30.08 | 574 | .0019 | 1592 | 19.05 | 230 | .0030 | 728 | 5.04 | 105 | .0017 |
| 16.0 | 3482 | 29.06 | 574 | .0021 | 1393 | 18.75 | 230 | .0034 | 637 | 4.81 | 105 | .0019 |
| 20.0 | 2785 | 26.32 | 574 | .0024 | 1114 | 16.67 | 230 | .0037 | 509 | 4.41 | 105 | .0022 |
| 25.0 | 2228 | 24.56 | 574 | .0028 | 891 | 16.00 | 230 | .0045 | 407 | 4.17 | 105 | .0026 |



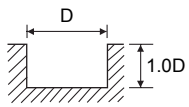




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

# CARBIDE, 4 FLUTE CORNER RADIUS with DOUBLE CORE - SLOTTING

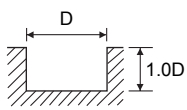
## GMG40 SERIES

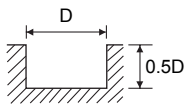
| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 6631 | 26.11 | 410 | .0010 | 6366 | 25.06 | 394 | .0010 | 6366 | 27.07 | 394 | .0011 |
| 8.0 | 4974 | 26.63 | 410 | .0013 | 4775 | 25.57 | 394 | .0013 | 4775 | 26.32 | 394 | .0014 |
| 10.0 | 3979 | 26.32 | 410 | .0017 | 3820 | 25.26 | 394 | .0017 | 3820 | 25.26 | 394 | .0017 |
| 12.0 | 3316 | 25.59 | 410 | .0019 | 3183 | 24.56 | 394 | .0019 | 3183 | 26.57 | 394 | .0021 |
| 14.0 | 2842 | 25.06 | 410 | .0022 | 2728 | 24.06 | 394 | .0022 | 2728 | 24.92 | 394 | .0023 |
| 16.0 | 2487 | 24.67 | 410 | .0025 | 2387 | 23.69 | 394 | .0025 | 2387 | 23.69 | 394 | .0025 |
| 20.0 | 1989 | 21.93 | 410 | .0028 | 1910 | 21.05 | 394 | .0028 | 1910 | 23.16 | 394 | .0030 |
| 25.0 | 1592 | 21.05 | 410 | .0033 | 1528 | 18.53 | 394 | .0030 | 1528 | 20.21 | 394 | .0033 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

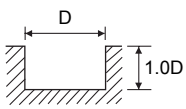
| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 4509 | 17.54 | 279 | .0010 | 6631 | 35.72 | 410 | .0013 | 1910 | 4.86 | 118 | .0006 |
| 8.0 | 3382 | 18.22 | 279 | .0013 | 4974 | 35.72 | 410 | .0018 | 1432 | 4.71 | 118 | .0008 |
| 10.0 | 2706 | 17.81 | 279 | .0016 | 3979 | 35.72 | 410 | .0022 | 1146 | 4.80 | 118 | .0010 |
| 12.0 | 2255 | 16.87 | 279 | .0019 | 3316 | 34.72 | 410 | .0026 | 955 | 4.86 | 118 | .0013 |
| 14.0 | 1933 | 16.74 | 279 | .0022 | 2842 | 33.12 | 410 | .0029 | 819 | 4.64 | 118 | .0014 |
| 16.0 | 1691 | 16.44 | 279 | .0024 | 2487 | 31.62 | 410 | .0032 | 716 | 4.50 | 118 | .0016 |
| 20.0 | 1353 | 15.18 | 279 | .0028 | 1989 | 29.76 | 410 | .0037 | 573 | 4.11 | 118 | .0018 |
| 25.0 | 1082 | 13.76 | 279 | .0032 | 1592 | 26.19 | 410 | .0041 | 458 | 3.77 | 118 | .0021 |

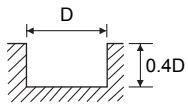



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 900N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 7427 | 24.56 | 459 | .0008 | 2918 | 15.71 | 180 | .0013 | 1326 | 3.76 | 82 | .0007 |
| 8.0 | 5570 | 24.56 | 459 | .0011 | 2188 | 15.71 | 180 | .0018 | 995 | 3.76 | 82 | .0009 |
| 10.0 | 4456 | 24.56 | 459 | .0014 | 1751 | 15.71 | 180 | .0022 | 796 | 3.76 | 82 | .0012 |
| 12.0 | 3714 | 24.56 | 459 | .0017 | 1459 | 15.28 | 180 | .0026 | 663 | 3.76 | 82 | .0014 |
| 14.0 | 3183 | 24.06 | 459 | .0019 | 1251 | 14.97 | 180 | .0030 | 568 | 3.58 | 82 | .0016 |
| 16.0 | 2785 | 23.25 | 459 | .0021 | 1094 | 14.73 | 180 | .0034 | 497 | 3.45 | 82 | .0017 |
| 20.0 | 2228 | 21.05 | 459 | .0024 | 875 | 13.10 | 180 | .0037 | 398 | 3.13 | 82 | .0020 |
| 25.0 | 1783 | 18.81 | 459 | .0026 | 700 | 11.52 | 180 | .0041 | 318 | 2.76 | 82 | .0022 |




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

# TitaNox-POWER END MILLS

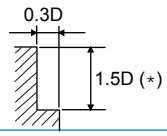
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 5 FLUTE - SIDE CUTTING

## GMG24, GMG26, GMG28, GMG30 SERIES

| MATERIAL | P | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | | | ALLOY STEELS | | | | TOOL STEELS | | | |
| HARDNESS | ~ HB 300 | | | | HB 300 ~ HB 380 | | | | ~ HB 380 | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000 ~ 1300N/mm² | | | | ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 7639 | 51.13 | 472 | .0013 | 5358 | 35.86 | 331 | .0013 | 3183 | 15.04 | 197 | .0009 |
| 8.0 | 5730 | 42.86 | 472 | .0015 | 4019 | 30.06 | 331 | .0015 | 2387 | 12.69 | 197 | .0011 |
| 10.0 | 4584 | 45.11 | 472 | .0020 | 3215 | 31.64 | 331 | .0020 | 1910 | 13.16 | 197 | .0014 |
| 12.0 | 3820 | 47.37 | 472 | .0025 | 2679 | 33.23 | 331 | .0025 | 1592 | 13.79 | 197 | .0017 |
| 16.0 | 2865 | 42.86 | 472 | .0030 | 2009 | 30.06 | 331 | .0030 | 1194 | 12.69 | 197 | .0021 |
| 20.0 | 2292 | 40.15 | 472 | .0035 | 1607 | 28.16 | 331 | .0035 | 955 | 11.65 | 197 | .0024 |
| 25.0 | 1833 | 36.45 | 472 | .0040 | 1286 | 25.57 | 331 | .0040 | 764 | 10.68 | 197 | .0028 |

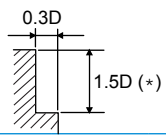
(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | M | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STAINLESS STEELS 300 | | | | STAINLESS STEELS 400 | | | | STAINLESS STEELS (PH) | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 4350 | 25.69 | 269 | .0012 | 6207 | 29.32 | 384 | .0009 | 3130 | 18.48 | 194 | .0012 |
| 8.0 | 3263 | 20.55 | 269 | .0013 | 4655 | 22.91 | 384 | .0010 | 2348 | 14.79 | 194 | .0013 |
| 10.0 | 2610 | 19.52 | 269 | .0015 | 3724 | 21.99 | 384 | .0012 | 1878 | 14.05 | 194 | .0015 |
| 12.0 | 2175 | 26.97 | 269 | .0025 | 3104 | 28.10 | 384 | .0018 | 1565 | 19.41 | 194 | .0025 |
| 16.0 | 1631 | 22.16 | 269 | .0027 | 2328 | 24.74 | 384 | .0021 | 1174 | 15.94 | 194 | .0027 |
| 20.0 | 1305 | 19.52 | 269 | .0030 | 1862 | 22.36 | 384 | .0024 | 939 | 14.05 | 194 | .0030 |
| 25.0 | 1044 | 18.09 | 269 | .0035 | 1490 | 20.82 | 384 | .0028 | 751 | 13.01 | 194 | .0035 |

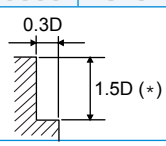
(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.

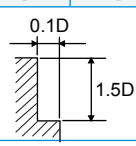



RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

| MATERIAL | K | | | | S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | TITANIUM | | | | HIGH TEMPERATURE ALLOY INCONEL HASTELLOY RENE | | | |
| HARDNESS | ~ HB 260 | | | | | | | | | | | |
| STRENGTH | ~ 900N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 6.0 | 5623 | 47.60 | 348 | .0017 | 3661 | 19.46 | 226 | .0011 | 1645 | 6.80 | 102 | .0008 |
| 8.0 | 4218 | 39.85 | 348 | .0019 | 2745 | 15.67 | 226 | .0011 | 1233 | 5.34 | 102 | .0009 |
| 10.0 | 3374 | 41.84 | 348 | .0025 | 2196 | 14.70 | 226 | .0013 | 987 | 5.24 | 102 | .0011 |
| 12.0 | 2812 | 43.73 | 348 | .0031 | 1830 | 20.54 | 226 | .0022 | 822 | 7.12 | 102 | .0017 |
| 16.0 | 2109 | 39.85 | 348 | .0038 | 1373 | 16.75 | 226 | .0024 | 617 | 5.83 | 102 | .0019 |
| 20.0 | 1687 | 36.86 | 348 | .0044 | 1098 | 14.92 | 226 | .0027 | 493 | 5.15 | 102 | .0021 |
| 25.0 | 1350 | 33.48 | 348 | .0050 | 879 | 13.66 | 226 | .0031 | 395 | 4.82 | 102 | .0024 |

(*): Apply below than 90% of Length of Cut, when it is less than 1.5D.




RPM = rev./min. FEED = inch/min.
Vc = ft/min. fz = inch/tooth

# CARBIDE

Being the best through innovation



# V7 PLUS A END MILLS

- Silent Cutting of Steels up to HRc40.
  Designed as Unequal Leads.

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| UGMG53 UGMG54 |  | CARBIDE, 4 FLUTE BALL NOSE ◆ | 1/8 11/32 | 1 | 950 |
| UGMF70 UGMF71 |  | CARBIDE, 4 FLUTE CORNER RADIUS ◆ | 1/8 3/8 | 1 | 951 |
| UGMF74 UGMF75 |  | CARBIDE, 4 FLUTE with EXTENDED NECK, CORNER RADIUS ◆ | 1/4 3/8 | 1 | 954 |
| UGMF68 UGMF69 |  | CARBIDE, 4 FLUTE ◆ | 1/8 11/32 | 1 | 955 |
| UGMF76 UGMF77 |  | CARBIDE, 4 FLUTE ◆ | 3/8 | 1 | 956 |
| UGMF72 UGMF73 |  | CARBIDE, 4 FLUTE with EXTENDED NECK ◆ | 1/4 3/8 | 1 | 957 |
| UGMG22 UGMG23 |  | CARBIDE, 6 FLUTE CORNER RADIUS ◆ | 1/4 3/8 | 1 | 958 |
| UGMG20 UGMG21 |  | CARBIDE, 6 FLUTE ◆ | 1/4 3/8 | 1 | 961 |
| **METRIC** | | | | | |
| GMG55 GMG56 |  | CARBIDE, 4 FLUTE BALL NOSE ◇ | R1.5 | R12.5 | 962 |
| GMF54 GMF55 |  | CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS ◇ | D3.0 | D20.0 | 963 |
| GMF58 GMF59 |  | CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS ◇ | D3.0 | D25.0 | 964 |
| GMF62 GMF63 |  | CARBIDE, 4 FLUTE with EXTENDED NECK CORNER RADIUS ◇ | D3.0 | D20.0 | 965 |
| GMF52 GMF53 |  | CARBIDE, 4 FLUTE SHORT LENGTH ◇ | D3.0 | D20.0 | 968 |
| GMF56 GMF57 |  | CARBIDE, 4 FLUTE LONG LENGTH ◇ | D3.0 | D25.0 | 969 |
| GMF60 GMF61 |  | CARBIDE, 4 FLUTE with EXTENDED NECK ◇ | D3.0 | D20.0 | 970 |
| GMG16 GMG17 |  | CARBIDE, 6 FLUTE LONG LENGTH CORNER RADIUS ◇ | D6.0 | D25.0 | 972 |
| GMG18 GMG19 |  | CARBIDE, 6 FLUTE EXTRA LONG LENGTH CORNER RADIUS ◇ | D6.0 | D25.0 | 973 |
| GMG12 GMG13 |  | CARBIDE, 6 FLUTE LONG LENGTH ◇ | D6.0 | D25.0 | 975 |
| GMG14 GMG15 |  | CARBIDE, 6 FLUTE EXTRA LONG LENGTH ◇ | D6.0 | D25.0 | 975 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 976 |

◆ U.S.A Stock

◇ Call for Availability

◎ : Excellent ○ : Good

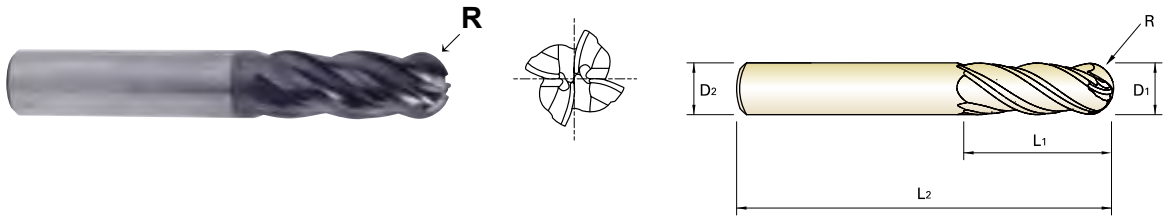
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMG53 SERIES** PLAIN SHANK
**UGMG54 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE BALL NOSE

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | R ±.0008 | PLAIN | FLAT

P.976

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| **UGMG53008** | - | 1/16 | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **UGMG53010** | - | 5/64 | **5/32** | 3/16 | 7/16 | 2 |
| **UGMG53012** | - | 3/32 | **3/16** | 3/16 | 7/16 | 2 |
| **UGMG53014** | - | 7/64 | **7/32** | 1/4 | 7/16 | 2-1/2 |
| **UGMG53016** | - | 1/8 | **1/4** | 1/4 | 1/2 | 2-1/2 |
| **UGMG53018** | - | 9/64 | **9/32** | 5/16 | 5/8 | 2-1/2 |
| **UGMG53020** | - | 5/32 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **UGMG53022** | **UGMG54022** | 11/64 | **11/32** | 3/8 | 13/16 | 2-1/2 |
| **UGMG53024** | **UGMG54024** | 3/16 | **3/8** | 3/8 | 7/8 | 2-1/2 |
| **UGMG53028** | **UGMG54028** | 7/32 | **7/16** | 7/16 | 1 | 2-3/4 |
| **UGMG53032** | **UGMG54032** | 1/4 | **1/2** | 1/2 | 1 | 3 |
| **UGMG53040** | **UGMG54040** | 5/16 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMG53048** | **UGMG54048** | 3/8 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMG53064** | **UGMG54064** | 1/2 | **1** | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

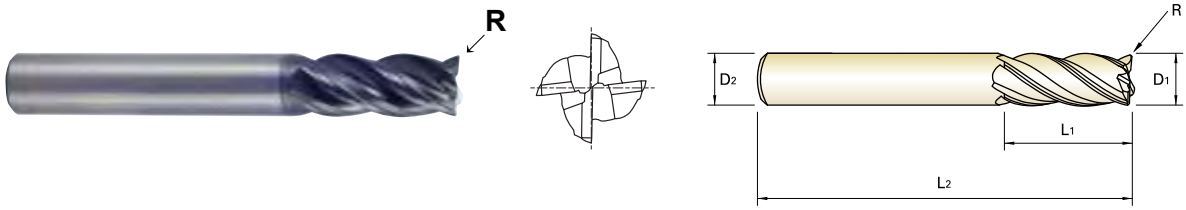
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF70 SERIES** PLAIN SHANK
**UGMF71 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| UGMF70008 | - | R.010 | 1/8 | 1/8 | 1/8 | 1-1/2 |
| UGMF70901 | - | R.010 | 1/8 | 1/8 | 3/8 | 1-1/2 |
| UGMF70902 | - | R.030 | 1/8 | 1/8 | 3/8 | 1-1/2 |
| UGMF70012 | - | R.010 | 3/16 | 3/16 | 3/16 | 2 |
| UGMF70903 | - | R.010 | 3/16 | 3/16 | 7/16 | 2 |
| UGMF70904 | - | R.030 | 3/16 | 3/16 | 7/16 | 2 |
| UGMF70016 | - | R.010 | 1/4 | 1/4 | 3/8 | 2 |
| UGMF70905 | - | R.030 | 1/4 | 1/4 | 3/8 | 2 |
| UGMF70906 | - | R.060 | 1/4 | 1/4 | 3/8 | 2 |
| UGMF70907 | - | R.010 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF70908 | - | R.015 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF70909 | - | R.030 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF70020 | - | R.030 | 5/16 | 5/16 | 7/16 | 2 |
| UGMF70910 | - | R.010 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| UGMF70911 | - | R.030 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| UGMF70912 | - | R.060 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| UGMF70024 | UGMF71024 | R.010 | 3/8 | 3/8 | 1/2 | 2-1/2 |
| UGMF70913 | UGMF71913 | R.030 | 3/8 | 3/8 | 1/2 | 2-1/2 |
| UGMF70914 | UGMF71914 | R.060 | 3/8 | 3/8 | 1/2 | 2-1/2 |
| UGMF70915 | UGMF71915 | R.010 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| UGMF70916 | UGMF71916 | R.030 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| UGMF70917 | UGMF71917 | R.060 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| UGMF70028 | UGMF71028 | R.015 | 7/16 | 7/16 | 5/8 | 2-1/2 |
| UGMF70918 | UGMF71918 | R.030 | 7/16 | 7/16 | 5/8 | 2-1/2 |
| UGMF70919 | UGMF71919 | R.010 | 7/16 | 7/16 | 1 | 2-3/4 |
| UGMF70920 | UGMF71920 | R.030 | 7/16 | 7/16 | 1 | 2-3/4 |

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◎ : Excellent ○ : Good

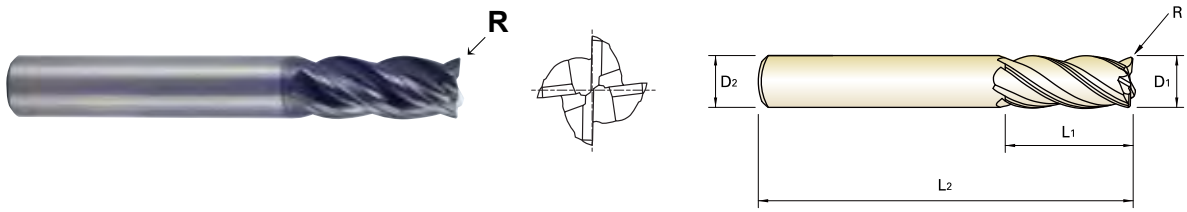
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF70 SERIES** PLAIN SHANK
**UGMF71 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| UGMF70921 | UGMF71921 | R.060 | 7/16 | 7/16 | 1 | 2-3/4 |
| UGMF70032 | UGMF71032 | R.010 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMF70922 | UGMF71922 | R.015 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMF70923 | UGMF71923 | R.030 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMF70924 | UGMF71924 | R.060 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMF70925 | UGMF71925 | R.010 | 1/2 | 1/2 | 1 | 3 |
| UGMF70926 | UGMF71926 | R.030 | 1/2 | 1/2 | 1 | 3 |
| UGMF70927 | UGMF71927 | R.060 | 1/2 | 1/2 | 1 | 3 |
| UGMF70928 | UGMF71928 | R.125 | 1/2 | 1/2 | 1 | 3 |
| UGMF70929 | UGMF71929 | R.010 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF70930 | UGMF71930 | R.015 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF70931 | UGMF71931 | R.030 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF70932 | UGMF71932 | R.060 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF70933 | UGMF71933 | R.125 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF70040 | UGMF71040 | R.010 | 5/8 | 5/8 | 3/4 | 3 |
| UGMF70934 | UGMF71934 | R.030 | 5/8 | 5/8 | 3/4 | 3 |
| UGMF70935 | UGMF71935 | R.060 | 5/8 | 5/8 | 3/4 | 3 |
| UGMF70936 | UGMF71936 | R.010 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF70937 | UGMF71937 | R.015 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF70938 | UGMF71938 | R.030 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF70939 | UGMF71939 | R.060 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF70940 | UGMF71940 | R.125 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF70048 | UGMF71048 | R.030 | 3/4 | 3/4 | 3/4 | 3 |
| UGMF70941 | UGMF71941 | R.060 | 3/4 | 3/4 | 3/4 | 3 |
| UGMF70942 | UGMF71942 | R.015 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMF70943 | UGMF71943 | R.030 | 3/4 | 3/4 | 1-1/2 | 4 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

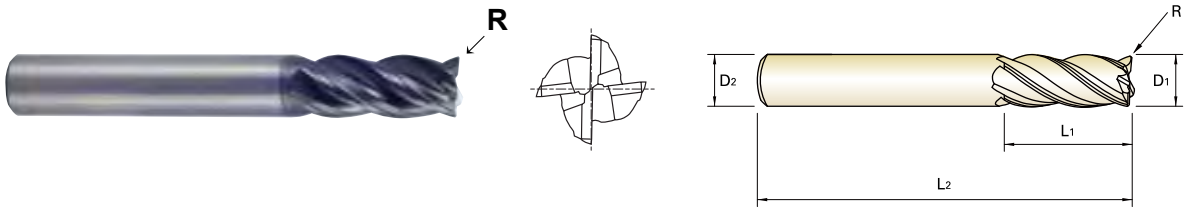
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF70 SERIES** PLAIN SHANK
**UGMF71 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **UGMF70944** | **UGMF71944** | R.060 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMF70945** | **UGMF71945** | R.125 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMF70064** | **UGMF71064** | R.015 | **1** | 1 | 1 | 4 |
| **UGMF70946** | **UGMF71946** | R.030 | **1** | 1 | 1 | 4 |
| **UGMF70947** | **UGMF71947** | R.060 | **1** | 1 | 1 | 4 |
| **UGMF70948** | **UGMF71948** | R.015 | **1** | 1 | 1-1/2 | 4 |
| **UGMF70949** | **UGMF71949** | R.030 | **1** | 1 | 1-1/2 | 4 |
| **UGMF70950** | **UGMF71950** | R.060 | **1** | 1 | 1-1/2 | 4 |
| **UGMF70951** | **UGMF71951** | R.125 | **1** | 1 | 1-1/2 | 4 |
| **UGMF70952** | **UGMF71952** | R.015 | **1** | 1 | 2 | 5 |
| **UGMF70953** | **UGMF71953** | R.030 | **1** | 1 | 2 | 5 |
| **UGMF70954** | **UGMF71954** | R.060 | **1** | 1 | 2 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

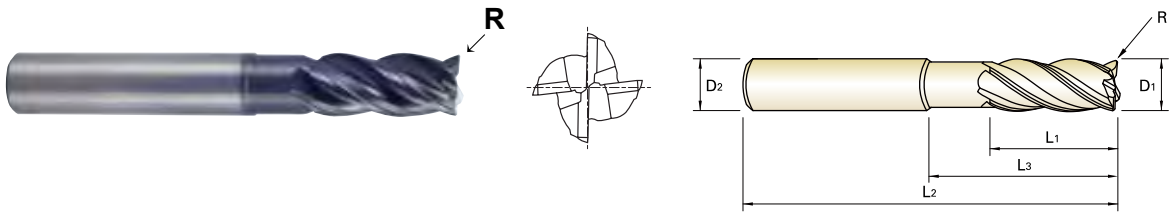
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF74 SERIES** PLAIN SHANK
**UGMF75 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK, CORNER RADIUS

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Neck Diameter |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L3 | D3 |
| UGMF74016 | - | R.015 | 1/4 | 1/4 | 3/8 | 3/4 | 4 |
| UGMF74901 | - | R.015 | 1/4 | 1/4 | 3/8 | 1-1/8 | 4 |
| UGMF74902 | - | R.015 | 1/4 | 1/4 | 3/8 | 2-1/8 | 4 |
| UGMF74024 | UGMF75024 | R.030 | 3/8 | 3/8 | 1/2 | 1-1/8 | 4 |
| UGMF74903 | UGMF75903 | R.030 | 3/8 | 3/8 | 1/2 | 2-1/8 | 4 |
| UGMF74904 | UGMF75904 | R.030 | 3/8 | 3/8 | 1/2 | 3-1/8 | 6 |
| UGMF74032 | UGMF75032 | R.030 | 1/2 | 1/2 | 5/8 | 1-1/2 | 4 |
| UGMF74905 | UGMF75905 | R.030 | 1/2 | 1/2 | 5/8 | 2-1/4 | 4 |
| UGMF74906 | UGMF75906 | R.030 | 1/2 | 1/2 | 5/8 | 3-3/8 | 6 |
| UGMF74040 | UGMF75040 | R.030 | 5/8 | 5/8 | 3/4 | 1-5/8 | 4 |
| UGMF74907 | UGMF75907 | R.030 | 5/8 | 5/8 | 3/4 | 2-3/8 | 6 |
| UGMF74908 | UGMF75908 | R.030 | 5/8 | 5/8 | 3/4 | 3-3/8 | 6 |
| UGMF74048 | UGMF75048 | R.030 | 3/4 | 3/4 | 1 | 2 | 4 |
| UGMF74909 | UGMF75909 | R.030 | 3/4 | 3/4 | 1 | 3 | 6 |
| UGMF74910 | UGMF75910 | R.030 | 3/4 | 3/4 | 1 | 4 | 6 |
| UGMF74064 | UGMF75064 | R.030 | 1 | 1 | 1-1/8 | 2 | 4 |
| UGMF74911 | UGMF75911 | R.030 | 1 | 1 | 1-1/8 | 3 | 6 |
| UGMF74912 | UGMF75912 | R.030 | 1 | 1 | 1-1/8 | 4 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

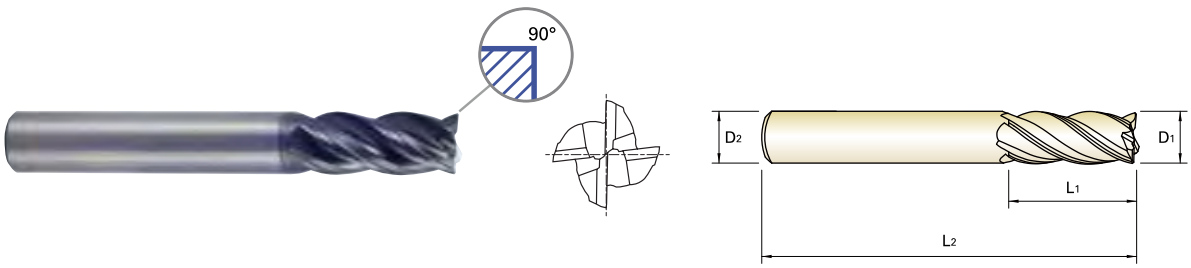
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF68 SERIES** PLAIN SHANK
**UGMF69 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

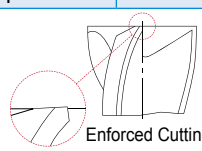
P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 |
| UGMF68008 | - | 1/8 | 1/8 | 1/8 | 1-1/2 |
| UGMF68901 | - | 1/8 | 1/8 | 3/8 | 1-1/2 |
| UGMF68010 | - | 5/32 | 3/16 | 3/16 | 2 |
| UGMF68902 | - | 5/32 | 3/16 | 7/16 | 2 |
| UGMF68012 | - | 3/16 | 3/16 | 3/16 | 2 |
| UGMF68903 | - | 3/16 | 3/16 | 7/16 | 2 |
| UGMF68014 | - | 7/32 | 1/4 | 1/4 | 2 |
| UGMF68904 | - | 7/32 | 1/4 | 7/16 | 2-1/2 |
| UGMF68016 | - | 1/4 | 1/4 | 3/8 | 2 |
| UGMF68905 | - | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF68018 | - | 9/32 | 5/16 | 5/8 | 2-1/2 |
| UGMF68020 | - | 5/16 | 5/16 | 7/16 | 2 |
| UGMF68906 | - | 5/16 | 5/16 | 13/16 | 2-1/2 |
| UGMF68022 | UGMF69022 | 11/32 | 3/8 | 1/2 | 2-1/2 |
| UGMF68024 | UGMF69024 | 3/8 | 3/8 | 1/2 | 2-1/2 |
| UGMF68907 | UGMF69907 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| UGMF68028 | UGMF69028 | 7/16 | 7/16 | 5/8 | 2-1/2 |
| UGMF68908 | UGMF69908 | 7/16 | 7/16 | 1 | 2-3/4 |
| UGMF68032 | UGMF69032 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMF68909 | UGMF69909 | 1/2 | 1/2 | 1 | 3 |
| UGMF68910 | UGMF69910 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMF68040 | UGMF69040 | 5/8 | 5/8 | 3/4 | 3 |
| UGMF68911 | UGMF69911 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF68048 | UGMF69048 | 3/4 | 3/4 | 3/4 | 3 |
| UGMF68912 | UGMF69912 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMF68064 | UGMF69064 | 1 | 1 | 1 | 4 |
| UGMF68913 | UGMF69913 | 1 | 1 | 1-1/2 | 4 |
| UGMF68914 | UGMF69914 | 1 | 1 | 2 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

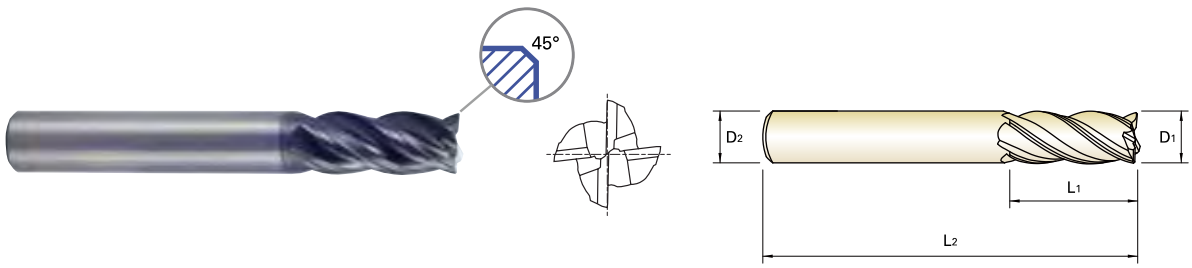
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMF76 SERIES** PLAIN SHANK
**UGMF77 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



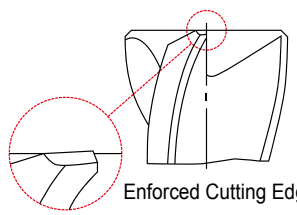

MG | 4 | M-Helix | PLAIN | FLAT | C x 45° | P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length | Chamfer |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 | |
| UGMF76024 | UGMF77024 | 3/8 | 3/8 | 7/8 | 2-1/2 | .011 |
| UGMF76032 | UGMF77032 | 1/2 | 1/2 | 5/8 | 2-1/2 | .013 |
| UGMF76901 | UGMF77901 | 1/2 | 1/2 | 1-1/4 | 3-1/2 | .013 |
| UGMF76040 | UGMF77040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | .015 |
| UGMF76048 | UGMF77048 | 3/4 | 3/4 | 1-1/2 4 | .019 | 0.20 |
| UGMF76064 | UGMF77064 | 1 | 1 | 1-1/2 4 | .019 | 0.30 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |


Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

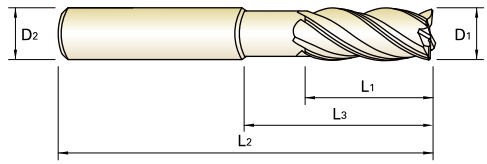
# V7 PLUS A END MILLS

**UGMF72 SERIES** PLAIN SHANK
**UGMF73 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

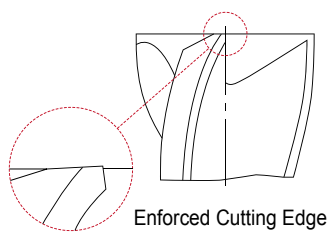
P.977, 978

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| UGMF72016 | - | 1/4 | 1/4 | 3/8 | 3/4 | 4 |
| UGMF72901 | - | 1/4 | 1/4 | 3/8 | 1-1/8 | 4 |
| UGMF72902 | - | 1/4 | 1/4 | 3/8 | 2-1/8 | 4 |
| UGMF72024 | UGMF73024 | 3/8 | 3/8 | 1/2 | 1-1/8 | 4 |
| UGMF72903 | UGMF73903 | 3/8 | 3/8 | 1/2 | 2-1/8 | 4 |
| UGMF72904 | UGMF73904 | 3/8 | 3/8 | 1/2 | 3-1/8 | 6 |
| UGMF72032 | UGMF73032 | 1/2 | 1/2 | 5/8 | 1-1/2 | 4 |
| UGMF72905 | UGMF73905 | 1/2 | 1/2 | 5/8 | 2-1/4 | 4 |
| UGMF72906 | UGMF73906 | 1/2 | 1/2 | 5/8 | 3-3/8 | 6 |
| UGMF72040 | UGMF73040 | 5/8 | 5/8 | 3/4 | 1-5/8 | 4 |
| UGMF72907 | UGMF73907 | 5/8 | 5/8 | 3/4 | 2-3/8 | 6 |
| UGMF72908 | UGMF73908 | 5/8 | 5/8 | 3/4 | 3-3/8 | 6 |
| UGMF72048 | UGMF73048 | 3/4 | 3/4 | 1 | 2 | 4 |
| UGMF72909 | UGMF73909 | 3/4 | 3/4 | 1 | 3 | 6 |
| UGMF72910 | UGMF73910 | 3/4 | 3/4 | 1 | 4 | 6 |
| UGMF72064 | UGMF73064 | 1 | 1 | 1-1/8 | 2 | 4 |
| UGMF72911 | UGMF73911 | 1 | 1 | 1-1/8 | 3 | 6 |
| UGMF72912 | UGMF73912 | 1 | 1 | 1-1/8 | 4 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

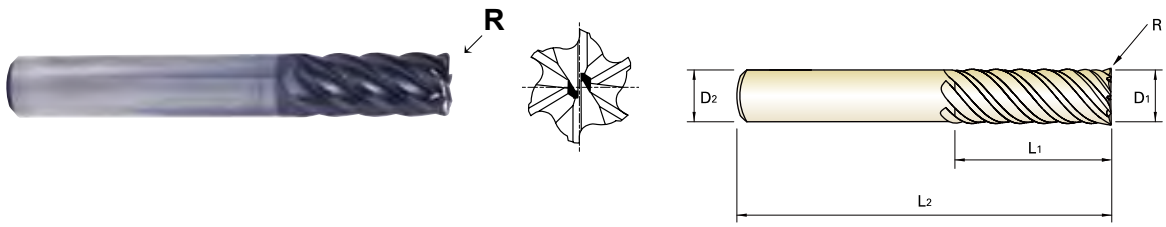
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMG22 SERIES** PLAIN SHANK
**UGMG23 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE SHORT CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT P.979

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| UGMG22016 | - | R.015 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMG22901 | - | R.015 | 1/4 | 1/4 | 1-1/8 | 3 |
| UGMG22902 | - | R.030 | 1/4 | 1/4 | 1-1/8 | 3 |
| UGMG22903 | - | R.015 | 1/4 | 1/4 | 1-1/2 | 4 |
| UGMG22904 | - | R.030 | 1/4 | 1/4 | 1-1/2 | 4 |
| UGMG22020 | - | R.015 | 5/16 | 5/16 | 3/4 | 2-1/2 |
| UGMG22905 | - | R.015 | 5/16 | 5/16 | 1-1/4 | 3 |
| UGMG22906 | - | R.030 | 5/16 | 5/16 | 1-1/4 | 3 |
| UGMG22907 | - | R.015 | 5/16 | 5/16 | 1-5/8 | 4 |
| UGMG22908 | - | R.030 | 5/16 | 5/16 | 1-5/8 | 4 |
| UGMG22024 | UGMG23024 | R.015 | 3/8 | 3/8 | 1 | 3 |
| UGMG22909 | UGMG23909 | R.030 | 3/8 | 3/8 | 1 | 3 |
| UGMG22910 | UGMG23910 | R.060 | 3/8 | 3/8 | 1 | 3 |
| UGMG22911 | UGMG23911 | R.015 | 3/8 | 3/8 | 1-1/2 | 4 |
| UGMG22912 | UGMG23912 | R.030 | 3/8 | 3/8 | 1-1/2 | 4 |
| UGMG22913 | UGMG23913 | R.060 | 3/8 | 3/8 | 1-1/2 | 4 |
| UGMG22914 | UGMG23914 | R.015 | 3/8 | 3/8 | 2 | 4 |
| UGMG22915 | UGMG23915 | R.030 | 3/8 | 3/8 | 2 | 4 |
| UGMG22916 | UGMG23916 | R.060 | 3/8 | 3/8 | 2 | 4 |
| UGMG22032 | UGMG23032 | R.015 | 1/2 | 1/2 | 1 | 3 |
| UGMG22917 | UGMG23917 | R.030 | 1/2 | 1/2 | 1 | 3 |
| UGMG22918 | UGMG23918 | R.060 | 1/2 | 1/2 | 1 | 3 |
| UGMG22919 | UGMG23919 | R.030 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMG22920 | UGMG23920 | R.060 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMG22921 | UGMG23921 | R.090 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMG22922 | UGMG23922 | R.120 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

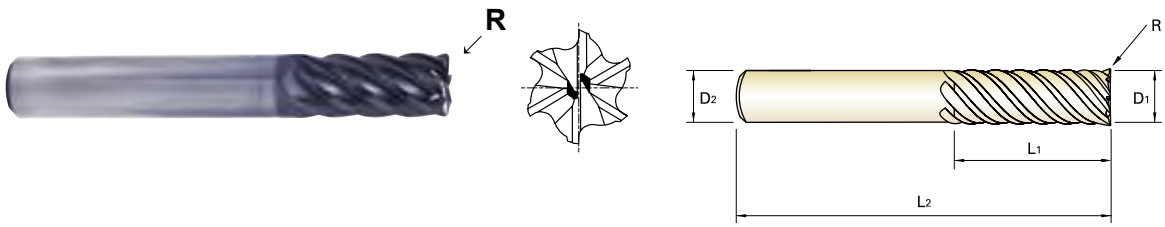
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMG22 SERIES** PLAIN SHANK
**UGMG23 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE SHORT CORNER RADIUS

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT

P.979

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| UGMG22923 | UGMG23923 | R.030 | 1/2 | 1/2 | 2 | 4 |
| UGMG22924 | UGMG23924 | R.060 | 1/2 | 1/2 | 2 | 4 |
| UGMG22925 | UGMG23925 | R.090 | 1/2 | 1/2 | 2 | 4 |
| UGMG22926 | UGMG23926 | R.120 | 1/2 | 1/2 | 2 | 4 |
| UGMG22927 | UGMG23927 | R.030 | 1/2 | 1/2 | 3 | 5 |
| UGMG22928 | UGMG23928 | R.060 | 1/2 | 1/2 | 3 | 5 |
| UGMG22929 | UGMG23929 | R.090 | 1/2 | 1/2 | 3 | 5 |
| UGMG22930 | UGMG23930 | R.120 | 1/2 | 1/2 | 3 | 5 |
| UGMG22040 | UGMG23040 | R.030 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMG22931 | UGMG23931 | R.060 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMG22932 | UGMG23932 | R.090 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMG22933 | UGMG23933 | R.120 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMG22934 | UGMG23934 | R.030 | 5/8 | 5/8 | 2 | 4 |
| UGMG22935 | UGMG23935 | R.060 | 5/8 | 5/8 | 2 | 4 |
| UGMG22936 | UGMG23936 | R.090 | 5/8 | 5/8 | 2 | 4 |
| UGMG22937 | UGMG23937 | R.120 | 5/8 | 5/8 | 2 | 4 |
| UGMG22938 | UGMG23938 | R.030 | 5/8 | 5/8 | 3 | 5 |
| UGMG22939 | UGMG23939 | R.060 | 5/8 | 5/8 | 3 | 5 |
| UGMG22940 | UGMG23940 | R.090 | 5/8 | 5/8 | 3 | 5 |
| UGMG22941 | UGMG23941 | R.120 | 5/8 | 5/8 | 3 | 5 |
| UGMG22048 | UGMG23048 | R.030 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMG22942 | UGMG23942 | R.060 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMG22943 | UGMG23943 | R.090 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMG22944 | UGMG23944 | R.120 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMG22945 | UGMG23945 | R.030 | 3/4 | 3/4 | 3 | 5-1/2 |
| UGMG22946 | UGMG23946 | R.060 | 3/4 | 3/4 | 3 | 5-1/2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

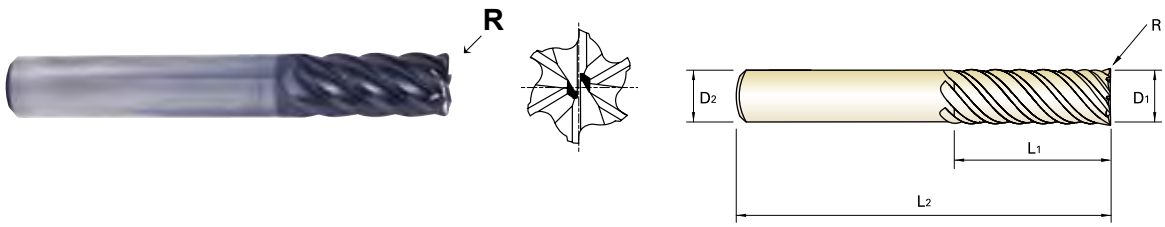
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMG22 SERIES** PLAIN SHANK
**UGMG23 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE SHORT CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT P.979

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| UGMG22947 | UGMG23947 | R.090 | 3/4 | 3/4 | 3 | 5-1/2 |
| UGMG22948 | UGMG23948 | R.120 | 3/4 | 3/4 | 3 | 5-1/2 |
| UGMG22064 | UGMG23064 | R.030 | 1 | 1 | 1-1/2 | 4 |
| UGMG22949 | UGMG23949 | R.060 | 1 | 1 | 1-1/2 | 4 |
| UGMG22950 | UGMG23950 | R.090 | 1 | 1 | 1-1/2 | 4 |
| UGMG22951 | UGMG23951 | R.120 | 1 | 1 | 1-1/2 | 4 |
| UGMG22952 | UGMG23952 | R.030 | 1 | 1 | 4 | 7 |
| UGMG22953 | UGMG23953 | R.060 | 1 | 1 | 4 | 7 |
| UGMG22954 | UGMG23954 | R.090 | 1 | 1 | 4 | 7 |
| UGMG22955 | UGMG23955 | R.120 | 1 | 1 | 4 | 7 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

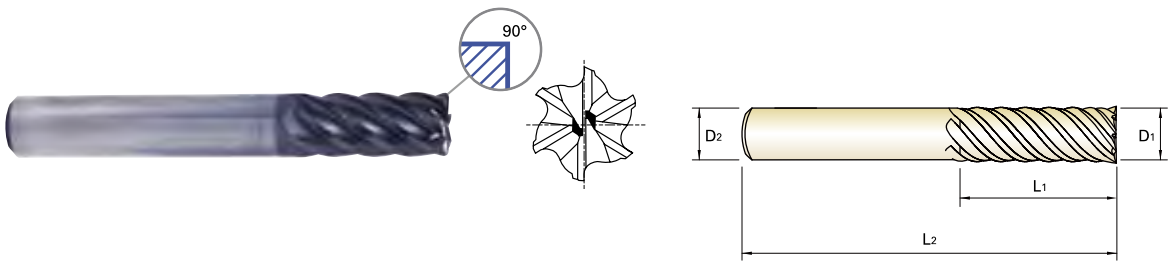
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**UGMG20 SERIES** PLAIN SHANK
**UGMG21 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



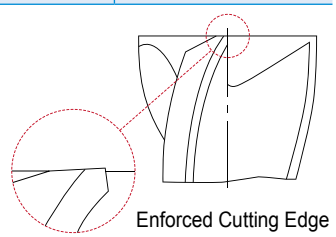

MG | 6 | 45° | PLAIN | FLAT | P.979

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 |
| UGMG20016 | - | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMG20901 | - | 1/4 | 1/4 | 1-1/8 | 3 |
| UGMG20902 | - | 1/4 | 1/4 | 1-1/2 | 4 |
| UGMG20020 | - | 5/16 | 5/16 | 3/4 | 2-1/2 |
| UGMG20903 | - | 5/16 | 5/16 | 1-1/4 | 3 |
| UGMG20904 | - | 5/16 | 5/16 | 1-5/8 | 4 |
| UGMG20024 | UGMG21024 | 3/8 | 3/8 | 1 | 3 |
| UGMG20905 | UGMG21905 | 3/8 | 3/8 | 1-1/2 | 4 |
| UGMG20906 | UGMG21906 | 3/8 | 3/8 | 2 | 4 |
| UGMG20032 | UGMG21032 | 1/2 | 1/2 | 1 | 3-1/4 |
| UGMG20907 | UGMG21907 | 1/2 | 1/2 | 1-1/4 | 3-1/2 |
| UGMG20908 | UGMG21908 | 1/2 | 1/2 | 2 | 4 |
| UGMG20909 | UGMG21909 | 1/2 | 1/2 | 3 | 5 |
| UGMG20040 | UGMG21040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMG20910 | UGMG21910 | 5/8 | 5/8 | 2 | 4 |
| UGMG20911 | UGMG21911 | 5/8 | 5/8 | 3 | 5 |
| UGMG20048 | UGMG21048 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMG20912 | UGMG21912 | 3/4 | 3/4 | 3 | 5-1/2 |
| UGMG20064 | UGMG60064 | 1 | 1 | 1-1/2 | 4 |
| UGMG20913 | UGMG21913 | 1 | 1 | 4 | 7 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |


Enforced Cutting Edge

◎ : Excellent ○ : Good

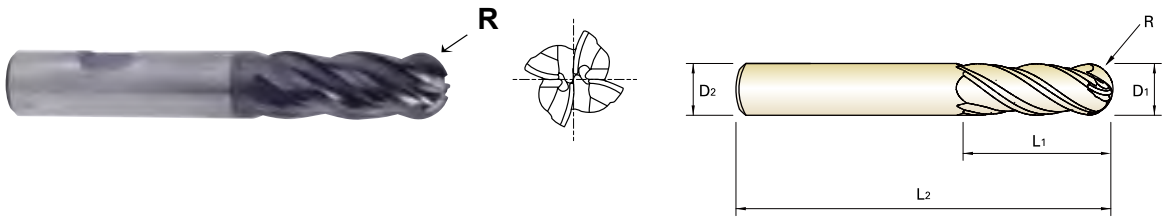
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

GMG55 SERIES PLAIN SHANK
GMG56 SERIES FLAT SHANK

## CARBIDE, 4 FLUTE BALL NOSE

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | R ±.0008 | PLAIN | FLAT

P.980

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **GMG55030** | **GMG56030** | R1.5 | **3.0** | 6 | 8 | 57 |
| **GMG55040** | **GMG56040** | R2.0 | **4.0** | 6 | 11 | 57 |
| **GMG55050** | **GMG56050** | R2.5 | **5.0** | 6 | 13 | 57 |
| **GMG55060** | **GMG56060** | R3.0 | **6.0** | 6 | 13 | 57 |
| **GMG55080** | **GMG56080** | R4.0 | **8.0** | 8 | 19 | 63 |
| **GMG55100** | **GMG56100** | R5.0 | **10.0** | 10 | 22 | 72 |
| **GMG55120** | **GMG56120** | R6.0 | **12.0** | 12 | 26 | 83 |
| **GMG55160** | **GMG56160** | R8.0 | **16.0** | 16 | 32 | 92 |
| **GMG55200** | **GMG56200** | R10.0 | **20.0** | 20 | 38 | 104 |
| **GMG55250** | **GMG56250** | R12.5 | **25.0** | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

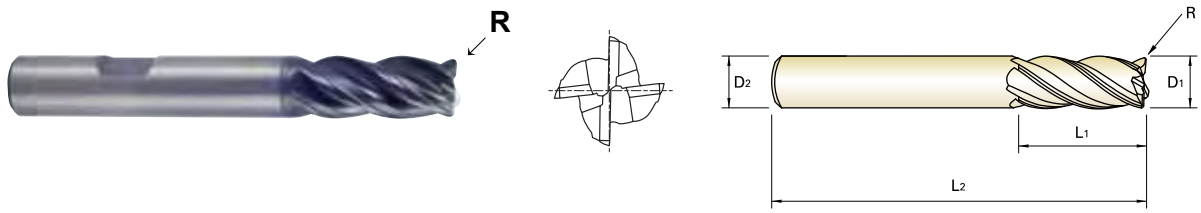
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF54 SERIES** PLAIN SHANK
**GMF55 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| GMF54030 | GMF55030 | R0.3 | 3.0 | 6 | 7 | 54 |
| GMF54901 | GMF55901 | R0.5 | 3.0 | 6 | 7 | 54 |
| GMF54040 | GMF55040 | R0.3 | 4.0 | 6 | 8 | 54 |
| GMF54902 | GMF55902 | R0.5 | 4.0 | 6 | 8 | 54 |
| GMF54050 | GMF55050 | R0.3 | 5.0 | 6 | 10 | 54 |
| GMF54903 | GMF55903 | R0.5 | 5.0 | 6 | 10 | 54 |
| GMF54060 | GMF55060 | R0.3 | 6.0 | 6 | 10 | 54 |
| GMF54904 | GMF55904 | R0.5 | 6.0 | 6 | 10 | 54 |
| GMF54905 | GMF55905 | R1.0 | 6.0 | 6 | 10 | 54 |
| GMF54080 | GMF55080 | R0.5 | 8.0 | 8 | 12 | 58 |
| GMF54906 | GMF55906 | R1.0 | 8.0 | 8 | 12 | 58 |
| GMF54100 | GMF55100 | R0.5 | 10.0 | 10 | 14 | 66 |
| GMF54907 | GMF55907 | R1.0 | 10.0 | 10 | 14 | 66 |
| GMF54120 | GMF55120 | R0.5 | 12.0 | 12 | 16 | 73 |
| GMF54908 | GMF55908 | R1.0 | 12.0 | 12 | 16 | 73 |
| GMF54909 | GMF55909 | R2.0 | 12.0 | 12 | 16 | 73 |
| GMF54140 | GMF55140 | R0.5 | 14.0 | 14 | 18 | 75 |
| GMF54160 | GMF55160 | R1.0 | 16.0 | 16 | 22 | 82 |
| GMF54912 | GMF55912 | R2.0 | 16.0 | 16 | 22 | 82 |
| GMF54913 | GMF55913 | R3.0 | 16.0 | 16 | 22 | 82 |
| GMF54180 | GMF55180 | R1.0 | 18.0 | 18 | 24 | 84 |
| GMF54200 | GMF55200 | R1.0 | 20.0 | 20 | 26 | 92 |
| GMF54916 | GMF55916 | R2.0 | 20.0 | 20 | 26 | 92 |
| GMF54917 | GMF55917 | R3.0 | 20.0 | 20 | 26 | 92 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

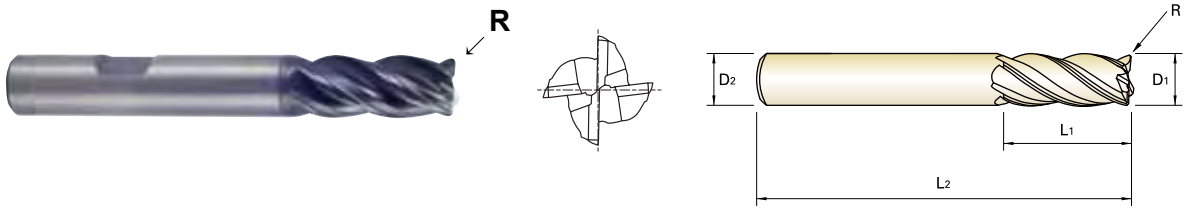
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF58 SERIES** PLAIN SHANK
**GMF59 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE LONG LENGTH CORNER RADIUS

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| GMF58030 | GMF59030 | R0.3 | 3.0 | 6 | 8 | 57 |
| GMF58901 | GMF59901 | R0.5 | 3.0 | 6 | 8 | 57 |
| GMF58040 | GMF59040 | R0.3 | 4.0 | 6 | 11 | 57 |
| GMF58902 | GMF59902 | R0.5 | 4.0 | 6 | 11 | 57 |
| GMF58050 | GMF59050 | R0.3 | 5.0 | 6 | 13 | 57 |
| GMF58903 | GMF59903 | R0.5 | 5.0 | 6 | 13 | 57 |
| GMF58060 | GMF59060 | R0.3 | 6.0 | 6 | 13 | 57 |
| GMF58904 | GMF59904 | R0.5 | 6.0 | 6 | 13 | 57 |
| GMF58905 | GMF59905 | R1.0 | 6.0 | 6 | 13 | 57 |
| GMF58080 | GMF59080 | R0.5 | 8.0 | 8 | 19 | 63 |
| GMF58906 | GMF59906 | R1.0 | 8.0 | 19 | 63 | 83 |
| GMF58100 | GMF59100 | R0.5 | 10.0 | 10 | 22 | 72 |
| GMF58907 | GMF59907 | R1.0 | 10.0 | 10 | 22 | 72 |
| GMF58120 | GMF59120 | R0.5 | 12.0 | 12 | 26 | 83 |
| GMF58908 | GMF59908 | R1.0 | 12.0 | 12 | 26 | 83 |
| GMF58909 | GMF59909 | R2.0 | 12.0 | 12 | 26 | 83 |
| GMF58140 | GMF59140 | R0.5 | 14.0 | 14 | 26 | 83 |
| GMF58160 | GMF59160 | R1.0 | 16.0 | 16 | 32 | 92 |
| GMF58912 | GMF59912 | R2.0 | 16.0 | 16 | 32 | 92 |
| GMF58913 | GMF59913 | R3.0 | 16.0 | 16 | 32 | 92 |
| GMF58180 | GMF59180 | R1.0 | 18.0 | 18 | 32 | 92 |
| GMF58200 | GMF59200 | R1.0 | 20.0 | 20 | 38 | 104 |
| GMF58916 | GMF59916 | R2.0 | 20.0 | 20 | 38 | 104 |
| GMF58917 | GMF59917 | R3.0 | 20.0 | 20 | 38 | 104 |
| GMF58250 | GMF59250 | R1.0 | 25.0 | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

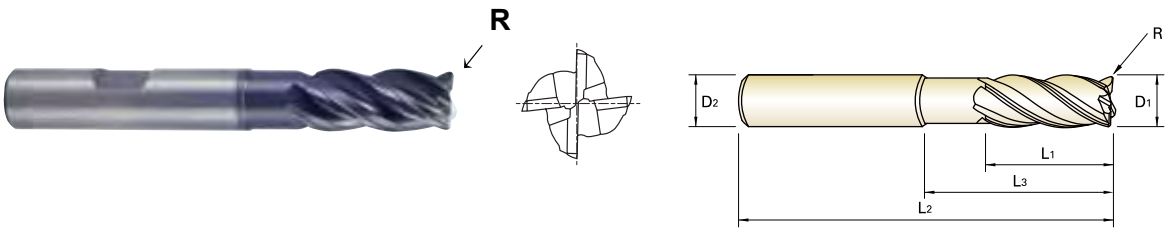
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF62 SERIES** PLAIN SHANK
**GMF63 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L3 | L2 |
| GMF62030 | GMF63030 | R0.3 | 3.0 | 6 | 7 | 12 | 54 |
| GMF62901 | GMF63901 | R0.5 | 3.0 | 6 | 7 | 12 | 54 |
| GMF62902 | GMF63902 | R0.3 | 3.0 | 6 | 7 | 17 | 57 |
| GMF62903 | GMF63903 | R0.5 | 3.0 | 6 | 7 | 17 | 57 |
| GMF62040 | GMF63040 | R0.3 | 4.0 | 6 | 8 | 15 | 57 |
| GMF62904 | GMF63904 | R0.5 | 4.0 | 6 | 8 | 15 | 57 |
| GMF62905 | GMF63905 | R0.3 | 4.0 | 6 | 8 | 22 | 63 |
| GMF62906 | GMF63906 | R0.5 | 4.0 | 6 | 8 | 22 | 63 |
| GMF62050 | GMF63050 | R0.3 | 5.0 | 6 | 10 | 17 | 57 |
| GMF62907 | GMF63907 | R0.5 | 5.0 | 6 | 10 | 17 | 57 |
| GMF62908 | GMF63908 | R0.3 | 5.0 | 6 | 10 | 27 | 67 |
| GMF62909 | GMF63909 | R0.5 | 5.0 | 6 | 10 | 27 | 67 |
| GMF62060 | GMF63060 | R0.3 | 6.0 | 6 | 10 | 15 | 57 |
| GMF62910 | GMF63910 | R0.5 | 6.0 | 6 | 10 | 15 | 57 |
| GMF62911 | GMF63911 | R1.0 | 6.0 | 6 | 10 | 15 | 57 |
| GMF62912 | GMF63912 | R0.3 | 6.0 | 6 | 10 | 20 | 62 |
| GMF62913 | GMF63913 | R0.5 | 6.0 | 6 | 10 | 20 | 62 |
| GMF62914 | GMF63914 | R1.0 | 6.0 | 6 | 10 | 20 | 62 |
| GMF62915 | GMF63915 | R0.3 | 6.0 | 6 | 10 | 32 | 74 |
| GMF62916 | GMF63916 | R0.5 | 6.0 | 6 | 10 | 32 | 74 |
| GMF62917 | GMF63917 | R1.0 | 6.0 | 6 | 10 | 32 | 74 |
| GMF62080 | GMF63080 | R0.5 | 8.0 | 8 | 12 | 20 | 63 |
| GMF62918 | GMF63918 | R1.0 | 8.0 | 8 | 12 | 20 | 63 |
| GMF62919 | GMF63919 | R0.5 | 8.0 | 8 | 12 | 30 | 73 |
| GMF62920 | GMF63920 | R1.0 | 8.0 | 8 | 12 | 30 | 73 |
| GMF62921 | GMF63921 | R0.5 | 8.0 | 8 | 12 | 46 | 90 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

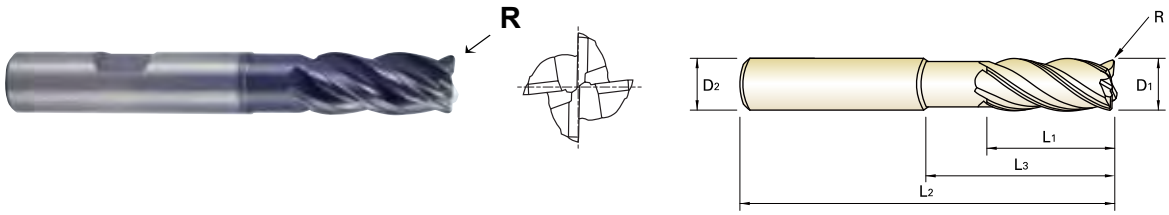
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF62 SERIES** PLAIN SHANK
**GMF63 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK CORNER RADIUS

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L3 | L2 |
| GMF62922 | GMF63922 | R1.0 | **8.0** | 8 | 12 | 46 | 90 |
| GMF62100 | GMF63100 | R0.5 | **10.0** | 10 | 14 | 25 | 72 |
| GMF62923 | GMF63923 | R1.0 | **10.0** | 10 | 14 | 25 | 72 |
| GMF62924 | GMF63924 | R0.5 | **10.0** | 10 | 14 | 35 | 82 |
| GMF62925 | GMF63925 | R1.0 | **10.0** | 10 | 14 | 35 | 82 |
| GMF62926 | GMF63926 | R0.5 | **10.0** | 10 | 14 | 55 | 102 |
| GMF62927 | GMF63927 | R1.0 | **10.0** | 10 | 14 | 55 | 102 |
| GMF62120 | GMF63120 | R0.5 | **12.0** | 12 | 16 | 30 | 83 |
| GMF62928 | GMF63928 | R1.0 | **12.0** | 12 | 16 | 30 | 83 |
| GMF62929 | GMF63929 | R2.0 | **12.0** | 12 | 16 | 30 | 83 |
| GMF62930 | GMF63930 | R0.5 | **12.0** | 12 | 16 | 40 | 93 |
| GMF62931 | GMF63931 | R1.0 | **12.0** | 12 | 16 | 40 | 93 |
| GMF62932 | GMF63932 | R2.0 | **12.0** | 12 | 16 | 40 | 93 |
| GMF62933 | GMF63933 | R0.5 | **12.0** | 12 | 16 | 64 | 117 |
| GMF62934 | GMF63934 | R1.0 | **12.0** | 12 | 16 | 64 | 117 |
| GMF62935 | GMF63935 | R2.0 | **12.0** | 12 | 16 | 64 | 117 |
| GMF62160 | GMF63160 | R1.0 | **16.0** | 16 | 22 | 38 | 92 |
| GMF62936 | GMF63936 | R2.0 | **16.0** | 16 | 22 | 38 | 92 |
| GMF62937 | GMF63937 | R3.0 | **16.0** | 16 | 22 | 38 | 92 |
| GMF62938 | GMF63938 | R1.0 | **16.0** | 16 | 22 | 55 | 109 |
| GMF62939 | GMF63939 | R2.0 | **16.0** | 16 | 22 | 55 | 109 |
| GMF62940 | GMF63940 | R3.0 | **16.0** | 16 | 22 | 55 | 109 |
| GMF62941 | GMF63941 | R1.0 | **16.0** | 16 | 22 | 87 | 141 |
| GMF62942 | GMF63942 | R2.0 | **16.0** | 16 | 22 | 87 | 141 |
| GMF62943 | GMF63943 | R3.0 | **16.0** | 16 | 22 | 87 | 141 |
| GMF62200 | GMF63200 | R1.0 | **20.0** | 20 | 26 | 50 | 104 |

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◎ : Excellent ○ : Good

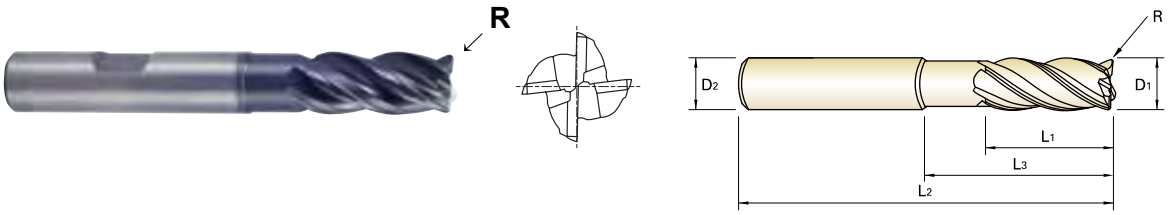
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF62 SERIES** PLAIN SHANK
**GMF63 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK CORNER RADIUS

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT

P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ |
| **GMF62944** | **GMF63944** | R2.0 | **20.0** | 20 | 26 | 50 | 104 |
| **GMF62945** | **GMF63945** | R3.0 | **20.0** | 20 | 26 | 50 | 104 |
| **GMF62946** | **GMF63946** | R1.0 | **20.0** | 20 | 26 | 70 | 124 |
| **GMF62947** | **GMF63947** | R2.0 | **20.0** | 20 | 26 | 70 | 124 |
| **GMF62948** | **GMF63948** | R3.0 | **20.0** | 20 | 26 | 70 | 124 |
| **GMF62949** | **GMF63949** | R1.0 | **20.0** | 20 | 26 | 110 | 164 |
| **GMF62950** | **GMF63950** | R2.0 | **20.0** | 20 | 26 | 110 | 164 |
| **GMF62951** | **GMF63951** | R3.0 | **20.0** | 20 | 26 | 110 | 164 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

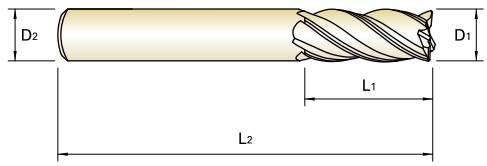
# V7 PLUS A END MILLS

**GMF52 SERIES** PLAIN SHANK
**GMF53 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE SHORT LENGTH

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



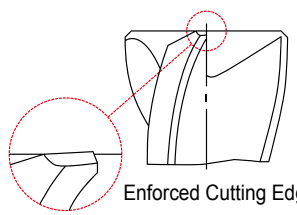

MG | 4 | M-Helix | PLAIN | FLAT | C x 45° | P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length | Chamfer |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 | |
| GMF52030 | GMF53030 | 3.0 | 6 | 7 | 54 | 0.10 |
| GMF52040 | GMF53040 | 4.0 | 6 | 8 | 54 | 0.15 |
| GMF52050 | GMF53050 | 5.0 | 6 | 10 | 54 | 0.15 |
| GMF52060 | GMF53060 | 6.0 | 6 | 10 | 54 | 0.20 |
| GMF52080 | GMF53080 | 8.0 | 8 | 12 | 58 | 0.20 |
| GMF52100 | GMF53100 | 10.0 | 10 | 14 | 66 | 0.30 |
| GMF52120 | GMF53120 | 12.0 | 12 | 16 | 73 | 0.35 |
| GMF52140 | GMF53140 | 14.0 | 14 | 18 | 75 | 0.40 |
| GMF52160 | GMF53160 | 16.0 | 16 | 22 | 82 | 0.40 |
| GMF52180 | GMF53180 | 18.0 | 18 | 24 | 84 | 0.50 |
| GMF52200 | GMF53200 | 20.0 | 20 | 26 | 92 | 0.50 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

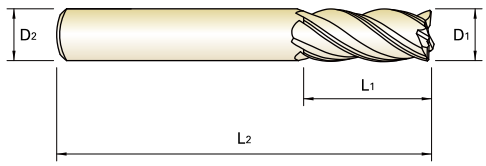
# V7 PLUS A END MILLS

**GMF56 SERIES** PLAIN SHANK
**GMF57 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



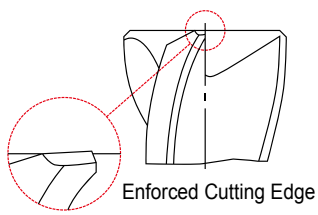

MG | 4 | M-Helix | PLAIN | FLAT | C x 45° | P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length | Chamfer |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **GMF56030** | **GMF57030** | **3.0** | 6 | 8 | 57 | 0.10 |
| **GMF56040** | **GMF57040** | **4.0** | 6 | 11 | 57 | 0.15 |
| **GMF56050** | **GMF57050** | **5.0** | 6 | 13 | 57 | 0.15 |
| **GMF56060** | **GMF57060** | **6.0** | 6 | 13 | 57 | 0.20 |
| **GMF56080** | **GMF57080** | **8.0** | 8 | 19 | 63 | 0.20 |
| **GMF56100** | **GMF57100** | **10.0** | 10 | 22 | 72 | 0.30 |
| **GMF56120** | **GMF57120** | **12.0** | 12 | 26 | 83 | 0.35 |
| **GMF56140** | **GMF57140** | **14.0** | 14 | 26 | 83 | 0.40 |
| **GMF56160** | **GMF57160** | **16.0** | 16 | 32 | 92 | 0.40 |
| **GMF56180** | **GMF57180** | **18.0** | 18 | 32 | 92 | 0.50 |
| **GMF56200** | **GMF57200** | **20.0** | 20 | 38 | 104 | 0.50 |
| **GMF56250** | **GMF57250** | **25.0** | 25 | 38 | 104 | 0.50 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |


Enforced Cutting Edge

◎ : Excellent ○ : Good

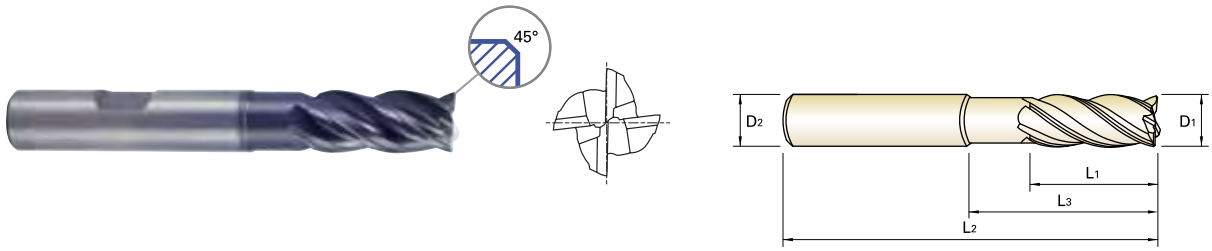
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF60 SERIES** PLAIN SHANK
**GMF61 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 4 | M-Helix | PLAIN | FLAT | C x 45° | P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Overall Length | Neck Diameter | Chamfer |
|---|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L3 | L2 | D3 | |
| GMF60030 | GMF61030 | 3.0 | 6 | 7 | 12 | 54 | 2.7 | 0.10 |
| GMF60901 | GMF61901 | 3.0 | 6 | 7 | 17 | 57 | 2.7 | 0.10 |
| GMF60902 | GMF61902 | 3.0 | 6 | 8 | 14 | 57 | 2.7 | 0.10 |
| GMF60040 | GMF61040 | 4.0 | 6 | 8 | 15 | 57 | 3.7 | 0.15 |
| GMF60903 | GMF61903 | 4.0 | 6 | 8 | 22 | 63 | 3.7 | 0.15 |
| GMF60904 | GMF61904 | 4.0 | 6 | 11 | 16 | 57 | 3.7 | 0.15 |
| GMF60050 | GMF61050 | 5.0 | 6 | 10 | 17 | 57 | 4.7 | 0.15 |
| GMF60905 | GMF61905 | 5.0 | 6 | 10 | 27 | 67 | 4.7 | 0.15 |
| GMF60906 | GMF61906 | 5.0 | 6 | 13 | 18 | 57 | 4.7 | 0.15 |
| GMF60060 | GMF61060 | 6.0 | 6 | 10 | 15 | 57 | 5.5 | 0.20 |
| GMF60907 | GMF61907 | 6.0 | 6 | 10 | 20 | 62 | 5.5 | 0.20 |
| GMF60908 | GMF61908 | 6.0 | 6 | 10 | 32 | 74 | 5.5 | 0.20 |
| GMF60909 | GMF61909 | 6.0 | 6 | 13 | 21 | 57 | 5.5 | 0.20 |
| GMF60080 | GMF61080 | 8.0 | 8 | 12 | 20 | 63 | 7.5 | 0.20 |
| GMF60910 | GMF61910 | 8.0 | 8 | 12 | 30 | 73 | 7.5 | 0.20 |
| GMF60911 | GMF61911 | 8.0 | 8 | 12 | 46 | 90 | 7.5 | 0.20 |
| GMF60912 | GMF61912 | 8.0 | 8 | 19 | 27 | 63 | 7.5 | 0.20 |
| GMF60100 | GMF61100 | 10.0 | 10 | 14 | 25 | 72 | 9.2 | 0.30 |
| GMF60913 | GMF61913 | 10.0 | 10 | 14 | 35 | 82 | 9.2 | 0.30 |
| GMF60914 | GMF61914 | 10.0 | 10 | 14 | 55 | 102 | 9.2 | 0.30 |
| GMF60915 | GMF61915 | 10.0 | 10 | 22 | 32 | 72 | 9.2 | 0.30 |
| GMF60120 | GMF61120 | 12.0 | 12 | 16 | 30 | 83 | 11.0 | 0.35 |
| GMF60916 | GMF61916 | 12.0 | 12 | 16 | 40 | 93 | 11.0 | 0.35 |
| GMF60917 | GMF61917 | 12.0 | 12 | 16 | 64 | 117 | 11.0 | 0.35 |
| GMF60918 | GMF61918 | 12.0 | 12 | 26 | 38 | 83 | 11.0 | 0.35 |
| GMF60160 | GMF61160 | 16.0 | 16 | 22 | 38 | 92 | 15.0 | 0.40 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

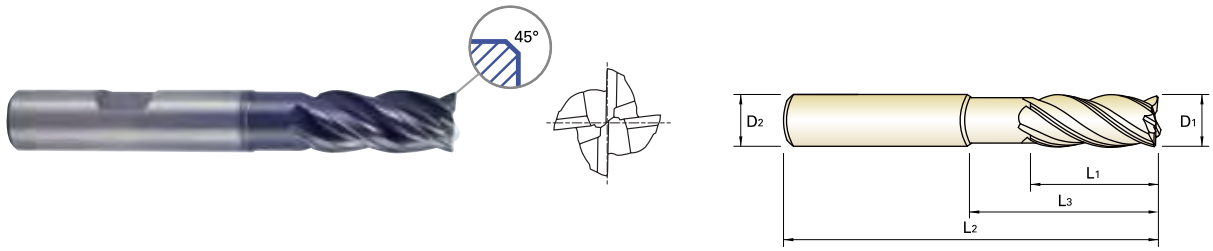
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMF60 SERIES** PLAIN SHANK
**GMF61 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE with EXTENDED NECK

- Special flute geometry and multiple helix eliminate vibrations
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40



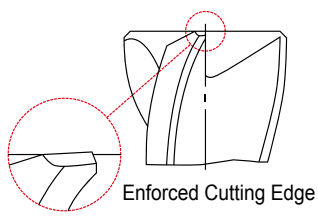

MG | 4 | M-Helix | PLAIN | FLAT | C x 45° | P.981, 982

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Length Below Shank | Overall Length | Neck Diameter | Chamfer |
|---|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L3 | L2 | D3 | |
| GMF60919 | GMF61919 | 16.0 | 16 | 22 | 55 | 109 | 15.0 | 0.40 |
| GMF60920 | GMF61920 | 16.0 | 16 | 22 | 87 | 141 | 15.0 | 0.40 |
| GMF60921 | GMF61921 | 16.0 | 16 | 32 | 44 | 92 | 15.0 | 0.40 |
| GMF60200 | GMF61200 | 20.0 | 20 | 26 | 50 | 104 | 19.0 | 0.50 |
| GMF60922 | GMF61922 | 20.0 | 20 | 26 | 70 | 124 | 19.0 | 0.50 |
| GMF60923 | GMF61923 | 20.0 | 20 | 26 | 110 | 164 | 19.0 | 0.50 |
| GMF60924 | GMF61924 | 20.0 | 20 | 38 | 54 | 104 | 19.0 | 0.50 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |




◎ : Excellent ○ : Good

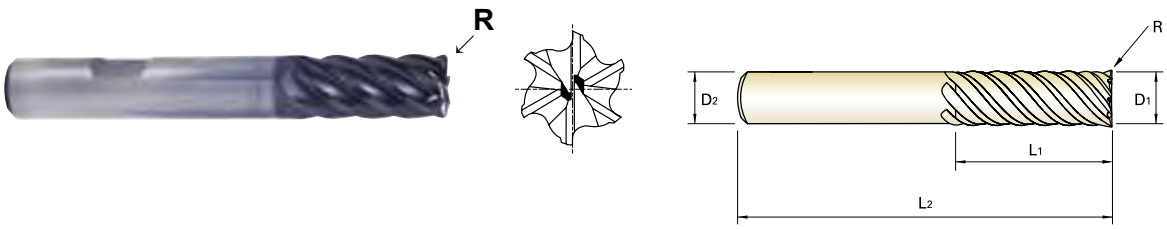
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMG16 SERIES** PLAIN SHANK
**GMG17 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE LONG LENGTH CORNER RADIUS

- The unique geometry of the variable pitch reduces chatter for high speed and trochoidal milling
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT

P.983

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| GMG16060 | GMG17060 | R0.5 | 6.0 | 6 | 13 | 57 |
| GMG16901 | GMG17901 | R1.0 | 6.0 | 6 | 13 | 57 |
| GMG16080 | GMG17080 | R0.5 | 8.0 | 8 | 19 | 63 |
| GMG16902 | GMG17902 | R1.0 | 8.0 | 8 | 19 | 63 |
| GMG16100 | GMG17100 | R0.5 | 10.0 | 10 | 22 | 72 |
| GMG16903 | GMG17903 | R1.0 | 10.0 | 10 | 22 | 72 |
| GMG16904 | GMG17904 | R1.5 | 10.0 | 10 | 22 | 72 |
| GMG16905 | GMG17905 | R2.0 | 10.0 | 10 | 22 | 72 |
| GMG16120 | GMG17120 | R0.5 | 12.0 | 12 | 26 | 83 |
| GMG16906 | GMG17906 | R1.0 | 12.0 | 12 | 26 | 83 |
| GMG16907 | GMG17907 | R1.5 | 12.0 | 12 | 26 | 83 |
| GMG16908 | GMG17908 | R2.0 | 12.0 | 12 | 26 | 83 |
| GMG16909 | GMG17909 | R3.0 | 12.0 | 12 | 26 | 83 |
| GMG16160 | GMG17160 | R1.0 | 16.0 | 16 | 32 | 92 |
| GMG16910 | GMG17910 | R1.5 | 16.0 | 16 | 32 | 92 |
| GMG16911 | GMG17911 | R2.0 | 16.0 | 16 | 32 | 92 |
| GMG16912 | GMG17912 | R3.0 | 16.0 | 16 | 32 | 92 |
| GMG16200 | GMG17200 | R1.0 | 20.0 | 20 | 38 | 104 |
| GMG16913 | GMG17913 | R1.5 | 20.0 | 20 | 38 | 104 |
| GMG16914 | GMG17914 | R2.0 | 20.0 | 20 | 38 | 104 |
| GMG16915 | GMG17915 | R3.0 | 20.0 | 20 | 38 | 104 |
| GMG16250 | GMG17250 | R1.0 | 25.0 | 25 | 44 | 104 |
| GMG16916 | GMG17916 | R1.5 | 25.0 | 25 | 44 | 104 |
| GMG16917 | GMG17917 | R2.0 | 25.0 | 25 | 44 | 104 |
| GMG16918 | GMG17918 | R3.0 | 25.0 | 25 | 44 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

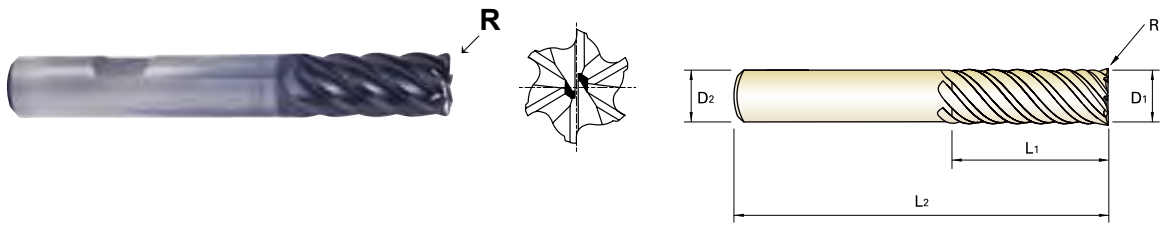
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMG18 SERIES** PLAIN SHANK
**GMG19 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE EXTRA LONG LENGTH CORNER RADIUS

- The unique geometry of the variable pitch reduces chatter for high speed and trochoidal milling
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT

P.983

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| GMG18060 | GMG19060 | R0.5 | 6.0 | 6 | 24 | 75 |
| GMG18901 | GMG19901 | R1.0 | 6.0 | 6 | 24 | 75 |
| GMG18080 | GMG19080 | R0.5 | 8.0 | 8 | 32 | 75 |
| GMG18902 | GMG19902 | R1.0 | 8.0 | 8 | 32 | 75 |
| GMG18903 | GMG19903 | R2.0 | 8.0 | 8 | 32 | 75 |
| GMG18100 | GMG19100 | R0.5 | 10.0 | 10 | 40 | 100 |
| GMG18904 | GMG19904 | R1.0 | 10.0 | 10 | 40 | 100 |
| GMG18905 | GMG19905 | R1.5 | 10.0 | 10 | 40 | 100 |
| GMG18906 | GMG19906 | R2.0 | 10.0 | 10 | 40 | 100 |
| GMG18120 | GMG19120 | R0.5 | 12.0 | 12 | 48 | 120 |
| GMG18907 | GMG19907 | R1.0 | 12.0 | 12 | 48 | 120 |
| GMG18908 | GMG19908 | R1.5 | 12.0 | 12 | 48 | 120 |
| GMG18909 | GMG19909 | R2.0 | 12.0 | 12 | 48 | 120 |
| GMG18910 | GMG19910 | R3.0 | 12.0 | 12 | 48 | 120 |
| GMG18160 | GMG19160 | R1.0 | 16.0 | 16 | 64 | 140 |
| GMG18911 | GMG19911 | R1.5 | 16.0 | 16 | 64 | 140 |
| GMG18912 | GMG19912 | R2.0 | 16.0 | 16 | 64 | 140 |
| GMG18913 | GMG19913 | R3.0 | 16.0 | 16 | 64 | 140 |
| GMG18200 | GMG19200 | R1.0 | 20.0 | 20 | 80 | 150 |
| GMG18914 | GMG19914 | R1.5 | 20.0 | 20 | 80 | 150 |
| GMG18915 | GMG19915 | R2.0 | 20.0 | 20 | 80 | 150 |
| GMG18916 | GMG19916 | R3.0 | 20.0 | 20 | 80 | 150 |
| GMG18917 | GMG19917 | R4.0 | 20.0 | 20 | 80 | 150 |
| GMG18918 | GMG19918 | R5.0 | 20.0 | 20 | 80 | 150 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

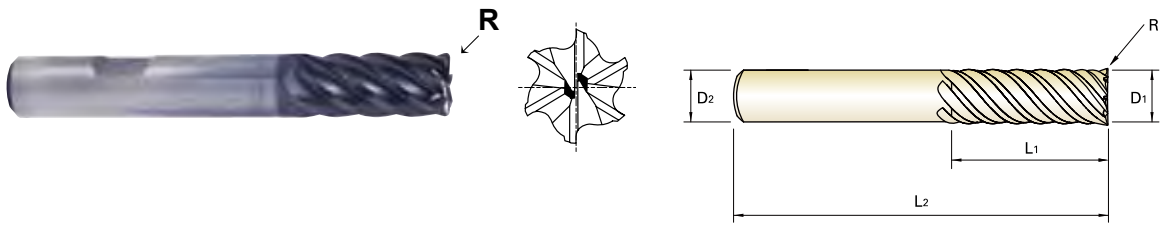
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMG18 SERIES** PLAIN SHANK
**GMG19 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE EXTRA LONG LENGTH CORNER RADIUS

▶ Special flute geometry and multiple helix eliminate vibrations
▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT

P.983

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | D1 | D2 | L1 | L2 |
| GMG18250 | GMG19250 | R1.0 | 25.0 | 25 | 100 | 170 |
| GMG18919 | GMG19919 | R1.5 | 25.0 | 25 | 100 | 170 |
| GMG18920 | GMG19920 | R2.0 | 25.0 | 25 | 100 | 170 |
| GMG18921 | GMG19921 | R3.0 | 25.0 | 25 | 100 | 170 |
| GMG18922 | GMG19922 | R4.0 | 25.0 | 25 | 100 | 170 |
| GMG18923 | GMG19923 | R5.0 | 25.0 | 25 | 100 | 170 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

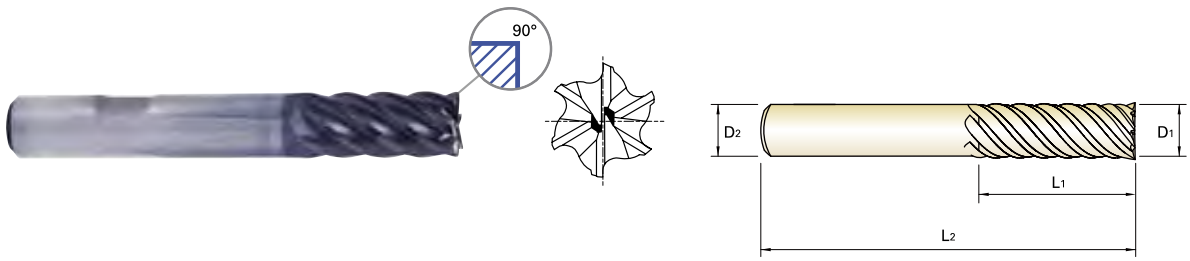
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

# V7 PLUS A END MILLS

**GMG12, GMG14 SERIES** PLAIN SHANK
**GMG13, GMG15 SERIES** FLAT SHANK

## CARBIDE, 6 FLUTE LONG & EXTRA LONG LENGTH

- The unique geometry of the variable pitch reduces chatter for high speed and trochoidal milling
- Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRc40




MG | 6 | 45° | PLAIN | FLAT

P.983

◇ Call for Availability

## LONG

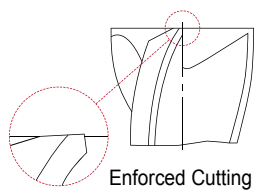
Unit : mm

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 |
| GMG12060 | GMG13060 | 6.0 | 6 | 13 | 57 |
| GMG12080 | GMG13080 | 8.0 | 8 | 19 | 63 |
| GMG12100 | GMG13100 | 10.0 | 10 | 22 | 72 |
| GMG12120 | GMG13120 | 12.0 | 12 | 26 | 83 |
| GMG12160 | GMG13160 | 16.0 | 16 | 32 | 92 |
| GMG12200 | GMG13200 | 20.0 | 20 | 38 | 104 |
| GMG12250 | GMG13250 | 25.0 | 25 | 44 | 104 |

## EXTRA LONG

| EDP No. | | Mill Diameter | Shank Diameter | Length Of Cut | Overall Length |
|---|---|---|---|---|---|
| PLAIN | FLAT | D1 | D2 | L1 | L2 |
| GMG14060 | GMG15060 | 6.0 | 6 | 24 | 75 |
| GMG14080 | GMG15080 | 8.0 | 8 | 32 | 75 |
| GMG14100 | GMG15100 | 10.0 | 10 | 40 | 100 |
| GMG14120 | GMG15120 | 12.0 | 12 | 48 | 120 |
| GMG14160 | GMG15160 | 16.0 | 16 | 64 | 140 |
| GMG14200 | GMG15200 | 20.0 | 20 | 80 | 150 |
| GMG14250 | GMG15250 | 25.0 | 25 | 100 | 170 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225 | HB225~325 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ◎ | | | | | | ○ | ○ |

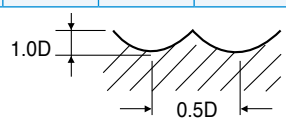
# V7 PLUS A END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE BALL NOSE

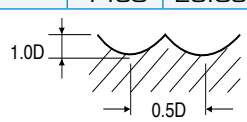
### UGMG53, UGMG54 SERIES

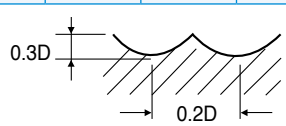
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000N/mm²~1300N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 16227 | 63.89 | 11338 | 44.64 | 6815 | 18.24 | 8526 | 26.85 | 7732 | 18.26 | 7732 | 24.35 |
| 3/16 | 10818 | 46.00 | 7559 | 32.14 | 4543 | 13.59 | 5684 | 17.90 | 5154 | 12.18 | 5154 | 16.23 |
| 13/64 | 9986 | 47.18 | 6977 | 32.96 | 4194 | 13.87 | 5247 | 20.66 | 4758 | 18.73 | 4758 | 18.73 |
| 1/4 | 8114 | 51.11 | 5669 | 35.71 | 3407 | 15.02 | 4263 | 27.53 | 3866 | 18.26 | 3866 | 24.96 |
| 5/16 | 6491 | 61.33 | 4535 | 42.85 | 2726 | 18.03 | 3410 | 24.17 | 3093 | 19.48 | 3093 | 21.92 |
| 3/8 | 5409 | 55.37 | 3779 | 38.69 | 2272 | 16.10 | 2842 | 22.38 | 2577 | 18.26 | 2577 | 20.29 |
| 1/2 | 4057 | 44.72 | 2834 | 31.25 | 1704 | 13.15 | 2132 | 18.46 | 1933 | 15.22 | 1933 | 16.74 |
| 5/8 | 3245 | 38.33 | 2268 | 26.43 | 1363 | 11.16 | 1705 | 16.11 | 1546 | 13.15 | 1546 | 14.61 |
| 11/16 | 2950 | 37.17 | 2061 | 25.65 | 1239 | 10.93 | 1550 | 15.62 | 1406 | 13.06 | 1406 | 14.17 |
| 3/4 | 2705 | 38.33 | 1890 | 26.78 | 1136 | 11.27 | 1421 | 14.55 | 1289 | 11.77 | 1289 | 13.19 |
| 1 | 2028 | 31.62 | 1417 | 22.10 | 852 | 9.39 | 1066 | 11.41 | 966 | 8.98 | 966 | 10.35 |




RPM = rev./min.
Feed = inch/min.

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 11918 | 58.18 | 4706 | 13.34 | 2109 | 4.65 |
| 3/16 | 7946 | 41.29 | 3137 | 8.89 | 1406 | 3.10 |
| 13/64 | 7334 | 42.74 | 2896 | 10.03 | 1298 | 3.47 |
| 1/4 | 5959 | 46.92 | 2353 | 13.71 | 1054 | 4.65 |
| 5/16 | 4767 | 55.56 | 1882 | 11.86 | 843 | 4.12 |
| 3/8 | 3973 | 50.68 | 1569 | 11.12 | 703 | 3.87 |
| 1/2 | 2980 | 40.82 | 1177 | 9.08 | 527 | 3.15 |
| 5/8 | 2384 | 34.91 | 941 | 8.00 | 422 | 2.79 |
| 11/16 | 2167 | 33.78 | 856 | 7.82 | 383 | 2.72 |
| 3/4 | 1986 | 35.04 | 784 | 7.16 | 351 | 2.49 |
| 1 | 1490 | 29.09 | 588 | 5.65 | 264 | 1.99 |




RPM = rev./min.
Feed = inch/min.

# V7 PLUS A END MILLS

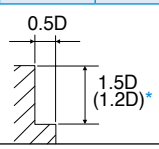
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE - SIDE CUTTING

### UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

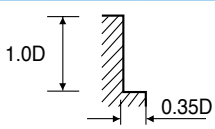
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000N/mm²~1300N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 15249 | 12.01 | 10727 | 8.45 | 6418 | 3.03 | 11521 | 9.07 | 16136 | 10.16 | 10421 | 8.21 |
| 5/32 | 12200 | 15.37 | 8581 | 10.81 | 5134 | 4.85 | 9217 | 11.61 | 12909 | 12.20 | 8337 | 10.50 |
| 3/16 | 10166 | 17.61 | 7151 | 12.39 | 4278 | 5.39 | 7681 | 15.72 | 10757 | 15.25 | 6947 | 14.22 |
| 7/32 | 8714 | 18.53 | 6129 | 13.03 | 3667 | 5.49 | 6583 | 16.07 | 9220 | 15.97 | 5955 | 14.54 |
| 1/4 | 7625 | 19.21 | 5363 | 13.51 | 3209 | 5.56 | 5761 | 16.33 | 8068 | 16.52 | 5210 | 14.77 |
| 9/32 | 6778 | 22.95 | 4767 | 16.14 | 2852 | 6.74 | 5120 | 18.55 | 7171 | 20.08 | 4632 | 16.78 |
| 5/16 | 6100 | 25.94 | 4291 | 18.24 | 2567 | 7.68 | 4608 | 20.32 | 6454 | 22.36 | 4168 | 18.38 |
| 11/32 | 5834 | 29.86 | 4089 | 20.93 | 2445 | 8.86 | 4189 | 25.07 | 5868 | 25.87 | 3789 | 22.68 |
| 3/8 | 5613 | 33.59 | 3912 | 23.41 | 2343 | 9.96 | 3840 | 29.03 | 5379 | 28.80 | 3474 | 26.26 |
| 7/16 | 4811 | 32.20 | 3353 | 22.44 | 2008 | 9.33 | 3292 | 26.96 | 4610 | 26.86 | 2977 | 24.15 |
| 1/2 | 4210 | 31.16 | 2934 | 21.71 | 1757 | 8.86 | 2880 | 25.40 | 4034 | 25.41 | 2605 | 22.57 |
| 5/8 | 3368 | 28.11 | 2347 | 19.59 | 1406 | 8.19 | 2304 | 22.86 | 3227 | 22.87 | 2084 | 20.35 |
| 3/4 | 2806 | 28.73 | 1956 | 20.02 | 1171 | 8.30 | 1920 | 23.28 | 2689 | 23.29 | 1737 | 21.06 |
| 1 | 2105 | 21.21 | 1467 | 14.78 | 879 | 6.23 | 1440 | 17.69 | 2017 | 17.47 | 1303 | 16.00 |

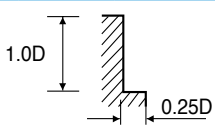
* Axial cutting depth




| Length of cut | | |
|---|---|---|
| | <1.5D | 1.2D |
| | ≥1.5D | 1.5D |

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 11216 | 10.60 | 8129 | 5.12 | 3117 | 2.45 |
| 5/32 | 8972 | 14.13 | 6503 | 7.17 | 2494 | 2.75 |
| 3/16 | 7477 | 16.48 | 5419 | 9.39 | 2078 | 3.93 |
| 7/32 | 6409 | 17.16 | 4645 | 9.88 | 1781 | 4.21 |
| 1/4 | 5608 | 17.66 | 4064 | 10.24 | 1559 | 4.42 |
| 9/32 | 4985 | 21.19 | 3613 | 11.66 | 1385 | 5.35 |
| 5/16 | 4486 | 24.02 | 3252 | 12.80 | 1247 | 6.09 |
| 11/32 | 4290 | 27.70 | 2956 | 15.83 | 1133 | 6.96 |
| 3/8 | 4115 | 31.11 | 2710 | 18.35 | 1039 | 7.69 |
| 7/16 | 3527 | 29.44 | 2323 | 17.01 | 891 | 7.15 |
| 1/2 | 3087 | 28.19 | 2032 | 16.00 | 779 | 6.75 |
| 5/8 | 2469 | 25.28 | 1626 | 14.34 | 623 | 6.28 |
| 3/4 | 2058 | 26.25 | 1355 | 14.72 | 520 | 6.30 |
| 1 | 1543 | 19.20 | 1016 | 11.20 | 390 | 4.85 |




RPM = rev./min.
Feed = inch/min.

# V7 PLUS A END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE - SLOTTING

### UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

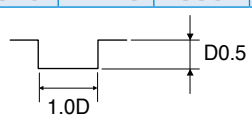
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000N/mm²~1300N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 15249 | 12.01 | 10727 | 8.45 | 6418 | 3.03 | 11521 | 9.07 | 16136 | 10.16 | 10421 | 8.21 |
| 5/32 | 12200 | 15.37 | 8581 | 10.81 | 5134 | 4.85 | 9217 | 11.61 | 12909 | 12.20 | 8337 | 10.50 |
| 3/16 | 10166 | 17.61 | 7151 | 12.39 | 4278 | 5.39 | 7681 | 15.72 | 10757 | 15.25 | 6947 | 14.22 |
| 7/32 | 8714 | 18.53 | 6129 | 13.03 | 3667 | 5.49 | 6583 | 16.07 | 9220 | 15.97 | 5955 | 14.54 |
| 1/4 | 7625 | 19.21 | 5363 | 13.51 | 3209 | 5.56 | 5761 | 16.33 | 8068 | 16.52 | 5210 | 14.77 |
| 9/32 | 6778 | 22.95 | 4767 | 16.14 | 2852 | 6.74 | 5120 | 18.55 | 7171 | 19.76 | 4632 | 16.78 |
| 5/16 | 6100 | 25.94 | 4291 | 18.24 | 2567 | 7.68 | 4608 | 20.32 | 6454 | 22.36 | 4168 | 18.38 |
| 11/32 | 5834 | 29.86 | 4089 | 20.93 | 2445 | 8.86 | 4189 | 25.07 | 5868 | 25.87 | 3789 | 22.68 |
| 3/8 | 5613 | 33.59 | 3912 | 23.41 | 2343 | 9.96 | 3840 | 29.03 | 5379 | 28.80 | 3474 | 26.26 |
| 7/16 | 4811 | 32.20 | 3353 | 22.44 | 2008 | 9.33 | 3292 | 26.96 | 4610 | 26.86 | 2977 | 24.15 |
| 1/2 | 4210 | 31.16 | 2934 | 21.71 | 1757 | 8.86 | 2880 | 25.40 | 4034 | 25.41 | 2605 | 22.57 |
| 5/8 | 3368 | 28.11 | 2347 | 19.59 | 1406 | 8.19 | 2304 | 22.86 | 3227 | 22.87 | 2084 | 20.35 |
| 3/4 | 2806 | 28.73 | 1956 | 18.17 | 1171 | 8.30 | 1920 | 23.28 | 2689 | 23.29 | 1737 | 21.06 |
| 1 | 2105 | 21.21 | 1467 | 14.78 | 879 | 6.23 | 1440 | 17.69 | 2017 | 17.47 | 1303 | 16.00 |

| * Axial cutting depth | | D / D(0.8D)* |
|---|---|---|
| Length of cut | <1.5D | 0.8D |
| | ≥1.5D | D |

RPM = rev./min.
Feed = inch/min.

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 11216 | 10.60 | 8129 | 5.12 | 3117 | 2.45 |
| 5/32 | 8972 | 14.13 | 6503 | 7.17 | 2494 | 2.75 |
| 3/16 | 7477 | 16.48 | 5419 | 9.39 | 2078 | 3.93 |
| 7/32 | 6409 | 17.16 | 4645 | 9.88 | 1781 | 4.21 |
| 1/4 | 5608 | 17.66 | 4064 | 10.24 | 1559 | 4.42 |
| 9/32 | 4985 | 21.19 | 3613 | 11.66 | 1385 | 5.35 |
| 5/16 | 4486 | 24.02 | 3252 | 12.80 | 1247 | 6.09 |
| 11/32 | 4290 | 27.70 | 2956 | 15.83 | 1133 | 6.96 |
| 3/8 | 4115 | 31.11 | 2710 | 18.35 | 1039 | 7.69 |
| 7/16 | 3527 | 29.44 | 2323 | 17.01 | 891 | 7.15 |
| 1/2 | 3087 | 28.19 | 2032 | 16.00 | 779 | 6.75 |
| 5/8 | 2469 | 25.28 | 1626 | 14.34 | 623 | 6.28 |
| 3/4 | 2058 | 26.25 | 1355 | 14.72 | 520 | 6.30 |
| 1 | 1543 | 19.20 | 1016 | 11.20 | 390 | 4.85 |

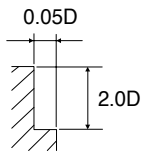
| * Axial cutting depth | | D / D(0.8D)* |
|---|---|---|
| Length of cut | <1.5D | 0.8D |
| | ≥1.5D | D |



## CARBIDE, 6 FLUTE - SIDE CUTTING

### UGMG20, UGMG21, UGMG22, UGMG23 SERIES

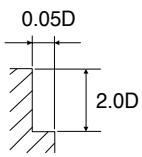
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000N/mm²~1300N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 6 | 15915 | 255.65 | 10769 | 127.20 | 5305 | 51.38 | 7799 | 75.53 | 11300 | 130.80 | 7109 | 68.85 |
| 8 | 11937 | 327.08 | 8077 | 162.18 | 3979 | 66.73 | 5849 | 98.10 | 8475 | 168.17 | 5332 | 89.42 |
| 10 | 9549 | 324.83 | 6462 | 161.80 | 3183 | 66.17 | 4679 | 97.27 | 6780 | 166.56 | 4265 | 88.67 |
| 12 | 7958 | 325.20 | 5385 | 162.81 | 2653 | 65.79 | 3899 | 96.71 | 5650 | 166.83 | 3554 | 88.16 |
| 16 | 5968 | 284.79 | 4039 | 142.14 | 1989 | 57.80 | 2924 | 84.97 | 4238 | 146.14 | 2666 | 77.46 |
| 20 | 4775 | 253.77 | 3231 | 127.45 | 1592 | 51.51 | 2340 | 75.71 | 3390 | 129.73 | 2133 | 69.02 |
| 25 | 3820 | 209.33 | 2585 | 106.24 | 1273 | 43.31 | 1872 | 63.22 | 2712 | 107.63 | 1706 | 57.23 |




If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C × 90% ap.

RPM = rev./min.
Feed = inch/min.

| MATERIAL | S | | | |
|---|---|---|---|---|
| | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | | | | |
| STRENGTH | | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 6 | 6154 | 47.97 | 1751 | 13.65 |
| 8 | 4615 | 59.97 | 1313 | 17.06 |
| 10 | 3692 | 61.06 | 1050 | 17.37 |
| 12 | 3077 | 60.33 | 875 | 16.96 |
| 16 | 2308 | 52.88 | 657 | 15.04 |
| 20 | 1846 | 49.28 | 525 | 13.90 |
| 25 | 1477 | 40.82 | 420 | 11.41 |




If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C × 90% ap.

RPM = rev./min.
Feed = inch/min.

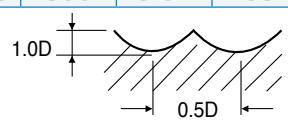
# V7 PLUS A END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE BALL NOSE

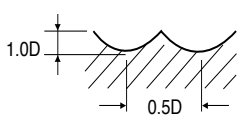
### GMG55, GMG56 SERIES

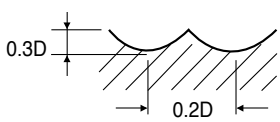
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000 N/mm² | | 1000 ~ 1300 N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 17189 | 67.67 | 11990 | 47.20 | 7215 | 19.32 | 9019 | 28.41 | 8170 | 19.30 | 8170 | 25.73 |
| 4 | 12892 | 54.81 | 8992 | 38.23 | 5411 | 16.19 | 6764 | 21.30 | 6127 | 14.47 | 6127 | 19.30 |
| 5 | 10313 | 48.72 | 7194 | 33.99 | 4329 | 14.32 | 5411 | 21.30 | 4902 | 19.30 | 4902 | 19.30 |
| 6 | 8594 | 54.14 | 5995 | 37.76 | 3608 | 15.91 | 4509 | 29.12 | 4085 | 19.30 | 4085 | 26.38 |
| 8 | 6446 | 60.90 | 4496 | 42.48 | 2706 | 17.90 | 3382 | 23.97 | 3064 | 19.30 | 3064 | 21.71 |
| 10 | 5157 | 52.78 | 3597 | 36.82 | 2165 | 15.34 | 2706 | 21.30 | 2451 | 17.37 | 2451 | 19.30 |
| 12 | 4297 | 47.37 | 2997 | 33.04 | 1804 | 13.92 | 2255 | 19.53 | 2042 | 16.08 | 2042 | 17.69 |
| 16 | 3223 | 38.07 | 2248 | 26.20 | 1353 | 11.08 | 1691 | 15.98 | 1532 | 13.03 | 1532 | 14.47 |
| 18 | 2865 | 36.09 | 1998 | 24.86 | 1203 | 10.60 | 1503 | 15.15 | 1362 | 12.65 | 1362 | 13.72 |
| 20 | 2578 | 36.54 | 1798 | 25.49 | 1082 | 10.74 | 1353 | 13.85 | 1225 | 11.19 | 1225 | 12.54 |
| 25 | 2063 | 32.16 | 1439 | 22.43 | 866 | 9.54 | 1082 | 11.59 | 980 | 9.11 | 980 | 10.50 |




RPM = rev./min.
Feed = mm/min.

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 12626 | 61.64 | 4987 | 14.14 | 2228 | 4.91 |
| 4 | 9470 | 49.21 | 3740 | 10.60 | 1671 | 3.68 |
| 5 | 7576 | 44.14 | 2992 | 10.37 | 1337 | 3.58 |
| 6 | 6313 | 49.71 | 2493 | 14.53 | 1114 | 4.91 |
| 8 | 4735 | 55.18 | 1870 | 11.78 | 836 | 4.08 |
| 10 | 3788 | 48.32 | 1496 | 10.60 | 668 | 3.68 |
| 12 | 3157 | 43.25 | 1247 | 9.62 | 557 | 3.33 |
| 16 | 2367 | 34.67 | 935 | 7.95 | 418 | 2.76 |
| 18 | 2104 | 32.81 | 831 | 7.59 | 371 | 2.63 |
| 20 | 1894 | 33.40 | 748 | 6.83 | 334 | 2.37 |
| 25 | 1515 | 29.59 | 598 | 5.75 | 267 | 2.02 |



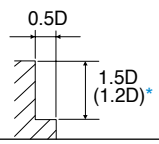




RPM = rev./min.
Feed = mm/min.

## CARBIDE, 4 FLUTE - SIDE CUTTING

### GMF52, GMF53, GMF54, GMF55, GMF56, GMF57, GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES

| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000 N/mm² | | 1000 ~ 1300 N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 16128 | 12.70 | 11353 | 8.94 | 6791 | 3.21 | 12202 | 9.61 | 17083 | 10.76 | 11035 | 8.69 |
| 4 | 12096 | 15.24 | 8515 | 10.73 | 5093 | 4.81 | 9151 | 11.53 | 12812 | 12.11 | 8276 | 10.43 |
| 5 | 9677 | 16.76 | 6812 | 11.80 | 4074 | 5.13 | 7321 | 14.99 | 10250 | 14.53 | 6621 | 13.55 |
| 6 | 8064 | 20.32 | 5677 | 14.30 | 3395 | 5.88 | 6101 | 17.29 | 8541 | 17.49 | 5517 | 15.64 |
| 8 | 6048 | 25.72 | 4257 | 18.10 | 2546 | 7.62 | 4576 | 20.18 | 6406 | 22.19 | 4138 | 18.25 |
| 10 | 5348 | 32.00 | 3724 | 22.29 | 2228 | 9.47 | 3661 | 27.67 | 5125 | 27.44 | 3310 | 25.02 |
| 12 | 4456 | 32.98 | 3104 | 22.97 | 1857 | 9.36 | 3050 | 26.90 | 4271 | 26.90 | 2759 | 23.89 |
| 14 | 3820 | 29.47 | 2660 | 20.53 | 1592 | 8.52 | 2615 | 24.71 | 3661 | 24.79 | 2365 | 21.97 |
| 16 | 3342 | 27.90 | 2328 | 19.43 | 1393 | 8.11 | 2288 | 22.70 | 3203 | 22.70 | 2069 | 20.20 |
| 18 | 2971 | 27.60 | 2069 | 19.22 | 1238 | 7.99 | 2034 | 22.42 | 2847 | 22.42 | 1839 | 19.98 |
| 20 | 2674 | 27.37 | 1862 | 19.06 | 1114 | 7.90 | 1830 | 22.19 | 2562 | 22.19 | 1655 | 20.07 |
| 25 | 2139 | 21.56 | 1490 | 15.01 | 891 | 6.32 | 1464 | 17.99 | 2050 | 17.76 | 1324 | 16.27 |

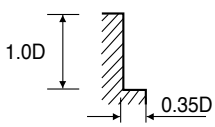


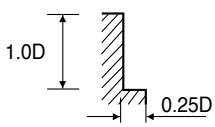

* Axial cutting depth

| Length of cut | | |
|---|---|---|
| | <1.5D | 1.2D |
| | ≥1.5D | 1.5D |

RPM = rev./min.
Feed = mm/min.

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 11884 | 11.23 | 8594 | 5.41 | 3289 | 2.59 |
| 4 | 8913 | 14.04 | 6446 | 7.11 | 2467 | 2.72 |
| 5 | 7130 | 15.72 | 5157 | 8.93 | 1974 | 3.73 |
| 6 | 5942 | 18.71 | 4297 | 10.83 | 1645 | 4.66 |
| 8 | 4456 | 23.86 | 3223 | 12.69 | 1233 | 6.02 |
| 10 | 3915 | 29.60 | 2578 | 17.46 | 987 | 7.30 |
| 12 | 3263 | 29.80 | 2149 | 16.92 | 822 | 7.12 |
| 14 | 2797 | 26.86 | 1842 | 15.37 | 705 | 6.77 |
| 16 | 2447 | 25.05 | 1611 | 14.21 | 617 | 6.22 |
| 18 | 2175 | 25.01 | 1432 | 13.99 | 548 | 5.96 |
| 20 | 1958 | 24.97 | 1289 | 14.01 | 493 | 5.98 |
| 25 | 1566 | 19.48 | 1031 | 11.37 | 395 | 4.91 |




RPM = rev./min.
Feed = mm/min.

# V7 PLUS A END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE - SLOTTING

### GMF52, GMF53, GMF54, GMF55, GMF56, GMF57, GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES

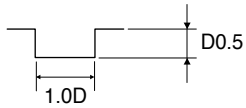
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEEL 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000 N/mm² | | 1000 ~ 1300 N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 16128 | 12.70 | 11353 | 8.94 | 6791 | 3.21 | 12202 | 9.61 | 17083 | 10.76 | 11035 | 8.69 |
| 4 | 12096 | 15.24 | 8515 | 10.73 | 5093 | 4.81 | 9151 | 11.53 | 12812 | 12.11 | 8276 | 10.43 |
| 5 | 9677 | 16.76 | 6812 | 11.80 | 4074 | 5.13 | 7321 | 14.99 | 10250 | 14.53 | 6621 | 13.55 |
| 6 | 8064 | 20.32 | 5677 | 14.30 | 3395 | 5.88 | 6101 | 17.29 | 8541 | 17.49 | 5517 | 15.64 |
| 8 | 6048 | 25.72 | 4257 | 18.10 | 2546 | 7.62 | 4576 | 20.18 | 6406 | 22.19 | 4138 | 18.25 |
| 10 | 5348 | 32.00 | 3724 | 22.29 | 2228 | 9.47 | 3661 | 27.67 | 5125 | 27.44 | 3310 | 25.02 |
| 12 | 4456 | 32.98 | 3104 | 22.97 | 1857 | 9.36 | 3050 | 26.90 | 4271 | 26.90 | 2759 | 23.89 |
| 14 | 3820 | 29.47 | 2660 | 20.53 | 1592 | 8.52 | 2615 | 24.71 | 3661 | 24.79 | 2365 | 21.97 |
| 16 | 3342 | 27.90 | 2328 | 19.43 | 1393 | 8.11 | 2288 | 22.70 | 3203 | 22.70 | 2069 | 20.20 |
| 18 | 2971 | 27.60 | 2069 | 19.22 | 1238 | 7.99 | 2034 | 22.42 | 2847 | 22.42 | 1839 | 19.98 |
| 20 | 2674 | 27.37 | 1862 | 19.06 | 1114 | 7.90 | 1830 | 22.19 | 2562 | 22.19 | 1655 | 20.07 |
| 25 | 2139 | 21.56 | 1490 | 15.01 | 891 | 6.32 | 1464 | 17.99 | 2050 | 17.76 | 1324 | 16.27 |

| * Axial cutting depth | | D(0.8D)* D |
|---|---|---|
| Length of cut | <1.5D | 0.8D |
| | ≥1.5D | D |

RPM = rev./min.
Feed = mm/min.

| MATERIAL | K | | S | | | |
|---|---|---|---|---|---|---|
| | CAST IRON | | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | ~ HB 260 | | | | | |
| STRENGTH | ~ 870N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 3 | 11884 | 11.23 | 8594 | 5.41 | 3289 | 2.59 |
| 4 | 8913 | 14.04 | 6446 | 7.11 | 2467 | 2.72 |
| 5 | 7130 | 15.72 | 5157 | 8.93 | 1974 | 3.73 |
| 6 | 5942 | 18.71 | 4297 | 10.83 | 1645 | 4.66 |
| 8 | 4456 | 23.86 | 3223 | 12.69 | 1233 | 6.02 |
| 10 | 3915 | 29.60 | 2578 | 17.46 | 987 | 7.30 |
| 12 | 3263 | 29.80 | 2149 | 16.92 | 822 | 7.12 |
| 14 | 2797 | 26.86 | 1842 | 15.37 | 705 | 6.77 |
| 16 | 2447 | 25.05 | 1611 | 14.21 | 617 | 6.22 |
| 18 | 2175 | 25.01 | 1432 | 13.99 | 548 | 5.96 |
| 20 | 1958 | 24.97 | 1289 | 14.01 | 493 | 5.98 |
| 25 | 1566 | 19.48 | 1031 | 11.37 | 395 | 4.91 |

| * Axial cutting depth | | D(0.8D)* D |
|---|---|---|
| Length of cut | <1.5D | 0.8D |
| | ≥1.5D | D |

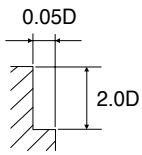



RPM = rev./min.
Feed = mm/min.

## CARBIDE, 6 FLUTE - SIDE CUTTING

### GMG12, GMG13, GMG14, GMG15, GMG16, GMG17, GMG18, GMG19 SERIES

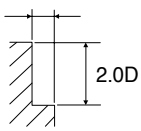
| MATERIAL | P | | | | | | M | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS | | ALLOY STEELS | | TOOL STEELS | | STAINLESS STEELS 300 | | STAINLESS STEELS 400 | | STAINLESS STEELS (PH) | |
| HARDNESS | ~ HB 300 | | HB 300 ~ HB 380 | | ~HB 380 | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000N/mm²~1300N/mm² | | ~ 1300 N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 15036 | 241.52 | 10176 | 120.19 | 5012 | 48.54 | 7365 | 71.33 | 10681 | 123.63 | 6723 | 65.11 |
| 5/16 | 12028 | 329.60 | 8141 | 163.46 | 4009 | 67.25 | 5892 | 98.82 | 8545 | 169.55 | 5379 | 90.21 |
| 3/8 | 10024 | 340.96 | 6784 | 169.88 | 3341 | 69.46 | 4910 | 102.07 | 7120 | 174.93 | 4482 | 93.17 |
| 1/2 | 7518 | 307.22 | 5088 | 153.85 | 2506 | 62.15 | 3682 | 91.34 | 5340 | 157.69 | 3362 | 83.38 |
| 5/8 | 6014 | 286.98 | 4071 | 143.27 | 2005 | 58.25 | 2946 | 85.60 | 4272 | 147.34 | 2689 | 78.14 |
| 3/4 | 5012 | 266.38 | 3392 | 133.82 | 1671 | 54.06 | 2455 | 79.45 | 3560 | 136.24 | 2241 | 72.53 |
| 1 | 3759 | 206.00 | 2544 | 104.57 | 1253 | 42.62 | 1841 | 62.20 | 2670 | 105.97 | 1681 | 56.38 |




If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C × 90% ap.

RPM = rev./min.
Feed = mm/min.

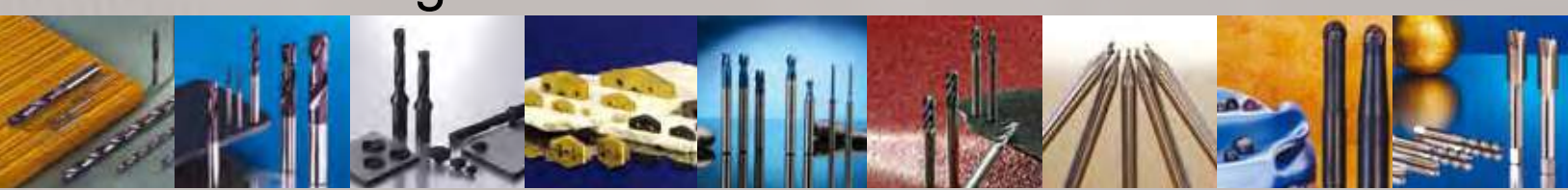
| MATERIAL | S | | | |
|---|---|---|---|---|
| | TITANIUM | | HIGH TEMPERATURE ALLOYS | |
| HARDNESS | | | | |
| STRENGTH | | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/4 | 5822 | 45.38 | 1650 | 12.86 |
| 5/16 | 4657 | 60.51 | 1320 | 17.15 |
| 3/8 | 3881 | 64.18 | 1100 | 18.19 |
| 1/2 | 2911 | 57.07 | 825 | 15.98 |
| 5/8 | 2329 | 53.36 | 660 | 15.13 |
| 3/4 | 1941 | 51.80 | 550 | 14.55 |
| 1 | 1455 | 40.22 | 413 | 11.21 |




If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C × 90% ap.

RPM = rev./min.
Feed = mm/min.

Global Cutting Tool Leader **YG-1**



# CARBIDE

Being the best through innovation



# V7 MILL INOX END MILLS

- Silent Cutting of Stainless Steels up to HRc40.
  Designed as Variable Leads, YG-1's Patent.

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| EMC75 EMD60 |  | CARBIDE, 4 FLUTE STUB LENGTH ◆ | D1/8 | D1 | 988 |
| EMC76 EMD61 |  | CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS ◆ | D1/8 | D1 | 989 |
| EMB12 EMB37 |  | CARBIDE, 4 FLUTE REGULAR LENGTH ◆ | D1/8 | D1 | 990 |
| EMB13 EMB38 |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS ◆ | D1/8 | D1 | 991 |
| EMB20 |  | CARBIDE, 4 FLUTE EXTENDED LENGTH LONG REACH ◆ | D1/4 | D1 | 992 |
| EMB78 EMB79 |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE ◆ | R1/16 | R1/2 | 993 |
| EMB76 EMB77 |  | CARBIDE, 5 FLUTE REGULAR LENGTH ◆ | D1/4 | D1 | 994 |

◆ U.S.A Stock

**METRIC**

| | | | | | |
|---|---|---|---|---|---|
| EMB41 EMB42 |  | CARBIDE, 4 FLUTE SHORT LENGTH ◇ | D3.0 | D20.0 | 995 |
| EMB43 EMB44 |  | CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS ◇ | D3.0 | D20.0 | 996 |
| EMB14 EMB39 |  | CARBIDE, 4 FLUTE REGULAR LENGTH ◇ | D3.0 | D25.0 | 997 |
| EMB15 EMB40 |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS ◇ | D3.0 | D25.0 | 998 |
| EMB74 EMB75 |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE ◇ | R1.5 | R12.5 | 999 |
| EMB72 EMB73 |  | CARBIDE, 5 FLUTE REGULAR LENGTH ◇ | D6.0 | D25.0 | 1000 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 1001 |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

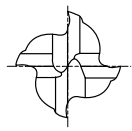
# V7 MILL INOX END MILLS

**EMC75 SERIES** PLAIN SHANK
**EMD60 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE STUB LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 4 | PLAIN | FLAT P.1001

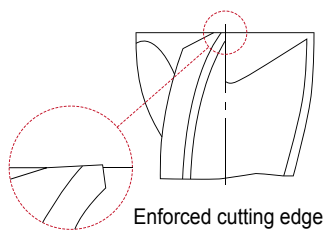
◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| EMC75008 | - | 1/8 | 1/8 | 1/8 | 1-1/2 |
| EMC75010 | - | 5/32 | 3/16 | 3/16 | 2 |
| EMC75012 | - | 3/16 | 3/16 | 3/16 | 2 |
| EMC75014 | - | 7/32 | 1/4 | 1/4 | 2 |
| EMC75016 | - | 1/4 | 1/4 | 1/4 | 2 |
| EMC75020 | - | 5/16 | 5/16 | 5/16 | 2 |
| - | EMD60024 | 3/8 | 3/8 | 3/8 | 2 |
| - | EMD60028 | 7/16 | 7/16 | 7/16 | 2-1/2 |
| - | EMD60032 | 1/2 | 1/2 | 1/2 | 2-1/2 |
| - | EMD60040 | 5/8 | 5/8 | 5/8 | 3 |
| - | EMD60048 | 3/4 | 3/4 | 3/4 | 3 |
| - | EMD60064 | 1 | 1 | 1 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMC76 SERIES** PLAIN SHANK
**EMD61 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE STUB LENGTH CORNER RADIUS

- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- ▶ Excellent work piece finishes
- ▶ Higher speeds, deeper cuts and metal removal rates




MG | 4 | PLAIN | FLAT

P.1001

◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| EMC76008 | - | R.015 | 1/8 | 1/8 | 1/8 | 1-1/2 |
| EMC76010 | - | R.015 | 5/32 | 3/16 | 3/16 | 2 |
| EMC76012 | - | R.015 | 3/16 | 3/16 | 3/16 | 2 |
| EMC76014 | - | R.020 | 7/32 | 1/4 | 1/4 | 2 |
| EMC76016 | - | R.020 | 1/4 | 1/4 | 1/4 | 2 |
| EMC76020 | - | R.020 | 5/16 | 5/16 | 5/16 | 2 |
| - | EMD61024 | R.020 | 3/8 | 3/8 | 3/8 | 2 |
| - | EMD61028 | R.020 | 7/16 | 7/16 | 7/16 | 2-1/2 |
| - | EMD61032 | R.030 | 1/2 | 1/2 | 1/2 | 2-1/2 |
| - | EMD61040 | R.040 | 5/8 | 5/8 | 5/8 | 3 |
| - | EMD61048 | R.040 | 3/4 | 3/4 | 3/4 | 3 |
| - | EMD61064 | R.040 | 1 | 1 | 1 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

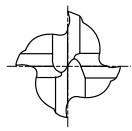
# V7 MILL INOX END MILLS

**EMB12 SERIES** PLAIN SHANK
**EMB37 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 4 | PLAIN | FLAT

P.1001

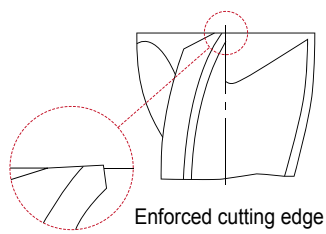
◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| EMB12008 | - | 1/8 | 1/8 | 3/8 | 1-1/2 |
| EMB12010 | - | 5/32 | 3/16 | 7/16 | 2 |
| EMB12012 | - | 3/16 | 3/16 | 7/16 | 2 |
| EMB12014 | - | 7/32 | 1/4 | 7/16 | 2-1/2 |
| EMB12016 | - | 1/4 | 1/4 | 1/2 | 2-1/2 |
| EMB12018 | - | 9/32 | 5/16 | 5/8 | 2-1/2 |
| EMB12020 | - | 5/16 | 5/16 | 13/16 | 2-1/2 |
| EMB12022 | - | 11/32 | 3/8 | 13/16 | 2-1/2 |
| - | EMB37024 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| - | EMB37026 | 13/32 | 7/16 | 15/16 | 2-3/4 |
| - | EMB37028 | 7/16 | 7/16 | 1 | 2-3/4 |
| - | EMB37030 | 15/32 | 1/2 | 1 | 3 |
| - | EMB37032 | 1/2 | 1/2 | 1 | 3 |
| - | EMB37036 | 9/16 | 9/16 | 1-1/8 | 3-1/2 |
| - | EMB37040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| - | EMB37048 | 3/4 | 3/4 | 1-1/2 | 4 |
| - | EMB37064 | 1 | 1 | 1-1/2 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMB13 SERIES** PLAIN SHANK
**EMB38 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates




MG | 4 | PLAIN | FLAT

P.1001

◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| **EMB13008** | - | R.015 | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **EMB13012** | - | R.015 | **3/16** | 3/16 | 7/16 | 2 |
| **EMB13016** | - | R.020 | **1/4** | 1/4 | 1/2 | 2-1/2 |
| **EMB13020** | - | R.020 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| - | **EMB38024** | R.020 | **3/8** | 3/8 | 7/8 | 2-1/2 |
| - | **EMB38028** | R.020 | **7/16** | 7/16 | 1 | 2-3/4 |
| - | **EMB38032** | R.030 | **1/2** | 1/2 | 1 | 3 |
| - | **EMB38036** | R.030 | **9/16** | 9/16 | 1-1/8 | 3-1/2 |
| - | **EMB38040** | R.040 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| - | **EMB38048** | R.040 | **3/4** | 3/4 | 1-1/2 | 4 |
| - | **EMB38064** | R.040 | **1** | 1 | 1-1/2 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

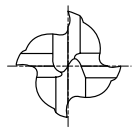
# V7 MILL INOX END MILLS

**EMB20 SERIES** PLAIN SHANK FLAT SHANK

## CARBIDE, 4 FLUTE EXTENDED LENGTH, LONG REACH

- ▶ Higher speeds, deeper cuts and metal removal rates.
- ▶ Improved surface finishes
- ▶ New "NANO" AlTiN coating





MG | 4 | PLAIN | FLAT

P.1001

◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Mill Diameter | Shank Diameter | Length of Cut | Reach Length | Overall Length |
|---|---|---|---|---|---|---|
| **EMB20160** | - | **1/4** | 1/4 | 3/8 | 1-1/4 | 4 |
| - | **EMB20240** | **3/8** | 3/8 | 1/2 | 1-7/8 | 4 |
| - | **EMB20320** | **1/2** | 1/2 | 5/8 | 2-1/4 | 4 |
| - | **EMB20400** | **5/8** | 5/8 | 3/4 | 2-1/4 | 4-1/8 |
| - | **EMB20401** | **5/8** | 5/8 | 3/4 | 3-1/4 | 5 |
| - | **EMB20480** | **3/4** | 3/4 | 1 | 2-1/4 | 4-1/4 |
| - | **EMB20481** | **3/4** | 3/4 | 1 | 3-1/4 | 5-1/2 |
| - | **EMB20640** | **1** | 1 | 1-1/8 | 2-1/4 | 4-1/2 |
| - | **EMB20641** | **1** | 1 | 1-1/8 | 3-1/4 | 5-1/2 |
| - | **EMB20642** | **1** | 1 | 1-1/8 | 4-1/4 | 6-1/2 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMB78 SERIES** PLAIN SHANK
**EMB79 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates




MG | 4 | R ±.0004" | PLAIN | FLAT | P.1002

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | R (±.0004) | | | | |
| **EMB78008** | - | R1/16 | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **EMB78010** | - | R5/64 | **5/32** | 3/16 | 7/16 | 2 |
| **EMB78012** | - | R3/32 | **3/16** | 3/16 | 7/16 | 2 |
| **EMB78016** | - | R1/8 | **1/4** | 1/4 | 1/2 | 2-1/2 |
| **EMB78020** | - | R5/32 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| - | **EMB79024** | R3/16 | **3/8** | 3/8 | 7/8 | 2-1/2 |
| - | **EMB79032** | R1/4 | **1/2** | 1/2 | 1 | 3 |
| - | **EMB79040** | R5/16 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| - | **EMB79048** | R3/8 | **3/4** | 3/4 | 1-1/2 | 4 |
| - | **EMB79064** | R1/2 | **1** | 1 | 1-1/2 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

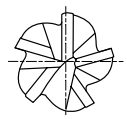
# V7 MILL INOX END MILLS

**EMB76 SERIES** PLAIN SHANK
**EMB77 SERIES** FLAT SHANK

## CARBIDE, 5 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 5 | PLAIN | FLAT | P.1002

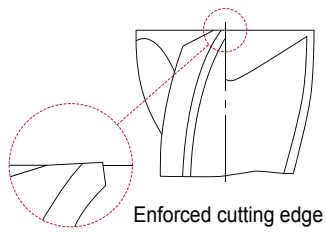
◆ U.S.A Stock

Unit : Inch

| EDP No. PLAIN | EDP No. FLAT | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| EMB76016 | - | 1/4 | 1/4 | 1/2 | 2-1/2 |
| EMB76020 | - | 5/16 | 5/16 | 13/16 | 2-1/2 |
| EMB76024 | EMB77024 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| - | EMB77032 | 1/2 | 1/2 | 1 | 3 |
| - | EMB77036 | 9/16 | 9/16 | 1-1/8 | 3-1/2 |
| - | EMB77040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| - | EMB77048 | 3/4 | 3/4 | 1-1/2 | 4 |
| - | EMB77064 | 1 | 1 | 1-1/2 | 4 |

▶ Shanks 3/8″ and over come standard with Flats.

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

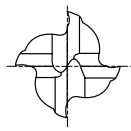
# V7 MILL INOX END MILLS

**EMB41 SERIES** PLAIN SHANK
**EMB42 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE SHORT LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 4 | PLAIN | FLAT

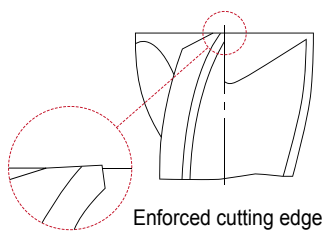
P.1001

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | Metric | Inch | | | |
| EMB41030 | EMB42030 | 3.0 | .1181 | 6 | 7 | 54 |
| EMB41040 | EMB42040 | 4.0 | .1575 | 6 | 8 | 54 |
| EMB41050 | EMB42050 | 5.0 | .1969 | 6 | 10 | 54 |
| EMB41060 | EMB42060 | 6.0 | .2362 | 6 | 10 | 54 |
| EMB41080 | EMB42080 | 8.0 | .3150 | 8 | 12 | 58 |
| EMB41100 | EMB42100 | 10.0 | .3937 | 10 | 14 | 66 |
| EMB41120 | EMB42120 | 12.0 | .4724 | 12 | 16 | 73 |
| EMB41140 | EMB42140 | 14.0 | .5512 | 14 | 18 | 75 |
| EMB41160 | EMB42160 | 16.0 | .6299 | 16 | 22 | 82 |
| EMB41180 | EMB42180 | 18.0 | .7087 | 18 | 24 | 84 |
| EMB41200 | EMB42200 | 20.0 | .7874 | 20 | 26 | 92 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMB43 SERIES** PLAIN SHANK
**EMB44 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE SHORT LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates




MG | 4 | PLAIN | FLAT

P.1001

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | Metric | Inch | | | |
| EMB43030 | EMB44030 | R0.3 | 3.0 | .1181 | 6 | 7 | 54 |
| EMB43040 | EMB44040 | R0.3 | 4.0 | .1575 | 6 | 8 | 54 |
| EMB43050 | EMB44050 | R0.3 | 5.0 | .1969 | 6 | 10 | 54 |
| EMB43060 | EMB44060 | R0.5 | 6.0 | .2362 | 6 | 10 | 54 |
| EMB43080 | EMB44080 | R0.5 | 8.0 | .3150 | 8 | 12 | 58 |
| EMB43100 | EMB44100 | R0.5 | 10.0 | .3937 | 10 | 14 | 66 |
| EMB43120 | EMB44120 | R0.7 | 12.0 | .4724 | 12 | 16 | 73 |
| EMB43140 | EMB44140 | R0.7 | 14.0 | .5512 | 14 | 18 | 75 |
| EMB43160 | EMB44160 | R1.0 | 16.0 | .6299 | 16 | 22 | 82 |
| EMB43180 | EMB44180 | R1.0 | 18.0 | .7087 | 18 | 24 | 84 |
| EMB43200 | EMB44200 | R1.0 | 20.0 | .7874 | 20 | 26 | 92 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

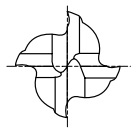
# V7 MILL INOX END MILLS

**EMB14 SERIES** PLAIN SHANK
**EMB39 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 4 | PLAIN | FLAT

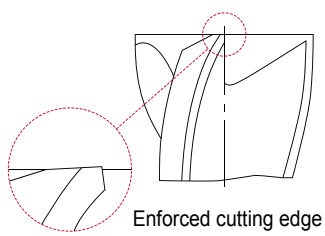
P.1001

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | Metric | Inch | | | |
| EMB14030 | - | 3.0 | .1181 | 6 | 8 | 57 |
| EMB14040 | - | 4.0 | .1575 | 6 | 11 | 57 |
| EMB14050 | - | 5.0 | .1969 | 6 | 13 | 57 |
| EMB14060 | - | 6.0 | .2362 | 6 | 13 | 57 |
| EMB14080 | - | 8.0 | .3150 | 8 | 19 | 63 |
| EMB14100 | - | 10.0 | .3937 | 10 | 22 | 72 |
| - | EMB39120 | 12.0 | .4724 | 12 | 26 | 83 |
| - | EMB39140 | 14.0 | .5512 | 14 | 26 | 83 |
| - | EMB39160 | 16.0 | .6299 | 16 | 32 | 92 |
| - | EMB39180 | 18.0 | .7087 | 18 | 32 | 92 |
| - | EMB39200 | 20.0 | .7874 | 20 | 38 | 104 |
| - | EMB39250 | 25.0 | .9800 | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMB15 SERIES** PLAIN SHANK
**EMB40 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates




MG 4 PLAIN FLAT P.1001

◇ Call for Availability

Unit : mm

| EDP No. | | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R | Metric | Inch | | | |
| EMB15030 | - | R0.3 | 3.0 | .1181 | 6 | 8 | 57 |
| EMB15040 | - | R0.3 | 4.0 | .1575 | 6 | 11 | 57 |
| EMB15050 | - | R0.3 | 5.0 | .1969 | 6 | 13 | 57 |
| EMB15060 | - | R0.5 | 6.0 | .2362 | 6 | 13 | 57 |
| EMB15080 | - | R0.5 | 8.0 | .3150 | 8 | 19 | 63 |
| EMB15100 | - | R0.5 | 10.0 | .3937 | 10 | 22 | 72 |
| - | EMB40120 | R0.7 | 12.0 | .4724 | 12 | 26 | 83 |
| - | EMB40140 | R0.7 | 14.0 | .5512 | 14 | 26 | 83 |
| - | EMB40160 | R1.0 | 16.0 | .6299 | 16 | 32 | 92 |
| - | EMB40180 | R1.0 | 18.0 | .7087 | 18 | 32 | 92 |
| - | EMB40200 | R1.0 | 20.0 | .7874 | 20 | 38 | 104 |
| - | EMB40250 | R1.0 | 25.0 | .9800 | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

# V7 MILL INOX END MILLS

**EMB74 SERIES** PLAIN SHANK
**EMB75 SERIES** FLAT SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates




MG | 4 | R ±0.01 | PLAIN | FLAT

P.1002

◇ Call for Availability

Unit : mm

| EDP No. | | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|
| PLAIN | FLAT | R (±0.01) | Metric | Inch | | | |
| **EMB74030** | **EMB75030** | R1.5 | **3.0** | **.1181** | 6 | 8 | 57 |
| **EMB74040** | **EMB75040** | R2.0 | **4.0** | **.1575** | 6 | 11 | 57 |
| **EMB74050** | **EMB75050** | R2.5 | **5.0** | **.1969** | 6 | 13 | 57 |
| **EMB74060** | **EMB75060** | R3.0 | **6.0** | **.2362** | 6 | 13 | 57 |
| **EMB74080** | **EMB75080** | R4.0 | **8.0** | **.3150** | 8 | 19 | 63 |
| **EMB74100** | **EMB75100** | R5.0 | **10.0** | **.3937** | 10 | 22 | 72 |
| **EMB74120** | **EMB75120** | R6.0 | **12.0** | **.4724** | 12 | 26 | 83 |
| **EMB74160** | **EMB75160** | R8.0 | **16.0** | **.6299** | 16 | 32 | 92 |
| **EMB74200** | **EMB75200** | R10.0 | **20.0** | **.7874** | 20 | 38 | 104 |
| **EMB74250** | **EMB75250** | R12.5 | **25.0** | **.9800** | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

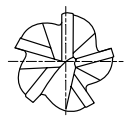
# V7 MILL INOX END MILLS

**EMB72** SERIES PLAIN SHANK
**EMB73** SERIES FLAT SHANK

## CARBIDE, 5 FLUTE REGULAR LENGTH

- Special flute geometry eliminates vibrations
- Designed for mild steels, stainless steel, cast iron, tool steels, titanium alloys, prehardened steels and low hardness material
- Excellent work piece finishes
- Higher speeds, deeper cuts and metal removal rates





MG | 5 | PLAIN | FLAT

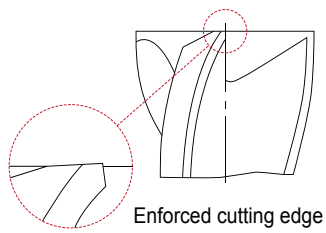
P.1002

◇ Call for Availability

Unit : mm

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| PLAIN | FLAT | Metric | Inch | | | |
| EMB72060 | EMB73060 | 6.0 | .2362 | 6 | 13 | 57 |
| EMB72080 | EMB73080 | 8.0 | .3150 | 8 | 19 | 63 |
| EMB72100 | EMB73100 | 10.0 | .3937 | 10 | 22 | 72 |
| EMB72120 | EMB73120 | 12.0 | .4724 | 12 | 26 | 83 |
| EMB72140 | EMB73140 | 14.0 | .5512 | 14 | 26 | 83 |
| EMB72160 | EMB73160 | 16.0 | .6299 | 16 | 32 | 92 |
| EMB72180 | EMB73180 | 18.0 | .7087 | 18 | 32 | 92 |
| EMB72200 | EMB73200 | 20.0 | .7874 | 20 | 38 | 104 |
| EMB72250 | EMB73250 | 25.0 | .9800 | 25 | 38 | 104 |

| Mill Dia. Tolerance (mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ○ | ○ | | | | ◎ | | | | | | | ◎ | ○ |

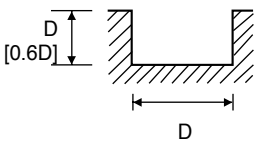
# V7 MILL INOX END MILLS

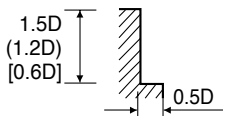
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE

### EMC75, EMD60, EMC76, EMD61, EMB12, EMB37, EMB13, EMB38, EMB20
### EMB41, EMB42, EMB43, EMB44, EMB14, EMB39, EMB15, EMB40 SERIES

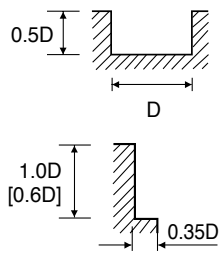
| MATERIAL | P | | M | | | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS CAST IRON | | STAINLESS STEELS 300SERIES | | STAINLESS STEELS 400SERIES | | TITANIUM | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc 20 | | | | | | | | | |
| STRENGTH | ~1000N/mm$^2$ | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 12735 | 10.2 | 9625 | 7.3 | 13475 | 7.6 | 8320 | 7.6 | 2565 | 2.1 |
| 3/16 | 8490 | 10.9 | 6385 | 8.3 | 12000 | 8.4 | 5550 | 8.4 | 1685 | 1.8 |
| 1/4 | 6370 | 11.5 | 4810 | 9.6 | 6815 | 9.6 | 4160 | 9.6 | 1285 | 2.5 |
| 5/16 | 5100 | 13.0 | 3850 | 10.7 | 5390 | 10.7 | 3330 | 10.7 | 1025 | 2.8 |
| 3/8 | 4245 | 18.4 | 3210 | 15.4 | 4490 | 15.4 | 2770 | 15.4 | 855 | 4.1 |
| 7/16 | 4010 | 24.5 | 2750 | 20.9 | 3850 | 20.9 | 2380 | 20.7 | 735 | 5.5 |
| 1/2 | 3500 | 25.9 | 2400 | 21.0 | 3370 | 21.0 | 2080 | 21.0 | 640 | 5.6 |
| 9/16 | 3110 | 26.0 | 2140 | 21.2 | 2990 | 21.2 | 1850 | 21.2 | 570 | 5.7 |
| 5/8 | 2800 | 26.1 | 1925 | 21.2 | 2700 | 21.2 | 1660 | 21.2 | 510 | 5.6 |
| 3/4 | 2340 | 24.0 | 1600 | 19.4 | 2250 | 19.4 | 1390 | 19.4 | 425 | 5.2 |
| 1 | 1755 | 17.4 | 1200 | 14.7 | 1685 | 15.1 | 1040 | 15.1 | 315 | 4.3 |




* ( ) : Short length Type
* [ ] : Stub length Type

* 1.2 x D Axial cutting depth should be applied for Short length series DIA over 5/16mm
* 0.6 x D Axial cutting depth should be applied for Stub length series.




RPM = rev./min.
FEED = inch/min.

# V7 MILL INOX END MILLS

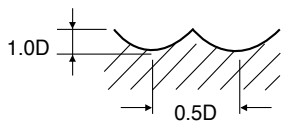
## RECOMMENDED CUTTING CONDITIONS

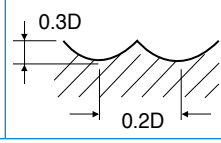
## CARBIDE, 4 FLUTE BALL NOSE

### EMB78, EMB79, EMB74, EMB75 SERIES

| MATERIAL | P | | M | | | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS CAST IRON | | STAINLESS STEELS 300SERIES | | STAINLESS STEELS 400SERIES | | TITANIUM | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc20 | | | | | | | | | |
| STRENGTH | ~1000N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 13530 | 53.2 | 7770 | 24.2 | 7020 | 16.4 | 5510 | 10.4 | 3010 | 5.2 |
| 3/16 | 9020 | 42.6 | 5180 | 20.3 | 4680 | 18.2 | 3680 | 8.7 | 2010 | 3.3 |
| 1/4 | 6770 | 40.7 | 3880 | 24.9 | 3510 | 16.4 | 2760 | 8.6 | 1500 | 3.7 |
| 5/16 | 5410 | 50.8 | 3110 | 21.9 | 2810 | 17.5 | 2210 | 10.4 | 1200 | 4.8 |
| 3/8 | 4510 | 42.6 | 2590 | 20.3 | 2340 | 16.6 | 1840 | 8.7 | 1000 | 4.2 |
| 7/16 | 3870 | 39.5 | 2220 | 18.3 | 2010 | 15.0 | 1580 | 8.6 | 860 | 4.4 |
| 1/2 | 3380 | 37.2 | 1940 | 16.8 | 1750 | 13.8 | 1380 | 8.6 | 750 | 4.5 |
| 9/16 | 3010 | 34.2 | 1730 | 15.6 | 1560 | 12.8 | 1230 | 8.0 | 670 | 4.5 |
| 5/8 | 2710 | 31.8 | 1550 | 14.7 | 1400 | 11.9 | 1100 | 7.6 | 600 | 4.4 |
| 3/4 | 2260 | 32.0 | 1290 | 13.3 | 1170 | 10.8 | 920 | 8.7 | 500 | 4.2 |
| 1 | 1690 | 26.5 | 970 | 10.7 | 880 | 8.2 | 690 | 7.4 | 380 | 3.1 |

RPM = rev./min.
FEED = inch/min.

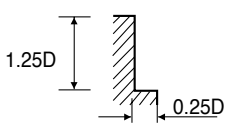


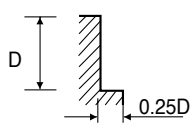




## CARBIDE, 5 FLUTE

### EMB76, EMB77, EMB72, EMB73 SERIES

| MATERIAL | P | | M | | | | S | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ALLOY STEELS CAST IRON | | STAINLESS STEELS 300SERIES | | STAINLESS STEELS 400SERIES | | TITANIUM | | HIGH TEMPERATURE ALLOY | |
| HARDNESS | ~HRc20 | | | | | | | | | |
| STRENGTH | ~1000N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 6870 | 46.1 | 5710 | 34.2 | 5310 | 31.8 | 4200 | 24.9 | 1350 | 4.4 |
| 5/16 | 5490 | 41.3 | 4570 | 28.6 | 4250 | 26.5 | 3360 | 20.6 | 1080 | 4.3 |
| 3/8 | 4580 | 45.5 | 3810 | 28.5 | 3540 | 26.3 | 2800 | 20.7 | 900 | 4.5 |
| 7/16 | 3920 | 44.0 | 3270 | 32.6 | 3040 | 23.9 | 2400 | 20.8 | 770 | 4.7 |
| 1/2 | 3430 | 42.8 | 2860 | 35.7 | 2660 | 22.1 | 2100 | 20.8 | 680 | 4.8 |
| 9/16 | 3050 | 41.7 | 2540 | 32.7 | 2360 | 29.6 | 1860 | 20.9 | 600 | 5.4 |
| 5/8 | 2750 | 41.4 | 2290 | 30.9 | 2130 | 28.4 | 1680 | 20.7 | 540 | 5.1 |
| 3/4 | 2290 | 39.6 | 1900 | 28.6 | 1770 | 26.4 | 1400 | 20.7 | 450 | 5.4 |
| 1 | 1720 | 34.2 | 1430 | 24.8 | 1330 | 23.2 | 1050 | 18.3 | 340 | 5.1 |




RPM = rev./min.
FEED = inch/min.

# CARBIDE & HSS

Being the best through innovation



# ALU-POWER END MILLS

- Silent Cutting of Aluminium Alloys, Mirror Surface

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **E5253** |  | CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - "BANSHEE" (FLAT SHANK) ◆ | D1/4 | D1 | **1008** |
| **E5254** |  | CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - "BANSHEE" (PLAIN SHANK) ◆ | D1/16 | D1 | **1009** |
| **E5976** |  | CARBIDE, 2 FLUTE 37° HELIX with EXTENDED NECK ◆ | D1/4 | D1 | **1010** |
| **E5980** |  | CARBIDE, 3 FLUTE 45° HELIX STUB LENGTH ◆ | D1/8 | D1 | **1011** |
| **E5981** |  | CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH ◆ | D1/8 | D1 | **1012** |
| **E5983** |  | CARBIDE, 3 FLUTE, 45° HELIX REGULAR LENGTH CORNER RADIUS ◆ | D1/2 | D1 | **1012** |
| **E5982** |  | CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH ◆ | D1/4 | D1 | **1013** |
| **E5984** |  | CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH CORNER RADIUS ◆ | D1/2 | D1 | **1013** |
| **E5E44** |  | CARBIDE, 3 FLUTE ROUGHING ◆ | D1/4 | D1 | **1014** |
| **E5E98** |  | CARBIDE, 3 FLUTE ROUGHING with NECK ◆ | D1/4 | D1 | **1014** |
| **E5E45** |  | CARBIDE, 3 FLUTE 37° ROUGHING BALL NOSE ◆ | D1/4 | D1 | **1015** |
| **E5977** |  | CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK ◆ | D1/4 | D1 | **1016** |
| **E5985** |  | CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK CORNER RADIUS ◆ | D1/2 | D1 | **1017** |
| **E5973** |  | CARBIDE, 2 FLUTE CORNER RADIUS with NECK ◆ | D5/32 | D3/4 | **1018** |
| **E5974** |  | CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK ◆ | R1/8 | R3/8 | **1019** |
| **E5978** |  | CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE ◆ | R1/8 | R1/2 | **1020** |
| **E5975** |  | CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK ◆ | R3/64 | R5/16 | **1021** |

◆ U.S.A Stock

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
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| | | | | | | | | | | ◎ | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|---|
| **METRIC - CARBIDE** | | | | | | |
| E5522<br>EG522 |  | CARBIDE, 2 FLUTE 45° HELIX LONG LENGTH TiCN COATED | ◇ | D3.0 | D20.0 | 1022 |
| EG930 |  | CARBIDE, 2 FLUTE 25° HELIX STUB CUT LENGTH<br>CORNER RADIUS TiCN COATED | ◇ | D2.0 | D20.0 | 1023 |
| EG909 |  | CARBIDE, 2 FLUTE STUB CUT LENGTH<br>CORNER RADIUS with NECK TiCN COATED | ◇ | D4.0 | D20.0 | 1024 |
| EG910 |  | CARBIDE 2 FLUTE 50° HELIX STUB CUT LENGTH<br>BALL NOSE with NECK TiCN COATED | ◇ | R3.0 | R10.0 | 1025 |
| EG908 |  | CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH<br>BALL NOSE with NECK TiCN COATED | ◇ | R1.0 | R8.0 | 1026 |

◇ Call for Availability

| | | | | | | |
|---|---|---|---|---|---|---|
| **INCH / SPEED FREEK - HSS POWDERED METAL** | | | | | | |
| EK191 |  | T15, 3 FLUTE 42° HELIX REGULAR LENGTH ROUGHING<br>for ALUMINUM | ◆ | D1/2 | D2 | 1027 |
| EK191 |  | T15, 3 FLUTE 42° HELIX REGULAR LENGTH ROUGHING<br>with CORNER RADIUS for ALUMINUM | ◆ | D3/4 | D1-1/4 | 1027 |
| EK226 |  | T15, 3 FLUTE 42° HELIX MEDIUM LENGTH ROUGHING<br>for ALUMINUM | ◆ | D3/4 | D2 | 1028 |
| EK226 |  | T15, 3 FLUTE 42° HELIX MEDIUM LENGTH ROUGHING<br>with CORNER RADIUS for ALUMINUM | ◆ | D3/4 | D1-1/4 | 1028 |
| EK192 |  | T15, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING<br>for ALUMINUM | ◆ | D1/2 | D2 | 1029 |
| EK192 |  | T15, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING<br>with CORNER RADIUS for ALUMINUM | ◆ | D3/4 | D1-1/4 | 1030 |
| EK196 |  | 3 FLUTE BALL NOSE 42° HELIX ROUGHING BALL NOSE<br>REGULAR LENGTH for ALUMINUM | ◆ | R1/4 | R5/8 | 1031 |
| EK193<br>EK132 |  | 3 FLUTE FINISHING with & without CORNER RADIUS<br>REGULAR & MEDIUM & LONG LENGTH | ◆ | D1/2 | D1-1/2 | 1032 |

◆ U.S.A Stock

| | | | | | | |
|---|---|---|---|---|---|---|
| **METRIC / SPEED FREEK - HSS POWDERED METAL** | | | | | | |
| EP922 |  | PREMIUM HSS-PM, 3 FLUTE, 42° HELIX SHORT LENGTH<br>ROUGHING for ALUMINUM | ◇ | D12.0 | D32.0 | 1034 |
| EP924 |  | PREMIUM HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH<br>ROUGHING for ALUMINUM | ◇ | D12.0 | D32.0 | 1035 |
| | | RECOMMENDED CUTTING CONDITIONS | | | | 1036 |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |
| | | | | | | | | | | ◎ | | | | |

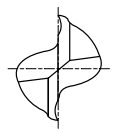
# ALU-POWER END MILLS

**E5253 SERIES** FLAT SHANK

## CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - "BANSHEE"

- ▶ High velocity milling of aluminum & other non ferrous materials.
- ▶ Excellent plunging capabilities.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.





MG | 2 | 42° | FLAT P.1036

◆ U.S.A Stock

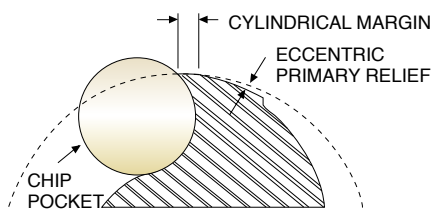
Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 17574 | 17574TN | 17574TC | 17574TF | 17574TE | 1/4 | 3/8 | 3/4 | 2-1/2 |
| 17580 | 17580TN | 17580TC | 17580TF | 17580TE | 5/16 | 3/8 | 13/16 | 2-1/2 |
| 17584 | 17584TN | 17584TC | 17584TF | 17584TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 17593 | 17593TN | 17593TC | 17593TF | 17593TE | 1/2 | 1/2 | 1 | 3 |
| 18593 | 18593TN | 18593TC | 18593TF | 18593TE | 1/2 | 1/2 | 2 | 4 |
| 17901 | 17901TN | 17901TC | 17901TF | 17901TE | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 17595 | 17595TN | 17595TC | 17595TF | 17595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 17598 | 17598TN | 17598TC | 17598TF | 17598TE | 3/4 | 3/4 | 1-1/2 | 4 |
| 18598 | 18598TN | 18598TC | 18598TF | 18598TE | 3/4 | 3/4 | 3 | 5-1/2 |
| 17600 | 17600TN | 17600TC | 17600TF | 17600TE | 1 | 1 | 1-1/2 | 4 |
| 18600 | 18600TN | 18600TC | 18600TF | 18600TE | 1 | 1 | 3 | 5-1/2 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(42°), bigger chip pocket.




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

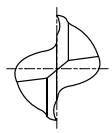
# ALU-POWER END MILLS

**E5254 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 42° HELIX REGULAR LENGTH - " BANSHEE"

- ▶ High velocity milling of aluminum & other non ferrous materials.
- ▶ Excellent plunging capabilities.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.





MG | 2 | 42° | PLAIN

P.1036

◆ U.S.A Stock

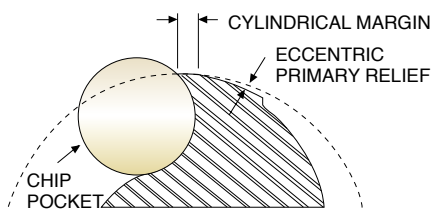
Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 21554 | 21554TN | 21554TC | 21554TF | 21554TE | 1/16 | 1/8 | 1/8 | 1-1/2 |
| 21556 | 21556TN | 21556TC | 21556TF | 21556TE | 3/32 | 1/8 | 1/4 | 1-1/2 |
| 21601 | 21601TN | 21601TC | 21601TF | 21601TE | 1/8 | 1/4 | 5/16 | 1-3/4 |
| 21566 | 21566TN | 21566TC | 21566TF | 21566TE | 3/16 | 1/4 | 7/16 | 2 |
| 21574 | 21574TN | 21574TC | 21574TF | 21574TE | 1/4 | 3/8 | 3/4 | 2-1/2 |
| 21580 | 21580TN | 21580TC | 21580TF | 21580TE | 5/16 | 3/8 | 13/16 | 2-1/2 |
| 21584 | 21584TN | 21584TC | 21584TF | 21584TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 21588 | 21588TN | 21588TC | 21588TF | 21588TE | 7/16 | 7/16 | 1 | 2-3/4 |
| 21593 | 21593TN | 21593TC | 21593TF | 21593TE | 1/2 | 1/2 | 1 | 3 |
| 21904 | 21904TN | 21904TC | 21904TF | 21904TE | 1/2 | 1/2 | 1-1/4 | 3 |
| 21901 | 21901TN | 21901TC | 21901TF | 21901TE | 1/2 | 1/2 | 2 | 4 |
| 21595 | 21595TN | 21595TC | 21595TF | 21595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 21598 | 21598TN | 21598TC | 21598TF | 21598TE | 3/4 | 3/4 | 1-1/2 | 4 |
| 21902 | 21902TN | 21902TC | 21902TF | 21902TE | 3/4 | 3/4 | 3 | 5-1/2 |
| 21600 | 21600TN | 21600TC | 21600TF | 21600TE | 1 | 1 | 1-1/2 | 4 |
| 21903 | 21903TN | 21903TC | 21903TF | 21903TE | 1 | 1 | 3 | 5-1/2 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(42°), bigger chip pocket.




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

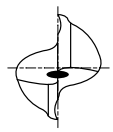
# ALU-POWER END MILLS

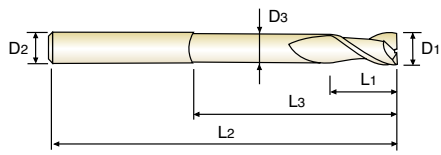
**E5976 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 37° HELIX with EXTENDED NECK

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ Excellent plunging capabilities.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.








MG | 2 | 37° | PLAIN

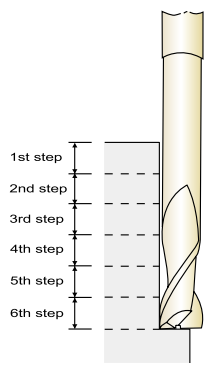
P.1039

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | D1 | D2 | L1 | L3 | L2 | D3 |
| 39573 | 39573TC | 1/4 | 1/4 | 3/8 | 2-1/4 | 4 | .220 |
| 39584 | 39584TC | 3/8 | 3/8 | 1/2 | 2-1/4 | 4 | .345 |
| 39593 | 39593TC | 1/2 | 1/2 | 5/8 | 2-1/4 | 5 | .470 |
| 39908 | 39908TC | 1/2 | 1/2 | 5/8 | 3-1/4 | 6 | .470 |
| 39901 | 39901TC | 1/2 | 1/2 | 5/8 | 4 | 6 | .470 |
| 39595 | 39595TC | 5/8 | 5/8 | 3/4 | 2-1/4 | 5 | .585 |
| 39902 | 39902TC | 5/8 | 5/8 | 3/4 | 3-1/4 | 6 | .585 |
| 39903 | 39903TC | 5/8 | 5/8 | 3/4 | 4-1/4 | 7 | .585 |
| 39598 | 39598TC | 3/4 | 3/4 | 1 | 2-1/4 | 5 | .710 |
| 39904 | 39904TC | 3/4 | 3/4 | 1 | 3-1/4 | 6 | .710 |
| 39905 | 39905TC | 3/4 | 3/4 | 1 | 4-1/4 | 7 | .710 |
| 39600 | 39600TC | 1 | 1 | 1-1/8 | 2-1/4 | 5 | .960 |
| 39906 | 39906TC | 1 | 1 | 1-1/8 | 3-1/4 | 6 | .960 |
| 39907 | 39907TC | 1 | 1 | 1-1/8 | 4-1/4 | 7 | .960 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |




**STEP MILLING**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

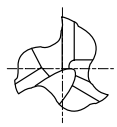
# ALU-POWER END MILLS

**E5980 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 45° HELIX STUB LENGTH

- ▶ Designed to machine aluminium at high speed condition.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Mirror face-excellent surface finish.





MG | 3 | 45° | PLAIN

P.1037

◆ U.S.A Stock

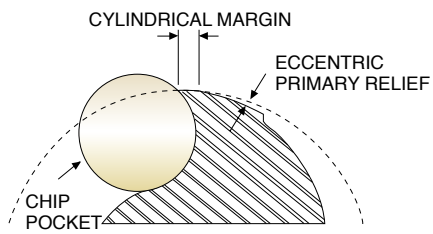
Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 25558 | 25558TC | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 25565 | 25565TC | 3/16 | 3/16 | 5/16 | 2 |
| 25573 | 25573TC | 1/4 | 1/4 | 3/8 | 2 |
| 25579 | 25579TC | 5/16 | 5/16 | 7/16 | 2 |
| 25584 | 25584TC | 3/8 | 3/8 | 1/2 | 2 |
| 25588 | 25588TC | 7/16 | 7/16 | 9/16 | 2-1/2 |
| 25593 | 25593TC | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 25595 | 25595TC | 5/8 | 5/8 | 3/4 | 3 |
| 25598 | 25598TC | 3/4 | 3/4 | 1 | 3 |
| 25600 | 25600TC | 1 | 1 | 1-1/4 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |



- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

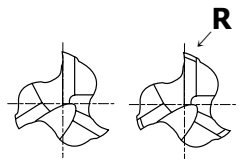
# ALU-POWER END MILLS

**E5981 SERIES** PLAIN SHANK
**E5983 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH & CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.






MG | 3 | 45° | PLAIN

P.1037

◆ U.S.A Stock

### ■ SQUARE

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | | | | |
| **28558** | **28558TC** | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **28565** | **28565TC** | **3/16** | 3/16 | 9/16 | 2 |
| **28573** | **28573TC** | **1/4** | 1/4 | 5/8 | 2-1/2 |
| **28579** | **28579TC** | **5/16** | 5/16 | 5/8 | 2-1/2 |
| **28584** | **28584TC** | **3/8** | 3/8 | 1 | 2-1/2 |
| **28588** | **28588TC** | **7/16** | 7/16 | 1-1/4 | 2-3/4 |
| **28593** | **28593TC** | **1/2** | 1/2 | 1-1/4 | 3 |
| **28595** | **28595TC** | **5/8** | 5/8 | 1-5/8 | 3-1/2 |
| **28598** | **28598TC** | **3/4** | 3/4 | 1-5/8 | 4 |
| **28600** | **28600TC** | **1** | 1 | 2 | 5 |

### ■ CORNER RADIUS

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R | | | | |
| **EA50321** | **EA50321C** | R.060 | **1/2** | 1/2 | 1-1/4 | 3 |
| **EA50401** | **EA50401C** | R.060 | **5/8** | 5/8 | 1-5/8 | 3-1/2 |
| **EA50481** | **EA50481C** | R.060 | **3/4** | 3/4 | 1-5/8 | 4 |
| **EA50641** | **EA50641C** | R.065 | **1** | 1 | 2 | 5 |
| **EA20321** | **EA20321C** | R.120 | **1/2** | 1/2 | 1-1/4 | 3 |
| **EA20401** | **EA20401C** | R.120 | **5/8** | 5/8 | 1-5/8 | 3-1/2 |
| **EA20481** | **EA20481C** | R.120 | **3/4** | 3/4 | 1-5/8 | 4 |
| **EA20641** | **EA20641C** | R.120 | **1** | 1 | 2 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

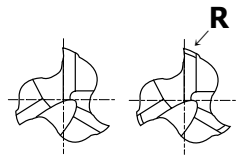
# ALU-POWER END MILLS

**E5982 SERIES** PLAIN SHANK
**E5984 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 45° HELIX LONG LENGTH & CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 45° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.






MG 3 45° PLAIN P.1037

◆ U.S.A Stock

### ■ SQUARE

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| **36573** | **36573TC** | **1/4** | 1/4 | 1-1/4 | 3-1/4 |
| **36579** | **36579TC** | **5/16** | 5/16 | 1-1/4 | 3-1/2 |
| **36584** | **36584TC** | **3/8** | 3/8 | 1-1/2 | 3-1/2 |
| **36588** | **36588TC** | **7/16** | 7/16 | 2 | 4 |
| **36593** | **36593TC** | **1/2** | 1/2 | 2 | 4 |
| **36595** | **36595TC** | **5/8** | 5/8 | 2-1/2 | 5 |
| **36598** | **36598TC** | **3/4** | 3/4 | 3-1/4 | 6 |
| **36600** | **36600TC** | **1** | 1 | 3-1/4 | 6 |

### ■ CORNER RADIUS

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| **EA60321** | **EA60321C** | R.060 | **1/2** | 1/2 | 2 | 4 |
| **EA60401** | **EA60401C** | R.060 | **5/8** | 5/8 | 2-1/2 | 5 |
| **EA60481** | **EA60481C** | R.060 | **3/4** | 3/4 | 3-1/4 | 6 |
| **EA60641** | **EA60641C** | R.060 | **1** | 1 | 3-1/4 | 6 |
| **EA30321** | **EA30321C** | R.120 | **1/2** | 1/2 | 2 | 4 |
| **EA30401** | **EA30401C** | R.120 | **5/8** | 5/8 | 2-1/2 | 5 |
| **EA30481** | **EA30481C** | R.120 | **3/4** | 3/4 | 3-1/4 | 6 |
| **EA30641** | **EA30641C** | R.120 | **1** | 1 | 3-1/4 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

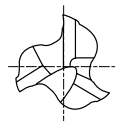
# ALU-POWER END MILLS

E5E44 SERIES PLAIN SHANK
E5E98 SERIES PLAIN SHANK

## CARBIDE, 3 FLUTE ROUGHING / ROUGHING with NECK

- Excellent cutting qualities on aluminum, copper
- Increased tool life and superior chip evacuation
- Reduces chipping of corner edges





* WITH NECK

MG | 3 | 30° | PLAIN

P.1044

◆ U.S.A Stock

### ROUGHING

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| **44016** | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **44024** | **3/8** | 3/8 | 7/8 | 2-1/2 |
| **44032** | **1/2** | 1/2 | 1 | 3 |
| 44040 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **44048** | **3/4** | 3/4 | 1-5/8 | 4 |
| **44064** | **1** | 1 | 1-3/4 | 4 |

### ROUGHING WITH NECK

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|
| **98016** | **1/4** | 1/4 | 3/4 | 1 | 2-1/2 |
| **98024** | **3/8** | 3/8 | 7/8 | 1-1/4 | 3 |
| **98032** | **1/2** | 1/2 | 1 | 1-3/8 | 3-1/4 |
| **98040** | **5/8** | 5/8 | 1-1/4 | 1-3/4 | 3-3/4 |
| **98048** | **3/4** | 3/4 | 1-5/8 | 2-1/4 | 4-1/2 |
| **98064** | **1** | 1 | 1-3/4 | 2-1/2 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

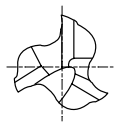
# ALU-POWER END MILLS

**E5E45 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE ROUGHING BALL NOSE

- Excellent cutting qualities on aluminum, copper
- Increased tool life and superior chip evacuation
- Reduces chipping of corner edges





MG | 3 | 30° | PLAIN

P.1044

◆ U.S.A Stock

Unit : Inch

| SAB CODE | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of FLUTE |
|---|---|---|---|---|---|
| 45016 | 1/4 | 1/4 | 3/4 | 2-1/2 | 3 |
| 45024 | 3/8 | 3/8 | 7/8 | 2-1/2 | 3 |
| 45032 | 1/2 | 1/2 | 1 | 3 | 3 |
| 45040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 | 3 |
| 45048 | 3/4 | 3/4 | 1-5/8 | 4 | 3 |
| 45064 | 1 | 1 | 1-3/4 | 4 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

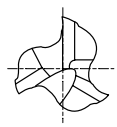
# ALU-POWER END MILLS

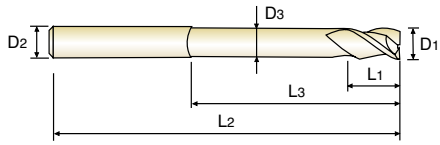
**E5977 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.








MG | 3 | 37° | PLAIN

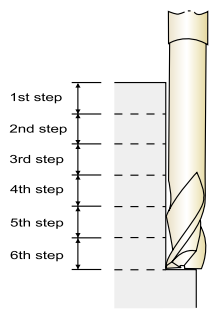
P.1038

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | D1 | D2 | L1 | L3 | L2 | D3 |
| 40573 | 40573TC | 1/4 | 1/4 | 3/8 | 2-1/4 | 4 | .220 |
| 40584 | 40584TC | 3/8 | 3/8 | 1/2 | 2-1/4 | 4 | .345 |
| 40593 | 40593TC | 1/2 | 1/2 | 5/8 | 2-1/4 | 5 | .470 |
| 40901 | 40901TC | 1/2 | 1/2 | 5/8 | 3-1/4 | 6 | .470 |
| 40902 | 40902TC | 1/2 | 1/2 | 5/8 | 4 | 6 | .470 |
| 40595 | 40595TC | 5/8 | 5/8 | 3/4 | 2-1/4 | 5 | .585 |
| 40903 | 40903TC | 5/8 | 5/8 | 3/4 | 3-1/4 | 6 | .585 |
| 40904 | 40904TC | 5/8 | 5/8 | 3/4 | 4-1/4 | 7 | .585 |
| 40598 | 40598TC | 3/4 | 3/4 | 1 | 2-1/4 | 5 | .710 |
| 40905 | 40905TC | 3/4 | 3/4 | 1 | 3-1/4 | 6 | .710 |
| 40906 | 40906TC | 3/4 | 3/4 | 1 | 4-1/4 | 7 | .710 |
| 40600 | 40600TC | 1 | 1 | 1-1/8 | 2-1/4 | 5 | .960 |
| 40907 | 40907TC | 1 | 1 | 1-1/8 | 3-1/4 | 6 | .960 |
| 40908 | 40908TC | 1 | 1 | 1-1/8 | 4-1/4 | 7 | .960 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |




**STEP MILLING**

◎ : Excellent ○ : Good

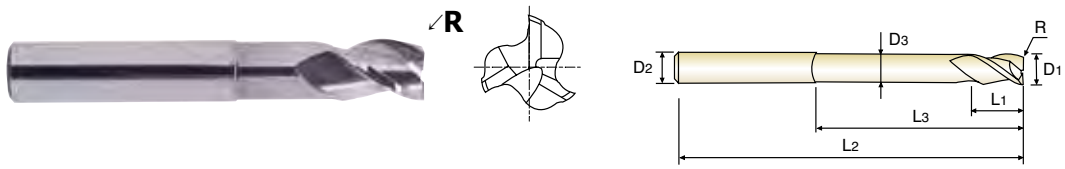
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**E5985 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK CORNER RADIUS

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ 3flute and 37° helix allow harmonic balance at high speed condition and smooth cutting.
- ▶ Improved surface roughness-cylindrical margin which is controlled tightly.
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.



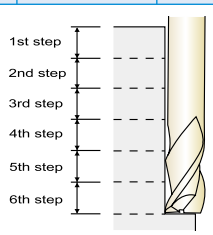

MG 3 37° PLAIN P.1038

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R | D1 | D2 | L1 | L3 | L2 | D3 |
| EA40321 | EA40321C | R.060 | 1/2 | 1/2 | 5/8 | 3-1/4 | 6 | .470 |
| EA40322 | EA40322C | R.060 | 1/2 | 1/2 | 5/8 | 4 | 6 | .470 |
| EA40401 | EA40401C | R.060 | 5/8 | 5/8 | 3/4 | 2-1/4 | 5 | .585 |
| EA40402 | EA40402C | R.060 | 5/8 | 5/8 | 3/4 | 3-1/4 | 6 | .585 |
| EA40403 | EA40403C | R.060 | 5/8 | 5/8 | 3/4 | 4-1/4 | 7 | .585 |
| EA40481 | EA40481C | R.060 | 3/4 | 3/4 | 1 | 2-1/4 | 5 | .710 |
| EA40482 | EA40482C | R.060 | 3/4 | 3/4 | 1 | 3-1/4 | 6 | .710 |
| EA40483 | EA40483C | R.060 | 3/4 | 3/4 | 1 | 4-1/4 | 7 | .710 |
| EA40641 | EA40641C | R.060 | 1 | 1 | 1-1/8 | 2-1/4 | 5 | .960 |
| EA40642 | EA40642C | R.060 | 1 | 1 | 1-1/8 | 3-1/4 | 6 | .960 |
| EA40643 | EA40643C | R.060 | 1 | 1 | 1-1/8 | 4-1/4 | 7 | .960 |
| EA10321 | EA10321C | R.120 | 1/2 | 1/2 | 5/8 | 3-1/4 | 6 | .470 |
| EA10322 | EA10322C | R.120 | 1/2 | 1/2 | 5/8 | 4 | 6 | .470 |
| EA10401 | EA10401C | R.120 | 5/8 | 5/8 | 3/4 | 2-1/4 | 5 | .585 |
| EA10402 | EA10402C | R.120 | 5/8 | 5/8 | 3/4 | 3-1/4 | 6 | .585 |
| EA10403 | EA10403C | R.120 | 5/8 | 5/8 | 3/4 | 4-1/4 | 7 | .585 |
| EA10481 | EA10481C | R.120 | 3/4 | 3/4 | 1 | 2-1/4 | 5 | .710 |
| EA10482 | EA10482C | R.120 | 3/4 | 3/4 | 1 | 3-1/4 | 6 | .710 |
| EA10483 | EA10483C | R.120 | 3/4 | 3/4 | 1 | 4-1/4 | 7 | .710 |
| EA10641 | EA10641C | R.120 | 1 | 1 | 1-1/8 | 2-1/4 | 5 | .960 |
| EA10642 | EA10642C | R.120 | 1 | 1 | 1-1/8 | 3-1/4 | 6 | .960 |
| EA10643 | EA10643C | R.120 | 1 | 1 | 1-1/8 | 4-1/4 | 7 | .960 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0005 | 0~−.0003 |




**STEP MILLING**

◎ : Excellent ○ : Good

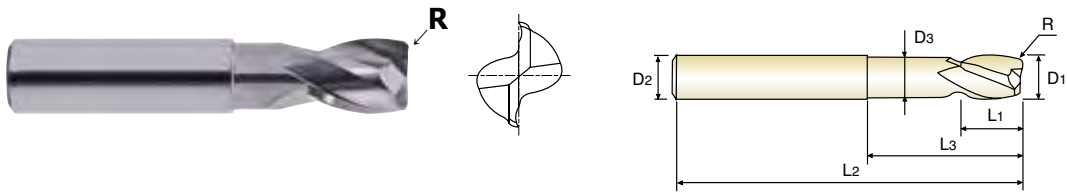
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**E5973 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE CORNER RADIUS with NECK

- ▶ Excellent cutting qualities on stainless steel, aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.




MG | 2 | 30° | R ±.001 | PLAIN

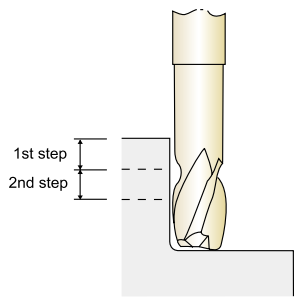
P.1039

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **24562** | **24562TC** | R.012 | **5/32** | 1/4 | 3/16 | 3/8 | 2 | .140 |
| **24573** | **24573TC** | R.020 | **1/4** | 1/4 | 5/16 | 3/4 | 2-3/8 | .226 |
| **24579** | **24579TC** | R.024 | **5/16** | 5/16 | 3/8 | 1-1/8 | 2-3/4 | .282 |
| **24584** | **24584TC** | R.031 | **3/8** | 3/8 | 1/2 | 1-1/2 | 3-1/8 | .336 |
| **24593** | **24593TC** | R.040 | **1/2** | 1/2 | 9/16 | 1-1/2 | 3-1/2 | .460 |
| **24595** | **24595TC** | R.051 | **5/8** | 5/8 | 3/4 | 1-3/4 | 4 | .566 |
| **24598** | **24598TC** | R.063 | **3/4** | 3/4 | 1 | 1-3/4 | 4 | .670 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |




**STEP MILLING**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

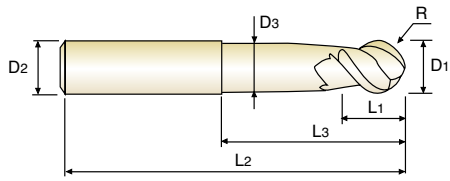
# ALU-POWER END MILLS

**E5974 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK

- Excellent cutting qualities on stainless steel, aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.




MG | 2 | 50° | R ±.0005 | PLAIN

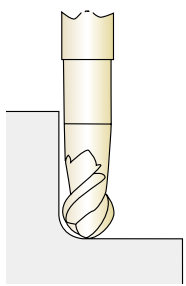
P.1041

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 |
| **37573** | **37573TC** | R 1/8 | **1/4** | 1/4 | 7/32 | 1 | 2-1/4 | .226 |
| **37579** | **37579TC** | R 5/32 | **5/16** | 5/16 | 9/32 | 1-1/8 | 2-1/2 | .280 |
| **37584** | **37584TC** | R 3/16 | **3/8** | 3/8 | 11/32 | 1-3/8 | 3 | .335 |
| **37593** | **37593TC** | R 1/4 | **1/2** | 1/2 | 13/32 | 1-1/2 | 3 | .460 |
| **37595** | **37595TC** | R 5/16 | **5/8** | 5/8 | 9/16 | 2 | 3-1/2 | .566 |
| **37598** | **37598TC** | R 3/8 | **3/4** | 3/4 | 11/16 | 2 | 4 | .671 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0010 | 0~−.0003 |



◎ : Excellent ○ : Good

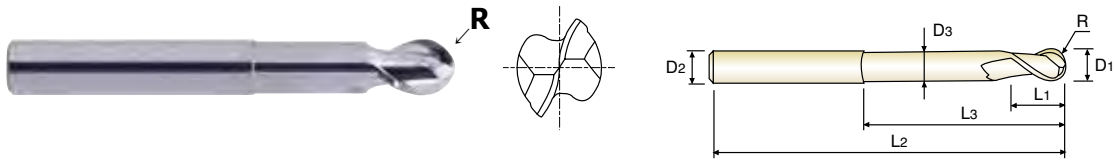
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**E5978 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE

- ▶ High velocity milling of aluminum & other non-ferrous materials.
- ▶ Extended neck design which is suitable for step milling.
- ▶ Improved surface roughness-cylinderical margin which is controlled tightly
- ▶ Maximum-metal removal rate.
- ▶ Superior chip evacuation.
- ▶ Mirror face-excellent surface finish.




MG | 2 | 37° | R ±.001 | PLAIN

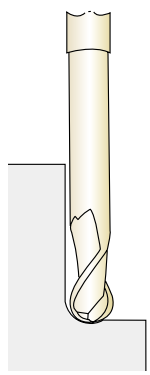
P.1040

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R (±.001) | D1 | D2 | L1 | L3 | L2 | D3 |
| **89573** | **89573TC** | R 1/8 | **1/4** | 1/4 | 3/8 | 2-1/4 | 4 | .220 |
| **89584** | **89584TC** | R 3/16 | **3/8** | 3/8 | 1/2 | 2-1/4 | 4 | .345 |
| **89593** | **89593TC** | R 1/4 | **1/2** | 1/2 | 5/8 | 2-1/4 | 5 | .470 |
| **89901** | **89901TC** | R 1/4 | **1/2** | 1/2 | 5/8 | 3-1/4 | 6 | .470 |
| **89902** | **89902TC** | R 1/4 | **1/2** | 1/2 | 5/8 | 4 | 6 | .470 |
| **89595** | **89595TC** | R 5/16 | **5/8** | 5/8 | 3/4 | 2-1/4 | 5 | .585 |
| **89903** | **89903TC** | R 5/16 | **5/8** | 5/8 | 3/4 | 3-1/4 | 6 | .585 |
| **89904** | **89904TC** | R 5/16 | **5/8** | 5/8 | 3/4 | 4-1/4 | 7 | .585 |
| **89598** | **89598TC** | R 3/8 | **3/4** | 3/4 | 1 | 2-1/4 | 5 | .710 |
| **89905** | **89905TC** | R 3/8 | **3/4** | 3/4 | 1 | 3-1/4 | 6 | .710 |
| **89906** | **89906TC** | R 3/8 | **3/4** | 3/4 | 1 | 4-1/4 | 7 | .710 |
| **89600** | **89600TC** | R1/2 | **1** | 1 | 1-1/8 | 2-1/4 | 5 | .960 |
| **89907** | **89907TC** | R1/2 | **1** | 1 | 1-1/8 | 3-1/4 | 6 | .960 |
| **89908** | **89908TC** | R1/2 | **1** | 1 | 1-1/8 | 4-1/4 | 7 | .960 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



◎ : Excellent ○ : Good

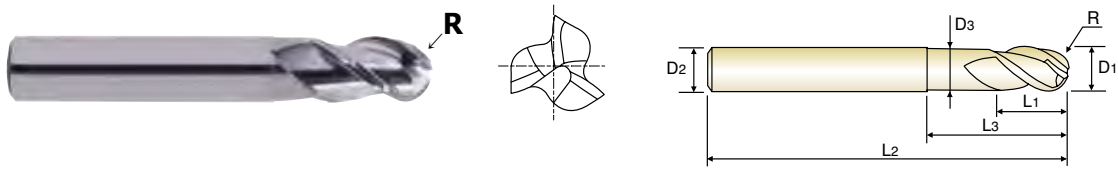
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**E5975 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK

- ▶ Excellent cutting qualities on stainless steel, aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.




MG | 3 | 40° | R ±.0005 | PLAIN

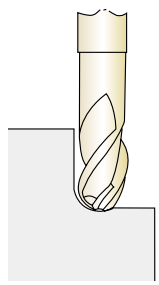
P.1041

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R (±.0005) | D1 | D2 | L1 | L3 | L2 | D3 |
| **38602** | **38602TC** | R 3/64 | **3/32** | 1/4 | 1/8 | 3/16 | 2-3/8 | .090 |
| **38601** | **38601TC** | R 1/16 | **1/8** | 1/4 | 3/16 | 1/4 | 2-3/8 | .117 |
| **38566** | **38566TC** | R 3/32 | **3/16** | 1/4 | 1/4 | 3/8 | 2-1/2 | .172 |
| **38573** | **38573TC** | R 1/8 | **1/4** | 1/4 | 3/8 | 1/2 | 3 | .235 |
| **38579** | **38579TC** | R 5/32 | **5/16** | 5/16 | 1/2 | 1 | 3 | .289 |
| **38584** | **38584TC** | R 3/16 | **3/8** | 3/8 | 5/8 | 1-1/4 | 3-1/8 | .351 |
| **38593** | **38593TC** | R 1/4 | **1/2** | 1/2 | 3/4 | 1-3/8 | 3-1/2 | .476 |
| **38595** | **38595TC** | R 5/16 | **5/8** | 5/8 | 1 | 1-1/2 | 4 | .601 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**E5522 SERIES** PLAIN SHANK
**EG522 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 45° HELIX LONG LENGTH - TiCN COATED

▶Suitable for high speed machining in aluminum and other non-ferrous materials, excellent surface finishes, superior chip removal.
▶Mirror face-excellent surface finish.



MG | 2 | 45° | PLAIN

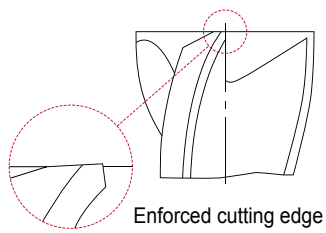
P.1042

◇ Call for Availability

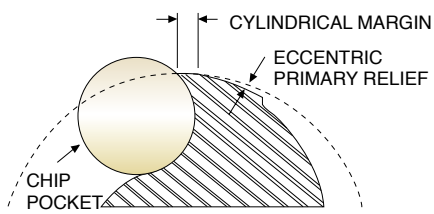
Unit : mm

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | Metric | Inch | | | |
| E5522030 | EG522030 | 3.0 | .1181 | 6 | 8 | 57 |
| E5522040 | EG522040 | 4.0 | .1575 | 6 | 11 | 57 |
| E5522050 | EG522050 | 5.0 | .1969 | 6 | 13 | 57 |
| E5522060 | EG522060 | 6.0 | .2362 | 6 | 13 | 57 |
| E5522080 | EG522080 | 8.0 | .3150 | 8 | 19 | 63 |
| E5522100 | EG522100 | 10.0 | .3937 | 10 | 22 | 72 |
| E5522120 | EG522120 | 12.0 | .4724 | 12 | 26 | 83 |
| E5522140 | EG522140 | 14.0 | .5512 | 14 | 26 | 83 |
| E5522160 | EG522160 | 16.0 | .6299 | 16 | 32 | 92 |
| E5522180 | EG522180 | 18.0 | .7087 | 18 | 32 | 92 |
| E5522200 | EG522200 | 20.0 | .7874 | 20 | 38 | 104 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |




- High performance in machining aluminum and non-ferrous materials
- Special designed geometry with high rigidity cutting edge
- Improved surface roughness - cylindrical margin which is controlled tightly.
- Excellent chip removal - higher rake angle, higher helix angle(45°), bigger chip pocket.




◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

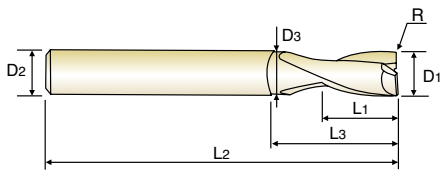
# ALU-POWER END MILLS

**EG930 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 25° HELIX STUB CUT LENGTH CORNER RADIUS TiCN COATED

- Designed for the machining aluminum and its alloys, non-ferrous materials.
- Increased tool life and higher cutting accuracy.
- Maximum-stock removal, chip ejection, stability.
- Corner Radius for avoiding the chipping.
- Mirror face-excellent surface finish.




MG | 2 | 25° | R ±0.025 | PLAIN

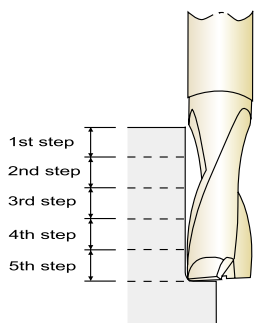
P.1042

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.025) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EG930020 | R0.2 | 2.0 | .0787 | 3 | 3 | 6 | 40 | 1.9 |
| EG930030 | R0.2 | 3.0 | .1181 | 3 | 4 | 8 | 40 | 2.9 |
| EG930040 | R0.2 | 4.0 | .1575 | 4 | 5 | 12 | 50 | 3.8 |
| EG930050 | R0.2 | 5.0 | .1969 | 5 | 8 | 14 | 50 | 4.8 |
| EG930060 | R0.2 | 6.0 | .2362 | 6 | 8 | 18 | 65 | 5.7 |
| EG930080 | R0.2 | 8.0 | .3150 | 8 | 10 | 22 | 70 | 7.7 |
| EG930100 | R0.2 | 10.0 | .3937 | 10 | 14 | 28 | 80 | 9.7 |
| EG930120 | R0.2 | 12.0 | .4724 | 12 | 16 | 35 | 90 | 11.5 |
| EG930160 | R0.2 | 16.0 | .6299 | 16 | 20 | 40 | 90 | 15.5 |
| EG930200 | R0.2 | 20.0 | .7874 | 20 | 25 | 50 | 100 | 19.5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |




**STEP MILLING**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

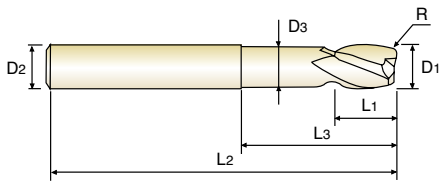
# ALU-POWER END MILLS

**EG909 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB CUT LENGTH CORNER RADIUS with NECK TiCN COATED

- Excellent cutting qualities on stainless steel, Aluminum, copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.




MG | 2 | 30° | R ±0.025 | PLAIN

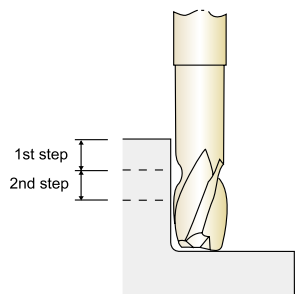
P.1043

◇ Call for Availability

Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.025) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EG909040 | R0.3 | 4.0 | .1575 | 6 | 5 | 10 | 50 | 3.6 |
| EG909060 | R0.5 | 6.0 | .2362 | 6 | 8 | 20 | 60 | 5.4 |
| EG909080 | R0.6 | 8.0 | .3150 | 8 | 10 | 30 | 70 | 7.2 |
| EG909100 | R0.8 | 10.0 | .3937 | 10 | 12 | 36 | 80 | 9.0 |
| EG909120 | R1.0 | 12.0 | .4724 | 12 | 14 | 40 | 90 | 11.0 |
| EG909160 | R1.3 | 16.0 | .6299 | 16 | 18 | 45 | 100 | 14.5 |
| EG909200 | R1.6 | 20.0 | .7874 | 20 | 24 | 45 | 100 | 18.0 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |




STEP MILLING

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

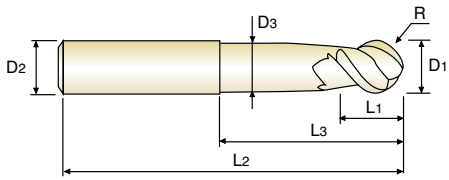
# ALU-POWER END MILLS

**EG910 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE 50° HELIX STUB CUT LENGTH BALL NOSE with NECK TiCN COATED

- ▶ Excellent cutting qualities on stainless steel, Aluminum, copper.
- ▶ Increased tool life and higher cutting accuracy.
- ▶ Mirror face-excellent surface finish.




MG | 2 | 50° | R ±0.01 | PLAIN

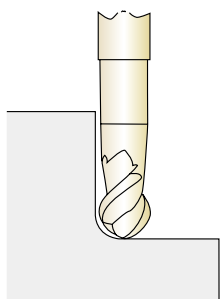
P.1043

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | $D_1$ | | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **EG910060** | R 3.0 | **6.0** | **.2362** | 6 | 5.5 | 25 | 55 | 5.4 |
| **EG910080** | R 4.0 | **8.0** | **.3150** | 8 | 7 | 30 | 65 | 7.2 |
| **EG910100** | R 5.0 | **10.0** | **.3937** | 10 | 8.5 | 35 | 75 | 9.0 |
| **EG910120** | R 6.0 | **12.0** | **.4724** | 12 | 10.5 | 40 | 75 | 11.0 |
| **EG910160** | R 8.0 | **16.0** | **.6299** | 16 | 14 | 50 | 90 | 14.5 |
| **EG910200** | R 10.0 | **20.0** | **.7874** | 20 | 17 | 50 | 100 | 18.0 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| ± 0.02 | h6 |



◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

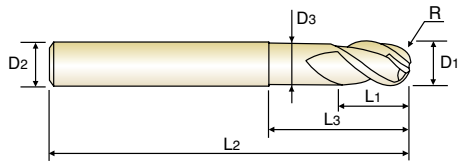
# ALU-POWER END MILLS

**EG908 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 40° HELIX LONG LENGTH BALL NOSE with NECK TiCN COATED

- Excellent cutting performance on stainless steels, Aluminum & copper.
- Increased tool life and higher cutting accuracy.
- Mirror face-excellent surface finish.




MG | 3 | 40° | R ±0.01 | PLAIN

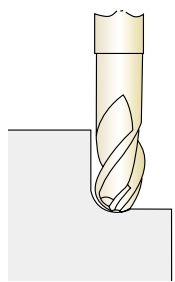
P.1044

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| **EG908020** | R1.0 | **2.0** | **.0787** | 6 | 3 | 2.5 | 60 | 1.9 |
| **EG908025** | R1.25 | **2.5** | **.0984** | 6 | 4 | 6 | 60 | 2.4 |
| **EG908030** | R1.5 | **3.0** | **.1181** | 6 | 4.5 | 6.5 | 60 | 2.8 |
| **EG908035** | R1.75 | **3.5** | **.1378** | 6 | 5 | 7 | 65 | 3.2 |
| **EG908040** | R2.0 | **4.0** | **.1575** | 6 | 6 | 8 | 65 | 3.7 |
| **EG908050** | R2.5 | **5.0** | **.1969** | 6 | 7.5 | 10 | 65 | 4.6 |
| **EG908060** | R3.0 | **6.0** | **.2362** | 6 | 9 | 12 | 75 | 5.6 |
| **EG908080** | R4.0 | **8.0** | **.3150** | 8 | 12 | 25 | 75 | 7.4 |
| **EG908100** | R5.0 | **10.0** | **.3937** | 10 | 15 | 30 | 80 | 9.4 |
| **EG908120** | R6.0 | **12.0** | **.4724** | 12 | 18 | 36 | 90 | 11.4 |
| **EG908160** | R8.0 | **16.0** | **.6299** | 16 | 24 | 40 | 100 | 15.4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EK191 SERIES** FLAT SHANK

## T15, 3 FLUTE 42° HELIX REGULAR LENGTH ROUGHING for ALUMINUM

▶ High performance metal removal in aluminum alloys.
▶ Corner radius against chipping




T15 ALU 3 42° FLAT P.1046

◆ U.S.A Stock

■ SQUARE

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 66515 | 66515 PC | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 66519 | 66519 PC | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 66524 | 66524 PC | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 66540 | 66540 PC | 1 | 1 | 2 | 4-1/2 |
| 66541 | 66541 PC | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 66542 | 66542 PC | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| * 66543 | * 66543 PC | 2 | 2 | 2 | 5-3/4 |

* Combination Shank

T15 ALU 3 42° R ±.001 FLAT P.1046

◆ U.S.A Stock

■ with CORNER RADIUS

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 66903 | 66903 PC | R .060 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 66904 | 66904 PC | R .090 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 66905 | 66905 PC | R .120 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 66906 | 66906 PC | R .060 | 1 | 1 | 2 | 4-1/2 |
| 66907 | 66907 PC | R .090 | 1 | 1 | 2 | 4-1/2 |
| 66908 | 66908 PC | R .120 | 1 | 1 | 2 | 4-1/2 |
| 66909 | 66909 PC | R .060 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 66910 | 66910 PC | R .090 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 66911 | 66911 PC | R .120 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EK226 SERIES** FLAT SHANK

## T15, 3 FLUTE 42° HELIX & MEDIUM LENGTH ROUGHING for ALUMINUM

▶ High performance metal removal in aluminum alloys.
▶ Corner radius against chipping




T15 | ALU | 3 | 42° | FLAT P.1046

◆ U.S.A Stock

### ■ SQUARE

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 80524 | 80524 PC | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| 80540 | 80540 PC | 1 | 1 | 3 | 5-1/2 |
| 80541 | 80541 PC | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| 80542 | 80542 PC | 1-1/2 | 1-1/4 | 3 | 5-1/2 |
| * 80543 | * 80543 PC | 2 | 2 | 3 | 6-3/4 |

* Combination Shank

T15 | ALU | 3 | 42° | R ±.001 | FLAT P.1046

◆ U.S.A Stock

### ■ with CORNER RADIUS

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 80901 | 80901 PC | R .060 | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| 80902 | 80902 PC | R .090 | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| 80903 | 80903 PC | R .120 | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| 80904 | 80904 PC | R .060 | 1 | 1 | 3 | 5-1/2 |
| 80905 | 80905 PC | R .090 | 1 | 1 | 3 | 5-1/2 |
| 80906 | 80906 PC | R .120 | 1 | 1 | 3 | 5-1/2 |
| 80907 | 80907 PC | R .060 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| 80908 | 80908 PC | R .090 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| 80909 | 80909 PC | R .120 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

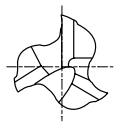
# ALU-POWER END MILLS

**EK192 SERIES** FLAT SHANK

## T15, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM

▶ High performance metal removal in aluminum alloys.





T15 | ALU | 3 | 42° | FLAT

P.1046

◆ U.S.A Stock

■ SQUARE

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 67515 | 67515 PC | 1/2 | 1/2 | 2 | 4 |
| 67519 | 67519 PC | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 67524 | 67524 PC | 3/4 | 3/4 | 3 | 5-1/4 |
| 67540 | 67540 PC | 1 | 1 | 4 | 6-1/2 |
| 67541 | 67541 PC | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 67542 | 67542 PC | 1-1/2 | 1-1/4 | 4 | 6-1/2 |
| * 67543 | * 67543 PC | 2 | 2 | 4 | 7-3/4 |
| 67544 | 67544 PC | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 67545 | 67545 PC | 1-1/2 | 1-1/4 | 6 | 8-1/2 |
| * 67546 | * 67546 PC | 2 | 2 | 6 | 9-3/4 |

* Combination Shank

■ with NECK

| EDP No. UNCOATED | EDP No. TiCN COATED | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| EK10482 | EK10482C | 3/4 | 3/4 | 1-1/2 | 3 | 5-1/4 | .705 |
| EK10483 | EK10483C | 3/4 | 3/4 | 1-1/2 | 4 | 6-1/4 | .705 |
| EK10642 | EK10642C | 1 | 1 | 1-1/2 | 3 | 5-1/2 | .950 |
| EK10643 | EK10643C | 1 | 1 | 2 | 4 | 6-1/2 | .950 |
| EK10644 | EK10644C | 1 | 1 | 2 | 6 | 8-1/2 | .950 |
| EK11601 | EK11601C | 1-1/4 | 1-1/4 | 2 | 4 | 6-1/2 | 1.200 |
| EK11602 | EK11602C | 1-1/4 | 1-1/4 | 2 | 6 | 8-1/2 | 1.200 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EK192 SERIES** FLAT SHANK

## T15, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING with CORNER RADIUS for ALUMINUM

▶ High performance metal in aluminum alloys.
▶ Corner radius against chipping




T15 | ALU | 3 | 42° | R ±.001 | FLAT

P.1046

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R | | | | |
| 67904 | 67904 PC | R .060 | 3/4 | 3/4 | 3 | 5-1/4 |
| 67905 | 67905 PC | R .090 | 3/4 | 3/4 | 3 | 5-1/4 |
| 67906 | 67906 PC | R .120 | 3/4 | 3/4 | 3 | 5-1/4 |
| 67907 | 67907 PC | R .060 | 1 | 1 | 4 | 6-1/2 |
| 67908 | 67908 PC | R .090 | 1 | 1 | 4 | 6-1/2 |
| 67909 | 67909 PC | R .120 | 1 | 1 | 4 | 6-1/2 |
| 67910 | 67910 PC | R .060 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 67911 | 67911 PC | R .090 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 67912 | 67912 PC | R .120 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 67913 | 67913 PC | R .060 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 67914 | 67914 PC | R .090 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 67915 | 67915 PC | R .120 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EK196 SERIES** FLAT SHANK

## T15, 3 FLUTE 42° HELIX ROUGHING BALL NOSE REGULAR LENGTH for ALUMINUM

▶High performance metal removal in aluminum alloys.




T15 | ALU | 3 | 42° | R ±.001 | FLAT

P.1045

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | R (±.001) | | | | |
| **EP12032** | **EP12032C** | R1/4 | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **EP12040** | **EP12040C** | R5/16 | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **EP12048** | **EP12048C** | R3/8 | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **EP12064** | **EP12064C** | R1/2 | **1** | 1 | 2 | 4-1/2 |
| **EP12110** | **EP12110C** | R5/8 | **1-1/4** | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

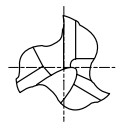
# ALU-POWER END MILLS

**EK193 SERIES** FLAT SHANK
**EK132 SERIES** FLAT SHANK

## T15, 3 FLUTE FINISHING
## REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

▶High performance metal removal in aluminum alloys.





T15 | 3 | 42° | FLAT

P.1045

◆ U.S.A Stock

### ■ SQUARE

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | | | | |
| EP10323 | EP10323C | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| EP10324 | EP10324C | 1/2 | 1/2 | 2 | 4 |
| EP10403 | EP10403C | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| EP10404 | EP10404C | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| EP10484 | EP10484C | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| EP10485 | EP10485C | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| EP10486 | EP10486C | 3/4 | 3/4 | 3 | 5-1/4 |
| EP10644 | EP10644C | 1 | 1 | 2 | 4-1/2 |
| EP10645 | EP10645C | 1 | 1 | 3 | 5-1/2 |
| EP10646 | EP10646C | 1 | 1 | 4 | 6-1/2 |
| EP11165 | EP11165C | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| EP11166 | EP11166C | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| EP11167 | EP11167C | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| EP11324 | EP11324C | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| EP11325 | EP11325C | 1-1/2 | 1-1/4 | 3 | 5-1/2 |
| EP11326 | EP11326C | 1-1/2 | 1-1/4 | 4 | 6-1/2 |

### ■ SQUARE with NECK

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| UNCOATED | TiCN COATED | | | | | | |
| EK13210 | EK13210C | 3/4 | 3/4 | 1-1/2 | 3 | 5-1/4 | .705 |
| EK13211 | EK13211C | 3/4 | 3/4 | 1-1/2 | 4 | 6-1/4 | .705 |
| EK13212 | EK13212C | 1 | 1 | 1-1/2 | 3 | 5-1/2 | .950 |
| EK13213 | EK13213C | 1 | 1 | 2 | 4 | 6-1/2 | .950 |
| EK13214 | EK13214C | 1 | 1 | 2 | 6 | 8-1/2 | .950 |
| EK13215 | EK13215C | 1-1/4 | 1-1/4 | 2 | 4 | 6-1/2 | 1.200 |
| EK13216 | EK13216C | 1-1/4 | 1-1/4 | 2 | 6 | 8-1/2 | 1.200 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | **0~+.0015 |

■ The TiN coated, or TiAlN coated is available on your request.

**The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EK193 SERIES** FLAT SHANK

## T15, 3 FLUTE FINISHING CORNER RADIUS REGULAR LENGTH & MEDIUM LENGTH & LONG LENGTH

- ▶High performance metal removal in aluminum alloys.
- ▶Corner radius against chipping




T15 | 3 | 42° | FLAT

P.1045

◆ U.S.A Stock

Unit : Inch

| EDP No. UNCOATED | EDP No. TiCN COATED | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| EP10321 | EP10321C | R.120 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| EP10322 | EP10322C | R.120 | 1/2 | 1/2 | 2 | 4 |
| EP10401 | EP10401C | R.120 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| EP10402 | EP10402C | R.120 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| EP10481 | EP10481C | R.120 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| EP10482 | EP10482C | R.120 | 3/4 | 3/4 | 2-1/4 | 4-5/8 |
| EP10483 | EP10483C | R.120 | 3/4 | 3/4 | 3 | 5-1/4 |
| EP10641 | EP10641C | R.120 | 1 | 1 | 2 | 4-1/2 |
| EP10642 | EP10642C | R.120 | 1 | 1 | 3 | 5-1/2 |
| EP10643 | EP10643C | R.120 | 1 | 1 | 4 | 6-1/2 |
| EP11162 | EP11162C | R.120 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| EP11163 | EP11163C | R.120 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| EP11164 | EP11164C | R.120 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| EP11321 | EP11321C | R.120 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| EP11322 | EP11322C | R.120 | 1-1/2 | 1-1/4 | 3 | 5-1/2 |
| EP11323 | EP11323C | R.120 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |

■ The TiN coated, or TiAlN coated is available on your request.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | **0~+.0015 |

**The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

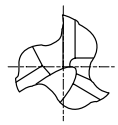
# ALU-POWER END MILLS

**EP922 SERIES** PLAIN SHANK

## PREMIUM HSS-PM, 3 FLUTE 42° HELIX SHORT LENGTH ROUGHING for ALUMINUM

- ▶ Maximum stock removal rates at High Speed Condition.
- ▶ Reduces vibrations and improves surface roughness.





YPM | ALU | 3 | 42° | PLAIN

P.1046

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| | js12 | | h6 | | |
| EP922120 | 12.0 | .4724 | 12 | 26 | 83 |
| EP922140 | 14.0 | .5512 | 12 | 26 | 83 |
| EP922160 | 16.0 | .6299 | 16 | 32 | 92 |
| EP922180 | 18.0 | .7087 | 16 | 32 | 92 |
| EP922200 | 20.0 | .7874 | 20 | 38 | 104 |
| EP922220 | 22.0 | .8661 | 20 | 38 | 104 |
| EP922250 | 25.0 | .9843 | 25 | 45 | 121 |
| EP922280 | 28.0 | 1.1024 | 25 | 45 | 121 |
| EP922320 | 32.0 | 1.2598 | 32 | 53 | 133 |

### Tolerances according to DIN 7160 & 7161

| | Tolerance range in µm | | | | | |
|---|---|---|---|---|---|---|
| | Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 | over 30 to 50 |
| js12 | ± 50 | ± 60 | ± 75 | ± 90 | ± 105 | ± 125 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 | 0 / — 16 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

# ALU-POWER END MILLS

**EP924 SERIES** PLAIN SHANK

## PREMIUM HSS-PM, 3 FLUTE 42° HELIX LONG LENGTH ROUGHING for ALUMINUM

- ▶ Maximum stock removal rates at High Speed Condition.
- ▶ Reduces vibrations and improves surface roughness.



YPM | ALU | 3 | 42° | PLAIN

P.1046

◇ Call for Availability

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| | js12 | | h6 | | |
| EP924120 | 12.0 | .4724 | 12 | 53 | 110 |
| EP924140 | 14.0 | .5512 | 12 | 53 | 110 |
| EP924160 | 16.0 | .6299 | 16 | 63 | 123 |
| EP924180 | 18.0 | .7087 | 16 | 63 | 123 |
| EP924200 | 20.0 | .7874 | 20 | 75 | 141 |
| EP924220 | 22.0 | .8661 | 20 | 75 | 141 |
| EP924250 | 25.0 | .9843 | 25 | 90 | 166 |
| EP924280 | 28.0 | 1.1024 | 25 | 90 | 166 |
| EP924320 | 32.0 | 1.2598 | 32 | 106 | 186 |

### Tolerances according to DIN 7160 & 7161

| | Tolerance range in μm | | | | | |
|---|---|---|---|---|---|---|
| | Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 | over 30 to 50 |
| js12 | ± 50 | ± 60 | ± 75 | ± 90 | ± 105 | ± 125 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 | 0 / — 16 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | ◎ | | | | |

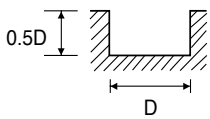
# ALU-POWER END MILLS

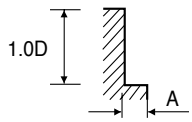
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE 42° HELIX - “BANSHEE”

### E5253, E5254 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/8 | 10000 | 27.6 | 10000 | 35.4 |
| 5/32 | 10000 | 35.4 | 10000 | 43.3 |
| 3/16 | 10000 | 39.4 | 10000 | 51.2 |
| 1/4 | 10000 | 47.2 | 10000 | 59.1 |
| 5/16 | 8000 | 55.1 | 8000 | 70.9 |
| 3/8 | 8000 | 66.9 | 8000 | 82.7 |
| 1/2 | 8000 | 82.7 | 8000 | 102.4 |
| 9/16 | 6000 | 70.9 | 6000 | 86.6 |
| 5/8 | 6000 | 74.8 | 6000 | 94.5 |
| 11/16 | 4000 | 55.1 | 4000 | 70.9 |
| 13/16 | 4000 | 63.0 | 4000 | 74.8 |




A : Ø1/8 ~ Ø3/8 = 0.25 × D
Ø1/2 ~ Ø13/16 = 0.5 × D

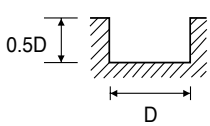
※ The Feed, in long & extra long types, should be reduced by around 50%.

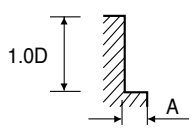
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE 42° HELIX TiCN COATED - “BANSHEE”

### EG253, EG254 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/8 | 15600 | 42.5 | 12000 | 56.7 |
| 5/32 | 15600 | 56.7 | 12000 | 66.1 |
| 3/16 | 15600 | 61.4 | 12000 | 80.3 |
| 1/4 | 15600 | 70.9 | 12000 | 94.5 |
| 5/16 | 12000 | 85.1 | 9600 | 108.7 |
| 3/8 | 12000 | 103.9 | 9600 | 127.6 |
| 1/2 | 12000 | 127.6 | 9600 | 160.6 |
| 9/16 | 9600 | 108.7 | 7200 | 132.2 |
| 5/8 | 9600 | 118.1 | 7200 | 146.5 |
| 11/16 | 6000 | 85.0 | 4800 | 108.7 |
| 13/16 | 6000 | 94.5 | 4800 | 118.1 |




A : Ø1/8 ~ Ø3/8 = 0.25 × D
Ø1/2 ~ Ø13/16 = 0.5 × D

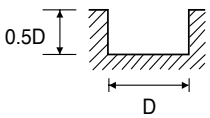
※ The Feed, in long & extra long types, should be reduced by around 50%.

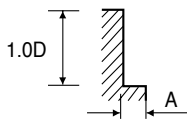
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE 45° HELIX FINISH

### E5980, E5981, E5982, E5983, E5984 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/8 | 10000 | 33.1 | 10000 | 42.5 |
| 5/32 | 10000 | 42.5 | 10000 | 52.0 |
| 3/16 | 10000 | 47.3 | 10000 | 61.4 |
| 1/4 | 10000 | 56.7 | 10000 | 70.9 |
| 5/16 | 8000 | 66.2 | 8000 | 85.1 |
| 3/8 | 8000 | 80.3 | 8000 | 99.2 |
| 1/2 | 8000 | 99.2 | 8000 | 122.9 |
| 9/16 | 6000 | 85.1 | 6000 | 104.0 |
| 5/8 | 6000 | 89.8 | 6000 | 113.4 |
| 11/16 | 4000 | 66.2 | 4000 | 85.1 |
| 13/16 | 4000 | 75.6 | 4000 | 89.8 |




A : Ø1/8 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø13/16 = 0.5×D

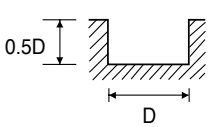
※ The Feed, in long & extra long types, should be reduced by around 50%.

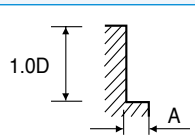
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE 45° HELIX FINISH TiCN COATED

### EG980, EG981, EG982, EG983, EG984 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/8 | 15600 | 43.0 | 12000 | 55.3 |
| 5/32 | 15600 | 55.3 | 12000 | 67.6 |
| 3/16 | 15600 | 61.4 | 12000 | 79.8 |
| 1/4 | 15600 | 73.7 | 12000 | 92.2 |
| 5/16 | 12000 | 86.0 | 9600 | 110.6 |
| 3/8 | 12000 | 104.4 | 9600 | 129.0 |
| 1/2 | 12000 | 128.9 | 9600 | 159.8 |
| 9/16 | 9600 | 110.6 | 7200 | 135.2 |
| 5/8 | 9600 | 116.7 | 7200 | 147.4 |
| 11/16 | 6000 | 86.0 | 4800 | 110.6 |
| 13/16 | 6000 | 98.3 | 4800 | 116.7 |




A : Ø1/8 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø13/16 = 0.5×D

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

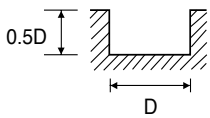
# ALU-POWER END MILLS

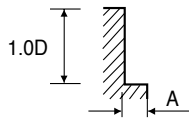
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK

### E5977, E5985 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/4 | 8000 | 45.4 | 8000 | 56.7 |
| 3/8 | 6400 | 64.3 | 6400 | 79.4 |
| 1/2 | 6400 | 79.4 | 6400 | 98.3 |
| 5/8 | 4800 | 71.8 | 4800 | 90.7 |
| 3/4 | 3200 | 70.9 | 3200 | 87.4 |
| 1 | 2600 | 63.8 | 2600 | 78.7 |




A : Ø1/4 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø1 = 0.5×D

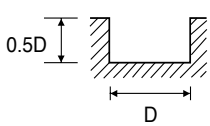
※ The Feed, in long & extra long types, should be reduced by around 50%.

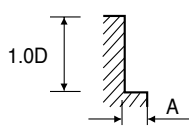
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE 37° HELIX with EXTENDED NECK TiCN COATED

### EG977, EG985 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/4 | 10500 | 59.0 | 10500 | 73.7 |
| 3/8 | 8300 | 83.5 | 8300 | 103.2 |
| 1/2 | 8300 | 103.2 | 8300 | 127.7 |
| 5/8 | 6200 | 93.4 | 6200 | 117.9 |
| 3/4 | 4200 | 92.1 | 4200 | 113.6 |
| 1 | 3400 | 83.0 | 3400 | 102.0 |




A : Ø1/4 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø1 = 0.5×D

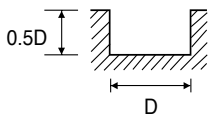
※ The Feed, in long & extra long types, should be reduced by around 50%.

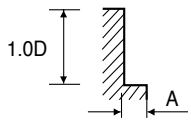
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE CORNER RADIUS with NECK

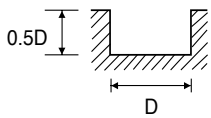
### E5973 SERIES

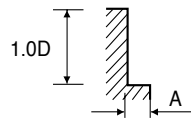
| MATERIAL | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | | | COPPER ALLOYS | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R.012 × 5/32 | 10000 | 36.4 | 10000 | 42.4 | 3000 | 9.1 | 3000 | 10.6 |
| R.020 × 1/4 | 10000 | 45.4 | 10000 | 60.6 | 3000 | 11.5 | 3000 | 15.2 |
| R.024 × 5/16 | 8000 | 54.5 | 8000 | 69.6 | 2300 | 13.6 | 2300 | 17.6 |
| R.031 × 3/8 | 8000 | 66.6 | 8000 | 81.8 | 2300 | 16.7 | 2300 | 20.6 |
| R.040 × 1/2 | 8000 | 81.8 | 8000 | 103.0 | 2300 | 20.6 | 2300 | 25.8 |
| R.051 × 5/8 | 6000 | 75.7 | 6000 | 93.9 | 1800 | 19.1 | 1800 | 23.6 |
| R.063 × 3/4 | 4000 | 60.6 | 4000 | 75.7 | 1150 | 15.2 | 1150 | 19.1 |




A : Ø5/32 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø3/4 = 0.5×D




A : Ø5/32 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø3/4 = 0.5×D

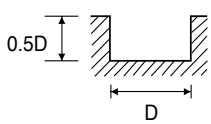
※ The Feed, in long & extra long types, should be reduced by around 50%.

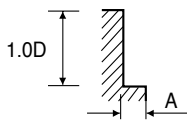
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE 37° HELIX with EXTENDED NECK

### E5976 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM NON FERROUS METALS | | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/4 | 8000 | 37.8 | 8000 | 47.3 |
| 3/8 | 6400 | 53.6 | 6400 | 66.2 |
| 1/2 | 6400 | 66.2 | 6400 | 81.9 |
| 5/8 | 4800 | 59.9 | 4800 | 75.6 |
| 3/4 | 3200 | 59.1 | 3200 | 72.9 |
| 1 | 2600 | 53.2 | 2600 | 65.6 |




A : Ø1/4 ~Ø3/8 = 0.25×D
Ø1/2 ~ Ø1 = 0.5×D

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

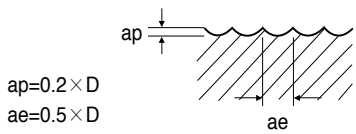
# ALU-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE

### E5978 SERIES

| MATERIAL | N | |
|---|---|---|
| | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED |
| R1/8 × 1/4 | 11200 | 55.1 |
| R5/32 × 5/16 | 8600 | 63.0 |
| R3/16 × 3/8 | 8600 | 74.0 |
| R1/4 × 1/2 | 8600 | 94.5 |
| R5/16 × 5/8 | 6800 | 85.0 |
| R3/8 × 3/4 | 4300 | 69.3 |



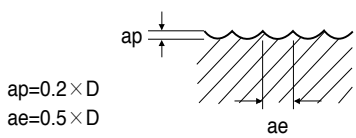

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE 37° HELIX LONG REACH BALL NOSE TiCN COATED

### EG978 SERIES

| MATERIAL | N | |
|---|---|---|
| | ALUMINUM NON FERROUS METALS | |
| DIAMETER | RPM | FEED |
| R1/8 × 1/4 | 14500 | 71.7 |
| R5/32 × 5/16 | 11200 | 81.9 |
| R3/16 × 3/8 | 11200 | 96.2 |
| R1/4 × 1/2 | 11200 | 122.9 |
| R5/16 × 5/8 | 8800 | 110.5 |
| R3/8 × 3/4 | 5600 | 104.0 |



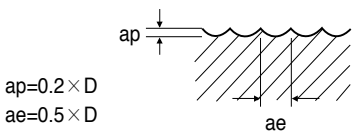

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE 50° HELIX BALL NOSE with NECK

### E5974 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | COPPER ALLOYS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R1/8 × 1/4 | 14000 | 53.0 | 4200 | 13.3 |
| R5/32 × 5/16 | 10800 | 60.5 | 3200 | 15.1 |
| R3/16 × 3/8 | 10800 | 71.2 | 3200 | 17.5 |
| R1/4 × 1/2 | 10800 | 90.8 | 3200 | 22.7 |
| R5/16 × 5/8 | 8500 | 81.8 | 2500 | 20.3 |
| R3/8 × 3/4 | 5400 | 66.6 | 1600 | 16.7 |



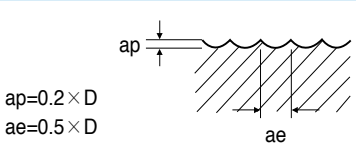

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE 40° HELIX BALL NOSE with NECK

### E5975 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | COPPER ALLOYS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R3/64 × 3/32 | 20700 | 28.8 | 6200 | 7.3 |
| R1/16 × 1/8 | 13800 | 28.8 | 4200 | 7.3 |
| R3/32 × 3/16 | 13800 | 40.9 | 4200 | 10.3 |
| R1/8 × 1/4 | 13800 | 53.0 | 4200 | 13.3 |
| R5/32 × 5/16 | 10800 | 60.6 | 3200 | 15.2 |
| R3/16 × 3/8 | 10800 | 71.2 | 3200 | 17.6 |
| R1/4 × 1/2 | 10800 | 90.9 | 3200 | 22.7 |
| R5/16 × 5/8 | 8500 | 81.8 | 2500 | 20.3 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

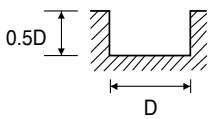
# ALU-POWER END MILLS

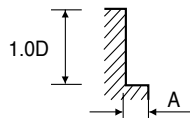
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE

### E5522 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM LOW SILICON ALUMINUM | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 3.0 | 10000 | 27.6 | 10000 | 35.4 |
| 4.0 | 10000 | 35.4 | 10000 | 43.3 |
| 5.0 | 10000 | 39.4 | 10000 | 51.2 |
| 6.0 | 10000 | 47.2 | 10000 | 59.1 |
| 8.0 | 8000 | 55.1 | 8000 | 70.9 |
| 10.0 | 8000 | 66.9 | 8000 | 82.7 |
| 12.0 | 8000 | 82.7 | 8000 | 102.4 |
| 14.0 | 6000 | 70.9 | 6000 | 86.6 |
| 16.0 | 6000 | 74.8 | 6000 | 94.5 |
| 18.0 | 4000 | 55.1 | 4000 | 70.9 |
| 20.0 | 4000 | 63.0 | 4000 | 74.8 |



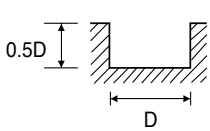

A : Ø3 ~ Ø10 = 0.25 × D
Ø12 ~ Ø20 = 0.5 × D

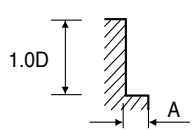
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE TiCN COATED

### EG522, EG930 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM LOW SILICON ALUMINUM | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 3.0 | 13000 | 35.4 | 13000 | 47.2 |
| 4.0 | 13000 | 47.2 | 13000 | 55.1 |
| 5.0 | 13000 | 51.2 | 13000 | 66.9 |
| 6.0 | 13000 | 59.1 | 13000 | 78.7 |
| 8.0 | 10000 | 70.9 | 10000 | 90.6 |
| 10.0 | 10000 | 86.6 | 10000 | 106.3 |
| 12.0 | 10000 | 106.3 | 10000 | 133.9 |
| 14.0 | 8000 | 90.6 | 8000 | 110.2 |
| 16.0 | 8000 | 98.4 | 8000 | 122.1 |
| 18.0 | 5000 | 70.9 | 5000 | 90.6 |
| 20.0 | 5000 | 78.7 | 5000 | 98.4 |



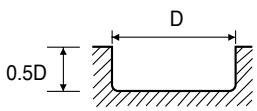

A : Ø3 ~ Ø10 = 0.25 × D
Ø12 ~ Ø20 = 0.5 × D

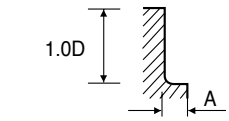
RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE CORNER RADIUS TiCN COATED

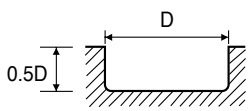
### EG909 SERIES

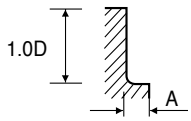
| MATERIAL | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | | | COPPER ALLOYS | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 4.0 | 13000 | 47.2 | 13000 | 55.1 | 3900 | 11.8 | 3900 | 13.8 |
| 6.0 | 13000 | 59.1 | 13000 | 78.7 | 3900 | 15.0 | 3900 | 19.7 |
| 8.0 | 10000 | 70.9 | 10000 | 90.6 | 3000 | 17.7 | 3000 | 22.8 |
| 10.0 | 10000 | 86.6 | 10000 | 106.3 | 3000 | 21.7 | 3000 | 26.8 |
| 12.0 | 10000 | 106.3 | 10000 | 133.9 | 3000 | 26.8 | 3000 | 33.5 |
| 16.0 | 8000 | 98.4 | 8000 | 122.1 | 2400 | 24.8 | 2400 | 30.7 |
| 20.0 | 5000 | 78.7 | 5000 | 98.4 | 1500 | 19.7 | 1500 | 24.8 |




A : ~Ø10=0.25D
Ø12~Ø20=0.5D



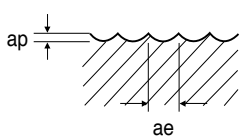

A : ~Ø10=0.25D
Ø12~Ø20=0.5D

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE 50° HELIX BALL NOSE TiCN COATED

### EG910 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | COPPER ALLOYS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R3.0 × 6.0 | 18000 | 68.9 | 5500 | 17.3 |
| R4.0 × 8.0 | 14000 | 78.7 | 4200 | 19.7 |
| R5.0 × 10.0 | 14000 | 92.5 | 4200 | 22.8 |
| R6.0 × 12.0 | 14000 | 118.1 | 4200 | 29.5 |
| R8.0 × 16.0 | 11000 | 106.3 | 3300 | 26.4 |
| R10.0 × 20.0 | 7000 | 86.6 | 2100 | 21.7 |




ap=0.2×D
ae=0.5×D

RPM = rev./min.
FEED = inch/min.

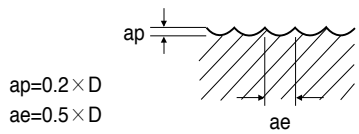
# ALU-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 3 FLUTE 40° HELIX BALL NOSE TiCN COATED

### EG908 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM LOW SILICON ALUMINUM | | COPPER ALLOYS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| R1.0 × 2.0 | 27000 | 37.4 | 8000 | 9.5 |
| R1.25 × 2.5 | 22000 | 37.4 | 6500 | 9.5 |
| R1.5 × 3.0 | 18000 | 37.4 | 5500 | 9.5 |
| R2.0 × 4.0 | 18000 | 49.2 | 5500 | 12.2 |
| R2.5 × 5.0 | 18000 | 53.2 | 5500 | 13.4 |
| R3.0 × 6.0 | 18000 | 68.9 | 5500 | 17.3 |
| R4.0 × 8.0 | 14000 | 78.7 | 4200 | 19.7 |
| R5.0 × 10.0 | 14000 | 92.5 | 4200 | 22.8 |
| R6.0 × 12.0 | 14000 | 118.1 | 4200 | 29.5 |
| R8.0 × 16.0 | 11000 | 106.3 | 3300 | 26.4 |

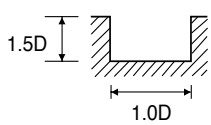


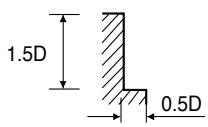

RPM = rev./min.
FEED = inch/min.

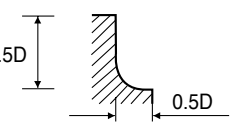
## CARBIDE, 3 FLUTE ROUGHING

### E5E44, E5E98, E5E45 SERIES

| MATERIAL | N | | | | | |
|---|---|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 7000 | 20.7 | 10000 | 29.5 | 10000 | 29.5 |
| 3/8 | 4700 | 16.1 | 6700 | 22.8 | 6700 | 22.8 |
| 1/2 | 3600 | 16.3 | 5100 | 23.0 | 5100 | 23.0 |
| 5/8 | 2800 | 16.9 | 4000 | 24.0 | 4000 | 24.0 |
| 3/4 | 2300 | 18.5 | 3300 | 26.4 | 3300 | 26.4 |
| 1 | 1800 | 17.3 | 2500 | 24.4 | 2500 | 24.4 |



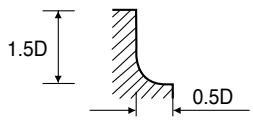




RPM = rev./min.
FEED = inch/min.

## T15, 3 FLUTE 42° HELIX SPEED-FREAK BALL NOSE

### EK196 SERIES

| MATERIAL | N | |
|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | |
| DIAMETER | RPM | FEED |
| 1/4 | 4500 | 7.9 |
| 5/16 | 3100 | 9.1 |
| 3/8 | 2500 | 13.8 |
| 1/2 | 2000 | 15.8 |
| 5/8 | 1600 | 17.7 |



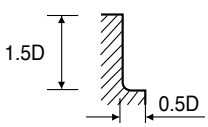

※ The FEED, in long & long reach types, should be reduced by around 50%

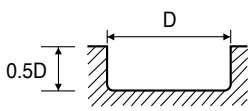
RPM = rev./min.
FEED = inch/min.

## T15, 3 FLUTE, 42° HELIX FINISHING with CORNER RADIUS

### EK193 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/2 | 4500 | 38 | 4095 | 38 |
| 5/8 | 3500 | 26 | 3185 | 39 |
| 3/4 | 2300 | 27 | 2093 | 41 |
| 1 | 2000 | 27 | 1820 | 40 |
| 1-1/4 | 1600 | 26 | 1456 | 38 |
| 1-1/2 | 1350 | 25 | 1229 | 38 |




※ The FEED, in long & long reach types, should be reduced by around 50%

RPM = rev./min.
FEED = inch/min.

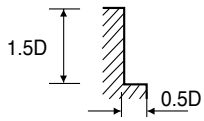
# ALU-POWER END MILLS

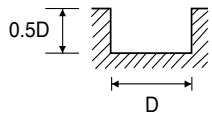
## RECOMMENDED CUTTING CONDITIONS

## PREMIUM HSS-PM, 3 FLUTE 42° HELIX ROUGHING TiAlN COATED

### EP922, EP924 SERIES

| MATERIAL | N | | | |
|---|---|---|---|---|
| | ALUMINUM ALUMINUM ALLOYS | | | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 12.0 | 2800 | 16.1 | 2800 | 21.7 |
| 16.0 | 2200 | 18.3 | 2200 | 24.6 |
| 20.0 | 1700 | 20.7 | 1700 | 27.6 |
| 25.0 | 1400 | 18.3 | 1400 | 24.6 |
| 32.0 | 1100 | 20.7 | 1100 | 27.6 |




※ The FEED, in long & long reach types, should be reduced by around 50%

RPM = rev./min.
FEED = inch/min.

## SPEED FREEK

### YG T-15 3 FLUTE ALUMINUM ROUGHER

**SPEEDS & FEEDS**

| MATERIAL | UNCOATED | TiCN | CHIP LOAD PER TOOTH & CUTTING DIAMETER | | | | |
|---|---|---|---|---|---|---|---|
| | SFM | SFM | 1/2 | 3/4 | 1.00 | 1.25 | 2.00 |
| ALUMINUM [SOFT] | 250-500 | 400-2,500 | .005 | .007 | .010 | .012 | .015 |
| AIRCRAFT ALUMINUM [UNDER 10% SILICON] | 250-750 | 500-3,250 | .005 | .007 | .010 | .012 | .015 |

### 3/4 DIA. / TiCN COATED / 10,186 RPM [2,000 SFM] @ 213 IPM

| | |
|---|---|
| SFM | $0.262 \times \text{CUTTER DIA} \times \text{RPM}$ |
| RPM | $3.82 \times \frac{\text{SFM}}{\text{CUTTER DIA}}$ |
| IPM | $\text{FPT} \times \text{N} \times \text{RPM}$ |

| | |
|---|---|
| FPT | $\frac{\text{IPM}}{\text{N X RPM}}$ |
| IPR | $\frac{\text{IPM}}{\text{RPM}}$ |
| CUTTING TIME | $\frac{\text{LENGTH OF CUT}}{\text{IPM}}$ |

SFM = SURFACE FEET PER MINUTE
RPM = REVOLUTIONS PER MINUTE
N = NUMBER OF TEETH
IPR = INCHES PER REVOLUTION
IPM = INCHES PER MINUTE
FPT = FEED PER TOOTH

# CARBIDE

YG

Being the best through innovation



# D-POWER GRAPHITE END MILLS

- Diamond Coated Carbide End Mills for Graphite

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **EI107** |  | CARBIDE, 4(2) FLUTE REGULAR LENGTH ◆ | D1/64 | D1/2 | **1050** |
| **EI099** |  | CARBIDE, 2 FLUTE REGULAR LENGTH BALL NOSE ◆ | R.0391 | R1/4 | **1051** |
| **EI106** |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE ◆ | R.0391 | R1/4 | **1051** |
| **EI971** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE ◆ | R.0391 | R1/4 | **1052** |
| **EI972** |  | CARBIDE, 2 FLUTE LONG REACH BALL NOSE ◆ | R.0391 | R5/32 | **1053** |
| **EIB07** |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE with NECK ◆ | R.0156 | R.0625 | **1054** |
| **EIB05** |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS ◆ | D1/16 | D1/2 | **1055** |
| **EIB06** |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS with NECK ◆ | D1/32 | D3/8 | **1056** |

◆ U.S.A Stock

| | | | | | |
|---|---|---|---|---|---|
| **METRIC** | | | | | |
| **EI880** |  | CARBIDE, 2 FLUTE SHORT LENGTH BALL NOSE ◇ | R1.0 | R6.0 | **1057** |
| **EI881** |  | CARBIDE, 3 FLUTE SHORT LENGTH BALL NOSE ◇ | R1.0 | R6.0 | **1057** |
| **EI451** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE ◇ | R1.0 | R6.0 | **1058** |
| **EI450** |  | CARBIDE, 2 FLUTE LONG REACH BALL NOSE ◇ | R1.0 | R4.0 | **1059** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **1060** |

◇ Call for Availability

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EI107 SERIES** PLAIN SHANK

## CARBIDE, 4(2) FLUTE REGULAR LENGTH

- ▶ Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- ▶ Ultra fine film of YG-1's diamond coated carbide end mills ensure the smooth and excellent surface on work materials.
- ▶ High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- ▶ YG-1's diamond coated carbide end mills may have good result for the machining of non-ferrous metals and non-metallic materials.



MG | 4 | 30° | PLAIN P.1061

**for GRAPHITE**

◆ U.S.A Stock

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| ★ 99686 | 1/64 | 1/8 | 3/65 | 1-1/2 |
| 99629 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 99630 | 3/16 | 3/16 | 5/8 | 2 |
| 99631 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 99632 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 99633 | 3/8 | 3/8 | 7/8 | 2-1/2 |
| 99635 | 1/2 | 1/2 | 1 | 3 |

★ 2Flute

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

▶Recommended Cutting Condition
▶Cutting speed : 500~1200 SFPM
▶ Feed : .002~.006 inch/tooth

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

EI099 SERIES PLAIN SHANK
EI106 SERIES PLAIN SHANK

## CARBIDE, 2&4 FLUTE REGULAR LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2 | 30° | R ±.0008 | PLAIN

P.1060

**for GRAPHITE**

◆ U.S.A Stock

**EI099(2 FLUTE), EI106(4 FLUTE) Series**

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 2 FLUTE | 4 FLUTE | R (±.0008) | | | | |
| **99572** | **99621** | R .0391 | **5/64** | 1/8 | 1/4 | 1-1/2 |
| **99573** | **99622** | R 3/64 | **3/32** | 1/8 | 3/8 | 1-1/2 |
| **99574** | **99623** | R 1/16 | **1/8** | 1/8 | 1/2 | 1-1/2 |
| **99575** | **99624** | R 3/32 | **3/16** | 3/16 | 5/8 | 2 |
| **99576** | **99625** | R 1/8 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **99577** | **99626** | R 5/32 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **99578** | **99627** | R 3/16 | **3/8** | 3/8 | 7/8 | 2-1/2 |
| **99583** | **99628** | R 1/4 | **1/2** | 1/2 | 1 | 3 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

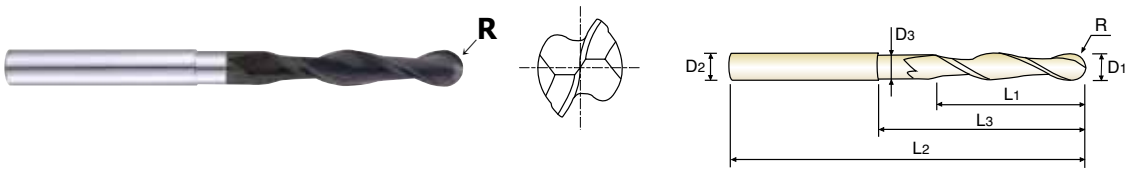
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EI971 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2 | 30° | R ±.0008 | PLAIN

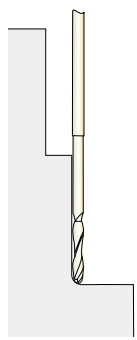
P.1060

**for GRAPHITE**
◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0008) | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **99671** | R.0391 | **5/64** | 1/8 | 3/8 | 3/4 | 3-1/4 | .076 |
| **99672** | R 1/16 | **1/8** | 1/8 | 5/8 | 1 | 3-1/4 | .120 |
| **99973** | R 3/32 | **3/16** | 3/16 | 1-1/8 | 2 | 4 | .182 |
| **99673** | R 3/32 | **3/16** | 1/4 | 1-1/8 | 2 | 4 | .185 |
| **99674** | R 1/8 | **1/4** | 1/4 | 1-1/8 | 2 | 4 | .230 |
| **99675** | R 5/32 | **5/16** | 5/16 | 1-1/2 | 2-3/8 | 4-1/2 | .293 |
| **99676** | R 3/16 | **3/8** | 3/8 | 2 | 2-3/4 | 4-3/4 | .355 |
| **99677** | R1/4 | **1/2** | 1/2 | 2-1/8 | 3 | 5-1/8 | .480 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |



◎ : Excellent ○ : Good

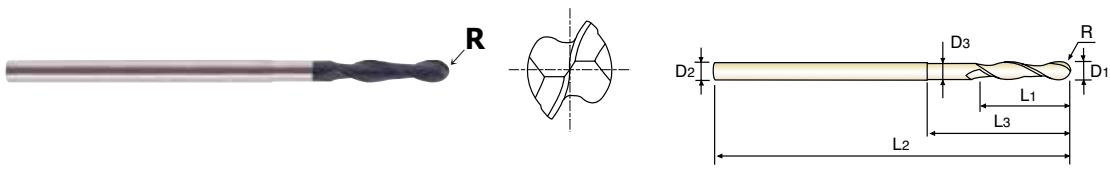
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

EI972 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE LONG REACH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2 | 30° | R ±.0008 | PLAIN

P.1060

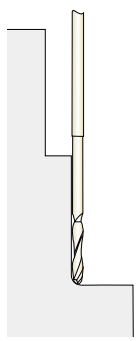
**for GRAPHITE**

◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.0008) | D1 | D2 | L1 | L3 | L2 | D3 |
| **99678** | R.0391 | **5/64** | 1/8 | 3/8 | 3/4 | 4 | .076 |
| **99679** | R1/16 | **1/8** | 1/8 | 5/8 | 1 | 4 | .120 |
| **99980** | R3/32 | **3/16** | 3/16 | 1-1/8 | 2 | 4-3/4 | .182 |
| **99680** | R3/32 | **3/16** | 1/4 | 1-1/8 | 2 | 4-3/4 | .186 |
| **99681** | R1/8 | **1/4** | 1/4 | 1-1/8 | 2 | 6 | .230 |
| **99682** | R5/32 | **5/16** | 5/16 | 1-1/2 | 2-3/8 | 6 | .293 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |



◎ : Excellent ○ : Good

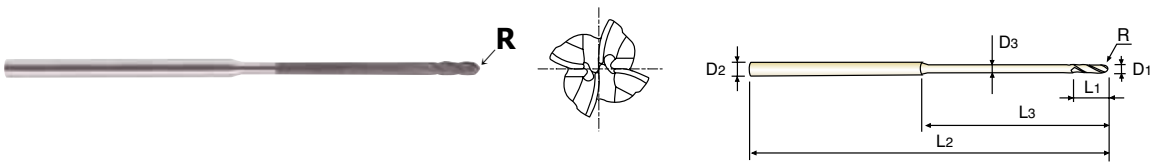
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EIB07 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE with NECK

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 4 | 30° | R ±.0008 | PLAIN

P.1060

**for GRAPHITE**
◆ U.S.A Stock

Unit : Inch

| EDP No. | Radius of Ball Nose R (±.0008) | Mill Diameter D1 | Shank Diameter D2 | Length of Cut L1 | Length Below Shank L3 | Overall Length L2 | Neck Diameter D3 |
|---|---|---|---|---|---|---|---|
| **EIB07002** | R.0156 | **1/32** | 1/8 | 3/32 | 3/8 | 3 | .028 |
| **EIB07901** | R.0156 | **1/32** | 1/8 | 3/32 | 1/2 | 3 | .028 |
| **EIB07003** | R.0234 | **3/64** | 1/8 | 9/64 | 9/16 | 3 | .043 |
| **EIB07902** | R.0234 | **3/64** | 1/8 | 9/64 | 3/4 | 3 | .043 |
| **EIB07004** | R.0312 | **1/16** | 1/8 | 3/16 | 3/4 | 3 | .057 |
| **EIB07903** | R.0312 | **1/16** | 1/8 | 3/16 | 1 | 3 | .057 |
| **EIB07006** | R.0469 | **3/32** | 1/8 | 9/32 | 1 | 3 | .086 |
| **EIB07904** | R.0469 | **3/32** | 1/8 | 9/32 | 1-1/2 | 3 | .086 |
| **EIB07008** | R.0625 | **1/8** | 1/8 | 3/8 | 1-1/2 | 3 | .115 |
| **EIB07905** | R.0625 | **1/8** | 1/8 | 3/8 | 2 | 3 | .115 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EIB05 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 4 | 30° | R ±.001 | PLAIN | P.1060

**for GRAPHITE**
◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.001) | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **EIB05004** | R.010 | **1/16** | 1/8 | 3/16 | - | 1-1/2 | - |
| **EIB05901** | R.015 | **1/16** | 1/8 | 3/16 | - | 1-1/2 | - |
| **EIB05006** | R.010 | **3/32** | 1/8 | 3/8 | - | 1-1/2 | - |
| **EIB05008** | R.015 | **1/8** | 1/8 | 1/2 | - | 1-1/2 | - |
| **EIB05902** | R.020 | **1/8** | 1/8 | 1/2 | - | 1-1/2 | - |
| **EIB05012** | R.020 | **3/16** | 3/16 | 5/8 | - | 2 | - |
| **EIB05911** | R.020 | **3/16** | 3/16 | 3/16 | 1-1/2 | 4 | .169 |
| **EIB05903** | R.030 | **3/16** | 3/16 | 5/8 | - | 2 | - |
| **EIB05016** | R.020 | **1/4** | 1/4 | 3/4 | - | 2-1/2 | - |
| **EIB05913** | R.020 | **1/4** | 1/4 | 1/4 | 2 | 4 | .230 |
| **EIB05912** | R.020 | **1/4** | 1/4 | 1/4 | 2 | 6 | .230 |
| **EIB05904** | R.030 | **1/4** | 1/4 | 3/4 | - | 2-1/2 | - |
| **EIB05024** | R.020 | **3/8** | 3/8 | 7/8 | - | 2-1/2 | - |
| **EIB05908** | R.020 | **3/8** | 3/8 | 3/8 | 2 | 4 | .355 |
| **EIB05907** | R.020 | **3/8** | 3/8 | 3/8 | - | 4 | - |
| **EIB05905** | R.030 | **3/8** | 3/8 | 7/8 | - | 2-1/2 | - |
| **EIB05032** | R.030 | **1/2** | 1/2 | 1 | - | 3 | - |
| **EIB05906** | R.060 | **1/2** | 1/2 | 1 | - | 3 | - |
| **EIB05909** | R.030 | **1/2** | 1/2 | 1-1/2 | - | 4 | - |
| **EIB05910** | R.030 | **1/2** | 1/2 | 3 | - | 6 | - |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0003 |

◎ : Excellent ○ : Good

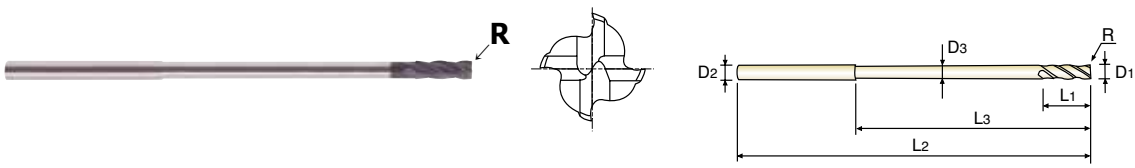
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EIB06 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS with NECK

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 4 | 30° | R ±.001 | PLAIN

P.1061

**for GRAPHITE**

◆ U.S.A Stock

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|
| | R (±.001) | $D_1$ | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **EIB06002** | R.005 | **1/32** | 1/8 | 3/32 | 3/8 | 3 | .028 |
| **EIB06901** | R.005 | **1/32** | 1/8 | 3/32 | 1/2 | 3 | .028 |
| **EIB06003** | R.010 | **3/64** | 1/8 | 9/64 | 9/16 | 3 | .043 |
| **EIB06902** | R.010 | **3/64** | 1/8 | 9/64 | 3/4 | 3 | .043 |
| **EIB06004** | R.010 | **1/16** | 1/8 | 3/16 | 3/4 | 3 | .057 |
| **EIB06903** | R.010 | **1/16** | 1/8 | 3/16 | 1 | 3 | .057 |
| **EIB06006** | R.010 | **3/32** | 1/8 | 9/32 | 1 | 3 | .086 |
| **EIB06904** | R.010 | **3/32** | 1/8 | 9/32 | 1-1/2 | 3 | .086 |
| **EIB06008** | R.010 | **1/8** | 1/8 | 3/8 | 1-1/2 | 3 | .115 |
| **EIB06905** | R.010 | **1/8** | 1/8 | 3/8 | 2 | 3 | .115 |
| **EIB06906** | R.015 | **1/8** | 1/8 | 3/16 | .800 | 2-1/2 | .115 |
| **EIB06907** | R.020 | **3/8** | 3/8 | 3/8 | 3 | 6 | .355 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

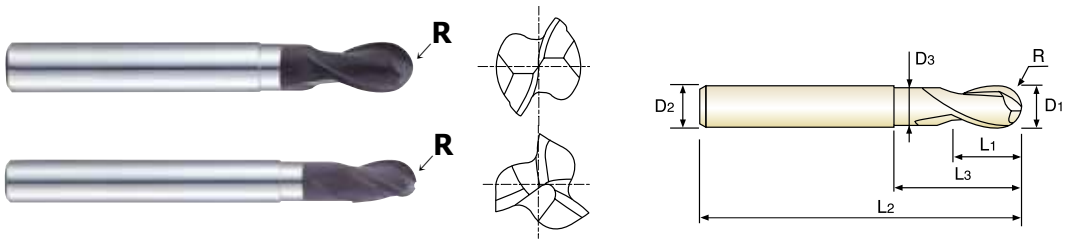
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

EI880 SERIES PLAIN SHANK
EI881 SERIES PLAIN SHANK

## CARBIDE, 2&3 FLUTE SHORT LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2&3 | 30° | R ±0.01 | PLAIN

P.1061

**for GRAPHITE**
◇ Call for Availability

### EI880(2 FLUTE), EI881(3 FLUTE) Series

Unit : mm

| EDP No. | | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|---|
| | | | Metric | Inch | | | | | |
| 2 FLUTE | 3 FLUTE | R (±0.01) | D1 | | D2 | L1 | L3 | L2 | D3 |
| EI880020 | EI881020 | R1.0 | 2.0 | .0787 | 6 | 3 | 5 | 60 | 1.9 |
| EI880025 | EI881025 | R1.25 | 2.5 | .0984 | 6 | 4 | 6 | 60 | 2.4 |
| EI880030 | EI881030 | R1.5 | 3.0 | .1181 | 6 | 4.5 | 6.5 | 60 | 2.8 |
| EI880035 | EI881035 | R1.75 | 3.5 | .1378 | 6 | 5 | 7 | 65 | 3.2 |
| EI880040 | EI881040 | R2.0 | 4.0 | .1575 | 6 | 6 | 8 | 65 | 3.7 |
| EI880050 | EI881050 | R2.5 | 5.0 | .1969 | 6 | 7.5 | 10 | 65 | 4.6 |
| EI880060 | EI881060 | R3.0 | 6.0 | .2362 | 6 | 9 | 12 | 75 | 5.6 |
| EI880080 | EI881080 | R4.0 | 8.0 | .3150 | 8 | 12 | 25 | 75 | 7.4 |
| EI880100 | EI881100 | R5.0 | 10.0 | .3937 | 10 | 15 | 30 | 80 | 9.4 |
| EI880120 | EI881120 | R6.0 | 12.0 | .4724 | 12 | 18 | 36 | 90 | 11.4 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

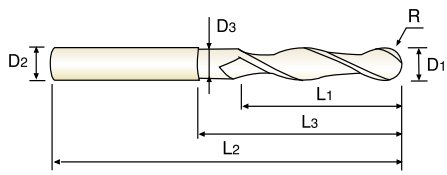
# D-POWER GRAPHITE END MILLS

**EI451 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2 | 30° | R ±0.01 | PLAIN

P.1061

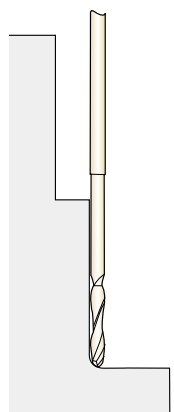
**for GRAPHITE**

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | $D_1$ | | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **99558** | R1.0 | **2.0** | **.0787** | 4 | 10 | 20 | 80 | 1.95 |
| **99559** | R1.5 | **3.0** | **.1181** | 4 | 15 | 25 | 80 | 2.9 |
| **99560** | R2.0 | **4.0** | **.1575** | 4 | 20 | 30 | 80 | 3.9 |
| **99561** | R2.5 | **5.0** | **.1969** | 6 | 30 | 50 | 100 | 4.9 |
| **99562** | R3.0 | **6.0** | **.2362** | 6 | 30 | 50 | 100 | 5.5 |
| **99563** | R4.0 | **8.0** | **.3150** | 8 | 40 | 60 | 110 | 7.5 |
| **99564** | R5.0 | **10.0** | **.3937** | 10 | 50 | 70 | 120 | 9.5 |
| **99565** | R6.0 | **12.0** | **.4724** | 12 | 55 | 75 | 130 | 11.5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



◎ : Excellent ○ : Good

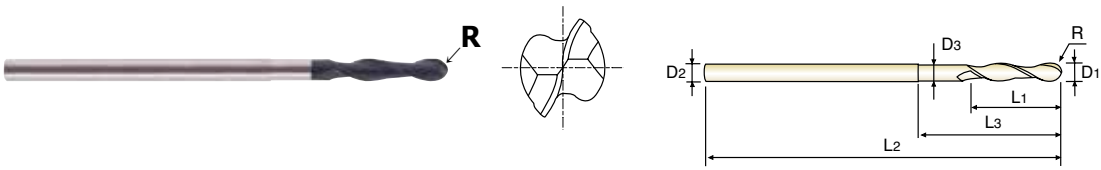
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

**EI450 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG REACH BALL NOSE

- Higher hardness of film and excellent wear-resistance increase the tool life dramatically.
- Ultra fine film of YG-1's diamond coated carbide ball end mills ensure the smooth and excellent surface on work materials.
- High performance on graphite, wrought aluminum, bakelite, plastics, wood, brass, etc.
- YG-1's diamond coated carbide ball end mills may have good result for the machining of non-ferrous metals and non-metallic materials.




MG | 2 | 30° | R ±0.01 | PLAIN

P.1061

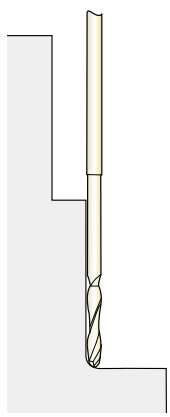
**for GRAPHITE**

◇ Call for Availability

Unit : mm

| EDP No. | Radius of Ball Nose | Mill Diameter | | Shank Diameter | Length of Cut | Length Below Shank | Overall Length | Neck Diameter |
|---|---|---|---|---|---|---|---|---|
| | | Metric | Inch | | | | | |
| | R (±0.01) | $D_1$ | | $D_2$ | $L_1$ | $L_3$ | $L_2$ | $D_3$ |
| **99566** | R1.0 | **2.0** | **.0787** | 4 | 10 | 20 | 100 | 1.95 |
| **99567** | R1.5 | **3.0** | **.1181** | 4 | 15 | 25 | 100 | 2.9 |
| **99568** | R2.0 | **4.0** | **.1575** | 4 | 20 | 30 | 100 | 3.9 |
| **99569** | R2.5 | **5.0** | **.1969** | 6 | 30 | 50 | 120 | 4.9 |
| **99570** | R3.0 | **6.0** | **.2362** | 6 | 30 | 50 | 150 | 5.5 |
| **99571** | R4.0 | **8.0** | **.3150** | 8 | 40 | 60 | 150 | 7.5 |

| Mill Dia. Tolerance(mm) | Shank Dia. Tolerance |
|---|---|
| 0~−0.03 | h6 |



◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ◎ | ○ | | | | |

# D-POWER GRAPHITE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE BALL NOSE

### EI106 SERIES

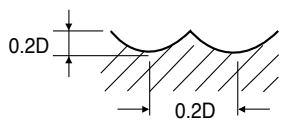
| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 5/64 | 16000 | 63.0 |
| 3/32 | 16000 | 88.2 |
| 1/8 | 16000 | 114.2 |
| 9/64 | 16000 | 137.8 |
| 5/32 | 16000 | 165.4 |
| 3/16 | 15500 | 200.8 |
| 1/4 | 15000 | 232.3 |
| 5/16 | 13000 | 236.2 |
| 3/8 | 11500 | 324.2 |
| 1/2 | 10500 | 248.0 |

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE

### EI099, EI971, EI972 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 5/64 | 16000 | 31.5 |
| 3/32 | 16000 | 44.1 |
| 1/8 | 16000 | 57.1 |
| 9/64 | 16000 | 58.9 |
| 5/32 | 16000 | 82.7 |
| 3/16 | 15500 | 100.4 |
| 1/4 | 15000 | 116.1 |
| 5/16 | 13000 | 118.1 |
| 3/8 | 11500 | 120.1 |
| 1/2 | 10500 | 124.0 |

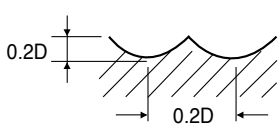



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE BALL NOSE with NECK

### EIB07 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 1/32 | 20000 | 37.9 |
| 3/64 | 20000 | 42.5 |
| 1/16 | 20000 | 51.7 |
| 5/64 | 16000 | 56.7 |
| 3/32 | 16000 | 79.4 |
| 1/8 | 16000 | 101.8 |
| 9/64 | 16000 | 124.7 |
| 5/32 | 16000 | 147.4 |
| 3/16 | 15500 | 182.0 |
| 1/4 | 15000 | 210.5 |
| 5/16 | 13000 | 211.5 |
| 3/8 | 11500 | 216.8 |
| 1/2 | 10500 | 224.7 |

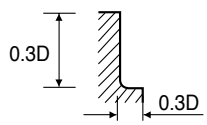



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE CORNER RADIUS

### EIB05 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 1/16 | 40000 | 126.0 |
| 5/64 | 40000 | 157.5 |
| 1/8 | 40000 | 220.5 |
| 5/32 | 40000 | 315.0 |
| 3/16 | 40000 | 378.0 |
| 1/4 | 40000 | 440.9 |
| 5/16 | 32000 | 440.9 |
| 3/8 | 26000 | 451.4 |
| 1/2 | 21000 | 430.5 |




RPM = rev./min.
FEED = inch/min.

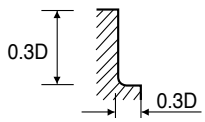
# D-POWER GRAPHITE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE CORNER RADIUS with NECK

### EIB06 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 1/32 | 40000 | 44.1 |
| 3/64 | 40000 | 66.1 |
| 1/16 | 40000 | 88.2 |
| 5/64 | 40000 | 110.2 |
| 1/8 | 40000 | 154.3 |
| 5/32 | 40000 | 220.5 |
| 3/16 | 40000 | 264.6 |
| 1/4 | 40000 | 308.7 |
| 5/16 | 32000 | 308.7 |
| 3/89 | 26000 | 316.1 |
| 1/2 | 21000 | 301.4 |

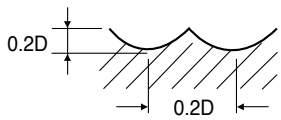



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE

### EI880, EI451, EI450 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 2.0 | 16000 | 31.5 |
| 2.5 | 16000 | 44.1 |
| 3.0 | 16000 | 57.1 |
| 3.5 | 16000 | 68.9 |
| 4.0 | 16000 | 82.7 |
| 5.0 | 15500 | 100.4 |
| 6.0 | 15000 | 116.1 |
| 8.0 | 13000 | 118.1 |
| 10.0 | 11500 | 120.1 |
| 12.0 | 10500 | 124.0 |

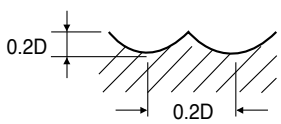



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 3 FLUTE BALL NOSE

### EI881 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 2.0 | 16000 | 47.2 |
| 2.5 | 16000 | 66.9 |
| 3.0 | 16000 | 84.7 |
| 3.5 | 16000 | 104.3 |
| 4.0 | 16000 | 122.1 |
| 5.0 | 15500 | 149.6 |
| 6.0 | 15000 | 175.2 |
| 8.0 | 13000 | 177.2 |
| 10.0 | 11500 | 181.1 |
| 12.0 | 10500 | 187.0 |

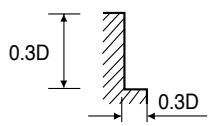



RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE

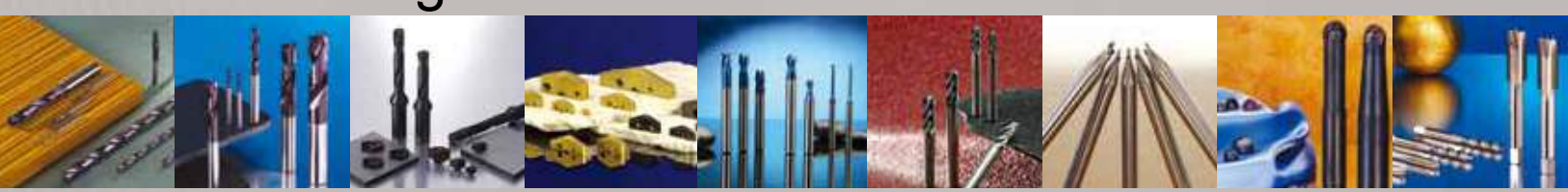
### EI107 SERIES

| MATERIAL | N | |
|---|---|---|
| | GRAPHITE | |
| DIAMETER | RPM | FEED |
| 1/64 | 40000 | 31.5 |
| 1/8 | 40000 | 63.0 |
| 3/16 | 40000 | 126.0 |
| 1/4 | 40000 | 189.0 |
| 5/16 | 32000 | 196.9 |
| 3/8 | 26000 | 204.7 |
| 1/2 | 20000 | 189.0 |




RPM = rev./min.
FEED = inch/min.

Global Cutting Tool Leader **YG-1**



# CARBIDE

YG

Being the best through innovation





# D-POWER CFRP END MILLS

- For composite materials including CFRP, GFRP

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| GUG82 |  | CARBIDE, MULTI FLUTE DUAL HELIX | D1/4 | D1/2 | **1066** |
| GUG83 |  | CARBIDE, 4 FLUTE | D1/4 | D1/2 | **1067** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **1068** |

◎ : Excellent ○ : Good

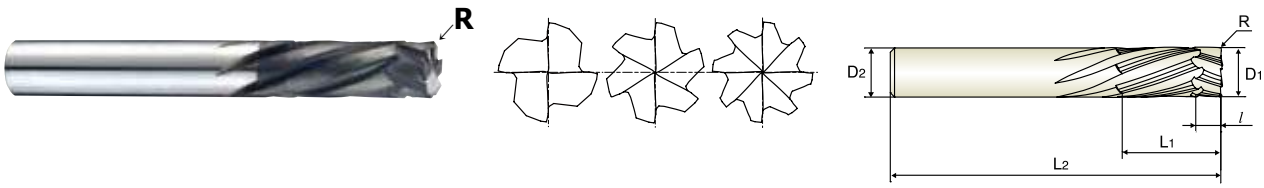
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ○ | | | ◎ | | |
| | | | | | | | | | ○ | | | ◎ | | |

# D-POWER CFRP END MILLS

**GUG82 SERIES** PLAIN SHANK

## CARBIDE, MULTI FLUTE DUAL HELIX

- For composite materials - CFRP, GFRP.
- Reduce delamination and burrs.
- Diamond coating with excellent abrasion resistance




MG 4-8 20°/20° PLAIN P.1068

**for CFRP**

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1(*l*) | L2 | |
| **GUG82016** | R.020 | **1/4** | 1/4 | 1/2(1/8) | 2-1/2 | 4 |
| **GUG82024** | R.020 | **3/8** | 3/8 | 3/4(3/16) | 3 | 6 |
| **GUG82032** | R.020 | **1/2** | 1/2 | 1(1/4) | 3-1/2 | 8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ○ | | | ◎ | | |

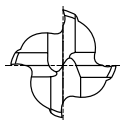
# D-POWER CFRP END MILLS

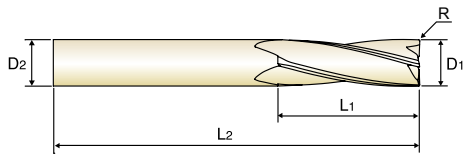
**GUG83 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE

- For composite materials - CFRP, GFRP.
- Reduce delamination and burrs.
- Diamond coating with excellent abrasion resistance






MG | 4 | 15° | PLAIN

P.1068

**for CFRP**

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| | R | D1 | D2 | L1(*l*) | L2 | |
| **GUG83016** | R.010 | **1/4** | 1/4 | 3/4 | 2-1/2 | 4 |
| **GUG83024** | R.015 | **3/8** | 3/8 | 1-1/4 | 3-1/4 | 4 |
| **GUG83032** | R.015 | **1/2** | 1/2 | 1-1/2 | 4 | 4 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | ○ | | | ◎ | | |

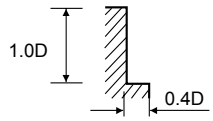
# D-POWER CFRP END MILLS

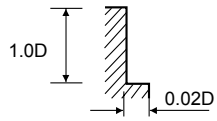
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, MULTI FLUTE DUAL HELIX

### GUG82 SERIES

| MATERIAL | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CFRP | | GFRP | | CFRP | | GFRP | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 7520 | 41.45 | 4010 | 15.79 | 10026 | 74.21 | 5013 | 27.63 |
| 3/8 | 5013 | 65.13 | 2674 | 23.37 | 6684 | 121.58 | 3342 | 35.53 |
| 1/2 | 3760 | 76.97 | 2005 | 27.16 | 5013 | 145.26 | 2507 | 39.47 |



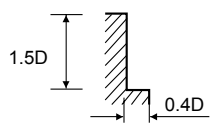



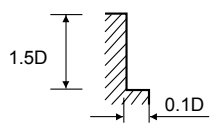

RPM = rev./min.
FEED = inch/min.

## CARBIDE, 4 FLUTE

### GUG83 SERIES

| MATERIAL | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CFRP | | GFRP | | CFRP | | GFRP | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 10026 | 55.26 | 5013 | 19.74 | 10026 | 44.21 | 5013 | 19.74 |
| 3/8 | 6684 | 57.89 | 3342 | 19.47 | 6684 | 46.32 | 3342 | 16.84 |
| 1/2 | 5013 | 51.32 | 2507 | 16.97 | 5013 | 41.05 | 2507 | 13.82 |




RPM = rev./min.
FEED = inch/min.

# CARBIDE

Being the best through innovation



# ROUTERS

- For composite materials including CFRP, GFRP

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| **RTI105** |  | CARBIDE, ROUTER END MILL TYPE | D1/4 | D1/2 | **1072** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **1073** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | | | ◎ | | |

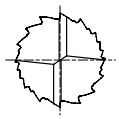
# ROUTERS

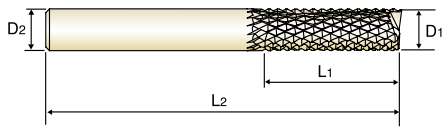
**RTI105 SERIES** PLAIN SHANK

## CARBIDE, ROUTER END MILL TYPE

- For composite materials - CFRP, GFRP.
- Reduce delamination and burrs.
- Diamond coating with excellent abrasion resistance





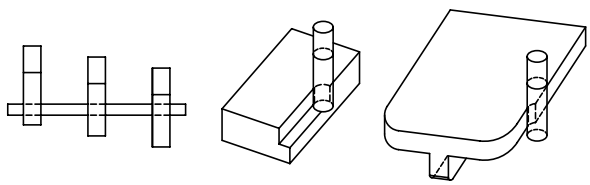



MG PLAIN P.1073

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| | D1 | D2 | L1 | L2 |
| **RTI105016** | 1/4 | **1/4** | 3/4 | 2-1/4 |
| **RTI105024** | 3/8 | **3/8** | 1-1/4 | 3-1/2 |
| **RTI105032** | 1/2 | **1/2** | 1-1/2 | 4 |

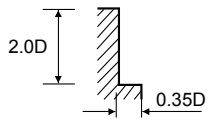
| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| −.0008~−.003 | h6 |



# CARBIDE, ROUTER END MILL TYPE

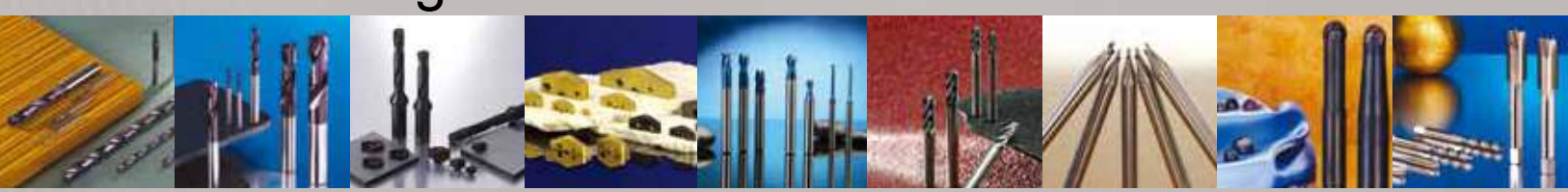
## RTI105 SERIES

| MATERIAL | N | | | | | |
|---|---|---|---|---|---|---|
| | CFRP | | | GFRP | | |
| DIAMETER | RPM | FEED | SFM | RPM | FEED | SFM |
| 1/4 | 10030 | 82.78 | 656 | 5010 | 41.34 | 328 |
| 3/8 | 6680 | 126.20 | 656 | 3340 | 63.10 | 328 |
| 1/2 | 5010 | 126.24 | 656 | 2510 | 63.12 | 329 |




RPM = rev./min.
FEED = inch/min.
SFM = ft/min.

Global Cutting Tool Leader **YG-1**



# CARBIDE

Being the best through innovation



# STANDARD CARBIDE END MILLS

- General Purpose

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | ◆ U.S.A Stock | |
| **UGMF90** |  | CARBIDE, 2 FLUTE REGULAR LENGTH ◆ | D1/8 | D1 | **1080** |
| **E5020** |  | CARBIDE, 2 FLUTE REGULAR LENGTH | D1/32 | D1 | **1081** |
| **UGMF89** |  | CARBIDE, 4 FLUTE REGULAR LENGTH ◆ | D1/16 | D1 | **1082** |
| **E5021** |  | CARBIDE, 4 FLUTE REGULAR LENGTH | D1/16 | D1 | **1083** |
| **E5244** |  | CARBIDE, 2 FLUTE STUB LENGTH | D1/16 | D3/4 | **1084** |
| **UGMGF57** |  | CARBIDE, 4 FLUTE STUB LENGTH ◆ | D1/16 | D3/4 | **1085** |
| **E5245** |  | CARBIDE, 4 FLUTE STUB LENGTH | D1/16 | D3/4 | **1086** |
| **E5011** |  | CARBIDE, 2 FLUTE LONG LENGTH | D1/8 | D1 | **1087** |
| **E5012** |  | CARBIDE, 4 FLUTE LONG LENGTH | D1/8 | D1 | **1087** |
| **UGMGF58** |  | CARBIDE, 4 FLUTE LONG LENGTH ◆ | D1/8 | D1 | **1088** |
| **E5026** |  | CARBIDE, 2 FLUTE EXTRA LONG LENGTH | D1/8 | D1 | **1089** |
| **UGMGF59** |  | CARBIDE, 4 FLUTE EXTRA LONG LENGTH ◆ | D1/8 | D1 | **1090** |
| **E5065** |  | CARBIDE, 4 FLUTE EXTRA LONG LENGTH | D1/8 | D1 | **1091** |
| **E5022** |  | CARBIDE, 2 FLUTE STUB LENGTH DOUBLE | D1/32 | D1/2 | **1092** |
| **E5023** |  | CARBIDE, 4 FLUTE STUB LENGTH DOUBLE | D1/16 | D1/2 | **1093** |
| **E5025** |  | CARBIDE, 2 FLUTE REGULAR LENGTH DOUBLE | D1/8 | D1/2 | **1094** |
| **E5024** |  | CARBIDE, 4 FLUTE REGULAR LENGTH DOUBLE | D1/8 | D1/2 | **1094** |
| **E5249** |  | CARBIDE, 2 FLUTE REGULAR LENGTH BALL NOSE | R1/16 | R1/2 | **1095** |
| **E5250** |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE | R1/16 | R1/2 | **1095** |
| **UGMF91** |  | CARBIDE, 4 FLUTE REGULAR LENGTH BALL NOSE ◆ | R1/16 | R1/2 | **1096** |
| **E5014** |  | CARBIDE, 2 FLUTE LONG LENGTH BALL NOSE | R1/16 | R1/2 | **1097** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **E5060** |  | CARBIDE, 4 FLUTE LONG LENGTH BALL NOSE | R1/16 | R1/2 | **1097** |
| **E5018** |  | CARBIDE, 2 FLUTE EXTRA LONG LENGTH BALL NOSE | R1/16 | R1/2 | **1098** |
| **E5062** |  | CARBIDE, 4 FLUTE EXTRA LONG LENGTH BALL NOSE | R1/16 | R1/2 | **1099** |
| **E5251 E5252** |  | CARBIDE, 2&4 FLUTE STUB LENGTH DOUBLE BALL NOSE | R7/64 | R1/4 | **1100** |
| **E5216** |  | CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS | D1/8 | D1 | **1101** |
| **E5069** |  | CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH CORNER RADIUS | D1/4 | D1 | **1103** |
| **E5243** |  | CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH | D1/8 | D1 | **1104** |
| **E5059** |  | CARBIDE, 3 FLUTE 50° HELIX STUB & REGULAR & LONG LENGTH | D1/4 | D3/4 | **1105** |
| **E5246** |  | CARBIDE, 3 FLUTE 60° HELIX REGULAR LENGTH | D1/8 | D1 | **1106** |
| **E5066** |  | CARBIDE, 5 FLUTE 45° HELIX STUB LENGTH | D1/8 | D1 | **1107** |
| **E5067** |  | CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH | D1/8 | D1 | **1108** |
| **E5068** |  | CARBIDE, 5 FLUTE 45° HELIX MEDIUM & LONG LENGTH | D1/4 | D1 | **1109** |
| **E5073** |  | CARBIDE, 5 FLUTE 45° HELIX EXTRA LONG LENGTH | D5/16 | D1 | **1110** |
| **E5058** |  | CARBIDE, 6 FLUTE 40° HELIX REGULAR LENGTH | D3/16 | D3/4 | **1111** |
| **E5056 E5057** |  | CARBIDE, 5 FLUTE 45° HELIX STUB & REGULAR LENGTH FINE PITCH ROUGHING CARBIDE | D3/8 | D1 | **1112** |
| **E5077** |  | CARBIDE, 3 FLUTE TAPER | D3/32 | D1/4 | **1113** |
| **E5078** |  | CARBIDE, 3 FLUTE TAPER BALL NOSE | R.047 | R.125 | **1114** |
| **METRIC** | | | | | |
| **EH527** |  | CARBIDE, 2 FLUTE LONG LENGTH TiAlN 'F' COATED | D3.5 | D20.0 | **1115** |
| **EH540** |  | CARBIDE, 4 FLUTE LONG LENGTH TiAlN 'F' COATED | D3.5 | D20.0 | **1116** |
| **EH882** |  | CARBIDE, 3 FLUTE 35° HELIX CORNER RADIUS TiAlN 'F' COATED | D3.0 | D20.0 | **1117** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **1118** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |
| ○ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ○ | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ◎ | | ◎ | | | | |

# CARBIDE END MILLS

**UGMF90 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 2 | 30° | PLAIN | P.1120

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| UGMF90008 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| UGMF90012 | 3/16 | 3/16 | 5/8 | 2 |
| UGMF90016 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF90024 | 3/8 | 3/8 | 1 | 2-1/2 |
| UGMF90032 | 1/2 | 1/2 | 1 | 3 |
| UGMF90040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF90048 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMF90064 | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | | | ○ | | | | |

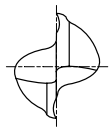
# CARBIDE END MILLS

**E5020 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 2 | 30° | PLAIN | P.1121

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 01552 | 01552TN | 01552TC | 01552TF | 01552TE | 1/32 | 1/8 | 5/64 | 1-1/2 |
| 01553 | 01553TN | 01553TC | 01553TF | 01553TE | 3/64 | 1/8 | 7/64 | 1-1/2 |
| 01554 | 01554TN | 01554TC | 01554TF | 01554TE | 1/16 | 1/8 | 3/16 | 1-1/2 |
| 01555 | 01555TN | 01555TC | 01555TF | 01555TE | 5/64 | 1/8 | 3/16 | 1-1/2 |
| 01556 | 01556TN | 01556TC | 01556TF | 01556TE | 3/32 | 1/8 | 3/8 | 1-1/2 |
| 01557 | 01557TN | 01557TC | 01557TF | 01557TE | 7/64 | 1/8 | 3/8 | 1-1/2 |
| 01558 | 01558TN | 01558TC | 01558TF | 01558TE | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 01560 | 01560TN | 01560TC | 01560TF | 01560TE | 9/64 | 3/16 | 1/2 | 2 |
| 01562 | 01562TN | 01562TC | 01562TF | 01562TE | 5/32 | 3/16 | 9/16 | 2 |
| 01564 | 01564TN | 01564TC | 01564TF | 01564TE | 11/64 | 3/16 | 5/8 | 2 |
| 01565 | 01565TN | 01565TC | 01565TF | 01565TE | 3/16 | 3/16 | 5/8 | 2 |
| 01569 | 01569TN | 01569TC | 01569TF | 01569TE | 13/64 | 1/4 | 5/8 | 2-1/2 |
| 01570 | 01570TN | 01570TC | 01570TF | 01570TE | 7/32 | 1/4 | 5/8 | 2-1/2 |
| 01572 | 01572TN | 01572TC | 01572TF | 01572TE | 15/64 | 1/4 | 3/4 | 2-1/2 |
| 01573 | 01573TN | 01573TC | 01573TF | 01573TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 01579 | 01579TN | 01579TC | 01579TF | 01579TE | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 01584 | 01584TN | 01584TC | 01584TF | 01584TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 01588 | 01588TN | 01588TC | 01588TF | 01588TE | 7/16 | 7/16 | 1 | 2-3/4 |
| 01593 | 01593TN | 01593TC | 01593TF | 01593TE | 1/2 | 1/2 | 1 | 3 |
| 01595 | 01595TN | 01595TC | 01595TF | 01595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 01598 | 01598TN | 01598TC | 01598TF | 01598TE | 3/4 | 3/4 | 1-1/2 | 4 |
| 01600 | 01600TN | 01600TC | 01600TF | 01600TE | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

UGMF89 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



MG | 2 | 30° | PLAIN

P.1119

MADE IN USA

◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| UGMF89004 | 1/16 | 1/8 | 3/16 | 1-1/2 |
| UGMF89005 | 5/64 | 1/8 | 3/16 | 1-1/2 |
| UGMF89006 | 3/32 | 1/8 | 3/8 | 1-1/2 |
| UGMF89007 | 7/64 | 1/8 | 3/8 | 1-1/2 |
| UGMF89008 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| UGMF89009 | 9/64 | 3/16 | 1/2 | 2 |
| UGMF89010 | 5/32 | 3/16 | 9/16 | 2 |
| UGMF89011 | 11/64 | 3/16 | 5/8 | 2 |
| UGMF89012 | 3/16 | 3/16 | 5/8 | 2 |
| UGMF89013 | 13/64 | 1/4 | 5/8 | 2-1/2 |
| UGMF89014 | 7/32 | 1/4 | 5/8 | 2-1/2 |
| UGMF89015 | 15/64 | 1/4 | 3/4 | 2-1/2 |
| UGMF89016 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| UGMF89018 | 9/32 | 5/16 | 3/4 | 2-1/2 |
| UGMF89020 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| UGMF89024 | 3/8 | 3/8 | 1 | 2-1/2 |
| UGMF89028 | 7/16 | 7/16 | 1 | 2-3/4 |
| UGMF89032 | 1/2 | 1/2 | 1 | 3 |
| UGMF89036 | 9/16 | 9/16 | 1-1/4 | 3-1/2 |
| UGMF89040 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| UGMF89048 | 3/4 | 3/4 | 1-1/2 | 4 |
| UGMF89056 | 7/8 | 7/8 | 1-1/2 | 4 |
| UGMF89064 | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | | | ○ | | | | |

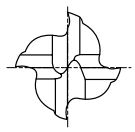
# CARBIDE END MILLS

**E5021 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency maching for hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN P.1122

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 07554 | 07554TN | 07554TC | 07554TF | 07554TE | 1/16 | 1/8 | 3/16 | 1-1/2 |
| 07555 | 07555TN | 07555TC | 07555TF | 07555TE | 5/64 | 1/8 | 3/16 | 1-1/2 |
| 07556 | 07556TN | 07556TC | 07556TF | 07556TE | 3/32 | 1/8 | 3/8 | 1-1/2 |
| 07557 | 07557TN | 07557TC | 07557TF | 07557TE | 7/64 | 1/8 | 3/8 | 1-1/2 |
| 07558 | 07558TN | 07558TC | 07558TF | 07558TE | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 07560 | 07560TN | 07560TC | 07560TF | 07560TE | 9/64 | 3/16 | 1/2 | 2 |
| 07561 | 07561TN | 07561TC | 07561TF | 07561TE | 5/32 | 3/16 | 9/16 | 2 |
| 07564 | 07564TN | 07564TC | 07564TF | 07564TE | 11/64 | 3/16 | 5/8 | 2 |
| 07565 | 07565TN | 07565TC | 07565TF | 07565TE | 3/16 | 3/16 | 5/8 | 2 |
| 07569 | 07569TN | 07569TC | 07569TF | 07569TE | 13/64 | 1/4 | 5/8 | 2-1/2 |
| 07570 | 07570TN | 07570TC | 07570TF | 07570TE | 7/32 | 1/4 | 5/8 | 2-1/2 |
| 07572 | 07572TN | 07572TC | 07572TF | 07572TE | 15/64 | 1/4 | 3/4 | 2-1/2 |
| 07573 | 07573TN | 07573TC | 07573TF | 07573TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 07576 | 07576TN | 07576TC | 07576TF | 07576TE | 9/32 | 5/16 | 3/4 | 2-1/2 |
| 07579 | 07579TN | 07579TC | 07579TF | 07579TE | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 07584 | 07584TN | 07584TC | 07584TF | 07584TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 07588 | 07588TN | 07588TC | 07588TF | 07588TE | 7/16 | 7/16 | 1 | 2-3/4 |
| 07593 | 07593TN | 07593TC | 07593TF | 07593TE | 1/2 | 1/2 | 1 | 3 |
| 07595 | 07595TN | 07595TC | 07595TF | 07595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07598 | 07598TN | 07598TC | 07598TF | 07598TE | 3/4 | 3/4 | 1-1/2 | 4 |
| 07600 | 07600TN | 07600TC | 07600TF | 07600TE | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5244 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



MG | 2 | 30° | PLAIN P.1121

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 30554 | 30554TN | 30554TC | 30554TF | 30554TE | 1/16 | 1/8 | 1/8 | 1-1/2 |
| 30556 | 30556TN | 30556TC | 30556TF | 30556TE | 3/32 | 1/8 | 3/16 | 1-1/2 |
| 30558 | 30558TN | 30558TC | 30558TF | 30558TE | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 30561 | 30561TN | 30561TC | 30561TF | 30561TE | 5/32 | 3/16 | 5/16 | 2 |
| 30565 | 30565TN | 30565TC | 30565TF | 30565TE | 3/16 | 3/16 | 3/8 | 2 |
| 30570 | 30570TN | 30570TC | 30570TF | 30570TE | 7/32 | 1/4 | 7/16 | 2 |
| 30573 | 30573TN | 30573TC | 30573TF | 30573TE | 1/4 | 1/4 | 1/2 | 2 |
| 30579 | 30579TN | 30579TC | 30579TF | 30579TE | 5/16 | 5/16 | 1/2 | 2 |
| 30584 | 30584TN | 30584TC | 30584TF | 30584TE | 3/8 | 3/8 | 5/8 | 2 |
| 30588 | 30588TN | 30588TC | 30588TF | 30588TE | 7/16 | 7/16 | 5/8 | 2-1/2 |
| 30593 | 30593TN | 30593TC | 30593TF | 30593TE | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 30595 | 30595TN | 30595TC | 30595TF | 30595TE | 5/8 | 5/8 | 3/4 | 3 |
| 30598 | 30598TN | 30598TC | 30598TF | 30598TE | 3/4 | 3/4 | 1 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

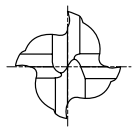
# CARBIDE END MILLS

**UGMGF57 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN

P.1119

MADE IN USA

◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| UGMGF57004 | 1/16 | 1/8 | 1/8 | 1-1/2 |
| UGMGF57006 | 3/32 | 1/8 | 3/16 | 1-1/2 |
| UGMGF57008 | 1/8 | 1/8 | 1/4 | 1-1/2 |
| UGMGF57010 | 5/32 | 3/16 | 5/16 | 2 |
| UGMGF57012 | 3/16 | 3/16 | 3/8 | 2 |
| UGMGF57014 | 7/32 | 1/4 | 7/16 | 2 |
| UGMGF57016 | 1/4 | 1/4 | 1/2 | 2 |
| UGMGF57020 | 5/16 | 5/16 | 1/2 | 2 |
| UGMGF57024 | 3/8 | 3/8 | 5/8 | 2 |
| UGMGF57028 | 7/16 | 7/16 | 5/8 | 2-1/2 |
| UGMGF57032 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| UGMGF57040 | 5/8 | 5/8 | 3/4 | 3 |
| UGMGF57048 | 3/4 | 3/4 | 1 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

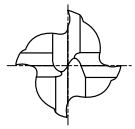
# CARBIDE END MILLS

**E5245 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN P.1122

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 31554 | 31554TN | 31554TC | 31554TF | 31554TE | 1/16 | 1/8 | 1/8 | 1-1/2 |
| 31556 | 31556TN | 31556TC | 31556TF | 31556TE | 3/32 | 1/8 | 3/16 | 1-1/2 |
| 31558 | 31558TN | 31558TC | 31558TF | 31558TE | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 31561 | 31561TN | 31561TC | 31561TF | 31561TE | 5/32 | 3/16 | 5/16 | 2 |
| 31565 | 31565TN | 31565TC | 31565TF | 31565TE | 3/16 | 3/16 | 3/8 | 2 |
| 31570 | 31570TN | 31570TC | 31570TF | 31570TE | 7/32 | 1/4 | 7/16 | 2 |
| 31573 | 31573TN | 31573TC | 31573TF | 31573TE | 1/4 | 1/4 | 1/2 | 2 |
| 31579 | 31579TN | 31579TC | 31579TF | 31579TE | 5/16 | 5/16 | 1/2 | 2 |
| 31584 | 31584TN | 31584TC | 31584TF | 31584TE | 3/8 | 3/8 | 5/8 | 2 |
| 31588 | 31588TN | 31588TC | 31588TF | 31588TE | 7/16 | 7/16 | 5/8 | 2-1/2 |
| 31593 | 31593TN | 31593TC | 31593TF | 31593TE | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 31595 | 31595TN | 31595TC | 31595TF | 31595TE | 5/8 | 5/8 | 3/4 | 3 |
| 31598 | 31598TN | 31598TC | 31598TF | 31598TE | 3/4 | 3/4 | 1 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~-.0012 | 0~-.0005 |

◎ : Excellent ○ : Good

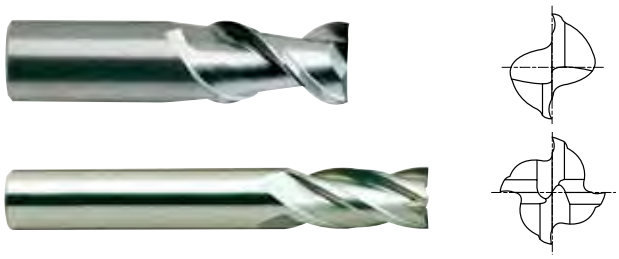
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5011 SERIES** PLAIN SHANK
**E5012 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



MG | 2&4 | 30° | PLAIN

P.1121, 1122

### E5011(2 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 02558 | 02558TN | 02558TC | 02558TF | 02558TE | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 02565 | 02565TN | 02565TC | 02565TF | 02565TE | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 02573 | 02573TN | 02573TC | 02573TF | 02573TE | 1/4 | 1/4 | 1-1/8 | 3 |
| 02579 | 02579TN | 02579TC | 02579TF | 02579TE | 5/16 | 5/16 | 1-1/8 | 3 |
| 02584 | 02584TN | 02584TC | 02584TF | 02584TE | 3/8 | 3/8 | 1-1/8 | 3 |
| 02588 | 02588TN | 02588TC | 02588TF | 02588TE | 7/16 | 7/16 | 2 | 4 |
| 02593 | 02593TN | 02593TC | 02593TF | 02593TE | 1/2 | 1/2 | 2 | 4 |
| 02595 | 02595TN | 02595TC | 02595TF | 02595TE | 5/8 | 5/8 | 2-1/4 | 5 |
| 02598 | 02598TN | 02598TC | 02598TF | 02598TE | 3/4 | 3/4 | 2-1/4 | 5 |
| 02600 | 02600TN | 02600TC | 02600TF | 02600TE | 1 | 1 | 2-1/4 | 5 |

### E5012(4 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 08558 | 08558TN | 08558TC | 08558TF | 08558TE | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 08565 | 08565TN | 08565TC | 08565TF | 08565TE | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 08573 | 08573TN | 08573TC | 08573TF | 08573TE | 1/4 | 1/4 | 1-1/8 | 3 |
| 08579 | 08579TN | 08579TC | 08579TF | 08579TE | 5/16 | 5/16 | 1-1/8 | 3 |
| 08584 | 08584TN | 08584TC | 08584TF | 08584TE | 3/8 | 3/8 | 1-1/8 | 3 |
| 08588 | 08588TN | 08588TC | 08588TF | 08588TE | 7/16 | 7/16 | 2 | 4 |
| 08593 | 08593TN | 08593TC | 08593TF | 08593TE | 1/2 | 1/2 | 2 | 4 |
| 08595 | 08595TN | 08595TC | 08595TF | 08595TE | 5/8 | 5/8 | 2-1/4 | 5 |
| 08598 | 08598TN | 08598TC | 08598TF | 08598TE | 3/4 | 3/4 | 2-1/4 | 5 |
| 08600 | 08600TN | 08600TC | 08600TF | 08600TE | 1 | 1 | 2-1/4 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

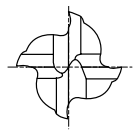
# CARBIDE END MILLS

UGMGF58 SERIES PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN

P.1119

MADE IN USA

◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| UGMGF58008 | 1/8 | 1/8 | 3/4 | 2-1/4 |
| UGMGF58012 | 3/16 | 3/16 | 3/4 | 2-1/2 |
| UGMGF58016 | 1/4 | 1/4 | 1-1/8 | 3 |
| UGMGF58020 | 5/16 | 5/16 | 1-1/8 | 3 |
| UGMGF58024 | 3/8 | 3/8 | 1-1/8 | 3 |
| UGMGF58028 | 7/16 | 7/16 | 2 | 4 |
| UGMGF58032 | 1/2 | 1/2 | 2 | 4 |
| UGMGF58040 | 5/8 | 5/8 | 2-1/4 | 5 |
| UGMGF58048 | 3/4 | 3/4 | 2-1/4 | 5 |
| UGMGF58064 | 1 | 1 | 2-1/4 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

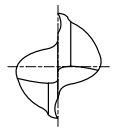
# CARBIDE END MILLS

**E5026 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 2 | 30° | PLAIN P.1121

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 54558 | 54558TN | 54558TC | 54558TF | 54558TE | 1/8 | 1/8 | 1 | 3 |
| 54565 | 54565TN | 54565TC | 54565TF | 54565TE | 3/16 | 3/16 | 1-1/8 | 3 |
| 54904 | 54904TN | 54904TC | 54904TF | 54904TE | 3/16 | 3/16 | 1 | 4 |
| 54573 | 54573TN | 54573TC | 54573TF | 54573TE | 1/4 | 1/4 | 1-1/2 | 4 |
| 54901 | 54901TN | 54901TC | 54901TF | 54901TE | 1/4 | 1/4 | 1-1/2 | 6 |
| 54579 | 54579TN | 54579TC | 54579TF | 54579TE | 5/16 | 5/16 | 1-5/8 | 4 |
| 54584 | 54584TN | 54584TC | 54584TF | 54584TE | 3/8 | 3/8 | 1-3/4 | 4 |
| 54902 | 54902TN | 54902TC | 54902TF | 54902TE | 3/8 | 3/8 | 1-1/2 | 6 |
| 54588 | 54588TN | 54588TC | 54588TF | 54588TE | 7/16 | 7/16 | 3 | 6 |
| 54903 | 54903TN | 54903TC | 54903TF | 54903TE | 1/2 | 1/2 | 1-1/2 | 6 |
| 54593 | 54593TN | 54593TC | 54593TF | 54593TE | 1/2 | 1/2 | 3 | 6 |
| 54595 | 54595TN | 54595TC | 54595TF | 54595TE | 5/8 | 5/8 | 3 | 6 |
| 54598 | 54598TN | 54598TC | 54598TF | 54598TE | 3/4 | 3/4 | 3 | 6 |
| 54600 | 54600TN | 54600TC | 54600TF | 54600TE | 1 | 1 | 3 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

UGMGF59 SERIES PLAIN SHANK

## CARBIDE, 4 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



MG | 4 | 30° | PLAIN | P.1119

MADE IN USA ◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| UGMGF59008 | 1/8 | 1/8 | 1 | 3 |
| UGMGF59012 | 3/16 | 3/16 | 1-1/8 | 3 |
| UGMGF59016 | 1/4 | 1/4 | 1-1/2 | 4 |
| UGMGF59020 | 5/16 | 5/16 | 1-5/8 | 4 |
| UGMGF59024 | 3/8 | 3/8 | 1-3/4 | 4 |
| UGMGF59028 | 7/16 | 7/16 | 3 | 6 |
| UGMGF59032 | 1/2 | 1/2 | 3 | 6 |
| UGMGF59040 | 5/8 | 5/8 | 3 | 6 |
| UGMGF59048 | 3/4 | 3/4 | 3 | 6 |
| UGMGF59064 | 1 | 1 | 3 | 6 |
| UGMGF59901 | 1/4 | 1/4 | 1-1/2 | 6 |
| UGMGF59902 | 3/8 | 3/8 | 1-1/2 | 6 |
| UGMGF59903 | 1/2 | 1/2 | 1-1/2 | 6 |
| UGMGF59904 | 3/16 | 3/16 | 1 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

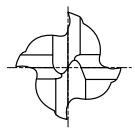
# CARBIDE END MILLS

**E5065 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE EXTRA LONG LENGTH

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN P.1122

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 55558 | 55558TN | 55558TC | 55558TF | 55558TE | 1/8 | 1/8 | 1 | 3 |
| 55565 | 55565TN | 55565TC | 55565TF | 55565TE | 3/16 | 3/16 | 1-1/8 | 3 |
| 55904 | 55904TN | 55904TC | 55904TF | 55904TE | 3/16 | 3/16 | 1 | 4 |
| 55573 | 55573TN | 55573TC | 55573TF | 55573TE | 1/4 | 1/4 | 1-1/2 | 4 |
| 55901 | 55901TN | 55901TC | 55901TF | 55901TE | 1/4 | 1/4 | 1-1/2 | 6 |
| 55579 | 55579TN | 55579TC | 55579TF | 55579TE | 5/16 | 5/16 | 1-5/8 | 4 |
| 55584 | 55584TN | 55584TC | 55584TF | 55584TE | 3/8 | 3/8 | 1-3/4 | 4 |
| 55902 | 55902TN | 55902TC | 55902TF | 55902TE | 3/8 | 3/8 | 1-1/2 | 6 |
| 55588 | 55588TN | 55588TC | 55588TF | 55588TE | 7/16 | 7/16 | 3 | 6 |
| 55903 | 55903TN | 55903TC | 55903TF | 55903TE | 1/2 | 1/2 | 1-1/2 | 6 |
| 55593 | 55593TN | 55593TC | 55593TF | 55593TE | 1/2 | 1/2 | 3 | 6 |
| 55595 | 55595TN | 55595TC | 55595TF | 55595TE | 5/8 | 5/8 | 3 | 6 |
| 55598 | 55598TN | 55598TC | 55598TF | 55598TE | 3/4 | 3/4 | 3 | 6 |
| 55600 | 55600TN | 55600TC | 55600TF | 55600TE | 1 | 1 | 3 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

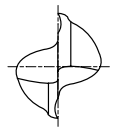
# CARBIDE END MILLS

**E5022 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE STUB LENGTH DOUBLE

- Same construction features as 2&4 flute single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 2 | 30° | PLAIN P.1121

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 32552 | 32552TN | 32552TC | 32552TF | 32552TE | 1/32 | 1/8 | 1/16 | 1-1/2 |
| 32553 | 32553TN | 32553TC | 32553TF | 32553TE | 3/64 | 1/8 | 3/32 | 1-1/2 |
| 32554 | 32554TN | 32554TC | 32554TF | 32554TE | 1/16 | 1/8 | 1/8 | 1-1/2 |
| 32555 | 32555TN | 32555TC | 32555TF | 32555TE | 5/64 | 1/8 | 1/8 | 1-1/2 |
| 32556 | 32556TN | 32556TC | 32556TF | 32556TE | 3/32 | 1/8 | 3/16 | 1-1/2 |
| 32557 | 32557TN | 32557TC | 32557TF | 32557TE | 7/64 | 1/8 | 3/16 | 1-1/2 |
| 32558 | 32558TN | 32558TC | 32558TF | 32558TE | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 32560 | 32560TN | 32560TC | 32560TF | 32560TE | 9/64 | 3/16 | 5/16 | 2 |
| 32562 | 32562TN | 32562TC | 32562TF | 32562TE | 5/32 | 3/16 | 5/16 | 2 |
| 32564 | 32564TN | 32564TC | 32564TF | 32564TE | 11/64 | 3/16 | 5/16 | 2 |
| 32565 | 32565TN | 32565TC | 32565TF | 32565TE | 3/16 | 3/16 | 3/8 | 2 |
| 32569 | 32569TN | 32569TC | 32569TF | 32569TE | 13/64 | 1/4 | 1/2 | 2-1/2 |
| 32570 | 32570TN | 32570TC | 32570TF | 32570TE | 7/32 | 1/4 | 1/2 | 2-1/2 |
| 32572 | 32572TN | 32572TC | 32572TF | 32572TE | 15/64 | 1/4 | 1/2 | 2-1/2 |
| 32573 | 32573TN | 32573TC | 32573TF | 32573TE | 1/4 | 1/4 | 1/2 | 2-1/2 |
| 32579 | 32579TN | 32579TC | 32579TF | 32579TE | 5/16 | 5/16 | 1/2 | 2-1/2 |
| 32584 | 32584TN | 32584TC | 32584TF | 32584TE | 3/8 | 3/8 | 9/16 | 2-1/2 |
| 32588 | 32588TN | 32588TC | 32588TF | 32588TE | 7/16 | 7/16 | 9/16 | 2-3/4 |
| 32593 | 32593TN | 32593TC | 32593TF | 32593TE | 1/2 | 1/2 | 5/8 | 3 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0012 | **0~−.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

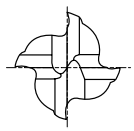
# CARBIDE END MILLS

**E5023 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE STUB LENGTH DOUBLE

- Same construction features as 2&4 flute single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN

P.1122

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 33554 | 33554TN | 33554TC | 33554TF | 33554TE | 1/16 | 1/8 | 1/8 | 1-1/2 |
| 33555 | 33555TN | 33555TC | 33555TF | 33555TE | 5/64 | 1/8 | 1/8 | 1-1/2 |
| 33556 | 33556TN | 33556TC | 33556TF | 33556TE | 3/32 | 1/8 | 3/16 | 1-1/2 |
| 33557 | 33557TN | 33557TC | 33557TF | 33557TE | 7/64 | 1/8 | 3/16 | 1-1/2 |
| 33558 | 33558TN | 33558TC | 33558TF | 33558TE | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 33560 | 33560TN | 33560TC | 33560TF | 33560TE | 9/64 | 3/16 | 5/16 | 2 |
| 33561 | 33561TN | 33561TC | 33561TF | 33561TE | 5/32 | 3/16 | 5/16 | 2 |
| 33564 | 33564TN | 33564TC | 33564TF | 33564TE | 11/64 | 3/16 | 5/16 | 2 |
| 33565 | 33565TN | 33565TC | 33565TF | 33565TE | 3/16 | 3/16 | 3/8 | 2 |
| 33569 | 33569TN | 33569TC | 33569TF | 33569TE | 13/64 | 1/4 | 1/2 | 2-1/2 |
| 33570 | 33570TN | 33570TC | 33570TF | 33570TE | 7/32 | 1/4 | 1/2 | 2-1/2 |
| 33572 | 33572TN | 33572TC | 33572TF | 33572TE | 15/64 | 1/4 | 1/2 | 2-1/2 |
| 33573 | 33573TN | 33573TC | 33573TF | 33573TE | 1/4 | 1/4 | 1/2 | 2-1/2 |
| 33579 | 33579TN | 33579TC | 33579TF | 33579TE | 5/16 | 5/16 | 1/2 | 2-1/2 |
| 33584 | 33584TN | 33584TC | 33584TF | 33584TE | 3/8 | 3/8 | 9/16 | 2-1/2 |
| 33588 | 33588TN | 33588TC | 33588TF | 33588TE | 7/16 | 7/16 | 9/16 | 2-3/4 |
| 33593 | 33593TN | 33593TC | 33593TF | 33593TE | 1/2 | 1/2 | 5/8 | 3 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0012 | **0~−.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5025 SERIES** FLAT SHANK
**E5024 SERIES** FLAT SHANK

## CARBIDE, 2&4 FLUTE REGULAR LENGTH DOUBLE

- Same construction features as single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.



MG | 2&4 | 30° | FLAT

P.1121, 1122

### E5025(2 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 11559 | 11559TN | 11559TC | 11559TF | 11559TE | 1/8 | 3/8 | 3/8 | 3-1/16 |
| 11563 | 11563TN | 11563TC | 11563TF | 11563TE | 5/32 | 3/8 | 7/16 | 3-1/8 |
| 11567 | 11567TN | 11567TC | 11567TF | 11567TE | 3/16 | 3/8 | 1/2 | 3-1/4 |
| 11571 | 11571TN | 11571TC | 11571TF | 11571TE | 7/32 | 3/8 | 9/16 | 3-3/8 |
| 11574 | 11574TN | 11574TC | 11574TF | 11574TE | 1/4 | 3/8 | 5/8 | 3-3/8 |
| 11577 | 11577TN | 11577TC | 11577TF | 11577TE | 9/32 | 3/8 | 11/16 | 3-3/8 |
| 11580 | 11580TN | 11580TC | 11580TF | 11580TE | 5/16 | 3/8 | 3/4 | 3-1/2 |
| 11582 | 11582TN | 11582TC | 11582TF | 11582TE | 11/32 | 3/8 | 3/4 | 3-1/2 |
| 11584 | 11584TN | 11584TC | 11584TF | 11584TE | 3/8 | 3/8 | 3/4 | 3-1/2 |
| 11589 | 11589TN | 11589TC | 11589TF | 11589TE | 7/16 | 1/2 | 7/8 | 4 |
| 11593 | 11593TN | 11593TC | 11593TF | 11593TE | 1/2 | 1/2 | 1 | 4 |

### E5024(4 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 13559 | 13559TN | 13559TC | 13559TF | 13559TE | 1/8 | 3/8 | 3/8 | 3-1/16 |
| 13563 | 13563TN | 13563TC | 13563TF | 13563TE | 5/32 | 3/8 | 7/16 | 3-1/8 |
| 13567 | 13567TN | 13567TC | 13567TF | 13567TE | 3/16 | 3/8 | 1/2 | 3-1/4 |
| 13571 | 13571TN | 13571TC | 13571TF | 13571TE | 7/32 | 3/8 | 9/16 | 3-3/8 |
| 13574 | 13574TN | 13574TC | 13574TF | 13574TE | 1/4 | 3/8 | 5/8 | 3-3/8 |
| 13577 | 13577TN | 13577TC | 13577TF | 13577TE | 9/32 | 3/8 | 11/16 | 3-3/8 |
| 13580 | 13580TN | 13580TC | 13580TF | 13580TE | 5/16 | 3/8 | 3/4 | 3-1/2 |
| 13582 | 13582TN | 13582TC | 13582TF | 13582TE | 11/32 | 3/8 | 3/4 | 3-1/2 |
| 13584 | 13584TN | 13584TC | 13584TF | 13584TE | 3/8 | 3/8 | 3/4 | 3-1/2 |
| 13589 | 13589TN | 13589TC | 13589TF | 13589TE | 7/16 | 1/2 | 7/8 | 4 |
| 13593 | 13593TN | 13593TC | 13593TF | 13593TE | 1/2 | 1/2 | 1 | 4 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0012 | **0~−.0020 |

**The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5249 SERIES** PLAIN SHANK
**E5250 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 2&4 | 30° | R ±.0008 | PLAIN

P.1123, 1124

### E5249(2 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 41558 | 41558TN | 41558TC | 41558TF | 41558TE | R1/16 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 41561 | 41561TN | 41561TC | 41561TF | 41561TE | R5/64 | 5/32 | 3/16 | 9/16 | 2 |
| 41565 | 41565TN | 41565TC | 41565TF | 41565TE | R3/32 | 3/16 | 3/16 | 5/8 | 2 |
| 41570 | 41570TN | 41570TC | 41570TF | 41570TE | R7/64 | 7/32 | 1/4 | 5/8 | 2-1/2 |
| 41573 | 41573TN | 41573TC | 41573TF | 41573TE | R1/8 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 41579 | 41579TN | 41579TC | 41579TF | 41579TE | R5/32 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 41584 | 41584TN | 41584TC | 41584TF | 41584TE | R3/16 | 3/8 | 3/8 | 1 | 2-1/2 |
| 41588 | 41588TN | 41588TC | 41588TF | 41588TE | R7/32 | 7/16 | 7/16 | 1 | 2-3/4 |
| 41593 | 41593TN | 41593TC | 41593TF | 41593TE | R1/4 | 1/2 | 1/2 | 1 | 3 |
| 41595 | 41595TN | 41595TC | 41595TF | 41595TE | R5/16 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 41598 | 41598TN | 41598TC | 41598TF | 41598TE | R3/8 | 3/4 | 3/4 | 1-1/2 | 4 |
| 41600 | 41600TN | 41600TC | 41600TF | 41600TE | R1/2 | 1 | 1 | 1-1/2 | 4 |

### E5250(4 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 43558 | 43558TN | 43558TC | 43558TF | 43558TE | R1/16 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 43561 | 43561TN | 43561TC | 43561TF | 43561TE | R5/64 | 5/32 | 3/16 | 9/16 | 2 |
| 43565 | 43565TN | 43565TC | 43565TF | 43565TE | R3/32 | 3/16 | 3/16 | 5/8 | 2 |
| 43570 | 43570TN | 43570TC | 43570TF | 43570TE | R7/64 | 7/32 | 1/4 | 5/8 | 2-1/2 |
| 43573 | 43573TN | 43573TC | 43573TF | 43573TE | R1/8 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 43579 | 43579TN | 43579TC | 43579TF | 43579TE | R5/32 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 43584 | 43584TN | 43584TC | 43584TF | 43584TE | R3/16 | 3/8 | 3/8 | 1 | 2-1/2 |
| 43588 | 43588TN | 43588TC | 43588TF | 43588TE | R7/32 | 7/16 | 7/16 | 1 | 2-3/4 |
| 43593 | 43593TN | 43593TC | 43593TF | 43593TE | R1/4 | 1/2 | 1/2 | 1 | 3 |
| 43595 | 43595TN | 43595TC | 43595TF | 43595TE | R5/16 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 43598 | 43598TN | 43598TC | 43598TF | 43598TE | R3/8 | 3/4 | 3/4 | 1-1/2 | 4 |
| 43600 | 43600TN | 43600TC | 43600TF | 43600TE | R1/2 | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

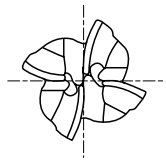
# CARBIDE END MILLS

UGMF91 SERIES PLAIN SHANK

## CARBIDE, 2 FLUTE REGULAR LENGTH

- These are designed for slotting, drilling, pocketing and general operation.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.





MG | 4 | 30° | PLAIN | R ±.0008 | P.1120

MADE IN USA

◆ U.S.A Stock

Unit : Inch

| EDP No. Y-COATED | Radiusof BallNose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| **UGMF91008** | 1/16 | **1/8** | 1/8 | 1/2 | 1-1/2 |
| **UGMF91010** | 5/64 | **5/32** | 3/16 | 9/16 | 2 |
| **UGMF91012** | 3/32 | **3/16** | 3/16 | 5/8 | 2 |
| **UGMF91016** | 1/8 | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **UGMF91020** | 5/32 | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **UGMF91024** | 3/16 | **3/8** | 3/8 | 1 | 2-1/2 |
| **UGMF91028** | 7/32 | **7/16** | 7/16 | 1 | 2-3/4 |
| **UGMF91032** | 1/4 | **1/2** | 1/2 | 1 | 3 |
| **UGMF91040** | 5/16 | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **UGMF91048** | 3/8 | **3/4** | 3/4 | 1-1/2 | 4 |
| **UGMF91064** | 1/2 | **1** | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | ○ | ○ | | | ○ | | | | |

# CARBIDE END MILLS

**E5014 SERIES** PLAIN SHANK
**E5060 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE LONG LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 2&4 | 30° | R ±.0008 | PLAIN

P.1123, 1124

### E5014(2 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 50558 | 50558TN | 50558TC | 50558TF | 50558TE | R1/16 | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 50565 | 50565TN | 50565TC | 50565TF | 50565TE | R3/32 | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 50573 | 50573TN | 50573TC | 50573TF | 50573TE | R1/8 | 1/4 | 1/4 | 1-1/8 | 3 |
| 50579 | 50579TN | 50579TC | 50579TF | 50579TE | R5/32 | 5/16 | 5/16 | 1-1/8 | 3 |
| 50584 | 50584TN | 50584TC | 50584TF | 50584TE | R3/16 | 3/8 | 3/8 | 1-1/8 | 3 |
| 50588 | 50588TN | 50588TC | 50588TF | 50588TE | R7/32 | 7/16 | 7/16 | 2 | 4 |
| 50593 | 50593TN | 50593TC | 50593TF | 50593TE | R1/4 | 1/2 | 1/2 | 2 | 4 |
| 50595 | 50595TN | 50595TC | 50595TF | 50595TE | R5/16 | 5/8 | 5/8 | 2-1/4 | 5 |
| 50598 | 50598TN | 50598TC | 50598TF | 50598TE | R3/8 | 3/4 | 3/4 | 2-1/4 | 5 |
| 50600 | 50600TN | 50600TC | 50600TF | 50600TE | R1/2 | 1 | 1 | 2-1/4 | 5 |

### E5060(4 FLUTE) Series

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 51558 | 51558TN | 51558TC | 51558TF | 51558TE | R1/16 | 1/8 | 1/8 | 3/4 | 2-1/4 |
| 51565 | 51565TN | 51565TC | 51565TF | 51565TE | R3/32 | 3/16 | 3/16 | 3/4 | 2-1/2 |
| 51573 | 51573TN | 51573TC | 51573TF | 51573TE | R1/8 | 1/4 | 1/4 | 1-1/8 | 3 |
| 51579 | 51579TN | 51579TC | 51579TF | 51579TE | R5/32 | 5/16 | 5/16 | 1-1/8 | 3 |
| 51584 | 51584TN | 51584TC | 51584TF | 51584TE | R3/16 | 3/8 | 3/8 | 1-1/8 | 3 |
| 51588 | 51588TN | 51588TC | 51588TF | 51588TE | R7/32 | 7/16 | 7/16 | 2 | 4 |
| 51593 | 51593TN | 51593TC | 51593TF | 51593TE | R1/4 | 1/2 | 1/2 | 2 | 4 |
| 51595 | 51595TN | 51595TC | 51595TF | 51595TE | R5/16 | 5/8 | 5/8 | 2-1/4 | 5 |
| 51598 | 51598TN | 51598TC | 51598TF | 51598TE | R3/8 | 3/4 | 3/4 | 2-1/4 | 5 |
| 51600 | 51600TN | 51600TC | 51600TF | 51600TE | R1/2 | 1 | 1 | 2-1/4 | 5 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5018 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE EXTRA LONG LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 2 | 30° | R ±.0008 | PLAIN

P.1123

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 52558 | 52558TN | 52558TC | 52558TF | 52558TE | R1/16 | 1/8 | 1/8 | 1 | 3 |
| 52565 | 52565TN | 52565TC | 52565TF | 52565TE | R3/32 | 3/16 | 3/16 | 1-1/8 | 3 |
| 52904 | 52904TN | 52904TC | 52904TF | 52904TE | R3/32 | 3/16 | 3/16 | 1 | 4 |
| 52573 | 52573TN | 52573TC | 52573TF | 52573TE | R1/8 | 1/4 | 1/4 | 1-1/2 | 4 |
| 52901 | 52901TN | 52901TC | 52901TF | 52901TE | R1/8 | 1/4 | 1/4 | 1-1/2 | 6 |
| 52579 | 52579TN | 52579TC | 52579TF | 52579TE | R5/32 | 5/16 | 5/16 | 1-5/8 | 4 |
| 52584 | 52584TN | 52584TC | 52584TF | 52584TE | R3/16 | 3/8 | 3/8 | 1-3/4 | 4 |
| 52902 | 52902TN | 52902TC | 52902TF | 52902TE | R3/16 | 3/8 | 3/8 | 1-1/2 | 6 |
| 52588 | 52588TN | 52588TC | 52588TF | 52588TE | R7/32 | 7/16 | 7/16 | 3 | 6 |
| 52903 | 52903TN | 52903TC | 52903TF | 52903TE | R1/4 | 1/2 | 1/2 | 1-1/2 | 6 |
| 52593 | 52593TN | 52593TC | 52593TF | 52593TE | R1/4 | 1/2 | 1/2 | 3 | 6 |
| 52595 | 52595TN | 52595TC | 52595TF | 52595TE | R5/16 | 5/8 | 5/8 | 3 | 6 |
| 52598 | 52598TN | 52598TC | 52598TF | 52598TE | R3/8 | 3/4 | 3/4 | 3 | 6 |
| 52600 | 52600TN | 52600TC | 52600TF | 52600TE | R1/2 | 1 | 1 | 3 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5062 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE EXTRA LONG LENGTH BALL NOSE

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 4 | 30° | R ±.0008 | PLAIN

P.1124

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 53558 | 53558TN | 53558TC | 53558TF | 53558TE | R1/16 | 1/8 | 1/8 | 1 | 3 |
| 53565 | 53565TN | 53565TC | 53565TF | 53565TE | R3/32 | 3/16 | 3/16 | 1-1/8 | 3 |
| 53573 | 53573TN | 53573TC | 53573TF | 53573TE | R1/8 | 1/4 | 1/4 | 1-1/2 | 4 |
| 53901 | 53901TN | 53901TC | 53901TF | 53901TE | R1/8 | 1/4 | 1/4 | 1-1/2 | 6 |
| 53579 | 53579TN | 53579TC | 53579TF | 53579TE | R5/32 | 5/16 | 5/16 | 1-5/8 | 4 |
| 53584 | 53584TN | 53584TC | 53584TF | 53584TE | R3/16 | 3/8 | 3/8 | 1-3/4 | 4 |
| 53902 | 53902TN | 53902TC | 53902TF | 53902TE | R3/16 | 3/8 | 3/8 | 1-1/2 | 6 |
| 53588 | 53588TN | 53588TC | 53588TF | 53588TE | R7/32 | 7/16 | 7/16 | 3 | 6 |
| 53903 | 53903TN | 53903TC | 53903TF | 53903TE | R1/4 | 1/2 | 1/2 | 1-1/2 | 6 |
| 53593 | 53593TN | 53593TC | 53593TF | 53593TE | R1/4 | 1/2 | 1/2 | 3 | 6 |
| 53595 | 53595TN | 53595TC | 53595TF | 53595TE | R5/16 | 5/8 | 5/8 | 3 | 6 |
| 53904 | 53904TN | 53904TC | 53904TF | 53904TE | R5/16 | 5/8 | 5/8 | 1-1/2 | 6 |
| 53598 | 53598TN | 53598TC | 53598TF | 53598TE | R3/8 | 3/4 | 3/4 | 3 | 6 |
| 53905 | 53905TN | 53905TC | 53905TF | 53905TE | R3/8 | 3/4 | 3/4 | 1-1/2 | 6 |
| 53600 | 53600TN | 53600TC | 53600TF | 53600TE | R1/2 | 1 | 1 | 3 | 6 |
| 53906 | 53906TN | 53906TC | 53906TF | 53906TE | R1/2 | 1 | 1 | 1-1/2 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

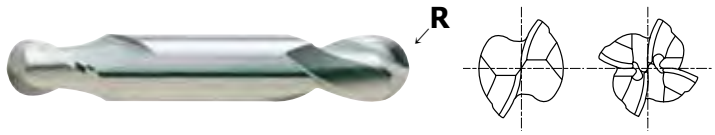
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5251 SERIES** PLAIN SHANK
**E5252 SERIES** PLAIN SHANK

## CARBIDE, 2&4 FLUTE STUB LENGTH DOUBLE BALL NOSE

- Same construction features as single end mill in a more economical version.
- Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 2&4 | 30° | R ±.0008 | PLAIN

P.1123, 1124

### E5251 Series ■ 2 FLUTE

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 47570 | 47570TN | 47570TC | 47570TF | 47570TE | R7/64 | 7/32 | 1/4 | 1/2 | 2-1/2 |
| 47573 | 47573TN | 47573TC | 47573TF | 47573TE | R1/8 | 1/4 | 1/4 | 1/2 | 2-1/2 |
| 47579 | 47579TN | 47579TC | 47579TF | 47579TE | R5/32 | 5/16 | 5/16 | 1/2 | 2-1/2 |
| 47584 | 47584TN | 47584TC | 47584TF | 47584TE | R3/16 | 3/8 | 3/8 | 9/16 | 2-1/2 |
| 47588 | 47588TN | 47588TC | 47588TF | 47588TE | R7/32 | 7/16 | 7/16 | 9/16 | 2-3/4 |
| 47593 | 47593TN | 47593TC | 47593TF | 47593TE | R1/4 | 1/2 | 1/2 | 5/8 | 3 |

### E5252 Series ■ 4 FLUTE

Unit : Inch

| EDP No. | | | | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | |
| 48570 | 48570TN | 48570TC | 48570TF | 48570TE | R7/64 | 7/32 | 1/4 | 1/2 | 2-1/2 |
| 48573 | 48573TN | 48573TC | 48573TF | 48573TE | R1/8 | 1/4 | 1/4 | 1/2 | 2-1/2 |
| 48579 | 48579TN | 48579TC | 48579TF | 48579TE | R5/32 | 5/16 | 5/16 | 1/2 | 2-1/2 |
| 48584 | 48584TN | 48584TC | 48584TF | 48584TE | R3/16 | 3/8 | 3/8 | 9/16 | 2-1/2 |
| 48588 | 48588TN | 48588TC | 48588TF | 48588TE | R7/32 | 7/16 | 7/16 | 9/16 | 2-3/4 |
| 48593 | 48593TN | 48593TC | 48593TF | 48593TE | R1/4 | 1/2 | 1/2 | 5/8 | 3 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0012 | **0~−.0020 |

**The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5216 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 4 | 30° | R ±.001 | PLAIN

P.1122

Unit : Inch

| EDP No. | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | YG:TYLON F | R | | | | |
| 07558-015R | 07558TF-015R | R.015 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 07558-030R | 07558TF-030R | R.030 | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 07565-015R | 07565TF-015R | R.015 | 3/16 | 3/16 | 5/8 | 2 |
| 07565-030R | 07565TF-030R | R.030 | 3/16 | 3/16 | 5/8 | 2 |
| 07573-015R | 07573TF-015R | R.015 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 07573-030R | 07573TF-030R | R.030 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 07573-045R | 07573TF-045R | R.045 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 07579-015R | 07579TF-015R | R.015 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 07579-030R | 07579TF-030R | R.030 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 07579-045R | 07579TF-045R | R.045 | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 07584-015R | 07584TF-015R | R.015 | 3/8 | 3/8 | 1 | 2-1/2 |
| 07584-030R | 07584TF-030R | R.030 | 3/8 | 3/8 | 1 | 2-1/2 |
| 07584-045R | 07584TF-045R | R.045 | 3/8 | 3/8 | 1 | 2-1/2 |
| 07584-060R | 07584TF-060R | R.060 | 3/8 | 3/8 | 1 | 2-1/2 |
| 07588-015R | 07588TF-015R | R.015 | 7/16 | 7/16 | 1 | 2-3/4 |
| 07588-030R | 07588TF-030R | R.030 | 7/16 | 7/16 | 1 | 2-3/4 |
| 07588-045R | 07588TF-045R | R.045 | 7/16 | 7/16 | 1 | 2-3/4 |
| 07588-060R | 07588TF-060R | R.060 | 7/16 | 7/16 | 1 | 2-3/4 |
| 07588-090R | 07588TF-090R | R.090 | 7/16 | 7/16 | 1 | 2-3/4 |
| 07593-015R | 07593TF-015R | R.015 | 1/2 | 1/2 | 1 | 3 |
| 07593-030R | 07593TF-030R | R.030 | 1/2 | 1/2 | 1 | 3 |
| 07593-045R | 07593TF-045R | R.045 | 1/2 | 1/2 | 1 | 3 |
| 07593-060R | 07593TF-060R | R.060 | 1/2 | 1/2 | 1 | 3 |
| 07593-090R | 07593TF-090R | R.090 | 1/2 | 1/2 | 1 | 3 |
| 07593-125R | 07593TF-125R | R.125 | 1/2 | 1/2 | 1 | 3 |
| 07595-015R | 07595TF-015R | R.015 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07595-030R | 07595TF-030R | R.030 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07595-045R | 07595TF-045R | R.045 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5216 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE REGULAR LENGTH CORNER RADIUS

▶ Suitable for cutting hardened & high alloy steels, steel casting, chill casting, malleable cast iron, CrNi-steels, brass, copper, aluminum with a high percentage of silicon and abrasive plastics.




MG | 4 | 30° | R ±.001 | PLAIN

P.1122

Unit : Inch

| EDP No. UNCOATED | EDP No. YG:TYLON F | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 07595-060R | 07595TF-060R | R.060 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07595-090R | 07595TF-090R | R.090 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07595-125R | 07595TF-125R | R.125 | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 07598-015R | 07598TF-015R | R.015 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07598-030R | 07598TF-030R | R.030 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07598-045R | 07598TF-045R | R.045 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07598-060R | 07598TF-060R | R.060 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07598-090R | 07598TF-090R | R.090 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07598-125R | 07598TF-125R | R.125 | 3/4 | 3/4 | 1-1/2 | 4 |
| 07600-015R | 07600TF-015R | R.015 | 1 | 1 | 1-1/2 | 4 |
| 07600-030R | 07600TF-030R | R.030 | 1 | 1 | 1-1/2 | 4 |
| 07600-045R | 07600TF-045R | R.045 | 1 | 1 | 1-1/2 | 4 |
| 07600-060R | 07600TF-060R | R.060 | 1 | 1 | 1-1/2 | 4 |
| 07600-090R | 07600TF-090R | R.090 | 1 | 1 | 1-1/2 | 4 |
| 07600-125R | 07600TF-125R | R.125 | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5069 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH CORNER RADIUS

▶ Designed to machine stainless steels, Inconols and other alloys.
▶ 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.




MG | 5 | 45° | R ±.001 | PLAIN

P.1118

Unit : Inch

| EDP No. | Corner Radius R | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 86573TF-030R | R.030 | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 86584TF-030R | R.030 | 3/8 | 3/8 | 1 | 2-1/2 |
| 86584TF-060R | R.060 | 3/8 | 3/8 | 1 | 2-1/2 |
| 86593TF-030R | R.030 | 1/2 | 1/2 | 1-1/4 | 3 |
| 86593TF-060R | R.060 | 1/2 | 1/2 | 1-1/4 | 3 |
| 86593TF-090R | R.090 | 1/2 | 1/2 | 1-1/4 | 3 |
| 86595TF-030R | R.030 | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 86595TF-060R | R.060 | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 86595TF-090R | R.090 | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 86595TF-125R | R.125 | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 86598TF-030R | R.030 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86598TF-060R | R.060 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86598TF-090R | R.090 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86598TF-125R | R.125 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86598TF-156R | R.156 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86598TF-187R | R.187 | 3/4 | 3/4 | 1-5/8 | 4 |
| 86600TF-030R | R.030 | 1 | 1 | 2 | 4 |
| 86600TF-060R | R.060 | 1 | 1 | 2 | 4 |
| 86600TF-090R | R.090 | 1 | 1 | 2 | 4 |
| 86600TF-125R | R.125 | 1 | 1 | 2 | 4 |
| 86600TF-156R | R.156 | 1 | 1 | 2 | 4 |
| 86600TF-187R | R.187 | 1 | 1 | 2 | 4 |

Any non stocked radius available in 1 week for uncoated tools

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

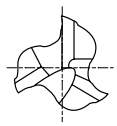
# CARBIDE END MILLS

**E5243 SERIES** PLAIN SHANK FLAT SHANK

## CARBIDE, 3 FLUTE 45° HELIX REGULAR LENGTH

- Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- The normal rake angle and 45° medium helix allows an extremely wide range of application.
- YG:TYLON super TiAlN coating are recommended for maximum performance.





MG | 3 | 45° | PLAIN | FLAT

Ø1/8~Ø5/16 Ø3/8~Ø1

P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| **34558** | **34558TN** | **34558TC** | **34558TF** | **34558TE** | **1/8** | 1/8 | 3/8 | 1-1/2 |
| **34565** | **34565TN** | **34565TC** | **34565TF** | **34565TE** | **3/16** | 3/16 | 9/16 | 2 |
| **34573** | **34573TN** | **34573TC** | **34573TF** | **34573TE** | **1/4** | 1/4 | 3/4 | 2-1/2 |
| **34579** | **34579TN** | **34579TC** | **34579TF** | **34579TE** | **5/16** | 5/16 | 13/16 | 2-1/2 |
| **34584** | **34584TN** | **34584TC** | **34584TF** | **34584TE** | **3/8** | 3/8 | 7/8 | 2-1/2 |
| **34593** | **34593TN** | **34593TC** | **34593TF** | **34593TE** | **1/2** | 1/2 | 1 | 3 |
| **34594** | **34594TN** | **34594TC** | **34594TF** | **34594TE** | **9/16** | 9/16 | 1-1/4 | 3-1/2 |
| **34595** | **34595TN** | **34595TC** | **34595TF** | **34595TE** | **5/8** | 5/8 | 1-1/4 | 3-1/2 |
| **34598** | **34598TN** | **34598TC** | **34598TF** | **34598TE** | **3/4** | 3/4 | 1-1/2 | 4 |
| **34600** | **34600TN** | **34600TC** | **34600TF** | **34600TE** | **1** | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

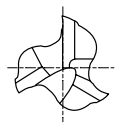
# CARBIDE END MILLS

**E5059 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 50° HELIX STUB & REGULAR & LONG LENGTH

- Designed to machine stainless steel, inconel, titanium and other hard to machine materials.
- It's 3 flute design gives high stability and allows good chip removal in plunging & slotting operations.
- The high rake angle and 50° helix allows an extremely wide range of application.
- YG:TYLON super TiAlN coating are recommended for maximum performance.



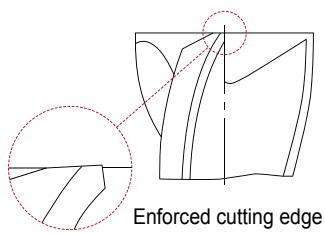


MG | 3 | 50° | PLAIN P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 83573 | 83573TN | 83573TC | 83573TF | 83573TE | 1/4 | 1/4 | 1/2 | 2 |
| 83901 | 83901TN | 83901TC | 83901TF | 83901TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 83902 | 83902TN | 83902TC | 83902TF | 83902TE | 1/4 | 1/4 | 1-1/4 | 3 |
| 83584 | 83584TN | 83584TC | 83584TF | 83584TE | 3/8 | 3/8 | 1/2 | 2 |
| 83903 | 83903TN | 83903TC | 83903TF | 83903TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 83904 | 83904TN | 83904TC | 83904TF | 83904TE | 3/8 | 3/8 | 1-1/2 | 3-1/2 |
| 83593 | 83593TN | 83593TC | 83593TF | 83593TE | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 83905 | 83905TN | 83905TC | 83905TF | 83905TE | 1/2 | 1/2 | 1 | 3 |
| 83906 | 83906TN | 83906TC | 83906TF | 83906TE | 1/2 | 1/2 | 2 | 4 |
| 83595 | 83595TN | 83595TC | 83595TF | 83595TE | 5/8 | 5/8 | 7/8 | 3 |
| 83907 | 83907TN | 83907TC | 83907TF | 83907TE | 5/8 | 5/8 | 2-1/2 | 6 |
| 83598 | 83598TN | 83598TC | 83598TF | 83598TE | 3/4 | 3/4 | 1 | 3-1/2 |
| 83908 | 83908TN | 83908TC | 83908TF | 83908TE | 3/4 | 3/4 | 3 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |



Enforced cutting edge

◎ : Excellent ○ : Good

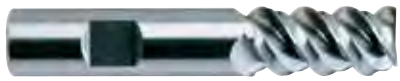
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

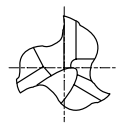
# CARBIDE END MILLS

**E5246 SERIES** PLAIN SHANK FLAT SHANK

## CARBIDE, 3 FLUTE 60° HELIX REGULAR LENGTH

▶ Excellent shearing and chip ejection due to 60˚ Helix.
▶ 20%～ 30% increase in chip load recommended over 30˚ helix tools.





MG | 3 | 60° | PLAIN | FLAT

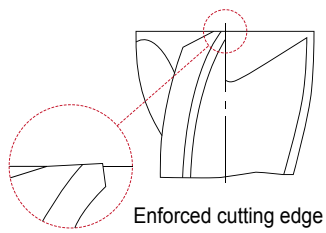
Ø1/8~Ø5/16 Ø3/8~Ø1

P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 20558 | 20558TN | 20558TC | 20558TF | 20558TE | 1/8 | 1/8 | 3/8 | 1-1/2 |
| 20565 | 20565TN | 20565TC | 20565TF | 20565TE | 3/16 | 3/16 | 9/16 | 2 |
| 20573 | 20573TN | 20573TC | 20573TF | 20573TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 20579 | 20579TN | 20579TC | 20579TF | 20579TE | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 20584 | 20584TN | 20584TC | 20584TF | 20584TE | 3/8 | 3/8 | 7/8 | 2-1/2 |
| 20593 | 20593TN | 20593TC | 20593TF | 20593TE | 1/2 | 1/2 | 1 | 3 |
| 20594 | 20594TN | 20594TC | 20594TF | 20594TE | 9/16 | 9/16 | 1-1/4 | 3-1/2 |
| 20595 | 20595TN | 20595TC | 20595TF | 20595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 20598 | 20598TN | 20598TC | 20598TF | 20598TE | 3/4 | 3/4 | 1-1/2 | 4 |
| 20600 | 20600TN | 20600TC | 20600TF | 20600TE | 1 | 1 | 1-1/2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

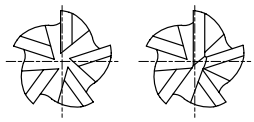
# CARBIDE END MILLS

**E5066 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE 45° HELIX STUB LENGTH

- Designed to machine stainless steels, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.





up to Ø3/16 over Ø3/16

MG 5 45° PLAIN P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 85558 | 85558TN | 85558TC | 85558TF | 85558TE | 1/8 | 1/8 | 1/4 | 1-1/2 |
| 85561 | 85561TN | 85561TC | 85561TF | 85561TE | 5/32 | 3/16 | 5/16 | 2 |
| 85565 | 85565TN | 85565TC | 85565TF | 85565TE | 3/16 | 3/16 | 5/16 | 2 |
| 85570 | 85570TN | 85570TC | 85570TF | 85570TE | 7/32 | 1/4 | 3/8 | 2 |
| 85573 | 85573TN | 85573TC | 85573TF | 85573TE | 1/4 | 1/4 | 3/8 | 2 |
| 85579 | 85579TN | 85579TC | 85579TF | 85579TE | 5/16 | 5/16 | 7/16 | 2 |
| 85584 | 85584TN | 85584TC | 85584TF | 85584TE | 3/8 | 3/8 | 1/2 | 2 |
| 85588 | 85588TN | 85588TC | 85588TF | 85588TE | 7/16 | 7/16 | 9/16 | 2-1/2 |
| 85593 | 85593TN | 85593TC | 85593TF | 85593TE | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 85595 | 85595TN | 85595TC | 85595TF | 85595TE | 5/8 | 5/8 | 3/4 | 3 |
| 85598 | 85598TN | 85598TC | 85598TF | 85598TE | 3/4 | 3/4 | 1 | 3 |
| 85600 | 85600TN | 85600TC | 85600TF | 85600TE | 1 | 1 | 1-1/4 | 3 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

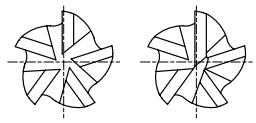
# CARBIDE END MILLS

**E5067 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE 45° HELIX REGULAR LENGTH

- Designed to machine stainless steels, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.





up to Ø3/16 over Ø3/16

MG | 5 | 45° | PLAIN P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 86558 | 86558TN | 86558TC | 86558TF | 86558TE | 1/8 | 1/8 | 1/2 | 1-1/2 |
| 86561 | 86561TN | 86561TC | 86561TF | 86561TE | 5/32 | 3/16 | 9/16 | 2 |
| 86565 | 86565TN | 86565TC | 86565TF | 86565TE | 3/16 | 3/16 | 9/16 | 2 |
| 86570 | 86570TN | 86570TC | 86570TF | 86570TE | 7/32 | 1/4 | 3/4 | 2-1/2 |
| 86573 | 86573TN | 86573TC | 86573TF | 86573TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 86579 | 86579TN | 86579TC | 86579TF | 86579TE | 5/16 | 5/16 | 13/16 | 2-1/2 |
| 86584 | 86584TN | 86584TC | 86584TF | 86584TE | 3/8 | 3/8 | 1 | 2-1/2 |
| 86588 | 86588TN | 86588TC | 86588TF | 86588TE | 7/16 | 7/16 | 1 | 2-3/4 |
| 86593 | 86593TN | 86593TC | 86593TF | 86593TE | 1/2 | 1/2 | 1-1/4 | 3 |
| 86595 | 86595TN | 86595TC | 86595TF | 86595TE | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 86598 | 86598TN | 86598TC | 86598TF | 86598TE | 3/4 | 3/4 | 1-5/8 | 4 |
| 86599 | 86599TN | 86599TC | 86599TF | 86599TE | 7/8 | 7/8 | 2 | 4 |
| 86600 | 86600TN | 86600TC | 86600TF | 86600TE | 1 | 1 | 2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

# CARBIDE END MILLS

**E5068 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE 45° HELIX MEDIUM & LONG LENGTH

- Designed to machine stainless steel, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.





MG | 5 | 45° | PLAIN

P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 58573 | 58573TN | 58573TC | 58573TF | 58573TE | 1/4 | 1/4 | 1-1/4 | 4 |
| 58579 | 58579TN | 58579TC | 58579TF | 58579TE | 5/16 | 5/16 | 1-1/4 | 4 |
| 58584 | 58584TN | 58584TC | 58584TF | 58584TE | 3/8 | 3/8 | 1-1/2 | 4 |
| 58588 | 58588TN | 58588TC | 58588TF | 58588TE | 7/16 | 7/16 | 2 | 4 |
| 58593 | 58593TN | 58593TC | 58593TF | 58593TE | 1/2 | 1/2 | 2 | 4 |
| 58595 | 58595TN | 58595TC | 58595TF | 58595TE | 5/8 | 5/8 | 2-1/2 | 5 |
| 58598 | 58598TN | 58598TC | 58598TF | 58598TE | 3/4 | 3/4 | 3-1/4 | 6 |
| 58901 | 58901TN | 58901TC | 58901TF | 58901TE | 3/4 | 3/4 | 2-1/4 | 5 |
| 58600 | 58600TN | 58600TC | 58600TF | 58600TE | 1 | 1 | 3-1/4 | 6 |
| 58902 | 58902TN | 58902TC | 58902TF | 58902TE | 1 | 1 | 2-5/8 | 6 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

# CARBIDE END MILLS

**E5073 SERIES** PLAIN SHANK

## CARBIDE, 5 FLUTE 45° HELIX EXTRA LONG LENGTH

- Designed to machine stainless steel, inconels and other alloys.
- The new design of stub length allows cutting at maximum speeds and feeds with minimum deflection
- 5 Flute and 45° medium helix allow harmonic balance and smooth cutting.





MG | 5 | 45° | PLAIN

P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| **59579** | **59579TN** | **59579TC** | **59579TF** | **59579TE** | **5/16** | 5/16 | 2-1/8 | 4 |
| **59584** | **59584TN** | **59584TC** | **59584TF** | **59584TE** | **3/8** | 3/8 | 2-1/2 | 6 |
| **59593** | **59593TN** | **59593TC** | **59593TF** | **59593TE** | **1/2** | 1/2 | 3-1/8 | 6 |
| **59595** | **59595TN** | **59595TC** | **59595TF** | **59595TE** | **5/8** | 5/8 | 4 | 6 |
| **59598** | **59598TN** | **59598TC** | **59598TF** | **59598TE** | **3/4** | 3/4 | 4 | 6 |
| **59600** | **59600TN** | **59600TC** | **59600TF** | **59600TE** | **1** | 1 | 4-1/8 | 7 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0003 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

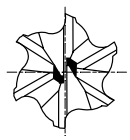
# CARBIDE END MILLS

**E5058 SERIES** PLAIN SHANK

## CARBIDE, 6 FLUTE 40° HELIX REGULAR LENGTH

- For finishing in most materials.
- 20～40% increase in inches per minute over 4 flute tools.
- YG:TYLON SUPER TiAlN coating recommended for maximum performance.





MG | 6 | 40° | PLAIN P.1118

Unit : Inch

| EDP No. | | | | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | |
| 84565 | 84565TN | 84565TC | 84565TF | 84565TE | 3/16 | 3/16 | 5/8 | 2 |
| 84573 | 84573TN | 84573TC | 84573TF | 84573TE | 1/4 | 1/4 | 3/4 | 2-1/2 |
| 84579 | 84579TN | 84579TC | 84579TF | 84579TE | 5/16 | 5/16 | 7/8 | 2-1/2 |
| 84584 | 84584TN | 84584TC | 84584TF | 84584TE | 3/8 | 3/8 | 7/8 | 2-1/2 |
| 84588 | 84588TN | 84588TC | 84588TF | 84588TE | 7/16 | 7/16 | 1 | 2-1/2 |
| 84593 | 84593TN | 84593TC | 84593TF | 84593TE | 1/2 | 1/2 | 1 | 3 |
| 84595 | 84595TN | 84595TC | 84595TF | 84595TE | 5/8 | 5/8 | 1-1/4 | 3-1/2 |
| 84598 | 84598TN | 84598TC | 84598TF | 84598TE | 3/4 | 3/4 | 1-1/2 | 4 |

| MATERIAL HARDNESS | | |
|---|---|---|
| Recommended Coating | Under 45 Rc F | Over 45 Rc E |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.0012 | 0~−.0005 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | ○ | ○ | | | | | ○ | ○ |

# CARBIDE END MILLS

**E5056 SERIES** FLAT SHANK
**E5057 SERIES** FLAT SHANK

## CARBIDE, 5 FLUTE 45° HELIX STUB & REGULAR LENGTH FINE PITCH ROUGHING CORNER RADIUS

- 5 flute design gives minimum harmonic vibration.
- Stub tools for minimum deflection and maximum rigidity.
- Ideal for profile milling.
- Not recommended for slotting.




MG FINE 5 45° FLAT P.1118

**E5056 Series** ■ STUB LENGTH

Unit : Inch

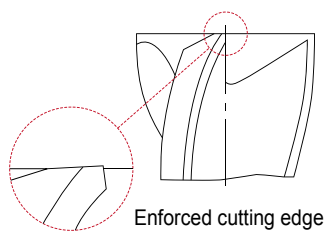
| EDP No. | | | | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R | | | | |
| 81584 | 81584TN | 81584TC | 81584TF | 81584TE | .040 | 3/8 | 3/8 | 1/2 | 2 |
| 81593 | 81593TN | 81593TC | 81593TF | 81593TE | .040 | 1/2 | 1/2 | 5/8 | 2-1/2 |
| 81595 | 81595TN | 81595TC | 81595TF | 81595TE | .060 | 5/8 | 5/8 | 3/4 | 3 |
| 81598 | 81598TN | 81598TC | 81598TF | 81598TE | .060 | 3/4 | 3/4 | 1 | 3 |
| 81600 | 81600TN | 81600TC | 81600TF | 81600TE | .060 | 1 | 1 | 1-1/4 | 3 |

**E5057 Series** ■ REGULAR LENGTH

Unit : Inch

| EDP No. | | | | | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R | | | | |
| 82584 | 82584TN | 82584TC | 82584TF | 82584TE | .040 | 3/8 | 3/8 | 1 | 2-1/2 |
| 82593 | 82593TN | 82593TC | 82593TF | 82593TE | .040 | 1/2 | 1/2 | 1-1/4 | 3 |
| 82595 | 82595TN | 82595TC | 82595TF | 82595TE | .060 | 5/8 | 5/8 | 1-5/8 | 3-1/2 |
| 82598 | 82598TN | 82598TC | 82598TF | 82598TE | .060 | 3/4 | 3/4 | 1-5/8 | 4 |
| 82600 | 82600TN | 82600TC | 82600TF | 82600TE | .060 | 1 | 1 | 2 | 4 |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|---|---|
| 0~−.003 | 0~−.0005 |


Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ◎ | | | | | | | ○ | |

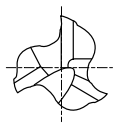
# CARBIDE END MILLS

**E5077 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE TAPER

▶ Designed for milling die cavity.
▶ Many different center line angles are available on your job requirement.





MG | 3 | 30° | PLAIN P.1118

Unit : Inch

| EDP No. | | | | | Cutting Small Diameter | Shank Diameter | Length of Cut | Overall Length | Center Ling Angle |
|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | | | | | |
| 87552 | 87552TN | 87552TC | 87552TF | 87552TE | 1/8 | 1/4 | 1-1/2 | 3 | 1° |
| 87553 | 87553TN | 87553TC | 87553TF | 87553TE | 1/8 | 1/4 | 1-1/2 | 3 | 1.5° |
| 87554 | 87554TN | 87554TC | 87554TF | 87554TE | 1/8 | 1/4 | 1-1/4 | 3 | 2° |
| 87556 | 87556TN | 87556TC | 87556TF | 87556TE | 1/8 | 1/4 | 1 | 3 | 3° |
| 87560 | 87560TN | 87560TC | 87560TF | 87560TE | 1/8 | 1/4 | 3/4 | 3 | 5° |
| 87564 | 87564TN | 87564TC | 87564TF | 87564TE | 1/8 | 1/4 | 1/2 | 3 | 7° |
| 87570 | 87570TN | 87570TC | 87570TF | 87570TE | 3/32 | 1/4 | 1/2 | 3 | 10° |
| 87572 | 87572TN | 87572TC | 87572TF | 87572TE | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 1° |
| 87573 | 87573TN | 87573TC | 87573TF | 87573TE | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 1.5° |
| 87574 | 87574TN | 87574TC | 87574TF | 87574TE | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 2° |
| 87576 | 87576TN | 87576TC | 87576TF | 87576TE | 5/32 | 3/8 | 1-3/4 | 3-1/2 | 3° |
| 87580 | 87580TN | 87580TC | 87580TF | 87580TE | 1/8 | 3/8 | 1-1/2 | 3-1/2 | 5° |
| 87584 | 87584TN | 87584TC | 87584TF | 87584TE | 1/8 | 3/8 | 1 | 3-1/2 | 7° |
| 87590 | 87590TN | 87590TC | 87590TF | 87590TE | 1/8 | 3/8 | 3/4 | 3-1/2 | 10° |
| 87592 | 87592TN | 87592TC | 87592TF | 87592TE | 1/4 | 1/2 | 2 | 4 | 1° |
| 87594 | 87594TN | 87594TC | 87594TF | 87594TE | 1/4 | 1/2 | 2 | 4 | 2° |
| 87596 | 87596TN | 87596TC | 87596TF | 87596TE | 1/4 | 1/2 | 2 | 4 | 3° |
| 87600 | 87600TN | 87600TC | 87600TF | 87600TE | 1/4 | 1/2 | 1-1/4 | 4 | 5° |
| 87902 | 87902TN | 87902TC | 87902TF | 87902TE | 3/16 | 1/2 | 1-1/4 | 4 | 7° |
| 87903 | 87903TN | 87903TC | 87903TF | 87903TE | 1/8 | 1/2 | 1 | 4 | 10° |

| Cutting Small Dia. Tolerance(mm) | | Shank Dia. Tolerance | Center Line Angle Tolerance |
|---|---|---|---|
| Ø1/16 ~ Ø1/4 | 0~−.0020 | 0~−.0005 | ±5′ |
| Ø17/64 ~ Ø1 | 0~−.0030 | | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**E5078 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE TAPER BALL NOSE

▶ Designed for milling die cavity.
▶ Many different center line angles are available on your job requirement.




MG | 3 | 30° | R ±.0008 | PLAIN P.1118

Unit : Inch

| EDP No. | | | | | TIP Radius | Cutting Small Diameter | Shank Diameter | Length of Cut | Overall Length | Center Ling Angle |
|---|---|---|---|---|---|---|---|---|---|---|
| UNCOATED | TiN COATED | TiCN COATED | YG:TYLON F | YG:TYLON E | R (±.0008) | | | | | |
| 88552 | 88552TN | 88552TC | 88552TF | 88552TE | .062 | 1/8 | 1/4 | 1-1/2 | 3 | 1° |
| 88553 | 88553TN | 88553TC | 88553TF | 88553TE | .062 | 1/8 | 1/4 | 1-1/2 | 3 | 1.5° |
| 88554 | 88554TN | 88554TC | 88554TF | 88554TE | .062 | 1/8 | 1/4 | 1-1/4 | 3 | 2° |
| 88556 | 88556TN | 88556TC | 88556TF | 88556TE | .062 | 1/8 | 1/4 | 1 | 3 | 3° |
| 88560 | 88560TN | 88560TC | 88560TF | 88560TE | .062 | 1/8 | 1/4 | 3/4 | 3 | 5° |
| 88564 | 88564TN | 88564TC | 88564TF | 88564TE | .062 | 1/8 | 1/4 | 1/2 | 3 | 7° |
| 88570 | 88570TN | 88570TC | 88570TF | 88570TE | .047 | 3/32 | 1/4 | 1/2 | 3 | 10° |
| 88572 | 88572TN | 88572TC | 88572TF | 88572TE | .093 | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 1° |
| 88573 | 88573TN | 88573TC | 88573TF | 88573TE | .093 | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 1.5° |
| 88574 | 88574TN | 88574TC | 88574TF | 88574TE | .093 | 3/16 | 3/8 | 1-3/4 | 3-1/2 | 2° |
| 88576 | 88576TN | 88576TC | 88576TF | 88576TE | .078 | 5/32 | 3/8 | 1-3/4 | 3-1/2 | 3° |
| 88580 | 88580TN | 88580TC | 88580TF | 88580TE | .062 | 1/8 | 3/8 | 1-1/2 | 3-1/2 | 5° |
| 88584 | 88584TN | 88584TC | 88584TF | 88584TE | .062 | 1/8 | 3/8 | 1 | 3-1/2 | 7° |
| 88590 | 88590TN | 88590TC | 88590TF | 88590TE | .062 | 1/8 | 3/8 | 3/4 | 3-1/2 | 10° |
| 88592 | 88592TN | 88592TC | 88592TF | 88592TE | .125 | 1/4 | 1/2 | 2 | 4 | 1° |
| 88594 | 88594TN | 88594TC | 88594TF | 88594TE | .125 | 1/4 | 1/2 | 2 | 4 | 2° |
| 88596 | 88596TN | 88596TC | 88596TF | 88596TE | .125 | 1/4 | 1/2 | 2 | 4 | 3° |
| 88600 | 88600TN | 88600TC | 88600TF | 88600TE | .125 | 1/4 | 1/2 | 1-1/4 | 4 | 5° |
| 88902 | 88902TN | 88902TC | 88902TF | 88902TE | .093 | 3/16 | 1/2 | 1-1/4 | 4 | 7° |
| 88903 | 88903TN | 88903TC | 88903TF | 88903TE | .062 | 1/8 | 1/2 | 1 | 4 | 10° |

| Cutting Small Dia. Tolerance(mm) | | Shank Dia. Tolerance | Center Line Angle Tolerance |
|---|---|---|---|
| Ø1/16 ~ Ø1/4 | 0~−.0020 | 0~−.0005 | ±5′ |
| Ø17/64 ~ Ø1 | 0~−.0030 | | |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**EH527 SERIES** PLAIN SHANK

## CARBIDE, 2 FLUTE LONG LENGTH - TiAlN 'F' Coated



MG | DIN 6528 | N | 2 | 30° | DIN 6535HA P.1125

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| | h10 | | h6 | | |
| EH527035 | 3.5 | .1378 | 3.5 | 7 | 50 |
| EH527040 | 4.0 | .1575 | 4 | 8 | 50 |
| EH527045 | 4.5 | .1772 | 4.5 | 8 | 50 |
| EH527050 | 5.0 | .1969 | 5 | 10 | 50 |
| EH527055 | 5.5 | .2165 | 5.5 | 10 | 57 |
| EH527060 | 6.0 | .2362 | 6 | 10 | 57 |
| EH527065 | 6.5 | .2559 | 6.5 | 13 | 60 |
| EH527070 | 7.0 | .2756 | 7 | 13 | 60 |
| EH527075 | 7.5 | .2953 | 7.5 | 16 | 63 |
| EH527080 | 8.0 | .3150 | 8 | 16 | 63 |
| EH527085 | 8.5 | .3346 | 8.5 | 16 | 67 |
| EH527090 | 9.0 | .3543 | 9 | 16 | 67 |
| EH527095 | 9.5 | .3740 | 9.5 | 19 | 72 |
| EH527100 | 10.0 | .3937 | 10 | 19 | 72 |
| EH527110 | 11.0 | .4330 | 11 | 22 | 83 |
| EH527120 | 12.0 | .4724 | 12 | 22 | 83 |
| EH527130 | 13.0 | .5118 | 13 | 22 | 83 |
| EH527140 | 14.0 | .5512 | 14 | 22 | 83 |
| EH527150 | 15.0 | .5905 | 15 | 26 | 92 |
| EH527160 | 16.0 | .6299 | 16 | 26 | 92 |
| EH527180 | 18.0 | .7087 | 18 | 26 | 92 |
| EH527200 | 20.0 | .7874 | 20 | 32 | 104 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |

◎ : Excellent ○ : Good

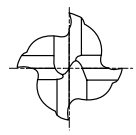
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**EH540 SERIES** PLAIN SHANK

## CARBIDE, 4 FLUTE LONG LENGTH - TiAlN 'F' Coated





MG | DIN 6528 | N | 4 | 30° | DIN 6535HA

P.1125

Unit : mm

| EDP No. | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| | Metric | Inch | | | |
| | h10 | | h6 | | |
| EH540035 | 3.5 | .1378 | 3.5 | 10 | 50 |
| EH540040 | 4.0 | .1575 | 4 | 11 | 50 |
| EH540045 | 4.5 | .1772 | 4.5 | 11 | 50 |
| EH540050 | 5.0 | .1969 | 5 | 13 | 50 |
| EH540055 | 5.5 | .2165 | 5.5 | 13 | 57 |
| EH540060 | 6.0 | .2362 | 6 | 13 | 57 |
| EH540065 | 6.5 | .2559 | 6.5 | 16 | 60 |
| EH540070 | 7.0 | .2756 | 7 | 16 | 60 |
| EH540075 | 7.5 | .2953 | 7.5 | 19 | 63 |
| EH540080 | 8.0 | .3150 | 8 | 19 | 63 |
| EH540085 | 8.5 | .3346 | 8.5 | 19 | 67 |
| EH540090 | 9.0 | .3543 | 9 | 19 | 67 |
| EH540095 | 9.5 | .3740 | 9.5 | 22 | 72 |
| EH540100 | 10.0 | .3937 | 10 | 22 | 72 |
| EH540110 | 11.0 | .4330 | 11 | 26 | 83 |
| EH540120 | 12.0 | .4724 | 12 | 26 | 83 |
| EH540130 | 13.0 | .5118 | 13 | 26 | 83 |
| EH540140 | 14.0 | .5512 | 14 | 26 | 83 |
| EH540150 | 15.0 | .5905 | 15 | 32 | 92 |
| EH540160 | 16.0 | .6299 | 16 | 32 | 92 |
| EH540180 | 18.0 | .7087 | 18 | 32 | 92 |
| EH540200 | 20.0 | .7874 | 20 | 38 | 104 |

**Tolerances according to DIN 7160 & 7161**

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | ○ | ○ | ○ | | ○ | | | | |

# CARBIDE END MILLS

**EH882 SERIES** PLAIN SHANK

## CARBIDE, 3 FLUTE 35 ° HELIX CORNER RADIUS - TiAlN 'F' Coated




MG | DIN 6527 | N | 3 | 35° | DIN 6535HA

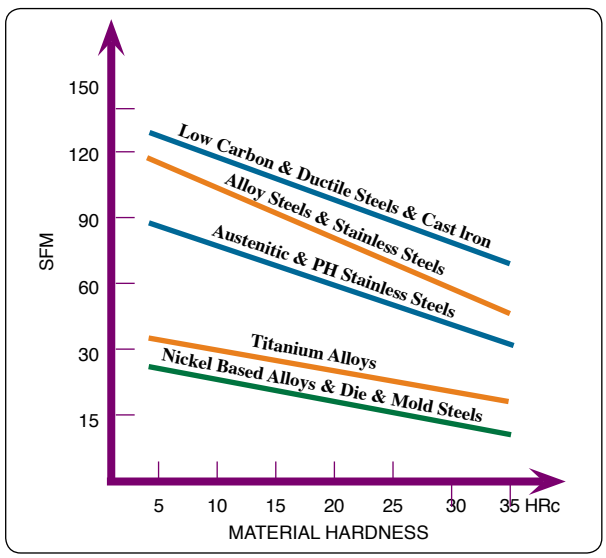
Unit : mm

| EDP No. | Corner Radius | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| | | Metric | Inch | | | |
| | R | h10 | | h6 | | |
| EH882030 | 0.20~0.25 | 3.0 | .1181 | 3 | 4 | 38 |
| EH882040 | 0.20~0.25 | 4.0 | .1575 | 6 | 5 | 54 |
| EH882050 | 0.20~0.25 | 5.0 | .1969 | 6 | 6 | 54 |
| EH882060 | 0.40~0.50 | 6.0 | .2362 | 6 | 7 | 54 |
| EH882080 | 0.40~0.50 | 8.0 | .3150 | 8 | 9 | 58 |
| EH882100 | 0.40~0.50 | 10.0 | .3937 | 10 | 11 | 66 |
| EH882120 | 0.75~0.85 | 12.0 | .4724 | 12 | 12 | 73 |
| EH882160 | 0.75~0.85 | 16.0 | .6299 | 16 | 16 | 82 |
| EH882200 | 0.75~0.85 | 20.0 | .7874 | 20 | 20 | 92 |

▶TiN & TiCN-COATING are available on your request.

### Tolerances according to DIN 7160 & 7161

| Tolerance range in μm | | | | | |
|---|---|---|---|---|---|
| Nominal-Diameter in mm | | | | | |
| | from 1 to 3 | over 3 to 6 | over 6 to 10 | over 10 to 18 | over 18 to 30 |
| h10 | 0 / — 40 | 0 / — 48 | 0 / — 58 | 0 / — 70 | 0 / — 84 |
| h6 | 0 / — 6 | 0 / — 8 | 0 / — 9 | 0 / — 11 | 0 / — 13 |




### TiAlN FEED CHART

Unit : inch

| Mill Diameter | Feed / Tooth | Mill Diameter | Feed / Tooth |
|---|---|---|---|
| 3 | .0035 ~ .0070 | 10 | .0018 ~ .0040 |
| 5 | .0050 ~ .0025 | 12 | .0025 ~ .0050 |
| 6 | .0012 ~ .0030 | 16 | .0030 ~ .0060 |
| 8 | .0018 ~ .0035 | 20 | .0035 ~ .0070 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | ○ | | | | ○ | ◎ | | ◎ | | | | |

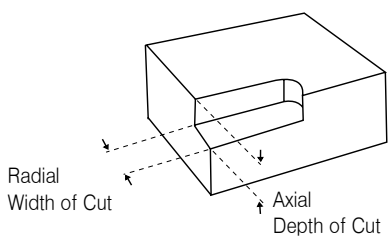
# CARBIDE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## SPEED & FEED RECOMMENDATIONS

| Material | Speed | Chip Load per Tooth by End Mill Diameter | | | Recommended Coating |
|---|---|---|---|---|---|
| | | Up to 1/4" | Up to 1/2" | Up to 1" | |
| **Carbon + Alloy Steel <45Rc** | 100-700 | .0002-.002 | .001-.003 | .003-.007 | TF |
| **Carbon + Alloy Steel >45Rc** | 50-400 | .0002-.001 | .0005-.0015 | .001-.003 | TE |
| **Stainless Steels Non-Hardenable 200-300 Series** | 150-500 | .0002-.001 | .001-.002 | .002-.006 | TF |
| **Stainless Steels Hardenable 400 Series Martensitic and PH Series** | 100-450 | .0002-.0005 | .0005-.001 | .001-.005 | TF |
| **Cast+Ductile Iron** | 100-800 | .0002-.0015 | .002-.003 | .003-.008 | TF or TE |
| **Nickel+Cobalt Based Alloys** | 20-200 | .0003-.0008 | .0008-.001 | .001-.002 | TE |
| **Titanium** | 30-200 | .0002-.0008 | .0008-.002 | .002-.004 | TE |
| **Aluminum** | 600-2000 | .0002-.002 | .002-.004 | .004-.008 | TiCN |
| **Copper** | 300-1000 | .0005-.002 | .002-.003 | .003-.006 | CrN |
| **Brass+ Bronze Alloys**<br>**Graphite** | 600-1000<br>600-1000 | .0005-.002<br>.0005-.005 | .002-.003<br>.001-.008 | .003-.006<br>.002-.010 | TiCN<br>D |
| **Plastic** | 600-1200 | .0006-.003 | .003-.006 | .006-.012 | TF |

**TF** = YG:TYLON F
**TE** = YG:TYLON E
**D** = DIAMOND
**CrN** = CROME NITRIDE




### SPEED & FEED DETERMINANTS

1. MATERIAL HARDNESS
2. MACHINE RIGIDITY
3. TYPE OF COATING
4. TOOL GEOMETRY
5. FINISH REQUIREMENTS
6. DEPTH & WIDTH OF CUT

# CARBIDE END MILLS

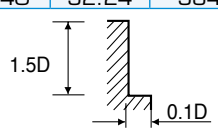
## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE - SIDE CUTTING

### UGMF89, UGMGF57, UGMGF58, UGMGF59 SERIES

| WORK MATERIAL | P | | | | | | | | | | | | M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | STAINLESS STEELS TITANIUM ALLOYS | | | |
| HARDNESS | ~ HRc 20 | | | | HRc 20 ~ HRc 30 | | | | HRc 30 ~ HRc 40 | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | | | 800N/mm² ~ 1000N/mm² | | | | 1000/mm² ~ 1300N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/16 | 11200 | 15.38 | 183 | .0003 | 9640 | 13.40 | 158 | .0003 | 8090 | 10.42 | 132 | .0003 | 15560 | 12.90 | 255 | .0002 |
| 5/64 | 10080 | 15.38 | 206 | .0004 | 8680 | 13.40 | 178 | .0004 | 7280 | 10.42 | 149 | .0004 | 14000 | 12.90 | 287 | .0002 |
| 3/32 | 9070 | 15.38 | 223 | .0004 | 7810 | 13.40 | 192 | .0004 | 6550 | 10.42 | 161 | .0004 | 12600 | 12.90 | 309 | .0003 |
| 7/64 | 7560 | 16.37 | 217 | .0005 | 6550 | 14.39 | 188 | .0005 | 5420 | 10.91 | 155 | .0005 | 10650 | 12.90 | 305 | .0003 |
| 1/8 | 6050 | 17.37 | 198 | .0007 | 5290 | 15.37 | 173 | .0007 | 4280 | 11.41 | 140 | .0007 | 8690 | 12.90 | 285 | .0004 |
| 9/64 | 5320 | 17.37 | 196 | .0008 | 4600 | 15.37 | 169 | .0008 | 3780 | 11.41 | 139 | .0008 | 7620 | 12.90 | 281 | .0004 |
| 5/32 | 4590 | 17.37 | 188 | .0009 | 3910 | 15.37 | 160 | .0010 | 3280 | 11.41 | 134 | .0009 | 6550 | 12.90 | 268 | .0005 |
| 11/64 | 4100 | 17.37 | 185 | .0011 | 3530 | 15.37 | 159 | .0011 | 2900 | 11.41 | 131 | .0010 | 5920 | 12.90 | 267 | .0005 |
| 3/16 | 3600 | 17.37 | 177 | .0012 | 3150 | 15.37 | 155 | .0012 | 2520 | 11.41 | 124 | .0011 | 5290 | 12.90 | 260 | .0006 |
| 13/64 | 3460 | 17.37 | 184 | .0013 | 2990 | 15.37 | 159 | .0013 | 2430 | 11.41 | 129 | .0012 | 5040 | 12.90 | 268 | .0006 |
| 7/32 | 3310 | 17.37 | 190 | .0013 | 2840 | 15.37 | 162 | .0014 | 2330 | 11.41 | 134 | .0012 | 4790 | 12.90 | 275 | .0007 |
| 15/64 | 3170 | 17.37 | 195 | .0014 | 2680 | 15.37 | 164 | .0014 | 2240 | 11.41 | 138 | .0013 | 4540 | 12.90 | 279 | .0007 |
| 1/4 | 3020 | 17.37 | 198 | .0014 | 2520 | 15.37 | 165 | .0015 | 2140 | 11.41 | 140 | .0013 | 4280 | 12.90 | 280 | .0008 |
| 9/32 | 2650 | 17.37 | 195 | .0016 | 2210 | 15.37 | 162 | .0017 | 1890 | 11.41 | 139 | .0015 | 3780 | 12.90 | 279 | .0009 |
| 5/16 | 2270 | 17.37 | 186 | .0019 | 1890 | 15.37 | 155 | .0020 | 1640 | 11.41 | 134 | .0017 | 3280 | 12.90 | 269 | .0010 |
| 3/8 | 1760 | 17.37 | 173 | .0025 | 1510 | 15.37 | 149 | .0025 | 1260 | 11.41 | 124 | .0023 | 2520 | 12.90 | 248 | .0013 |
| 7/16 | 1640 | 17.37 | 188 | .0026 | 1390 | 15.37 | 159 | .0028 | 1170 | 11.41 | 134 | .0024 | 2330 | 12.90 | 267 | .0014 |
| 1/2 | 1510 | 17.37 | 198 | .0029 | 1260 | 15.37 | 165 | .0031 | 1080 | 11.41 | 141 | .0026 | 2140 | 12.90 | 280 | .0015 |
| 9/16 | 1260 | 17.37 | 186 | .0034 | 1130 | 15.37 | 167 | .0034 | 930 | 11.41 | 137 | .0031 | 1760 | 12.90 | 259 | .0018 |
| 5/8 | 1130 | 19.34 | 185 | .0043 | 1010 | 16.87 | 165 | .0042 | 820 | 14.39 | 134 | .0044 | 1640 | 14.39 | 269 | .0022 |
| 3/4 | 980 | 19.34 | 193 | .0049 | 830 | 16.87 | 164 | .0051 | 690 | 14.39 | 136 | .0052 | 1350 | 15.37 | 265 | .0028 |
| 7/8 | 830 | 17.41 | 190 | .0052 | 700 | 16.87 | 160 | .0054 | 590 | 12.95 | 135 | .0055 | 1130 | 13.83 | 259 | .0031 |
| 1 | 750 | 15.67 | 197 | .0052 | 630 | 16.87 | 165 | .0054 | 530 | 11.65 | 139 | .0055 | 1020 | 12.45 | 267 | .0031 |

| WORK MATERIAL | K | | | | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | ALUMINIUM ALLOYS | | | | COPPER, BRASS NON-FERROUS METALS | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/16 | 13220 | 28.77 | 216 | .0005 | 31110 | 59.52 | 509 | .0005 | 23330 | 46.63 | 382 | .0005 |
| 5/64 | 11900 | 28.77 | 244 | .0006 | 28000 | 59.52 | 573 | .0005 | 21000 | 46.63 | 430 | .0006 |
| 3/32 | 10710 | 28.77 | 263 | .0007 | 25200 | 59.52 | 619 | .0006 | 18900 | 46.63 | 464 | .0006 |
| 7/64 | 8820 | 28.77 | 253 | .0008 | 21420 | 59.52 | 614 | .0007 | 15750 | 46.63 | 451 | .0007 |
| 1/8 | 6930 | 28.77 | 227 | .0010 | 17640 | 59.52 | 578 | .0008 | 12600 | 46.63 | 413 | .0009 |
| 9/64 | 6110 | 28.77 | 225 | .0012 | 15120 | 59.52 | 557 | .0010 | 11340 | 46.63 | 418 | .0010 |
| 5/32 | 5290 | 28.77 | 217 | .0014 | 12600 | 59.52 | 516 | .0012 | 10080 | 46.63 | 413 | .0012 |
| 11/64 | 4730 | 28.77 | 213 | .0015 | 11530 | 59.52 | 519 | .0013 | 8950 | 46.63 | 403 | .0013 |
| 3/16 | 4160 | 28.77 | 204 | .0017 | 10460 | 59.52 | 514 | .0014 | 7810 | 46.63 | 384 | .0015 |
| 13/64 | 3970 | 30.26 | 211 | .0019 | 10020 | 60.77 | 533 | .0015 | 7500 | 47.37 | 399 | .0016 |
| 7/32 | 3780 | 31.75 | 217 | .0021 | 9580 | 62.01 | 549 | .0016 | 7180 | 48.12 | 412 | .0017 |
| 15/64 | 3590 | 33.24 | 220 | .0023 | 9140 | 63.25 | 561 | .0017 | 6870 | 48.86 | 422 | .0018 |
| 1/4 | 3400 | 34.72 | 223 | .0026 | 8690 | 64.49 | 569 | .0019 | 6550 | 49.60 | 429 | .0019 |
| 9/32 | 2960 | 35.72 | 218 | .0030 | 7620 | 64.49 | 561 | .0021 | 5800 | 49.60 | 427 | .0021 |
| 5/16 | 2520 | 36.71 | 206 | .0036 | 6550 | 64.49 | 536 | .0025 | 5040 | 49.60 | 413 | .0025 |
| 3/8 | 2140 | 38.69 | 210 | .0045 | 5290 | 64.49 | 520 | .0030 | 3910 | 49.60 | 384 | .0032 |
| 7/16 | 1890 | 39.68 | 217 | .0052 | 4790 | 64.49 | 549 | .0034 | 3590 | 49.60 | 412 | .0035 |
| 1/2 | 1640 | 40.68 | 215 | .0062 | 4280 | 64.49 | 561 | .0038 | 3280 | 49.60 | 430 | .0038 |
| 9/16 | 1510 | 42.66 | 223 | .0071 | 3780 | 64.49 | 557 | .0043 | 2770 | 49.60 | 408 | .0045 |
| 5/8 | 1260 | 43.66 | 206 | .0087 | 3280 | 64.49 | 537 | .0049 | 2520 | 49.60 | 413 | .0049 |
| 3/4 | 1100 | 38.69 | 216 | .0088 | 2710 | 64.49 | 533 | .0059 | 2100 | 49.60 | 413 | .0059 |
| 7/8 | 950 | 34.82 | 218 | .0092 | 2270 | 58.04 | 520 | .0064 | 1770 | 44.64 | 406 | .0063 |
| 1 | 850 | 31.34 | 223 | .0092 | 2040 | 52.24 | 534 | .0064 | 1590 | 40.18 | 417 | .0063 |




RPM = rev./min.
Feed = inch/min.
SFM = ft/min
Fz = inch/tooth

# CARBIDE END MILLS

## RECOMMENDED CUTTING CONDITIONS

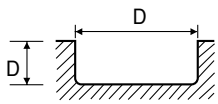
## CARBIDE, 2 FLUTE - SLOTTING

### UGMF90 SERIES

| WORK MATERIAL | P | | | | | | | | | | | | M | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | STAINLESS STEELS TITANIUM ALLOYS | | | |
| HARDNESS | ~ HRc 20 | | | | HRc 20 ~ HRc 30 | | | | HRc 30 ~ HRc 40 | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | | | 800N/mm² ~ 1000N/mm² | | | | 1000/mm² ~ 1300N/mm² | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/8 | 6050 | 5.94 | 198 | .0005 | 5290 | 5.21 | 173 | .0005 | 4280 | 3.97 | 140 | .0005 | 8690 | 4.22 | 285 | .0002 |
| 3/16 | 3600 | 5.94 | 177 | .0008 | 3150 | 5.21 | 155 | .0008 | 2520 | 3.97 | 124 | .0008 | 5290 | 4.22 | 260 | .0004 |
| 1/4 | 3020 | 5.94 | 198 | .0010 | 2520 | 5.21 | 165 | .0010 | 2140 | 3.97 | 140 | .0009 | 4280 | 4.22 | 280 | .0005 |
| 3/8 | 1760 | 5.94 | 173 | .0017 | 1510 | 5.21 | 148 | .0017 | 1260 | 3.97 | 124 | .0016 | 2520 | 4.22 | 248 | .0008 |
| 1/2 | 1510 | 5.94 | 198 | .0020 | 1260 | 5.21 | 165 | .0021 | 1080 | 3.97 | 141 | .0018 | 2140 | 4.22 | 280 | .0010 |
| 5/8 | 1130 | 6.45 | 185 | .0029 | 1010 | 5.46 | 165 | .0027 | 820 | 4.97 | 134 | .0030 | 1640 | 4.97 | 269 | .0015 |
| 3/4 | 980 | 6.45 | 193 | .0033 | 830 | 5.46 | 163 | .0033 | 690 | 4.97 | 136 | .0036 | 1350 | 4.97 | 265 | .0018 |
| 1 | 750 | 5.22 | 197 | .0035 | 630 | 4.42 | 165 | .0035 | 530 | 4.02 | 139 | .0038 | 1020 | 4.02 | 267 | .0020 |

| WORK MATERIAL | K | | | | N | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CAST IRON | | | | ALUMINIUM ALLOYS | | | | COPPER, BRASS NON-FERROUS METALS | | | |
| HARDNESS | | | | | | | | | | | | |
| STRENGTH | | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/8 | 6930 | 9.91 | 227 | .0007 | 17640 | 20.84 | 578 | .0006 | 12600 | 15.37 | 413 | .0006 |
| 3/16 | 4160 | 9.91 | 204 | .0012 | 10460 | 20.84 | 514 | .0010 | 7810 | 15.37 | 384 | .0010 |
| 1/4 | 3400 | 11.41 | 223 | .0017 | 8690 | 21.82 | 569 | .0013 | 6550 | 16.87 | 429 | .0013 |
| 3/8 | 2140 | 12.90 | 210 | .0030 | 5290 | 21.82 | 520 | .0021 | 3910 | 16.87 | 384 | .0022 |
| 1/2 | 1640 | 13.40 | 215 | .0041 | 4280 | 21.82 | 561 | .0025 | 3280 | 16.87 | 430 | .0026 |
| 5/8 | 1260 | 14.39 | 206 | .0057 | 3280 | 21.82 | 537 | .0033 | 2520 | 16.87 | 413 | .0033 |
| 3/4 | 1100 | 15.37 | 216 | .0070 | 2710 | 21.82 | 533 | .0040 | 2100 | 16.87 | 413 | .0040 |
| 1 | 850 | 12.45 | 223 | .0073 | 2040 | 17.67 | 534 | .0043 | 1590 | 13.67 | 417 | .0043 |

RPM = rev./min.
Feed = inch/min.
SFM = ft/min
Fz = inch/tooth

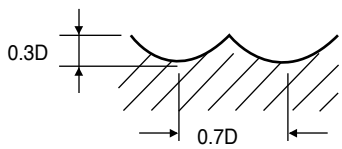



## CARBIDE, 4 FLUTE BALL NOSE

### UGMF91 SERIES

| WORK MATERIAL | P | | | | | | | | K | | | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CARBON STEELS ALLOY STEELS TOOL STEELS | | | | CAST IRON | | | | ALUMINIUM ALLOYS | | | |
| HARDNESS | ~ HRc 30 | | | | HRc 30 ~ HRc 40 | | | | | | | | | | | |
| STRENGTH | ~ 1000N/mm² | | | | 1000N/mm² ~ 1300N/mm² | | | | | | | | | | | |
| DIAMETER | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz | RPM | FEED | SFM | Fz |
| 1/8 | 5670 | 9.91 | 186 | .0004 | 4790 | 4.46 | 157 | .0002 | 8060 | 15.37 | 264 | .0005 | 23440 | 27.28 | 768 | .0003 |
| 3/16 | 3400 | 10.42 | 167 | .0008 | 2770 | 4.46 | 136 | .0004 | 4790 | 22.32 | 235 | .0012 | 13860 | 32.25 | 681 | .0006 |
| 1/4 | 2770 | 9.91 | 181 | .0009 | 2380 | 4.46 | 156 | .0005 | 3910 | 24.31 | 256 | .0016 | 11840 | 32.25 | 776 | .0007 |
| 3/8 | 1640 | 8.94 | 161 | .0014 | 1390 | 4.46 | 137 | .0008 | 2380 | 30.77 | 234 | .0032 | 7060 | 36.71 | 694 | .0013 |
| 1/2 | 1390 | 8.43 | 182 | .0015 | 1200 | 4.46 | 157 | .0009 | 2020 | 30.77 | 265 | .0038 | 5920 | 42.65 | 776 | .0018 |
| 5/8 | 1070 | 8.43 | 175 | .0020 | 880 | 4.46 | 144 | .0013 | 1510 | 31.74 | 247 | .0052 | 4410 | 36.71 | 722 | .0021 |
| 3/4 | 980 | 8.43 | 193 | .0022 | 800 | 4.46 | 157 | .0014 | 1320 | 31.74 | 259 | .0060 | 4030 | 36.71 | 792 | .0023 |
| 1 | 770 | 6.83 | 202 | .0022 | 630 | 3.61 | 165 | .0014 | 1020 | 25.71 | 267 | .0063 | 3160 | 29.73 | 828 | .0024 |

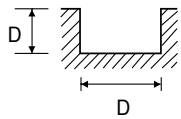
RPM = rev./min.
Feed = inch/min.
SFM = ft/min
Fz = inch/tooth



## CARBIDE, 2 FLUTE - SLOTTING

### E5020, E5244, E5011, E5026, E5022, E5025 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 10 00N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | FEED | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5500 | 3.2 | 4800 | 2.8 | 4000 | 2.2 | 8000 | 2.6 | 6500 | 5.9 | 16000 | 12.6 | 12000 | 9.5 |
| 1/8 | 3700 | 3.5 | 3200 | 3.2 | 2600 | 2.4 | 5300 | 2.6 | 4200 | 5.9 | 11000 | 12.6 | 8000 | 9.5 |
| 5/32 | 2800 | 3.5 | 2400 | 3.2 | 2000 | 2.4 | 4000 | 2.6 | 3200 | 5.9 | 8000 | 12.6 | 6000 | 9.5 |
| 3/16 | 2200 | 3.5 | 1900 | 3.2 | 1600 | 2.4 | 3200 | 2.6 | 2500 | 5.9 | 6400 | 12.6 | 4800 | 9.5 |
| 1/4 | 1800 | 3.5 | 1600 | 3.2 | 1300 | 2.4 | 2600 | 2.6 | 2100 | 7.1 | 5300 | 13.4 | 4000 | 10.2 |
| 5/16 | 1400 | 3.5 | 1200 | 3.2 | 1000 | 2.4 | 2000 | 2.6 | 1600 | 7.5 | 4000 | 13.4 | 3000 | 10.2 |
| 3/8 | 1100 | 3.5 | 950 | 3.2 | 800 | 2.4 | 1600 | 2.6 | 1300 | 7.9 | 3200 | 13.4 | 2400 | 10.2 |
| 1/2 | 900 | 3.5 | 800 | 3.2 | 660 | 2.4 | 1300 | 2.6 | 1000 | 8.3 | 2600 | 13.4 | 2000 | 10.2 |
| 9/16 | 800 | 3.5 | 700 | 3.2 | 570 | 2.4 | 1100 | 2.6 | 900 | 8.7 | 2300 | 13.4 | 1700 | 10.2 |
| 5/8 | 700 | 3.9 | 600 | 3.4 | 500 | 3.0 | 1000 | 3.0 | 800 | 8.9 | 2000 | 13.4 | 1500 | 10.2 |
| 13/16 | 550 | 3.9 | 480 | 3.4 | 400 | 3.0 | 800 | 3.2 | 640 | 9.5 | 1600 | 13.4 | 1200 | 10.2 |



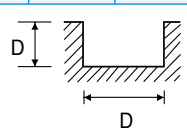

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## CARBIDE, 2 FLUTE TiAlN "F" COATED - SLOTTING

### EH020, EH244, EH011, EH026, EH022, EH025 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 8640 | 4.7 | 7440 | 4.3 | 6240 | 3.3 | 12000 | 4.0 | 10200 | 9.4 | 24000 | 19.9 | 18000 | 14.6 |
| 1/8 | 5760 | 5.7 | 5040 | 5.0 | 4080 | 3.8 | 8280 | 4.0 | 6600 | 9.4 | 16800 | 19.9 | 12000 | 14.6 |
| 5/32 | 4370 | 5.7 | 3720 | 5.0 | 3120 | 3.8 | 6240 | 4.0 | 5040 | 9.4 | 12000 | 19.9 | 9600 | 14.6 |
| 3/16 | 3430 | 5.7 | 3000 | 5.0 | 2400 | 3.8 | 5040 | 4.0 | 3960 | 9.4 | 9960 | 19.9 | 7440 | 14.6 |
| 1/4 | 2880 | 5.7 | 2400 | 5.0 | 2040 | 3.8 | 4080 | 4.0 | 3240 | 10.9 | 8280 | 20.8 | 6240 | 16.1 |
| 5/16 | 2160 | 5.7 | 1800 | 5.0 | 1560 | 3.8 | 3120 | 4.0 | 2400 | 11.8 | 6240 | 20.8 | 4800 | 16.1 |
| 3/8 | 1680 | 5.7 | 1440 | 5.0 | 1200 | 3.8 | 2400 | 4.0 | 2040 | 12.3 | 5040 | 20.8 | 3720 | 16.1 |
| 1/2 | 1440 | 5.7 | 1200 | 5.0 | 1030 | 3.8 | 2040 | 4.0 | 1560 | 12.8 | 4080 | 20.8 | 3120 | 16.1 |
| 9/16 | 1200 | 5.7 | 1080 | 5.0 | 890 | 3.8 | 1680 | 4.0 | 1440 | 13.2 | 3600 | 20.8 | 2640 | 16.1 |
| 5/8 | 1080 | 6.1 | 960 | 5.2 | 780 | 4.7 | 1560 | 4.8 | 1200 | 13.7 | 3120 | 20.8 | 2400 | 16.1 |
| 13/16 | 880 | 6.1 | 740 | 5.2 | 620 | 4.7 | 1200 | 4.8 | 1000 | 14.6 | 2400 | 20.8 | 1870 | 16.1 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

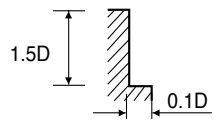
# CARBIDE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE - SIDE CUTTING

### E5021, E5245, E5012, E5065, E5023, E5024, E5216 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5500 | 9.5 | 4800 | 8.3 | 4000 | 6.3 | 8000 | 7.9 | 6500 | 17.7 | 16000 | 37.8 | 12000 | 25.4 |
| 1/8 | 3700 | 10.6 | 3200 | 9.5 | 2600 | 7.1 | 5300 | 7.9 | 4200 | 17.7 | 11000 | 37.8 | 8000 | 25.4 |
| 5/32 | 2800 | 10.6 | 2400 | 9.5 | 2000 | 7.1 | 4000 | 7.9 | 3200 | 17.7 | 8000 | 37.8 | 6000 | 25.4 |
| 3/16 | 2200 | 10.6 | 1900 | 9.5 | 1600 | 7.1 | 3200 | 7.9 | 2500 | 17.7 | 6400 | 37.8 | 4800 | 25.4 |
| 1/4 | 1800 | 10.6 | 1600 | 9.5 | 1300 | 7.1 | 2600 | 7.9 | 2100 | 21.3 | 5300 | 40.2 | 4000 | 30.7 |
| 5/16 | 1400 | 10.6 | 1200 | 9.5 | 1000 | 7.1 | 2000 | 7.9 | 1600 | 22.4 | 4000 | 40.2 | 3000 | 30.7 |
| 3/8 | 1100 | 10.6 | 950 | 9.5 | 800 | 7.1 | 1600 | 7.9 | 1300 | 23.6 | 3200 | 40.2 | 2400 | 30.7 |
| 1/2 | 900 | 10.6 | 800 | 9.5 | 660 | 7.1 | 1300 | 7.9 | 1000 | 24.8 | 2600 | 40.2 | 2000 | 30.7 |
| 9/16 | 800 | 10.6 | 700 | 9.5 | 570 | 7.1 | 1100 | 7.9 | 900 | 26.0 | 2300 | 40.2 | 1700 | 30.7 |
| 5/8 | 700 | 11.8 | 600 | 10.2 | 500 | 8.7 | 1000 | 8.9 | 800 | 26.8 | 2000 | 40.2 | 1500 | 30.7 |
| 13/16 | 550 | 11.8 | 480 | 10.2 | 400 | 8.7 | 800 | 9.5 | 640 | 28.4 | 1600 | 40.2 | 1200 | 30.7 |



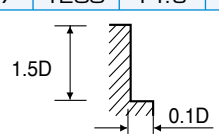

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## CARBIDE, 4 FLUTE TiAlN "F" COATED - SIDE CUTTING

### EH021, EH245, EH012, EH065, EH023, EH024, EH216 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 8640 | 14.7 | 7440 | 12.8 | 6240 | 9.9 | 12000 | 12.3 | 10200 | 27.4 | 24000 | 56.7 | 18000 | 44.4 |
| 1/8 | 5760 | 16.5 | 5040 | 14.6 | 4080 | 10.9 | 8280 | 12.3 | 6600 | 27.4 | 16800 | 56.7 | 12000 | 44.4 |
| 5/32 | 4370 | 16.5 | 3720 | 14.6 | 3120 | 10.9 | 6240 | 12.3 | 5040 | 27.4 | 12000 | 56.7 | 9600 | 44.4 |
| 3/16 | 3430 | 16.5 | 3000 | 14.6 | 2400 | 10.9 | 5040 | 12.3 | 3960 | 27.4 | 9960 | 56.7 | 7440 | 44.4 |
| 1/4 | 2880 | 16.5 | 2400 | 14.6 | 2040 | 10.9 | 4080 | 12.3 | 3240 | 33.1 | 8280 | 61.4 | 6240 | 47.2 |
| 5/16 | 2160 | 16.5 | 1800 | 14.6 | 1560 | 10.9 | 3120 | 12.3 | 2400 | 35.0 | 6240 | 61.4 | 4800 | 47.2 |
| 3/8 | 1680 | 16.5 | 1440 | 14.6 | 1200 | 10.9 | 2400 | 12.3 | 2040 | 36.9 | 5040 | 61.4 | 3720 | 47.2 |
| 1/2 | 1440 | 16.5 | 1200 | 14.6 | 1030 | 10.9 | 2040 | 12.3 | 1560 | 38.8 | 4080 | 61.4 | 3120 | 47.2 |
| 9/16 | 1200 | 16.5 | 1080 | 14.6 | 890 | 10.9 | 1680 | 12.3 | 1440 | 40.6 | 3600 | 61.4 | 2640 | 47.2 |
| 5/8 | 1080 | 18.4 | 960 | 16.1 | 780 | 13.7 | 1560 | 13.7 | 1200 | 41.6 | 3120 | 61.4 | 2400 | 47.2 |
| 13/16 | 880 | 18.4 | 740 | 16.1 | 620 | 13.7 | 1200 | 14.6 | 1000 | 36.9 | 2400 | 61.4 | 1870 | 47.2 |



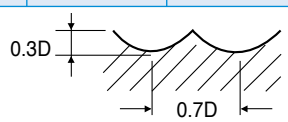

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE

### E5249, E5014, E5018, E5251 SERIES

| MATERIAL | P | | | | K | | N | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CAST IRON | | ALUMINUM ALLOYS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc 40 | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5200 | 3.5 | 4400 | 1.8 | 7300 | 5.9 | 21500 | 11.0 |
| 1/8 | 3500 | 3.9 | 2900 | 1.8 | 4900 | 6.3 | 14300 | 11.0 |
| 5/32 | 2600 | 3.9 | 2100 | 1.8 | 3600 | 7.9 | 10900 | 11.0 |
| 3/16 | 2100 | 4.1 | 1700 | 1.8 | 2900 | 9.1 | 8800 | 13.0 |
| 1/4 | 1700 | 3.9 | 1430 | 1.8 | 2400 | 9.9 | 7260 | 13.0 |
| 5/16 | 1270 | 3.7 | 1100 | 1.8 | 1800 | 12.6 | 5500 | 15.0 |
| 3/8 | 1000 | 3.7 | 870 | 1.8 | 1430 | 12.6 | 4300 | 15.0 |
| 1/2 | 870 | 3.4 | 730 | 1.8 | 1200 | 12.6 | 3600 | 17.3 |
| 9/16 | 750 | 3.4 | 620 | 1.8 | 1000 | 12.8 | 3000 | 17.3 |
| 5/8 | 650 | 3.4 | 540 | 1.8 | 920 | 12.8 | 2700 | 15.0 |
| 11/16 | 580 | 3.4 | 480 | 1.8 | 810 | 12.8 | 2400 | 15.0 |
| 13/16 | 500 | 3.4 | 430 | 1.8 | 730 | 11.4 | 2100 | 15.0 |



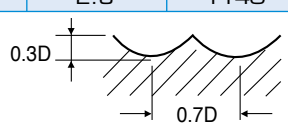

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## CARBIDE, 2 FLUTE BALL NOSE TiAlN "F" COATED

### EH249, EH014, EF018, EF251 SERIES

| MATERIAL | P | | | | K | | N | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CAST IRON | | ALUMINUM ALLOYS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 8110 | 5.7 | 6840 | 2.8 | 11400 | 9.4 | 33600 | 17.0 |
| 1/8 | 5400 | 6.1 | 4560 | 2.8 | 7680 | 9.9 | 22320 | 17.0 |
| 5/32 | 4080 | 6.1 | 3240 | 2.8 | 5640 | 12.3 | 16800 | 17.0 |
| 3/16 | 3240 | 6.4 | 2640 | 2.8 | 4560 | 14.2 | 13200 | 20.3 |
| 1/4 | 2640 | 6.1 | 2270 | 2.8 | 3720 | 15.6 | 11280 | 20.3 |
| 5/16 | 1920 | 5.7 | 1680 | 2.8 | 2760 | 19.9 | 8640 | 23.2 |
| 3/8 | 1560 | 5.7 | 1320 | 2.8 | 1680 | 19.9 | 6720 | 23.2 |
| 1/2 | 1320 | 5.2 | 1140 | 2.8 | 1920 | 19.9 | 5640 | 26.9 |
| 9/16 | 1180 | 5.2 | 960 | 2.8 | 1560 | 19.9 | 4680 | 26.9 |
| 5/8 | 1020 | 5.2 | 840 | 2.8 | 1440 | 19.9 | 4200 | 23.2 |
| 11/16 | 900 | 5.2 | 740 | 2.8 | 1200 | 19.9 | 3720 | 23.2 |
| 13/16 | 780 | 5.2 | 670 | 2.8 | 1140 | 18.0 | 3240 | 23.2 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

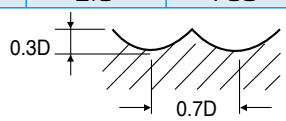
# CARBIDE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 4 FLUTE BALL NOSE

### E5250, E5060, E5062, E5252 SERIES

| MATERIAL | P | | | | K | | N | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CAST IRON | | IRON RPM FEED ALUMINUM ALLOYS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5200 | 5.5 | 4400 | 2.8 | 7300 | 9.1 | 21500 | 16.5 |
| 1/8 | 3500 | 5.9 | 2900 | 2.8 | 4900 | 9.5 | 14300 | 16.5 |
| 5/32 | 2600 | 5.9 | 2100 | 2.8 | 3600 | 11.8 | 10900 | 16.5 |
| 3/16 | 2100 | 6.3 | 1700 | 2.8 | 2900 | 13.8 | 8800 | 19.7 |
| 1/4 | 1700 | 5.9 | 1430 | 2.8 | 2400 | 15.0 | 7260 | 19.7 |
| 5/16 | 1270 | 5.5 | 1100 | 2.8 | 1800 | 18.9 | 5500 | 22.4 |
| 3/8 | 1000 | 5.5 | 870 | 2.8 | 1430 | 18.9 | 4300 | 22.4 |
| 1/2 | 870 | 5.1 | 730 | 2.8 | 1200 | 18.9 | 3600 | 26.0 |
| 9/16 | 750 | 5.1 | 620 | 2.8 | 1000 | 19.3 | 3000 | 26.0 |
| 5/8 | 650 | 5.1 | 540 | 2.8 | 920 | 19.3 | 2700 | 22.4 |
| 11/16 | 580 | 5.1 | 480 | 2.8 | 810 | 19.3 | 2400 | 22.4 |
| 13/16 | 500 | 5.1 | 430 | 2.8 | 730 | 17.3 | 2100 | 22.4 |



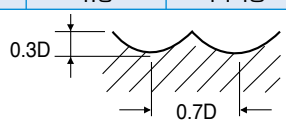

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## CARBIDE, 4 FLUTE BALL NOSE TiAlN "F" COATED

### EH250, EH060, EH062, EH252 SERIES

| MATERIAL | P | | | | K | | N | |
|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CAST IRON | | ALUMINUM ALLOYS | |
| HARDNESS | ~ HRc30 | | HRc30 ~ HRc40 | | | | | |
| STRENGTH | ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 8110 | 8.5 | 6840 | 4.3 | 11400 | 14.2 | 33600 | 26.0 |
| 1/8 | 5400 | 9.4 | 4560 | 4.3 | 7680 | 14.6 | 22320 | 26.0 |
| 5/32 | 4080 | 9.4 | 3240 | 4.3 | 5640 | 18.4 | 16800 | 26.0 |
| 3/16 | 3240 | 9.9 | 2640 | 4.3 | 4560 | 21.3 | 13200 | 30.7 |
| 1/4 | 2640 | 9.4 | 2270 | 4.3 | 3720 | 23.2 | 11280 | 30.7 |
| 5/16 | 1920 | 8.5 | 1680 | 4.3 | 2760 | 29.3 | 8640 | 35.0 |
| 3/8 | 1560 | 8.5 | 1320 | 4.3 | 2270 | 29.3 | 6720 | 35.0 |
| 1/2 | 1320 | 8.0 | 1140 | 4.3 | 1920 | 29.3 | 5640 | 40.6 |
| 9/16 | 1180 | 8.0 | 960 | 4.3 | 1560 | 30.2 | 4680 | 40.6 |
| 5/8 | 1020 | 8.0 | 840 | 4.3 | 1440 | 30.2 | 4200 | 35.0 |
| 11/16 | 900 | 8.0 | 740 | 4.3 | 1200 | 30.2 | 3720 | 35.0 |
| 13/16 | 780 | 8.0 | 670 | 4.3 | 1140 | 26.9 | 3240 | 35.0 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

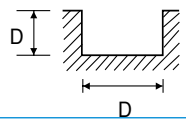
# CARBIDE END MILLS

## RECOMMENDED CUTTING CONDITIONS

## CARBIDE, 2 FLUTE TiAlN-COATED - SLOTTING

### EH527 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 | 7700 | 4.3 | 6720 | 3.9 | 5600 | 3.0 | 11200 | 3.5 | 9100 | 8.3 | 22400 | 17.7 | 16800 | 13.2 |
| 3.0 | 5180 | 4.9 | 4480 | 4.3 | 3640 | 3.4 | 7420 | 3.5 | 5880 | 8.3 | 15400 | 17.7 | 11200 | 13.2 |
| 4.0 | 3920 | 4.9 | 3360 | 4.3 | 2800 | 3.4 | 5600 | 3.5 | 4480 | 8.3 | 11200 | 17.7 | 8400 | 13.2 |
| 5.0 | 3080 | 4.9 | 2660 | 4.3 | 2240 | 3.4 | 4480 | 3.5 | 3500 | 8.3 | 8960 | 17.7 | 6720 | 13.2 |
| 6.0 | 2520 | 4.9 | 2240 | 4.3 | 1820 | 3.4 | 3640 | 3.5 | 2940 | 9.8 | 7420 | 18.7 | 5600 | 14.4 |
| 8.0 | 1960 | 4.9 | 1680 | 4.3 | 1400 | 3.4 | 2800 | 3.5 | 2240 | 10.4 | 5600 | 18.7 | 4200 | 14.4 |
| 10.0 | 1540 | 4.9 | 1330 | 4.3 | 1120 | 3.4 | 2240 | 3.5 | 1820 | 11.0 | 4480 | 18.7 | 3360 | 14.4 |
| 12.0 | 1260 | 4.9 | 1120 | 4.3 | 924 | 3.4 | 1820 | 3.5 | 1400 | 11.6 | 3640 | 18.7 | 2800 | 14.4 |
| 14.0 | 1120 | 4.9 | 980 | 4.3 | 798 | 3.4 | 1540 | 3.5 | 1260 | 12.2 | 3220 | 18.7 | 2380 | 14.4 |
| 16.0 | 980 | 5.5 | 840 | 4.7 | 700 | 4.1 | 1400 | 4.1 | 1120 | 12.4 | 2800 | 18.7 | 2100 | 14.4 |
| 20.0 | 770 | 5.5 | 672 | 4.7 | 560 | 4.1 | 1120 | 4.3 | 900 | 13.2 | 2240 | 18.7 | 1680 | 14.4 |



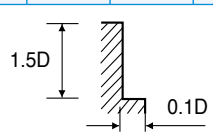

※The FEED, in long & extra long types, should be reduced by around 50%

RPM = rev./min. FEED = inch/min.

## CARBIDE, 4 FLUTE TiAlN-COATED - SIDE CUTTING

### EH540 SERIES

| MATERIAL | P | | | | | | M | | K | | N | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS TITANIUM ALLOYS | | CAST IRON | | ALUMINUM ALLOYS | | COPPER. BRASS NON-FERROUS METALS | |
| HARDNESS | ~ HRc 20 | | HRc 20 ~ HRc 30 | | HRc 30 ~ HRc 40 | | | | | | | | | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | | | | | | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 2.0 | 7700 | 13.2 | 6720 | 11.6 | 5600 | 8.9 | 11200 | 11.0 | 9100 | 24.8 | 22400 | 53.0 | 16800 | 39.8 |
| 3.0 | 5180 | 15.0 | 4480 | 13.2 | 3640 | 9.8 | 7420 | 11.0 | 5880 | 24.8 | 15400 | 53.0 | 11200 | 39.8 |
| 4.0 | 3920 | 15.0 | 3360 | 13.2 | 2800 | 9.8 | 5600 | 11.0 | 4480 | 24.8 | 11200 | 53.0 | 8400 | 39.8 |
| 5.0 | 3080 | 15.0 | 2660 | 13.2 | 2240 | 9.8 | 4480 | 11.0 | 3500 | 24.8 | 8960 | 53.0 | 6720 | 39.8 |
| 6.0 | 2520 | 15.0 | 2240 | 13.2 | 1820 | 9.8 | 3640 | 11.0 | 2940 | 29.7 | 7420 | 56.3 | 5600 | 42.9 |
| 8.0 | 1960 | 15.0 | 1680 | 13.2 | 1400 | 9.8 | 2800 | 11.0 | 2240 | 31.5 | 5600 | 56.3 | 4200 | 42.9 |
| 10.0 | 1540 | 15.0 | 1330 | 13.2 | 1120 | 9.8 | 2240 | 11.0 | 1820 | 33.1 | 4480 | 56.3 | 3360 | 42.9 |
| 12.0 | 1260 | 15.0 | 1120 | 13.2 | 920 | 9.8 | 1820 | 11.0 | 1400 | 34.7 | 3640 | 56.3 | 2800 | 42.9 |
| 14.0 | 1120 | 15.0 | 980 | 13.2 | 800 | 9.8 | 1540 | 11.0 | 1260 | 36.4 | 3220 | 56.3 | 2380 | 42.9 |
| 16.0 | 980 | 16.5 | 840 | 14.4 | 700 | 12.2 | 1400 | 12.4 | 1120 | 37.4 | 2800 | 56.3 | 2100 | 42.9 |
| 20.0 | 770 | 16.5 | 670 | 14.4 | 560 | 12.2 | 1120 | 13.2 | 900 | 39.8 | 2240 | 56.3 | 1680 | 42.9 |




※The FEED, in long & extra long types, should be reduced by around 50%

RPM = rev./min. FEED = inch/min.

# PROPERTIES AND APPLICATIONS OF COATINGS

| | Titanium Nitride | Titanium Carbonitride | Super TiAlN "F" Coatings | Super TiAlN "E" Coatings |
|---|---|---|---|---|
| **Hardness** | 82 Rc | 92 Rc | 92 Rc | 95 Rc |
| **Coefficient of Friction Against Dry Steel (.8)** | .4 | .4 | .4 | .4 |
| **Coating Thickness 3 Microns = .0001** | 1- 4 | 1- 4 | 1- 5 | 1- 3 |
| **Maximum Working Temperature** | 1100 F | 750 F | 1470 F | 1470 F |
| **Coating Color** | Gold | Blue - Gray | Violet - Gray | Violet - Gray |
| **Key Characteristics** | Good General Purpose | Good Wear Resistance<br>Good Toughness<br>Moderate Heat Resistance | Enhanced Toughness<br>High Heat Resistance | High Hardness<br>Enhanced Toughness<br>High Heat Resistance |
| **Primary Applications** | Machining of Iron Based Materials | General Machining of Various Materials | Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, High Speed Machining Wet, Dry, or Semi Dry Condition | Hardened Workpieces, Steel, Cast Iron, Stainless, Nickel Based Alloys, High Temp and Titanium Alloys, Machining Wet, Dry, or Semi Dry Condition |
| **YG:TYLON SUPER TiAlN COATED TOOLS CAN BE RUN 20% - 50% FASTER THAN TiN or TiCN ON MOST MATERIALS** | | | | |

# HSS

Being the best through innovation



# ONLY ONE COATED PM60 END MILLS

- Perfect solution to protect carbide chipping problems under vibrations

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| GYG64 |  | PM60, 2 FLUTE (Center Cut) | D1/8 | D1 | 1130 |
| GYG67 |  | PM60, 4 FLUTE BALL NOSE | R1/16 | R1/2 | 1131 |
| GYG65 |  | PM60, 4 FLUTE (Center Cut) | D1/8 | D1 | 1132 |
| GYG66 |  | PM60, 4 FLUTE MULTIPLE HELIX (Center Cut) | D1/8 | D1 | 1133 |
| GYG69 |  | PM60, MULTI FLUTE MULTIPLE HELIX CORNER RADIUS ROUGHING - FINE (Center Cut) | D1/4 | D1 | 1134 |
| GYG68 |  | PM60, MULTI FLUTE ROUGHING- FINE (Center Cut) | D1/4 | D1-1/4 | 1135 |
| GYG70 |  | PM60, MULTI FLUTE ROUGHING - COARSE (Center Cut) | D1/4 | D1-1/4 | 1136 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 1137 |

◎ : Excellent ○ : Good

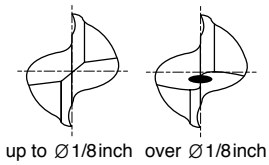
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

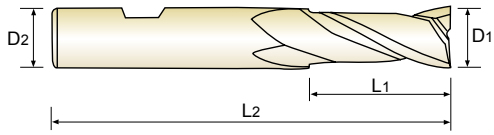
# ONLY ONE END MILLS

GYG64 SERIES FLAT SHANK

## PM60, 2 FLUTE (Center Cut)






PM 60 | 2 | 30° | FLAT

P. 1137

Unit : Inch

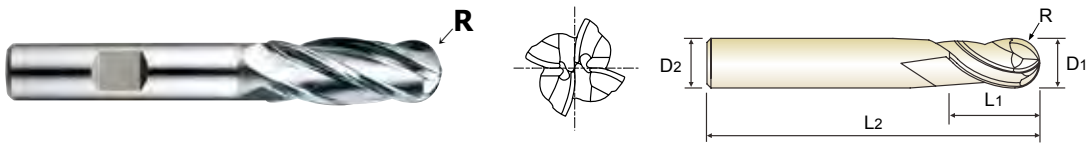
| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| Y-COATED | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **GYG64008** | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **GYG64012** | **3/16** | 3/8 | 7/16 | 2-5/16 |
| **GYG64016** | **1/4** | 3/8 | 1/2 | 2-5/16 |
| **GYG64020** | **5/16** | 3/8 | 9/16 | 2-5/16 |
| **GYG64024** | **3/8** | 3/8 | 9/16 | 2-5/16 |
| **GYG64032** | **1/2** | 1/2 | 1 | 3 |
| **GYG64040** | **5/8** | 5/8 | 1-5/16 | 3-7/16 |
| **GYG64048** | **3/4** | 3/4 | 1-5/16 | 3-7/16 |
| **GYG64064** | **1** | 1 | 1-5/8 | 4-1/8 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0 ~ −.0012 | h6 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

# PM60, 4 FLUTE BALL NOSE




PM 60 | 4 | 30° | R ±.001 | FLAT

P.1138

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| Y-COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **GYG67008** | R1/16 | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **GYG67012** | R3/32 | **3/16** | 3/8 | 1/2 | 2-3/8 |
| **GYG67016** | R1/8 | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **GYG67020** | R5/32 | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **GYG67024** | R3/16 | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **GYG67032** | R1/4 | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **GYG67040** | R5/16 | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **GYG67048** | R3/8 | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **GYG67064** | R1/2 | **1** | 1 | 2 | 4-1/2 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0 ~ −.0012 | h6 |

◎ : Excellent ○ : Good

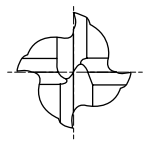
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

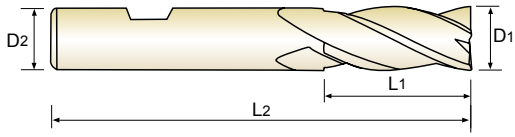
# ONLY ONE END MILLS

GYG65 SERIES FLAT SHANK

## PM60, 4 FLUTE (Center Cut)








PM 60 | 4 | 30° | FLAT P.1139

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| Y-COATED | $D_1$ | $D_2$ | $L_1$ | $L_2$ |
| **GYG65008** | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **GYG65012** | **3/16** | 3/8 | 1/2 | 2-3/8 |
| **GYG65016** | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **GYG65020** | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **GYG65024** | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **GYG65032** | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **GYG65040** | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **GYG65048** | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **GYG65056** | **7/8** | 7/8 | 1-7/8 | 4-1/8 |
| **GYG65064** | **1** | 1 | 2 | 4-1/2 |

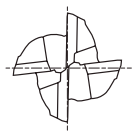
| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0 ~ −.0012 | h6 |

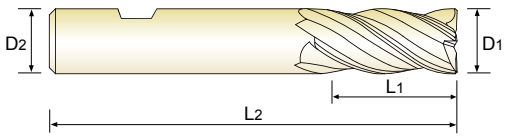
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

# PM60, 4 FLUTE MULTIPLE HELIX (Center Cut)








PM 60 | 4 | M-Helix | FLAT | P.1140

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| Y-COATED | D1 | D2 | L1 | L2 |
| **GYG66008** | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **GYG66012** | **3/16** | 3/8 | 1/2 | 2-3/8 |
| **GYG66016** | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **GYG66020** | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **GYG66024** | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **GYG66032** | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **GYG66040** | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **GYG66048** | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **GYG66064** | **1** | 1 | 2 | 4-1/2 |

| Mill Dia. Tolerance(inch) | Shank Dia. Tolerance |
|---|---|
| 0 ~ −.0012 | h6 |

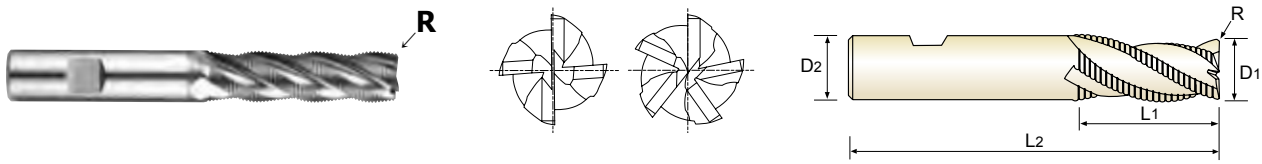
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

ONLY ONE END MILLS

GYG69 SERIES FLAT SHANK

# PM60, MULTI FLUTE MULTIPLE HELIX CORNER RADIUS ROUGHING - FINE (Center Cut)




PM 60 | 4-5 | M-Helix | FINE | FLAT

P.1142

Unit : Inch

| EDP No. | Corner Radius | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| Y-COATED | R | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| **GYG69016** | R.020 | **1/4** | 3/8 | 5/8 | 2-7/16 | 4 |
| **GYG69020** | R.020 | **5/16** | 3/8 | 3/4 | 2-1/2 | 4 |
| **GYG69024** | R.020 | **3/8** | 3/8 | 3/4 | 2-1/2 | 4 |
| **GYG69032** | R.020 | **1/2** | 1/2 | 1-1/4 | 3-1/4 | 4 |
| **GYG69040** | R.040 | **5/8** | 5/8 | 1-1/4 | 3-3/8 | 5 |
| **GYG69048** | R.040 | **3/4** | 3/4 | 1-5/8 | 3-7/8 | 5 |
| **GYG69064** | R.040 | **1** | 1 | 2 | 4-1/2 | 5 |

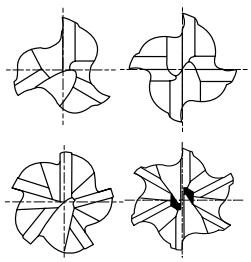
| Mill Dia. Tolerance(inch) |
|---|
| 0 ~ +.0030 |

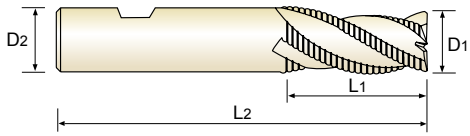
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

# PM60, MULTI FLUTE ROUGHING- FINE (Center Cut)








PM 60 | 3-6 | 30° | FINE | FLAT

P.1141

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| Y-COATED | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| GYG68016 | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| GYG68020 | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| GYG68901 | 5/16 | 3/8 | 1-3/8 | 3_3/16 | 3 |
| GYG68024 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| GYG68902 | 3/8 | 3/8 | 1-1/2 | 3-1/4 | 4 |
| GYG68032 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| GYG68903 | 1/2 | 1/2 | 2 | 4 | 4 |
| GYG68040 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| GYG68904 | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| GYG68048 | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| GYG68905 | 3/4 | 3/4 | 2-1/2 | 4-3/4 | 4 |
| GYG68906 | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| GYG68064 | 1 | 1 | 2 | 4-1/2 | 5 |
| GYG68907 | 1 | 1 | 4 | 6-1/2 | 5 |
| GYG68116 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

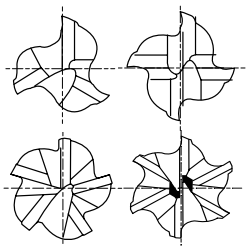
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

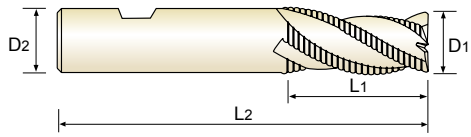
# ONLY ONE END MILLS

GYG70 SERIES FLAT SHANK

## PM60, MULTI FLUTE ROUGHING- COARSE (Center Cut)








PM 60 | 3-6 | 30° | COARSE | FLAT

P.1141

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|
| Y-COATED | $D_1$ | $D_2$ | $L_1$ | $L_2$ | |
| GYG70016 | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| GYG70020 | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| GYG70024 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| GYG70032 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| GYG70040 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| GYG70048 | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| GYG70064 | 1 | 1 | 2 | 4-1/2 | 5 |
| GYG70116 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

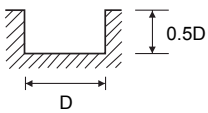
◎ : Excellent ○ : Good

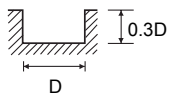
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | ○ | | | ◎ | ◎ | ○ | | | | | | |

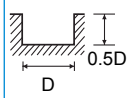
## PM60, 2 FLUTE (Center Cut)

### GYG64 SERIES

| MATERIAL | P | | | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc35 | | HRc35 ~ HRc40 | | HRc40 ~ HRc45 | | | |
| STRENGTH | ~ 500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1100N/mm² | | 1100 ~ 1300N/mm² | | 1300 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 5710 | 7.20 | 4610 | 5.81 | 3810 | 5.10 | 2610 | 3.49 | 2010 | 2.68 | 1400 | 1.99 | 2210 | 3.13 |
| 3/16 | 4950 | 12.85 | 4080 | 9.95 | 3280 | 9.03 | 2140 | 4.88 | 1670 | 3.68 | 1200 | 2.75 | 1870 | 4.13 |
| 1/4 | 3960 | 11.85 | 3310 | 9.38 | 2610 | 8.62 | 1650 | 4.82 | 1300 | 3.69 | 900 | 2.56 | 1450 | 4.12 |
| 5/16 | 3130 | 13.05 | 2650 | 11.46 | 2170 | 9.55 | 1400 | 5.64 | 1080 | 4.01 | 760 | 2.82 | 1200 | 4.45 |
| 3/8 | 2640 | 14.76 | 2270 | 13.24 | 1840 | 11.43 | 1140 | 6.17 | 870 | 4.86 | 630 | 3.60 | 970 | 5.42 |
| 1/2 | 2030 | 12.15 | 1650 | 10.81 | 1300 | 9.34 | 850 | 5.30 | 650 | 3.64 | 450 | 2.52 | 730 | 4.06 |
| 5/8 | 1620 | 12.66 | 1380 | 9.26 | 1080 | 8.53 | 680 | 4.83 | 540 | 3.84 | 380 | 2.64 | 580 | 4.17 |
| 3/4 | 1200 | 10.99 | 990 | 8.23 | 890 | 7.46 | 550 | 4.52 | 450 | 3.52 | 320 | 2.50 | 500 | 3.99 |
| 1 | 890 | 7.22 | 750 | 6.63 | 580 | 5.40 | 430 | 3.52 | 300 | 2.37 | 200 | 1.50 | 330 | 2.51 |



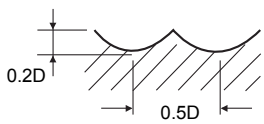



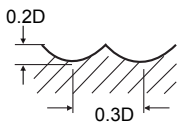

RPM = rev./min.
FEED = inch/min.

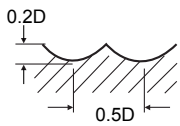
# PM60, 4 FLUTE BALL NOSE

## GYG67 SERIES

| MATERIAL | P | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc40 | | HRc40 ~ HRc45 | | | |
| STRENGTH | ~ 500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | 1300 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 8320 | 23.59 | 6620 | 15.63 | 4410 | 8.34 | 2310 | 3.63 | 1600 | 2.53 | 2510 | 3.95 |
| 3/16 | 6270 | 29.13 | 4950 | 19.65 | 3260 | 10.71 | 1690 | 4.99 | 1190 | 3.51 | 1880 | 5.97 |
| 1/4 | 5010 | 32.37 | 3960 | 21.83 | 2610 | 11.91 | 1350 | 5.54 | 950 | 3.90 | 1500 | 6.63 |
| 5/16 | 4050 | 37.64 | 3130 | 24.63 | 2170 | 14.32 | 1080 | 5.97 | 760 | 4.20 | 1200 | 7.01 |
| 3/8 | 3480 | 44.88 | 2640 | 29.52 | 1770 | 17.29 | 870 | 7.53 | 600 | 5.40 | 940 | 7.96 |
| 1/2 | 2610 | 35.72 | 2030 | 23.34 | 1350 | 13.43 | 650 | 5.54 | 450 | 3.84 | 730 | 6.52 |
| 5/8 | 2070 | 34.48 | 1560 | 22.91 | 1080 | 12.96 | 540 | 5.80 | 380 | 4.08 | 600 | 6.63 |
| 3/4 | 1700 | 31.41 | 1250 | 20.72 | 870 | 11.22 | 450 | 5.40 | 320 | 3.75 | 500 | 6.00 |
| 1 | 1130 | 21.67 | 880 | 14.51 | 550 | 8.16 | 300 | 3.55 | 200 | 2.24 | 330 | 3.90 |



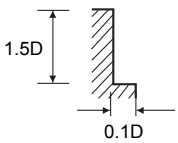
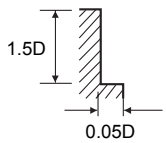
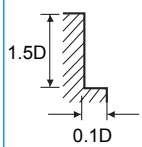




RPM =rev./min.
FEED = inch/min.

## PM60, 4 FLUTE (Center Cut)

### GYG65 SERIES

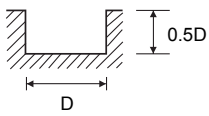
| MATERIAL | P | | | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc35 | | HRc35 ~ HRc40 | | HRc40 ~ HRc45 | | | |
| STRENGTH | ~ 500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1100N/mm² | | 1100 ~ 1300N/mm² | | 1300 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 7520 | 17.76 | 6820 | 16.11 | 5010 | 11.05 | 3110 | 8.32 | 2710 | 5.54 | 1900 | 3.90 | 3010 | 6.16 |
| 3/16 | 5550 | 25.34 | 5010 | 20.53 | 3680 | 16.21 | 2540 | 11.20 | 2140 | 7.75 | 1470 | 5.56 | 2340 | 8.47 |
| 1/4 | 4410 | 24.32 | 4060 | 19.82 | 2960 | 14.91 | 2060 | 10.36 | 1650 | 8.08 | 1150 | 5.63 | 1800 | 8.81 |
| 5/16 | 3730 | 27.02 | 3130 | 22.66 | 2410 | 17.43 | 1680 | 11.41 | 1400 | 8.84 | 960 | 6.06 | 1520 | 9.36 |
| 3/8 | 2910 | 31.14 | 2640 | 26.19 | 2010 | 18.63 | 1270 | 13.40 | 1140 | 10.02 | 800 | 7.20 | 1240 | 10.91 |
| 1/2 | 2260 | 25.22 | 2030 | 21.42 | 1580 | 16.41 | 1000 | 10.74 | 800 | 8.08 | 580 | 5.90 | 900 | 8.95 |
| 5/8 | 1950 | 24.20 | 1680 | 20.43 | 1200 | 16.11 | 820 | 10.49 | 660 | 7.92 | 460 | 5.52 | 740 | 8.76 |
| 3/4 | 1570 | 21.77 | 1320 | 18.29 | 990 | 13.66 | 670 | 8.63 | 550 | 6.95 | 380 | 4.90 | 600 | 7.58 |
| 7/8 | 1250 | 19.04 | 1130 | 14.97 | 820 | 11.96 | 560 | 7.48 | 470 | 6.03 | 330 | 4.20 | 530 | 6.68 |
| 1 | 1180 | 17.25 | 990 | 14.03 | 750 | 10.66 | 490 | 6.93 | 430 | 5.84 | 300 | 4.17 | 460 | 6.43 |
| | | | | |   | | | | | |   | |   | |

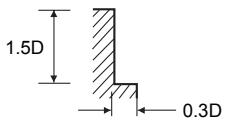
RPM = rev./min.
FEED = inch/min.

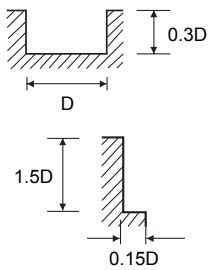
# PM60, 4 FLUTE MULTIPLE HELIX (Center Cut)

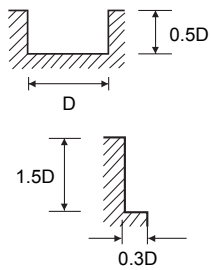
## GYG66 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc35 | | HRc35 ~ HRc45 | | | |
| STRENGTH | ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | 1100 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 7020 | 5.53 | 6420 | 5.05 | 4410 | 3.47 | 2710 | 1.71 | 4810 | 3.79 |
| 3/16 | 4680 | 8.84 | 4210 | 7.29 | 2940 | 5.09 | 1800 | 2.84 | 3210 | 6.57 |
| 1/4 | 3510 | 8.84 | 3210 | 8.08 | 2210 | 5.56 | 1350 | 2.98 | 2410 | 6.82 |
| 5/16 | 2810 | 12.38 | 2570 | 11.32 | 1760 | 7.78 | 1080 | 4.09 | 1930 | 8.79 |
| 3/8 | 2570 | 15.81 | 2340 | 14.37 | 1640 | 9.80 | 1000 | 5.05 | 1600 | 12.13 |
| 1/2 | 1930 | 14.29 | 1750 | 12.99 | 1230 | 9.09 | 730 | 4.58 | 1200 | 10.61 |
| 5/8 | 1540 | 12.89 | 1400 | 11.72 | 980 | 8.05 | 600 | 4.17 | 960 | 9.55 |
| 3/4 | 1290 | 13.17 | 1170 | 11.97 | 820 | 8.51 | 500 | 4.42 | 800 | 9.73 |
| 1 | 970 | 9.57 | 880 | 8.70 | 610 | 6.29 | 360 | 3.09 | 600 | 7.39 |



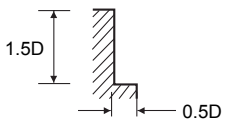



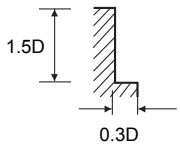

RPM = rev./min.
FEED = inch/min.

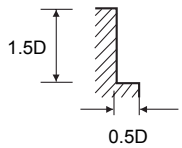
# PM60, MULTI FLUTE ROUGHING (Center Cut)

## GYG68, GYG70 SERIES

| MATERIAL | P | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc40 | | HRc40 ~ HRc45 | | | |
| STRENGTH | ~ 500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | 1300 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 3160 | 10.07 | 2510 | 7.99 | 1800 | 5.12 | 1450 | 4.64 | 1050 | 3.48 | 1650 | 4.88 |
| 5/16 | 2890 | 13.98 | 2290 | 10.80 | 1680 | 7.56 | 1280 | 6.06 | 880 | 4.17 | 1440 | 6.65 |
| 3/8 | 2410 | 20.84 | 1900 | 15.90 | 1340 | 9.89 | 1140 | 7.87 | 800 | 5.68 | 1200 | 8.53 |
| 1/2 | 1800 | 18.47 | 1350 | 14.71 | 1030 | 10.36 | 850 | 8.05 | 580 | 5.45 | 900 | 9.09 |
| 5/8 | 1440 | 19.78 | 1140 | 15.66 | 800 | 10.99 | 660 | 8.44 | 460 | 5.96 | 720 | 9.66 |
| 3/4 | 1200 | 21.03 | 950 | 16.35 | 670 | 11.26 | 550 | 8.77 | 380 | 6.11 | 600 | 10.04 |
| 1 | 940 | 19.43 | 710 | 14.91 | 490 | 10.20 | 430 | 8.39 | 300 | 5.92 | 460 | 9.31 |
| 1 1/4 | 670 | 17.77 | 500 | 13.38 | 350 | 9.45 | 300 | 7.67 | 210 | 5.32 | 330 | 8.52 |




RPM =rev./min.
FEED = inch/min.

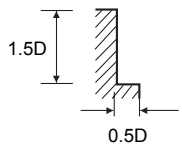
ONLY ONE END MILLS

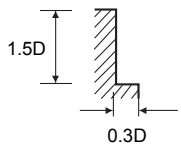
RECOMMENDED CUTTING CONDITIONS

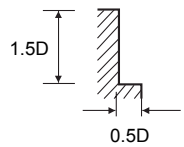
# PM60, MULTI FLUTE MULTIPLE HELIX CORNER RADIUS ROUGHING - FINE (Center Cut)

## GYG69 SERIES

| MATERIAL | P | | | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | | | ~ HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc40 | | HRc40 ~ HRc45 | | | |
| STRENGTH | ~ 500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | | 1300 ~ 1400N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 3810 | 12.00 | 3010 | 9.95 | 2160 | 6.11 | 1750 | 5.53 | 1250 | 3.95 | 1960 | 5.85 |
| 5/16 | 3490 | 16.48 | 2770 | 13.07 | 2050 | 9.02 | 1520 | 7.20 | 1080 | 4.95 | 1720 | 8.15 |
| 3/8 | 2870 | 24.89 | 2270 | 18.97 | 1570 | 11.38 | 1340 | 9.47 | 940 | 6.48 | 1440 | 10.18 |
| 1/2 | 2180 | 22.32 | 1630 | 17.70 | 1230 | 12.19 | 1000 | 9.63 | 700 | 6.63 | 1080 | 10.86 |
| 5/8 | 1740 | 23.70 | 1380 | 18.79 | 960 | 13.07 | 800 | 10.42 | 560 | 7.18 | 860 | 11.71 |
| 3/4 | 1450 | 25.18 | 1140 | 19.46 | 800 | 13.58 | 670 | 10.66 | 470 | 7.37 | 740 | 12.16 |
| 1 | 1130 | 23.31 | 850 | 17.78 | 590 | 12.41 | 510 | 10.12 | 350 | 6.91 | 550 | 11.29 |




RPM = rev./min.
FEED = inch/min.

HSS

Being the best through innovation



# SINE-POWER END MILLS

- High Performane HSS Rongher for Titanium and Titanium Alloys

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| E2F64 |  | HSS Co8, 4&6 FLUTE | D3/4 | D2 | 1146 |
| | | RECOMMENDED CUTTING CONDITIONS | | | 1147 |

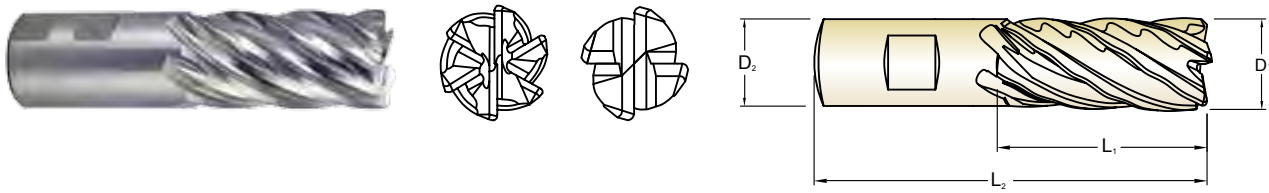
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | | | | ◎ | |

# SINE-POWER END MILLS

**E2F64 SERIES** FLAT SHANK

## HSSCo8, 4&6 FLUTE




HSS Co8 | 4&6 | 35° | C x 45° | FLAT P.1147

Unit : Inch

| EDP No. | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | Chamfer | No. of Flute |
|---|---|---|---|---|---|---|
| | D1 | D2 | L1 | L2 | | |
| E2F64048 | 3/4 | 3/4 | 1 5/8 | 3 7/8 | .030 | 4 |
| E2F64901 | 3/4 | 3/4 | 2 1/4 | 4 1/2 | .030 | 4 |
| E2F64902 | 3/4 | 3/4 | 3 | 5 1/4 | .030 | 4 |
| E2F64064 | 1 | 1 | 2 | 4 1/2 | .030 | 4 |
| E2F64903 | 1 | 1 | 2 | 4 1/2 | .030 | 6 |
| E2F64904 | 1 | 1 | 3 | 5 1/2 | .030 | 4 |
| E2F64905 | 1 | 1 | 3 | 5 1/2 | .030 | 6 |
| E2F64906 | 1 | 1 | 4 | 6 1/2 | .030 | 4 |
| E2F64907 | 1 | 1 | 4 | 6 1/2 | .030 | 6 |
| E2F64116 | 1 1/4 | 1 1/4 | 2 | 4 1/2 | .040 | 4 |
| E2F64908 | 1 1/4 | 1 1/4 | 2 | 4 1/2 | .040 | 6 |
| E2F64909 | 1 1/4 | 1 1/4 | 3 | 5 1/2 | .040 | 4 |
| E2F64910 | 1 1/4 | 1 1/4 | 3 | 5 1/2 | .040 | 6 |
| E2F64911 | 1 1/4 | 1 1/4 | 4 | 6 1/2 | .040 | 4 |
| E2F64912 | 1 1/4 | 1 1/4 | 4 | 6 1/2 | .040 | 6 |
| E2F64132 | 1 1/2 | 1 1/4 | 2 | 4 1/2 | .040 | 6 |
| E2F64913 | 1 1/2 | 1 1/4 | 3 | 5 1/2 | .040 | 6 |
| E2F64914 | 1 1/2 | 1 1/4 | 4 | 6 1/2 | .040 | 6 |
| E2F64915 | 1 1/2 | 1 1/4 | 6 | 8 1/2 | .040 | 6 |
| E2F64200 | 2 | 2 | 2 | 5 3/4 | .040 | 6 |
| E2F64916 | 2 | 2 | 3 | 6 3/4 | .040 | 6 |
| E2F64917 | 2 | 2 | 4 | 7 3/4 | .040 | 6 |
| E2F64918 | 2 | 2 | 6 | 9 3/4 | .040 | 6 |
| E2F64919 | 2 | 2 | 8 | 11 3/4 | .040 | 6 |

| Cutting Dia. Tolerance(inch) | Shank Dia. Tolerance(inch) |
|---|---|
| 0~ + .0030 | - .0001~ - .0005 |

※ Radius, coatings and HSS-PM available on request

◎ : Excellent ○ : Good

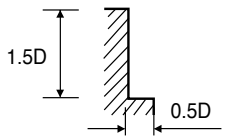
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| | | | | | | | | | | | | | ◎ | |

## HSSCo8, 4&6 FLUTE

**E2F64 SERIES**

### SIDE CUTTING

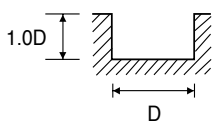
| MATERIAL | S | | | |
|---|---|---|---|---|
| | TITANIUM ALLOYS | | TITANIUM ALLOYS - DIFFICULT | |
| DIAMETER | RPM | Feed | RPM | Feed |
| 3/4 | 382 | 4 | 306 | 3 |
| 1 | 287 | 4 | 229 | 3 |
| 1-1/4 | 229 | 4 | 183 | 3 |
| 1-1/2 | 191 | 4 | 153 | 3 |
| 2 | 143 | 4 | 115 | 3 |




RPM = rev./min.
FEED = inch/min.

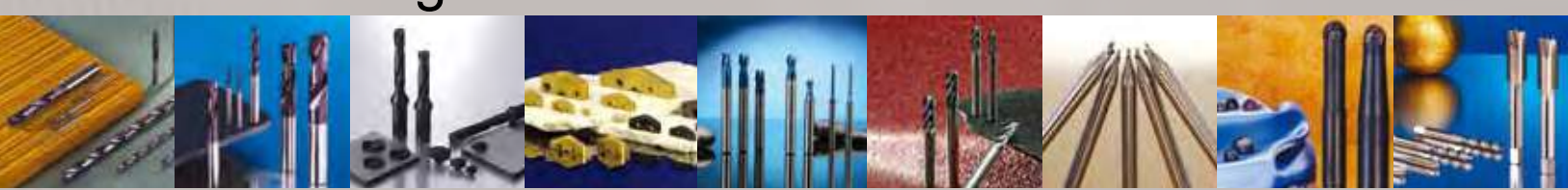
### SLOTTING

| MATERIAL | S | | | |
|---|---|---|---|---|
| | TITANIUM ALLOYS | | TITANIUM ALLOYS - DIFFICULT | |
| DIAMETER | RPM | Feed | RPM | Feed |
| 3/4 | 331 | 3 | 204 | 2 |
| 1 | 248 | 4 | 153 | 2 |
| 1-1/4 | 199 | 4 | 122 | 2 |
| 1-1/2 | 166 | 4 | 102 | 2 |
| 2 | 124 | 4 | 76 | 3 |




RPM = rev./min.
FEED = inch/min.

Global Cutting Tool Leader **YG-1**



# HSS

Being the best through innovation



# TANK-POWER END MILLS

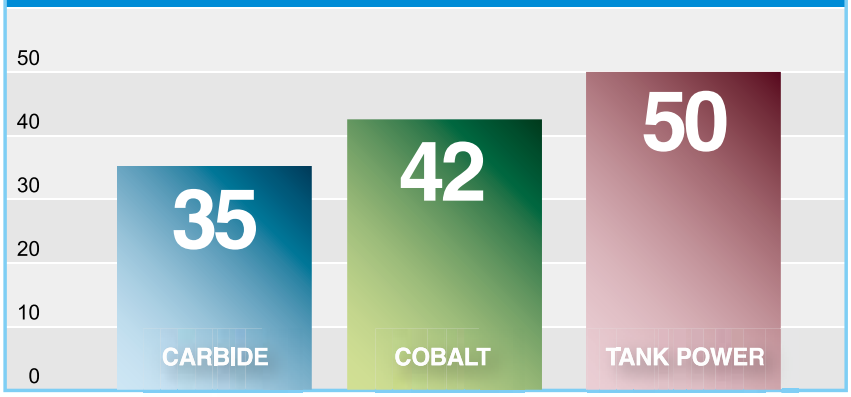
- Next Generation of Powdered Metal End Mills
  Higher Edge Strength & Feed Rates

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **E9983** |  | PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH ◆ | D1/8 | D1 | **1152** |
| **E9984** |  | PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH DOUBLE ◆ | D1/8 | D1 | **1153** |
| **E9985** |  | PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH ◆ | D1/8 | D1 | **1154** |
| **E9986** |  | PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH DOUBLE ◆ | D1/8 | D1 | **1155** |
| **E9988** |  | PREMIUM HSS-PM, 3&4 FLUTE 60° HELIX REGULAR LENGTH ◆ | D1/4 | D1 | **1156** |
| **E9992** |  | PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH BALL NOSE ◆ | R1/16 | R1/2 | **1157** |
| **E9990** |  | PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING ◆ | D1/4 | D1-1/4 | **1158** |
| **E9991** |  | PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING ◆ | D1/4 | D1-1/4 | **1159** |
| **E9A86** |  | PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING ◆ | D5/16 | D1-1/4 | **1160** |
| **E9A87** |  | PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING ◆ | D5/16 | D1-1/4 | **1161** |
| **E9921** |  | PREMIUM HSS-PM, MULTI FLUTE FINE PITCH ROUGHING EXTENDED NECK CENTER CUTTING ◆ | D1/2 | D1-1/4 | **1162** |
| | | RECOMMENDED CUTTING CONDITIONS | | | **1163** |

◆ U.S.A Stock

## TOUGHNESS VALUE AND EDGE STRENGTH



◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

## APPROXIMATE WEAR VALUES



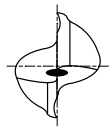
# TANK-POWER END MILLS

**E9983 SERIES** FLAT SHANK

## PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, YPM made by powder metallurgy makes much higher productivity possible.





YPM | 2 | 30° | FLAT

P.1163

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | |
| E9983008 | E9983008TF | 1/8 | 3/8 | 3/8 | 2-5/16 |
| E9983012 | E9983012TF | 3/16 | 3/8 | 7/16 | 2-5/16 |
| E9983016 | E9983016TF | 1/4 | 3/8 | 1/2 | 2-5/16 |
| E9983020 | E9983020TF | 5/16 | 3/8 | 9/16 | 2-5/16 |
| E9983024 | E9983024TF | 3/8 | 3/8 | 9/16 | 2-5/16 |
| E9983032 | E9983032TF | 1/2 | 1/2 | 1 | 3 |
| E9983040 | E9983040TF | 5/8 | 5/8 | 1-5/16 | 3-7/16 |
| E9983048 | E9983048TF | 3/4 | 3/4 | 1-5/16 | 3-7/16 |
| E9983056 | E9983056TF | 7/8 | 7/8 | 1-1/2 | 3-3/4 |
| E9983064 | E9983064TF | 1 | 1 | 1-5/8 | 4-1/8 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

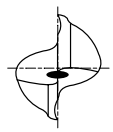
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

# PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E9984, E9984 two flute, end mills are the double end version of E9983, E9983 single-end tools.
Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, YPM made by powder metallurgy makes much higher productivity possible.





YPM 2 30° FLAT P.1163

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | |
| E9984008 | E9984008TF | 1/8 | 3/8 | 3/8 | 3-1/16 |
| E9984012 | E9984012TF | 3/16 | 3/8 | 7/16 | 3-1/8 |
| E9984016 | E9984016TF | 1/4 | 3/8 | 1/2 | 3-1/8 |
| E9984020 | E9984020TF | 5/16 | 3/8 | 9/16 | 3-1/8 |
| E9984024 | E9984024TF | 3/8 | 3/8 | 9/16 | 3-1/8 |
| E9984032 | E9984032TF | 1/2 | 1/2 | 13/16 | 3-3/4 |
| E9984040 | E9984040TF | 5/8 | 5/8 | 1-1/8 | 4-1/2 |
| E9984048 | E9984048TF | 3/4 | 3/4 | 1-5/16 | 5 |
| E9984056 | E9984056TF | 7/8 | 7/8 | 1-9/16 | 5-1/2 |
| E9984064 | E9984064TF | 1 | 1 | 1-5/8 | 5-7/8 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0010 | ** 0~−.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

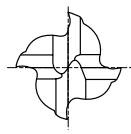
# TANK-POWER END MILLS

**E9985 SERIES** FLAT SHANK

## PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, YPM made by powder metallurgy makes much higher productivity possible.





YPM | 4 | 30° | FLAT

P.1163

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | |
| E9985008 | E9985008TF | 1/8 | 3/8 | 3/8 | 2-5/16 |
| E9985012 | E9985012TF | 3/16 | 3/8 | 1/2 | 2-3/8 |
| E9985016 | E9985016TF | 1/4 | 3/8 | 5/8 | 2-7/16 |
| E9985020 | E9985020TF | 5/16 | 3/8 | 3/4 | 2-1/2 |
| E9985024 | E9985024TF | 3/8 | 3/8 | 3/4 | 2-1/2 |
| E9985032 | E9985032TF | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| E9985040 | E9985040TF | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| E9985048 | E9985048TF | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| E9985056 | E9985056TF | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| E9985064 | E9985064TF | 1 | 1 | 2 | 4-1/2 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

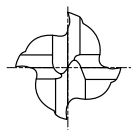
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

# PREMIUM HSS-PM, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E9986,EP986 four flute end mills are the double end version of E9985,EP985 single-end tools.
Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, YPM made by powder metallurgy makes much higher productivity possible.





YPM | 4 | 30° | FLAT

P.1163

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | |
| E9986008 | E9986008TF | 1/8 | 3/8 | 3/8 | 3-1/16 |
| E9986012 | E9986012TF | 3/16 | 3/8 | 1/2 | 3-1/4 |
| E9986016 | E9986016TF | 1/4 | 3/8 | 5/8 | 3-3/8 |
| E9986020 | E9986020TF | 5/16 | 3/8 | 3/4 | 3-1/2 |
| E9986024 | E9986024TF | 3/8 | 3/8 | 3/4 | 3-1/2 |
| E9986032 | E9986032TF | 1/2 | 1/2 | 1 | 4-1/8 |
| E9986040 | E9986040TF | 5/8 | 5/8 | 1-3/8 | 5 |
| E9986048 | E9986048TF | 3/4 | 3/4 | 1-5/8 | 5-5/8 |
| E9986056 | E9986056TF | 7/8 | 7/8 | 1-7/8 | 6-1/8 |
| E9986064 | E9986064TF | 1 | 1 | 1-7/8 | 6-3/8 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~−.0010 | ** 0~−.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

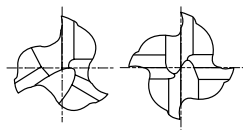
# TANK-POWER END MILLS

**E9988 SERIES** FLAT SHANK

## PREMIUM HSS-PM, 3&4 FLUTE 60° HELIX REGULAR LENGTH

▶ Faster feed & speed than normal HSS can be applied to hardened steels up to Rc 45. Accordingly, YPM made by powder metallurgy makes much higher productivity possible.





YPM | 3&4 | 60° | FLAT

P.1164

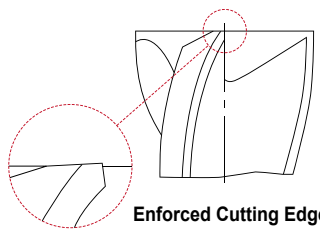
◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | | |
| E9988016 | E9988016TF | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| E9988020 | E9988020TF | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| E9988024 | E9988024TF | 3/8 | 3/8 | 3/4 | 2-1/2 | 3 |
| E9988028 | E9988028TF | 7/16 | 3/8 | 1 | 2-11/16 | 3 |
| E9988032 | E9988032TF | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 3 |
| E9988040 | E9988040TF | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 3 |
| E9988048 | E9988048TF | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 3 |
| E9988901 | E9988901TF | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 4 |
| E9988056 | E9988056TF | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 4 |
| E9988064 | E9988064TF | 1 | 1 | 2 | 4-1/2 | 4 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

# TANK-POWER END MILLS

**E9992 SERIES** FLAT SHANK

## PREMIUM HSS-PM, 2 FLUTE REGULAR LENGTH BALL NOSE

▶ The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.




YPM | 2 | 30° | R ±.001 | FLAT

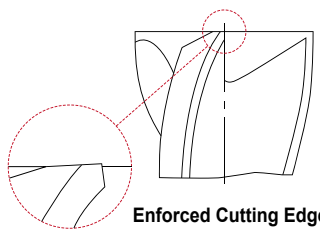
P.1165

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | R (±.001) | | | | |
| E9992008 | E9992008TF | R1/16 | 1/8 | 3/8 | 3/8 | 2-5/16 |
| E9992012 | E9992012TF | R3/32 | 3/16 | 3/8 | 1/2 | 2-3/8 |
| E9992016 | E9992016TF | R1/8 | 1/4 | 3/8 | 5/8 | 2-7/16 |
| E9992020 | E9992020TF | R5/32 | 5/16 | 3/8 | 3/4 | 2-1/2 |
| E9992024 | E9992024TF | R3/16 | 3/8 | 3/8 | 3/4 | 2-1/2 |
| E9992032 | E9992032TF | R1/4 | 1/2 | 1/2 | 1 | 3 |
| E9992040 | E9992040TF | R5/16 | 5/8 | 5/8 | 1-3/8 | 3-1/2 |
| E9992048 | E9992048TF | R3/8 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| E9992056 | E9992056TF | R7/16 | 7/8 | 7/8 | 2 | 4-1/4 |
| E9992064 | E9992064TF | R1/2 | 1 | 1 | 2-1/4 | 4-3/4 |

| Mill Dia. Tolerance (inch) |
|---|
| 0~−.0015 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

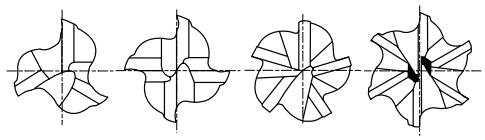
# TANK-POWER END MILLS

**E9990 SERIES** FLAT SHANK

## PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





YPM | FINE | 3-6 | 30° | FLAT

P.1164

◆ U.S.A Stock

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| UNCOATED | TANK-POWER COATED | | | | | |
| E9990016 | E9990016TF | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| E9990907 | E9990907TF | 1/4 | 3/8 | 1-1/8 | 2-15/16 | 3 |
| E9990020 | E9990020TF | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| E9990024 | E9990024TF | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| E9990028 | E9990028TF | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| E9990032 | E9990032TF | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| E9990908 | E9990908TF | 1/2 | 1/2 | 1-5/8 | 3-5/8 | 4 |
| E9990036 | E9990036TF | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| E9990040 | E9990040TF | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| E9990048 | E9990048TF | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| E9990948 | E9990948TF | 3/4 | 5/8 | 1-5/8 | 3-7/8 | 4 |
| E9990909 | E9990909TF | 3/4 | 3/4 | 2-1/2 | 4-3/4 | 4 |
| E9990056 | E9990056TF | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| E9990901 | E9990901TF | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| E9990064 | E9990064TF | 1 | 1 | 2 | 4-1/2 | 5 |
| E9990905 | E9990905TF | 1 | 1 | 3 | 5-1/2 | 5 |
| E9990108 | E9990108TF | 1-1/8 | 1 | 2 | 4-1/2 | 6 |
| E9990116 | E9990116TF | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| E9990906 | E9990906TF | 1-1/4 | 1-1/4 | 3 | 5-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

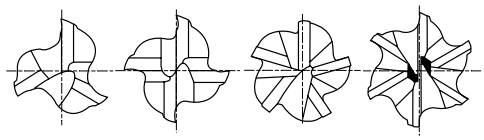
# TANK-POWER END MILLS

**E9991 SERIES** FLAT SHANK

## PREMIUM HSS-PM, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.





YPM | COARSE | 3-6 | 30° | FLAT

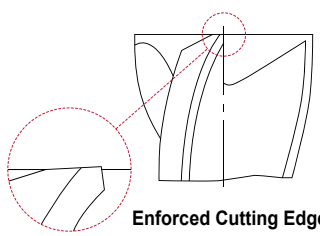
P.1164

◆ U.S.A Stock

Unit : Inch

| EDP No. UNCOATED | EDP No. TANK-POWER COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| E9991016 | E9991016TF | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| E9991902 | E9991902TF | 1/4 | 3/8 | 1-1/8 | 2-15/16 | 3 |
| E9991020 | E9991020TF | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| E9991024 | E9991024TF | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| E9991028 | E9991028TF | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| E9991032 | E9991032TF | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| E9991903 | E9991903TF | 1/2 | 1/2 | 1-5/8 | 3-5/8 | 4 |
| E9991036 | E9991036TF | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| E9991040 | E9991040TF | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| E9991048 | E9991048TF | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| E9991948 | E9991948TF | 3/4 | 5/8 | 1-5/8 | 3-7/8 | 4 |
| E9991904 | E9991904TF | 3/4 | 3/4 | 2-1/2 | 4-3/4 | 4 |
| E9991056 | E9991056TF | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| E9991901 | E9991901TF | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| E9991064 | E9991064TF | 1 | 1 | 2 | 4-1/2 | 5 |
| E9991905 | E9991905TF | 1 | 1 | 3 | 5-1/2 | 5 |
| E9991108 | E9991108TF | 1-1/8 | 1 | 2 | 4-1/2 | 6 |
| E9991116 | E9991116TF | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| E9991906 | E9991906TF | 1-1/4 | 1-1/4 | 3 | 5-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

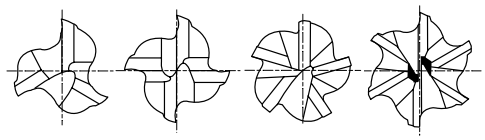
# TANK-POWER END MILLS

**E9A86 SERIES** FLAT SHANK

## PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.





YPM | FINE | 3-6 | 30° | FLAT

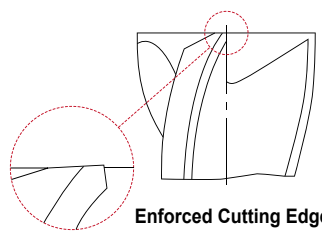
P.1164

◆ U.S.A Stock

Unit : Inch

| EDP No. UNCOATED | EDP No. TANK-POWER COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| E9A86020 | E9A86020TF | 5/16 | 3/8 | 1-3/8 | 3-3/16 | 3 |
| E9A86024 | E9A86024TF | 3/8 | 3/8 | 1-1/2 | 3-1/4 | 4 |
| E9A86924 | E9A86924TF | 3/8 | 3/8 | 1-1/2 | 4 | 4 |
| E9A86032 | E9A86032TF | 1/2 | 1/2 | 2 | 4 | 4 |
| E9A86040 | E9A86040TF | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| E9A86048 | E9A86048TF | 3/4 | 5/8 | 3 | 5-1/8 | 4 |
| E9990902 | E9990902TF | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| E9A86056 | E9A86056TF | 7/8 | 3/4 | 3-1/2 | 5-3/4 | 5 |
| E9A86956 | E9A86956TF | 7/8 | 7/8 | 3-1/2 | 5-3/4 | 5 |
| E9990903 | E9990903TF | 1 | 1 | 4 | 6-1/2 | 5 |
| E9A86116 | E9A86116TF | 1-1/4 | 3/4 | 4 | 6-1/4 | 6 |
| E9990904 | E9990904TF | 1-1/4 | 1-1/4 | 4 | 6-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



**Enforced Cutting Edge**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

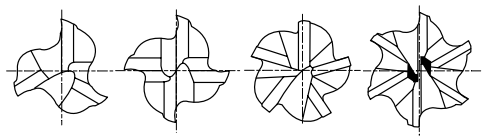
# TANK-POWER END MILLS

**E9A87 SERIES** FLAT SHANK

## PREMIUM HSS-PM, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.





YPM | COARSE | 3-6 | 30° | FLAT

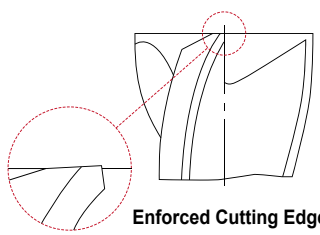
P.1164

◆ U.S.A Stock

Unit : Inch

| EDP No. UNCOATED | EDP No. TANK-POWER COATED | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|
| E9A87020 | E9A87020TF | 5/16 | 3/8 | 1-3/8 | 3-3/16 | 3 |
| E9A87024 | E9A87024TF | 3/8 | 3/8 | 1-1/2 | 3-1/4 | 4 |
| E9A87924 | E9A87924TF | 3/8 | 3/8 | 1-1/2 | 4 | 4 |
| E9A87032 | E9A87032TF | 1/2 | 1/2 | 2 | 4 | 4 |
| E9A87040 | E9A87040TF | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| E9A87048 | E9A87048TF | 3/4 | 5/8 | 3 | 5-1/8 | 4 |
| E9A87948 | E9A87948TF | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| E9A87056 | E9A87056TF | 7/8 | 3/4 | 3-1/2 | 5-3/4 | 5 |
| E9A87956 | E9A87956TF | 7/8 | 7/8 | 3-1/2 | 5-3/4 | 5 |
| E9A87064 | E9A87064TF | 1 | 1 | 4 | 6-1/2 | 5 |
| E9A87116 | E9A87116TF | 1-1/4 | 3/4 | 4 | 6-1/4 | 6 |
| E9A87917 | E9A87917TF | 1-1/4 | 1-1/4 | 4 | 6-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



**Enforced Cutting Edge**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

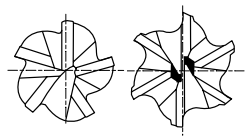
# TANK-POWER END MILLS

**E9921 SERIES** FLAT SHANK

## PREMIUM HSS-PM, MULTI FLUTE FINE PITCH ROUGHING EXTENDED NECK CENTER CUTTING

▶ This TANK-POWER rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths.





YPM | FINE | 5&6 | 35° | FLAT

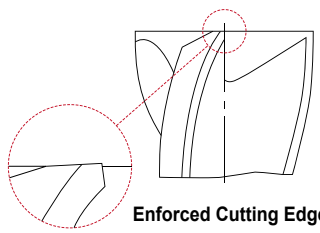
P.1164

◆ U.S.A Stock

Unit : Inch

| EDP No. UNCOATED | EDP No. TiAlN COATED | Mill Diameter | Shank Diameter | Length of Cut | Reach Extended Neck | Overall Length | No. of Flute |
|---|---|---|---|---|---|---|---|
| EP20322 | EP20322F | 1/2 | 1/2 | 1-1/4 | 3 | 5 | 5 |
| EP20402 | EP20402F | 5/8 | 5/8 | 1-5/8 | 4 | 6-1/8 | 5 |
| EP20482 | EP20482F | 3/4 | 3/4 | 1-5/8 | 4 | 6-1/4 | 5 |
| EP20484 | EP20484F | 3/4 | 3/4 | 1-5/8 | 6 | 8-1/4 | 5 |
| EP20642 | EP20642F | 1 | 1 | 2 | 4 | 6-1/2 | 6 |
| EP20643 | EP20643F | 1 | 1 | 2 | 6 | 8-1/2 | 6 |
| EP21161 | EP21161F | 1-1/4 | 1 1/4 | 2 | 4 | 6-1/2 | 6 |
| EP21162 | EP21162F | 1-1/4 | 1 1/4 | 2 | 6 | 8-1/2 | 6 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



**Enforced Cutting Edge**

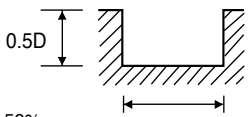
◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ◎ | | | | ◎ | ◎ | ○ | | | | | | |

## PREMIUM HSS-PM, 2 FLUTE FINISH - SLOTTING

### E9983, E9984 SERIES

| MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc35 | | HRc35~HRc40 | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1100N/mm² | | 1100~1300N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4600 | 5.9 | 3800 | 5.0 | 3150 | 4.2 | 2150 | 2.8 | 1650 | 2.2 |
| 3/16 | 3800 | 8.5 | 3150 | 6.7 | 2600 | 6.1 | 1650 | 3.5 | 1350 | 2.6 |
| 1/4 | 3150 | 9.1 | 2650 | 7.5 | 2100 | 6.6 | 1350 | 3.8 | 1050 | 3.0 |
| 5/16 | 2500 | 9.4 | 2100 | 8.2 | 1700 | 6.9 | 1100 | 3.9 | 855 | 3.0 |
| 3/8 | 2100 | 10.1 | 1800 | 8.9 | 1450 | 7.6 | 910 | 4.2 | 715 | 3.4 |
| 1/2 | 1650 | 9.3 | 1350 | 8.1 | 1050 | 7.0 | 665 | 3.9 | 525 | 2.9 |
| 5/8 | 1300 | 9.1 | 1100 | 7.3 | 855 | 6.1 | 535 | 3.6 | 425 | 2.8 |
| 3/4 | 995 | 7.9 | 820 | 6.2 | 710 | 5.3 | 450 | 3.2 | 360 | 2.5 |
| 7/8 | 795 | 6.2 | 675 | 5.1 | 560 | 4.3 | 375 | 2.7 | 300 | 2.0 |
| 1 | 710 | 5.2 | 590 | 4.7 | 465 | 3.9 | 335 | 2.5 | 235 | 1.7 |



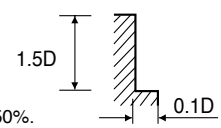

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## PREMIUM HSS-PM, 4 FLUTE FINISH - SIDE CUTTING

### E9985, E9986 SERIES

| MATERIAL | P | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS TOOL STEELS AUSTENITIC STAINLESS STEELS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc35 | | HRc35~HRc40 | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1100N/mm² | | 1100~1300N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 6300 | 17.7 | 6000 | 14.4 | 4250 | 10.4 | 2700 | 7.2 | 2320 | 5.1 |
| 3/16 | 4600 | 19.7 | 4100 | 16.1 | 3040 | 12.6 | 2070 | 8.5 | 1780 | 6.2 |
| 1/4 | 3800 | 22.1 | 3300 | 18.1 | 2500 | 13.0 | 1700 | 9.7 | 1400 | 7.1 |
| 5/16 | 3100 | 22.4 | 2600 | 18.9 | 2000 | 14.2 | 1400 | 9.4 | 1150 | 7.2 |
| 3/8 | 2500 | 24.8 | 2200 | 20.5 | 1680 | 15.0 | 1180 | 10.2 | 960 | 7.7 |
| 1/2 | 1900 | 22.1 | 1720 | 18.5 | 1270 | 14.4 | 860 | 9.3 | 690 | 2.7 |
| 5/8 | 1600 | 20.1 | 1410 | 16.9 | 1000 | 13.3 | 690 | 8.9 | 620 | 6.7 |
| 3/4 | 1400 | 17.7 | 1150 | 15.2 | 830 | 11.5 | 580 | 7.3 | 470 | 5.7 |
| 7/8 | 1030 | 15.8 | 930 | 12.4 | 675 | 9.8 | 470 | 6.3 | 390 | 5.1 |
| 1 | 1000 | 14.6 | 830 | 11.8 | 620 | 8.8 | 420 | 5.6 | 360 | 4.9 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

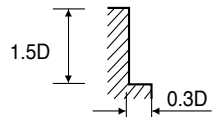
# TANK-POWER END MILLS

## RECOMMENDED CUTTING CONDITIONS

## PREMIUM HSS-PM, 3&4 FLUTE 60° HELIX - SIDE CUTTING

### E9988 SERIES

| MATERIAL | P | | | | | |
|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALLOY STEELS, TOOL STEELS AUSTENITIC STAINLESS STEELS | |
| HARDNESS | ~HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc40 | |
| STRENGTH | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 3850 | 7.9 | 2500 | 5.3 | 1900 | 3.5 |
| 5/16 | 3050 | 7.9 | 2100 | 6.3 | 1700 | 3.5 |
| 3/8 | 2700 | 8.5 | 1700 | 6.3 | 1450 | 3.8 |
| 1/2 | 1850 | 9.7 | 1200 | 6.3 | 960 | 4.1 |
| 5/8 | 1300 | 11.0 | 845 | 8.5 | 690 | 5.4 |
| 3/4 | 895 | 14.6 | 580 | 11.9 | 475 | 7.9 |
| 7/8 | 720 | 16.6 | 475 | 14.0 | 380 | 8.8 |
| 1 | 630 | 19.0 | 415 | 16.0 | 335 | 10.0 |



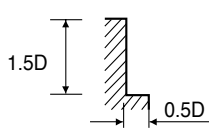

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## PREMIUM HSS-PM, MULTI FLUTE ROUGHING - SIDE CUTTING

### E9990, E9991, E9A86, E9A87, E9921 SERIES

| MATERIAL | P | | | | | | | | M | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | | STAINLESS STEELS | |
| HARDNESS | ~HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc35 | | HRc35 ~ HRc40 | | | |
| STRENGTH | ~800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1100N/mm² | | 1100 ~ 1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2650 | 7.8 | 2050 | 6.3 | 1450 | 4.4 | 1200 | 3.4 | 1900 | 5.6 |
| 3/8 | 1900 | 13.1 | 1500 | 10.1 | 1050 | 6.4 | 885 | 5.2 | 1270 | 8.6 |
| 1/2 | 1450 | 14.2 | 1100 | 11.4 | 805 | 7.9 | 665 | 6.1 | 950 | 9.3 |
| 5/8 | 1150 | 14.2 | 905 | 11.4 | 630 | 7.9 | 525 | 6.1 | 760 | 9.7 |
| 3/4 | 960 | 14.4 | 780 | 11.4 | 540 | 7.9 | 445 | 6.1 | 630 | 9.5 |
| 7/8 | 845 | 14.5 | 615 | 11.4 | 445 | 7.8 | 375 | 6.1 | 540 | 9.3 |
| 1 | 740 | 14.0 | 560 | 10.6 | 395 | 7.4 | 315 | 6.0 | 470 | 9.0 |



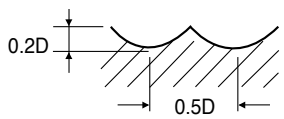

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

# PREMIUM HSS-PM, 2 FLUTE BALL NOSE - PROFILING

## E9992 SERIES

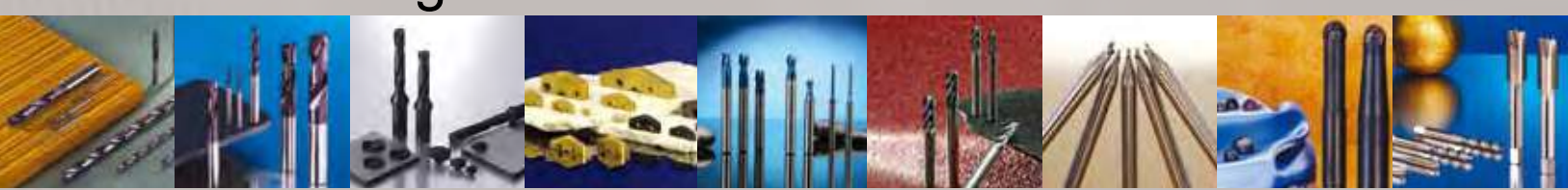
| MATERIAL | P | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | STRUCTURAL STEELS CARBON STEELS | | STRUCTURAL STEELS CARBON STEELS CAST IRONS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | PREHARDENED STEELS ALLOY STEELS TOOL STEELS | |
| HARDNESS | | | ~HRc20 | | HRc20 ~ HRc30 | | HRc30 ~ HRc40 | |
| STRENGTH | ~500N/mm² | | 500 ~ 800N/mm² | | 800 ~ 1000N/mm² | | 1000 ~ 1300N/mm² | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 6800 | 12.3 | 5300 | 8.2 | 3550 | 4.5 | 1850 | 2.1 |
| 3/16 | 5100 | 15.3 | 4000 | 10.3 | 2650 | 5.7 | 1350 | 2.7 |
| 1/4 | 4050 | 16.8 | 3150 | 11.2 | 2100 | 6.2 | 1100 | 3.0 |
| 5/16 | 3250 | 18.1 | 2550 | 12.2 | 1700 | 6.9 | 860 | 3.0 |
| 3/8 | 2750 | 19.9 | 2100 | 13.4 | 1450 | 7.6 | 700 | 3.4 |
| 1/2 | 2100 | 17.8 | 1600 | 12.0 | 1100 | 6.8 | 530 | 2.9 |
| 5/8 | 1600 | 16.6 | 1250 | 11.1 | 860 | 6.1 | 425 | 2.8 |
| 3/4 | 1350 | 14.7 | 1050 | 9.8 | 700 | 5.4 | 360 | 2.5 |
| 7/8 | 1100 | 12.6 | 865 | 8.4 | 560 | 4.6 | 300 | 2.1 |
| 1 | 890 | 10.5 | 690 | 7.0 | 445 | 3.9 | 235 | 1.7 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

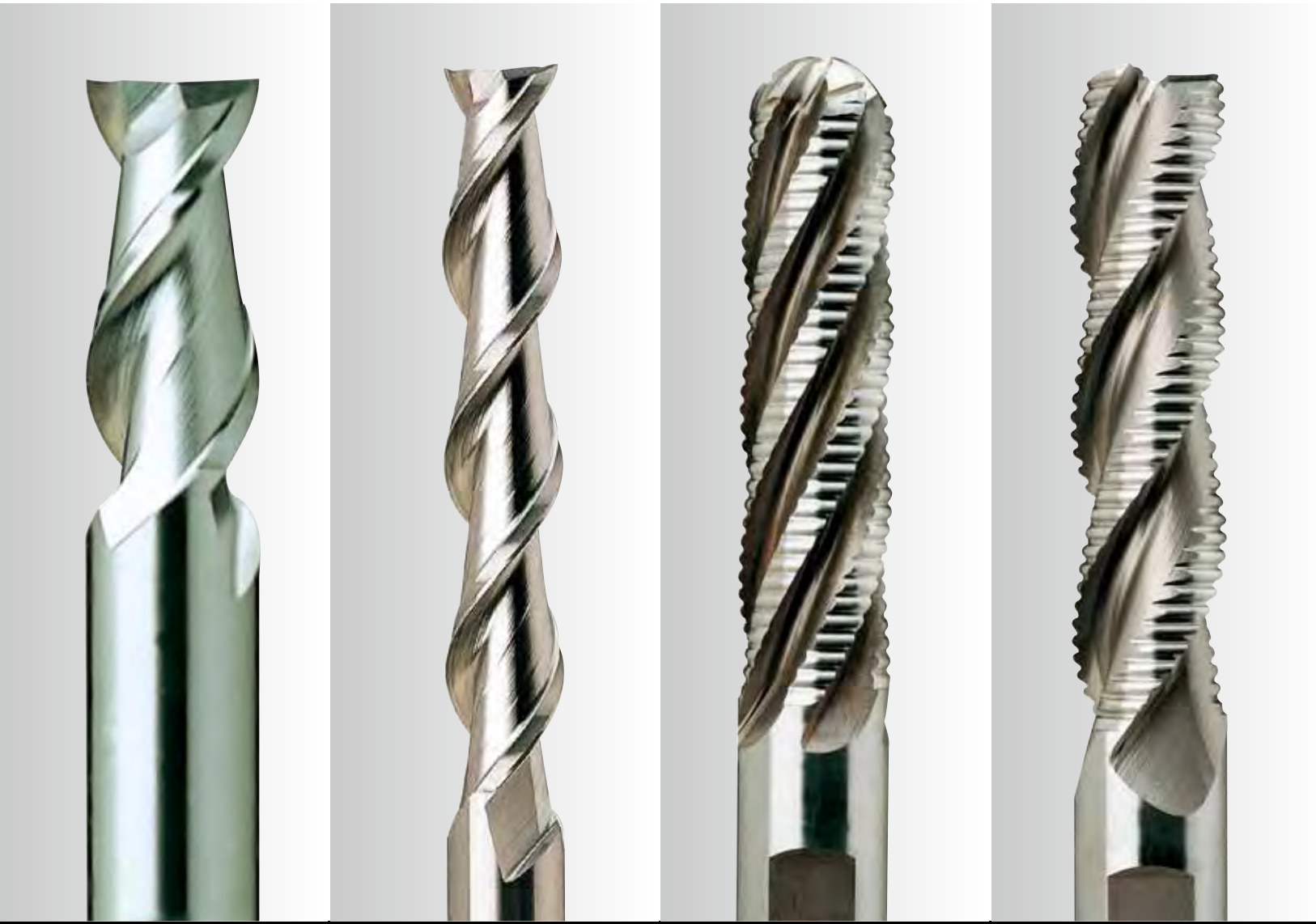
Global Cutting Tool Leader **YG-1**



HSS

YG

Being the best through innovation



# COBALT & HSS END MILLS

- General Purpose, Non-coated, Many Coatings Available

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| E2030 E1030 |  | HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH | D1/8 | D2 | 1175 |
| E2080 E1080 |  | HSSCo8 & HSS, 2 FLUTE LONG LENGTH | D1/4 | D2 | 1177 |
| E2033 E1033 |  | HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH | D1/8 | D1-1/4 | 1178 |
| E2050 E1050 |  | HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE | D1/8 | D1 | 1179 |
| E2110 E1110 |  | HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE | R1/16 | R1 | 1181 |
| E2111 E1111 |  | HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH BALL NOSE | R1/16 | R1/2 | 1182 |
| E2112 E1112 |  | HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE DOUBLE | R1/16 | R1/2 | 1183 |
| E2031 E1031 |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH | D1/8 | D1 | 1184 |
| E2032 E1032 |  | HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH | D5/8 | D2 | 1186 |
| E2034 E1034 |  | HSSCo8 & HSS, 4 FLUTE LONG LENGTH | D1/4 | D1 | 1187 |
| E2035 E1035 |  | HSSCo8 & HSS, 6 FLUTE LONG LENGTH | D1-1/8 | D2 | 1187 |
| E2036 E1036 |  | HSSCo8 & HSS, 4 FLUTE EXTRA LONG LENGTH | D1/4 | D1 | 1188 |
| E2037 E1037 |  | HSSCo8 & HSS, 6 FLUTE EXTRA LONG LENGTH | D1-1/4 | D2 | 1188 |
| E2051 E1051 |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE | D1/8 | D1 | 1189 |
| E2031 E1031 |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH 3/4 SHANK | D3/4 | D1 | 1191 |
| E2032 E1032 |  | HSSCo8 & HSS, 6&8 FLUTE REGULAR LENGTH 3/4 SHANK | D1-1/8 | D2 | 1191 |
| E2020 |  | HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE | R1/16 | R1 | 1192 |
| E2021 |  | HSSCo8, 4 FLUTE LONG LENGTH BALL NOSE | R1/8 | R1/2 | 1193 |
| E2069 |  | HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE DOUBLE | R1/16 | R1/2 | 1194 |
| E2039 E1039 |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING | D1/8 | D1-1/2 | 1195 |
| E2042 E1042 |  | HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH CENTER CUTTING | D1/2 | D2 | 1197 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE | | PAGE |
|---|---|---|---|---|---|
| | | | MIN | MAX | |
| **INCH** | | | | | |
| **E2039 E2042** |  | HSSCo8, MULTI FLUTE MEDIUM LENGTH CENTER CUTTING | D1 | D2 | **1198** |
| **E2040 E1040** |  | HSSCo8 & HSS, 4 FLUTE LONG LENGTH CENTER CUTTING | D1/4 | D1-1/2 | **1199** |
| **E2162 E1162** |  | HSSCo8 & HSS, 6 FLUTE LONG LENGTH CENTER CUTTING | D1/2 | D2 | **1199** |
| **E2041 E1041** |  | HSSCo8 & HSS, 4 FLUTE EXTRA LONG LENGTH CENTER CUTTING | D1/4 | D1-1/4 | **1200** |
| **E2175 E1175** |  | HSSCo8 & HSS, 6 FLUTE EXTRA LONG LENGTH CENTER CUTTING | D1/2 | D2 | **1200** |
| **E2053 E1053** |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING | D1/8 | D1 | **1201** |
| **E2100 E1100** |  | HSSCo8 & HSS, 6 FLUTE REGULAR with COMBINATION 2″ SHANK CENTER CUTTING | D2 | D2 | **1203** |
| **E2001 E1001** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH DOUBLE | D1/32 | D3/16 | **1204** |
| **E2003 E1003** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH DOUBLE | D1/32 | D3/16 | **1205** |
| **E2005 E1005** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH DOUBLE | D1/16 | D3/16 | **1206** |
| **E2002 E1002** |  | HSSCo8 & HSS, 4 FLUTE MINIATURE STUB LENGTH DOUBLE | D1/16 | D3/16 | **1207** |
| **E2004 E1004** |  | HSSCo8 & HSS, 4 FLUTE MINIATURE REGULAR LENGTH DOUBLE | D1/16 | D3/16 | **1208** |
| **E2006 E1006** |  | HSSCo8 & HSS, 4 FLUTE MINIATURE LONG LENGTH DOUBLE | D1/16 | D3/16 | **1209** |
| **E2008 E1008** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH BALL NOSE DOUBLE | R1/32 | R3/32 | **1210** |
| **E2013 E1013** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH BALL NOSE DOUBLE | R1/64 | R3/32 | **1211** |
| **E2015 E1015** |  | HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH BALL NOSE DOUBLE | R1/32 | R3/32 | **1212** |
| **E1070** |  | HSS, 2 FLUTE 42° HELIX REGULAR & MEDIUM LENGTH for ALUMINUM | D1/4 | D2 | **1213** |
| **E1071** |  | HSS, 2 FLUTE 42° HELIX LONG LENGTH for ALUMINUM | D1/4 | D2 | **1214** |
| **E1072** |  | HSS, 2 FLUTE 42° HELIX EXTRA LONG LENGTH for ALUMINUM | D1/4 | D1-1/2 | **1214** |
| **E2086** |  | HSSCo8, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING | D1/4 | D1 | **1215** |
| **E2085** |  | HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING CENTER CUTTING | D1/4 | D1 | **1216** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ○ | | | | | | | | | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# SELECTION GUIDE

| ITEM | MODEL | DESCRIPTION | SIZE MIN | SIZE MAX | PAGE |
|---|---|---|---|---|---|
| **INCH** | | | | | |
| **E2079** |  | HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING | D1/4 | D2 | **1217** |
| **E2077** |  | HSSCo8, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING | D1/2 | D2 | **1218** |
| **E2086** |  | HSSCo8, 3 FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING | D1/4 | D1 | **1219** |
| **E2170** |  | HSSCo8, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING | D1/4 | D2 | **1220** |
| **E2171** |  | HSSCo8, MULTI FLUTE MEDIUM LENGTH COARSE PITCH ROUGHING | D1 | D2 | **1221** |
| **E2172** |  | HSSCo8, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING | D1/2 | D2 | **1222** |
| **E2241** |  | HSSCo8,3 FLUTE STUB LENGTH COARSE PITCH ROUGHING CENTER CUTTING | D1/4 | D1 | **1223** |
| **E2195** |  | HSSCo8, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING CENTER CUTTING | D1/2 | D1-1/2 | **1224** |
| **E2197** |  | HSSCo8, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING CENTER CUTTING | D1/2 | D1-1/2 | **1224** |
| **E2193 E2125** |  | HSSCo8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING BALL NOSE | R1/8 | R3/4 | **1225** |
| **E2248** |  | HSSCo8, MULTI FLUTE REGULAR LENGTH ROUGHING & FINISHING | D1/4 | D2 | **1226** |
| **E2191** |  | HSSCo8, 3 FLUTE 37° HELIX REGULAR LENGTH ROUGHING for ALUMINUM | D1/4 | D1-1/2 | **1227** |
| **E2226 E2192** |  | HSSCo8, 3 FLUTE 37° HELIX MEDIUM & LONG LENGTH ROUGHING for ALUMINUM | D1/2 | D1-1/2 | **1228** |
| **E2163 E1163** |  | HSSCo8 & HSS, 2 FLUTE 15° HELIX for KEYWAY CUTTING | D1/8 | D1 | **1229** |
| **E2120 E2121** |  | HSSCo8, 3&4 FLUTE 60° HELIX REGULAR LENGTH | D1/4 | D3/4 | **1230** |
| **E2160** |  | HSSCo8, 3 FLUTE SHORT LENGTH THROW AWAY | D7/8 D1/16 | D2 D1/4 | **1231** |
| **E2161** |  | HSSCo8, 3 FLUTE LONG LENGTH THROW AWAY | D1/16 | D1/4 | **1231** |
| **E2237 E1237** |  | HSSCo8 & HSS, 4 FLUTE CORNER ROUNDING | D1/4 | D5/8 | **1232** |
| **METRIC** | | | | | |
| **E2482 E1482** |  | HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH - METRIC | D2.0 (.0787) | D45.0 (1.772) | **1233** |
| **E2483 E1483** |  | HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH - METRIC | D2.0 (.0787) | D45.0 (1.772) | **1234** |
| | | END MILL SET SERIES / RECOMMENDED CUTTING CONDITIONS | | | **1237** |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ◎ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

## SUPER CUTTING END MILLS

| DESCRIPTION | | | | YG-1 | **ANSI | REMARK |
|---|---|---|---|---|---|---|
| TYPE | NO. OF FLUTE | LENGTH OF CUT | TYPE OF END | | | |
| **SINGLE END** | 2 | REGULAR LONG EX. LONG | ALL | +.0010 .0000 *(+.0015 .0000) | +.0030 .0000 | |
| | MULTIPLE | ALL | ALL | +.0010 .0000 *(+.0015 .0000) | +.0030 .0000 | |
| **KEY WAY** | 2 | ALL | CENTER CUTTING | +.0000 -.0015 | +.0000 -.0015 | |
| **DOUBLE END** | 2 | REGULAR | ALL | .0000 -.0010 *(.0000 -.0020) | .0000 -.0015 | |
| | 4 | ALL | CENTER CUTTING | .0000 -.0010 *(.0000 -.0020) | .0000 -.0015 | |
| | 4 | ALL | NON CENTER CUTTING | +.0010 .0000 *(.0000 -.0020) | +.0030 .0000 *(.0000 -.0025) | |
| **3/16 SHANK DOUBLE END** | 2 | STUB REGULAR | ALL | .0000 -.0010 *(.0000 -.0020) | .0000 -.0015 | |
| | | LONG | ALL | +.0010 .0000 *(.0000 -.0020) | +.0030 .0000 *(.0000 -.0025) | |
| | 4 | ALL | ALL | +.0010 .0000 *(.0000 -.0020) | +.0030 .0000 *(.0000 -.0025) | |
| **ROUGHING** | MULTIPLE | ALL | ALL | +.0060 .0000 | +.025 -.005 | |
| **ROUGHING & FINISHING** | MULTIPLE | REGULAR | ALL | +.0025 +.0005 | | |
| **HELICAL 60°** | 3.4 | REGULAR | CENTER CUTTING | +.0010 .0000 *(+.0015 .0000) | | |
| **THROW AWAY 1/4 SHANK** | 3 | ALL | CENTER CUTTING | -.0005 -.0013 | | |

* The shank of End Mills is the same diameter as the cutting portion.

** ANSI B94-19-1977 published by the American Society of Mechanical Engineers.

# COBALT & HSS END MILLS

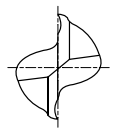
**E2030 SERIES** 8% COBALT (M42) FLAT SHANK

**E1030 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 01289 | 01039 | 1/8 | 3/8 | 3/8 | 2-5/16 |
| 01291 | 01041 | 5/32 | 3/8 | 7/16 | 2-5/16 |
| 01293 | 01043 | 3/16 | 3/8 | 7/16 | 2-5/16 |
| 01295 | 01045 | 7/32 | 3/8 | 1/2 | 2-5/16 |
| 01297 | 01047 | 1/4 | 3/8 | 1/2 | 2-5/16 |
| 01299 | 01049 | 9/32 | 3/8 | 9/16 | 2-5/16 |
| 01301 | 01051 | 5/16 | 3/8 | 9/16 | 2-5/16 |
| 01303 | 01053 | 11/32 | 3/8 | 9/16 | 2-5/16 |
| 01305 | 01055 | 3/8 | 3/8 | 9/16 | 2-5/16 |
| 01308 | 01058 | 13/32 | 3/8 | 13/16 | 2-1/2 |
| 01312 | 01062 | 7/16 | 3/8 | 13/16 | 2-1/2 |
| 01316 | 01066 | 15/32 | 3/8 | 13/16 | 2-1/2 |
| 01320 | 01070 | 1/2 | 3/8 | 13/16 | 2-1/2 |
| 01321 | 01071 | 1/2 | 1/2 | 1 | 3 |
| 01328 | 01078 | 9/16 | 1/2 | 1-1/8 | 3-1/8 |
| 01336 | 01086 | 5/8 | 1/2 | 1-1/8 | 3-1/8 |
| 01337 | 01087 | 5/8 | 5/8 | 1-5/16 | 3-7/16 |
| 01348 | 01098 | 11/16 | 5/8 | 1-5/16 | 3-7/16 |
| 01357 | 01107 | 3/4 | 1/2 | 1-5/16 | 3-5/16 |
| 01358 | 01108 | 3/4 | 5/8 | 1-5/16 | 3-7/16 |
| 01359 | 01109 | 3/4 | 3/4 | 1-5/16 | 3-7/16 |
| 01373 | 01123 | 13/16 | 5/8 | 1-1/2 | 3-5/8 |
| 01391 | 01141 | 7/8 | 3/4 | 1-1/2 | 3-3/4 |
| 01394 | 01144 | 7/8 | 7/8 | 1-1/2 | 3-3/4 |
| 01409 | 01159 | 15/16 | 7/8 | 1-1/2 | 3-3/4 |
| 01420 | 01170 | 1 | 5/8 | 1-1/2 | 3-5/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.

▶ NEXT PAGE

■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)

■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)

▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

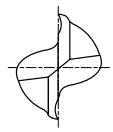
# COBALT & HSS END MILLS

**E2030 SERIES** 8% COBALT (M42) FLAT SHANK
**E1030 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH

▶ These end mills are furnished as regular with right-hand cutting and right-hand helical flutes. All shanks are flatted for holder set screw. These are designed for slotting, drilling, pocketing and general-purpose operation.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 01422 | 01172 | 1 | 3/4 | 1-1/2 | 3-3/4 |
| 01426 | 01176 | 1 | 1 | 1-5/8 | 4-1/8 |
| 01435 | 01185 | 1-1/8 | 1 | 1-5/8 | 4-1/8 |
| 01445 | 01195 | 1-1/4 | 1-1/4 | 1-5/8 | 4-1/8 |
| 01451 | 01201 | 1-3/8 | 1 | 1-5/8 | 4-1/8 |
| 01453 | 01203 | 1-3/8 | 1-1/4 | 1-5/8 | 4-1/8 |
| 01459 | 01209 | 1-1/2 | 1 | 1-5/8 | 4-1/8 |
| 01461 | 01211 | 1-1/2 | 1-1/4 | 1-5/8 | 4-1/8 |
| 01469 | 01219 | 1-3/4 | 1-1/4 | 1-5/8 | 4-1/8 |
| 01477 | 01227 | 2 | 1-1/4 | 1-5/8 | 4-1/8 |
| * 01480 | * 01230 | 2 | 2 | 2 | 5-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

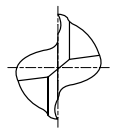
**E2080 SERIES** 8% COBALT (M42) FLAT SHANK

**E1080 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE LONG LENGTH

▶Longer flute length than E2030 type and allows deeper cutting.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 02297 | 02047 | 1/4 | 3/8 | 1-1/4 | 3-1/8 |
| 02301 | 02051 | 5/16 | 3/8 | 1-3/8 | 3-1/8 |
| 02305 | 02055 | 3/8 | 3/8 | 1-1/2 | 3-1/4 |
| 02321 | 02071 | 1/2 | 1/2 | 2 | 4 |
| 02337 | 02087 | 5/8 | 5/8 | 2 | 4-1/8 |
| 02359 | 02109 | 3/4 | 3/4 | 2-1/4 | 4-1/2 |
| 02394 | 02144 | 7/8 | 7/8 | 2-1/2 | 4-3/4 |
| 02426 | 02176 | 1 | 1 | 3 | 5-1/2 |
| 02435 | 02185 | 1-1/8 | 1 | 3 | 5-1/2 |
| 02443 | 02193 | 1-1/4 | 1 | 3 | 5-1/2 |
| 02445 | 02195 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| 02461 | 02211 | 1-1/2 | 1-1/4 | 3 | 5-1/2 |
| 02469 | 02219 | 1-3/4 | 1-1/4 | 3 | 5-1/2 |
| 02477 | 02227 | 2 | 1-1/4 | 3 | 5-1/2 |
| * 02482 | * 02232 | 2 | 2 | 3 | 6-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

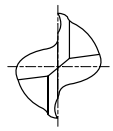
# COBALT & HSS END MILLS

**E2033 SERIES** 8% COBALT (M42) FLAT SHANK
**E1033 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH

▶ Provided with the longest flute length and suitable for high accuracy machining of deep step.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | | |
| 03289 | 03039 | 1/8 | 3/8 | 3/8 | - | 2-3/8 |
| 03293 | 03043 | 3/16 | 3/8 | 1/2 | 1-1/8 | 2-11/16 |
| 03297 | 03047 | 1/4 | 3/8 | 5/8 | 1-1/2 | 3-1/16 |
| 03301 | 03051 | 5/16 | 3/8 | 3/4 | 1-3/4 | 3-5/16 |
| 03305 | 03055 | 3/8 | 3/8 | 3/4 | 1-3/4 | 3-5/16 |
| 03321 | 03071 | 1/2 | 1/2 | 1 | 2-7/32 | 4 |
| 03337 | 03087 | 5/8 | 5/8 | 1-3/8 | 2-23/32 | 4-5/8 |
| 03359 | 03109 | 3/4 | 3/4 | 1-5/8 | 3-11/32 | 5-3/8 |
| 03394 | 03144 | 7/8 | 7/8 | 2 | 4 | 6 |
| 03426 | 03176 | 1 | 1 | 2-1/2 | 4-31/32 | 7-1/4 |
| 03445 | 03195 | 1-1/4 | 1-1/4 | 3 | 4-31/32 | 7-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

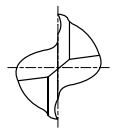
**E2050 SERIES** 8% COBALT (M42) FLAT SHANK

**E1050 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 11289 | 11039 | 1/8 | 3/8 | 3/8 | 3-1/16 |
| 11290 | 11040 | 9/64 | 3/8 | 7/16 | 3-1/8 |
| 11291 | 11041 | 5/32 | 3/8 | 7/16 | 3-1/8 |
| 11292 | 11042 | 11/64 | 3/8 | 7/16 | 3-1/8 |
| 11293 | 11043 | 3/16 | 3/8 | 7/16 | 3-1/8 |
| 11294 | 11044 | 13/64 | 3/8 | 1/2 | 3-1/8 |
| 11295 | 11045 | 7/32 | 3/8 | 1/2 | 3-1/8 |
| 11296 | 11046 | 15/64 | 3/8 | 1/2 | 3-1/8 |
| 11297 | 11047 | 1/4 | 3/8 | 1/2 | 3-1/8 |
| 11298 | 11048 | 17/64 | 3/8 | 9/16 | 3-1/8 |
| 11299 | 11049 | 9/32 | 3/8 | 9/16 | 3-1/8 |
| 11300 | 11050 | 19/64 | 3/8 | 9/16 | 3-1/8 |
| 11301 | 11051 | 5/16 | 3/8 | 9/16 | 3-1/8 |
| 11302 | 11052 | 21/64 | 3/8 | 9/16 | 3-1/8 |
| 11303 | 11053 | 11/32 | 3/8 | 9/16 | 3-1/8 |
| 11304 | 11054 | 23/64 | 3/8 | 9/16 | 3-1/8 |
| 11305 | 11055 | 3/8 | 3/8 | 9/16 | 3-1/8 |
| 11307 | 11057 | 25/64 | 1/2 | 13/16 | 3-3/4 |
| 11309 | 11059 | 13/32 | 1/2 | 13/16 | 3-3/4 |
| 11311 | 11061 | 27/64 | 1/2 | 13/16 | 3-3/4 |
| 11313 | 11063 | 7/16 | 1/2 | 13/16 | 3-3/4 |
| 11315 | 11065 | 29/64 | 1/2 | 13/16 | 3-3/4 |
| 11317 | 11067 | 15/32 | 1/2 | 13/16 | 3-3/4 |
| 11319 | 11069 | 31/64 | 1/2 | 13/16 | 3-3/4 |
| 11321 | 11071 | 1/2 | 1/2 | 13/16 | 3-3/4 |
| 11326 | 11076 | 17/32 | 5/8 | 1-1/8 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

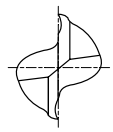
# COBALT & HSS END MILLS

**E2050 SERIES** 8% COBALT (M42) FLAT SHANK
**E1050 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2050 two flute end mills are the double-end version of E2030 single-end tools. Same excellent tool geometry for slotting, keying and general purpose milling, plus the added economy offered by the double-end design.





HSS Co8 | HSS | 2 | 30° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 11330 | 11080 | 9/16 | 5/8 | 1-1/8 | 4-1/2 |
| 11334 | 11084 | 19/32 | 5/8 | 1-1/8 | 4-1/2 |
| 11337 | 11087 | 5/8 | 5/8 | 1-1/8 | 4-1/2 |
| 11344 | 11094 | 21/32 | 3/4 | 1-5/16 | 5 |
| 11350 | 11100 | 11/16 | 3/4 | 1-5/16 | 5 |
| 11354 | 11104 | 23/32 | 3/4 | 1-5/16 | 5 |
| 11359 | 11109 | 3/4 | 3/4 | 1-5/16 | 5 |
| 11368 | 11118 | 25/32 | 7/8 | 1-9/16 | 5-1/2 |
| 11377 | 11127 | 13/16 | 7/8 | 1-9/16 | 5-1/2 |
| 11384 | 11134 | 27/32 | 7/8 | 1-9/16 | 5-1/2 |
| 11394 | 11144 | 7/8 | 7/8 | 1-9/16 | 5-1/2 |
| 11402 | 11152 | 29/32 | 1 | 1-5/8 | 5-7/8 |
| 11410 | 11160 | 15/16 | 1 | 1-5/8 | 5-7/8 |
| 11417 | 11167 | 31/32 | 1 | 1-5/8 | 5-7/8 |
| 11426 | 11176 | 1 | 1 | 1-5/8 | 5-7/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2110 SERIES** 8% COBALT (M42) FLAT SHANK

**E1110 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE

▶ The two flute ball end mills are designed for milling of radius bottom slots, fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut. The two flute design provides good chip removal ability in slotting.




HSS Co8 | HSS | 2 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | |
| **41289** | **41039** | R1/16 | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **41293** | **41043** | R3/32 | **3/16** | 3/8 | 1/2 | 2-3/8 |
| **41297** | **41047** | R1/8 | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **41301** | **41051** | R5/32 | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **41305** | **41055** | R3/16 | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **41313** | **41063** | R7/32 | **7/16** | 1/2 | 1 | 3 |
| **41321** | **41071** | R1/4 | **1/2** | 1/2 | 1 | 3 |
| **41328** | **41078** | R9/32 | **9/16** | 1/2 | 1-1/8 | 3-1/8 |
| **41336** | **41086** | R5/16 | **5/8** | 1/2 | 1-1/8 | 3-1/8 |
| **41337** | **41087** | R5/16 | **5/8** | 5/8 | 1-3/8 | 3-1/2 |
| **41357** | **41107** | R3/8 | **3/4** | 1/2 | 1-5/16 | 3-5/16 |
| **41359** | **41109** | R3/8 | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **41391** | **41141** | R7/16 | **7/8** | 3/4 | 2 | 4-1/4 |
| **41394** | **41144** | R7/16 | **7/8** | 7/8 | 2 | 4-1/4 |
| **41422** | **41172** | R1/2 | **1** | 3/4 | 2-1/4 | 4-1/2 |
| **41426** | **41176** | R1/2 | **1** | 1 | 2-1/4 | 4-3/4 |
| **41431** | **41181** | R9/16 | **1-1/8** | 3/4 | 1-5/8 | 3-7/8 |
| **41435** | **41185** | R9/16 | **1-1/8** | 1 | 2-1/4 | 4-3/4 |
| **41439** | **41189** | R5/8 | **1-1/4** | 3/4 | 1-5/8 | 3-7/8 |
| **41445** | **41195** | R5/8 | **1-1/4** | 1-1/4 | 2-1/2 | 5 |
| **41449** | **41199** | R11/16 | **1-3/8** | 3/4 | 1-5/8 | 4-1/8 |
| **41453** | **41203** | R11/16 | **1-3/8** | 1-1/4 | 2-1/2 | 5 |
| **41457** | **41207** | R3/4 | **1-1/2** | 3/4 | 1-5/8 | 4-1/8 |
| **41461** | **41211** | R3/4 | **1-1/2** | 1-1/4 | 2-1/2 | 5 |
| **41478** | **41227** | R1 | **2** | 1-1/4 | 2-1/2 | 5 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2111 SERIES** 8% COBALT (M42) FLAT SHANK
**E1111 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE EXTENDED LENGTH BALL NOSE

▶Longer flute length than E2110 type and suitable for high efficient copying process and deep cutting of die mold corner radius.




HSS Co8 | HSS | 2 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Length Below Shank | Overall Length |
|---|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | | |
| **42289** | **42039** | R1/16 | **1/8** | 3/8 | 3/8 | - | 2-3/8 |
| **42293** | **42043** | R3/32 | **3/16** | 3/8 | 1/2 | 1-1/8 | 2-11/16 |
| **42297** | **42047** | R1/8 | **1/4** | 3/8 | 5/8 | 1-1/2 | 3-1/16 |
| **42301** | **42051** | R5/32 | **5/16** | 3/8 | 3/4 | 1-3/4 | 3-5/16 |
| **42305** | **42055** | R3/16 | **3/8** | 3/8 | 3/4 | 1-3/4 | 3-5/16 |
| **42313** | **42063** | R7/32 | **7/16** | 1/2 | 1 | 1-7/8 | 3-11/16 |
| **42321** | **42071** | R1/4 | **1/2** | 1/2 | 1 | 2-1/4 | 4 |
| **42337** | **42087** | R5/16 | **5/8** | 5/8 | 1-3/8 | 2-3/4 | 4-5/8 |
| **42359** | **42109** | R3/8 | **3/4** | 3/4 | 1-5/8 | 3-3/8 | 5-3/8 |
| **42426** | **42176** | R1/2 | **1** | 1 | 2-1/2 | 5 | 7-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2112 SERIES** 8% COBALT (M42) FLAT SHANK

**E1112 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

▶ Same construction features as E2110 end mill in a more economical version. Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.




HSS Co8 | HSS | 2 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | |
| **45289** | **45039** | R1/16 | **1/8** | 3/8 | 3/8 | 3-1/16 |
| **45293** | **45043** | R3/32 | **3/16** | 3/8 | 7/16 | 3-1/8 |
| **45297** | **45047** | R1/8 | **1/4** | 3/8 | 1/2 | 3-1/8 |
| **45301** | **45051** | R5/32 | **5/16** | 3/8 | 9/16 | 3-1/8 |
| **45305** | **45055** | R3/16 | **3/8** | 3/8 | 9/16 | 3-1/8 |
| **45313** | **45063** | R7/32 | **7/16** | 1/2 | 13/16 | 3-3/4 |
| **45321** | **45071** | R1/4 | **1/2** | 1/2 | 13/16 | 3-3/4 |
| **45337** | **45087** | R5/16 | **5/8** | 5/8 | 1-1/8 | 4-1/2 |
| **45359** | **45109** | R3/8 | **3/4** | 3/4 | 1-5/16 | 5 |
| **45426** | **45176** | R1/2 | **1** | 1 | 1-5/8 | 5-7/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

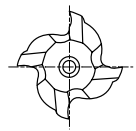
**E2031 SERIES** 8% COBALT (M42) FLAT SHANK

**E1031 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 04289 | 04039 | 1/8 | 3/8 | 3/8 | 2-5/16 |
| 04290 | 04040 | 9/64 | 3/8 | 7/16 | 2-3/8 |
| 04291 | 04041 | 5/32 | 3/8 | 7/16 | 2-3/8 |
| 04292 | 04042 | 11/64 | 3/8 | 1/2 | 2-3/8 |
| 04293 | 04043 | 3/16 | 3/8 | 1/2 | 2-3/8 |
| 04294 | 04044 | 13/64 | 3/8 | 9/16 | 2-7/16 |
| 04295 | 04045 | 7/32 | 3/8 | 9/16 | 2-7/16 |
| 04296 | 04046 | 15/64 | 3/8 | 5/8 | 2-7/16 |
| 04297 | 04047 | 1/4 | 3/8 | 5/8 | 2-7/16 |
| 04298 | 04048 | 17/64 | 3/8 | 11/16 | 2-1/2 |
| 04299 | 04049 | 9/32 | 3/8 | 11/16 | 2-1/2 |
| 04300 | 04050 | 19/64 | 3/8 | 3/4 | 2-1/2 |
| 04301 | 04051 | 5/16 | 3/8 | 3/4 | 2-1/2 |
| 04302 | 04052 | 21/64 | 3/8 | 3/4 | 2-1/2 |
| 04303 | 04053 | 11/32 | 3/8 | 3/4 | 2-1/2 |
| 04304 | 04054 | 23/64 | 3/8 | 3/4 | 2-1/2 |
| 04305 | 04055 | 3/8 | 3/8 | 3/4 | 2-1/2 |
| 04306 | 04056 | 25/64 | 3/8 | 1 | 2-11/16 |
| 04308 | 04058 | 13/32 | 3/8 | 1 | 2-11/16 |
| 04310 | 04060 | 27/64 | 3/8 | 1 | 2-11/16 |
| 04312 | 04062 | 7/16 | 3/8 | 1 | 2-11/16 |
| 04315 | 04065 | 29/64 | 1/2 | 1-1/4 | 3-1/4 |
| 04317 | 04067 | 15/32 | 1/2 | 1-1/4 | 3-1/4 |
| 04319 | 04069 | 31/64 | 1/2 | 1-1/4 | 3-1/4 |
| 04320 | 04070 | 1/2 | 3/8 | 1 | 2-11/16 |
| 04321 | 04071 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 04324 | 04074 | 17/32 | 1/2 | 1-3/8 | 3-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.

▶ NEXT PAGE

■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)

■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)

▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2031 SERIES** 8% COBALT (M42) FLAT SHANK

**E1031 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 04328 | 04078 | 9/16 | 1/2 | 1-3/8 | 3-3/8 |
| 04332 | 04082 | 19/32 | 1/2 | 1-3/8 | 3-3/8 |
| 04336 | 04086 | 5/8 | 1/2 | 1-3/8 | 3-3/8 |
| 04337 | 04087 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 04340 | 04090 | 21/32 | 1/2 | 1-5/8 | 3-5/8 |
| 04348 | 04098 | 11/16 | 5/8 | 1-5/8 | 3-3/4 |
| 04352 | 04102 | 23/32 | 1/2 | 1-5/8 | 3-5/8 |
| 04357 | 04107 | 3/4 | 1/2 | 1-5/8 | 3-5/8 |
| 04358 | 04108 | 3/4 | 5/8 | 1-5/8 | 3-3/4 |
| 04359 | 04109 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 04364 | 04114 | 25/32 | 5/8 | 1-7/8 | 4 |
| 04375 | 04125 | 13/16 | 3/4 | 1-7/8 | 4-1/8 |
| 04380 | 04130 | 27/32 | 5/8 | 1-7/8 | 4 |
| 04391 | 04141 | 7/8 | 3/4 | 1-7/8 | 4-1/8 |
| 04394 | 04144 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 04399 | 04149 | 29/32 | 3/4 | 1-7/8 | 4-1/8 |
| 04407 | 04157 | 15/16 | 3/4 | 1-7/8 | 4-1/8 |
| 04414 | 04164 | 31/32 | 3/4 | 1-7/8 | 4-1/8 |
| 04420 | 04170 | 1 | 5/8 | 1-7/8 | 4 |
| 04422 | 04172 | 1 | 3/4 | 1-7/8 | 4-1/8 |
| 04426 | 04176 | 1 | 1 | 2 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

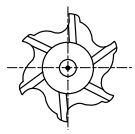
# COBALT & HSS END MILLS

**E2032 SERIES** 8% COBALT (M42) FLAT SHANK
**E1032 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH

▶ Possible for high-speed cutting, suitable for high efficiency machining. Easy to regrind.





HSS Co8 | HSS | 6 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 04338 | 04088 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 04360 | 04110 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 04376 | 04126 | 13/16 | 3/4 | 1-7/8 | 4-1/8 |
| 04390 | 04140 | 7/8 | 5/8 | 1-7/8 | 4 |
| 04395 | 04145 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 04405 | 04155 | 15/16 | 5/8 | 1-7/8 | 4 |
| 04421 | 04171 | 1 | 5/8 | 1-7/8 | 4 |
| 04427 | 04177 | 1 | 1 | 2 | 4-1/2 |
| 04432 | 04182 | 1-1/8 | 3/4 | 2 | 4-1/4 |
| 04436 | 04186 | 1-1/8 | 1 | 2 | 4-1/2 |
| 04440 | 04190 | 1-1/4 | 3/4 | 2 | 4-1/4 |
| 04444 | 04194 | 1-1/4 | 1 | 2 | 4-1/2 |
| 04446 | 04196 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 04452 | 04202 | 1-3/8 | 1 | 2 | 4-1/2 |
| 04460 | 04210 | 1-1/2 | 1 | 2 | 4-1/2 |
| 04462 | 04212 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| 04470 | 04220 | 1-3/4 | 1-1/4 | 2 | 4-1/2 |
| 04478 | 04228 | 2 | 1-1/4 | 2 | 4-1/2 |
| 04481 | 04231 | 2 | 2 | 2 | 5-3/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

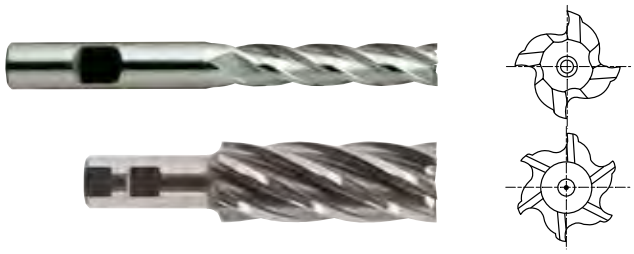
| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

**E2034 / E2035 SERIES** 8% COBALT (M42) FLAT SHANK
**E1034 / E1035 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4&6 FLUTE LONG LENGTH

▶ Longer flute length than E2031 type and allows deeper cutting. Easy to regrind.



HSS Co8 | HSS | 4&6 | 30° | FLAT

P.1239, 1244, 1248

### E2034(8% COBALT) , E1034(HSS) Series ■ 4 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 05297 | 05047 | 1/4 | 3/8 | 1-1/4 | 3-1/16 |
| 05301 | 05051 | 5/16 | 3/8 | 1-3/8 | 3-1/8 |
| 05305 | 05055 | 3/8 | 3/8 | 1-1/2 | 3-1/4 |
| 05313 | 05063 | 7/16 | 1/2 | 1-3/4 | 3-3/4 |
| 05321 | 05071 | 1/2 | 1/2 | 2 | 4 |
| 05337 | 05087 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 05359 | 05109 | 3/4 | 3/4 | 3 | 5-1/4 |
| 05394 | 05144 | 7/8 | 7/8 | 3-1/2 | 5-3/4 |
| 05426 | 05176 | 1 | 1 | 4 | 6-1/2 |

### E2035(8% COBALT) , E1035(HSS) Series ■ 6 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 05436 | 05186 | 1-1/8 | 1 | 4 | 6-1/2 |
| 05444 | 05194 | 1-1/4 | 1 | 4 | 6-1/2 |
| 05446 | 05196 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 05460 | 05210 | 1-1/2 | 1 | 4 | 6-1/2 |
| 05462 | 05212 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |
| 05470 | 05220 | 1-3/4 | 1-1/4 | 4 | 6-1/2 |
| 05478 | 05228 | 2 | 1-1/4 | 4 | 6-1/2 |
| * 05485 | * 05235 | 2 | 2 | 4 | 7-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| E1034 E2034 | ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| E1035 E2035 | ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

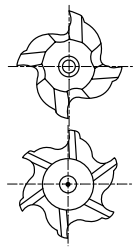
# COBALT & HSS END MILLS

**E2036 / E2037 SERIES** 8% COBALT (M42) FLAT SHANK
**E1036 / E1037 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH

▶ Provided with the longest flute length and suitable for high accuracy machining of deep step. Easy to regrind.





HSS Co8 | HSS | 4&6 | 30° | FLAT

P.1239, 1244, 1248

### E2036(8% COBALT) , E1036(HSS) Series ■ 4 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 06297 | 06047 | 1/4 | 3/8 | 1-3/4 | 3-9/16 |
| 06301 | 06051 | 5/16 | 3/8 | 2 | 3-3/4 |
| 06305 | 06055 | 3/8 | 3/8 | 2-1/2 | 4-1/4 |
| 06321 | 06071 | 1/2 | 1/2 | 3 | 5 |
| 06337 | 06087 | 5/8 | 5/8 | 4 | 6-1/8 |
| 06359 | 06109 | 3/4 | 3/4 | 4 | 6-1/4 |
| 06394 | 06144 | 7/8 | 7/8 | 5 | 7-1/4 |
| 06426 | 06176 | 1 | 1 | 6 | 8-1/2 |

### E2037(8% COBALT) , E1037(HSS) Series ■ 6 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 06446 | 06196 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 06462 | 06212 | 1-1/2 | 1-1/4 | 8 | 10-1/2 |
| * 06491 | * 06241 | 2 | 2 | 8 | 11-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels ~HRc20 | Alloy Steels HRc20~30 | Prehardened Steels HRc30~40 | Hardened Steels HRc40~45 | Hardened Steels HRc45~55 | High Hardened Steels HRc55~70 | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| E1036 E2036 | ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| E1037 E2037 | ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

**E2051 SERIES** 8% COBALT (M42) FLAT SHANK

**E1051 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 12289 | 12039 | 1/8 | 3/8 | 3/8 | 3-1/16 |
| 12290 | 12040 | 9/64 | 3/8 | 7/16 | 3-1/8 |
| 12291 | 12041 | 5/32 | 3/8 | 7/16 | 3-1/8 |
| 12292 | 12042 | 11/64 | 3/8 | 1/2 | 3-1/4 |
| 12293 | 12043 | 3/16 | 3/8 | 1/2 | 3-1/4 |
| 12294 | 12044 | 13/64 | 3/8 | 9/16 | 3-1/4 |
| 12295 | 12045 | 7/32 | 3/8 | 9/16 | 3-1/4 |
| 12296 | 12046 | 15/64 | 3/8 | 5/8 | 3-3/8 |
| 12297 | 12047 | 1/4 | 3/8 | 5/8 | 3-3/8 |
| 12298 | 12048 | 17/64 | 3/8 | 11/16 | 3-3/8 |
| 12299 | 12049 | 9/32 | 3/8 | 11/16 | 3-3/8 |
| 12300 | 12050 | 19/64 | 3/8 | 3/4 | 3-1/2 |
| 12301 | 12051 | 5/16 | 3/8 | 3/4 | 3-1/2 |
| 12302 | 12052 | 21/64 | 3/8 | 3/4 | 3-1/2 |
| 12303 | 12053 | 11/32 | 3/8 | 3/4 | 3-1/2 |
| 12304 | 12054 | 23/64 | 3/8 | 3/4 | 3-1/2 |
| 12305 | 12055 | 3/8 | 3/8 | 3/4 | 3-1/2 |
| 12307 | 12057 | 25/64 | 1/2 | 1 | 4-1/8 |
| 12309 | 12059 | 13/32 | 1/2 | 1 | 4-1/8 |
| 12311 | 12061 | 27/64 | 1/2 | 1 | 4-1/8 |
| 12313 | 12063 | 7/16 | 1/2 | 1 | 4-1/8 |
| 12315 | 12065 | 29/64 | 1/2 | 1 | 4-1/8 |
| 12317 | 12067 | 15/32 | 1/2 | 1 | 4-1/8 |
| 12319 | 12069 | 31/64 | 1/2 | 1 | 4-1/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.

▶ NEXT PAGE

■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)

■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)

▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

**E2051 SERIES** 8% COBALT (M42) FLAT SHANK

**E1051 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE

▶ Series E2051 four flute end mills are the double-end version of E2031 four flute tools and are used for the same type of finishing operation. Two tools on one shank saves on sharpening set-up as well as on initial tool costs. Easy to regrind.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 12321 | 12071 | 1/2 | 1/2 | 1 | 4-1/8 |
| 12330 | 12080 | 9/16 | 5/8 | 1-3/8 | 5 |
| 12337 | 12087 | 5/8 | 5/8 | 1-3/8 | 5 |
| 12350 | 12100 | 11/16 | 3/4 | 1-5/8 | 5-5/8 |
| 12359 | 12109 | 3/4 | 3/4 | 1-5/8 | 5-5/8 |
| 12377 | 12127 | 13/16 | 7/8 | 1-7/8 | 6-1/8 |
| 12394 | 12144 | 7/8 | 7/8 | 1-7/8 | 6-1/8 |
| 12410 | 12160 | 15/16 | 1 | 1-7/8 | 6-3/8 |
| 12426 | 12176 | 1 | 1 | 1-7/8 | 6-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

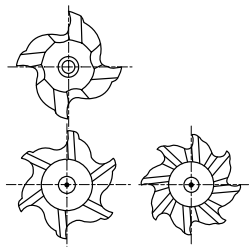
**E2031 / E2032 SERIES** 8% COBALT (M42) FLAT SHANK

**E1031 / E1032 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4, 6&8 FLUTE REGULAR LENGTH 3/4″ SHANK

▶ E2031(3/4″ shank, multi flute, general purpose end mills) are recommended for finishing operations for Bridgeport machines and other similar operations. Easy to regrind.





HSS Co8 | HSS | 4-8 | 30° | FLAT

P.1239, 1244, 1248

### E2031(8% COBALT) , E1031(HSS) Series ■ 4 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 04359 | 04109 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 04375 | 04125 | 13/16 | 3/4 | 1-7/8 | 4-1/8 |
| 04391 | 04141 | 7/8 | 3/4 | 1-7/8 | 4-1/8 |
| 04407 | 04157 | 15/16 | 3/4 | 1-7/8 | 4-1/8 |
| 04422 | 04172 | 1 | 3/4 | 1-7/8 | 4-1/8 |

### E2032(8% COBALT) , E1032(HSS) Series ■ 6&8 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|---|
| 04432 | 04182 | 1-1/8 | 3/4 | 2 | 4-1/4 | 6 |
| 04440 | 04190 | 1-1/4 | 3/4 | 2 | 4-1/4 | 6 |
| 04458 | 04208 | 1-1/2 | 3/4 | 2 | 4-1/4 | 6 |
| 04468 | 04218 | 1-3/4 | 3/4 | 2 | 4-1/2 | 6 |
| 04476 | 04226 | 2 | 3/4 | 2 | 4-1/2 | 8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| E1031 E2031 | ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| E1032 E2032 | ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

**E2020 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE

▶ The four flute ball end mills are designed for milling of radius bottom slots fillets and special contours. The end teeth are cut to center allowing these end mills to drill into material at the beginning of a slotting cut.




HSS Co8 | 4 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | R | | | | |
| **43289** | R1/16 | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **43293** | R3/32 | **3/16** | 3/8 | 1/2 | 2-3/8 |
| **43297** | R1/8 | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **43301** | R5/32 | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **43305** | R3/16 | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **43312** | R7/32 | **7/16** | 3/8 | 1 | 2-11/16 |
| **43321** | R1/4 | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **43337** | R5/16 | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **43350** | R11/32 | **11/16** | 5/8 | 1-5/8 | 3-3/4 |
| **43359** | R3/8 | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **43394** | R7/16 | **7/8** | 7/8 | 1-7/8 | 4-1/8 |
| **43426** | R1/2 | **1** | 1 | 2 | 4-1/2 |
| **43435** | R9/16 | **1-1/8** | 1 | 2 | 4-1/2 |
| **43445** | R5/8 | **1-1/4** | 1-1/4 | 2 | 4-1/2 |
| **43461** | R3/4 | **1-1/2** | 1-1/4 | 2 | 4-1/2 |
| **43477** | R1 | **2** | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2021 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 4 FLUTE LONG LENGTH BALL NOSE

▶Longer flute length than E2020 type and suitable for high efficient copying process and deep cutting of die mold corner radius.




HSS Co8 | 4 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | R | | | | |
| **44297** | R1/8 | **1/4** | 3/8 | 1-1/4 | 3-1/16 |
| **44301** | R5/32 | **5/16** | 3/8 | 1-3/8 | 3-1/8 |
| **44305** | R3/16 | **3/8** | 3/8 | 1-1/2 | 3-1/4 |
| **44321** | R1/4 | **1/2** | 1/2 | 2 | 4 |
| **44337** | R5/16 | **5/8** | 5/8 | 2-1/2 | 4-5/8 |
| **44359** | R3/8 | **3/4** | 3/4 | 3 | 5-1/4 |
| **44394** | R7/16 | **7/8** | 7/8 | 3-1/2 | 5-3/4 |
| **44426** | R1/2 | **1** | 1 | 4 | 6-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2069 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 4 FLUTE REGULAR LENGTH BALL NOSE DOUBLE

▶ Same construction features as E2020 end mill in a more economical version. Removes more material per grind. Machine ground notch assures positive anchorage in tool holder.




HSS Co8 | 4 | 30° | FLAT

P.1240, 1245, 1249

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | R | | | | |
| **46289** | R1/16 | **1/8** | 3/8 | 3/8 | 3-1/16 |
| **46293** | R3/32 | **3/16** | 3/8 | 1/2 | 3-1/4 |
| **46297** | R1/8 | **1/4** | 3/8 | 5/8 | 3-3/8 |
| **46301** | R5/32 | **5/16** | 3/8 | 3/4 | 3-1/2 |
| **46305** | R3/16 | **3/8** | 3/8 | 3/4 | 3-1/2 |
| **46313** | R7/32 | **7/16** | 1/2 | 1 | 4-1/8 |
| **46321** | R1/4 | **1/2** | 1/2 | 1 | 4-1/8 |
| **46337** | R5/16 | **5/8** | 5/8 | 1-3/8 | 5 |
| **46359** | R3/8 | **3/4** | 3/4 | 1-5/8 | 5-5/8 |
| **46426** | R1/2 | **1** | 1 | 1-7/8 | 6-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

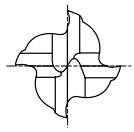
**E2039 SERIES** 8% COBALT (M42) FLAT SHANK

**E1039 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 07289 | 07039 | 1/8 | 3/8 | 3/8 | 2-5/16 |
| 07291 | 07041 | 5/32 | 3/8 | 7/16 | 2-3/8 |
| 07293 | 07043 | 3/16 | 3/8 | 1/2 | 2-3/8 |
| 07295 | 07045 | 7/32 | 3/8 | 9/16 | 2-7/16 |
| 07297 | 07047 | 1/4 | 3/8 | 5/8 | 2-7/16 |
| 07299 | 07049 | 9/32 | 3/8 | 11/16 | 2-1/2 |
| 07301 | 07051 | 5/16 | 3/8 | 3/4 | 2-1/2 |
| 07303 | 07053 | 11/32 | 3/8 | 3/4 | 2-1/2 |
| 07305 | 07055 | 3/8 | 3/8 | 3/4 | 2-1/2 |
| 07308 | 07058 | 13/32 | 3/8 | 1 | 2-11/16 |
| 07312 | 07062 | 7/16 | 3/8 | 1 | 2-11/16 |
| 07316 | 07066 | 15/32 | 3/8 | 1 | 2-11/16 |
| 07320 | 07070 | 1/2 | 3/8 | 1 | 2-11/16 |
| 07321 | 07071 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

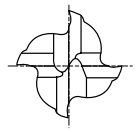
# COBALT & HSS END MILLS

**E2039 SERIES** 8% COBALT (M42) FLAT SHANK
**E1039 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 07336 | 07086 | 5/8 | 1/2 | 1-3/8 | 3-3/8 |
| 07337 | 07087 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 07348 | 07098 | 11/16 | 5/8 | 1-5/8 | 3-3/4 |
| 07357 | 07107 | 3/4 | 1/2 | 1-5/8 | 3-5/8 |
| 07358 | 07108 | 3/4 | 5/8 | 1-5/8 | 3-3/4 |
| 07359 | 07109 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 07391 | 07141 | 7/8 | 3/4 | 1-7/8 | 4-1/8 |
| 07394 | 07144 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 07420 | 07170 | 1 | 5/8 | 1-7/8 | 4 |
| 07422 | 07172 | 1 | 3/4 | 1-7/8 | 4-1/8 |
| 07426 | 07176 | 1 | 1 | 2 | 4-1/2 |
| 07435 | 07185 | 1-1/8 | 1 | 2 | 4-1/2 |
| 07445 | 07195 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 07461 | 07211 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

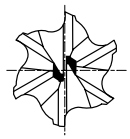
**E2042 SERIES** 8% COBALT (M42) FLAT SHANK

**E1042 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 6 FLUTE REGULAR LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.





HSS Co8 | HSS | 6 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 07322 | 07072 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 07338 | 07088 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 07349 | 07099 | 11/16 | 5/8 | 1-5/8 | 3-3/4 |
| 07360 | 07110 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 07395 | 07145 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 07427 | 07177 | 1 | 1 | 2 | 4-1/2 |
| 07436 | 07186 | 1-1/8 | 1 | 2 | 4-1/2 |
| 07446 | 07196 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 07448 | | 1-5/16 | 3/4 | 2 | 4-1/4 |
| 07462 | 07212 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| 07478 | 07228 | 2 | 1-1/4 | 2 | 4-1/2 |
| * 07481 | * 07231 | 2 | 2 | 2 | 5-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

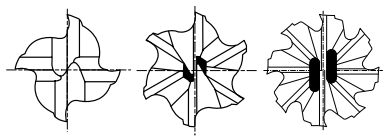
**E2039 SERIES** 8% COBALT (M42) FLAT SHANK

**E2042 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE MEDIUM LENGTH CENTER CUTTING

▶ Center cutting allows these end mills to drill into the part for the beginning of a slot. These center cutting end mills are recommended for pocketing, tracer milling, cam milling, die sinking and slotting.





HSS Co8 | 4-8 | 30° | FLAT

P.1239, 1244, 1248

### E2039(4 FLUTE), E2042(6&8 FLUTE) Series

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 07901 | 1 | 1 | 3 | 5-1/2 | 4 |
| 07902 | 1-1/4 | 1-1/4 | 3 | 5-1/2 | 4 |
| 07903 | 1-1/2 | 1-1/4 | 3 | 5-1/2 | 4 |
| 07094 | 1 | 1 | 3 | 5-1/2 | 6 |
| 07095 | 1-1/4 | 1-1/4 | 3 | 5-1/2 | 6 |
| 07096 | 1-1/2 | 1-1/4 | 3 | 5-1/2 | 6 |
| 07097 | 1-3/4 | 1-1/4 | 3 | 5-1/2 | 6 |
| 99098 | 2 | 1-1/4 | 3 | 5-1/2 | 8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2040 / E2162 SERIES** 8% COBALT (M42) FLAT SHANK

**E1040 / E1162 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4&6 FLUTE LONG LENGTH CENTER CUTTING

▶ Longer flute length than E2039 type, E2042 and allows deeper cutting.



HSS Co8 | HSS | 4&6 | 30° | FLAT

P.1239, 1244, 1248

### E2040(8% COBALT) , E1040(HSS) Series ■ 4 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 08297 | 08047 | 1/4 | 3/8 | 1-1/4 | 3-1/16 |
| 08301 | 08051 | 5/16 | 3/8 | 1-3/8 | 3-1/8 |
| 08305 | 08055 | 3/8 | 3/8 | 1-1/2 | 3-1/4 |
| 08321 | 08071 | 1/2 | 1/2 | 2 | 4 |
| 08337 | 08087 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 08359 | 08109 | 3/4 | 3/4 | 3 | 5-1/4 |
| 08394 | 08144 | 7/8 | 7/8 | 3-1/2 | 5-3/4 |
| 08426 | 08176 | 1 | 1 | 4 | 6-1/2 |
| 08445 | 08195 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 08461 | 08211 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |

### E2162(8% COBALT) , E1162(HSS) Series ■ 6 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 08322 | 08072 | 1/2 | 1/2 | 2 | 4 |
| 08338 | 08088 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 08360 | 08110 | 3/4 | 3/4 | 3 | 5-1/4 |
| 08395 | 08145 | 7/8 | 7/8 | 3-1/2 | 5-3/4 |
| 08427 | 08177 | 1 | 1 | 4 | 6-1/2 |
| 08446 | 08196 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 08462 | 08212 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |
| 08478 | 08228 | 2 | 1-1/4 | 4 | 6-1/2 |
| * 08485 | * 08235 | 2 | 2 | 4 | 7-3/4 |
| * 08489 | * 08239 | 2 | 2 | 6 | 9-3/4 |

* Combination Shank

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| E1040 E2040 | ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| E1162 E2162 | ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

**E2041 / E2175 SERIES** 8% COBALT (M42) FLAT SHANK
**E1041 / E1175 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4&6 FLUTE EXTRA LONG LENGTH CENTER CUTTING

▶ Provided with longest flute length and suitable for high accuracy machining of deep step.



HSS Co8 | HSS | 4&6 | 30° | FLAT

P.1239, 1244, 1248

### E2041(8% COBALT) , E1041(HSS) Series ■ 4 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 09297 | 09047 | 1/4 | 3/8 | 1-3/4 | 3-9/16 |
| 09301 | 09051 | 5/16 | 3/8 | 2 | 3-3/4 |
| 09305 | 09055 | 3/8 | 3/8 | 2-1/2 | 4-1/4 |
| 09321 | 09071 | 1/2 | 1/2 | 3 | 5 |
| 09337 | 09087 | 5/8 | 5/8 | 4 | 6-1/8 |
| 09359 | 09109 | 3/4 | 3/4 | 4 | 6-1/4 |
| 09394 | 09144 | 7/8 | 7/8 | 5 | 7-1/4 |
| 09426 | 09176 | 1 | 1 | 6 | 8-1/2 |
| 09445 | 09195 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |

### E2175(8% COBALT) , E1175(HSS) Series ■ 6 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 09322 | 09072 | 1/2 | 1/2 | 3 | 5 |
| 09338 | 09088 | 5/8 | 5/8 | 4 | 6-1/8 |
| 09360 | 09110 | 3/4 | 3/4 | 4 | 6-1/4 |
| 09395 | 09145 | 7/8 | 7/8 | 5 | 7-1/4 |
| 09427 | 09177 | 1 | 1 | 6 | 8-1/2 |
| 09446 | 09196 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 09462 | 09212 | 1-1/2 | 1-1/4 | 8 | 10-1/2 |
| * 09491 | * 09241 | 2 | 2 | 8 | 11-3/4 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| Series | P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| | ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| E1041 E2041 | ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |
| E1175 E2175 | ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

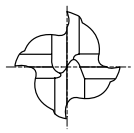
**E2053 SERIES** 8% COBALT (M42) FLAT SHANK

**E1053 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

▶ Series E2053 end mills are the double-end version of E2039 center cutting single-end tools. They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 13289 | 13039 | 1/8 | 3/8 | 3/8 | 3-1/16 |
| 13290 | 13040 | 9/64 | 3/8 | 7/16 | 3-1/8 |
| 13291 | 13041 | 5/32 | 3/8 | 7/16 | 3-1/8 |
| 13292 | 13042 | 11/64 | 3/8 | 1/2 | 3-1/4 |
| 13293 | 13043 | 3/16 | 3/8 | 1/2 | 3-1/4 |
| 13294 | 13044 | 13/64 | 3/8 | 9/16 | 3-1/4 |
| 13295 | 13045 | 7/32 | 3/8 | 9/16 | 3-1/4 |
| 13296 | 13046 | 15/64 | 3/8 | 5/8 | 3-3/8 |
| 13297 | 13047 | 1/4 | 3/8 | 5/8 | 3-3/8 |
| 13298 | 13048 | 17/64 | 3/8 | 11/16 | 3-3/8 |
| 13299 | 13049 | 9/32 | 3/8 | 11/16 | 3-3/8 |
| 13300 | 13050 | 19/64 | 3/8 | 3/4 | 3-1/2 |
| 13301 | 13051 | 5/16 | 3/8 | 3/4 | 3-1/2 |
| 13302 | 13052 | 21/64 | 3/8 | 3/4 | 3-1/2 |
| 13303 | 13053 | 11/32 | 3/8 | 3/4 | 3-1/2 |
| 13304 | 13054 | 23/64 | 3/8 | 3/4 | 3-1/2 |
| 13305 | 13055 | 3/8 | 3/8 | 3/4 | 3-1/2 |
| 13307 | 13057 | 25/64 | 1/2 | 1 | 4-1/8 |
| 13309 | 13059 | 13/32 | 1/2 | 1 | 4-1/8 |
| 13311 | 13061 | 27/64 | 1/2 | 1 | 4-1/8 |
| 13313 | 13063 | 7/16 | 1/2 | 1 | 4-1/8 |
| 13315 | 13065 | 29/64 | 1/2 | 1 | 4-1/8 |
| 13317 | 13067 | 15/32 | 1/2 | 1 | 4-1/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

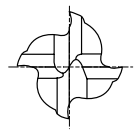
**E2053 SERIES** 8% COBALT (M42) FLAT SHANK

**E1053 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH DOUBLE CENTER CUTTING

▶ Series E2053 end mills are the double-end version of E2039 center cutting single-end tools. They are used for slotting, shallow pocketing, tracer milling or die sinking and similar operation.





HSS Co8 | HSS | 4 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 13319 | 13069 | 31/64 | 1/2 | 1 | 4-1/8 |
| 13321 | 13071 | 1/2 | 1/2 | 1 | 4-1/8 |
| 13330 | 13080 | 9/16 | 5/8 | 1-3/8 | 5 |
| 13337 | 13087 | 5/8 | 5/8 | 1-3/8 | 5 |
| 13350 | 13100 | 11/16 | 3/4 | 1-5/8 | 5-5/8 |
| 13359 | 13109 | 3/4 | 3/4 | 1-5/8 | 5-5/8 |
| 13377 | 13127 | 13/16 | 7/8 | 1-7/8 | 6-1/8 |
| 13394 | 13144 | 7/8 | 7/8 | 1-7/8 | 6-1/8 |
| 13426 | 13176 | 1 | 1 | 1-7/8 | 6-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

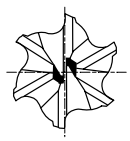
# COBALT & HSS END MILLS

**E2100 SERIES** 8% COBALT (M42) FLAT SHANK
**E1100 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 6 FLUTE REGULAR with COMBINATION 2˝ SHANK CENTER CUTTING

▶ These are to be used for heavy hogging cuts in die-sinking, tape & tracer controlled milling and similar work.
The Heavy-Duty end mills are made with toughened Combination shank, heavy web construction, accurate machine-ground end-teeth notching and a special surface treatment to reduce cutting-edge wear.





HSS Co8 | HSS | 6 | 30° | FLAT

P.1239, 1244, 1248

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| **10481** | **10231** | **2** | 2 | 2 | 5-3/4 |
| **10485** | **10235** | **2** | 2 | 4 | 7-3/4 |
| **10487** | **10237** | **2** | 2 | 5 | 8-3/4 |
| **10489** | **10239** | **2** | 2 | 6 | 9-3/4 |
| **10491** | **10241** | **2** | 2 | 8 | 11-3/4 |

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) |
|---|
| 0~+.0030 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

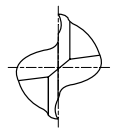
# COBALT & HSS END MILLS

**E2001 SERIES** 8% COBALT (M42) PLAIN SHANK
**E1001 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH DOUBLE

▶ Tools under Miniature end mills have 3/16″ shank diameter without flats. They are designed with positive rake angle geometry and a high helix angle to insure free cutting action. The flute design provides good strength behind the cutting edge. Suitable for finishing of precision components such as watch, camera, electronic apparatus molds, etc.





HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

P.1242

~Ø3/32 Ø7/64~

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 49252 | 49002 | 1/32 | 3/16 | 3/64 | 2 |
| 49254 | 49004 | 3/64 | 3/16 | 1/16 | 2 |
| 49256 | 49006 | 1/16 | 3/16 | 3/32 | 2 |
| 49258 | 49008 | 5/64 | 3/16 | 1/8 | 2 |
| 49260 | 49010 | 3/32 | 3/16 | 9/64 | 2 |
| 49262 | 49012 | 7/64 | 3/16 | 5/32 | 2 |
| 49264 | 49014 | 1/8 | 3/16 | 3/16 | 2 |
| 49266 | 49016 | 9/64 | 3/16 | 7/32 | 2 |
| 49268 | 49018 | 5/32 | 3/16 | 15/64 | 2 |
| 49270 | 49020 | 11/64 | 3/16 | 1/4 | 2 |
| 49272 | 49022 | 3/16 | 3/16 | 9/32 | 2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

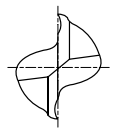
**E2003 SERIES** 8% COBALT (M42) PLAIN SHANK

**E1003 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.





HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| **50252** | **50002** | **1/32** | 3/16 | 3/32 | 2-1/4 |
| **50254** | **50004** | **3/64** | 3/16 | 9/64 | 2-1/4 |
| **50256** | **50006** | **1/16** | 3/16 | 3/16 | 2-1/4 |
| **50258** | **50008** | **5/64** | 3/16 | 15/64 | 2-1/4 |
| **50260** | **50010** | **3/32** | 3/16 | 9/32 | 2-1/4 |
| **50262** | **50012** | **7/64** | 3/16 | 21/64 | 2-1/4 |
| **50264** | **50014** | **1/8** | 3/16 | 3/8 | 2-1/4 |
| **50266** | **50016** | **9/64** | 3/16 | 13/32 | 2-1/4 |
| **50268** | **50018** | **5/32** | 3/16 | 7/16 | 2-1/4 |
| **50270** | **50020** | **11/64** | 3/16 | 1/2 | 2-1/4 |
| **50272** | **50022** | **3/16** | 3/16 | 1/2 | 2-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2005 SERIES** 8% COBALT (M42) PLAIN SHANK
**E1005 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.



HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| 51256 | 51006 | 1/16 | 3/16 | 7/32 | 2-1/2 |
| 51258 | 51008 | 5/64 | 3/16 | 1/4 | 2-1/2 |
| 51260 | 51010 | 3/32 | 3/16 | 9/32 | 2-5/8 |
| 51262 | 51012 | 7/64 | 3/16 | 9/32 | 2-5/8 |
| 51264 | 51014 | 1/8 | 3/16 | 3/4 | 3-1/8 |
| 51266 | 51016 | 9/64 | 3/16 | 3/4 | 3-1/8 |
| 51268 | 51018 | 5/32 | 3/16 | 7/8 | 3-1/4 |
| 51270 | 51020 | 11/64 | 3/16 | 7/8 | 3-1/4 |
| 51272 | 51022 | 3/16 | 3/16 | 1 | 3-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

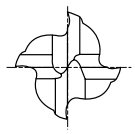
**E2002 SERIES** 8% COBALT (M42) PLAIN SHANK

**E1002 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 4FLUTE MINIATURE STUB LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.





HSS Co8 | HSS | 4 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| **52256** | **52006** | **1/16** | 3/16 | 3/32 | 2 |
| **52258** | **52008** | **5/64** | 3/16 | 1/8 | 2 |
| **52260** | **52010** | **3/32** | 3/16 | 9/64 | 2 |
| **52262** | **52012** | **7/64** | 3/16 | 5/32 | 2 |
| **52264** | **52014** | **1/8** | 3/16 | 3/16 | 2 |
| **52266** | **52016** | **9/64** | 3/16 | 7/32 | 2 |
| **52268** | **52018** | **5/32** | 3/16 | 15/64 | 2 |
| **52270** | **52020** | **11/64** | 3/16 | 1/4 | 2 |
| **52272** | **52022** | **3/16** | 3/16 | 9/32 | 2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

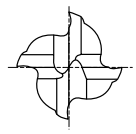
# COBALT & HSS END MILLS

**E2004 SERIES** 8% COBALT (M42) PLAIN SHANK
**E1004 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 4FLUTE MINIATURE REGULAR LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.





HSS Co8 | HSS | 4 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 53256 | 53006 | 1/16 | 3/16 | 3/16 | 2-1/4 |
| 53258 | 53008 | 5/64 | 3/16 | 15/64 | 2-1/4 |
| 53260 | 53010 | 3/32 | 3/16 | 9/32 | 2-1/4 |
| 53262 | 53012 | 7/64 | 3/16 | 21/64 | 2-1/4 |
| 53264 | 53014 | 1/8 | 3/16 | 3/8 | 2-1/4 |
| 53266 | 53016 | 9/64 | 3/16 | 13/32 | 2-1/4 |
| 53268 | 53018 | 5/32 | 3/16 | 7/16 | 2-1/4 |
| 53270 | 53020 | 11/64 | 3/16 | 1/2 | 2-1/4 |
| 53272 | 53022 | 3/16 | 3/16 | 1/2 | 2-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

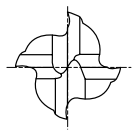
**E2006 SERIES** 8% COBALT (M42) PLAIN SHANK

**E1006 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 4FLUTE MINIATURE LONG LENGTH DOUBLE

▶ Suitable for finishing of precision components such as watch, camera electronic apparatus molds, etc.





HSS Co8 | HSS | 4 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| **54256** | **54006** | **1/16** | 3/16 | 7/32 | 2-1/2 |
| **54258** | **54008** | **5/64** | 3/16 | 1/4 | 2-1/2 |
| **54260** | **54010** | **3/32** | 3/16 | 9/32 | 2-5/8 |
| **54262** | **54012** | **7/64** | 3/16 | 9/32 | 2-5/8 |
| **54264** | **54014** | **1/8** | 3/16 | 3/4 | 3-1/8 |
| **54266** | **54016** | **9/64** | 3/16 | 3/4 | 3-1/8 |
| **54268** | **54018** | **5/32** | 3/16 | 7/8 | 3-1/4 |
| **54270** | **54020** | **11/64** | 3/16 | 7/8 | 3-1/4 |
| **54272** | **54022** | **3/16** | 3/16 | 1 | 3-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2008 SERIES** 8% COBALT (M42) PLAIN SHANK

**E1008 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE STUB LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.




HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | |
| **55256** | **55006** | R1/32 | **1/16** | 3/16 | 3/32 | 2 |
| **55260** | **55010** | R3/64 | **3/32** | 3/16 | 9/64 | 2 |
| **55264** | **55014** | R1/16 | **1/8** | 3/16 | 3/16 | 2 |
| **55268** | **55018** | R5/64 | **5/32** | 3/16 | 15/64 | 2 |
| **55272** | **55022** | R3/32 | **3/16** | 3/16 | 9/32 | 2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2013 SERIES** 8% COBALT (M42) PLAIN SHANK

**E1013 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE REGULAR LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.




HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

P.1242

~Ø3/32 Ø7/64~

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | |
| **56252** | **56002** | R1/64 | **1/32** | 3/16 | 3/32 | 2-1/4 |
| **56254** | **56004** | R3/128 | **3/64** | 3/16 | 9/64 | 2-1/4 |
| **56256** | **56006** | R1/64 | **1/16** | 3/16 | 3/16 | 2-1/4 |
| **56258** | **56008** | R5/128 | **5/64** | 3/16 | 15/64 | 2-1/4 |
| **56260** | **56010** | R3/64 | **3/32** | 3/16 | 9/32 | 2-1/4 |
| **56262** | **56012** | R7/128 | **7/64** | 3/16 | 21/64 | 2-1/4 |
| **56264** | **56014** | R1/16 | **1/8** | 3/16 | 3/8 | 2-1/4 |
| **56266** | **56016** | R9/128 | **9/64** | 3/16 | 13/32 | 2-1/4 |
| **56268** | **56018** | R5/64 | **5/32** | 3/16 | 7/16 | 2-1/4 |
| **56270** | **56020** | R11/128 | **11/64** | 3/16 | 1/2 | 2-1/4 |
| **56272** | **56022** | R3/32 | **3/16** | 3/16 | 1/2 | 2-1/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~—.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2015 SERIES** 8% COBALT (M42) PLAIN SHANK
**E1015 SERIES** HSS (M2) PLAIN SHANK

## HSSCo8 & HSS, 2 FLUTE MINIATURE LONG LENGTH BALL NOSE DOUBLE

▶ Helical flute in the nose radius.
Suitable for high efficient copying process and cutting of die mold corner radius.




HSS Co8 | HSS | 2 | 39° | 30° | PLAIN

~Ø3/32 Ø7/64~

P.1242

Unit : Inch

| EDP No. | | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | R | | | | |
| **57256** | **57006** | R1/32 | **1/16** | 3/16 | 7/32 | 2-1/2 |
| **57260** | **57010** | R3/64 | **3/32** | 3/16 | 9/32 | 2-5/8 |
| **57264** | **57014** | R1/16 | **1/8** | 3/16 | 3/4 | 3-1/8 |
| **57268** | **57018** | R5/64 | **5/32** | 3/16 | 7/8 | 3-1/4 |
| **57272** | **57022** | R3/32 | **3/16** | 3/16 | 1 | 3-3/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~—.0020 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

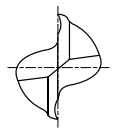
# COBALT & HSS END MILLS

**E1070 SERIES** HSS (M2) FLAT SHANK

## HSS, 2 FLUTE 42° HELIX REGULAR & MEDIUM LENGTH for ALUMINUM

▶ The two flute end mills for aluminum have High Helix flute design making them well suited for milling aluminum and other non-ferrous materials. Special rake angles and low micro inch finishes on the primary clearance angles and flute faces insure free cutting action, fine finishes and longer tool life for both non-ferrous materials as well as harder alloys. These tools are made from regular HSS(M2), which is good for aluminum cutting.





HSS | 2 | 42° | FLAT P.1237

### REGULAR LENGTH

Unit : Inch

| EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 17047 | 1/4 | 3/8 | 5/8 | 2-7/16 |
| 17051 | 5/16 | 3/8 | 3/4 | 2-1/2 |
| 17055 | 3/8 | 3/8 | 3/4 | 2-1/2 |
| 17062 | 7/16 | 3/8 | 1 | 2-11/16 |
| 17071 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 17087 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 17109 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |
| 17141 | 7/8 | 3/4 | 1-7/8 | 4-1/8 |
| 17144 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 17172 | 1 | 3/4 | 1-7/8 | 4-1/8 |
| 17176 | 1 | 1 | 2 | 4-1/2 |
| 17195 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 17211 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| 17219 | 1-3/4 | 1-1/4 | 2 | 4-1/2 |
| 17227 | 2 | 1-1/4 | 2 | 4-1/2 |

### MEDIUM LENGTH

Unit : Inch

| EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 99089 | 1 | 1 | 3 | 5-1/2 |
| 99090 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |
| 99091 | 1-1/2 | 1-1/4 | 3 | 5-1/2 |
| 99092 | 1-3/4 | 1-1/4 | 3 | 5-1/2 |
| 99093 | 2 | 1-1/4 | 3 | 5-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | | | | | | | | | | ◎ | | | | |

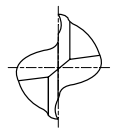
# COBALT & HSS END MILLS

**E1071 SERIES** HSS (M2) FLAT SHANK
**E1072 SERIES** HSS (M2) FLAT SHANK

## HSS, 2 FLUTE 42° HELIX LONG & EXTRA LONG LENGTH for ALUMINUM

▶ Sharp cutting most suitable flute shape for cutting aluminum alloy, etc.
These tools are made from regular HSS(M2), which is good for aluminum cutting.





HSS | 2 | 42° | FLAT

P.1237

### LONG LENGTH

Unit : Inch

| EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 18047 | 1/4 | 3/8 | 1-1/4 | 3-1/16 |
| 18051 | 5/16 | 3/8 | 1-3/8 | 3-1/8 |
| 18055 | 3/8 | 3/8 | 1-1/2 | 3-1/4 |
| 18063 | 7/16 | 1/2 | 1-3/4 | 3-3/4 |
| 18071 | 1/2 | 1/2 | 2 | 4 |
| 18087 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 18109 | 3/4 | 3/4 | 3 | 5-1/4 |
| 18176 | 1 | 1 | 4 | 6-1/2 |
| 18195 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 18211 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |
| 18227 | 2 | 1-1/4 | 4 | 6-1/2 |

### EXTRA LONG LENGTH

Unit : Inch

| EDP No. HSS (M2) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 19047 | 1/4 | 3/8 | 1-3/4 | 3-9/16 |
| 19051 | 5/16 | 3/8 | 2 | 3-3/4 |
| 19055 | 3/8 | 3/8 | 2-1/2 | 4-1/4 |
| 19071 | 1/2 | 1/2 | 3 | 5 |
| 19087 | 5/8 | 5/8 | 4 | 6-1/8 |
| 19109 | 3/4 | 3/4 | 4 | 6-1/4 |
| 19176 | 1 | 1 | 6 | 8-1/2 |
| 19195 | 1-1/4 | 1-1/4 | 6 | 8-1/2 |
| 19211 | 1-1/2 | 1-1/4 | 8 | 10-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ○ | | | | | | | | | | ◎ | | | | |

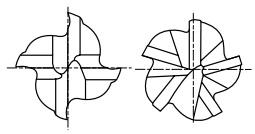
# COBALT & HSS END MILLS

**E2086 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | FINE | 4&5 | 30° | FLAT

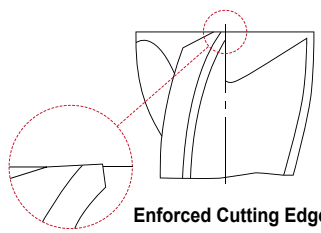
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| **75297** | **1/4** | 3/8 | 1/4 | 2-1/16 | 4 |
| **75305** | **3/8** | 3/8 | 3/8 | 2-5/32 | 4 |
| **75313** | **7/16** | 1/2 | 1/2 | 2-1/2 | 4 |
| **75321** | **1/2** | 1/2 | 1/2 | 2-1/2 | 4 |
| **75337** | **5/8** | 5/8 | 5/8 | 2-3/4 | 4 |
| **75359** | **3/4** | 3/4 | 3/4 | 2-7/8 | 4 |
| **75391** | **7/8** | 3/4 | 7/8 | 3-1/8 | 5 |
| **75426** | **1** | 1 | 1 | 3-1/2 | 5 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



**Enforced Cutting Edge**

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

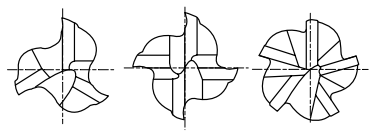
# COBALT & HSS END MILLS

**E2085 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | FINE | 3-5 | 30° | FLAT

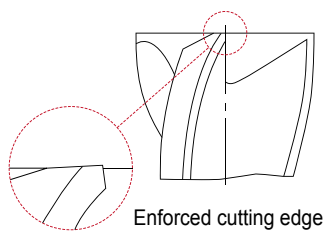
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 76297 | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| 76301 | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| 76305 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| 76312 | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| 76321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| 76328 | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| 76337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 76359 | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| 76391 | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| 76394 | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| 76422 | 1 | 3/4 | 2 | 4-1/4 | 5 |
| 76426 | 1 | 1 | 2 | 4-1/2 | 5 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

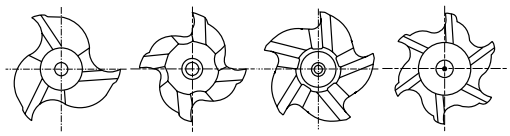
# COBALT & HSS END MILLS

**E2079 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR LENGTH FINE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | FINE | 3-6 | 30° | FLAT

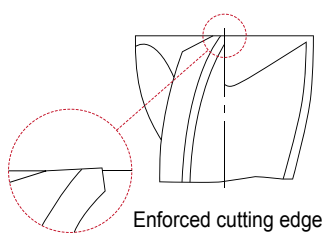
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 70297 | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| 70301 | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| 70305 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| 70312 | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| 70321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| 70328 | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| 70337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 70358 | 3/4 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 70359 | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| 70391 | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| 70394 | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| 70422 | 1 | 3/4 | 2 | 4-1/4 | 5 |
| 70426 | 1 | 1 | 2 | 4-1/2 | 5 |
| 70431 | 1-1/8 | 3/4 | 2 | 4-1/4 | 6 |
| 70435 | 1-1/8 | 1 | 2 | 4-1/2 | 6 |
| 70439 | 1-1/4 | 3/4 | 2 | 4-1/4 | 6 |
| 70445 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 70449 | 1-3/8 | 3/4 | 2 | 4-1/4 | 6 |
| 70457 | 1-1/2 | 3/4 | 2 | 4-1/4 | 6 |
| 70461 | 1-1/2 | 1-1/4 | 2 | 4-1/2 | 6 |
| 70469 | 1-3/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 70475 | 2 | 3/4 | 2 | 4-1/4 | 6 |
| 70477 | 2 | 1-1/4 | 2 | 4-1/2 | 6 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

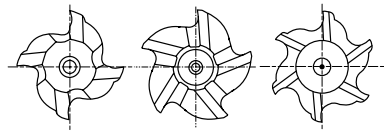
# COBALT & HSS END MILLS

**E2077 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE LONG LENGTH FINE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | FINE | 4-6 | 30° | FLAT

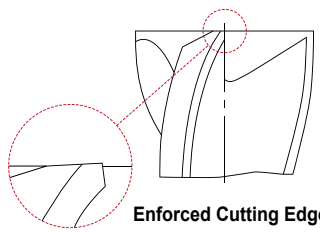
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 71321 | 1/2 | 1/2 | 2 | 4 | 4 |
| 71337 | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| 71358 | 3/4 | 5/8 | 3 | 5-1/4 | 4 |
| 71359 | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| 71394 | 7/8 | 7/8 | 3-1/2 | 5-3/4 | 5 |
| 71426 | 1 | 1 | 4 | 6-1/2 | 5 |
| 71445 | 1-1/4 | 1-1/4 | 4 | 6-1/2 | 6 |
| 71457 | 1-1/2 | 3/4 | 4 | 6-1/4 | 6 |
| 71461 | 1-1/2 | 1-1/4 | 4 | 6-1/2 | 6 |
| 71469 | 1-3/4 | 1-1/4 | 4 | 6-1/2 | 6 |
| 71477 | 2 | 1-1/4 | 4 | 6-1/2 | 6 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced Cutting Edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

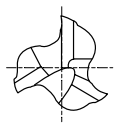
# COBALT & HSS END MILLS

**E2086 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3 FLUTE STUB LENGTH FINE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | FINE | 3 | 30° | FLAT

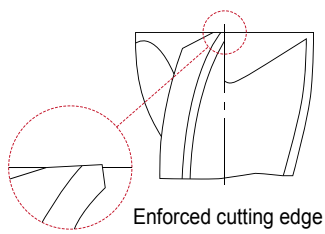
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| **72297** | **1/4** | 3/8 | 1/4 | 2-1/16 |
| **72305** | **3/8** | 3/8 | 3/8 | 2-5/32 |
| **72321** | **1/2** | 1/2 | 1/2 | 2-1/2 |
| **72337** | **5/8** | 5/8 | 5/8 | 2-3/4 |
| **72359** | **3/4** | 3/4 | 3/4 | 2-7/8 |
| **72391** | **7/8** | 3/4 | 7/8 | 3-1/8 |
| **72422** | **1** | 3/4 | 1 | 3-1/4 |
| **72426** | **1** | 1 | 1 | 3-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

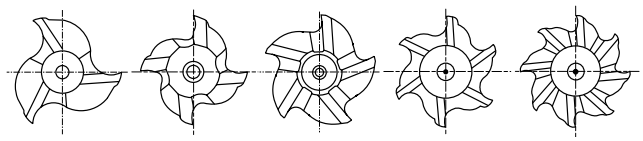
# COBALT & HSS END MILLS

**E2170 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.
The end tooth of this tool has a center hole design for many accurate resharpenings between centers.





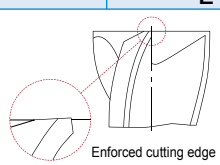
HSS Co8 | COARSE | 3-8 | 30° | FLAT

P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 60297 | 1/4 | 3/8 | 5/8 | 2-7/16 | 3 |
| 60301 | 5/16 | 3/8 | 3/4 | 2-1/2 | 3 |
| 60305 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| 60312 | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| 60321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| 60328 | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| 60337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 60348 | 11/16 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 60358 | 3/4 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 60359 | 3/4 | 3/4 | 1-5/8 | 3-3/4 | 4 |
| 60375 | 13/16 | 3/4 | 1-7/8 | 4-1/8 | 4 |
| 60391 | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| 60394 | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| 60409 | 15/16 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| 60422 | 1 | 3/4 | 2 | 4-1/4 | 5 |
| 60426 | 1 | 1 | 2 | 4-1/2 | 5 |
| 60431 | 1-1/8 | 3/4 | 2 | 4-1/4 | 6 |
| 60435 | 1-1/8 | 1 | 2 | 4-1/2 | 6 |
| 60439 | 1-1/4 | 3/4 | 2 | 4-1/4 | 6 |
| 60445 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 60449 | 1-3/8 | 3/4 | 2 | 4-1/4 | 6 |
| 60457 | 1-1/2 | 3/4 | 2 | 4-1/4 | 6 |
| 60461 | 1-1/2 | 1-1/4 | 2 | 4-1/2 | 6 |
| 60467 | 1-3/4 | 3/4 | 2 | 4-1/4 | 6 |
| 60469 | 1-3/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 60475 | 2 | 3/4 | 2 | 4-1/4 | 6 |
| 60477 | 2 | 1-1/4 | 2 | 4-1/2 | 6 |
| * 60480 | 2 | 2 | 2 | 5-3/4 | 8 |
| * 60482 | 2 | 2 | 3 | 6-3/4 | 8 |
| * 60484 | 2 | 2 | 4 | 7-3/4 | 8 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |




* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

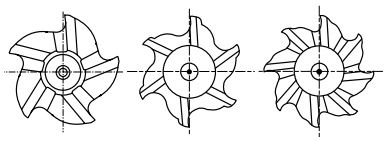
# COBALT & HSS END MILLS

**E2171 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE MEDIUM LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.





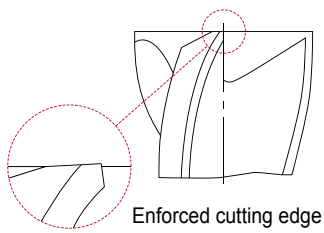
HSS Co8 | COARSE | 5-8 | 30° | FLAT P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| **61426** | **1** | 1 | 3 | 5-1/2 | 5 |
| **61445** | **1-1/4** | 1-1/4 | 3 | 5-1/2 | 6 |
| **61461** | **1-1/2** | 1-1/4 | 3 | 5-1/2 | 6 |
| **61488** | **2** | 2 | 6 | 9-3/4 | 8 |

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

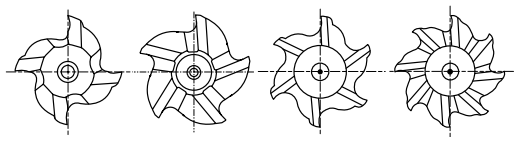
# COBALT & HSS END MILLS

**E2172 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE LONG LENGTH COARSE PITCH ROUGHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.





HSS Co8 | COARSE | 4-8 | 30° | FLAT

P.1241, 1246, 1250

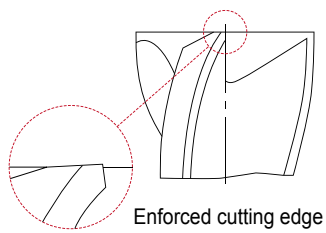
Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 62321 | 1/2 | 1/2 | 2 | 4 | 4 |
| 62337 | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| 62358 | 3/4 | 5/8 | 3 | 5-1/8 | 4 |
| 62359 | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| 62391 | 7/8 | 3/4 | 3-1/2 | 5-3/4 | 5 |
| 62422 | 1 | 3/4 | 4 | 6-1/4 | 5 |
| 62426 | 1 | 1 | 4 | 6-1/2 | 5 |
| 62439 | 1-1/4 | 3/4 | 4 | 6-1/4 | 6 |
| 62445 | 1-1/4 | 1-1/4 | 4 | 6-1/2 | 6 |
| 62457 | 1-1/2 | 3/4 | 4 | 6-1/4 | 6 |
| 62461 | 1-1/2 | 1-1/4 | 4 | 6-1/2 | 6 |
| 62469 | 1-3/4 | 1-1/4 | 4 | 6-1/2 | 6 |
| 62477 | 2 | 1-1/4 | 4 | 6-1/2 | 6 |
| * 62490 | 2 | 2 | 8 | 11-3/4 | 8 |

* Combination Shank

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

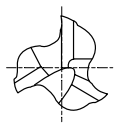
# COBALT & HSS END MILLS

**E2241 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3FLUTE STUB LENGTH COARSE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials. The end tooth of this tool has a center hole design for many accurate resharpenings between centers.





HSS Co8 | COARSE | 3 | 30° | FLAT

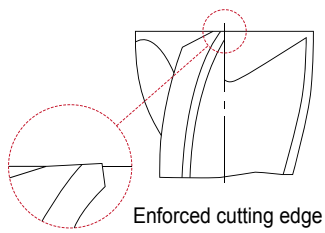
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| **63297** | **1/4** | 3/8 | 1/4 | 2-1/16 |
| **63305** | **3/8** | 3/8 | 3/8 | 2-5/32 |
| **63321** | **1/2** | 1/2 | 1/2 | 2-1/2 |
| **63337** | **5/8** | 5/8 | 5/8 | 2-3/4 |
| **63359** | **3/4** | 3/4 | 3/4 | 2-7/8 |
| **63426** | **1** | 1 | 1 | 3-1/2 |

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

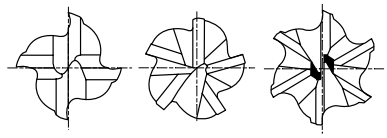
**E2195 SERIES** 8% COBALT (M42) FLAT SHANK

**E2197 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING CENTER CUTTING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.





HSS Co8 | COARSE | 4-6 | 30° | FLAT

P.1241, 1246, 1250

**E2195 Series** ■ REGULAR LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 64321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| 64337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 64359 | 3/4 | 3/4 | 1-5/8 | 3-7/8 | 4 |
| 64426 | 1 | 1 | 2 | 4-1/2 | 5 |
| 64445 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 64461 | 1-1/2 | 1-1/4 | 2 | 4-1/2 | 6 |

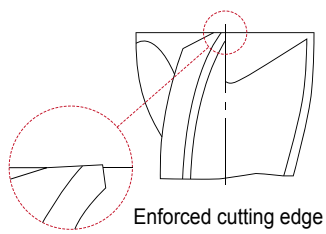
**E2197 Series** ■ LONG LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 65321 | 1/2 | 1/2 | 2 | 4 | 4 |
| 65337 | 5/8 | 5/8 | 2-1/2 | 4-5/8 | 4 |
| 65359 | 3/4 | 3/4 | 3 | 5-1/4 | 4 |
| 65426 | 1 | 1 | 4 | 6-1/2 | 5 |
| 65445 | 1-1/4 | 1-1/4 | 4 | 6-1/2 | 6 |
| 65461 | 1-1/2 | 1-1/4 | 4 | 6-1/2 | 6 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2193 SERIES** 8% COBALT (M42) FLAT SHANK

**E2125 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR & LONG LENGTH COARSE PITCH ROUGHING BALL NOSE

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting steel grades and many non-ferrous materials.




HSS Co8 | COARSE | 3-6 | 30° | FLAT

P.1241, 1246, 1250

### E2193 Series ■ REGULAR LENGTH

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | R | | | | | |
| **68297** | R1/8 | **1/4** | 3/8 | 5/8 | 2-7/16 | 3 |
| **68301** | R5/32 | **5/16** | 3/8 | 3/4 | 2-1/2 | 3 |
| **68305** | R3/16 | **3/8** | 3/8 | 3/4 | 2-1/2 | 4 |
| **68321** | R1/4 | **1/2** | 1/2 | 1-1/4 | 3-1/4 | 4 |
| **68337** | R5/16 | **5/8** | 5/8 | 1-5/8 | 3-3/4 | 4 |
| **68359** | R3/8 | **3/4** | 3/4 | 1-3/4 | 4 | 4 |
| **68422** | R1/2 | **1** | 3/4 | 2 | 4-1/2 | 5 |
| **68426** | R1/2 | **1** | 1 | 2 | 4-1/2 | 5 |
| **68439** | R5/8 | **1-1/4** | 3/4 | 2 | 4-1/2 | 6 |
| **68445** | R5/8 | **1-1/4** | 1-1/4 | 2 | 4-1/2 | 6 |
| **68457** | R3/4 | **1-1/2** | 3/4 | 2 | 4-1/2 | 6 |
| **68461** | R3/4 | **1-1/2** | 1-1/4 | 2 | 4-1/2 | 6 |

### E2125 Series ■ LONG LENGTH

Unit : Inch

| EDP No. | Radius of Ball Nose | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | R | | | | | |
| **69321** | R1/4 | **1/2** | 1/2 | 2-1/2 | 4-1/2 | 4 |
| **69337** | R5/16 | **5/8** | 5/8 | 2-1/2 | 4-5/8 | 4 |
| **69359** | R3/8 | **3/4** | 3/4 | 3 | 5-1/4 | 4 |
| **69426** | R1/2 | **1** | 1 | 4 | 6-1/2 | 5 |
| **69445** | R5/8 | **1-1/4** | 1-1/4 | 4 | 6-1/2 | 6 |
| **69461** | R3/4 | **1-1/2** | 1-1/4 | 4 | 6-1/2 | 6 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

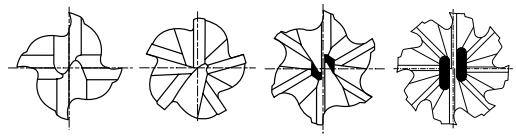
# COBALT & HSS END MILLS

**E2248 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, MULTI FLUTE REGULAR LENGTH ROUGHING & FINISHING

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | NF | 4-8 | 30° | FLAT

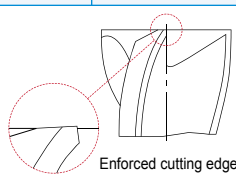
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length | No.of Flute |
|---|---|---|---|---|---|
| 73297 | 1/4 | 3/8 | 5/8 | 2-7/16 | 4 |
| 73301 | 5/16 | 3/8 | 3/4 | 2-1/2 | 4 |
| 73305 | 3/8 | 3/8 | 3/4 | 2-1/2 | 4 |
| 73312 | 7/16 | 3/8 | 1 | 2-11/16 | 4 |
| 73321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 | 4 |
| 73328 | 9/16 | 1/2 | 1-3/8 | 3-3/8 | 4 |
| 73337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 73348 | 11/16 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 73358 | 3/4 | 5/8 | 1-5/8 | 3-3/4 | 4 |
| 73359 | 3/4 | 3/4 | 1-5/8 | 3-3/4 | 4 |
| 73391 | 7/8 | 3/4 | 1-7/8 | 4-1/8 | 5 |
| 73394 | 7/8 | 7/8 | 1-7/8 | 4-1/8 | 5 |
| 73422 | 1 | 3/4 | 2 | 4-1/4 | 5 |
| 73426 | 1 | 1 | 2 | 4-1/2 | 5 |
| 73431 | 1-1/8 | 3/4 | 2 | 4-1/4 | 6 |
| 73435 | 1-1/8 | 1 | 2 | 4-1/2 | 6 |
| 73439 | 1-1/4 | 3/4 | 2 | 4-1/4 | 6 |
| 73445 | 1-1/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 73457 | 1-1/2 | 3/4 | 2 | 4-1/4 | 6 |
| 73461 | 1-1/2 | 1-1/4 | 2 | 4-1/2 | 6 |
| 73467 | 1-3/4 | 3/4 | 2 | 4-1/4 | 6 |
| 73469 | 1-3/4 | 1-1/4 | 2 | 4-1/2 | 6 |
| 73475 | 2 | 3/4 | 2 | 4-1/4 | 6 |
| 73477 | 2 | 1-1/4 | 2 | 4-1/2 | 6 |
| * 73480 | 2 | 2 | 2 | 5-3/4 | 8 |
| * 73482 | 2 | 2 | 3 | 6-3/4 | 8 |
| * 73484 | 2 | 2 | 4 | 7-3/4 | 8 |

* Combination Shank

| Mill Dia. Tolerance (inch) |
|---|
| + .0025 |
| + .0005 |




■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

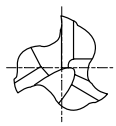
# COBALT & HSS END MILLS

**E2191 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3 FLUTE 37° HELIX REGULAR LENGTH ROUGHING for ALUMINUM

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is suitable for a very broad spectrum of materials having up to high tensile strengths. In many cases, the milled surfaces are of acceptable quality.





HSS Co8 | ALU | 3 | 37° | FLAT

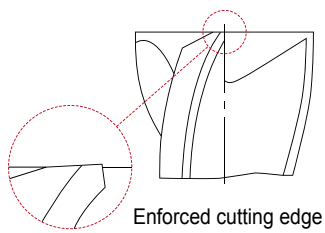
P.1241, 1246, 1250

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| **66297** | **1/4** | 3/8 | 5/8 | 2-7/16 |
| **66301** | **5/16** | 3/8 | 3/4 | 2-1/2 |
| **66305** | **3/8** | 3/8 | 3/4 | 2-1/2 |
| **66321** | **1/2** | 1/2 | 1-1/4 | 3-1/4 |
| **66337** | **5/8** | 5/8 | 1-5/8 | 3-3/4 |
| **66359** | **3/4** | 3/4 | 1-5/8 | 3-7/8 |
| **66391** | **7/8** | 3/4 | 1-7/8 | 4-1/8 |
| **66426** | **1** | 1 | 2 | 4-1/2 |
| **66445** | **1-1/4** | 1-1/4 | 2 | 4-1/2 |
| **66461** | **1-1/2** | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ◎ | | | | |

# COBALT & HSS END MILLS

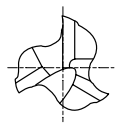
**E2226 SERIES** 8% COBALT (M42) FLAT SHANK

**E2192 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3 FLUTE 37° HELIX MEDIUM & LONG LENGTH ROUGHING for ALUMINUM

▶ This general purpose rougher is designed for high production metal removal in a wide range of work piece material. It is recommended for cutting aluminum, aluminum alloy and many non-ferrous materials.





HSS Co8 | ALU | 3 | 37° | FLAT

P.1241, 1246, 1250

**E2226 Series** ■ MEDIUM LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 66901 | 1 | 1 | 3 | 5-1/2 |
| 66902 | 1-1/4 | 1-1/4 | 3 | 5-1/2 |

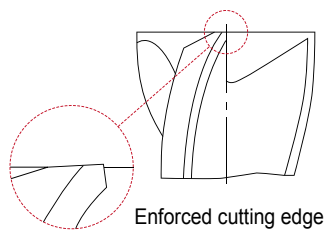
**E2192 Series** ■ LONG LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 67321 | 1/2 | 1/2 | 2 | 4 |
| 67337 | 5/8 | 5/8 | 2-1/2 | 4-5/8 |
| 67359 | 3/4 | 3/4 | 3 | 5-1/4 |
| 67426 | 1 | 1 | 4 | 6-1/2 |
| 67445 | 1-1/4 | 1-1/4 | 4 | 6-1/2 |
| 67461 | 1-1/2 | 1-1/4 | 4 | 6-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| up to 1 | 0~+.0030 |
| over 1 | 0~+.0060 |



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

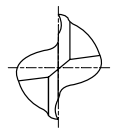
# COBALT & HSS END MILLS

**E2163 SERIES** 8% COBALT (M42) FLAT SHANK
**E1163 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE 15° HELIX for KEYWAY CUTTING

▶ E2163(E1163) are keyway cutting end mills that have the same design as the general purpose of two flute single end mill, but are held to a mill diameter tolerance of +.0000 -.0015. These close tolerance end mills are recommended for cutting keyway which must be held close to nominal size.





HSS Co8 | HSS | 2 | 15° | FLAT

P.1237, 1243, 1247

Unit : Inch

| EDP No. | | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | | | | |
| **14289** | **14039** | **1/8** | 3/8 | 3/8 | 2-5/16 |
| **14293** | **14043** | **3/16** | 3/8 | 7/16 | 2-5/16 |
| **14297** | **14047** | **1/4** | 3/8 | 1/2 | 2-5/16 |
| **14301** | **14051** | **5/16** | 3/8 | 9/16 | 2-5/16 |
| **14305** | **14055** | **3/8** | 3/8 | 9/16 | 2-5/16 |
| **14312** | **14062** | **7/16** | 3/8 | 13/16 | 2-1/2 |
| **14321** | **14071** | **1/2** | 1/2 | 1 | 3 |
| **14337** | **14087** | **5/8** | 5/8 | 1-5/16 | 3-7/16 |
| **14359** | **14109** | **3/4** | 3/4 | 1-5/16 | 3-9/16 |
| **14394** | **14144** | **7/8** | 7/8 | 1-1/2 | 3-3/4 |
| **14426** | **14176** | **1** | 1 | 1-5/8 | 4-1/8 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) |
|---|
| 0~−.0015 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

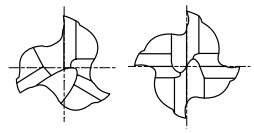
**E2120 SERIES** 8% COBALT (M42) FLAT SHANK

**E2121 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3&4 FLUTE 60° HELIX REGULAR LENGTH

▶ Provided with high helix angle(60° ).
Smooth cutting and small cutting resistance.
Suitable for machining of difficult-to-cut materials.





HSS Co8 | 3&4 | 60° | FLAT

P.1239

**E2120 Series** ■ 3 FLUTE

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 20297 | 1/4 | 3/8 | 5/8 | 2-7/16 |
| 20301 | 5/16 | 3/8 | 3/4 | 2-1/2 |
| 20305 | 3/8 | 3/8 | 3/4 | 2-1/2 |
| 20312 | 7/16 | 3/8 | 1 | 2-11/16 |
| 20321 | 1/2 | 1/2 | 1-1/4 | 3-1/4 |
| 20337 | 5/8 | 5/8 | 1-5/8 | 3-3/4 |
| 20359 | 3/4 | 3/4 | 1-5/8 | 3-7/8 |

**E2121 Series** ■ 4 FLUTE

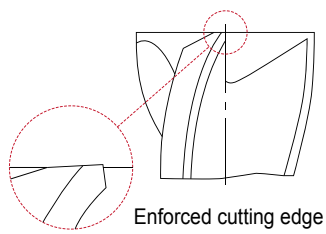
Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 20394 | 7/8 | 7/8 | 1-7/8 | 4-1/8 |
| 20426 | 1 | 1 | 2 | 4-1/2 |
| 20445 | 1-1/4 | 1-1/4 | 2 | 4-1/2 |
| 20461 | 1-1/2 | 1-1/4 | 2 | 4-1/2 |
| 20477 | 2 | 1-1/4 | 2 | 4-1/2 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.



Enforced cutting edge

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | | | | | |

# COBALT & HSS END MILLS

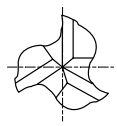
**E2160 SERIES** 8% COBALT (M42) FLAT SHANK

**E2161 SERIES** 8% COBALT (M42) FLAT SHANK

## HSSCo8, 3 FLUTE SHORT & LONG LENGTH THROW AWAY

▶ Well balanced web design to minimize deflection & chattering. High accuracy for O.D. is guaranteed under the strict tolerance control. Much higher(50%) table speed than 2 Flute is allowed.





HSS Co8 | 3 | 30° | FLAT

P.1238

### E2160 Series ■ SHORT LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 22257 | 1/16 | 1/4 | 3/32 | 31/32 |
| 22261 | 3/32 | 1/4 | 5/32 | 1-1/64 |
| 22265 | 1/8 | 1/4 | 3/16 | 1-3/32 |
| 22269 | 5/32 | 1/4 | 1/4 | 1-9/32 |
| 22273 | 3/16 | 1/4 | 9/32 | 1-11/32 |
| 22277 | 7/32 | 1/4 | 5/16 | 1-13/32 |
| 22281 | 1/4 | 1/4 | 3/8 | 1-13/32 |

### E2161 Series ■ LONG LENGTH

Unit : Inch

| EDP No. 8% COBALT (M42) | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|
| 23257 | 1/16 | 1/4 | 5/32 | 1-3/32 |
| 23261 | 3/32 | 1/4 | 1/4 | 1-1/4 |
| 23265 | 1/8 | 1/4 | 5/16 | 1-11/32 |
| 23269 | 5/32 | 1/4 | 3/8 | 1-17/32 |
| 23273 | 3/16 | 1/4 | 7/16 | 1-21/32 |
| 23277 | 7/32 | 1/4 | 1/2 | 1-3/4 |
| 23281 | 1/4 | 1/4 | 5/8 | 1-3/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

| Mill Dia. Tolerance (inch) |
|---|
| — .0005 |
| — .0013 |

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

**E2237 SERIES** 8% COBALT (M42) FLAT SHANK

**E1237 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE CORNER ROUNDING

▶ This general corner rounding end mills are designed for machining fillets on work piece.



HSS Co8 | HSS | 4 | FLAT

Unit : Inch

| EDP No. 8% COBALT (M42) | EDP No. HSS (M2) | Radius | Pilot Diameter | Outside Diameter | Shank Diameter | Overall Length |
|---|---|---|---|---|---|---|
| 29251 | 29001 | 1/16 | 1/4 | 7/16 | 3/8 | 2-1/2 |
| 29252 | 29002 | 3/32 | 1/4 | 1/2 | 3/8 | 2-1/2 |
| 29253 | 29003 | 1/8 | 1/4 | 5/8 | 1/2 | 3 |
| 29254 | 29004 | 5/32 | 5/16 | 3/4 | 1/2 | 3 |
| 29255 | 29005 | 3/16 | 3/8 | 7/8 | 1/2 | 3 |
| 29256 | 29006 | 3/16 | 3/8 | 7/8 | 3/4 | 3-1/8 |
| 29257 | 29007 | 7/32 | 5/16 | 7/8 | 1/2 | 3-1/4 |
| 29258 | 29008 | 1/4 | 3/8 | 1 | 1/2 | 3 |
| 29259 | 29009 | 9/32 | 3/8 | 1 | 5/8 | 3 |
| 29260 | 29010 | 1/4 | 3/8 | 1 | 3/4 | 3-1/4 |
| 29261 | 29011 | 5/16 | 3/8 | 1-1/8 | 1/2 | 3-1/4 |
| 29262 | 29012 | 5/16 | 3/8 | 1-1/8 | 5/8 | 3-1/2 |
| 29263 | 29013 | 5/16 | 3/8 | 1-1/8 | 3/4 | 3-1/2 |
| 29264 | 29014 | 5/16 | 3/8 | 1-1/8 | 7/8 | 3-1/2 |
| 29265 | 29015 | 3/8 | 3/8 | 1-1/4 | 1/2 | 3-1/2 |
| 29266 | 29016 | 3/8 | 3/8 | 1-1/4 | 3/4 | 3-3/4 |
| 29267 | 29017 | 3/8 | 3/8 | 1-1/4 | 7/8 | 3-3/4 |
| 29268 | 29018 | 7/16 | 3/8 | 1-3/8 | 3/4 | 3-3/4 |
| 29269 | 29019 | 7/16 | 3/8 | 1-3/8 | 1 | 4 |
| 29270 | 29020 | 1/2 | 3/8 | 1-1/2 | 3/4 | 3-7/8 |
| 29271 | 29021 | 1/2 | 3/8 | 1-1/2 | 1 | 4-1/8 |
| 29272 | 29022 | 5/8 | 5/16 | 1-5/8 | 3/4 | 4 |
| 29273 | 29023 | 5/8 | 5/16 | 1-5/8 | 1 | 4 |
| 29274 | 29024 | 5/8 | 9/16 | 1-15/16 | 3/4 | 4 |
| 29275 | 29025 | 5/8 | 9/16 | 1-15/16 | 1 | 4-1/4 |
| 29276 | 29026 | 3/4 | 5/16 | 1-7/8 | 3/4 | 4 |
| 29277 | 29027 | 3/4 | 5/16 | 1-7/8 | 1 | 4 |
| 29278 | 29028 | 3/4 | 5/8 | 2-1/4 | 3/4 | 4-1/8 |
| 29279 | 29029 | 3/4 | 5/8 | 2-1/4 | 1 | 4-5/16 |
| 29280 | 29030 | 7/8 | 5/8 | 2-1/2 | 3/4 | 4-1/2 |
| 29281 | 29031 | 1 | 5/8 | 2-5/8 | 3/4 | 4-1/2 |
| 29282 | 29032 | 1 | 5/8 | 2-3/4 | 1 | 4-3/4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

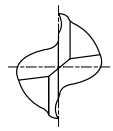
**E2482 SERIES** 8% COBALT (M42) FLAT SHANK

**E1482 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 2 FLUTE REGULAR LENGTH

▶ Two flute end mills with metric cutting diameter are especially recommended for slotting operation, pocketing keyway cutting and other general purpose work including plunge cutting.





HSS Co8 | HSS | 2 | 30° | FLAT

Unit : Inch

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | Metric | Inch | | | |
| 15252 | 15002 | 2.0 | .0787 | 3/8 | 5/16 | 2-5/16 |
| 15253 | 15003 | 2.5 | .0984 | 3/8 | 5/16 | 2-5/16 |
| 15254 | 15004 | 3.0 | .1181 | 3/8 | 5/16 | 2-5/16 |
| 15255 | 15005 | 3.5 | .1378 | 3/8 | 7/16 | 2-5/16 |
| 15256 | 15006 | 4.0 | .1575 | 3/8 | 7/16 | 2-5/16 |
| 15257 | 15007 | 4.5 | .1772 | 3/8 | 1/2 | 2-5/16 |
| 15258 | 15008 | 5.0 | .1969 | 3/8 | 1/2 | 2-5/16 |
| 15259 | 15009 | 5.5 | .2165 | 3/8 | 1/2 | 2-5/16 |
| 15260 | 15010 | 6.0 | .2362 | 3/8 | 1/2 | 2-5/16 |
| 15261 | 15011 | 7.0 | .2756 | 3/8 | 9/16 | 2-5/16 |
| 15262 | 15012 | 8.0 | .3150 | 3/8 | 9/16 | 2-5/16 |
| 15263 | 15013 | 9.0 | .3543 | 3/8 | 9/16 | 2-5/16 |
| 15264 | 15014 | 10.0 | .3937 | 3/8 | 13/16 | 2-1/2 |
| 15265 | 15015 | 11.0 | .4330 | 3/8 | 13/16 | 2-1/2 |
| 15266 | 15016 | 12.0 | .4724 | 3/8 | 13/16 | 2-1/2 |
| 15267 | 15017 | 12.5 | .4921 | 1/2 | 1-1/8 | 3-1/8 |
| 15268 | 15018 | 13.0 | .5118 | 1/2 | 1-1/8 | 3-1/8 |
| 15270 | 15020 | 14.0 | .5512 | 1/2 | 1-1/8 | 3-1/8 |
| 15276 | 15026 | 16.0 | .6299 | 5/8 | 1-5/16 | 3-7/16 |
| 15280 | 15030 | 18.0 | .7087 | 5/8 | 1-5/16 | 3-7/16 |
| 15282 | 15032 | 20.0 | .7874 | 5/8 | 1-1/2 | 3-3/4 |
| 15284 | 15034 | 22.0 | .8661 | 3/4 | 1-1/2 | 3-3/4 |
| 15288 | 15038 | 24.0 | .9449 | 3/4 | 2 | 4-1/2 |
| 15290 | 15040 | 25.0 | .9843 | 1 | 2 | 4-1/2 |
| 15296 | 15046 | 32.0 | 1.2598 | 1 | 2 | 4-1/2 |
| 15298 | 15048 | 36.0 | 1.4173 | 1 | 2 | 4-1/2 |
| 15300 | 15050 | 40.0 | 1.5748 | 1-1/4 | 2 | 4-1/2 |
| 15302 | 15052 | 45.0 | 1.7717 | 1-1/4 | 2 | 4-1/2 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

# COBALT & HSS END MILLS

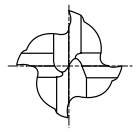
**E2483 SERIES** 8% COBALT (M42) FLAT SHANK

**E1483 SERIES** HSS (M2) FLAT SHANK

## HSSCo8 & HSS, 4 FLUTE REGULAR LENGTH

▶ E2483 have an extensive range of standard regular length in metric diameter.
End mills with center cutting are recommended for a wide range of cutting jobs, including slotting, shallow pocketing and tracer milling.





HSS Co8 | HSS | 4 | 30° | FLAT

Unit : Inch

| EDP No. | | Mill Diameter | | Shank Diameter | Length of Cut | Overall Length |
|---|---|---|---|---|---|---|
| 8% COBALT (M42) | HSS (M2) | Metric | Inch | | | |
| 16252 | 16002 | 2.0 | .0787 | 3/8 | 3/8 | 2-5/16 |
| 16253 | 16003 | 2.5 | .0984 | 3/8 | 3/8 | 2-5/16 |
| 16254 | 16004 | 3.0 | .1181 | 3/8 | 3/8 | 2-5/16 |
| 16255 | 16005 | 3.5 | .1378 | 3/8 | 1/2 | 2-3/8 |
| 16256 | 16006 | 4.0 | .1575 | 3/8 | 1/2 | 2-3/8 |
| 16257 | 16007 | 4.5 | .1772 | 3/8 | 9/16 | 2-1/2 |
| 16258 | 16008 | 5.0 | .1969 | 3/8 | 9/16 | 2-1/2 |
| 16259 | 16009 | 5.5 | .2165 | 3/8 | 5/8 | 2-1/2 |
| 16260 | 16010 | 6.0 | .2362 | 3/8 | 5/8 | 2-1/2 |
| 16261 | 16011 | 7.0 | .2756 | 3/8 | 11/16 | 2-1/2 |
| 16262 | 16012 | 8.0 | .3150 | 3/8 | 3/4 | 2-1/2 |
| 16263 | 16013 | 9.0 | .3543 | 3/8 | 3/4 | 2-1/2 |
| 16264 | 16014 | 10.0 | .3937 | 3/8 | 1 | 2-11/16 |
| 16265 | 16015 | 11.0 | .4330 | 3/8 | 1 | 2-11/16 |
| 16266 | 16016 | 12.0 | .4724 | 3/8 | 1 | 2-11/16 |
| 16267 | 16017 | 12.5 | .4921 | 1/2 | 1-1/4 | 3-1/4 |
| 16268 | 16018 | 13.0 | .5118 | 1/2 | 1-1/4 | 3-1/4 |
| 16270 | 16020 | 14.0 | .5512 | 1/2 | 1-3/8 | 3-3/8 |
| 16276 | 16026 | 16.0 | .6299 | 5/8 | 1-5/8 | 3-3/4 |
| 16280 | 16030 | 18.0 | .7087 | 5/8 | 1-5/8 | 3-3/4 |
| 16282 | 16032 | 20.0 | .7874 | 5/8 | 1-7/8 | 4-1/8 |
| 16284 | 16034 | 22.0 | .8661 | 3/4 | 1-7/8 | 4-1/8 |
| 16288 | 16038 | 24.0 | .9449 | 3/4 | 2 | 4-1/2 |
| 16290 | 16040 | 25.0 | .9843 | 1 | 2 | 4-1/2 |
| 16296 | 16046 | 32.0 | 1.2598 | 1 | 2 | 4-1/2 |
| 16298 | 16048 | 36.0 | 1.4173 | 1 | 2 | 4-1/2 |
| 16300 | 16050 | 40.0 | 1.5748 | 1-1/4 | 2 | 4-1/2 |
| 16302 | 16052 | 45.0 | 1.7717 | 1-1/4 | 2 | 4-1/2 |

| Mill Dia. Tolerance (inch) | |
|---|---|
| 0~+.0010 | ** 0~+.0015 |

** The shank of end mills is the same diameter as the cutting portion.

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

◎ : Excellent ○ : Good

| P | | | | | H | M | K | N | | | | | S | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels | | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HRc20 | HRc20~30 | HRc30~40 | HRc40~45 | HRc45~55 | HRc55~70 | | | | | | | | | |
| ◎ | ◎ | ○ | | | | | | ○ | | ○ | | | | |

## END MILL SET SERIES

▶ Various range of sizes in these end mill sets gives you plenty of opportunities to reduce manufacturing costs and improve productivity.

### SET OF MINIATURE, (3/16" SHANK) DOUBLE

| EDP No. | ITEM No. | EDP No. | ITEM No. | Type | Length | Mill Diameter | No.of Flute |
|---|---|---|---|---|---|---|---|
| 8% COBALT (M42) | | HSS (M2) | | | | | |
| 96002 | CMR211 | 96001 | MR211 | Sq. END (11PCS.) | REGULAR | 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16 | 2 |
| 96004 | CMR409 | 96003 | MR409 | Sq. END (9PCS.) | REGULAR | 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16 | 4 |
| 96006 | CMS211 | 96005 | MS211 | Sq. END (11PCS.) | STUB | 1/32, 3/64, 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16 | 2 |
| 96008 | CMS409 | 96007 | MS409 | Sq. END (9PCS.) | STUB | 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64, 3/16 | 4 |

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

* WITH TRANSPARENT PLASTIC CASE

### SET OF 3/8" SHANK, (WELDON) SINGLE

| EDP No. | ITEM No. | EDP No. | ITEM No. | Type | Length | Mill Diameter | No.of Flute |
|---|---|---|---|---|---|---|---|
| 8% COBALT (M42) | | HSS (M2) | | | | | |
| 96010 | CWR205 | 96009 | WR205 | Sq. END (5PCS.) | REGULAR | 1/8, 3/16, 1/4, 5/16, 3/8 | 2 |
| 96012 | CWR405 | 96011 | WR405 | Sq. END (5PCS.) | REGULAR | 1/8, 3/16, 1/4, 5/16, 3/8 | 4 |
| 96014 | CWRC05 | 96013 | WRC05 | CENTER CUT (5PCS.) | REGULAR | 1/8, 3/16, 1/4, 5/16, 3/8 | 04 |

■ The TiN coated, TiCN coated or TiAIN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAIN F), CE(TiAIN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAIN F), HE(TiAIN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

* WITH TRANSPARENT PLASTIC CASE

# COBALT & HSS END MILLS

## END MILL SET SERIES

▶ Various range of sizes in these end mill sets gives you a plenty of opportunities to reduce manufacturing costs and improve productivity.

### SET OF 3/8" SHANK, (WELDON) DOUBLE

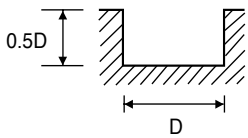
| EDP No. | ITEM No. | EDP No. | ITEM No. | Type | Length | Mill Diameter | No.of Flute |
|---|---|---|---|---|---|---|---|
| 8% COBALT (M42) | | HSS (M2) | | | | | |
| 96016 | CDR209 | 96015 | DR209 | Sq. END (9PCS.) | REGULAR | 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8 | 2 |
| 96018 | CDR409 | 96017 | DR409 | Sq. END (9PCS.) | REGULAR | 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8 | 4 |
| 96020 | CDRC09 | 96019 | DRC09 | CENTER CUT (9PCS.) | REGULAR | 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8 | 4 |

■ The TiN coated, TiCN coated or TiAlN coated is available on your request.
■ Coating Codes for Cobalt
Uncoated EDP NO. + CN(TiN), CC(TiCN), CF(TiAlN F), CE(TiAlN E), CH(Hardslick)
■ Coating Codes for HSS
Uncoated EDP NO. + HN(TiN), HC(TiCN), HF(TiAlN F), HE(TiAlN E), HH(Hardslick)
▶ Coated Price Shown in Price List. Call for Availability.

* WITH TRANSPARENT PLASTIC CASE

## HSSCo8 & HSS, 2 FLUTE FINISH - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 3500 | 2.2 | 3200 | 1.8 | 2500 | 1.6 | 1600 | 0.8 | 11000 | 9.8 |
| 1/4 | 1800 | 3.5 | 1600 | 3.1 | 1200 | 2.4 | 800 | 1.6 | 5600 | 12.2 |
| 3/8 | 1100 | 4.0 | 900 | 3.5 | 800 | 3.1 | 450 | 1.8 | 3100 | 15.8 |
| 1/2 | 900 | 4.3 | 800 | 4.0 | 630 | 3.1 | 400 | 2.0 | 2500 | 15.0 |
| 5/8 | 700 | 4.3 | 560 | 3.5 | 450 | 2.8 | 280 | 1.8 | 2000 | 13.8 |
| 3/4 | 630 | 4.0 | 500 | 3.5 | 400 | 2.8 | 250 | 1.8 | 1800 | 13.8 |
| 7/8 | 500 | 4.0 | 450 | 3.5 | 350 | 2.8 | 220 | 1.8 | 1400 | 11.8 |
| 1 | 450 | 3.5 | 400 | 3.1 | 310 | 2.4 | 180 | 1.4 | 1200 | 11.0 |
| 1-1/8 | 400 | 3.1 | 350 | 2.8 | 280 | 2.2 | 160 | 1.2 | 1100 | 10.5 |
| 1-3/8 | 310 | 2.4 | 250 | 2.0 | 200 | 1.6 | 120 | 1.0 | 900 | 8.7 |
| 1-1/2 | 310 | 2.4 | 250 | 2.0 | 200 | 1.6 | 120 | 1.0 | 900 | 8.7 |
| 1-3/4 | 280 | 2.4 | 220 | 2.0 | 180 | 1.6 | 110 | 1.0 | 800 | 7.8 |
| 2 | 250 | 2.0 | 190 | 1.8 | 110 | 1.0 | 80 | 0.8 | 630 | 6.3 |

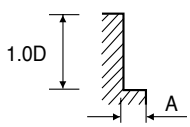



※ The Feed, in long & extra long types, should be reduced by around 50%.

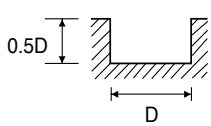
RPM = rev./min.
FEED = inch/min.

## HSS, 2 FLUTE, 42° HELIX FINISH for ALUMINUM

| MATERIAL | K | | N | |
|---|---|---|---|---|
| | NON-ALLOYED STEELS ALLOY STEELS CAST IRON | | ALUMINUM NONFERROUS METALS | |
| DIAMETER | RPM | FEED | RPM | FEED |
| 1/8 | 8000 | 29.0 | 8000 | 22.5 |
| 3/16 | 7400 | 32.5 | 7400 | 25.0 |
| 1/4 | 6800 | 37.0 | 6800 | 28.5 |
| 5/16 | 5200 | 55.0 | 5200 | 43.5 |
| 7/16 | 5000 | 47.0 | 5000 | 47.0 |
| 1/2 | 4500 | 61.0 | 4500 | 47.0 |
| 9/16 | 3500 | 63.0 | 3500 | 49.0 |
| 5/8 | 3500 | 63.0 | 3500 | 49.0 |
| 3/4 | 2300 | 67.0 | 2300 | 51.0 |
| 13/16 | 2000 | 67.0 | 2000 | 51.0 |




A : Ø1/8 ~ Ø5/16 = 0.25 × D
Ø7/16 ~ Ø13/16 = 0.5 × D



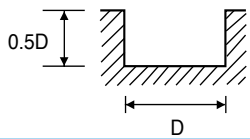

RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8, 3 FLUTE FINISH - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5600 | 2.4 | 4500 | 1.8 | 4000 | 1.8 | 2200 | 0.8 | 12000 | 9.4 |
| 1/8 | 3500 | 3.1 | 3200 | 2.6 | 2500 | 2.4 | 1600 | 1.2 | 11000 | 15.0 |
| 1/4 | 1800 | 5.3 | 1600 | 4.7 | 1200 | 3.5 | 800 | 2.4 | 5600 | 18.5 |
| 3/8 | 1100 | 6.0 | 900 | 5.3 | 800 | 4.7 | 450 | 2.6 | 3100 | 23.6 |
| 1/2 | 900 | 6.5 | 800 | 6.0 | 630 | 4.7 | 400 | 3.0 | 2500 | 22.4 |
| 9/16 | 800 | 6.5 | 700 | 5.3 | 560 | 4.7 | 350 | 3.0 | 2200 | 20.9 |
| 5/8 | 700 | 6.5 | 560 | 5.3 | 450 | 4.1 | 280 | 2.6 | 2000 | 20.9 |
| 7/8 | 500 | 6.0 | 450 | 5.3 | 350 | 4.1 | 220 | 2.6 | 1400 | 17.7 |
| 1 | 450 | 5.3 | 400 | 4.7 | 310 | 3.5 | 180 | 2.0 | 1200 | 16.5 |
| 1-1/8 | 400 | 4.7 | 350 | 4.1 | 280 | 3.1 | 160 | 1.8 | 1100 | 15.8 |

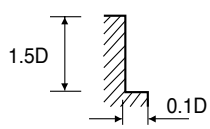



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## HSSCo8, 3 FLUTE FINISH - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 5600 | 2.4 | 4500 | 1.6 | 4000 | 1.4 | 2200 | 0.6 | 12000 | 7.1 |
| 1/8 | 3500 | 3.1 | 3200 | 2.4 | 2500 | 1.8 | 1600 | 0.8 | 11000 | 11.0 |
| 5/32 | 2800 | 4.1 | 2200 | 3.0 | 1800 | 2.0 | 1100 | 1.2 | 8000 | 13.0 |
| 3/16 | 2200 | 5.3 | 1800 | 3.7 | 1600 | 2.6 | 900 | 1.4 | 6300 | 13.8 |
| 1/4 | 1800 | 5.3 | 1600 | 4.3 | 1200 | 2.6 | 800 | 1.8 | 5600 | 13.8 |
| 5/16 | 1400 | 6.0 | 1100 | 4.7 | 900 | 3.1 | 560 | 2.0 | 4000 | 17.3 |
| 3/8 | 1100 | 6.0 | 900 | 4.7 | 800 | 3.8 | 450 | 2.0 | 3100 | 17.7 |
| 1/2 | 900 | 6.5 | 800 | 5.3 | 630 | 3.8 | 400 | 2.2 | 2500 | 16.9 |
| 9/16 | 800 | 6.5 | 700 | 4.7 | 560 | 3.8 | 350 | 2.2 | 2200 | 15.8 |
| 5/8 | 700 | 6.5 | 560 | 4.7 | 450 | 3.1 | 280 | 2.0 | 2000 | 15.8 |
| 11/16 | 630 | 6.0 | 500 | 4.7 | 400 | 3.1 | 250 | 2.0 | 1800 | 15.8 |
| 13/16 | 560 | 6.0 | 450 | 4.7 | 400 | 3.1 | 220 | 2.0 | 1600 | 14.2 |
| 7/8 | 500 | 6.0 | 450 | 4.7 | 350 | 3.1 | 220 | 2.0 | 1400 | 13.4 |
| 1 | 450 | 5.3 | 400 | 4.3 | 310 | 2.6 | 180 | 1.4 | 1200 | 12.6 |
| 1-1/8 | 400 | 4.7 | 350 | 3.7 | 280 | 2.4 | 160 | 1.2 | 1100 | 11.8 |
| 1-3/16 | 350 | 4.1 | 310 | 3.1 | 250 | 2.2 | 160 | 1.2 | 1100 | 11.8 |



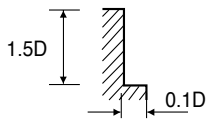

※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min. FEED = inch/min.

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8 & HSS, MULTI FLUTE FINISH - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 3500 | 4.3 | 3200 | 3.1 | 2500 | 2.4 | 1600 | 1.2 | 11000 | 15.0 |
| 1/4 | 1800 | 7.1 | 1600 | 5.7 | 1200 | 3.5 | 800 | 2.4 | 5600 | 18.5 |
| 3/8 | 1100 | 7.9 | 900 | 6.3 | 800 | 4.7 | 450 | 2.6 | 3100 | 23.6 |
| 1/2 | 900 | 8.7 | 800 | 7.1 | 630 | 4.7 | 400 | 3.0 | 2500 | 22.4 |
| 5/8 | 700 | 8.7 | 560 | 6.3 | 450 | 4.1 | 280 | 2.6 | 2000 | 20.9 |
| 3/4 | 630 | 7.9 | 500 | 6.3 | 400 | 4.1 | 250 | 2.6 | 1800 | 20.9 |
| 13/16 | 500 | 7.9 | 450 | 6.3 | 350 | 4.1 | 220 | 2.6 | 1400 | 17.7 |
| 15/16 | 500 | 7.9 | 450 | 6.3 | 350 | 4.1 | 220 | 2.6 | 1400 | 17.7 |
| 1 | 450 | 7.1 | 400 | 5.7 | 310 | 3.5 | 180 | 2.0 | 1200 | 16.5 |
| 1-1/2 | 310 | 4.7 | 250 | 3.5 | 200 | 2.4 | 120 | 1.4 | 900 | 13.0 |
| 1-3/4 | 280 | 4.7 | 220 | 3.5 | 150 | 2.4 | 110 | 1.4 | 800 | 11.8 |
| 2 | 280 | 4.7 | 190 | 3.5 | 110 | 1.8 | 80 | 1.0 | 630 | 11.8 |

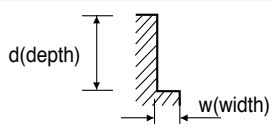



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, MULTI FLUTE 60° HELIX FINISH - SIDE CUTTING

| MATERIAL | | P | | | | M | | K | |
|---|---|---|---|---|---|---|---|---|---|
| | | MILD STEELS | | ALLOY STEELS | | TOOL STEELS STAINLESS STEELS | | CAST IRON | |
| HARDNESS | | ~HRc13 | | HRc13~HRc32 | | HRc25~HRc35 | | ~HRc20 | |
| DIAMETER | w×d | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 0.02 × 0.35 | 1840 | 3.6 | 1250 | 2.2 | 980 | 1.8 | 2050 | 4.8 |
| 1/4 | 0.08 × 0.35 | 1600 | 3.6 | 650 | 2.2 | 510 | 1.6 | 1100 | 4.5 |
| 5/8 | 0.02 × 1 | 750 | 2.9 | 460 | 2.0 | 390 | 1.4 | 840 | 4.1 |
| 5/8 | 0.18 × 1 | 650 | 2.9 | 400 | 2.0 | 340 | 1.4 | 730 | 4.1 |
| 3/4 | 0.02 × 1.2 | 520 | 2.5 | 370 | 1.8 | 300 | 1.4 | 630 | 4.1 |
| 3/4 | 0.26 × 1.2 | 450 | 2.5 | 320 | 1.8 | 260 | 1.4 | 550 | 4.1 |
| 1 | 0.02 × 1.6 | 460 | 2.9 | 290 | 1.8 | 240 | 1.4 | 510 | 4.3 |
| 1 | 0.30 × 1.6 | 400 | 2.9 | 250 | 1.8 | 210 | 1.4 | 440 | 4.3 |
| 1-1/2 | 0.02 × 1.6 | 280 | 2.5 | 170 | 1.4 | 150 | 1.3 | 320 | 3.6 |
| 1-1/2 | 0.80 × 1.6 | 240 | 2.5 | 150 | 1.4 | 130 | 1.3 | 280 | 3.6 |
| 2 | 0.02 × 2 | 220 | 2.2 | 140 | 1.3 | 115 | 1.1 | 260 | 2.9 |
| 2 | 1.60 × 2 | 190 | 2.2 | 120 | 1.3 | 100 | 1.1 | 225 | 2.9 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

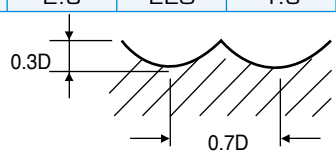
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8 & HSS, 2 FLUTE BALL NOSE

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 4500 | 3.7 | 3400 | 2.8 | 2000 | 1.2 | 1400 | 0.8 | 11000 | 9.1 |
| R5/64 × 5/32 | 3200 | 4.5 | 2400 | 3.1 | 1400 | 1.4 | 1000 | 1.0 | 8000 | 10.2 |
| R1/8 × 1/4 | 2200 | 5.3 | 1700 | 3.5 | 1000 | 1.8 | 700 | 1.0 | 5600 | 11.0 |
| R5/32 × 5/16 | 1600 | 6.3 | 1200 | 4.1 | 700 | 2.0 | 500 | 1.2 | 4000 | 13.8 |
| R3/16 × 3/8 | 1300 | 7.1 | 1000 | 4.7 | 560 | 2.4 | 400 | 1.4 | 3200 | 14.2 |
| R1/4 × 1/2 | 1000 | 6.7 | 800 | 4.1 | 450 | 2.2 | 320 | 1.4 | 2500 | 13.4 |
| R5/16 × 5/8 | 800 | 6.0 | 600 | 4.0 | 350 | 2.2 | 250 | 1.4 | 2000 | 11.8 |
| R3/32 × 3/16 | 600 | 5.5 | 500 | 3.4 | 300 | 2.0 | 200 | 1.4 | 1600 | 11.0 |
| R1/2 × 1 | 500 | 5.1 | 400 | 2.8 | 220 | 1.6 | 160 | 1.2 | 1300 | 9.8 |

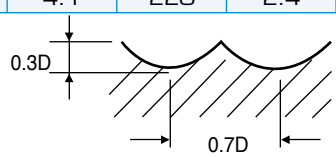



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MULTI FLUTE BALL NOSE

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/8 × 1/4 | 2200 | 7.9 | 1700 | 5.3 | 1000 | 2.8 | 700 | 1.6 | 5600 | 16.5 |
| R5/32 × 5/16 | 1600 | 9.4 | 1200 | 6.3 | 700 | 3.0 | 500 | 1.8 | 4000 | 20.9 |
| R3/16 × 3/8 | 1300 | 10.6 | 1000 | 7.1 | 560 | 3.5 | 400 | 2.0 | 3200 | 21.3 |
| R1/4 × 1/2 | 1000 | 10.2 | 800 | 6.3 | 450 | 3.1 | 320 | 2.0 | 2500 | 20.1 |
| R5/16 × 5/8 | 800 | 9.1 | 600 | 6.0 | 350 | 3.1 | 250 | 2.0 | 2000 | 17.7 |
| R3/32 × 3/16 | 600 | 8.3 | 500 | 5.1 | 300 | 3.0 | 200 | 2.0 | 1600 | 16.5 |
| R1/2 × 1 | 500 | 7.9 | 400 | 4.1 | 220 | 2.4 | 160 | 1.8 | 1300 | 15.0 |

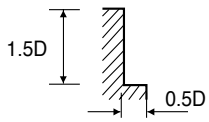



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, MULTI FLUTE ROUGHING - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 1800 | 3.1 | 1600 | 2.4 | 1200 | 2.2 | 800 | 1.2 | 4500 | 7.9 |
| 5/16 | 1400 | 4.1 | 1100 | 3.0 | 900 | 2.6 | 560 | 1.4 | 3100 | 9.1 |
| 3/8 | 1100 | 6.0 | 900 | 4.7 | 800 | 4.3 | 450 | 2.4 | 2500 | 13.8 |
| 1/2 | 900 | 7.1 | 800 | 5.5 | 630 | 4.3 | 400 | 2.8 | 2000 | 15.8 |
| 5/8 | 700 | 7.1 | 560 | 5.5 | 450 | 4.3 | 280 | 2.8 | 1600 | 17.7 |
| 11/16 | 630 | 7.1 | 500 | 5.5 | 400 | 4.3 | 250 | 2.8 | 1400 | 18.5 |
| 7/8 | 500 | 8.7 | 450 | 6.7 | 350 | 5.5 | 220 | 3.4 | 1100 | 18.5 |
| 1 | 450 | 8.7 | 400 | 6.7 | 310 | 5.5 | 180 | 3.4 | 1000 | 17.7 |
| 1-1/8 | 400 | 8.1 | 350 | 6.3 | 280 | 5.1 | 160 | 3.4 | 900 | 20.1 |
| 1-1/4 | 350 | 8.1 | 280 | 6.3 | 220 | 5.1 | 140 | 3.4 | 800 | 19.7 |
| 1-3/8 | 310 | 8.1 | 250 | 6.3 | 200 | 5.1 | 120 | 3.4 | 700 | 18.5 |
| 1-3/4 | 280 | 7.9 | 220 | 6.0 | 180 | 4.7 | 110 | 3.1 | 630 | 17.7 |
| 2 | 220 | 7.9 | 180 | 6.7 | 160 | 5.5 | 90 | 3.1 | 500 | 14.6 |

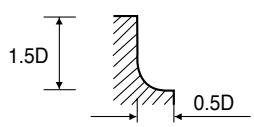



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, MULTI FLUTE BALL NOSE ROUGHING - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R5/32 × 5/16 | 1400 | 4.1 | 1100 | 3.0 | 900 | 2.6 | 560 | 1.4 | 3100 | 9.1 |
| R3/16 × 3/8 | 1100 | 6.0 | 900 | 4.7 | 800 | 4.3 | 450 | 2.4 | 2500 | 9.8 |
| R1/4 × 1/2 | 900 | 7.1 | 800 | 5.5 | 630 | 4.3 | 400 | 2.8 | 2000 | 15.8 |
| R5/16 × 5/8 | 700 | 7.1 | 560 | 5.5 | 450 | 4.3 | 280 | 2.8 | 1600 | 17.7 |
| R7/16 × 7/8 | 560 | 7.1 | 450 | 5.5 | 400 | 4.3 | 220 | 2.8 | 1200 | 19.7 |
| R1/2 × 1 | 450 | 8.7 | 400 | 6.7 | 310 | 5.5 | 180 | 3.4 | 1000 | 17.7 |
| R5/8 × 1-1/4 | 350 | 8.1 | 280 | 6.3 | 220 | 5.1 | 140 | 3.4 | 800 | 19.7 |
| R7/8 × 1-3/4 | 280 | 7.9 | 220 | 6.0 | 180 | 4.7 | 110 | 3.1 | 630 | 17.7 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

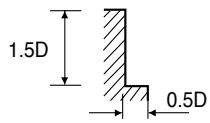
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8 & HSS, MULTI FLUTE ROUGHING & FINISHING - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 1800 | 2.5 | 1300 | 2.0 | 1200 | 1.8 | 800 | 1.0 | 4500 | 6.3 |
| 5/16 | 1400 | 3.4 | 1100 | 2.4 | 900 | 2.2 | 560 | 1.2 | 3100 | 7.3 |
| 3/8 | 1100 | 4.7 | 900 | 3.7 | 800 | 3.5 | 450 | 2.0 | 2500 | 11.0 |
| 1/2 | 900 | 5.7 | 800 | 4.3 | 630 | 3.5 | 400 | 2.2 | 2000 | 12.6 |
| 5/8 | 700 | 5.7 | 560 | 4.3 | 450 | 3.5 | 280 | 2.2 | 1600 | 14.2 |
| 11/16 | 630 | 5.7 | 500 | 4.3 | 400 | 3.5 | 250 | 2.2 | 1400 | 15.0 |
| 7/8 | 500 | 6.9 | 450 | 5.3 | 350 | 4.3 | 220 | 2.8 | 1100 | 15.0 |
| 1 | 450 | 6.9 | 400 | 5.3 | 310 | 4.3 | 180 | 2.8 | 1000 | 14.2 |
| 1-1/4 | 350 | 6.7 | 280 | 5.1 | 220 | 4.1 | 140 | 2.8 | 800 | 15.8 |
| 1-3/8 | 310 | 6.7 | 250 | 5.1 | 200 | 4.1 | 120 | 2.8 | 700 | 15.0 |
| 2 | 240 | 5.4 | 190 | 4.0 | 150 | 3.4 | 110 | 2.6 | 500 | 11.2 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MINIATURE

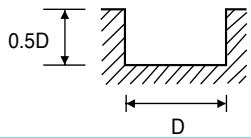
| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | HIGH TENSILE STEELS MEDIUM STRENGTH STAINLESS STEELS MEDIUM STRENGTH TITANIUM SLOOYS | | MEDIUM TENSILE STEELS UNALLOYED TITANIUM TOOL STEELS HEAT RESISTANT FERRITIC LOW ALLOYS | | VILD STEEL FORGING HARD BRASS & BRONZE COPPER | | ALUMINUM ALUMINUM ALLOYS PLASTIC WOODS | | ALUMINUM ALUMINUM ALLOYS | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 6600~8800 | 0.3 | 11000 up | 0.5 | 11000 up | 0.8 | 11000 up | 1.2 | 11000 up | 1.5 |
| 1/32 | 3300~4400 | 0.5 | 5500~5600 | 0.6 | 7700~9900 | 1.6 | 11000 up | 1.6 | 11000 up | 2.5 |
| 3/64 | 2200~2935 | 0.6 | 3665~4400 | 0.6 | 5135~6600 | 2.5 | 7335~8800 | 2.0 | 11000 up | 2.6 |
| 1/16 | 1650~2260 | 0.6 | 2750~3300 | 1.0 | 3350~4950 | 3.3 | 5500~6600 | 2.6 | 11000 up | 4.2 |
| 5/64 | 1320~1760 | 0.6 | 2200~2640 | 1.0 | 3850~3960 | 3.3 | 4400~5820 | 2.6 | 8500 up | 4.2 |
| 3/32 | 1100~1285 | 0.6 | 1835~2200 | 1.0 | 2565~3300 | 3.3 | 3665~4400 | 2.6 | 7330up | 4.2 |
| 7/64 | 345~1255 | 0.6 | 1570~1885 | 1.0 | 2200~2830 | 3.3 | 3140~3770 | 2.6 | 5625 up | 4.3 |
| 1/8 | 825~1100 | 0.6 | 1375~1650 | 1.0 | 1925~2475 | 3.3 | 2750~3300 | 2.8 | 5500 up | 4.5 |
| 9/64 | 735~980 | 0.6 | 1220~1465 | 1.0 | 1710~2200 | 3.4 | 2445~3770 | 2.8 | 4890~9780 | 4.5 |
| 5/32 | 560~880 | 0.8 | 1100~1320 | 1.1 | 1540~1980 | 3.6 | 2205~2640 | 2.9 | 4400~8800 | 4.5 |
| 11/64 | 600~800 | 0.9 | 1000~1200 | 1.2 | 1400~1800 | 3.7 | 2000~2400 | 3.0 | 4000~3000 | 4.6 |
| 3/16 | 550~735 | 1.0 | 915~1100 | 1.4 | 1285~1650 | 3.3 | 1535~2200 | 3.3 | 3685~7335 | 4.7 |

RPM = rev./min.
FEED = inch/min.

**NOTES :**
(1) The cutting conditions in this table are given for reference, which should be varied depending on the machine, tooling, depth of cut. cutting fluid and other conditons.
(2) Use a holder of strong gripping force and machine of high stiffness

## HSSCo8 & HSS, 2 FLUTE FINISH TiN-COATED - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4200 | 2.6 | 3840 | 2.2 | 3000 | 1.9 | 1920 | 1.0 | 13200 | 11.8 |
| 1/4 | 2160 | 4.2 | 1920 | 3.7 | 1440 | 2.9 | 960 | 1.9 | 6720 | 14.6 |
| 3/8 | 1320 | 4.8 | 1080 | 4.2 | 960 | 3.7 | 540 | 2.2 | 3720 | 19.0 |
| 1/2 | 1090 | 5.2 | 960 | 4.8 | 756 | 3.7 | 480 | 2.4 | 3000 | 18.0 |
| 5/8 | 840 | 5.2 | 672 | 4.2 | 540 | 3.7 | 336 | 2.2 | 2400 | 16.6 |
| 3/4 | 756 | 4.8 | 600 | 4.2 | 480 | 3.4 | 300 | 2.2 | 2160 | 16.6 |
| 7/8 | 600 | 4.8 | 540 | 4.2 | 420 | 3.4 | 264 | 2.2 | 1680 | 14.2 |
| 1 | 540 | 4.2 | 480 | 3.7 | 372 | 2.9 | 260 | 2.2 | 1440 | 13.2 |
| 1-1/8 | 480 | 3.7 | 420 | 3.4 | 336 | 2.6 | 432 | 1.7 | 1320 | 12.6 |
| 1-3/8 | 372 | 2.9 | 300 | 2.4 | 240 | 1.9 | 144 | 1.2 | 1080 | 10.4 |
| 1-1/2 | 372 | 2.9 | 300 | 2.4 | 240 | 1.9 | 144 | 1.2 | 1080 | 10.4 |
| 1-3/4 | 336 | 2.9 | 264 | 2.4 | 216 | 1.9 | 132 | 1.2 | 960 | 9.5 |
| 2 | 300 | 2.4 | 228 | 2.2 | 132 | 1.2 | 96 | 1.0 | 756 | 7.6 |

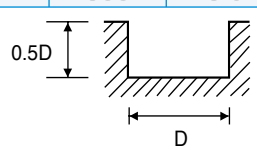



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, 3 FLUTE FINISH TiN-COATED - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 6720 | 2.8 | 5400 | 2.2 | 4800 | 2.2 | 2640 | 1.0 | 14400 | 11.3 |
| 1/5 | 4200 | 3.7 | 3840 | 3.1 | 3000 | 2.9 | 1920 | 1.4 | 13200 | 18.0 |
| 1/4 | 2160 | 6.4 | 1920 | 5.6 | 1440 | 4.2 | 960 | 2.9 | 6720 | 21.7 |
| 3/8 | 1320 | 7.2 | 1080 | 6.4 | 960 | 5.6 | 540 | 3.1 | 3720 | 28.3 |
| 1/2 | 1080 | 7.8 | 960 | 7.2 | 756 | 5.6 | 480 | 3.6 | 3000 | 26.9 |
| 5/8 | 840 | 7.8 | 672 | 6.4 | 540 | 4.9 | 336 | 3.1 | 2400 | 25.1 |
| 11/16 | 756 | 7.2 | 600 | 6.4 | 480 | 4.9 | 300 | 3.1 | 2160 | 25.1 |
| 7/8 | 600 | 7.2 | 540 | 6.4 | 420 | 4.9 | 264 | 3.1 | 1680 | 21.2 |
| 1 | 540 | 6.4 | 480 | 5.6 | 372 | 4.2 | 216 | 2.4 | 1440 | 19.8 |
| 1-1/8 | 430 | 5.6 | 420 | 4.9 | 336 | 3.7 | 192 | 2.2 | 1320 | 19.0 |
| 1-3/16 | 420 | 4.9 | 372 | 4.2 | 300 | 3.6 | 192 | 2.2 | 1320 | 19.0 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

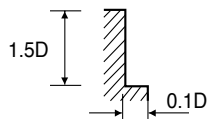
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8 & HSS, 3 FLUTE FINISH TiN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 6720 | 2.9 | 5400 | 1.9 | 4800 | 1.7 | 2640 | 0.7 | 14400 | 8.5 |
| 1/8 | 4200 | 3.7 | 3840 | 2.9 | 3000 | 2.2 | 1920 | 1.0 | 13200 | 13.2 |
| 1/4 | 2160 | 6.4 | 1920 | 5.2 | 1440 | 3.1 | 960 | 2.2 | 6720 | 16.6 |
| 3/8 | 1320 | 7.2 | 1080 | 5.6 | 960 | 4.2 | 540 | 2.4 | 3720 | 21.2 |
| 1/2 | 1080 | 7.8 | 960 | 6.4 | 756 | 4.2 | 480 | 2.6 | 3000 | 20.3 |
| 9/16 | 960 | 7.8 | 840 | 5.6 | 672 | 4.2 | 420 | 2.6 | 2640 | 19.0 |
| 5/8 | 840 | 7.8 | 672 | 5.6 | 540 | 3.7 | 336 | 2.4 | 2400 | 19.0 |
| 11/16 | 756 | 7.2 | 600 | 5.6 | 480 | 3.7 | 300 | 2.4 | 2160 | 19.0 |
| 7/8 | 600 | 7.2 | 540 | 5.6 | 420 | 3.7 | 264 | 2.4 | 1680 | 16.1 |
| 1 | 540 | 6.4 | 480 | 5.2 | 372 | 3.1 | 216 | 1.7 | 1440 | 15.1 |
| 1-1/8 | 430 | 5.6 | 420 | 4.4 | 336 | 2.9 | 192 | 1.4 | 1320 | 14.2 |

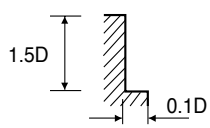



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MULTI FLUTE FINISH TiN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4200 | 5.2 | 3840 | 3.7 | 3000 | 2.9 | 1920 | 1.4 | 13200 | 18.0 |
| 1/4 | 2640 | 8.5 | 1920 | 6.8 | 1440 | 4.2 | 960 | 2.9 | 6720 | 22.2 |
| 3/8 | 1320 | 9.5 | 1080 | 7.6 | 960 | 5.6 | 540 | 3.1 | 3700 | 28.3 |
| 1/2 | 1080 | 10.4 | 960 | 8.5 | 756 | 5.6 | 480 | 3.6 | 3000 | 26.9 |
| 5/8 | 840 | 10.4 | 672 | 7.6 | 540 | 4.9 | 336 | 3.1 | 2400 | 25.1 |
| 3/4 | 756 | 9.5 | 600 | 7.6 | 480 | 4.9 | 300 | 3.1 | 2160 | 25.1 |
| 7/8 | 600 | 9.5 | 540 | 7.6 | 420 | 4.9 | 264 | 3.1 | 1680 | 21.2 |
| 15/16 | 600 | 9.5 | 540 | 7.6 | 420 | 4.9 | 264 | 3.1 | 1680 | 21.2 |
| 1 | 540 | 8.5 | 480 | 6.8 | 372 | 4.2 | 216 | 2.4 | 1440 | 19.8 |
| 1-1/2 | 372 | 5.6 | 300 | 4.2 | 240 | 2.9 | 144 | 1.7 | 1080 | 15.6 |
| 1-3/4 | 336 | 5.6 | 264 | 4.2 | 216 | 2.9 | 132 | 1.7 | 960 | 14.2 |
| 2 | 336 | 5.6 | 264 | 4.2 | 168 | 2.2 | 96 | 1.2 | 960 | 14.2 |

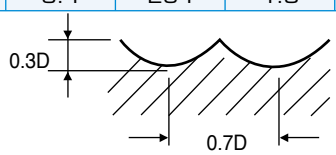



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, 2 FLUTE BALL NOSE TiN-COATED

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 5400 | 4.4 | 4080 | 3.4 | 2400 | 1.4 | 1680 | 1.0 | 13200 | 10.9 |
| R5/64 × 5/32 | 3840 | 5.4 | 2880 | 3.7 | 1680 | 1.7 | 1200 | 1.2 | 9600 | 12.2 |
| R1/8 × 1/4 | 2640 | 6.4 | 2040 | 4.2 | 1200 | 2.2 | 840 | 1.2 | 6720 | 13.2 |
| R5/32 × 5/16 | 1920 | 7.6 | 1440 | 4.9 | 840 | 2.4 | 600 | 1.4 | 4800 | 16.6 |
| R3/16 × 3/8 | 1560 | 8.5 | 1200 | 5.6 | 672 | 2.9 | 480 | 1.7 | 3840 | 17.0 |
| R1/4 × 1/2 | 1200 | 8.0 | 960 | 4.9 | 540 | 2.6 | 384 | 1.7 | 3330 | 16.1 |
| R5/16 × 5/8 | 960 | 7.2 | 720 | 4.8 | 420 | 2.6 | 300 | 1.7 | 2400 | 14.2 |
| R3/32 × 3/16 | 720 | 6.6 | 600 | 4.1 | 360 | 2.4 | 240 | 1.7 | 1923 | 13.2 |
| R1/2 × 1 | 600 | 6.1 | 480 | 3.4 | 264 | 1.9 | 192 | 1.4 | 1560 | 11.8 |

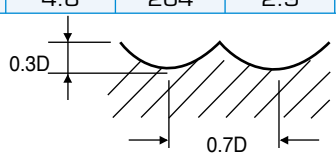



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MULTI FLUTE BALL NOSE TiN-COATED

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm$^2$ | | 500~800N/mm$^2$ | | 800~1000N/mm$^2$ | | 1000~1300N/mm$^2$ | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/8 × 1/4 | 2640 | 9.5 | 2040 | 6.4 | 1200 | 3.4 | 840 | 1.9 | 6720 | 19.8 |
| R5/32 × 5/16 | 1920 | 11.3 | 1440 | 7.6 | 840 | 3.6 | 600 | 2.2 | 4800 | 25.1 |
| R3/16 × 3/8 | 1560 | 12.7 | 1200 | 8.5 | 672 | 4.2 | 480 | 2.4 | 3840 | 25.6 |
| R1/4 × 1/2 | 1200 | 12.2 | 960 | 7.6 | 540 | 3.7 | 384 | 2.4 | 3000 | 24.1 |
| R5/16 × 5/8 | 960 | 10.9 | 720 | 7.2 | 420 | 3.7 | 300 | 2.4 | 2400 | 21.2 |
| R3/32 × 3/16 | 720 | 10.0 | 600 | 6.1 | 380 | 3.6 | 240 | 2.4 | 1920 | 19.8 |
| R1/2 × 1 | 600 | 9.5 | 480 | 4.8 | 264 | 2.9 | 192 | 2.2 | 1560 | 18.0 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

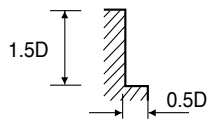
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8, MULTI FLUTE ROUGHING TiN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2160 | 3.7 | 1920 | 2.9 | 1440 | 2.6 | 960 | 1.4 | 5400 | 9.5 |
| 5/16 | 1680 | 4.9 | 1320 | 3.6 | 1080 | 3.1 | 672 | 1.7 | 3720 | 10.9 |
| 3/8 | 1320 | 7.2 | 1080 | 5.6 | 960 | 5.2 | 540 | 2.9 | 3000 | 16.6 |
| 1/2 | 1080 | 8.5 | 960 | 6.6 | 756 | 5.2 | 480 | 3.4 | 2400 | 19.0 |
| 5/8 | 840 | 8.5 | 672 | 6.6 | 540 | 5.2 | 336 | 3.4 | 1920 | 22.2 |
| 11/16 | 756 | 8.5 | 600 | 6.6 | 480 | 5.2 | 300 | 3.4 | 1680 | 22.2 |
| 7/8 | 600 | 10.4 | 540 | 8.0 | 420 | 6.6 | 264 | 4.1 | 1320 | 21.2 |
| 1 | 540 | 10.4 | 480 | 8.0 | 372 | 6.6 | 216 | 4.1 | 1200 | 21.2 |
| 1-1/8 | 480 | 9.7 | 420 | 7.6 | 336 | 6.1 | 192 | 4.1 | 1680 | 24.1 |
| 1-1/4 | 420 | 9.7 | 336 | 7.6 | 264 | 6.1 | 168 | 4.1 | 960 | 23.6 |
| 1-3/8 | 372 | 9.7 | 300 | 7.6 | 240 | 6.1 | 144 | 4.1 | 840 | 22.2 |
| 1-3/4 | 336 | 9.5 | 264 | 7.2 | 216 | 5.6 | 132 | 3.7 | 756 | 21.2 |
| 2 | 264 | 9.5 | 216 | 8.0 | 192 | 6.6 | 108 | 3.7 | 600 | 17.5 |

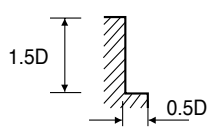



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, MULTI FLUTE ROUGHING & FINISHING TiN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2160 | 3.0 | 1920 | 2.4 | 1440 | 2.2 | 960 | 1.2 | 5400 | 7.6 |
| 5/16 | 1680 | 4.0 | 1320 | 2.9 | 1080 | 2.4 | 672 | 1.4 | 3720 | 8.8 |
| 3/8 | 1320 | 5.6 | 1080 | 4.4 | 960 | 4.2 | 540 | 2.4 | 3000 | 13.2 |
| 1/2 | 1080 | 6.8 | 960 | 5.2 | 756 | 4.2 | 480 | 2.6 | 2400 | 15.1 |
| 5/8 | 840 | 6.8 | 672 | 5.2 | 540 | 4.2 | 336 | 2.6 | 1920 | 17.6 |
| 11/16 | 756 | 6.8 | 600 | 5.2 | 480 | 4.2 | 300 | 2.6 | 1680 | 18.0 |
| 7/8 | 600 | 8.3 | 540 | 6.4 | 420 | 5.2 | 264 | 3.4 | 1320 | 18.0 |
| 1 | 540 | 8.3 | 480 | 6.4 | 372 | 5.2 | 216 | 3.4 | 1200 | 17.6 |
| 1-1/4 | 420 | 8.0 | 336 | 6.1 | 264 | 4.9 | 168 | 3.4 | 960 | 19.0 |
| 1-3/8 | 372 | 8.0 | 300 | 6.1 | 240 | 4.9 | 144 | 3.4 | 840 | 18.0 |
| 2 | 288 | 6.4 | 228 | 4.8 | 192 | 4.1 | 132 | 3.1 | 600 | 13.4 |

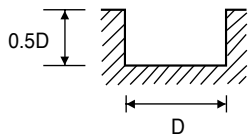



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, 2 FLUTE FINISH TiCN-COATED - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4550 | 2.9 | 3840 | 2.3 | 3250 | 2.1 | 2048 | 1.0 | 14300 | 12.7 |
| 1/4 | 2340 | 4.6 | 2080 | 4.0 | 1560 | 3.1 | 1040 | 3.2 | 7280 | 15.9 |
| 3/8 | 1430 | 5.2 | 1170 | 4.6 | 1040 | 4.0 | 585 | 3.2 | 4030 | 20.5 |
| 1/2 | 1170 | 5.6 | 1040 | 5.2 | 819 | 4.0 | 520 | 2.8 | 3250 | 19.5 |
| 5/8 | 910 | 5.6 | 728 | 4.6 | 585 | 3.6 | 364 | 2.3 | 2600 | 17.9 |
| 3/4 | 819 | 5.2 | 650 | 4.6 | 520 | 3.6 | 325 | 2.3 | 2340 | 17.9 |
| 7/8 | 650 | 5.2 | 585 | 4.6 | 455 | 3.6 | 286 | 2.3 | 1820 | 15.3 |
| 1 | 585 | 4.6 | 520 | 4.0 | 403 | 3.1 | 234 | 1.8 | 1560 | 14.3 |
| 1-1/8 | 520 | 4.0 | 455 | 3.6 | 364 | 2.9 | 208 | 1.6 | 1430 | 13.7 |
| 1-3/8 | 403 | 3.1 | 325 | 2.6 | 260 | 2.1 | 156 | 1.3 | 1170 | 11.3 |
| 1-1/2 | 403 | 3.1 | 325 | 2.6 | 260 | 2.1 | 156 | 1.3 | 1170 | 11.3 |
| 1-3/4 | 364 | 3.1 | 286 | 2.6 | 234 | 2.1 | 143 | 1.3 | 1040 | 10.3 |
| 2 | 325 | 2.6 | 228 | 2.3 | 143 | 1.3 | 104 | 1.0 | 819 | 8.2 |

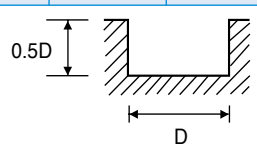



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, 3 FLUTE FINISH TiCN-COATED - SLOTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 7280 | 3.1 | 5850 | 2.3 | 5200 | 2.3 | 2860 | 1.0 | 15600 | 12.2 |
| 1/8 | 4550 | 4.0 | 2340 | 3.4 | 3250 | 3.1 | 2080 | 1.6 | 14300 | 19.5 |
| 1/4 | 2340 | 6.9 | 2080 | 6.1 | 1560 | 4.6 | 1040 | 3.1 | 7280 | 23.5 |
| 3/8 | 1430 | 7.8 | 1170 | 6.9 | 1040 | 6.1 | 585 | 3.4 | 4030 | 30.7 |
| 1/2 | 1170 | 8.5 | 1040 | 7.8 | 819 | 6.1 | 520 | 3.8 | 3250 | 29.1 |
| 9/16 | 1040 | 8.5 | 910 | 6.9 | 728 | 6.1 | 455 | 3.8 | 2860 | 27.2 |
| 5/8 | 910 | 8.5 | 728 | 6.9 | 585 | 5.3 | 364 | 3.4 | 2600 | 27.2 |
| 7/8 | 650 | 7.8 | 585 | 6.9 | 455 | 5.3 | 286 | 3.4 | 1820 | 23.0 |
| 1 | 585 | 6.9 | 520 | 6.1 | 403 | 4.6 | 234 | 2.6 | 1560 | 21.5 |
| 1-1/8 | 520 | 6.9 | 455 | 5.3 | 364 | 4.3 | 208 | 2.3 | 1430 | 20.5 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

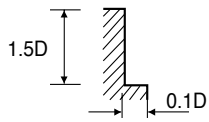
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8 & HSS, 3 FLUTE FINISH TiCN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 3/32 | 7280 | 3.1 | 5850 | 2.1 | 5200 | 1.8 | 2860 | 0.8 | 15600 | 9.2 |
| 1/8 | 4550 | 4.0 | 4160 | 3.1 | 3250 | 2.3 | 2080 | 1.0 | 14300 | 14.3 |
| 1/4 | 2240 | 6.9 | 2080 | 5.6 | 1560 | 3.4 | 1040 | 2.3 | 7280 | 17.9 |
| 5/16 | 1820 | 7.8 | 1430 | 5.1 | 1170 | 4.0 | 728 | 2.6 | 5200 | 22.5 |
| 1/2 | 1170 | 8.5 | 1040 | 6.9 | 819 | 4.6 | 520 | 2.9 | 3250 | 22.0 |
| 9/16 | 1040 | 8.5 | 910 | 6.1 | 728 | 4.6 | 455 | 2.9 | 2860 | 20.5 |
| 5/8 | 910 | 8.5 | 728 | 6.1 | 585 | 4.6 | 364 | 2.6 | 2600 | 20.5 |
| 11/16 | 819 | 7.8 | 650 | 6.1 | 520 | 4.0 | 325 | 2.6 | 2340 | 20.5 |
| 7/8 | 650 | 7.8 | 585 | 6.1 | 455 | 4.0 | 286 | 2.6 | 1820 | 17.4 |
| 1 | 585 | 6.9 | 520 | 5.6 | 403 | 3.4 | 234 | 1.8 | 1560 | 16.4 |
| 1-1/8 | 520 | 6.1 | 455 | 4.8 | 362 | 3.1 | 208 | 1.6 | 1430 | 15.3 |

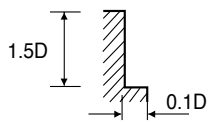



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MULTI FLUTE FINISH TiCN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/8 | 4550 | 5.6 | 4160 | 4.0 | 3250 | 3.1 | 22080 | 1.6 | 14300 | 19.5 |
| 1/4 | 2340 | 9.2 | 2090 | 8.4 | 1560 | 4.6 | 1040 | 3.1 | 7280 | 24.1 |
| 3/8 | 1430 | 10.3 | 1170 | 8.2 | 1040 | 6.1 | 585 | 3.4 | 4030 | 30.7 |
| 1/2 | 1170 | 11.3 | 1040 | 9.2 | 818 | 6.1 | 520 | 3.9 | 3250 | 29.1 |
| 5/8 | 910 | 11.3 | 728 | 8.2 | 585 | 5.3 | 364 | 3.4 | 2600 | 27.2 |
| 3/4 | 819 | 10.3 | 650 | 8.2 | 520 | 5.3 | 325 | 3.4 | 2340 | 27.2 |
| 7/8 | 650 | 10.3 | 585 | 8.2 | 455 | 5.3 | 286 | 3.4 | 1820 | 23.0 |
| 15/16 | 650 | 10.3 | 585 | 8.2 | 455 | 5.3 | 234 | 3.4 | 1820 | 23.0 |
| 1 | 585 | 9.2 | 520 | 8.4 | 403 | 4.6 | 208 | 2.6 | 1560 | 21.9 |
| 1-1/2 | 403 | 6.1 | 325 | 4.6 | 260 | 3.1 | 156 | 1.8 | 1170 | 16.9 |
| 1-3/4 | 364 | 6.1 | 286 | 4.6 | 234 | 3.1 | 143 | 1.8 | 1040 | 15.3 |
| 2 | 364 | 6.1 | 286 | 4.6 | 182 | 2.3 | 104 | 1.3 | 1040 | 15.3 |

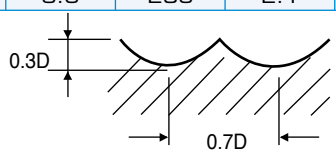



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, 2 FLUTE BALL NOSE TiCN-COATED

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/16 × 1/8 | 5850 | 4.8 | 4420 | 3.6 | 2600 | 1.6 | 1820 | 1.0 | 14300 | 11.8 |
| R5/64 × 5/32 | 4160 | 5.9 | 3120 | 4.0 | 1820 | 1.8 | 1300 | 1.3 | 10400 | 13.3 |
| R1/8 × 1/4 | 2860 | 6.9 | 2210 | 4.6 | 1300 | 2.3 | 910 | 1.3 | 7280 | 12.3 |
| R5/32 × 5/16 | 2080 | 8.2 | 1560 | 5.3 | 910 | 2.6 | 650 | 1.6 | 5200 | 17.9 |
| R3/16 × 3/8 | 1690 | 9.2 | 1300 | 6.1 | 728 | 3.1 | 520 | 1.8 | 4160 | 18.5 |
| R1/4 × 1/2 | 1300 | 8.7 | 1040 | 5.3 | 585 | 2.9 | 416 | 1.8 | 3250 | 17.4 |
| R5/16 × 5/8 | 1043 | 7.8 | 780 | 5.2 | 455 | 2.9 | 325 | 1.8 | 2600 | 15.3 |
| R3/32 × 3/16 | 780 | 7.2 | 650 | 4.4 | 390 | 2.6 | 263 | 1.8 | 2080 | 14.8 |
| R1/2 × 1 | 650 | 6.6 | 520 | 3.6 | 286 | 2.1 | 208 | 1.6 | 1690 | 12.7 |

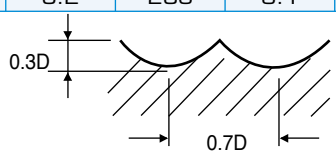



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8 & HSS, MULTI FLUTE BALL NOSE TiCN-COATED

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| R1/8 × 1/4 | 2860 | 10.3 | 2210 | 6.9 | 1300 | 3.6 | 910 | 2.1 | 7280 | 21.5 |
| R5/32 × 5/16 | 2080 | 12.2 | 1560 | 8.2 | 910 | 3.9 | 650 | 2.3 | 5200 | 27.2 |
| R3/16 × 3/8 | 1690 | 13.8 | 1300 | 9.2 | 728 | 4.6 | 520 | 2.6 | 4160 | 27.7 |
| R1/4 × 1/2 | 1300 | 13.3 | 1040 | 8.2 | 585 | 4.0 | 416 | 2.6 | 3250 | 26.1 |
| R5/16 × 5/8 | 1040 | 11.8 | 780 | 7.8 | 455 | 4.0 | 325 | 2.6 | 2600 | 23.0 |
| R3/32 × 3/16 | 780 | 10.8 | 650 | 6.6 | 390 | 3.9 | 260 | 2.6 | 2080 | 21.5 |
| R1/2 × 1 | 650 | 10.3 | 520 | 5.2 | 286 | 3.1 | 208 | 2.3 | 1690 | 19.5 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

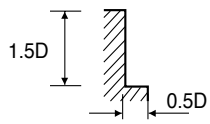
RPM = rev./min.
FEED = inch/min.

# COBALT & HSS END MILLS

## RECOMMENDED CUTTING CONDITIONS

## HSSCo8, MULTI FLUTE ROUGHING TiCN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2340 | 4.0 | 2080 | 3.1 | 1560 | 2.9 | 1040 | 1.6 | 5850 | 10.3 |
| 5/16 | 1820 | 5.3 | 1430 | 3.9 | 1170 | 3.4 | 728 | 1.8 | 4030 | 11.5 |
| 3/8 | 1430 | 7.8 | 1170 | 6.1 | 1040 | 5.6 | 585 | 3.1 | 3250 | 17.9 |
| 1/2 | 1170 | 9.2 | 1040 | 7.2 | 819 | 5.6 | 520 | 3.6 | 2600 | 20.5 |
| 5/8 | 910 | 9.2 | 728 | 7.2 | 585 | 5.6 | 364 | 3.6 | 2080 | 24.1 |
| 11/16 | 819 | 9.2 | 650 | 7.2 | 520 | 5.6 | 325 | 3.6 | 1820 | 24.1 |
| 7/8 | 650 | 11.3 | 585 | 8.7 | 455 | 7.2 | 286 | 4.4 | 1430 | 23.0 |
| 1 | 585 | 11.3 | 520 | 8.7 | 403 | 7.2 | 234 | 4.4 | 1300 | 23.0 |
| 1-1/8 | 520 | 10.5 | 455 | 8.2 | 364 | 6.6 | 208 | 4.4 | 1170 | 26.1 |
| 1-1/4 | 455 | 10.5 | 364 | 8.2 | 286 | 6.6 | 182 | 4.4 | 1040 | 25.6 |
| 1-3/8 | 403 | 10.5 | 325 | 8.2 | 260 | 6.6 | 156 | 4.4 | 910 | 24.1 |
| 1-3/4 | 364 | 10.3 | 286 | 7.8 | 234 | 6.1 | 143 | 4.0 | 819 | 23.0 |
| 2 | 286 | 10.3 | 234 | 8.7 | 208 | 7.2 | 117 | 4.0 | 650 | 19.0 |

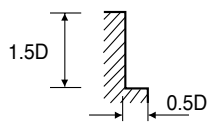



※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

## HSSCo8, MULTI FLUTE ROUGHING & FINISHING TiCN-COATED - SIDE CUTTING

| MATERIAL | P | | | | | | | | N | |
|---|---|---|---|---|---|---|---|---|---|---|
| | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | CARBON STEELS ALLOY STEELS TOOL STEELS | | ALUMINUM ALUMINUM ALLOYS | |
| HARDNESS | | | ~HRc20 | | HRc20~HRc30 | | HRc30~HRc40 | | | |
| STRENGTH | ~ 500N/mm² | | 500~800N/mm² | | 800~1000N/mm² | | 1000~1300N/mm² | | | |
| DIAMETER | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED | RPM | FEED |
| 1/4 | 2340 | 3.3 | 2080 | 2.6 | 1560 | 2.3 | 1040 | 1.3 | 5850 | 8.2 |
| 5/16 | 1820 | 4.4 | 1430 | 3.1 | 1170 | 2.6 | 728 | 1.6 | 4030 | 9.5 |
| 3/8 | 1430 | 6.1 | 1170 | 4.8 | 1040 | 4.6 | 585 | 2.6 | 3250 | 14.3 |
| 1/2 | 1170 | 7.4 | 1040 | 5.6 | 819 | 4.6 | 520 | 2.9 | 2600 | 16.4 |
| 5/8 | 910 | 7.4 | 728 | 5.6 | 585 | 4.6 | 364 | 2.9 | 2080 | 18.5 |
| 11/16 | 819 | 7.4 | 650 | 5.6 | 520 | 4.6 | 325 | 2.9 | 1820 | 19.5 |
| 7/8 | 650 | 9.0 | 585 | 6.9 | 455 | 5.6 | 286 | 3.6 | 1430 | 19.5 |
| 1 | 585 | 9.0 | 520 | 6.9 | 403 | 5.6 | 234 | 3.6 | 1300 | 18.5 |
| 1-1/4 | 455 | 8.7 | 384 | 6.6 | 286 | 5.3 | 182 | 3.6 | 1040 | 20.5 |
| 1-3/4 | 403 | 8.7 | 325 | 6.6 | 260 | 5.3 | 156 | 3.6 | 910 | 19.5 |
| 2 | 312 | 7.0 | 247 | 5.2 | 238 | 4.4 | 143 | 3.9 | 650 | 14.6 |




※ The Feed, in long & extra long types, should be reduced by around 50%.

RPM = rev./min.
FEED = inch/min.

# END MILLS

Being the best through innovation

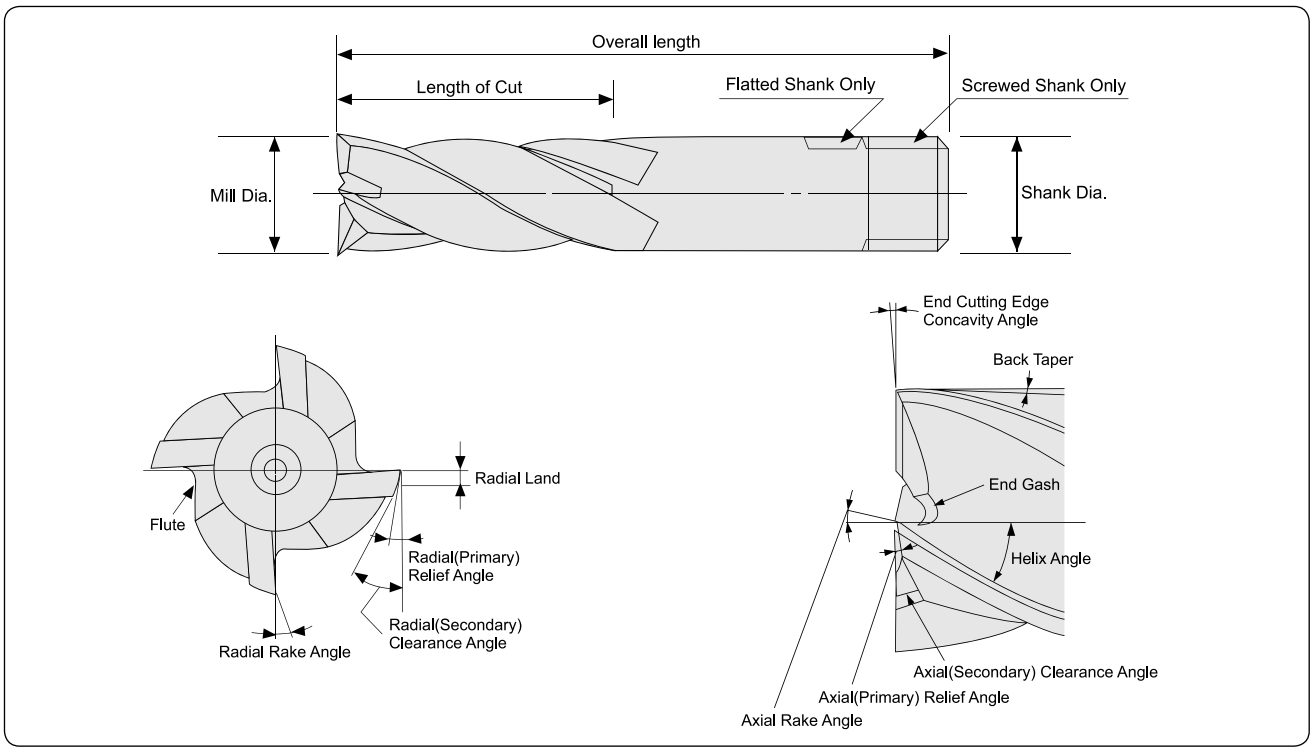


# TECHNICAL DATA

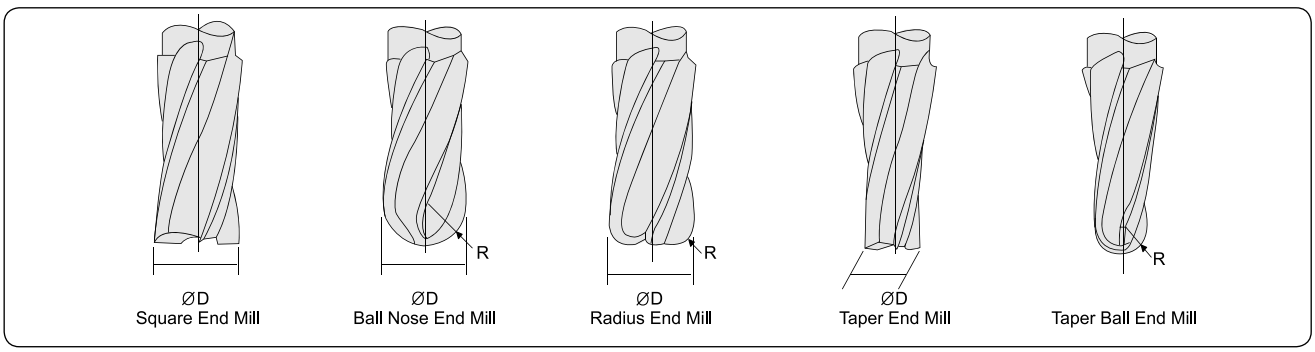
# TECHNICAL DATA

## SUPER CUTTING END MILLS

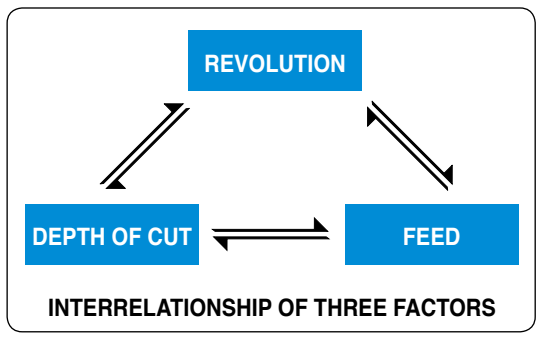
## 1 Names of End Mill Parts




## 2 Type of End Mill




Speed, feed and depth of cut are the most important factors to consider for best results in milling. Improper feeds and speeds often cause low production, poor work quality and unnecessary damage to the cutter.
This section covers the basic principles of speed and feed selection for milling cutters and end mills. It will serve as a guide in setting-up new milling jobs.




INTERRELATIONSHIP OF THREE FACTORS

## Speeds

In milling, Speed is measured in peripheral feet per minute.(revolution per minute × cutter circumference in feet) This is frequently referred to as “peripheral speed” “cutting speed” or “surface speed”.

Revolutions per Minute $N = \frac{1000V}{\pi \times D}$

V : Cutting Speed(m/min)
D : Diameter of Tool(mm)
N : Revolution per minute(rev/min)
$\pi$ : 3.1416

They will have to be tempered to suit the conditons ON THE JOB. For example:

| Use Lower Speed Ranges for | Use Higher Speed Ranges for |
|---|---|
| Hard materials | Softer materials |
| Tough materials | Better finishes |
| Abrasive materials | Smaller diameter cutters |
| Heavy cuts | Light cuts |
| Minimum tool wear | Frail work pieces or set-ups |
| Maximum cutter life | Hand feed operations |
| | Maximum production rates |
| | Non-metallics |

## Feeds

Feed is usually measured in millimeters per minute. It is the product of feed per tooth times revolution per minute times the number of teeth in the cutter. Due to variations in cutter sizes, numbers of teeth and revolutions per minute, all feed rates should be calculated from feed per tooth. Feed per tooth is the basis of all feed rates per minute, whether the cutters are large or small, fine or coarse tooth, and are run at high or low peripheral speed. Because feed per tooth affects chip thickness. It is a very important factor in cutter life.
Highest possible feed per tooth will usually give longer cutter life between grinds and greater production per grind. Excessive feeds may over load the cutter teeth and cause breakage or chipping of the cutting edges. The following factors should be kept in mind when using the recommended starting feed per tooth.

Feed in milimeters per Minute

F.M = F.R. × R.P.M

F.R. : Feed per Revolutions in milimeters
R.P.M .: Revolutions per Minutes

The following factors should be kept in mind when using the recommended stating feed per tooth.

| Use Higher Feeds For | Use Lower Feeds For |
|---|---|
| Heavy, roughing cuts | Light, and finishing cuts |
| Rigid set-ups | Frail set-ups |
| Easy-to-machine work materials | Hard to machine work materials |
| Rugged cutters | Frail and small cutters |
| Slab milling cuts | Deep slots |
| Low tensile strength materials | High tensile strength materials |
| Coarse tooth cutters | Fine tooth cutters |
| Abrasive materials | |

## SPEED AND FEED CALCULATIONS FOR MILLING CUTTERS AND OTHER ROTATING TOOLS

| TO FIND | HAVING | | FORMULA |
|---|---|---|---|
| Surface(or Periphery) Speed in meter Per Minute=S.P.M. | Diameter of Tool in milimeters<br>Revolutions per Minute | =D<br>=R.P.M. | $V=\frac{D\times 3.1416\times R.P.M.}{1000}$ |
| Revolutions Per Minute=R.P.M. | Surface Speed in meter per Minute<br>Diameter of Tool in milimeters | =S.P.M<br>=D | $R.P.M.=\frac{V\times 1000}{D\times 3.1416}$ |
| Feed per Revolution in milimeters-F.R. | Feed in milimeters per Minute<br>Revolution per Minute | =F.M.<br>=R.P.M. | $F.R.=\frac{F.M.}{R.P.M.}$ |
| Feed in milimeters Per Minute-F.M. | Feed per Revolution in milimeters<br>Revolution per Minute | =F.R.<br>=R.P.M. | $F.M.=F.R.\times R.P.M.$ |
| Number of Cutting Teeth per Minute=T.M. | Number of Teeth in Tool<br>Revolution per Minute | =T<br>=R.P.M. | $T.M=T\times R.P.M.$ |
| Feed per tooth=F.T. | Number of Teeth in Tool<br>Feed per Revolution in milimeters | =T<br>=R.P.M. | $F.T.=\frac{F.R.}{T}$ |
| Feed per Tooth=F.T. | Number of Teeth in Tool<br>Feed in milimeters per Minute<br>Speed in Revolution per Minute | =T<br>=F.M.<br>=R.P.M. | $F.T.=\frac{F.M.}{T\times R.P.M.}$ |

## 5 Case of Resharpening

When the product finish become worse, the cutting edge must get dulled, chips become smaller and the cutting sound gets louder. In such cases, an end mill must be resharpened. The following are the damages of end mills when the resharpening is required.

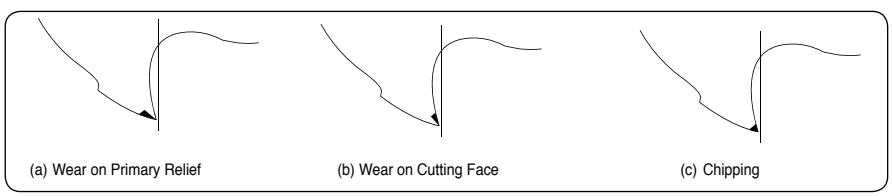



Fig. 1. Damages of Cutting Edge

## 6 Sharpen at Predetermined Wear Land

Cutters should be sharpened as soon as the wear land(Fig. 2.) reaches a predetermined width. This width should permit sharpening without excessive loss of tool life. It may vary from a few hundreths to some tenth of a millimeter, depending on the type of cutter and the finish required on the product. This method is used on production runs where uneven amounts of stock is removed or where the material varies in machinability. It is also used on small quantity product lots.

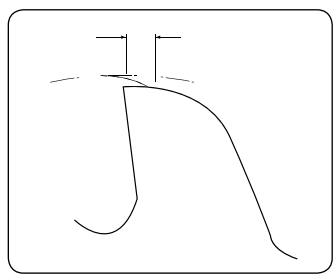


Fig. 2. Wear Land

## Resharpening Peripheral Cutting Edge

# 1 RESHARPENING PERIPHERAL CUTTING EDGE

The geometry of relief angle in an end mill consists of three methods as shown in Fig.3 concave, flat, and eccentric. Recently, most end mills have the eccentric relief(eccentric sharpening). In this method, since the relief is formed an eccentric are surface in cylindrical grinding method, the roughness of the finished surface of the relief improves and the strength of cutting edge increase at the same time.(Fig.4) As a result, the tool life is improved.

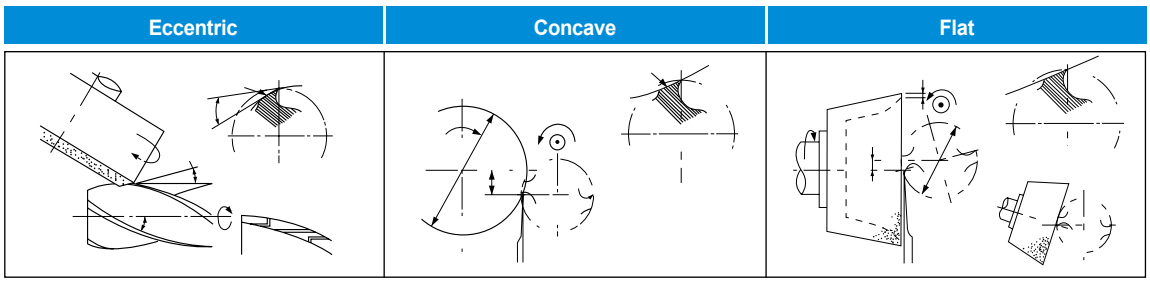



Fig. 3. Three Types of Primary Relief

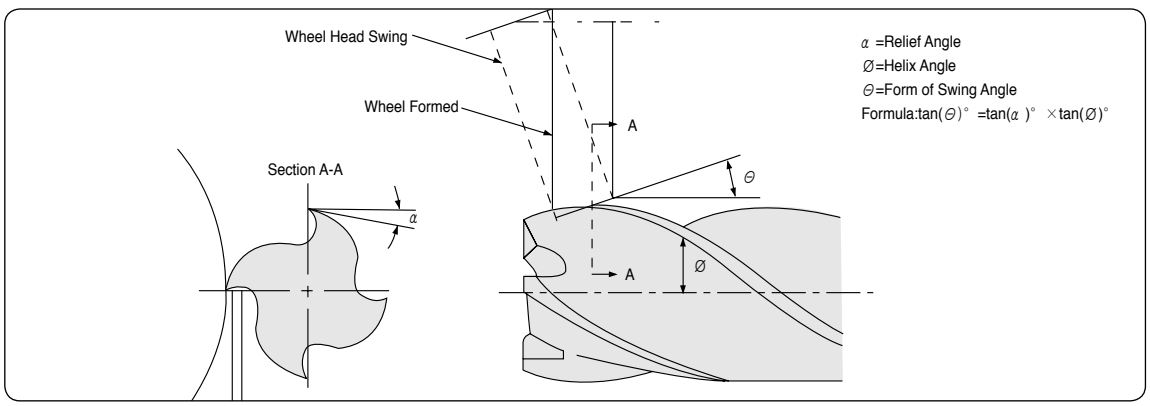



Fig. 4. Toothing of Eccentric Relief Angle

# 2 ANGLE OF WHEEL INCLINATION

Eccentric relief is produced with a plain wheel positioned with its axis parallel or at a slight angle with the cutter axis. The degree of relief is varied by changing the angle of wheel inclination.

**Table 1. RECOMMENDED RELIEF ON END MILLS**

| Mill Diameter (inches) | Eccentric relief indicator drop for relief Angles shown | | Checking Distance | Wheel Angles(Deg.)Θ | | | Radial Relief Angles(α 1) | Clearance Angles(α 2) |
|---|---|---|---|---|---|---|---|---|
| | | | | 15° Helix | 30° Helix | 60° Helix | | |
| - | Min | Max. | - | *Angle | *Angle | *Angle | *Angle | *Angle |
| 1/8 | .0040 | .0052 | .015 | 4° 42′ | 10° 02′ | 27° 58′ | 17° 03′ | 25° |
| 1/4 | .0035 | .0050 | .020 | 3° 15′ | 6° 59′ | 20° 12′ | 12° 00′ | 25° |
| 1/2 | .0040 | .0053 | .025 | 2° 51′ | 6° 07′ | 17° 51′ | 10° 32′ | 25° |
| 1 | .0038 | .0055 | 1/32 | 2° 16′ | 4° 54′ | 14° 27′ | 8° 27′ | 25° |
| 1-1/2 | .0033 | .0050 | 1/32 | 2° 02′ | 4° 22′ | 12° 57′ | 7° 33′ | 25° |
| 2 | .0033 | .0050 | 1/32 | 2° 02′ | 4° 22′ | 12° 57′ | 7° 33′ | 25° |

The actual at the radial relief angle is normally kept within the range shown but may be varied to suit the cutter material, the work material and the operating conditions.
* Angle is calculated from the basic mean at the radical angle.

## 8 Resharpening End Teeth

The three necessary operations and one option feature, along with setup suggestions are shown in Fig.5 A to D in each drawing, the shaded area indicates the surface being ground.

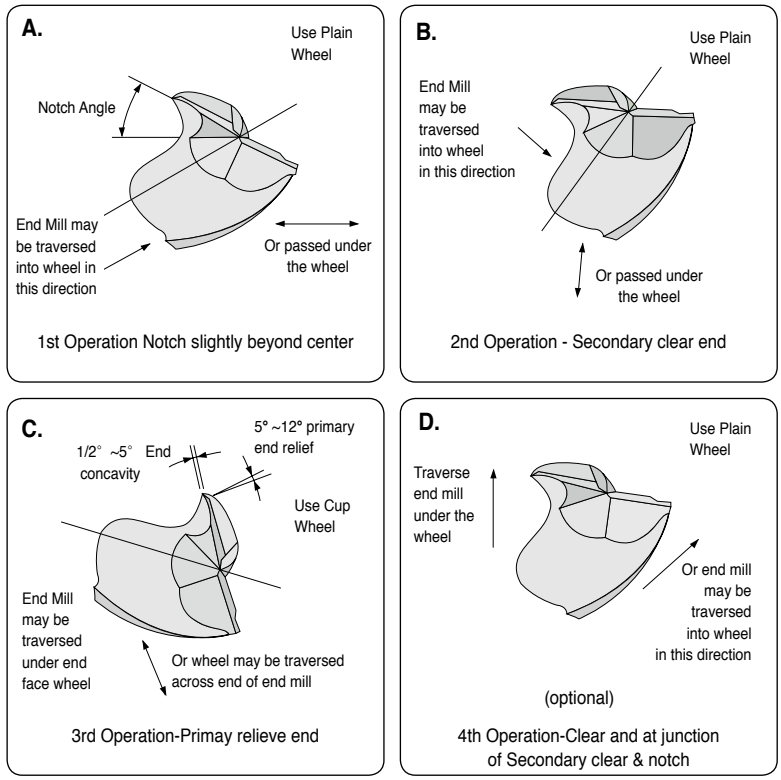



Fig 5. PROCEDURE FOR SHARPENING END OF 2 FLUTE SQUARE END MILLS

## 9 Inspection

The inspection is calculated by using the formula shown in Table1.
Procedure To Check
Radial Relief Angles
With Indicators.

1. Mount the cutter to rotate freely with no end movement.
2. Adjust the sharp pointed indicator to bear at the very tip of the cutting edge, pointing in a radial line, shown in Figure6
3. Roll the cutter the tabuleted amount gives under "checking distance" using the second indicator as control.
4. Consult chart for amount of drop for the particular diameter and relief angle.

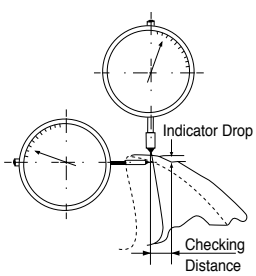
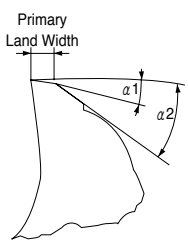
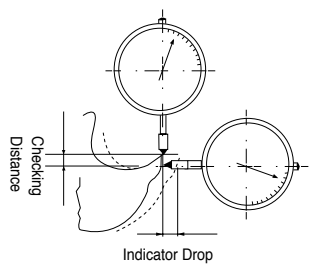
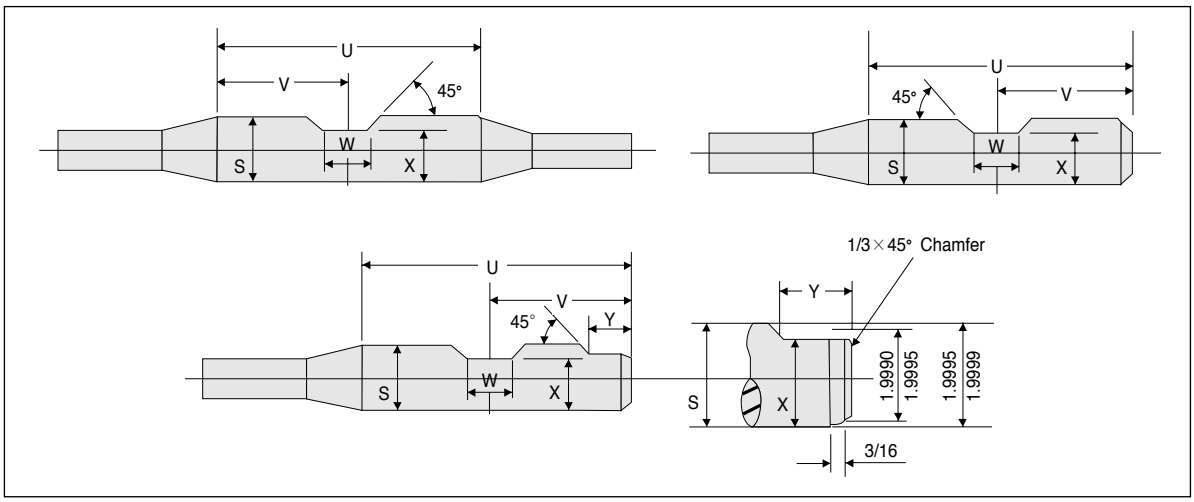
| Radial Relief | Peripheral Cutting Edge | Cutting Angle |
|---|---|---|
|  |  |  |



Fig. 6. Indicator Set-Up for Checking

## 10 Standard Weldon Shanks




## 11 Dimensions

All dimensions are given in inches.

| Diameter of Shank S | Length of Shank U | V | W | | X | Y |
|---|---|---|---|---|---|---|
| | | | Min. | Max. | | |
| 3/8 | 1-9/16 | 25/32 | 0.280 | 0.282 | 0.325 | - |
| 1/2 | 1-25/32 | 57/64 | 0.330 | 0.332 | 0.440 | - |
| 5/8 | 1-29/32 | 61/64 | 0.400 | 0.402 | 0.560 | - |
| 3/4 | 2-1/32 | 1-1/64 | 0.455 | 0.457 | 0.675 | - |
| 7/8 | 2-1/32 | 1-1/64 | 0.455 | 0.457 | 0.810 | 1/2 |
| 1 | 2-9/32 | 1-9/64 | 0.515 | 0.517 | 0.925 | 1/2 |
| 1-1/4 | 2-9/32 | 1-9/64 | 0.515 | 0.517 | 1.156 | 1/2 |
| 1-1/2 | 2-11/16 | 1-3/16 | 0.515 | 0.517 | 1.406 | 9/16 |
| 2 | 3-1/4 | 1-27/32 | 0.700 | 0.702 | 1.900 | 27/32 |
| 2-1/2 | 3-1/2 | 1-15/16 | 0.700 | 0.702 | 2.400 | 27/32 |

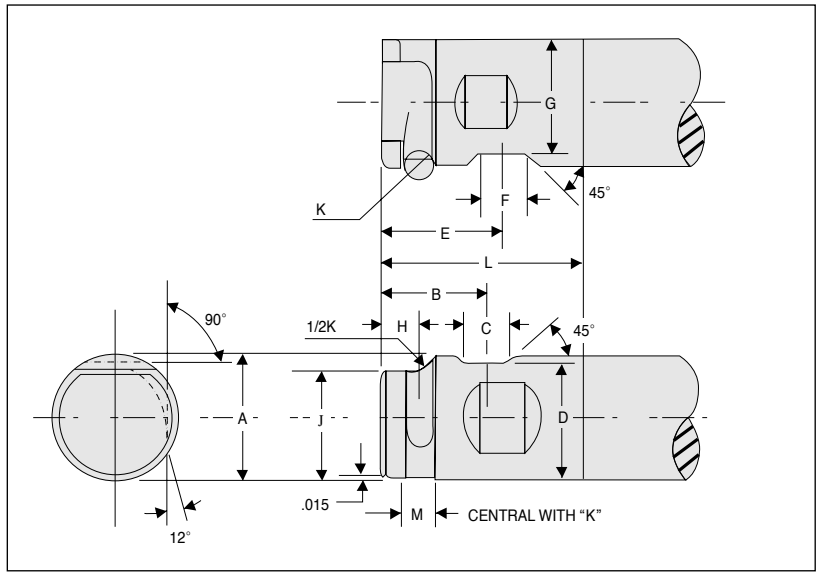
## 12 Tolerances

| Element | Range | Direction | Tolerance |
|---|---|---|---|
| Diameter of Shank, S | All Sizes | minus | .0001 to .0005 |
| Length of Shank, U | All Sizes | plus or minus | 1/32 |
| Dimension, V | All Sizes | plus or minus | 1/64 |
| Dimension, X | All Sizes | minus | 1/64 |
| Dimension, Y | 7/8 to 2-1/2 inc. | plus or minus | 1/32 |

Extracted from Milling Cutters and End Mills. MCTI 1989.

## 13 Combination Shanks for End Mills

Right hand End Mill shank shown. For left hand End Mills flat "F" and pin groove "K" should be located 180° from that shown, maintaining 12° relationship of flat "F" and groove "K"




## 14 Dimensions

All dimensions are given in inches.

| Diameter of Shank A | Length of Shank L | B | C | D | E | F | G | H | J | K | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-1/2 | 2-11/16 | 1-3/16 | 0.515 | 1.406 | 1-1/2 | 0.515 | 1.371 | 9/16 | 1.302 | 0.377 | 7/16 |
| 2 | 3-1/4 | 1-23/32 | 0.700 | 1.900 | 1-3/4 | 0.700 | 1.809 | 5/8 | 1.772 | 0.440 | 1/2 |
| 2-1/2 | 3-1/2 | 1-15/16 | 0.700 | 2.400 | 2 | 0.700 | 2.312 | 3/4 | 2.245 | 0.503 | 9/16 |

## 15 Tolerances

| Element | Direction | Tolerance |
|---|---|---|
| Diameter of Shank, A | minus | .0001 to .0005 |
| Length of Shank, L | plus or minus | 1/32 |
| Dimension, B | plus or minus | 1/64 |
| Dimension, C | plus | .002 |
| Dimension, D | minus | 1/64 |
| Dimension, E | plus or minus | 1/64 |
| Dimension, F | plus or minus | .005 |
| Dimension, G | minus | 1/64 |
| Dimension, H | plus | 1/64 |
| Dimension, J | plus or minus | .002 |
| Dimension, K | plus | .003 |

Extracted from Milling Cutters and End Mills. MCTI 1989.

## Troubleshooting in Endmilling

| Trouble | Occurrences of trouble | Countermeasures |
|---|---|---|
| Breaking of tool | · At time of engaging with work material<br>· When ending cut | 1. Decrease feed rate.<br>2. Decrease projection amount<br>3. Shorten cutting edge length to required minimum limit |
| | · During normal cutting | 1. Decrease feed rate<br>2. Control wear → replace tool early<br>3. Replace chuck or collet<br>4. Decrease projection amount<br>5. Carry out honing<br>6. If 4 flute, reduce to 2 flute(clogging of chipping)<br>7. If dry cutting change to wet cutting utilize cutting fluid. In case of wet cutting flow oil supplied from the front, change to from rear angle of side top. Use ample with rate. |
| | · When changing direction of feed | 1. Utilize circular interpolation(in case of NC machine) or temporarily stop feed(Dowelling)<br>2. Reduce feed rate before and after change of directions<br>3. Replace chuck or collect |
| Fracture of cutting edge | · Fracture of corners | 1. Carry out chamfering or nose with hand lapper.<br>2. Down cut → Up cut |
| | · Fracture at boundary of depth of cut | 1. Down cut → Up cut<br>2. Reduce cutting speed |
| | · Chipping at center part or overall | 1. Carry out honing. Or enlarge.<br>2. Change number of rotation(in case machine vibrates)<br>3. Increase cutting speed<br>4. In ease of squeaking noise during cutting, increase feed.<br>5. It dry cutting use cutting fluid or blow air.<br>6. Replace chuck or collet<br>7. Reduce cutting speed |
| | · Large fracturing of cutting edge | 1. Decrease feed rate<br>2. If 4 flute reduce to 2 flute<br>3. Carry out honing. Or enlarge<br>4. Replace chuck or collet<br>5. Reduce cutting speed<br>6. If dry cutting, change to wet cutting. In case oil supply in wet cutting is from the front, change to rear at an angle or from side top. Use ample supply. |
| Rapid tool wear | | 1. Reduce cutting speed<br>2. Up cut → Down cut<br>3. Increase feed<br>4. Utilize wet cutting or air<br>5. If reground tool, improve surface roughness of flank. |

# TECHNICAL DATA

## SUPER CUTTING END MILLS

| Trouble | Occurrences of trouble | Countermeasures |
|---|---|---|
| Inferior finished surface | · Surface is good but rough | 1. Decrease feed<br>2. In case using 2 flute, increase to 4 flute |
| | · Small chip welding | 1. Increase cutting speed<br>2. Utilize wet cutting air blow(ample supply)<br>3. Carry out fine honing<br>4. Up cut → Down cut<br>5. Increase feed or enlarge finish allowance |
| | · With transverse streaks | 1. Carry out fine honing<br>2. Use water insoluble cutting fluid<br>3. Down cut → Up cut |
| | · Signs of excessive cutting | 1. Reduce finishing depth of cut<br>2. Increase cutting speed<br>3. Reduce feed |
| Poor machining accuracy | · Finish dimensions are on minus side | 1. Up cut → Down cut<br>2. Reduce finishing depth of cut<br>3. Replace chuck or collet<br>4. Reduce projection amount<br>5. Increase cutting speed |
| | · Poor perpendicularity | 1. Reduce finishing depth of cut<br>2. Replace chuck or collet<br>3. Reduce projection amount<br>4. Increase cutting speed<br>5. 2Flute → 4 Flute<br>6. Reduce feed<br>7. Check wear rate → Replace tool |
| Chattering | | 1. Increase feed rate(in case over 0.05 mm/Zahn, try reducing)<br>2. Change cutting speed<br>3. Replace chuck or collet<br>4. Reduce projection amount<br>5. Use 2 flute cutter for rough cutting and 4 flute for finishing<br>6. Down cut → Up cut |

# ROTARY TOOL HOLDERS

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DUAL CONTACT HYDRAULIC CHUCK - CCT, CBT, HSK

HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE)

**SHRINK FIT HOLDER - CAT, BT**

DUAL CONTACT SHRINK FIT HOLDER - CCT, CBT, HSK

SHRINK FIT EXTENSION - ST

**END MILL HOLDER & SIDE LOCK ARBOR - CAT, BT**

DUAL CONTACT SIDE LOCK ARBOR - CCT, CBT

DUAL CONTACT END MILL HOLDER - HSK

**ER COLLET CHUCK - CAT, BT**

DUAL CONTACT ER COLLET CHUCK - HSK

SHORT & TENSION ER COLLET CHUCK - SHORT, TENSION (For TAPPING)

NC ER COLLET CHUCK - NC (For CNC LATHE)

ER COLLET

**DUAL CONTACT SK SLIM CHUCK - CCT, CBT, HSK**

STRAIGHT SK SLIM CHUCK - K

SK COLLET

**TG COLLET CHUCK - CAT, BT**

**MILLING CHUCK - CAT, BT**

DUAL CONTACT HIGH SPEED MILLING CHUCK - CCT, CBT, HSK

MILLING CHUCK COLLET

**MORSE TAPER ADAPTER - CAT, BT**

**TAPPING CHUCK - CAT, BT**

SYNCHRO TAPPING ER CHUCK - CAT

QUICK CHANGE TAP ADAPTER

**SHELL MILL ARBOR - CAT, BT**

DUAL CONTACT SHELL MILL ARBOR - CCT, CBT

**NC DRILL CHUCK - CAT, BT**

DUAL CONTACT NC DRILL CHUCK - HSK

STRAIGHT NC DRILL CHUCK - K

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| HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE) | 1281-1286 |
| **SHRINK FIT HOLDER - CAT, BT** | 1287-1288 |
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| DUAL CONTACT SIDE LOCK ARBOR - CCT, CBT | 1306-1307 |
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| SHORT & TENSION ER COLLET CHUCK - SHORT, TENSION (For TAPPING) | 1315 |
| NC ER COLLET CHUCK - NC (For CNC LATHE) | 1316-1317 |
| ER COLLET | 1318-1324 |
| **DUAL CONTACT SK SLIM CHUCK - CCT, CBT, HSK** | 1325-1327 |
| STRAIGHT SK SLIM CHUCK - K | 1328 |
| SK COLLET | 1329-1331 |
| **TG COLLET CHUCK - CAT, BT** | 1332-1334 |
| **MILLING CHUCK - CAT, BT** | 1335 |
| DUAL CONTACT HIGH SPEED MILLING CHUCK - CCT, CBT, HSK | 1336-1338 |
| MILLING CHUCK COLLET | 1339 |
| **MORSE TAPER ADAPTER - CAT, BT** | 1340 |
| **TAPPING CHUCK - CAT, BT** | 1341-1342 |
| SYNCHRO TAPPING ER CHUCK - CAT | 1343 |
| QUICK CHANGE TAP ADAPTER | 1344 |
| **SHELL MILL ARBOR - CAT, BT** | 1345-1346 |
| DUAL CONTACT SHELL MILL ARBOR - CCT, CBT | 1347-1349 |
| **NC DRILL CHUCK - CAT, BT** | 1350-1351 |
| DUAL CONTACT NC DRILL CHUCK - HSK | 1352 |
| STRAIGHT NC DRILL CHUCK - K | 1352 |
| **JACOBS TAPER ARBOR - CAT, BT** | 1353 |
| **STUB ARBOR - CAT, BT** | 1354-1355 |
| **SLITTING SAW ARBOR - CAT, BT** | 1356 |
| **PULL STUD** | 1357 |
| **TOOL CLAMP** | 1358 |

# HYDRAULIC CHUCK (SLIM)





FIG.1

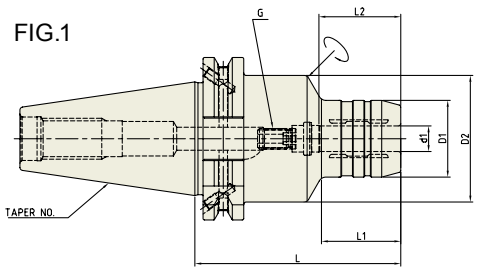
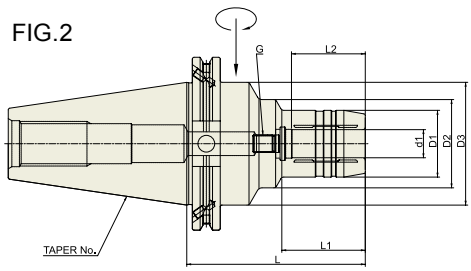



FIG.2




| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ ASME B5.50-2009-CAT

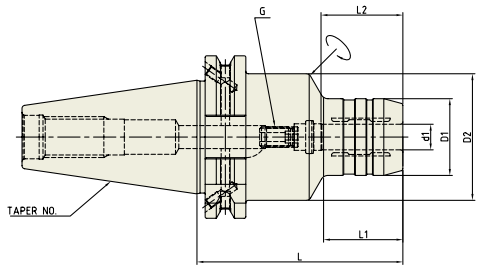
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | D3 | L | L1 | L2 | G | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WK020 | 40 | CAT40 AD/B - HC1/4-4.00 | 0.250 | 1.024 | 1.750 | - | 4.000 | 1.280 | 1.063 | M5x0.8mm | Fig.1 |
| WK022 | | CAT40 AD/B - HC3/8-4.00 | 0.375 | 1.181 | 1.750 | - | 4.000 | 1.634 | 1.260 | M6x1.0mm | |
| WK024 | | CAT40 AD/B - HC1/2-4.00 | 0.500 | 1.260 | 1.750 | - | 4.000 | 1.634 | 1.457 | M10x1.0mm | |
| WK026 | | CAT40 AD/B - HC5/8-4.00 | 0.625 | 1.496 | 1.750 | - | 4.000 | 1.949 | 1.654 | M10x1.0mm | |
| WK028 | | CAT40 AD/B - HC3/4-4.00 | 0.750 | 1.654 | 1.750 | - | 4.000 | 1.949 | 1.654 | M10x1.0mm | |
| WK030 | | CAT40 AD/B - HC1-4.00 | 1.000 | 2.165 | 2.480 | - | 4.000 | 2.618 | 1.890 | M16x1.0mm | |
| WK032 | | CAT40 AD/B - HC1 1/4-4.00 | 1.250 | 2.480 | 3.150 | - | 4.000 | 1.378 | 2.165 | M16x1.0mm | |
| WL020 | 50 | CAT50 AD/B - HC1/4-4.00 | 0.250 | 1.024 | 1.978 | 2.752 | 4.000 | 1.280 | 1.063 | M5x0.8mm | Fig.2 |
| WL022 | | CAT50 AD/B - HC3/8-4.00 | 0.375 | 1.181 | 1.978 | 2.752 | 4.000 | 1.417 | 1.260 | M6x1.0mm | |
| WL024 | | CAT50 AD/B - HC1/2-4.00 | 0.500 | 1.260 | 1.978 | 2.752 | 4.000 | 1.634 | 1.457 | M10x1.0mm | |
| WL026 | | CAT50 AD/B - HC5/8-4.00 | 0.625 | 1.496 | 1.978 | 2.752 | 4.000 | 1.870 | 1.654 | M10x1.0mm | |
| WL028 | | CAT50 AD/B - HC3/4-4.00 | 0.750 | 1.654 | 1.978 | 2.752 | 4.000 | 1.949 | 1.654 | M10x1.0mm | |
| WL030 | | CAT50 AD/B - HC1-4.00 | 1.000 | 2.244 | 2.480 | 2.752 | 4.000 | 1.949 | 1.890 | M16x1.0mm | |
| WL032 | | CAT50 AD/B - HC1 1/4-4.00 | 1.250 | 2.520 | - | 2.752 | 4.000 | 2.559 | 2.165 | M16x1.0mm | |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (SLIM) CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤3Um | AD/B |

## ■ ASME B5.50-2009-CAT

Unit : mm

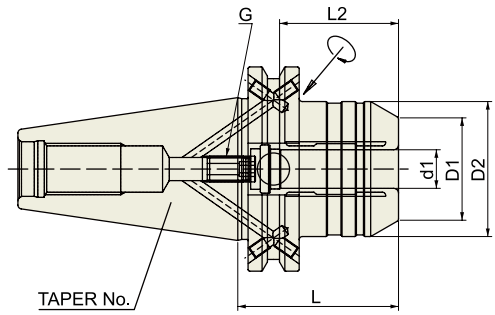
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WK060 | 40 | CAT40 AD/B - HC6-80.5 | 6 | 26 | 49.5 | 80.5 | 29.5 | 27 | M5x0.8mm |
| WK062 | | CAT40 AD/B - HC6-110 | 6 | 26 | 49.5 | 110 | 29.5 | 27 | M5x0.8mm |
| WK064 | | CAT40 AD/B - HC8-80.5 | 8 | 28 | 49.5 | 80.5 | 30 | 27 | M6x1.0mm |
| WK066 | | CAT40 AD/B - HC8-110 | 8 | 28 | 49.5 | 110 | 30 | 27 | M6x1.0mm |
| WK068 | | CAT40 AD/B - HC10-80.5 | 10 | 30 | 49.5 | 80.5 | 31 | 32 | M8x1.0mm |
| WK070 | | CAT40 AD/B - HC10-110 | 10 | 30 | 49.5 | 110 | 31 | 32 | M8x1.0mm |
| WK072 | | CAT40 AD/B - HC12-80.5 | 12 | 32 | 49.5 | 80.5 | 31.5 | 37 | M10x1.0mm |
| WK074 | | CAT40 AD/B - HC12-110 | 12 | 32 | 49.5 | 110 | 31.5 | 37 | M10x1.0mm |
| WK076 | | CAT40 AD/B - HC16-80.5 | 16 | 38 | 49.5 | 80.5 | 33 | 42 | M12x1.0mm |
| WK078 | | CAT40 AD/B - HC16-110 | 16 | 38 | 49.5 | 110 | 33 | 42 | M12x1.0mm |
| WK080 | | CAT40 AD/B - HC20-80.5 | 20 | 42 | 49.5 | 80.5 | 34 | 42 | M16x1.0mm |
| WK082 | | CAT40 AD/B - HC20-110 | 20 | 42 | 49.5 | 110 | 34 | 42 | M16x1.0mm |
| WK084 | | CAT40 AD/B - HC25-80.5 | 25 | 55 | 66 | 80.5 | 22 | 48 | M16x1.0mm |
| WK086 | | CAT40 AD/B - HC32-80.5 | 32 | 63 | 80 | 80.5 | 25.5 | 55 | M16x1.0mm |
| WL060 | 50 | CAT50 AD/B - HC6-80.5 | 6 | 26 | 49.5 | 80.5 | 30 | 27 | M5x0.8mm |
| WL062 | | CAT50 AD/B - HC8-80.5 | 8 | 28 | 49.5 | 80.5 | 30 | 27 | M6x1.0mm |
| WL064 | | CAT50 AD/B - HC10-80.5 | 10 | 30 | 49.5 | 80.5 | 32 | 32 | M8x1.0mm |
| WL066 | | CAT50 AD/B - HC12-80.5 | 12 | 32 | 49.5 | 80.5 | 35 | 37 | M10x1.0mm |
| WL068 | | CAT50 AD/B - HC16-80.5 | 16 | 38 | 49.5 | 80.5 | 40 | 42 | M12x1.0mm |
| WL070 | | CAT50 AD/B - HC20-80.5 | 20 | 42 | 49.5 | 80.5 | 40 | 42 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (SHORT & RIGID)








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ ASME B5.50-2009-CAT

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| WK020SNR | 40 | CAT40 AD/B - HC 1/2S-2.52 | 0.500 | 1.260 | 1.654 | 2.520 | 1.457 | M8x1.0mm |
| WK021SNR | | CAT40 AD/B - HC 5/8S-2.52 | 0.625 | 1.362 | 1.752 | 2.520 | 1.654 | M10x1.0mm |
| WK022SNR | | CAT40 AD/B - HC 3/4S-2.52 | 0.750 | 1.469 | 1.949 | 2.520 | 1.654 | M10x1.0mm |
| WK024SNR | | CAT40 AD/B - HC 1S-3.50 | 1.000 | 2.244 | 2.598 | 3.500 | 1.890 | M16x1.0mm |
| WL020SNR | 50 | CAT50 AD/B - HC 1/2S-3.19 | 0.500 | 1.879 | 2.752 | 3.189 | 1.457 | M8x1.0mm |
| WL022SNR | | CAT50 AD/B - HC 5/8S-3.19 | 0.625 | 1.819 | 2.752 | 3.189 | 1.654 | M8x1.0mm |
| WL024SNR | | CAT50 AD/B - HC 3/4S-3.19 | 0.750 | 2.185 | 2.752 | 3.189 | 1.654 | M10x1.0mm |
| WL026SNR | | CAT50 AD/B - HC 1.00S-3.19 | 1.000 | 2.185 | 2.752 | 3.189 | 1.890 | M16x1.0mm |
| WL028SNR | | CAT50 AD/B - HC 1.25S-3.19 | 1.250 | 2.185 | 2.752 | 3.189 | 2.165 | M16x1.0mm |

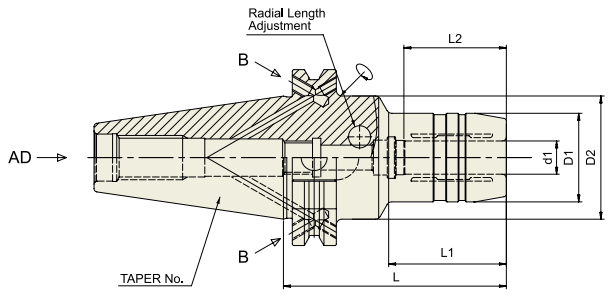
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| WK100SNR | 40 | CAT40 AD/B - HC12S-50 | 12 | 32 | 42 | 50 | 37 | M8x1.0mm |
| WK102SNR | | CAT40 AD/B - HC20S-64.5 | 20 | 37 | 49.5 | 64.5 | 42 | M16x1.0mm |
| WL100SNR | 50 | CAT50 AD/B - HC12S-50 | 12 | 32 | 42 | 50 | 37 | M8x1.0mm |
| WL102SNR | | CAT50 AD/B - HC20S-64.5 | 20 | 37 | 49.5 | 64.5 | 42 | M16x1.0mm |
| WL104SNR | | CAT50 AD/B - HC32S-81 | 32 | 55 | 72 | 81 | 55 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (RADIAL TOOL LENGTH PRE-SETTING TYPE) CAT




| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ ASME B5.50-2009-CAT

Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 |
|---|---|---|---|---|---|---|---|---|
| WK100HCR | 40 | CAT40 AD/B - HCR12-80.5 | 12 | 32 | 49.5 | 80.5 | 31.5 | 37 |
| WK102HCR | | CAT40 AD/B - HCR20-80.5 | 20 | 42 | 49.5 | 80.5 | 34 | 42 |
| WK104HCR | | CAT40 AD/B - HCR32-110 | 32 | 64 | 80 | 110 | 50 | 55 |
| WL100HCR | 50 | CAT50 AD/B - HCR12-80.5 | 12 | 32 | 49.5 | 80.5 | 31.5 | 37 |
| WL102HCR | | CAT50 AD/B - HCR20-80.5 | 20 | 42 | 49.5 | 80.5 | 34 | 42 |
| WL104HCR | | CAT50 AD/B - HCR32-100 | 32 | 60 | 60 | 100 | - | 55 |

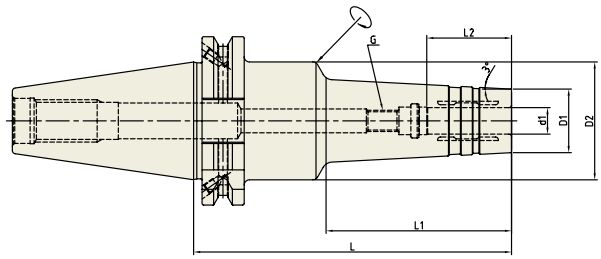
* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (For MOULD)

CAT








| ASME B5.50 -CAT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ ASME B5.50-2009-CAT

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WK020HMC | 40 | CAT40 AD/B - HMC 1/4-4.72 | 0.250 | 0.787 | 1.949 | 4.724 | 2.756 | 1.063 | M5x0.8mm |
| WK022HMC | | CAT40 AD/B - HMC 1/4-5.91 | 0.250 | 0.787 | 1.949 | 5.906 | 3.937 | 1.063 | M5x0.8mm |
| WK024HMC | | CAT40 AD/B - HMC 5/16-4.72 | 0.313 | 0.866 | 1.949 | 4.724 | 2.756 | 1.063 | M6x1.0mm |
| WK026HMC | | CAT40 AD/B - HMC 5/16-5.91 | 0.313 | 0.866 | 1.949 | 5.906 | 3.937 | 1.063 | M6x1.0mm |
| WK028HMC | | CAT40 AD/B - HMC 3/8-4.72 | 0.375 | 0.945 | 1.949 | 4.724 | 2.756 | 1.260 | M8x1.0mm |
| WK030HMC | | CAT40 AD/B - HMC 3/8-5.91 | 0.375 | 0.945 | 1.949 | 5.906 | 3.937 | 1.260 | M8x1.0mm |
| WK032HMC | | CAT40 AD/B - HMC 1/2-4.72 | 0.500 | 1.024 | 1.949 | 4.724 | 2.756 | 1.457 | M10x1.0mm |
| WK034HMC | | CAT40 AD/B - HMC 1/2-5.91 | 0.500 | 1.024 | 1.949 | 5.906 | 3.937 | 1.457 | M10x1.0mm |
| WK036HMC | | CAT40 AD/B - HMC 5/8-4.72 | 0.625 | 1.260 | 1.949 | 4.724 | 2.756 | 1.654 | M12x1.0mm |
| WK038HMC | | CAT40 AD/B - HMC 5/8-5.91 | 0.625 | 1.260 | 1.949 | 5.906 | 3.937 | 1.654 | M12x1.0mm |
| WK040HMC | | CAT40 AD/B - HMC 3/4-4.72 | 0.750 | 1.339 | 1.949 | 4.724 | 2.756 | 1.654 | M16x1.0mm |
| WK042HMC | | CAT40 AD/B - HMC 3/4-5.91 | 0.750 | 1.339 | 1.949 | 5.906 | 3.937 | 1.654 | M16x1.0mm |
| WL020HMC | 50 | CAT50 AD/B - HMC 1/4-5.91 | 0.250 | 0.787 | 1.752 | 5.906 | 3.937 | 1.063 | M5x0.8mm |
| WL022HMC | | CAT50 AD/B - HMC 5/16-5.91 | 0.313 | 0.866 | 1.752 | 5.906 | 3.937 | 1.063 | M6x1.0mm |
| WL024HMC | | CAT50 AD/B - HMC 3/8-5.91 | 0.375 | 0.945 | 1.752 | 5.906 | 3.937 | 1.260 | M8x1.0mm |
| WL026HMC | | CAT50 AD/B - HMC 1/2-5.91 | 0.500 | 1.024 | 1.752 | 5.906 | 3.937 | 1.457 | M10x1.0mm |
| WL028HMC | | CAT50 AD/B - HMC 5/8-5.91 | 0.625 | 1.260 | 1.752 | 5.906 | 3.937 | 1.654 | M12x1.0mm |
| WL030HMC | | CAT50 AD/B - HMC 3/4-5.91 | 0.750 | 1.339 | 1.752 | 5.906 | 3.937 | 1.654 | M16x1.0mm |

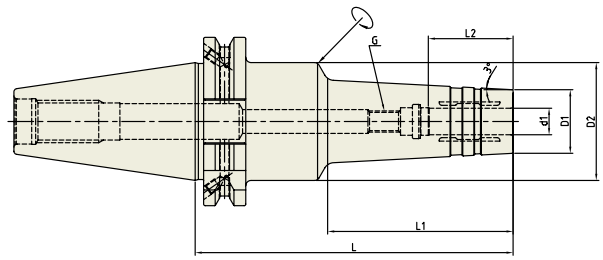
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WK100HMC | 40 | CAT40 AD/B - HMC 6-120 | 6 | 20 | 49.5 | 120 | 70 | 27 | M5X0.8mm |
| WK102HMC | | CAT40 AD/B - HMC 6-150 | 6 | 20 | 49.5 | 150 | 100 | 27 | M5X0.8mm |
| WK104HMC | | CAT40 AD/B - HMC 8-120 | 8 | 22 | 49.5 | 120 | 70 | 27 | M6X1.0mm |
| WK106HMC | | CAT40 AD/B - HMC 8-150 | 8 | 22 | 49.5 | 150 | 100 | 27 | M6X1.0mm |
| WK108HMC | | CAT40 AD/B - HMC 10-120 | 10 | 24 | 49.5 | 120 | 70 | 32 | M8X1.0mm |
| WK110HMC | | CAT40 AD/B - HMC 10-150 | 10 | 24 | 49.5 | 150 | 100 | 32 | M8X1.0mm |
| WK112HMC | | CAT40 AD/B - HMC 12-120 | 12 | 25 | 49.5 | 120 | 70 | 37 | M10X1.0mm |
| WK114HMC | | CAT40 AD/B - HMC 12-150 | 12 | 25 | 49.5 | 150 | 100 | 37 | M10X1.0mm |
| WK116HMC | | CAT40 AD/B - HMC 16-120 | 16 | 32 | 49.5 | 120 | 70 | 42 | M12X1.0mm |
| WK118HMC | | CAT40 AD/B - HMC 16-150 | 16 | 32 | 49.5 | 150 | 100 | 42 | M12X1.0mm |
| WK120HMC | | CAT40 AD/B - HMC 20-120 | 20 | 36 | 49.5 | 120 | 70 | 42 | M16X1.0mm |
| WK122HMC | | CAT40 AD/B - HMC 20-150 | 20 | 36 | 49.5 | 150 | 100 | 42 | M16X1.0mm |
| WL100HMC | 50 | CAT50 AD/B - HMC 6-150 | 6 | 20 | 44.5 | 150 | 100 | 27 | M5X0.8mm |
| WL102HMC | | CAT50 AD/B - HMC 8-150 | 8 | 22 | 44.5 | 150 | 100 | 27 | M6X1.0mm |
| WL104HMC | | CAT50 AD/B - HMC 10-150 | 10 | 24 | 44.5 | 150 | 100 | 32 | M8X1.0mm |
| WL106HMC | | CAT50 AD/B - HMC 12-150 | 12 | 25 | 44.5 | 150 | 100 | 37 | M10X1.0mm |
| WL108HMC | | CAT50 AD/B - HMC 16-150 | 16 | 32 | 44.5 | 150 | 100 | 42 | M12X1.0mm |
| WL110HMC | | CAT50 AD/B - HMC 20-150 | 20 | 36 | 44.5 | 150 | 100 | 42 | M16X1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (SLIM) BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

Unit : inch

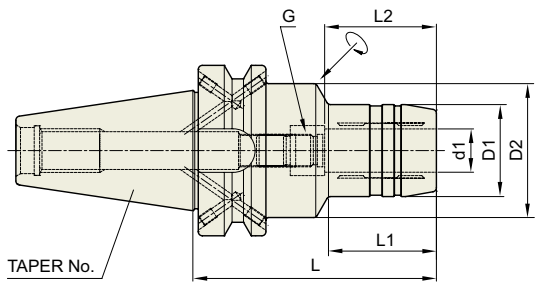
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WG020 | 30 | BT30 AD/B - HC 1/4-2.75 | 0.250 | 1.024 | 1.752 | 2.750 | 1.161 | 1.063 | M5x0.8mm |
| WG022 | | BT30 AD/B - HC 5/16-2.75 | 0.313 | 1.102 | 1.752 | 2.750 | 1.181 | 1.063 | M6x1.0mm |
| WG024 | | BT30 AD/B - HC 3/8-2.95 | 0.375 | 1.181 | 1.752 | 2.953 | 1.220 | 1.260 | M8x1.0mm |
| WG026 | | BT30 AD/B - HC 1/2-3.35 | 0.500 | 1.260 | 1.772 | 3.346 | 1.575 | 1.457 | M10x1.0mm |
| WG028 | | BT30 AD/B - HC 5/8-3.54 | 0.625 | 1.496 | 1.772 | 3.543 | 1.811 | 1.654 | M10x1.0mm |
| WG030 | | BT30 AD/B - HC 3/4-3.54 | 0.750 | 1.654 | 1.772 | 3.543 | 1.890 | 1.654 | M6x1.0mm |
| WH020 | 40 | BT40 AD/B - HC 1/4-3.54 | 0.250 | 1.024 | 1.752 | 3.543 | 1.181 | 1.063 | M5x0.8mm |
| WH022 | | BT40 AD/B - HC 5/16-3.54 | 0.313 | 1.102 | 1.752 | 3.543 | 1.280 | 1.063 | M6x1.0mm |
| WH024 | | BT40 AD/B - HC 3/8-3.54 | 0.375 | 1.181 | 1.752 | 3.543 | 1.260 | 1.260 | M8x1.0mm |
| WH026 | | BT40 AD/B - HC 1/2-3.54 | 0.500 | 1.260 | 1.752 | 3.543 | 1.378 | 1.457 | M10x1.0mm |
| WH028 | | BT40 AD/B - HC 5/8-3.54 | 0.625 | 1.496 | 1.870 | 3.543 | 1.575 | 1.654 | M12x1.0mm |
| WH030 | | BT40 AD/B - HC 3/4-3.54 | 0.750 | 1.654 | 1.870 | 3.543 | 1.575 | 1.654 | M16x1.0mm |
| WH032 | | BT40 AD/B - HC 1-3.94 | 1.000 | 1.969 | 2.362 | 3.937 | 1.772 | 1.890 | M16x1.0mm |
| WH034 | | BT40 AD/B - HC 1 1/4-4.13 | 1.250 | 2.362 | - | 4.134 | - | 2.165 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (SLIM)








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

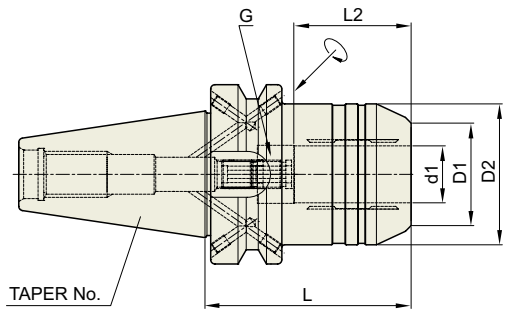
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WG100 | 30 | BT30 AD/B - HC6-70 | 6 | 26 | 44.5 | 70 | 29.5 | 27 | M5x0.8mm |
| WG102 | | BT30 AD/B - HC8-70 | 8 | 28 | 44.5 | 70 | 30 | 27 | M6x1.0mm |
| WG104 | | BT30 AD/B - HC10-75 | 10 | 30 | 44.5 | 75 | 31 | 32 | M8x1.0mm |
| WG106 | | BT30 AD/B - HC12-85 | 12 | 32 | 45 | 85 | 45 | 37 | M10x1.0mm |
| WG108 | | BT30 AD/B - HC14-85 | 14 | 34 | 45 | 85 | 45 | 37 | M10x1.0mm |
| WG110 | | BT30 AD/B - HC16-90 | 16 | 38 | 45 | 90 | 50 | 42 | M10x1.0mm |
| WG112 | | BT30 AD/B - HC18-90 | 18 | 40 | 45 | 90 | 50 | 42 | M10x1.0mm |
| WG114 | | BT30 AD/B - HC20-90 | 20 | 42 | 45 | 90 | 50 | 42 | M6x1.0mm |
| WH100 | 40 | BT40 AD/B - HC6-90 | 6 | 26 | 44.5 | 90 | 43 | 27 | M5x0.8mm |
| WH102 | | BT40 AD/B - HC8-90 | 8 | 28 | 44.5 | 90 | 44.5 | 27 | M6x1.0mm |
| WH104 | | BT40 AD/B - HC10-90 | 10 | 30 | 44.5 | 90 | 44.5 | 32 | M8x1.0mm |
| WH106 | | BT40 AD/B - HC12-90 | 12 | 32 | 44.5 | 90 | 44.5 | 37 | M10x1.0mm |
| WH108 | | BT40 AD/B - HC14-90 | 14 | 34 | 44.5 | 90 | 44.5 | 37 | M10x1.0mm |
| WH110 | | BT40 AD/B - HC16-90 | 16 | 38 | 44.5 | 90 | 47.5 | 42 | M12x1.0mm |
| WH112 | | BT40 AD/B - HC18-90 | 18 | 40 | 44.5 | 90 | 47.5 | 42 | M12x1.0mm |
| WH114 | | BT40 AD/B - HC20-90 | 20 | 42 | 44.5 | 90 | 47.5 | 42 | M16x1.0mm |
| WH116 | | BT40 AD/B - HC25-100 | 25 | 50 | 60 | 100 | 47.5 | 48 | M16x1.0mm |
| WH118 | | BT40 AD/B - HC32-105 | 32 | 60 | - | 105 | - | 55 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (SHORT & RIGID) BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

Unit : mm

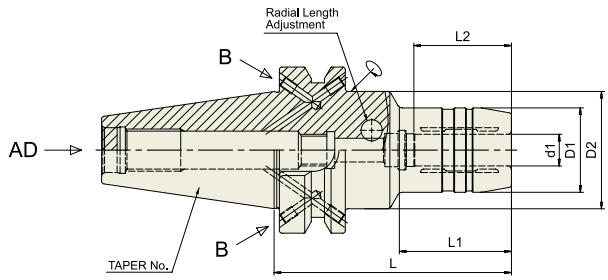
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| **WG100SNR** | 30 | BT30 AD/B - HC20S-85 | 20 | 41 | 44 | 85 | 42 | M6x1.0mm |
| **WH100SNR** | 40 | BT40 AD/B - HC12S-58 | 12 | 32 | 42 | 58 | 37 | M8x1.0mm |
| **WH102SNR** | | BT40 AD/B - HC20S-72.5 | 20 | 38 | 49.25 | 72.5 | 42 | M8x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (RADIAL TOOL LENGTH PRE-SETTING TYPE)






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

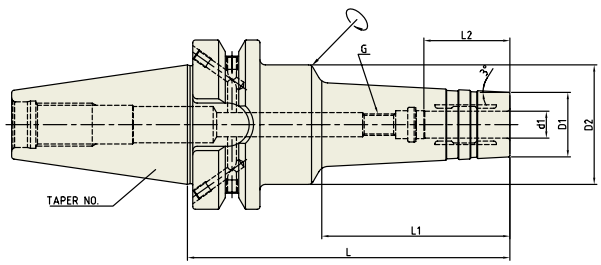
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 |
|---|---|---|---|---|---|---|---|---|
| WG100HCR | 30 | BT30 AD/B - HCR12-85 | 12 | 32 | 45 | 85 | 45 | 37 |
| WG102HCR | | BT30 AD/B - HCR20-85 | 20 | 44 | - | 85 | - | 42 |
| WH100HCR | 40 | BT40 AD/B - HCR12-90 | 12 | 32 | 44.5 | 90 | 42.5 | 37 |
| WH102HCR | | BT40 AD/B - HCR20-90 | 20 | 42 | 44.5 | 90 | 47.5 | 42 |
| WH104HCR | | BT40 AD/B - HCR32-105 | 32 | 60 | - | 105 | - | 55 |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK (For MOULD) BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WH100HMC | 40 | BT40 AD/B - HMC6-120 | 6 | 20 | 44.5 | 120 | 70 | 27 | M5x0.8mm |
| WH102HMC | | BT40 AD/B - HMC6-150 | 6 | 20 | 44.5 | 150 | 100 | 27 | M5x0.8mm |
| WH104HMC | | BT40 AD/B - HMC8-120 | 8 | 22 | 44.5 | 120 | 70 | 27 | M6x1.0mm |
| WH106HMC | | BT40 AD/B - HMC8-150 | 8 | 22 | 44.5 | 150 | 100 | 27 | M6x1.0mm |
| WH108HMC | | BT40 AD/B - HMC10-120 | 10 | 24 | 44.5 | 120 | 70 | 32 | M8x1.0mm |
| WH110HMC | | BT40 AD/B - HMC10-150 | 10 | 24 | 44.5 | 150 | 100 | 32 | M8x1.0mm |
| WH112HMC | | BT40 AD/B - HMC12-120 | 12 | 25 | 44.5 | 120 | 70 | 37 | M10x1.0mm |
| WH114HMC | | BT40 AD/B - HMC12-150 | 12 | 25 | 44.5 | 150 | 100 | 37 | M10x1.0mm |
| WH116HMC | | BT40 AD/B - HMC16-120 | 16 | 32 | 44.5 | 120 | 70 | 42 | M12x1.0mm |
| WH118HMC | | BT40 AD/B - HMC16-150 | 16 | 32 | 44.5 | 150 | 100 | 42 | M12x1.0mm |
| WH120HMC | | BT40 AD/B - HMC20-120 | 20 | 36 | 43.75 | 120 | - | 42 | M16x1.0mm |
| WH122HMC | | BT40 AD/B - HMC20-150 | 20 | 36 | 46.9 | 150 | - | 42 | M16x1.0mm |

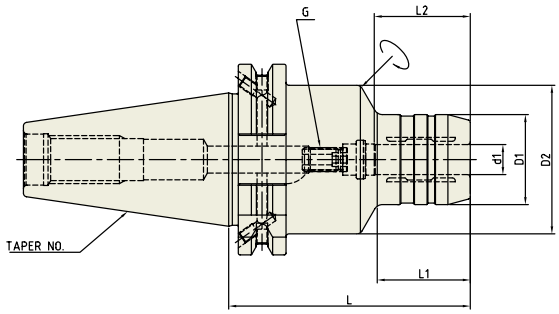
* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (SLIM)

CCT








| CCT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ CCT (CAT DUAL CONTACT)

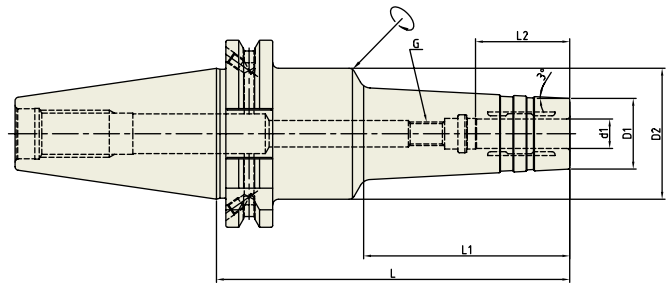
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WB020 | 40 | CCT40 AD/B - HC1/4-3.54 | 0.250 | 1.024 | 1.752 | 3.543 | 1.280 | 1.063 | M5x0.8mm |
| WB022 | | CCT40 AD/B - HC5/16-3.54 | 0.313 | 1.102 | 1.752 | 3.543 | 1.280 | 1.063 | M6x1.0mm |
| WB024 | | CCT40 AD/B - HC3/8-3.54 | 0.375 | 1.181 | 1.752 | 3.543 | 1.634 | 1.260 | M8x1.0mm |
| WB026 | | CCT40 AD/B - HC1/2-3.54 | 0.500 | 1.260 | 1.752 | 3.543 | 1.634 | 1.457 | M10x1.0mm |
| WB028 | | CCT40 AD/B - HC5/8-3.54 | 0.625 | 1.496 | 1.752 | 3.543 | 1.949 | 1.654 | M10x1.0mm |
| WB030 | | CCT40 AD/B - HC3/4-3.54 | 0.750 | 1.654 | 1.752 | 3.543 | 1.949 | 1.654 | M10x1.0mm |
| WB032 | | CCT40 AD/B - HC1-3.94 | 1.000 | 2.165 | 2.480 | 3.937 | 2.559 | 1.890 | M16x1.0mm |
| WB034 | | CCT40 AD/B - HC1 1/4-4.13 | 1.250 | 2.480 | 3.150 | 4.134 | 1.378 | 2.165 | M16x1.0mm |
| WC020 | 50 | CCT50 AD/B - HC1/4-3.54 | 0.250 | 1.024 | 1.969 | 3.543 | 1.181 | 1.063 | M5x0.8mm |
| WC022 | | CCT50 AD/B - HC5/16-3.54 | 0.313 | 1.102 | 1.969 | 3.543 | 1.181 | 1.063 | M6x1.0mm |
| WC024 | | CCT50 AD/B - HC3/8-3.54 | 0.375 | 1.181 | 1.969 | 3.543 | 1.260 | 1.260 | M8x1.0mm |
| WC026 | | CCT50 AD/B - HC1/2-3.54 | 0.500 | 1.260 | 1.969 | 3.543 | 1.378 | 1.457 | M10x1.0mm |
| WC028 | | CCT50 AD/B - HC5/8-3.54 | 0.625 | 1.496 | 1.969 | 3.543 | 1.575 | 1.654 | M10x1.0mm |
| WC030 | | CCT50 AD/B - HC3/4-3.54 | 0.750 | 1.654 | 1.969 | 3.543 | 1.575 | 1.654 | M10x1.0mm |
| WC032 | | CCT50 AD/B - HC1-4.13 | 1.000 | 2.244 | 2.480 | 4.134 | 2.047 | 1.890 | M16x1.0mm |
| WC034 | | CCT50 AD/B - HC1 1/4-4.53 | 1.250 | 2.480 | 2.953 | 4.528 | 2.441 | 2.165 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (For MOULD) CCT






| CCT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ CCT (CAT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WB020HMC | 40 | CCT40 AD/B - HMC 1/4-4.72 | 0.250 | 0.787 | 1.949 | 4.724 | 2.756 | 1.063 | M5x0.8mm |
| WB022HMC | | CCT40 AD/B - HMC 1/4-5.91 | 0.250 | 0.787 | 1.949 | 5.906 | 3.937 | 1.063 | M5x0.8mm |
| WB024HMC | | CCT40 AD/B - HMC 5/16-4.72 | 0.313 | 0.866 | 1.949 | 4.724 | 2.756 | 1.063 | M6x1.0mm |
| WB026HMC | | CCT40 AD/B - HMC 5/16-5.91 | 0.313 | 0.866 | 1.949 | 5.906 | 3.937 | 1.063 | M6x1.0mm |
| WB028HMC | | CCT40 AD/B - HMC 3/8-4.72 | 0.375 | 0.945 | 1.949 | 4.724 | 2.756 | 1.260 | M8x1.0mm |
| WB030HMC | | CCT40 AD/B - HMC 3/8-5.91 | 0.375 | 0.945 | 1.949 | 5.906 | 3.937 | 1.260 | M8x1.0mm |
| WB032HMC | | CCT40 AD/B - HMC 1/2-4.72 | 0.500 | 1.024 | 1.949 | 4.724 | 2.756 | 1.457 | M10x1.0mm |
| WB034HMC | | CCT40 AD/B - HMC 1/2-5.91 | 0.500 | 1.024 | 1.949 | 5.906 | 3.937 | 1.457 | M10x1.0mm |
| WB036HMC | | CCT40 AD/B - HMC 5/8-4.72 | 0.625 | 1.260 | 1.949 | 4.724 | 2.756 | 1.654 | M12x1.0mm |
| WB038HMC | | CCT40 AD/B - HMC 5/8-5.91 | 0.625 | 1.260 | 1.949 | 5.906 | 3.937 | 1.654 | M12x1.0mm |
| WB040HMC | | CCT40 AD/B - HMC 3/4-4.72 | 0.750 | 1.339 | 1.949 | 4.724 | 2.756 | 1.654 | M16x1.0mm |
| WB042HMC | | CCT40 AD/B - HMC 3/4-5.91 | 0.750 | 1.339 | 1.949 | 5.906 | 3.937 | 1.654 | M16x1.0mm |
| WC020HMC | 50 | CCT50 AD/B - HMC 1/4-5.91 | 0.250 | 0.787 | 1.752 | 5.906 | 3.937 | 1.063 | M5x0.8mm |
| WC022HMC | | CCT50 AD/B - HMC 5/16-5.91 | 0.313 | 0.866 | 1.752 | 5.906 | 3.937 | 1.063 | M6x1.0mm |
| WC024HMC | | CCT50 AD/B - HMC 3/8-5.91 | 0.375 | 0.945 | 1.752 | 5.906 | 3.937 | 1.260 | M8x1.0mm |
| WC026HMC | | CCT50 AD/B - HMC 1/2-5.91 | 0.500 | 1.024 | 1.752 | 5.906 | 3.937 | 1.457 | M10x1.0mm |
| WC028HMC | | CCT50 AD/B - HMC 5/8-5.91 | 0.625 | 1.260 | 1.752 | 5.906 | 3.937 | 1.654 | M12x1.0mm |
| WC030HMC | | CCT50 AD/B - HMC 3/4-5.91 | 0.750 | 1.339 | 1.752 | 5.906 | 3.937 | 1.654 | M16x1.0mm |

Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WB100HMC | 40 | CCT40 AD/B - HMC6-120 | 6 | 20 | 49.5 | 120 | 70 | 27 | M5X0.8mm |
| WB102HMC | | CCT40 AD/B - HMC6-150 | 6 | 20 | 49.5 | 150 | 100 | 27 | M5X0.8mm |
| WB104HMC | | CCT40 AD/B - HMC8-120 | 8 | 22 | 49.5 | 120 | 70 | 27 | M6X1.0mm |
| WB106HMC | | CCT40 AD/B - HMC8-150 | 8 | 22 | 49.5 | 150 | 100 | 27 | M6X1.0mm |
| WB108HMC | | CCT40 AD/B - HMC10-120 | 10 | 24 | 49.5 | 120 | 70 | 32 | M8X1.0mm |
| WB110HMC | | CCT40 AD/B - HMC10-150 | 10 | 24 | 49.5 | 150 | 100 | 32 | M8X1.0mm |
| WB112HMC | | CCT40 AD/B - HMC12-120 | 12 | 25 | 49.5 | 120 | 70 | 37 | M10X1.0mm |
| WB114HMC | | CCT40 AD/B - HMC12-150 | 12 | 25 | 49.5 | 150 | 100 | 37 | M10X1.0mm |
| WB116HMC | | CCT40 AD/B - HMC16-120 | 16 | 32 | 49.5 | 120 | 70 | 42 | M12X1.0mm |
| WB118HMC | | CCT40 AD/B - HMC16-150 | 16 | 32 | 49.5 | 150 | 100 | 42 | M12X1.0mm |
| WB120HMC | | CCT40 AD/B - HMC20-120 | 20 | 36 | 49.5 | 120 | 70 | 42 | M16X1.0mm |
| WB122HMC | | CCT40 AD/B - HMC20-150 | 20 | 36 | 49.5 | 150 | 100 | 42 | M16X1.0mm |
| WC100HMC | 50 | CCT50 AD/B - HMC6-150 | 6 | 20 | 44.5 | 150 | 100 | 27 | M5X0.8mm |
| WC102HMC | | CCT50 AD/B - HMC8-150 | 8 | 22 | 44.5 | 150 | 100 | 27 | M6X1.0mm |
| WC104HMC | | CCT50 AD/B - HMC10-150 | 10 | 24 | 44.5 | 150 | 100 | 32 | M8X1.0mm |
| WC106HMC | | CCT50 AD/B - HMC12-150 | 12 | 25 | 44.5 | 150 | 100 | 37 | M10X1.0mm |
| WC108HMC | | CCT50 AD/B - HMC16-150 | 16 | 32 | 44.5 | 150 | 100 | 42 | M12X1.0mm |
| WC110HMC | | CCT50 AD/B - HMC20-150 | 20 | 36 | 44.5 | 150 | 100 | 42 | M16X1.0mm |

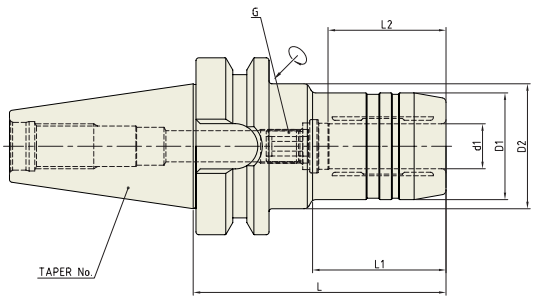
* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (SLIM)

CBT








| CBT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ CBT (BT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WD020 | 30 | CBT30 - HC1/4-2.76 | 0.250 | 1.024 | 1.752 | 2.756 | 1.161 | 1.063 | M5x0.8mm |
| WD022 | | CBT30 - HC5/16-2.76 | 0.313 | 1.102 | 1.752 | 2.756 | 1.220 | 1.063 | M6x1.0mm |
| WD024 | | CBT30 - HC3/8-2.95 | 0.375 | 1.181 | 1.752 | 2.953 | 1.220 | 1.260 | M8x1.0mm |
| WD026 | | CBT30 - HC1/2-3.35 | 0.500 | 1.260 | 1.772 | 3.346 | 1.575 | 1.457 | M10x1.0mm |
| WD028 | | CBT30 - HC5/8-3.54 | 0.625 | 1.496 | 1.772 | 3.543 | 1.811 | 1.654 | M12x1.0mm |
| WD030 | | CBT30 - HC3/4-3.54 | 0.750 | 1.654 | 1.772 | 3.543 | 1.890 | 1.654 | M16x1.0mm |
| WE020 | 40 | CBT40 - HC1/4-3.54 | 0.250 | 1.024 | 1.752 | 3.543 | 1.181 | 1.063 | M5x0.8mm |
| WE022 | | CBT40 - HC5/16-3.54 | 0.313 | 1.102 | 1.752 | 3.543 | 1.280 | 1.063 | M6x1.0mm |
| WE024 | | CBT40 - HC3/8-3.54 | 0.375 | 1.181 | 1.752 | 3.543 | 1.260 | 1.260 | M8x1.0mm |
| WE026 | | CBT40 - HC1/2-3.54 | 0.500 | 1.260 | 1.752 | 3.543 | 1.378 | 1.457 | M10x1.0mm |
| WE028 | | CBT40 - HC5/8-3.54 | 0.625 | 1.496 | 1.870 | 3.543 | 1.575 | 1.654 | M12x1.0mm |
| WE030 | | CBT40 - HC3/4-3.54 | 0.750 | 1.654 | 1.870 | 3.543 | 1.575 | 1.654 | M10x1.0mm |
| WE032 | | CBT40 - HC1"-3.94 | 1.000 | 1.969 | 2.362 | 3.937 | 1.772 | 1.890 | M16x1.0mm |
| WE034 | | CBT40 - HC1 1/4-4.13 | 1.250 | 2.362 | - | 4.134 | - | 2.165 | M16x1.0mm |

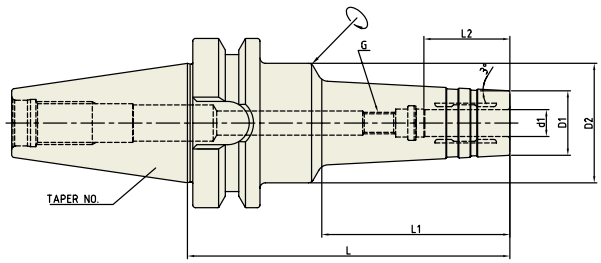
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WD100 | 30 | CBT30 - HC6-70 | 6 | 26 | 44.5 | 70 | 29.5 | 27 | M5x0.8mm |
| WD102 | | CBT30 - HC8-70 | 8 | 28 | 44.5 | 70 | 30 | 27 | M6x1.0mm |
| WD104 | | CBT30 - HC10-75 | 10 | 30 | 44.5 | 75 | 31 | 32 | M8x1.0mm |
| WD106 | | CBT30 - HC12-85 | 12 | 32 | 44.5 | 85 | 45 | 37 | M10x1.0mm |
| WD108 | | CBT30 - HC14-85 | 14 | 34 | 44.5 | 85 | 45 | 37 | M10x1.0mm |
| WD110 | | CBT30 - HC16-90 | 16 | 38 | 45 | 90 | 50 | 42 | M10x1.0mm |
| WD112 | | CBT30 - HC18-90 | 18 | 40 | 45 | 90 | 50 | 42 | M10x1.0mm |
| WD114 | | CBT30 - HC20-90 | 20 | 42 | 45 | 90 | 50 | 42 | M6x1.0mm |
| WE100 | 40 | CBT40 - HC6-90 | 6 | 26 | 44.5 | 90 | 43 | 27 | M5x0.8mm |
| WE102 | | CBT40 - HC8-90 | 8 | 28 | 44.5 | 90 | 44.5 | 27 | M6x1.0mm |
| WE104 | | CBT40 - HC10-90 | 10 | 30 | 44.5 | 90 | 44.5 | 32 | M8x1.0mm |
| WE106 | | CBT40 - HC12-90 | 12 | 32 | 44.5 | 90 | 44.5 | 37 | M10x1.0mm |
| WE108 | | CBT40 - HC14-90 | 14 | 34 | 44.5 | 90 | 44.5 | 37 | M10x1.0mm |
| WE110 | | CBT40 - HC16-90 | 16 | 38 | 44.5 | 90 | 47.5 | 42 | M12x1.0mm |
| WE112 | | CBT40 - HC18-90 | 18 | 40 | 44.5 | 90 | 47.5 | 42 | M12x1.0mm |
| WE114 | | CBT40 - HC20-90 | 20 | 42 | 44.5 | 90 | 47.5 | 42 | M16x1.0mm |
| WE116 | | CBT40 - HC25-100 | 25 | 50 | 60 | 100 | 47.5 | 48 | M16x1.0mm |
| WE118 | | CBT40 - HC32-105 | 32 | 60 | - | 105 | - | 55 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (For MOULD) CBT






| CBT | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ CBT (BT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WE020HMC | 40 | CBT40 - HMC1/4-4.72 | 0.250 | 0.787 | 1.752 | 4.724 | 2.756 | 1.063 | M5x0.8mm |
| WE022HMC | | CBT40 - HMC1/4-5.91 | 0.250 | 0.787 | 1.752 | 5.906 | 3.937 | 1.063 | M5x0.8mm |
| WE024HMC | | CBT40 - HMC5/16-4.72 | 0.313 | 0.866 | 1.752 | 4.724 | 2.756 | 1.063 | M6x1.0mm |
| WE026HMC | | CBT40 - HMC5/16-5.91 | 0.313 | 0.866 | 1.752 | 5.906 | 3.937 | 1.063 | M6x1.0mm |
| WE028HMC | | CBT40 - HMC3/8-4.72 | 0.375 | 0.945 | 1.752 | 4.724 | 2.756 | 1.260 | M8x1.0mm |
| WE030HMC | | CBT40 - HMC3/8-5.91 | 0.375 | 0.945 | 1.752 | 5.906 | 3.937 | 1.260 | M8x1.0mm |
| WE032HMC | | CBT40 - HMC1/2-4.72 | 0.500 | 1.024 | 1.752 | 4.724 | 2.756 | 1.457 | M10x1.0mm |
| WE034HMC | | CBT40 - HMC1/2-5.91 | 0.500 | 1.024 | 1.752 | 5.906 | 3.937 | 1.457 | M10x1.0mm |
| WE036HMC | | CBT40 - HMC5/8-4.72 | 0.625 | 1.260 | 1.752 | 4.724 | 2.756 | 1.654 | M12x1.0mm |
| WE038HMC | | CBT40 - HMC5/8-5.91 | 0.625 | 1.260 | 1.752 | 5.906 | 3.937 | 1.654 | M12x1.0mm |
| WE040HMC | | CBT40 - HMC3/4-4.72 | 0.750 | 1.339 | 1.722 | 4.724 | - | 1.654 | M16x1.0mm |
| WE042HMC | | CBT40 - HMC3/4-5.91 | 0.750 | 1.339 | 1.846 | 5.906 | - | 1.654 | M16x1.0mm |

Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WE100HMC | 40 | CBT40 - HMC6-120 | 6 | 20 | 44.5 | 120 | 70 | 27 | M5x0.8mm |
| WE102HMC | | CBT40 - HMC6-150 | 6 | 20 | 44.5 | 150 | 100 | 27 | M5x0.8mm |
| WE104HMC | | CBT40 - HMC8-120 | 8 | 22 | 44.5 | 120 | 70 | 27 | M6x1.0mm |
| WE106HMC | | CBT40 - HMC8-150 | 8 | 22 | 44.5 | 150 | 100 | 27 | M6x1.0mm |
| WE108HMC | | CBT40 - HMC10-120 | 10 | 24 | 44.5 | 120 | 70 | 32 | M8x1.0mm |
| WE110HMC | | CBT40 - HMC10-150 | 10 | 24 | 44.5 | 150 | 100 | 32 | M8x1.0mm |
| WE112HMC | | CBT40 - HMC12-120 | 12 | 25 | 44.5 | 120 | 70 | 37 | M10x1.0mm |
| WE114HMC | | CBT40 - HMC12-150 | 12 | 25 | 44.5 | 150 | 100 | 37 | M10x1.0mm |
| WE116HMC | | CBT40 - HMC16-120 | 16 | 32 | 44.5 | 120 | 70 | 42 | M12x1.0mm |
| WE118HMC | | CBT40 - HMC16-150 | 16 | 32 | 44.5 | 150 | 100 | 42 | M12x1.0mm |
| WE120HMC | | CBT40 - HMC20-120 | 20 | 36 | 43.8 | 120 | - | 42 | M16x1.0mm |
| WE122HMC | | CBT40 - HMC20-150 | 20 | 36 | 46.9 | 150 | - | 42 | M16x1.0mm |

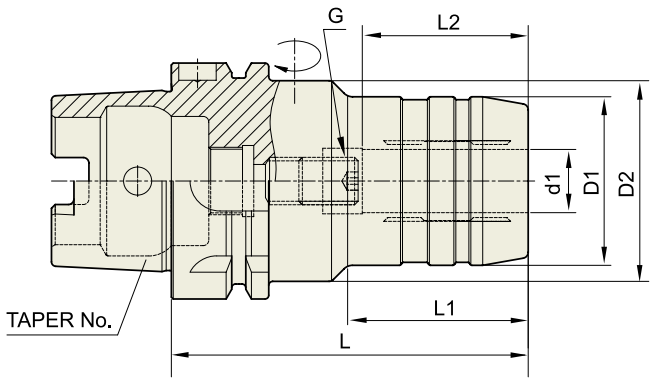
* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (SLIM)

HSK

HYDRAULIC CHUCK






| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | - | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ DIN69893/ISO 12164-1 HSK FROM A

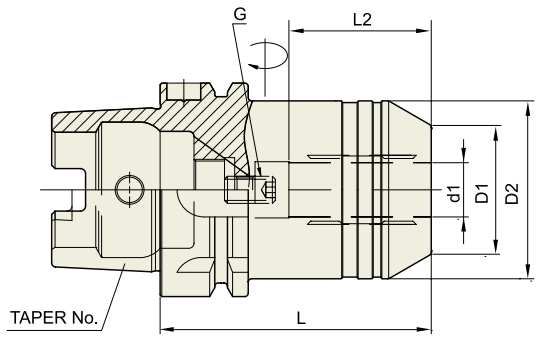
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WQ020 | 63A | HSK63A - HC 1/4-2.76 | 0.250 | 1.024 | 1.969 | 2.756 | 0.945 | 1.063 | M5x0.8mm |
| WQ022 | | HSK63A - HC 3/8-3.15 | 0.375 | 1.181 | 1.969 | 3.150 | 1.378 | 1.260 | M8x1.0mm |
| WQ024 | | HSK63A - HC 1/2-3.35 | 0.500 | 1.260 | 1.969 | 3.346 | 1.575 | 1.457 | M10x1.0mm |
| WQ026 | | HSK63A - HC 3/4-3.54 | 0.750 | 1.654 | 1.969 | 3.543 | 1.890 | 1.654 | M16x1.0mm |
| WQ028 | | HSK63A - HC 1-4.72 | 1.000 | 2.244 | 2.480 | 4.724 | 2.323 | 1.890 | M16x1.0mm |
| WQ030 | | HSK63A - HC 1 1/4-4.92 | 1.250 | 2.520 | 2.953 | 4.921 | 2.480 | 2.165 | M16x1.0mm |
| WR020 | 100A | HSK100A - HC 1/4-2.95 | 0.250 | 1.024 | 1.969 | 2.953 | 1.024 | 1.063 | M5x0.8mm |
| WR022 | | HSK100A - HC 3/8-2.95 | 0.375 | 1.181 | 1.969 | 3.543 | 1.654 | 1.260 | M8x1.0mm |
| WR024 | | HSK100A - HC 1/2-3.74 | 0.500 | 1.260 | 1.969 | 3.740 | 1.850 | 1.457 | M10x1.0mm |
| WR026 | | HSK100A - HC 3/4-4.13 | 0.750 | 1.654 | 1.969 | 4.134 | 2.323 | 1.654 | M16x1.0mm |
| WR028 | | HSK100A - HC 1-4.33 | 1.000 | 2.244 | 2.480 | 4.331 | 2.441 | 1.890 | M16x1.0mm |
| WR032 | | HSK100A - HC 1 1/4-4.33 | 1.250 | 2.520 | 2.953 | 4.331 | 2.441 | 2.165 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (SHORT & RIGID) HSK






| DIN69893 -HSK | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | - | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

Unit : mm

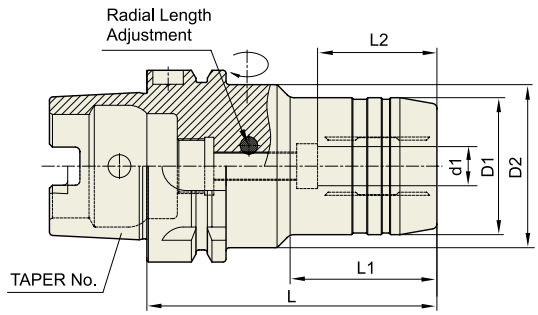
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | G |
|---|---|---|---|---|---|---|---|---|
| **WQ100SNR** | 63A | HSK63A - HC12S-80 | 12 | 32 | 42 | 80 | 37 | M8x1.0mm |
| **WQ102SNR** | | HSK63A - HC20S-80 | 20 | 38 | 52.5 | 80 | 42 | M8x1.0mm |
| **WR100SNR** | 100A | HSK100A - HC12S-85 | 12 | 32 | 42 | 85 | 35 | M8x1.0mm |
| **WR102SNR** | | HSK100A - HC20S-90 | 20 | 38 | 52.5 | 90 | 42 | M8x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (RADIAL TOOL LENGTH PRE-SETTING TYPE) HSK








| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | - | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

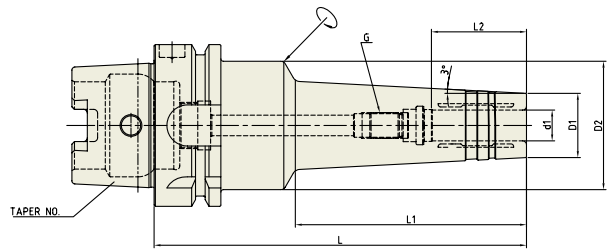
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 |
|---|---|---|---|---|---|---|---|---|
| WQ100HCR | 63A | HSK63A - HCR6-85 | 6 | 26 | 50 | 85 | 33 | 27 |
| WQ102HCR | | HSK63A - HCR8-85 | 8 | 28 | 50 | 85 | 33 | 27 |
| WQ104HCR | | HSK63A - HCR10-85 | 10 | 30 | 50 | 85 | 38 | 32 |
| WQ106HCR | | HSK63A - HCR12-95 | 12 | 32 | 50 | 95 | 40 | 37 |
| WQ108HCR | | HSK63A - HCR14-95 | 14 | 34 | 50 | 95 | 46 | 37 |
| WQ110HCR | | HSK63A - HCR16-95 | 16 | 38 | 50 | 95 | 51 | 42 |
| WQ112HCR | | HSK63A - HCR18-95 | 18 | 40 | 50 | 95 | 52 | 42 |
| WQ114HCR | | HSK63A - HCR20-100 | 20 | 42 | 50 | 100 | 51 | 42 |
| WQ116HCR | | HSK63A - HCR25-120 | 25 | 57 | 63 | 120 | 54.5 | 48 |
| WQ118HCR | | HSK63A - HCR32-125 | 32 | 64 | 75 | 125 | 57.5 | 55 |
| WR100HCR | 100A | HSK100A - HCR6-90 | 6 | 26 | 63 | 90 | 33 | 27 |
| WR102HCR | | HSK100A - HCR8-90 | 8 | 28 | 63 | 90 | 33 | 27 |
| WR104HCR | | HSK100A - HCR10-95 | 10 | 30 | 63 | 95 | 36 | 32 |
| WR106HCR | | HSK100A - HCR12-100 | 12 | 32 | 63 | 100 | 40 | 37 |
| WR108HCR | | HSK100A - HCR14-100 | 14 | 34 | 63 | 100 | 41 | 37 |
| WR110HCR | | HSK100A - HCR16-105 | 16 | 38 | 63 | 105 | 46 | 42 |
| WR112HCR | | HSK100A - HCR18-105 | 18 | 40 | 63 | 105 | 46 | 42 |
| WR114HCR | | HSK100A - HCR20-105 | 20 | 42 | 75 | 105 | 51 | 42 |
| WR116HCR | | HSK100A - HCR25-115 | 25 | 57 | 75 | 115 | 55.5 | 48 |
| WR118HCR | | HSK100A - HCR32-120 | 32 | 64 | 75 | 120 | 63.5 | 55 |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# DUAL CONTACT HYDRAULIC CHUCK (For MOULD) HSK






| DIN69893 -HSK | Taper Accuracy | G Value | RPM | Run-Out (at 3D) | Coolant System |
|---|---|---|---|---|---|
| | - | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WQ020HMC | 63A | HSK63A - HMC1/4-5.71 | 0.250 | 0.787 | 1.969 | 5.709 | 3.543 | 1.063 | M5x0.8mm |
| WQ022HMC | | HSK63A - HMC5/16-5.71 | 0.313 | 0.866 | 1.969 | 5.709 | 3.543 | 1.063 | M6x1.0mm |
| WQ024HMC | | HSK63A - HMC3/8-5.71 | 0.375 | 0.945 | 1.969 | 5.709 | 3.543 | 1.260 | M8x1.0mm |
| WQ026HMC | | HSK63A - HMC1/2-5.71 | 0.500 | 1.024 | 1.969 | 5.709 | 3.543 | 1.457 | M10x1.0mm |
| WQ028HMC | | HSK63A - HMC5/8-5.71 | 0.625 | 1.260 | 1.969 | 5.709 | 3.543 | 1.654 | M12x1.0mm |
| WQ030HMC | | HSK63A - HMC3/4-5.71 | 0.750 | 1.339 | 1.969 | 5.709 | 3.543 | 1.654 | M16x1.0mm |
| WR100HMC | 100A | HSK100A - HMC1/4-5.71 | 0.250 | 0.787 | 1.969 | 5.709 | 3.543 | 1.063 | M5x0.8mm |
| WR102HMC | | HSK100A - HMC5/16-5.71 | 0.313 | 0.866 | 1.969 | 5.709 | 3.543 | 1.063 | M6x1.0mm |
| WR104HMC | | HSK100A - HMC3/8-5.71 | 0.375 | 0.945 | 1.969 | 5.709 | 3.543 | 1.260 | M8x1.0mm |
| WR106HMC | | HSK100A - HMC1/2-5.71 | 0.500 | 1.024 | 1.969 | 5.709 | 3.543 | 1.457 | M10x1.0mm |
| WR108HMC | | HSK100A - HMC5/8-5.71 | 0.625 | 1.260 | 1.969 | 5.709 | 3.543 | 1.654 | M12x1.0mm |
| WR110HMC | | HSK100A - HMC3/4-5.71 | 0.750 | 1.339 | 1.969 | 5.709 | 3.543 | 1.654 | M16x1.0mm |

Unit : inch

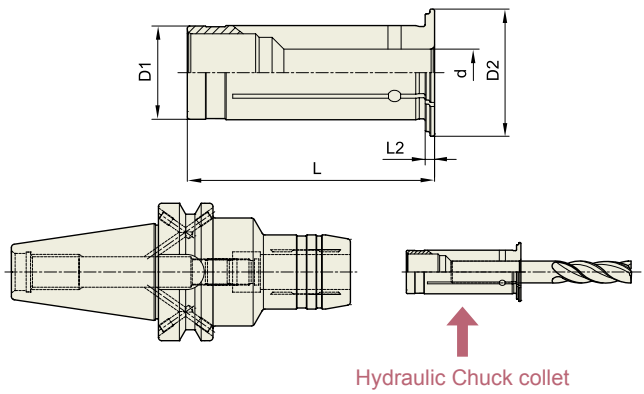
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | L2 | G |
|---|---|---|---|---|---|---|---|---|---|
| WQ100HMC | 63A | HSK63A - HMC6-145 | 6 | 20 | 50 | 145 | 90 | 27 | M5x0.8mm |
| WQ102HMC | | HSK63A - HMC8-145 | 8 | 22 | 50 | 145 | 90 | 27 | M6x1.0mm |
| WQ104HMC | | HSK63A - HMC10-145 | 10 | 24 | 50 | 145 | 90 | 32 | M8x1.0mm |
| WQ106HMC | | HSK63A - HMC12-145 | 12 | 25 | 50 | 145 | 90 | 37 | M10x1.0mm |
| WQ108HMC | | HSK63A - HMC16-145 | 16 | 32 | 50 | 145 | 90 | 42 | M12x1.0mm |
| WQ110HMC | | HSK63A - HMC20-145 | 20 | 36 | 50 | 145 | 90 | 42 | M16x1.0mm |
| WR200HMC | 100A | HSK100A - HMC6-150 | 6 | 20 | 50 | 150 | 90 | 27 | M5x0.8mm |
| WR202HMC | | HSK100A - HMC8-150 | 8 | 22 | 50 | 150 | 90 | 27 | M6x1.0mm |
| WR204HMC | | HSK100A - HMC10-150 | 10 | 24 | 50 | 150 | 90 | 32 | M8x1.0mm |
| WR206HMC | | HSK100A - HMC12-150 | 12 | 25 | 50 | 150 | 90 | 37 | M10x1.0mm |
| WR208HMC | | HSK100A - HMC16-150 | 16 | 32 | 50 | 150 | 90 | 42 | M12x1.0mm |
| WR210HMC | | HSK100A - HMC20-150 | 20 | 36 | 50 | 150 | 90 | 42 | M16x1.0mm |

* APPLICABLE HYDRAULIC CHUCK COLLETS(REDUCTION SLEEVES) ON PAGE 925~930.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : OPEN TYPE)








Hydraulic Chuck collet

## ■ METRIC / INCH

Unit : inch

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 412108 | HK12 | 1/8" | 0.125 | 0.472 | 0.748 | 1.850 | 0.079 |
| 412316 | | 3/16" | 0.188 | 0.472 | 0.748 | 1.850 | 0.079 |
| 412104 | | 1/4" | 0.250 | 0.472 | 0.748 | 1.850 | 0.079 |
| 412516 | | 5/16" | 0.313 | 0.472 | 0.748 | 1.850 | 0.079 |
| 420108 | HK20 | 1/8" | 0.125 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420316 | | 3/16" | 0.188 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420104 | | 1/4" | 0.250 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420516 | | 5/16" | 0.313 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420308 | | 3/8" | 0.375 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420102 | | 1/2" | 0.500 | 0.787 | 1.063 | 2.067 | 0.079 |
| 420508 | | 5/8" | 0.625 | 0.787 | 1.063 | 2.067 | 0.079 |
| 432108 | HK32 | 1/8" | 0.125 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432316 | | 3/16" | 0.188 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432104 | | 1/4" | 0.250 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432516 | | 5/16" | 0.313 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432308 | | 3/8" | 0.375 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432102 | | 1/2" | 0.500 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432508 | | 5/8" | 0.625 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432304 | | 3/4" | 0.750 | 1.260 | 1.535 | 2.500 | 0.118 |
| 432100 | | 1 | 1.000 | 1.260 | 1.535 | 2.500 | 0.118 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

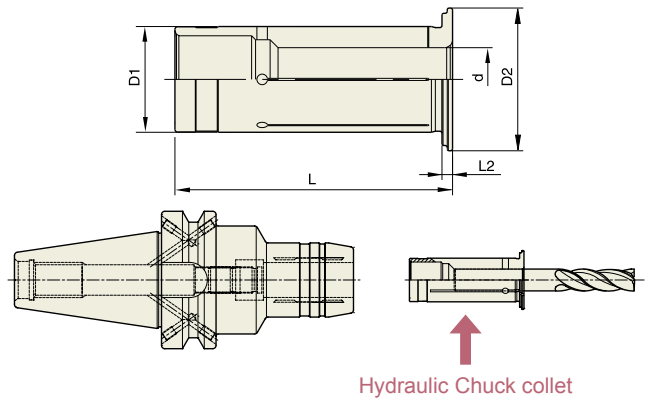
Hydraulic Chuck collet (reduction sleeve) is cut into trisection by high precision cutting to guarantee precise I.D and strong clamping power.

**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : CLOSED TYPE)






Hydraulic Chuck collet

## ■ METRIC / INCH

Unit : inch

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 512108 | HS12 | 1/8" | 0.125 | 0.472 | 0.748 | 1.850 | 0.079 |
| 512316 | | 3/16" | 0.188 | 0.472 | 0.748 | 1.850 | 0.079 |
| 512104 | | 1/4" | 0.250 | 0.472 | 0.748 | 1.850 | 0.079 |
| 512516 | | 5/16" | 0.313 | 0.472 | 0.748 | 1.850 | 0.079 |
| 520108 | HS20 | 1/8" | 0.125 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520316 | | 3/16" | 0.188 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520104 | | 1/4" | 0.250 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520516 | | 5/16" | 0.313 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520308 | | 3/8" | 0.375 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520102 | | 1/2" | 0.500 | 0.787 | 1.063 | 2.067 | 0.079 |
| 520508 | | 5/8" | 0.625 | 0.787 | 1.063 | 2.067 | 0.079 |
| 532108 | HS32 | 1/8" | 0.125 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532316 | | 3/16" | 0.188 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532104 | | 1/4" | 0.250 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532516 | | 5/16" | 0.313 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532308 | | 3/8" | 0.375 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532102 | | 1/2" | 0.500 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532508 | | 5/8" | 0.625 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532304 | | 3/4" | 0.750 | 1.260 | 1.535 | 2.500 | 0.118 |
| 532100 | | 1 | 1.000 | 1.260 | 1.535 | 2.500 | 0.118 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

The wall of Hydraulic Chuck collet (reduction sleeve) is cut by high precision wire-cutting to guarantee precise I.D and strong clamping power.

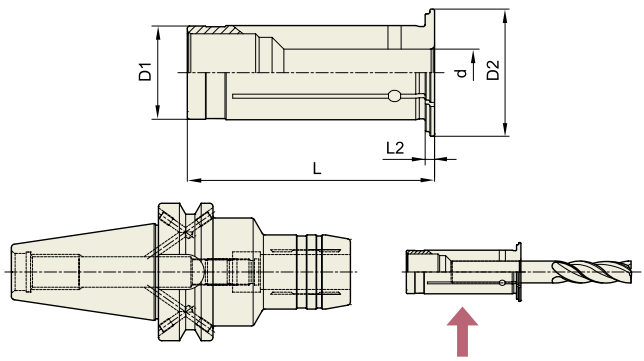
**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : OPEN TYPE)








Hydraulic Chuck collet

## ■ INCH / INCH

Unit : inch

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 612108 | HK1/2" | 1/8" | 0.125 | 0.500 | 0.748 | 1.850 | 0.079 |
| 612316 | | 3/16" | 0.188 | 0.500 | 0.748 | 1.850 | 0.079 |
| 612104 | | 1/4" | 0.250 | 0.500 | 0.748 | 1.850 | 0.079 |
| 612516 | | 5/16" | 0.313 | 0.500 | 0.748 | 1.850 | 0.079 |
| 625108 | HK3/4" | 1/8" | 0.125 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625316 | | 3/16" | 0.188 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625104 | | 1/4" | 0.250 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625516 | | 5/16" | 0.313 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625308 | | 3/8" | 0.375 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625102 | | 1/2" | 0.500 | 0.750 | 1.063 | 2.067 | 0.079 |
| 625508 | | 5/8" | 0.625 | 0.750 | 1.063 | 2.067 | 0.079 |
| 632108 | HK1 1/4" | 1/8" | 0.125 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632316 | | 3/16" | 0.188 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632104 | | 1/4" | 0.250 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632516 | | 5/16" | 0.313 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632308 | | 3/8" | 0.375 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632102 | | 1/2" | 0.500 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632508 | | 5/8" | 0.625 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632304 | | 3/4" | 0.750 | 1.250 | 1.535 | 2.500 | 0.118 |
| 632100 | | 1 | 1.000 | 1.250 | 1.535 | 2.500 | 0.118 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

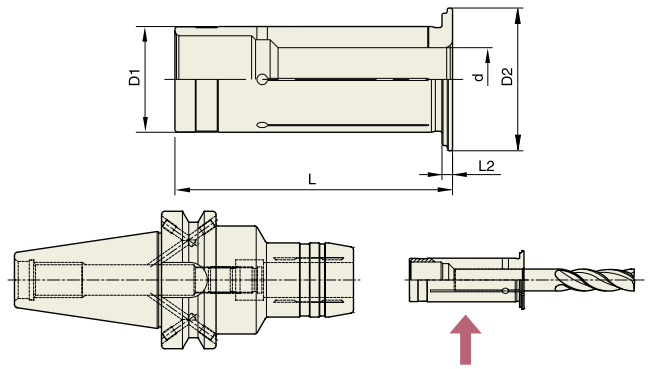
Hydraulic Chuck collet (reduction sleeve) is cut into trisection by high precision cutting to guarantee precise I.D and strong clamping power.

**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : CLOSED TYPE)






Hydraulic Chuck collet

## ■ INCH / INCH

Unit : inch

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 712108 | HS1/2" | 1/8" | 0.125 | 0.500 | 0.748 | 1.850 | 0.079 |
| 712316 | | 3/16" | 0.188 | 0.500 | 0.748 | 1.850 | 0.079 |
| 712104 | | 1/4" | 0.250 | 0.500 | 0.748 | 1.850 | 0.079 |
| 712516 | | 5/16" | 0.313 | 0.500 | 0.748 | 1.850 | 0.079 |
| 725108 | HS3/4" | 1/8" | 0.125 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725316 | | 3/16" | 0.188 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725104 | | 1/4" | 0.250 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725516 | | 5/16" | 0.313 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725308 | | 3/8" | 0.375 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725102 | | 1/2" | 0.500 | 0.750 | 1.063 | 2.067 | 0.079 |
| 725508 | | 5/8" | 0.625 | 0.750 | 1.063 | 2.067 | 0.079 |
| 732108 | HS1 1/4" | 1/8" | 0.125 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732316 | | 3/16" | 0.188 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732104 | | 1/4" | 0.250 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732516 | | 5/16" | 0.313 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732308 | | 3/8" | 0.375 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732102 | | 1/2" | 0.500 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732508 | | 5/8" | 0.625 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732304 | | 3/4" | 0.750 | 1.250 | 1.535 | 2.500 | 0.118 |
| 732100 | | 1 | 1.000 | 1.250 | 1.535 | 2.500 | 0.118 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

The wall of Hydraulic Chuck collet (reduction sleeve) is cut by high precision wire-cutting to guarantee precise I.D and strong clamping power.

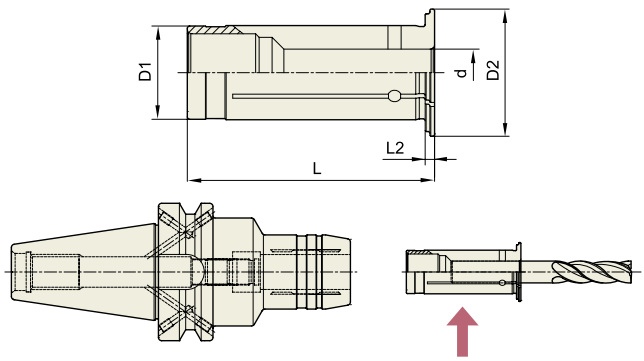
**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : OPEN TYPE)








Hydraulic Chuck collet

## ■ METRIC / METRIC

Unit : mm

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 812030 | HK12 | 3 | 3 | 12 | 19 | 47 | 2 |
| 812040 | | 4 | 4 | 12 | 19 | 47 | 2 |
| 812050 | | 5 | 5 | 12 | 19 | 47 | 2 |
| 812060 | | 6 | 6 | 12 | 19 | 47 | 2 |
| 812070 | | 7 | 7 | 12 | 19 | 47 | 2 |
| 812008 | | 8 | 8 | 12 | 19 | 47 | 2 |
| 820030 | HK20 | 3 | 3 | 20 | 27 | 52.5 | 2 |
| 820040 | | 4 | 4 | 20 | 27 | 52.5 | 2 |
| 820050 | | 5 | 5 | 20 | 27 | 52.5 | 2 |
| 820060 | | 6 | 6 | 20 | 27 | 52.5 | 2 |
| 820070 | | 7 | 7 | 20 | 27 | 52.5 | 2 |
| 820080 | | 8 | 8 | 20 | 27 | 52.5 | 2 |
| 820090 | | 9 | 9 | 20 | 27 | 52.5 | 2 |
| 820100 | | 10 | 10 | 20 | 27 | 52.5 | 2 |
| 820110 | | 11 | 11 | 20 | 27 | 52.5 | 2 |
| 820120 | | 12 | 12 | 20 | 27 | 52.5 | 2 |
| 820130 | | 13 | 13 | 20 | 27 | 52.5 | 2 |
| 820140 | | 14 | 14 | 20 | 27 | 52.5 | 2 |
| 820150 | | 15 | 15 | 20 | 27 | 52.5 | 2 |
| 820160 | | 16 | 16 | 20 | 27 | 52.5 | 2 |
| 832060 | HK32 | 6 | 6 | 32 | 39 | 63.5 | 3 |
| 832080 | | 8 | 8 | 32 | 39 | 63.5 | 3 |
| 832100 | | 10 | 10 | 32 | 39 | 63.5 | 3 |
| 832120 | | 12 | 12 | 32 | 39 | 63.5 | 3 |
| 832140 | | 14 | 14 | 32 | 39 | 63.5 | 3 |
| 832160 | | 16 | 16 | 32 | 39 | 63.5 | 3 |
| 832180 | | 18 | 18 | 32 | 39 | 63.5 | 3 |
| 832200 | | 20 | 20 | 32 | 39 | 63.5 | 3 |
| 832250 | | 25 | 25 | 32 | 39 | 63.5 | 3 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

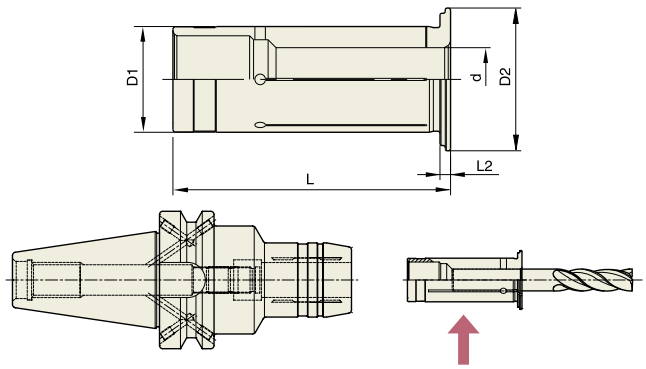
Hydraulic Chuck collet (reduction sleeve) is cut into trisection by high precision cutting to guarantee precise I.D and strong clamping power.

**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# HYDRAULIC CHUCK COLLET (REDUCTION SLEEVE : CLOSED TYPE)






Hydraulic Chuck collet

## ■ METRIC / METRIC

Unit : mm

| EDP No. | TYPE | | d | D1 | D2 | L | L2 |
|---|---|---|---|---|---|---|---|
| 912030 | HS12 | 3 | 3 | 12 | 19 | 47 | 2 |
| 912040 | | 4 | 4 | 12 | 19 | 47 | 2 |
| 912050 | | 5 | 5 | 12 | 19 | 47 | 2 |
| 912060 | | 6 | 6 | 12 | 19 | 47 | 2 |
| 912070 | | 7 | 7 | 12 | 19 | 47 | 2 |
| 912008 | | 8 | 8 | 12 | 19 | 47 | 2 |
| 920030 | HS20 | 3 | 3 | 20 | 27 | 52.5 | 2 |
| 920040 | | 4 | 4 | 20 | 27 | 52.5 | 2 |
| 920050 | | 5 | 5 | 20 | 27 | 52.5 | 2 |
| 920060 | | 6 | 6 | 20 | 27 | 52.5 | 2 |
| 920070 | | 7 | 7 | 20 | 27 | 52.5 | 2 |
| 920080 | | 8 | 8 | 20 | 27 | 52.5 | 2 |
| 920090 | | 9 | 9 | 20 | 27 | 52.5 | 2 |
| 920100 | | 10 | 10 | 20 | 27 | 52.5 | 2 |
| 920110 | | 11 | 11 | 20 | 27 | 52.5 | 2 |
| 920120 | | 12 | 12 | 20 | 27 | 52.5 | 2 |
| 920130 | | 13 | 13 | 20 | 27 | 52.5 | 2 |
| 920140 | | 14 | 14 | 20 | 27 | 52.5 | 2 |
| 920150 | | 15 | 15 | 20 | 27 | 52.5 | 2 |
| 920160 | | 16 | 16 | 20 | 27 | 52.5 | 2 |
| 932060 | HS32 | 6 | 6 | 32 | 39 | 63.5 | 3 |
| 932080 | | 8 | 8 | 32 | 39 | 63.5 | 3 |
| 932100 | | 10 | 10 | 32 | 39 | 63.5 | 3 |
| 932120 | | 12 | 12 | 32 | 39 | 63.5 | 3 |
| 932140 | | 14 | 14 | 32 | 39 | 63.5 | 3 |
| 932160 | | 16 | 16 | 32 | 39 | 63.5 | 3 |
| 932180 | | 18 | 18 | 32 | 39 | 63.5 | 3 |
| 932200 | | 20 | 20 | 32 | 39 | 63.5 | 3 |
| 932250 | | 25 | 25 | 32 | 39 | 63.5 | 3 |

* OTHER SPECIAL SIZES OF HYDRAULIC CHUCK COLLETS CAN BE SUPPLIED ON REQUEST.

**▶ Feature**

The wall of Hydraulic Chuck collet (reduction sleeve) is cut by high precision wire-cutting to guarantee precise I.D and strong clamping power.

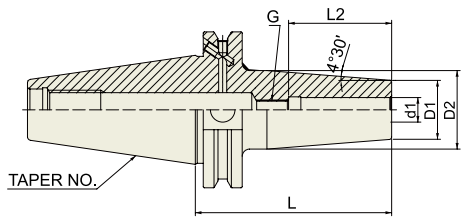
**▶ Chucking Method**

Please assemble cutting tool with collet first, and then insert collet into Hydraulic Chuck.

# SHRINK FIT HOLDER








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Run-Out (at LD) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ ASME B5.50-2009-CAT

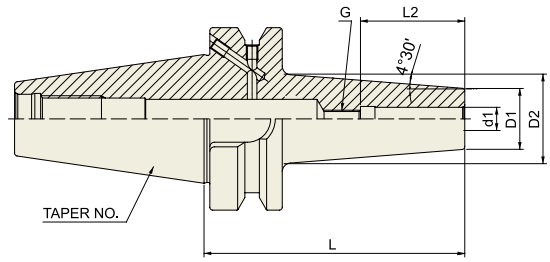
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| VK020 | 40 | CAT40 AD/B - SFH1/8-3.15 | 0.125 | 0.394 | 0.748 | 3.150 | 0.354 | - |
| VK022 | | CAT40 AD/B - SFH3/16-3.15 | 0.188 | 0.394 | 0.748 | 3.150 | 0.472 | - |
| VK024 | | CAT40 AD/B - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VK026 | | CAT40 AD/B - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VK028 | | CAT40 AD/B - SFH3/8-3.15 | 0.375 | 0.945 | 1.260 | 3.150 | 1.654 | M8x1.0mm |
| VK030 | | CAT40 AD/B - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VK032 | | CAT40 AD/B - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VK034 | | CAT40 AD/B - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VK036 | | CAT40 AD/B - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VK038 | | CAT40 AD/B - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VK040 | | CAT40 AD/B - SFH3/4-3.15 | 0.750 | 1.299 | 1.654 | 3.150 | 2.047 | M16x1.0mm |
| VK042 | | CAT40 AD/B - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VK044 | | CAT40 AD/B - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VK046 | | CAT40 AD/B - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VK048 | | CAT40 AD/B - SFH1-1/4-3.94 | 1.250 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VK050 | | CAT40 AD/B - SFH1-1/4-6.30 | 1.250 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VL020 | 50 | CAT50 AD/B - SFH1/8-3.15 | 0.125 | 0.394 | 0.748 | 3.150 | 0.354 | - |
| VL022 | | CAT50 AD/B - SFH3/16-3.15 | 0.188 | 0.394 | 0.748 | 3.150 | 0.472 | - |
| VL024 | | CAT50 AD/B - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VL026 | | CAT50 AD/B - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VL028 | | CAT50 AD/B - SFH3/8-3.15 | 0.375 | 0.945 | 1.260 | 3.150 | 1.654 | M8x1.0mm |
| VL030 | | CAT50 AD/B - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VL032 | | CAT50 AD/B - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VL034 | | CAT50 AD/B - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VL036 | | CAT50 AD/B - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VL038 | | CAT50 AD/B - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VL040 | | CAT50 AD/B - SFH3/4-3.15 | 0.750 | 1.299 | 1.654 | 3.150 | 2.047 | M16x1.0mm |
| VL042 | | CAT50 AD/B - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VL044 | | CAT50 AD/B - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VL046 | | CAT50 AD/B - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VL048 | | CAT50 AD/B - SFH1-1/4-3.94 | 1.250 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VL050 | | CAT50 AD/B - SFH1-1/4-6.30 | 1.250 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |

# SHRINK FIT HOLDER

BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Run-Out (at LD) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

## ■ JIS B6339/MAS 403-BT

Unit : inch

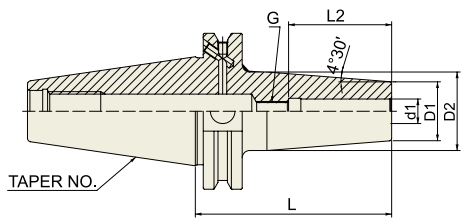
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| VG020 | 30 | BT30 AD/B - SFH1/8-2.36 | 0.125 | 0.394 | 0.629 | 2.362 | 0.354 | - |
| VG022 | | BT30 AD/B - SFH3/16-2.36 | 0.188 | 0.394 | 0.629 | 2.362 | 0.472 | - |
| VG024 | | BT30 AD/B - SFH1/4-2.36 | 0.250 | 0.827 | 1.062 | 2.362 | 1.417 | M5x0.8mm |
| VG026 | | BT30 AD/B - SFH3/8-2.36 | 0.375 | 0.945 | 1.180 | 2.362 | 1.654 | M8x1.0mm |
| VG028 | | BT30 AD/B - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VG030 | | BT30 AD/B - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VG032 | | BT30 AD/B - SFH3/4-3.54 | 0.750 | 1.299 | 1.654 | 3.543 | 2.047 | M16x1.0mm |
| VH020 | 40 | BT40 AD/B - SFH1/8-3.54 | 0.125 | 0.394 | 0.748 | 3.543 | 0.354 | - |
| VH022 | | BT40 AD/B - SFH3/16-3.54 | 0.188 | 0.394 | 0.748 | 3.543 | 0.472 | - |
| VH024 | | BT40 AD/B - SFH1/4-3.54 | 0.250 | 0.827 | 1.063 | 3.543 | 1.417 | M5x0.8mm |
| VH026 | | BT40 AD/B - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VH028 | | BT40 AD/B - SFH3/8-3.54 | 0.375 | 0.945 | 1.260 | 3.543 | 1.654 | M8x1.0mm |
| VH030 | | BT40 AD/B - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VH032 | | BT40 AD/B - SFH1/2-3.54 | 0.500 | 0.945 | 1.260 | 3.543 | 1.850 | M10x1.0mm |
| VH034 | | BT40 AD/B - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VH036 | | BT40 AD/B - SFH5/8-3.54 | 0.625 | 1.063 | 1.339 | 3.543 | 1.969 | M12x1.0mm |
| VH038 | | BT40 AD/B - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VH040 | | BT40 AD/B - SFH3/4-3.54 | 0.750 | 1.299 | 1.654 | 3.543 | 2.047 | M16x1.0mm |
| VH042 | | BT40 AD/B - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VH044 | | BT40 AD/B - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VH046 | | BT40 AD/B - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |

# DUAL CONTACT SHRINK FIT HOLDER

CCT

SHRINK FIT HOLDER






| CCT | Taper Accuracy | G Value | RPM | Run-Out (at LD) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD/B |

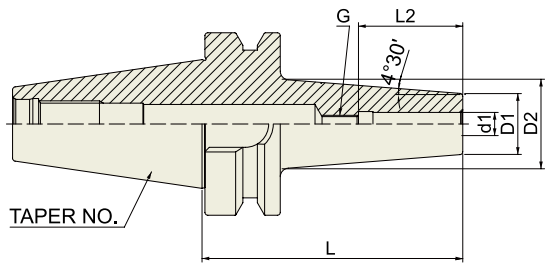
## ■ CCT (CAT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| VB020 | 40 | CCT40 AD/B - SFH1/8-3.15 | 0.125 | 0.394 | 0.748 | 3.150 | 0.354 | - |
| VB022 | | CCT40 AD/B - SFH3/16-3.15 | 0.188 | 0.394 | 0.748 | 3.150 | 0.472 | - |
| VB024 | | CCT40 AD/B - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VB026 | | CCT40 AD/B - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VB028 | | CCT40 AD/B - SFH3/8-3.15 | 0.375 | 0.945 | 1.260 | 3.150 | 1.654 | M8x1.0mm |
| VB030 | | CCT40 AD/B - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VB032 | | CCT40 AD/B - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VB034 | | CCT40 AD/B - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VB036 | | CCT40 AD/B - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VB038 | | CCT40 AD/B - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VB040 | | CCT40 AD/B - SFH3/4-3.15 | 0.750 | 1.299 | 1.654 | 3.150 | 2.047 | M16x1.0mm |
| VB042 | | CCT40 AD/B - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VB044 | | CCT40 AD/B - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VB046 | | CCT40 AD/B - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VB048 | | CCT40 AD/B - SFH1-1/4-3.94 | 1.250 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VB050 | | CCT40 AD/B - SFH1-1/4-6.30 | 1.250 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VC020 | 50 | CCT50 AD/B - SFH1/8-3.15 | 0.125 | 0.394 | 0.748 | 3.150 | 0.354 | - |
| VC022 | | CCT50 AD/B - SFH3/16-3.15 | 0.188 | 0.394 | 0.748 | 3.150 | 0.472 | - |
| VC024 | | CCT50 AD/B - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VC026 | | CCT50 AD/B - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VC028 | | CCT50 AD/B - SFH3/8-3.15 | 0.375 | 0.945 | 1.260 | 3.150 | 1.654 | M8x1.0mm |
| VC030 | | CCT50 AD/B - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VC032 | | CCT50 AD/B - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VC034 | | CCT50 AD/B - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VC036 | | CCT50 AD/B - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VC040 | | CCT50 AD/B - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VC042 | | CCT50 AD/B - SFH3/4-3.15 | 0.750 | 1.299 | 1.654 | 3.150 | 2.047 | M16x1.0mm |
| VC044 | | CCT50 AD/B - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VC046 | | CCT50 AD/B - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VC048 | | CCT50 AD/B - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VC050 | | CCT50 AD/B - SFH1-1/4-3.94 | 1.250 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VC052 | | CCT50 AD/B - SFH1-1/4-6.30 | 1.250 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |

# DUAL CONTACT SHRINK FIT HOLDER — CBT






| CBT | Taper Accuracy | G Value | RPM | Run-Out (at LD) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ CBT (BT DUAL CONTACT)

Unit : inch

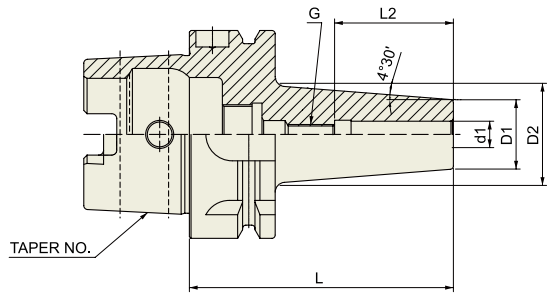
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| VD020 | 30 | CBT30 - SFH1/8-2.36 | 0.125 | 0.394 | 0.629 | 2.362 | 0.354 | - |
| VD022 | | CBT30 - SFH3/16-2.36 | 0.188 | 0.394 | 0.629 | 2.362 | 0.472 | - |
| VD024 | | CBT30 - SFH1/4-2.36 | 0.250 | 0.827 | 1.062 | 2.362 | 1.417 | M5x0.8mm |
| VD026 | | CBT30 - SFH3/8-2.36 | 0.375 | 0.945 | 1.180 | 2.362 | 1.654 | M8x1.0mm |
| VD028 | | CBT30 - SFH1/2-3.15 | 0.500 | 0.945 | 1.260 | 3.150 | 1.850 | M10x1.0mm |
| VD030 | | CBT30 - SFH5/8-3.15 | 0.625 | 1.063 | 1.339 | 3.150 | 1.969 | M12x1.0mm |
| VD032 | | CBT30 - SFH3/4-3.54 | 0.750 | 1.299 | 1.654 | 3.543 | 2.047 | M16x1.0mm |
| VE020 | 40 | CBT40 - SFH1/8-3.54 | 0.125 | 0.394 | 0.748 | 3.543 | 0.354 | - |
| VE022 | | CBT40 - SFH3/16-3.54 | 0.188 | 0.394 | 0.748 | 3.543 | 0.472 | - |
| VE024 | | CBT40 - SFH1/4-3.54 | 0.250 | 0.827 | 1.063 | 3.543 | 1.417 | M5x0.8mm |
| VE026 | | CBT40 - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VE028 | | CBT40 - SFH3/8-3.54 | 0.375 | 0.945 | 1.260 | 3.543 | 1.654 | M8x1.0mm |
| VE030 | | CBT40 - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VE032 | | CBT40 - SFH1/2-3.54 | 0.500 | 0.945 | 1.260 | 3.543 | 1.850 | M10x1.0mm |
| VE034 | | CBT40 - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VE036 | | CBT40 - SFH5/8-3.54 | 0.625 | 1.063 | 1.339 | 3.543 | 1.969 | M12x1.0mm |
| VE038 | | CBT40 - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VE040 | | CBT40 - SFH3/4-3.54 | 0.750 | 1.299 | 1.654 | 3.543 | 2.047 | M16x1.0mm |
| VE042 | | CBT40 - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VE044 | | CBT40 - SFH1-3.94 | 1.000 | 1.732 | 2.087 | 3.937 | 2.283 | M16x1.0mm |
| VE046 | | CBT40 - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |

# DUAL CONTACT SHRINK FIT HOLDER

HSK

SHRINK FIT HOLDER






| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Run-Out (at LD) | Coolant System |
|---|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | ≤0.00012" | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

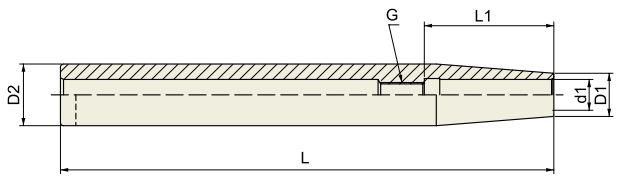
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L2 | G |
|---|---|---|---|---|---|---|---|---|
| VQ020 | 63A | HSK63A - SFH1/8-3.15 | 0.125 | 0.394 | 0.728 | 3.150 | 0.354 | - |
| VQ022 | | HSK63A - SFH3/16-3.15 | 0.188 | 0.394 | 0.728 | 3.150 | 0.472 | - |
| VQ024 | | HSK63A - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VQ026 | | HSK63A - SFH1/4-6.30 | 0.250 | 0.827 | 1.063 | 6.299 | 1.417 | M5x0.8mm |
| VQ028 | | HSK63A - SFH3/8-3.35 | 0.375 | 0.945 | 1.260 | 3.346 | 1.654 | M8x1.0mm |
| VQ030 | | HSK63A - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VQ032 | | HSK63A - SFH1/2-3.54 | 0.500 | 0.945 | 1.260 | 3.543 | 1.850 | M10x1.0mm |
| VQ034 | | HSK63A - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VQ036 | | HSK63A - SFH5/8-3.74 | 0.625 | 1.063 | 1.339 | 3.740 | 1.969 | M12x1.0mm |
| VQ038 | | HSK63A - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VQ040 | | HSK63A - SFH3/4-3.94 | 0.750 | 1.299 | 1.654 | 3.937 | 2.047 | M16x1.0mm |
| VQ042 | | HSK63A - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VQ046 | | HSK63A - SFH1-4.53 | 1.000 | 1.732 | 2.087 | 4.528 | 2.283 | M16x1.0mm |
| VQ048 | | HSK63A - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VR020 | 100A | HSK100A - SFH1/8-3.15 | 0.125 | 0.394 | 0.648 | 3.150 | 0.354 | - |
| VR022 | | HSK100A - SFH3/16-3.15 | 0.188 | 0.394 | 0.648 | 3.150 | 0.472 | - |
| VR023 | | HSK100A - SFH1/4-3.15 | 0.250 | 0.827 | 1.063 | 3.150 | 1.417 | M5x0.8mm |
| VR024 | | HSK100A - SFH3/8-3.54 | 0.375 | 0.945 | 1.260 | 3.543 | 1.654 | M8x1.0mm |
| VR026 | | HSK100A - SFH3/8-6.30 | 0.375 | 0.945 | 1.260 | 6.299 | 1.654 | M8x1.0mm |
| VR028 | | HSK100A - SFH1/2-3.74 | 0.500 | 0.945 | 1.260 | 3.740 | 1.850 | M10x1.0mm |
| VR030 | | HSK100A - SFH1/2-6.30 | 0.500 | 0.945 | 1.260 | 6.299 | 1.850 | M10x1.0mm |
| VR032 | | HSK100A - SFH5/8-3.94 | 0.625 | 1.063 | 1.339 | 3.937 | 1.969 | M12x1.0mm |
| VR034 | | HSK100A - SFH5/8-6.30 | 0.625 | 1.063 | 1.339 | 6.299 | 1.969 | M12x1.0mm |
| VR036 | | HSK100A - SFH3/4-4.13 | 0.750 | 1.299 | 1.654 | 4.134 | 2.047 | M16x1.0mm |
| VR038 | | HSK100A - SFH3/4-6.30 | 0.750 | 1.299 | 1.654 | 6.299 | 2.047 | M16x1.0mm |
| VR040 | | HSK100A - SFH1-4.53 | 1.000 | 1.732 | 2.087 | 4.528 | 2.283 | M16x1.0mm |
| VR042 | | HSK100A - SFH1-6.30 | 1.000 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |
| VR044 | | HSK100A - SFH1-1/4-4.72 | 1.250 | 1.732 | 2.087 | 4.724 | 2.283 | M16x1.0mm |
| VR046 | | HSK100A - SFH1-1/4"-6.30 | 1.250 | 1.732 | 2.087 | 6.299 | 2.283 | M16x1.0mm |

# SHRINK FIT EXTENSION

ST






■ INCH

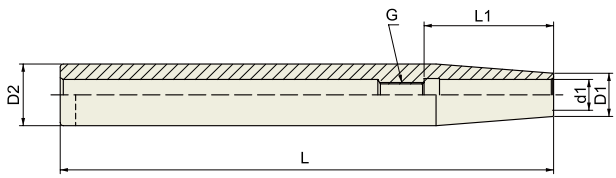
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | G |
|---|---|---|---|---|---|---|---|---|
| VS010 | ST1/2 | ST1/2 - SFH1/8-6.30 | 0.125 | 0.394 | 0.500 | 6.299 | 0.354 | - |
| VS011 | | ST1/2 - SFH3/16-6.30 | 0.188 | 0.394 | 0.500 | 6.299 | 0.472 | - |
| VS012 | | ST1/2 - SFH1/4-6.30 | 0.250 | 0.394 | 0.500 | 6.299 | 1.417 | M5x0.8mm |
| VS020 | ST5/8 | ST5/8 - SFH1/8-6.30 | 0.125 | 0.394 | 0.625 | 6.299 | 0.354 | - |
| VS021 | | ST5/8 - SFH3/16-6.30 | 0.188 | 0.394 | 0.625 | 6.299 | 0.472 | - |
| VS022 | | ST5/8 - SFH1/4-6.30 | 0.250 | 0.394 | 0.625 | 6.299 | 1.417 | M5x0.8mm |
| VS023 | | ST5/8 - SFH5/16-6.30 | 0.313 | 0.472 | 0.625 | 6.299 | 1.535 | M6x0.8mm |
| VS030 | ST3/4 | ST3/4 - SFH1/8-6.30 | 0.125 | 0.394 | 0.750 | 6.299 | 0.354 | - |
| VS031 | | ST3/4 - SFH3/16-6.30 | 0.188 | 0.394 | 0.750 | 6.299 | 0.472 | - |
| VS032 | | ST3/4 - SFH1/4-6.30 | 0.250 | 0.551 | 0.750 | 6.299 | 1.417 | M5x0.8mm |
| VS033 | | ST3/4 - SFH5/16-6.30 | 0.313 | 0.551 | 0.750 | 6.299 | 1.535 | M6x1.0mm |
| VS034 | | ST3/4 - SFH3/8-6.30 | 0.375 | 0.551 | 0.750 | 6.299 | 1.654 | M8x1.0mm |
| VS035 | | ST3/4 - SFH1/2-6.30 | 0.500 | 0.630 | 0.750 | 6.299 | 1.850 | M10x1.0mm |
| VS040 | ST1 | ST1 - SFH1/8-6.30 | 0.125 | 0.394 | 1.000 | 6.299 | 0.354 | - |
| VS041 | | ST1 - SFH3/16-6.30 | 0.188 | 0.394 | 1.000 | 6.299 | 0.472 | - |
| VS042 | | ST1 - SFH1/4-6.30 | 0.250 | 0.551 | 1.000 | 6.299 | 1.417 | M6x1.0mm |
| VS043 | | ST1 - SFH5/16-6.30 | 0.313 | 0.551 | 1.000 | 6.299 | 1.535 | M6x1.0mm |
| VS044 | | ST1 - SFH3/8-6.30 | 0.375 | 0.787 | 1.000 | 6.299 | 1.654 | M8x1.0mm |
| VS045 | | ST1 - SFH1/2-6.30 | 0.500 | 0.787 | 1.000 | 6.299 | 1.850 | M10x1.0mm |
| VS046 | | ST1 - SFH5/8-6.30 | 0.625 | 0.866 | 1.000 | 6.299 | 1.969 | M12x1.0mm |
| VS050 | ST1-1/4 | ST1-1/4 - SFH1/8-6.30 | 0.125 | 0.394 | 1.250 | 6.299 | 0.354 | - |
| VS051 | | ST1-1/4 - SFH3/16-6.30 | 0.188 | 0.394 | 1.250 | 6.299 | 0.472 | - |
| VS052 | | ST1-1/4 - SFH1/4-6.30 | 0.250 | 0.551 | 1.250 | 6.299 | 1.417 | M5x0.8mm |
| VS053 | | ST1-1/4 - SFH5/16-6.30 | 0.313 | 0.551 | 1.250 | 6.299 | 1.535 | M6x1.0mm |
| VS054 | | ST1-1/4 - SFH3/8-6.30 | 0.375 | 0.945 | 1.250 | 6.299 | 1.654 | M8x1.0mm |
| VS055 | | ST1-1/4 - SFH1/2-6.30 | 0.500 | 0.945 | 1.250 | 6.299 | 1.850 | M10x1.0mm |
| VS056 | | ST1-1/4 - SFH5/8-6.30 | 0.625 | 1.063 | 1.250 | 6.299 | 1.969 | M12x1.0mm |
| VS057 | | ST1-1/4 - SFH3/4-6.30 | 0.750 | 1.063 | 1.250 | 6.299 | 2.047 | M16x1.0mm |

# SHRINK FIT EXTENSION








## ■ METRIC (STANDARD)

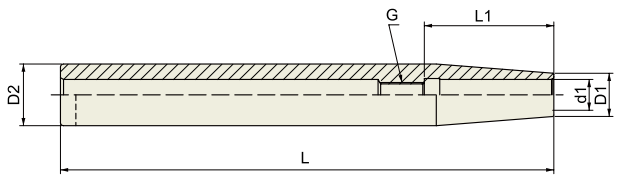
Unit : mm

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | G |
|---|---|---|---|---|---|---|---|---|
| VS010M | 12 | ST12-SFH3-120 | 3 | 8 | 12 | 120 | 10 | - |
| VS011M | | ST12-SFH4-120 | 4 | 8 | 12 | 120 | 12 | - |
| VS012M | | ST12-SFH5-120 | 5 | 10 | 12 | 120 | 15 | - |
| VS013M | | ST12-SFH6-120 | 6 | 10 | 12 | 120 | 36 | M5x0.8mm |
| VS020M | 16 | ST16-SFH3-120 | 3 | 10 | 16 | 120 | 10 | - |
| VS021M | | ST16-SFH4-120 | 4 | 10 | 16 | 120 | 12 | - |
| VS022M | | ST16-SFH5-120 | 5 | 10 | 16 | 120 | 15 | - |
| VS023M | | ST16-SFH6-120 | 6 | 10 | 16 | 120 | 36 | M5x0.8mm |
| VS024M | | ST16-SFH8-120 | 8 | 12 | 16 | 120 | 36 | M6x1.0mm |
| VS030M | 20 | ST20-SFH3-120 | 3 | 10 | 20 | 120 | 10 | - |
| VS031M | | ST20-SFH4-120 | 4 | 10 | 20 | 120 | 12 | - |
| VS032M | | ST20-SFH5-120 | 5 | 10 | 20 | 120 | 15 | - |
| VS033M | | ST20-SFH6-120 | 6 | 10 | 20 | 120 | 36 | M5x0.8mm |
| VS034M | | ST20-SFH8-120 | 8 | 12 | 20 | 120 | 36 | M6x1.0mm |
| VS035M | | ST20-SFH10-120 | 10 | 14 | 20 | 120 | 43 | M8x1.0mm |
| VS036M | | ST20-SFH12-120 | 12 | 16 | 20 | 120 | 48 | M10x1.0mm |

# SHRINK FIT EXTENSION

ST






## ■ METRIC (EXTENDED)

Unit : mm

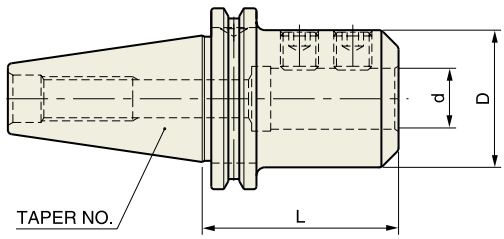
| EDP No. | TAPER No. | MODEL No. | d1 | D1 | D2 | L | L1 | G |
|---|---|---|---|---|---|---|---|---|
| VS110M | 12 | ST12-SFH3-160 | 3 | 8 | 12 | 160 | 10 | - |
| VS111M | | ST12-SFH4-160 | 4 | 8 | 12 | 160 | 12 | - |
| VS112M | | ST12-SFH5-160 | 5 | 10 | 12 | 160 | 15 | - |
| VS113M | | ST12-SFH6-160 | 6 | 10 | 12 | 160 | 36 | M5x0.8mm |
| VS210M | 16 | ST16-SFH3-160 | 3 | 10 | 16 | 160 | 10 | - |
| VS211M | | ST16-SFH4-160 | 4 | 10 | 16 | 160 | 12 | - |
| VS212M | | ST16-SFH5-160 | 5 | 10 | 16 | 160 | 15 | - |
| VS213M | | ST16-SFH6-160 | 6 | 10 | 16 | 160 | 36 | M5x0.8mm |
| VS214M | | ST16-SFH8-160 | 8 | 12 | 16 | 160 | 36 | M6x1.0mm |
| VS310M | 20 | ST20-SFH3-160 | 3 | 10 | 20 | 160 | 10 | - |
| VS311M | | ST20-SFH4-160 | 4 | 10 | 20 | 160 | 12 | - |
| VS312M | | ST20-SFH5-160 | 5 | 10 | 20 | 160 | 15 | - |
| VS313M | | ST20-SFH6-160 | 6 | 10 | 20 | 160 | 36 | M5x0.8mm |
| VS314M | | ST20-SFH8-160 | 8 | 12 | 20 | 160 | 36 | M6x1.0mm |
| VS315M | | ST20-SFH10-160 | 10 | 14 | 20 | 160 | 43 | M8x1.0mm |
| VS316M | | ST20-SFH12-160 | 12 | 16 | 20 | 160 | 48 | M10x1.0mm |
| VS410M | 25 | ST25-SFH3-160 | 3 | 10 | 25 | 160 | 10 | - |
| VS411M | | ST25-SFH4-160 | 4 | 10 | 25 | 160 | 12 | - |
| VS412M | | ST25-SFH5-160 | 5 | 15 | 25 | 160 | 15 | - |
| VS413M | | ST25-SFH6-160 | 6 | 20 | 25 | 160 | 36 | M5x0.8mm |
| VS414M | | ST25-SFH8-160 | 8 | 20 | 25 | 160 | 36 | M6x1.0mm |
| VS415M | | ST25-SFH10-160 | 10 | 20 | 25 | 160 | 43 | M8x1.0mm |
| VS416M | | ST25-SFH12-160 | 12 | 20 | 25 | 160 | 48 | M10x1.0mm |
| VS417M | | ST25-SFH14-160 | 14 | 20 | 25 | 160 | 48 | M10x1.0mm |
| VS418M | | ST25-SFH16-160 | 16 | 22 | 25 | 160 | 51 | M12x1.0mm |
| VS510M | 32 | ST32-SFH6-160 | 6 | 20 | 32 | 160 | 36 | M5x0.8mm |
| VS511M | | ST32-SFH8-160 | 8 | 20 | 32 | 160 | 36 | M6x1.0mm |
| VS512M | | ST32-SFH10-160 | 10 | 24 | 32 | 160 | 43 | M8x1.0mm |
| VS513M | | ST32-SFH12-160 | 12 | 24 | 32 | 160 | 48 | M10x1.0mm |
| VS514M | | ST32-SFH14-160 | 14 | 27 | 32 | 160 | 48 | M10x1.0mm |
| VS515M | | ST32-SFH16-160 | 16 | 27 | 32 | 160 | 51 | M12x1.0mm |
| VS516M | | ST32-SFH18-160 | 18 | 27 | 32 | 160 | 51 | M12x1.0mm |
| VS517M | | ST32-SFH20-160 | 20 | 27 | 32 | 160 | 53 | M16x1.0mm |

# END MILL HOLDER

CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD |

## ■ ASME B5.50-2009-CAT

## ■ STUB

Unit : inch

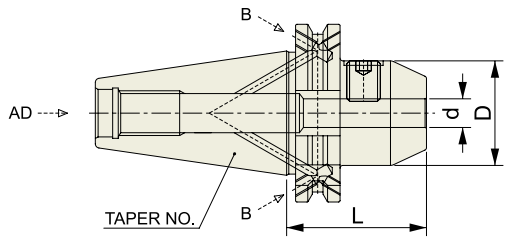
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK206 | 40 | CAT40 - EMH 1/2 - 1.75 | 0.500 | 1.25 | 1.75 |
| AK208 | | CAT40 - EMH 5/8 - 1.75 | 0.625 | 1.50 | 1.75 |
| AK210 | | CAT40 - EMH 3/4 - 1.75 | 0.750 | 1.75 | 1.75 |
| AK214 | | CAT40 - EMH 1"- 1.75 | 1.000 | 1.75 | 1.75 |
| AK217 | | CAT40 - EMH 1 1/4 - 2.00 | 1.250 | 2.25 | 2.00 |

* HIGH BALANCED END MIll HOLDERS ON PAGE 943~944.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER

CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ ASME B5.50-2009-CAT

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK000B | 40 | CAT40 AD/B - EMH 1/8 - 2.50 | 0.125 | 0.69 | 2.50 |
| AK001B | | CAT40 AD/B - EMH 3/16 - 2.50 | 0.187 | 0.69 | 2.50 |
| AK002B | | CAT40 AD/B - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AK003B | | CAT40 AD/B - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AK004B | | CAT40 AD/B - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AK005B | | CAT40 AD/B - EMH 7/16 - 2.50 | 0.437 | 1.13 | 2.50 |
| AK006B | | CAT40 AD/B - EMH 1/2 - 2.63 | 0.500 | 1.25 | 2.63 |
| AK008B | | CAT40 AD/B - EMH 5/8 - 3.75 | 0.625 | 1.50 | 3.75 |
| AK010B | | CAT40 AD/B - EMH 3/4 - 3.75 | 0.750 | 1.75 | 3.75 |
| AK012B | | CAT40 AD/B - EMH 7/8 - 4.00 | 0.875 | 1.88 | 4.00 |
| AK014B | | CAT40 AD/B - EMH 1" - 4.00 | 1.000 | 2.00 | 4.00 |
| AK017B | | CAT40 AD/B - EMH 1 1/4 - 4.25 | 1.250 | 2.50 | 4.25 |
| AK021B | | CAT40 AD/B - EMH 1 1/2 - 4.63 | 1.500 | 2.50 | 4.63 |
| AL002B | 50 | CAT50 AD/B - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AL003B | | CAT50 AD/B - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AL004B | | CAT50 AD/B - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AL005B | | CAT50 AD/B - EMH 7/16 - 2.63 | 0.437 | 1.13 | 2.63 |
| AL006B | | CAT50 AD/B - EMH 1/2 - 2.63 | 0.500 | 1.25 | 2.63 |
| AL008B | | CAT50 AD/B - EMH 5/8 - 3.75 | 0.625 | 1.50 | 3.75 |
| AL010B | | CAT50 AD/B - EMH 3/4 - 3.75 | 0.750 | 1.75 | 3.75 |
| AL012B | | CAT50 AD/B - EMH 7/8 - 3.75 | 0.875 | 1.88 | 3.75 |
| AL014B | | CAT50 AD/B - EMH 1" - 4.00 | 1.000 | 2.00 | 4.00 |
| AL017B | | CAT50 AD/B - EMH 1 1/4 - 4.00 | 1.250 | 2.50 | 4.00 |
| AL021B | | CAT50 AD/B - EMH 1 1/2 - 4.00 | 1.500 | 2.50 | 4.00 |
| AL029B | | CAT50 AD/B - EMH 2" - 5.63 | 2.000 | 3.75 | 5.63 |

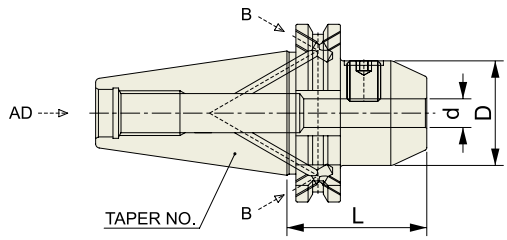
* HIGH BALANCED END MILL HOLDERS ARE AVAILABLE ON REQUEST.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER

CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ ASME B5.50-2009-CAT

## ■ EXTENDED

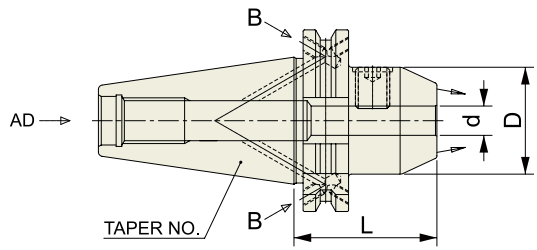
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK104B | 40 | CAT40 AD/B - EMH 3/8 - 4.50 | 0.375 | 1.00 | 4.50 |
| AK106B | | CAT40 AD/B - EMH 1/2 - 4.63 | 0.500 | 1.25 | 4.63 |
| AK108B | | CAT40 AD/B - EMH 5/8 - 5.75 | 0.625 | 1.50 | 5.75 |
| AK110B | | CAT40 AD/B - EMH 3/4 - 5.75 | 0.750 | 1.75 | 5.75 |
| AK112B | | CAT40 AD/B - EMH 7/8 - 6.00 | 0.875 | 1.88 | 6.00 |
| AK114B | | CAT40 AD/B - EMH 1" - 6.00 | 1.000 | 2.00 | 6.00 |
| AK117B | | CAT40 AD/B - EMH 1 1/4 - 6.25 | 1.250 | 2.50 | 6.25 |
| AK121B | | CAT40 AD/B - EMH 1 1/2 - 6.63 | 1.500 | 2.50 | 6.63 |
| AL104B | 50 | CAT50 AD/B - EMH 3/8 - 4.50 | 0.375 | 1.00 | 4.50 |
| AL106B | | CAT50 AD/B - EMH 1/2 - 4.63 | 0.500 | 1.25 | 4.63 |
| AL108B | | CAT50 AD/B - EMH 5/8 - 5.75 | 0.625 | 1.50 | 5.75 |
| AL110B | | CAT50 AD/B - EMH 3/4 - 5.75 | 0.750 | 1.75 | 5.75 |
| AL112B | | CAT50 AD/B - EMH 7/8 - 5.75 | 0.875 | 1.88 | 5.75 |
| AL114B | | CAT50 AD/B - EMH 1" - 6.00 | 1.000 | 2.00 | 6.00 |
| AL117B | | CAT50 AD/B - EMH 1 1/4 - 6.00 | 1.250 | 2.50 | 6.00 |
| AL121B | | CAT50 AD/B - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |
| AL129B | | CAT50 AD/B - EMH 2" - 7.63 | 2.000 | 3.75 | 7.63 |

* HIGH BALANCED END MILL HOLDERS ARE AVAILABLE ON REQUEST.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER (SPRAY NOZZLE TYPE) CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B+C |

## ■ ASME B5.50-2009-CAT

Unit : inch

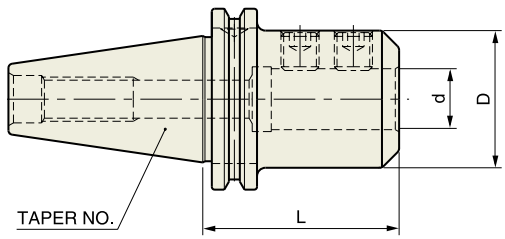
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK002C | 40 | CAT40AD/B - EMH 1/4C-1.97 | 0.250 | 0.780 | 1.969 |
| AK003C | | CAT40AD/B - EMH 5/16C-1.97 | 0.313 | 0.880 | 1.969 |
| AK004C | | CAT40AD/B - EMH 3/8C-1.97 | 0.375 | 1.000 | 1.969 |
| AK005C | | CAT40AD/B - EMH 1/2C-1.97 | 0.500 | 1.250 | 1.969 |
| AK008C | | CAT40AD/B - EMH 5/8C-2.48 | 0.625 | 1.500 | 2.480 |
| AK010C | | CAT40AD/B - EMH 3/4C-2.48 | 0.750 | 1.750 | 2.480 |
| AK012C | | CAT40AD/B - EMH 1C-3.94 | 1.000 | 2.000 | 3.937 |
| AK017C | | CAT40AD/B - EMH 1 1/4C-3.94 | 1.250 | 2.500 | 3.937 |
| AL002C | 50 | CAT50AD/B - EMH 1/4C-2.48 | 0.250 | 0.780 | 2.480 |
| AL003C | | CAT50AD/B - EMH 5/16C-2.48 | 0.313 | 0.880 | 2.480 |
| AL004C | | CAT50AD/B - EMH 3/8C-2.48 | 0.375 | 1.000 | 2.480 |
| AL005C | | CAT50AD/B - EMH 1/2C-2.48 | 0.500 | 1.250 | 2.480 |
| AL008C | | CAT50AD/B - EMH 5/8C-2.48 | 0.625 | 1.500 | 2.480 |
| AL010C | | CAT50AD/B - EMH 3/4C-2.48 | 0.750 | 1.750 | 2.480 |
| AL012C | | CAT50AD/B - EMH 1C-3.15 | 1.000 | 2.000 | 3.150 |
| AL017C | | CAT50AD/B - EMH 1 1/4C-3.94 | 1.250 | 2.500 | 3.937 |

* HIGH BALANCED END MILL HOLDERS ARE AVAILABLE ON REQUEST.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# HIGH BALANCED END MILL HOLDER








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ ASME B5.50-2009-CAT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK206B25 | 40 | CAT40 - EMH 1/2 - 1.75 | 0.500 | 1.25 | 1.75 |
| AK208B25 | | CAT40 - EMH 5/8 - 1.75 | 0.625 | 1.50 | 1.75 |
| AK210B25 | | CAT40 - EMH 3/4 - 1.75 | 0.750 | 1.75 | 1.75 |
| AK214B25 | | CAT40 - EMH 1" - 1.75 | 1.000 | 1.75 | 1.75 |
| AK217B25 | | CAT40 - EMH 1 1/4 - 2.00 | 1.250 | 2.25 | 2.00 |

## ■ STANDARD

Unit : inch

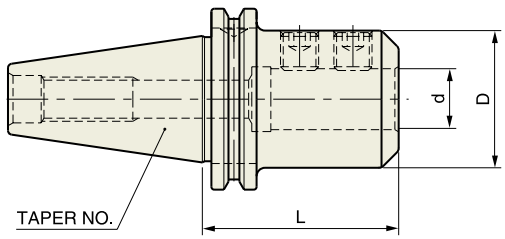
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK000B25 | 40 | CAT40 - EMH 1/8 - 2.50 | 0.125 | 0.69 | 2.50 |
| AK001B25 | | CAT40 - EMH 3/16 - 2.50 | 0.187 | 0.69 | 2.50 |
| AK002B25 | | CAT40 - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AK003B25 | | CAT40 - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AK004B25 | | CAT40 - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AK005B25 | | CAT40 - EMH 7/16 - 2.50 | 0.437 | 1.13 | 2.50 |
| AK006B25 | | CAT40 - EMH 1/2 - 2.63 | 0.500 | 1.25 | 2.63 |
| AK008B25 | | CAT40 - EMH 5/8 - 3.75 | 0.625 | 1.50 | 3.75 |
| AK010B25 | | CAT40 - EMH 3/4 - 3.75 | 0.750 | 1.75 | 3.75 |
| AK012B25 | | CAT40 - EMH 7/8 - 4.00 | 0.875 | 1.88 | 4.00 |
| AK014B25 | | CAT40 - EMH 1" - 4.00 | 1.000 | 2.00 | 4.00 |
| AK017B25 | | CAT40 - EMH 1 1/4 - 4.25 | 1.250 | 2.50 | 4.25 |
| AK021B25 | | CAT40 - EMH 1 1/2 - 4.63 | 1.500 | 2.50 | 4.63 |
| AL002B25 | 50 | CAT50 - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AL003B25 | | CAT50 - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AL004B25 | | CAT50 - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AL005B25 | | CAT50 - EMH 7/16 - 2.63 | 0.437 | 1.13 | 2.63 |
| AL006B25 | | CAT50 - EMH 1/2 - 2.63 | 0.500 | 1.25 | 2.63 |
| AL008B25 | | CAT50 - EMH 5/8 - 3.75 | 0.625 | 1.50 | 3.75 |
| AL010B25 | | CAT50 - EMH 3/4 - 3.75 | 0.750 | 1.75 | 3.75 |
| AL012B25 | | CAT50 - EMH 7/8 - 3.75 | 0.875 | 1.88 | 3.75 |
| AL014B25 | | CAT50 - EMH 1" - 4.00 | 1.000 | 2.00 | 4.00 |
| AL017B25 | | CAT50 - EMH 1 1/4 - 4.00 | 1.250 | 2.50 | 4.00 |
| AL021B25 | | CAT50 - EMH 1 1/2 - 4.00 | 1.500 | 2.50 | 4.00 |
| AL029B25 | | CAT50 - EMH 2" - 5.63 | 2.000 | 3.75 | 5.63 |

* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# HIGH BALANCED END MILL HOLDER

CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ ASME B5.50-2009-CAT

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AK104B25 | 40 | CAT40 - EMH 3/8 - 4.50 | 0.375 | 1.00 | 4.50 |
| AK106B25 | | CAT40 - EMH 1/2 - 4.63 | 0.500 | 1.25 | 4.63 |
| AK108B25 | | CAT40 - EMH 5/8 - 5.75 | 0.625 | 1.50 | 5.75 |
| AK110B25 | | CAT40 - EMH 3/4 - 5.75 | 0.750 | 1.75 | 5.75 |
| AK112B25 | | CAT40 - EMH 7/8 - 6.00 | 0.875 | 1.88 | 6.00 |
| AK114B25 | | CAT40 - EMH 1" - 6.00 | 1.000 | 2.00 | 6.00 |
| AK117B25 | | CAT40 - EMH 1 1/4 - 6.25 | 1.250 | 2.50 | 6.25 |
| AK121B25 | | CAT40 - EMH 1 1/2 - 6.63 | 1.500 | 2.50 | 6.63 |
| AL104B25 | 50 | CAT50 - EMH 3/8 - 4.50 | 0.375 | 1.00 | 4.50 |
| AL106B25 | | CAT50 - EMH 1/2 - 4.63 | 0.500 | 1.25 | 4.63 |
| AL108B25 | | CAT50 - EMH 5/8 - 5.75 | 0.625 | 1.50 | 5.75 |
| AL110B25 | | CAT50 - EMH 3/4 - 5.75 | 0.750 | 1.75 | 5.75 |
| AL112B25 | | CAT50 - EMH 7/8 - 5.75 | 0.875 | 1.88 | 5.75 |
| AL114B25 | | CAT50 - EMH 1" - 6.00 | 1.000 | 2.00 | 6.00 |
| AL117B25 | | CAT50 - EMH 1 1/4 - 6.00 | 1.250 | 2.50 | 6.00 |
| AL121B25 | | CAT50 - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |
| AL129B25 | | CAT50 - EMH 2" - 7.63 | 2.000 | 3.75 | 7.63 |

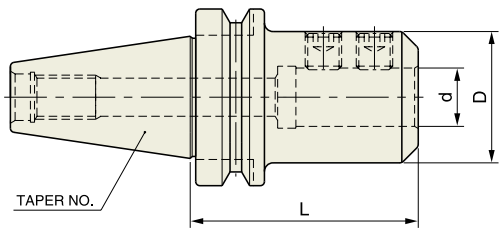
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER

BT








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD |

## ■ JIS B6339/MAS 403-BT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH206 | 40 | BT40 - EMH 1/2 - 1.25 | 0.500 | 1.25 | 1.25 |
| AH208 | | BT40 - EMH 5/8 - 1.38 | 0.625 | 1.50 | 1.38 |
| AH210 | | BT40 - EMH 3/4 - 1.44 | 0.750 | 1.75 | 1.44 |
| AH214 | | BT40 - EMH 1" - 2.50 | 1.000 | 2.00 | 2.50 |
| AH217 | | BT40 - EMH 1 1/4 - 2.50 | 1.250 | 2.50 | 2.50 |

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AI002 | 50 | BT50 - EMH 1/4 - 3.00 | 0.250 | 0.78 | 3.00 |
| AI004 | | BT50 - EMH 3/8 - 3.00 | 0.375 | 1.00 | 3.00 |
| AI006 | | BT50 - EMH 1/2 - 3.00 | 0.500 | 1.25 | 3.00 |
| AI008 | | BT50 - EMH 5/8 - 3.00 | 0.625 | 1.50 | 3.00 |
| AI010 | | BT50 - EMH 3/4 - 3.00 | 0.750 | 1.75 | 3.00 |
| AI012 | | BT50 - EMH 7/8 - 4.00 | 0.875 | 1.88 | 4.00 |
| AI014 | | BT50 - EMH 1" - 4.25 | 1.000 | 2.00 | 4.25 |
| AI017 | | BT50 - EMH 1 1/4 - 4.25 | 1.250 | 2.50 | 4.25 |
| AI021 | | BT50 - EMH 1 1/2 - 4.25 | 1.500 | 2.50 | 4.25 |
| AI029 | | BT50 - EMH 2" - 5.00 | 2.000 | 3.75 | 5.00 |

## ■ EXTENDED

Unit : inch

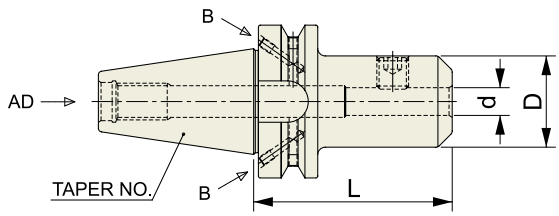
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AI104 | 50 | BT50 - EMH 3/8 - 6.00 | 0.375 | 1.00 | 6.00 |
| AI106 | | BT50 - EMH 1/2 - 6.00 | 0.500 | 1.25 | 6.00 |
| AI108 | | BT50 - EMH 5/8 - 6.00 | 0.625 | 1.50 | 6.00 |
| AI110 | | BT50 - EMH 3/4 - 6.00 | 0.750 | 1.75 | 6.00 |
| AI112 | | BT50 - EMH 7/8 - 6.00 | 0.875 | 1.88 | 6.00 |
| AI114 | | BT50 - EMH 1" - 6.00 | 1.000 | 2.00 | 6.00 |
| AI117 | | BT50 - EMH 1 1/4 - 6.00 | 1.250 | 2.50 | 6.00 |
| AI121 | | BT50 - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |
| AI129 | | BT50 - EMH 2" - 6.00 | 2.000 | 3.75 | 6.00 |

* HIGH BALANCED END MIII HOLDEERS ON PAGE 948~949.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER

BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ JIS B6339/MAS 403-BT

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH000B | 40 | BT40 AD/B - EMH 1/8 - 2.50 | 0.125 | 0.69 | 2.50 |
| AH001B | | BT40 AD/B - EMH 3/16 - 2.50 | 0.187 | 0.69 | 2.50 |
| AH002B | | BT40 AD/B - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AH003B | | BT40 AD/B - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AH004B | | BT40 AD/B - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AH005B | | BT40 AD/B - EMH 7/16 - 2.50 | 0.437 | 1.13 | 2.50 |
| AH006B | | BT40 AD/B - EMH 1/2 - 2.50 | 0.500 | 1.25 | 2.50 |
| AH008B | | BT40 AD/B - EMH 5/8 - 2.50 | 0.625 | 1.50 | 2.50 |
| AH010B | | BT40 AD/B - EMH 3/4 - 2.50 | 0.750 | 1.75 | 2.50 |
| AH012B | | BT40 AD/B - EMH 7/8 - 3.50 | 0.875 | 1.88 | 3.50 |
| AH014B | | BT40 AD/B - EMH 1" - 3.75 | 1.000 | 2.00 | 3.75 |
| AH017B | | BT40 AD/B - EMH 1 1/4 - 3.75 | 1.250 | 2.50 | 3.75 |
| AH021B | | BT40 AD/B - EMH 1 1/2 - 4.25 | 1.500 | 2.50 | 4.25 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH104B | 40 | BT40 AD/B - EMH 3/8 - 4.00 | 0.375 | 1.00 | 4.00 |
| AH106B | | BT40 AD/B - EMH 1/2 - 4.00 | 0.500 | 1.25 | 4.00 |
| AH108B | | BT40 AD/B - EMH 5/8 - 4.00 | 0.625 | 1.50 | 4.00 |
| AH110B | | BT40 AD/B - EMH 3/4 - 4.00 | 0.750 | 1.75 | 4.00 |
| AH114B | | BT40 AD/B - EMH 1"- 5.00 | 1.000 | 2.00 | 5.00 |
| AH117B | | BT40 AD/B - EMH 1 1/4 - 5.00 | 1.250 | 2.50 | 5.00 |
| AH121B | | BT40 AD/B - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |

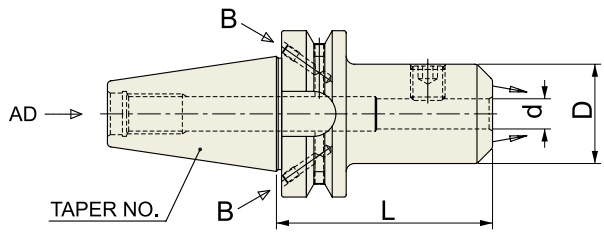
* HIGH BALANCED END MILL HOLDERS ARE AVAILABLE ON REQUEST.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# END MILL HOLDER (SPRAY NOZZLE TYPE)

BT








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B+C |

## ■ JIS B6339/MAS 403-BT

Unit : inch

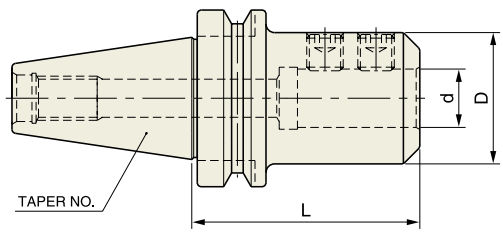
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH002C | 40 | BT40AD/B - EMH 1/4C-1.97 | 0.250 | 0.780 | 1.969 |
| AH003C | | BT40AD/B - EMH 5/16C-1.97 | 0.313 | 0.880 | 1.969 |
| AH004C | | BT40AD/B - EMH 3/8C-2.48 | 0.375 | 1.000 | 2.480 |
| AH006C | | BT40AD/B - EMH 1/2C-2.48 | 0.500 | 1.250 | 2.480 |
| AH008C | | BT40AD/B - EMH 5/8C-2.48 | 0.625 | 1.500 | 2.480 |
| AH010C | | BT40AD/B - EMH 3/4C-2.48 | 0.750 | 1.750 | 2.480 |
| AH012C | | BT40AD/B - EMH 1C-3.54 | 1.000 | 2.000 | 3.543 |
| AH014C | | BT40AD/B - EMH 1 1/4-3.94 | 1.250 | 2.500 | 3.937 |

* HIGH BALANCED END MILL HOLDERS ARE AVAILABLE ON REQUEST.
* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# HIGH BALANCED END MILL HOLDER

BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

■ JIS B6339/MAS 403-BT

■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH206B25 | 40 | BT40 - EMH 1/2 - 1.25 | 0.500 | 1.25 | 1.25 |
| AH208B25 | | BT40 - EMH 5/8 - 1.38 | 0.625 | 1.50 | 1.38 |
| AH210B25 | | BT40 - EMH 3/4 - 1.44 | 0.750 | 1.75 | 1.44 |
| AH214B25 | | BT40 - EMH 1"- 2.50 | 1.000 | 2.00 | 2.50 |
| AH217B25 | | BT40 - EMH 1 1/4 - 2.50 | 1.250 | 2.50 | 2.50 |

■ STANDARD

Unit : inch

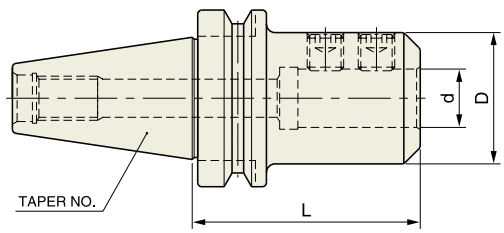
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH000B25 | 40 | BT40 - EMH 1/8 - 2.50 | 0.125 | 0.69 | 2.50 |
| AH001B25 | | BT40 - EMH 3/16 - 2.50 | 0.187 | 0.69 | 2.50 |
| AH002B25 | | BT40 - EMH 1/4 - 2.50 | 0.250 | 0.78 | 2.50 |
| AH003B25 | | BT40 - EMH 5/16 - 2.50 | 0.312 | 0.88 | 2.50 |
| AH004B25 | | BT40 - EMH 3/8 - 2.50 | 0.375 | 1.00 | 2.50 |
| AH005B25 | | BT40 - EMH 7/16 - 2.50 | 0.437 | 1.13 | 2.50 |
| AH006B25 | | BT40 - EMH 1/2 - 2.50 | 0.500 | 1.25 | 2.50 |
| AH008B25 | | BT40 - EMH 5/8 - 2.50 | 0.625 | 1.50 | 2.50 |
| AH010B25 | | BT40 - EMH 3/4 - 2.50 | 0.750 | 1.75 | 2.50 |
| AH012B25 | | BT40 - EMH 7/8 - 3.50 | 0.875 | 1.88 | 3.50 |
| AH014B25 | | BT40 - EMH 1"- 3.75 | 1.000 | 2.00 | 3.75 |
| AH017B25 | | BT40 - EMH 1 1/4 - 3.75 | 1.250 | 2.50 | 3.75 |
| AH021B25 | | BT40 - EMH 1 1/2 - 4.25 | 1.500 | 2.50 | 4.25 |
| AI002B25 | 50 | BT50 - EMH 1/4 - 3.00 | 0.250 | 0.78 | 3.00 |
| AI004B25 | | BT50 - EMH 3/8 - 3.00 | 0.375 | 1.00 | 3.00 |
| AI006B25 | | BT50 - EMH 1/2 - 3.00 | 0.500 | 1.25 | 3.00 |
| AI008B25 | | BT50 - EMH 5/8 - 3.00 | 0.625 | 1.50 | 3.00 |
| AI010B25 | | BT50 - EMH 3/4 - 3.00 | 0.750 | 1.75 | 3.00 |
| AI012B25 | | BT50 - EMH 7/8 - 4.00 | 0.875 | 1.88 | 4.00 |
| AI014B25 | | BT50 - EMH 1"- 4.25 | 1.000 | 2.00 | 4.25 |
| AI017B25 | | BT50 - EMH 1 1/4 - 4.25 | 1.250 | 2.50 | 4.25 |
| AI021B25 | | BT50 - EMH 1 1/2 - 4.25 | 1.500 | 2.50 | 4.25 |
| AI029B25 | | BT50 - EMH 2"- 5.00 | 2.000 | 3.75 | 5.00 |

* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# HIGH BALANCED END MILL HOLDER








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ JIS B6339/MAS 403-BT

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AH104B25 | 40 | BT40 - EMH 3/8 - 4.00 | 0.375 | 1.00 | 4.00 |
| AH106B25 | | BT40 - EMH 1/2 - 4.00 | 0.500 | 1.25 | 4.00 |
| AH108B25 | | BT40 - EMH 5/8 - 4.00 | 0.625 | 1.50 | 4.00 |
| AH110B25 | | BT40 - EMH 3/4 - 4.00 | 0.750 | 1.75 | 4.00 |
| AH114B25 | | BT40 - EMH 1"- 5.00 | 1.000 | 2.00 | 5.00 |
| AH117B25 | | BT40 - EMH 1 1/4 - 5.00 | 1.250 | 2.50 | 5.00 |
| AH121B25 | | BT40 - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |
| AI104B25 | 50 | BT50 - EMH 3/8 - 6.00 | 0.375 | 1.00 | 6.00 |
| AI106B25 | | BT50 - EMH 1/2 - 6.00 | 0.500 | 1.25 | 6.00 |
| AI108B25 | | BT50 - EMH 5/8 - 6.00 | 0.625 | 1.50 | 6.00 |
| AI110B25 | | BT50 - EMH 3/4 - 6.00 | 0.750 | 1.75 | 6.00 |
| AI112B25 | | BT50 - EMH 7/8 - 6.00 | 0.875 | 1.88 | 6.00 |
| AI114B25 | | BT50 - EMH 1"- 6.00 | 1.000 | 2.00 | 6.00 |
| AI117B25 | | BT50 - EMH 1 1/4 - 6.00 | 1.250 | 2.50 | 6.00 |
| AI121B25 | | BT50 - EMH 1 1/2 - 6.00 | 1.500 | 2.50 | 6.00 |
| AI129B25 | | BT50 - EMH 2"- 6.00 | 2.000 | 3.75 | 6.00 |

* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# DUAL CONTACT SIDE LOCK ARBOR

CCT



FIG.1

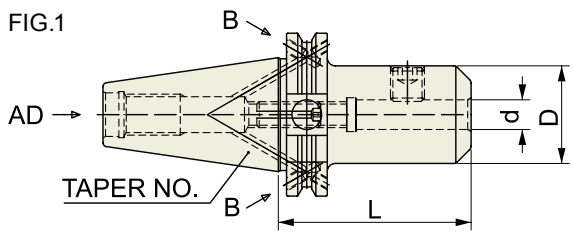
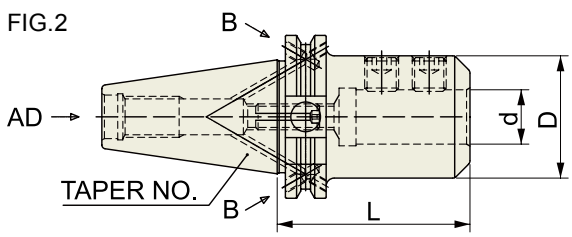



FIG.2




| CCT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD/B |

## ■ CCT (CAT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L | Remarks |
|---|---|---|---|---|---|---|
| AB020 | 40 | CCT40 AD/B - SLA1/4-2.36 | 0.250 | 0.780 | 2.362 | FIG.1 |
| AB022 | | CCT40 AD/B - SLA5/16-2.36 | 0.313 | 0.880 | 2.362 | |
| AB024 | | CCT40 AD/B - SLA3/8-2.36 | 0.375 | 1.000 | 2.362 | |
| AB026 | | CCT40 AD/B - SLA1/2-2.36 | 0.500 | 1.250 | 2.362 | |
| AB028 | | CCT40 AD/B - SLA5/8-3.54 | 0.625 | 1.500 | 3.543 | |
| AB030 | | CCT40 AD/B - SLA3/4-3.54 | 0.750 | 1.750 | 3.543 | |
| AB032 | | CCT40 AD/B - SLA1-3.54 | 1.000 | 2.000 | 3.543 | FIG.2 |
| AB034 | | CCT40 AD/B - SLA1-1/4-3.54 | 1.250 | 2.500 | 3.543 | |
| AC020 | 50 | CCT50 AD/B - SLA1/4-3.54 | 0.250 | 0.780 | 3.543 | FIG.1 |
| AC022 | | CCT50 AD/B - SLA5/16-3.54 | 0.313 | 0.880 | 3.543 | |
| AC024 | | CCT50 AD/B - SLA3/8-3.54 | 0.375 | 1.000 | 3.543 | |
| AC026 | | CCT50 AD/B - SLA1/2-3.54 | 0.500 | 1.250 | 3.543 | |
| AC028 | | CCT50 AD/B - SLA5/8-4.13 | 0.625 | 1.500 | 4.134 | |
| AC030 | | CCT50 AD/B - SLA3/4-4.13 | 0.750 | 1.750 | 4.134 | |
| AC032 | | CCT50 AD/B - SLA1-4.13 | 1.000 | 2.000 | 4.134 | FIG.2 |
| AC034 | | CCT50 AD/B - SLA1-1/4-4.13 | 1.250 | 2.500 | 4.134 | |

* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# DUAL CONTACT SIDE LOCK ARBOR

CBT





FIG.1

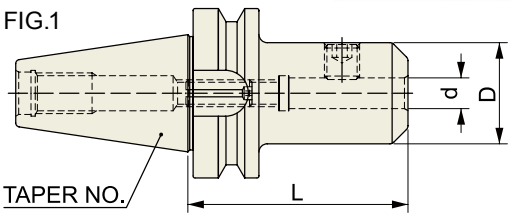
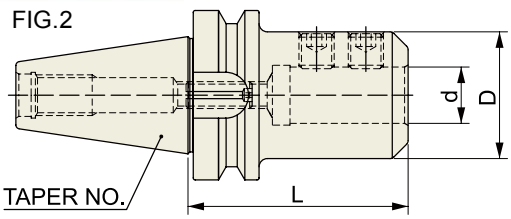



FIG.2




| CBT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ CBT (BT DUAL CONTACT)

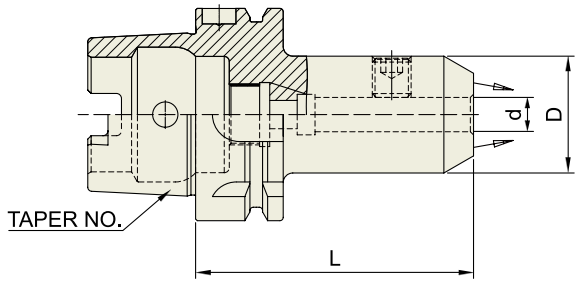
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L | Remarks |
|---|---|---|---|---|---|---|
| AD020 | 30 | CBT30 - SLA1/4-2.36 | 0.250 | 0.780 | 2.362 | FIG.1 |
| AD022 | | CBT30 - SLA5/16-2.36 | 0.313 | 0.880 | 2.362 | |
| AD024 | | CBT30 - SLA3/8-2.36 | 0.375 | 1.000 | 2.362 | |
| AD026 | | CBT30 - SLA1/2-2.36 | 0.500 | 1.250 | 2.362 | |
| AD028 | | CBT30 - SLA5/8-2.95 | 0.625 | 1.500 | 2.953 | |
| AD030 | | CBT30 - SLA3/4-2.95 | 0.750 | 1.750 | 2.953 | FIG.2 |
| AD032 | | CBT30 - SLA1-2.95 | 1.000 | 2.000 | 2.953 | |
| AE020 | 40 | CBT40 - SLA1/4-2.36 | 0.250 | 0.780 | 2.362 | FIG.1 |
| AE022 | | CBT40 - SLA5/16-2.36 | 0.313 | 0.880 | 2.362 | |
| AE024 | | CBT40 - SLA3/8-2.36 | 0.375 | 1.000 | 2.362 | |
| AE026 | | CBT40 - SLA1/2-2.36 | 0.500 | 1.250 | 2.362 | |
| AE028 | | CBT40 - SLA5/8-3.54 | 0.625 | 1.500 | 3.540 | |
| AE030 | | CBT40 - SLA3/4-3.54 | 0.750 | 1.750 | 3.540 | |
| AE032 | | CBT40 - SLA1-3.54 | 1.000 | 2.000 | 3.540 | FIG.2 |
| AE034 | | CBT40 - SLA1-1/4-3.54 | 1.250 | 2.500 | 3.540 | |

* SET SCREWS FOR END MILL HOLDERS ON PAGE 952.

# DUAL CONTACT END MILL HOLDER (SPRAY NOZZLE TYPE) HSK






| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | - | 2.5 | 25,000 | AD+C |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

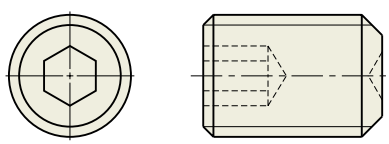
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| AQ020C | 63A | HSK63A - EMH1/4C-2.56 | 0.250 | 0.780 | 2.559 |
| AQ022C | | HSK63A - EMH5/16C-2.56 | 0.313 | 0.880 | 2.559 |
| AQ024C | | HSK63A - EMH3/8C-2.56 | 0.375 | 1.000 | 2.559 |
| AQ026C | | HSK63A - EMH1/2C-3.15 | 0.500 | 1.250 | 3.150 |
| AQ028C | | HSK63A - EMH5/8C-3.15 | 0.625 | 1.500 | 3.150 |
| AQ030C | | HSK63A - EMH3/4C-3.15 | 0.750 | 1.750 | 3.150 |
| AQ032C | | HSK63A - EMH1C-4.33 | 1.000 | 2.000 | 4.331 |
| AQ034C | | HSK63A - EMH1-1/4C-4.33 | 1.250 | 2.500 | 4.331 |
| AR020C | 100A | HSK100A - EMH1/4C-3.15 | 0.250 | 0.780 | 3.150 |
| AR022C | | HSK100A - EMH5/16C-3.15 | 0.313 | 0.880 | 3.150 |
| AR024C | | HSK100A - EMH3/8C-3.15 | 0.375 | 1.000 | 3.150 |
| AR026C | | HSK100A - EMH1/2C-3.15 | 0.500 | 1.250 | 3.150 |
| AR028C | | HSK100A - EMH5/8C-3.94 | 0.625 | 1.500 | 3.937 |
| AR030C | | HSK100A - EMH3/4C-3.94 | 0.750 | 1.750 | 3.937 |
| AR032C | | HSK100A - EMH1C-3.94 | 1.000 | 2.000 | 3.937 |
| AR034C | | HSK100A - EMH1-1/4C-3.94 | 1.250 | 2.500 | 3.937 |

# END MILL HOLDER SCREWS

## ■ HEXAGON SOCKET SET SCREW (FLAT TYPE)

| EDP No. | SCREW | END MILL DIA. |
|---|---|---|
| ZZ000 | UNC#8-32 | 1/8 |
| ZZ001 | UNF#10-32 | 3/16 |
| ZZ002 | UNF1/4-28 | 1/4 |
| ZZ003 | UNF5/16-24 | 5/16 |
| ZZ004 | UNF3/8-24 | 3/8 |
| ZZ005 | UNF3/8-24 | 7/16 |
| ZZ006 | UNF7/16-20 | 1/2 |
| ZZ007 | UNF1/2-20 | 5/8 |
| ZZ008 | UNF5/8-18 | 3/4 |
| ZZ009 | UNF5/8-18 | 7/8 |
| ZZ010 | UNF3/4-16 | 1" |
| ZZ011 | UNF3/4-16 | 1 1/4 |
| ZZ012 | UNF3/4-16 | 1 1/2 |
| ZZ013 | UN1"-14 | 2" |

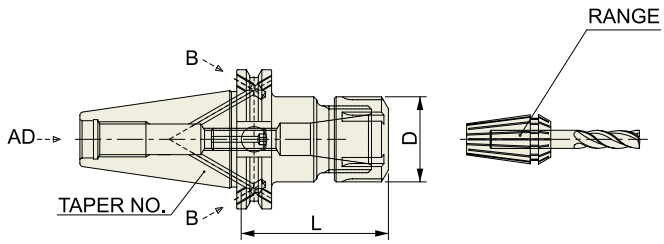


# ER COLLET CHUCK

CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ ASME B5.50-2009-CAT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK232B | 40 | CAT40 AD/B - ER20 - 2.55 | 0.039-0.511 | 1.26 | 2.55 | ER20 |
| BK233B | | CAT40 AD/B - ER25 - 2.50 | 0.039-0.629 | 1.65 | 2.50 | ER25 |
| BK234B | | CAT40 AD/B - ER32 - 2.70 | 0.078-0.787 | 1.88 | 2.70 | ER32 |

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK030B | 40 | CAT40 AD/B - ER11 - 3.00 | 0.019-0.275 | 0.75 | 3.00 | ER11 |
| BK031B | | CAT40 AD/B - ER16 - 3.00 | 0.019-0.393 | 1.10 | 3.00 | ER16 |
| BK032B | | CAT40 AD/B - ER20 - 4.00 | 0.039-0.511 | 1.33 | 4.00 | ER20 |
| BK133B | | CAT40 AD/B - ER25 - 4.00 | 0.039-0.629 | 1.65 | 4.00 | ER25 |
| BK134B | | CAT40 AD/B - ER32 - 4.00 | 0.078-0.787 | 1.96 | 4.00 | ER32 |
| BK136B | | CAT40 AD/B - ER40 - 4.00 | 0.118-1.024 | 2.48 | 4.00 | ER40 |
| BL031B | 50 | CAT50 AD/B - ER16 - 4.00 | 0.031-0.406 | 1.10 | 4.00 | ER16 |
| BL032B | | CAT50 AD/B - ER20 - 4.00 | 0.039-0.511 | 1.33 | 4.00 | ER20 |
| BL033B | | CAT50 AD/B - ER25 - 4.00 | 0.039-0.629 | 1.65 | 4.00 | ER25 |
| BL034B | | CAT50 AD/B - ER32 - 4.00 | 0.078-0.787 | 1.96 | 4.00 | ER32 |
| BL036B | | CAT50 AD/B - ER40 - 4.00 | 0.118-1.024 | 2.48 | 4.00 | ER40 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK331B | 40 | CAT40 AD/B - ER16 - 6.00 | 0.019-0.393 | 1.10 | 6.00 | ER16 |
| BK332B | | CAT40 AD/B - ER20 - 6.00 | 0.039-0.511 | 1.33 | 6.00 | ER20 |
| BK333B | | CAT40 AD/B - ER25 - 6.00 | 0.039-0.629 | 1.65 | 6.00 | ER25 |
| BK334B | | CAT40 AD/B - ER32 - 6.00 | 0.078-0.787 | 1.96 | 6.00 | ER32 |
| BL331B | 50 | CAT50 AD/B - ER16 - 6.00 | 0.031-0.406 | 1.10 | 6.00 | ER16 |
| BL332B | | CAT50 AD/B - ER20 - 6.00 | 0.039-0.511 | 1.33 | 6.00 | ER20 |
| BL333B | | CAT50 AD/B - ER25 - 6.00 | 0.039-0.629 | 1.65 | 6.00 | ER25 |
| BL334B | | CAT50 AD/B - ER32 - 6.00 | 0.078-0.787 | 1.96 | 6.00 | ER32 |

## ■ EXTRA EXTENDED

Unit : inch

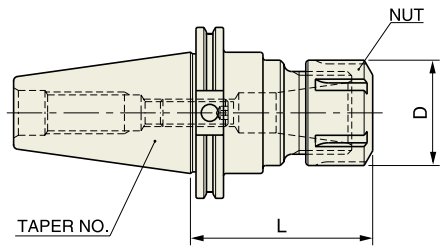
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK432B | 40 | CAT40 AD/B - ER20 - 8.00 | 0.039-0.511 | 1.33 | 8.00 | ER20 |

* HIGH BALANCED ER COLLET CHUCKS ARE AVAILABLE ON REQUEST.
* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# HIGH BALANCED ER COLLET CHUCK

CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ ASME B5.50-2009-CAT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK232B25 | 40 | CAT40 - ER20 - 2.55 | 0.039-0.511 | 1.339 | 2.55 | ER20 |
| BK233B25 | | CAT40 - ER25 - 2.50 | 0.039-0.629 | 1.654 | 2.50 | ER25 |
| BK234B25 | | CAT40 - ER32 - 2.70 | 0.078-0.787 | 1.969 | 2.70 | ER32 |

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK030B25 | 40 | CAT40 - ER11 - 3.00 | 0.019-0.275 | 0.748 | 3.00 | ER11 |
| BK031B25 | | CAT40 - ER16 - 3.00 | 1/32-13/32 | 1.102 | 2.88 | ER16 |
| BK032B25 | | CAT40 - ER20 - 4.00 | 0.039-0.511 | 1.339 | 4.00 | ER20 |
| BK133B25 | | CAT40 - ER25 - 4.00 | 0.039-0.629 | 1.654 | 4.00 | ER25 |
| BK134B25 | | CAT40 - ER32 - 4.00 | 0.078-0.787 | 1.969 | 4.00 | ER32 |
| BL031B25 | 50 | CAT50 - ER16 - 4.00 | 1/32-13/32 | 1.102 | 4.88 | ER16 |
| BL032B25 | | CAT50 - ER20 - 4.00 | 0.039-0.511 | 1.339 | 4.00 | ER20 |
| BL033B25 | | CAT50 - ER25 - 4.00 | 0.039-0.629 | 1.654 | 4.00 | ER25 |
| BL034B25 | | CAT50 - ER32 - 4.00 | 0.078-0.787 | 1.969 | 4.00 | ER32 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK331B25 | 40 | CAT40 - ER16 - 4.88 | 1/32-13/32 | 1.102 | 4.88 | ER16 |
| BK332B25 | | CAT40 - ER20 - 6.00 | 0.039-0.511 | 1.339 | 6.00 | ER20 |
| BK333B25 | | CAT40 - ER25 - 6.00 | 0.039-0.629 | 1.654 | 6.00 | ER25 |
| BK334B25 | | CAT40 - ER32 - 6.00 | 0.078-0.787 | 1.969 | 6.00 | ER32 |
| BL331B25 | 50 | CAT50 - ER16 - 6.88 | 1/32-13/32 | 1.102 | 6.88 | ER16 |
| BL332B25 | | CAT50 - ER20 - 6.00 | 0.039-0.511 | 1.339 | 6.00 | ER20 |
| BL333B25 | | CAT50 - ER25 - 6.00 | 0.039-0.629 | 1.654 | 6.00 | ER25 |
| BL334B25 | | CAT50 - ER32 - 6.00 | 0.078-0.787 | 1.969 | 6.00 | ER32 |

## ■ EXTRA EXTENDED

Unit : inch

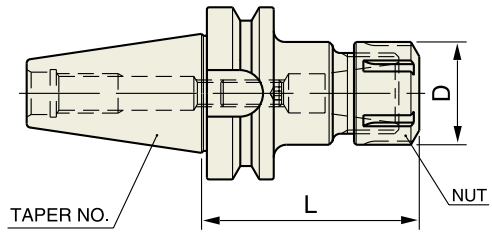
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BK432B25 | 40 | CAT40 - ER20 - 8.00 | 0.039-0.511 | 1.339 | 8.00 | ER20 |

* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# ER COLLET CHUCK








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD |

## ■ JIS B6339/MAS 403-BT

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BI031 | 50 | BT50 - ER16 - 4.88 | 1/32-13/32 | 1.102 | 4.88 | ER16 |
| BI032 | | BT50 - ER20 - 2.63 | 0.039-0.511 | 1.339 | 2.63 | ER20 |
| BI033 | | BT50 - ER25 - 2.63 | 0.039-0.629 | 1.654 | 2.63 | ER25 |
| BI034 | | BT50 - ER32 - 4.00 | 0.078-0.787 | 1.969 | 4.00 | ER32 |

## ■ EXTENDED

Unit : inch

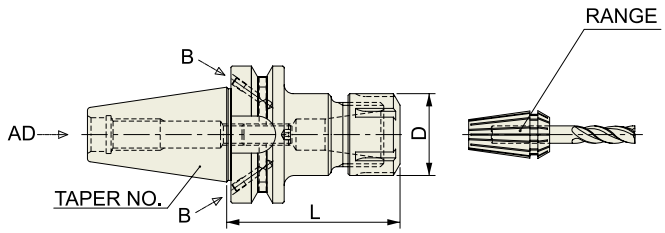
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BI331 | 50 | BT50 - ER16 - 6.00 | 1/32-13/32 | 1.102 | 6.00 | ER16 |
| BI332 | | BT50 - ER20 - 6.00 | 0.039-0.511 | 1.339 | 6.00 | ER20 |
| BI333 | | BT50 - ER25 - 6.00 | 0.039-0.629 | 1.654 | 6.00 | ER25 |
| BI334 | | BT50 - ER32 - 6.00 | 0.078-0.787 | 1.969 | 6.00 | ER32 |

* HIGH BALANCED ER COLLET CHUCKS ARE ON PAGE 957 .
* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# ER COLLET CHUCK

BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ JIS B6339/MAS 403-BT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH232B | 40 | BT40 AD/B - ER20 - 2.20 | 0.039-0.511 | 1.33 | 2.20 | ER20 |
| BH233B | | BT40 AD/B - ER25 - 2.50 | 0.039-0.629 | 1.65 | 2.50 | ER25 |
| BH234B | | BT40 AD/B - ER32 - 2.40 | 0.078-0.787 | 1.96 | 2.40 | ER32 |

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH030B | 40 | BT40 AD/B - ER11 - 3.00 | 0.019-0.275 | 0.75 | 3.00 | ER11 |
| BH031B | | BT40 AD/B - ER16 - 3.00 | 0.019-0.393 | 1.10 | 3.00 | ER16 |
| BH032B | | BT40 AD/B - ER20 - 4.00 | 0.039-0.511 | 1.33 | 4.00 | ER20 |
| BH133B | | BT40 AD/B - ER25 - 4.00 | 0.039-0.629 | 1.65 | 4.00 | ER25 |
| BH134B | | BT40 AD/B - ER32 - 4.00 | 0.078-0.787 | 1.96 | 4.00 | ER32 |
| BH136B | | BT40 AD/B - ER40 - 4.00 | 0.118-1.024 | 2.48 | 4.00 | ER40 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH331B | 40 | BT40 AD/B - ER16 - 6.00 | 0.019-0.393 | 1.10 | 6.00 | ER16 |
| BH332B | | BT40 AD/B - ER20 - 6.00 | 0.039-0.511 | 1.33 | 6.00 | ER20 |
| BH333B | | BT40 AD/B - ER25 - 6.00 | 0.039-0.629 | 1.65 | 6.00 | ER25 |
| BH334B | | BT40 AD/B - ER32 - 6.00 | 0.078-0.787 | 1.96 | 6.00 | ER32 |

## ■ EXTRA EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH432B | 40 | BT40 AD/B - ER20 - 8.00 | 0.039-0.511 | 1.33 | 8.00 | ER20 |

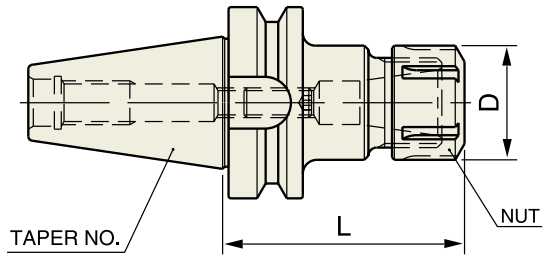
* HIGH BALANCED ER COLLET CHUCKS ARE AVAILABLE ON REQUEST.
* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# HIGH BALANCED ER COLLET CHUCK

BT








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

■ JIS B6339/MAS 403-BT

## ■ STUB

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH232B25 | 40 | BT40 - ER20 - 2.20 | 0.039-0.511 | 1.339 | 2.20 | ER20 |
| BH233B25 | | BT40 - ER25 - 2.50 | 0.039-0.629 | 1.654 | 2.50 | ER25 |
| BH234B25 | | BT40 - ER32 - 2.40 | 0.078-0.787 | 1.969 | 2.40 | ER32 |

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH030B25 | 40 | BT40 - ER11 - 3.00 | 0.019-0.275 | 0.748 | 3.00 | ER11 |
| BH031B25 | | BT40 - ER16 - 2.88 | 1/32-13/32 | 1.102 | 2.88 | ER16 |
| BH032B25 | | BT40 - ER20 - 4.00 | 0.039-0.511 | 1.339 | 4.00 | ER20 |
| BH133B25 | | BT40 - ER25 - 4.00 | 0.039-0.629 | 1.654 | 4.00 | ER25 |
| BH134B25 | | BT40 - ER32 - 4.00 | 0.078-0.787 | 1.969 | 4.00 | ER32 |
| BI031B25 | 50 | BT50 - ER16 - 4.88 | 1/32-13/32 | 1.102 | 4.88 | ER16 |
| BI032B25 | | BT50 - ER20 - 2.63 | 0.039-0.511 | 1.339 | 2.63 | ER20 |
| BI033B25 | | BT50 - ER25 - 2.63 | 0.039-0.629 | 1.654 | 2.63 | ER25 |
| BI034B25 | | BT50 - ER32 - 4.00 | 0.078-0.787 | 1.969 | 4.00 | ER32 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH331B25 | 40 | BT40 - ER16 - 4.88 | 1/32-13/32 | 1.102 | 4.88 | ER16 |
| BH332B25 | | BT40 - ER20 - 6.00 | 0.039-0.511 | 1.339 | 6.00 | ER20 |
| BH333B25 | | BT40 - ER25 - 6.00 | 0.039-0.629 | 1.654 | 6.00 | ER25 |
| BH334B25 | | BT40 - ER32 - 6.00 | 0.078-0.787 | 1.969 | 6.00 | ER32 |
| BI331B25 | 50 | BT50 - ER16 - 6.00 | 1/32-13/32 | 1.102 | 6.00 | ER16 |
| BI332B25 | | BT50 - ER20 - 6.00 | 0.039-0.511 | 1.339 | 6.00 | ER20 |
| BI333B25 | | BT50 - ER25 - 6.00 | 0.039-0.629 | 1.654 | 6.00 | ER25 |
| BI334B25 | | BT50 - ER32 - 6.00 | 0.078-0.787 | 1.969 | 6.00 | ER32 |

## ■ EXTRA EXTENDED

Unit : inch

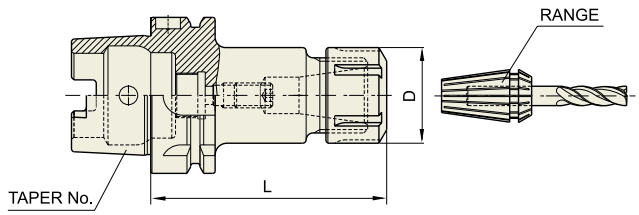
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| BH432B25 | 40 | BT40 - ER20 - 8.00 | 0.039-0.511 | 1.339 | 8.00 | ER20 |

* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# DUAL CONTACT ER COLLET CHUCK

HSK






| DIN69893 - HSK | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | - | 2.5 | 25,000 | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

Unit : inch

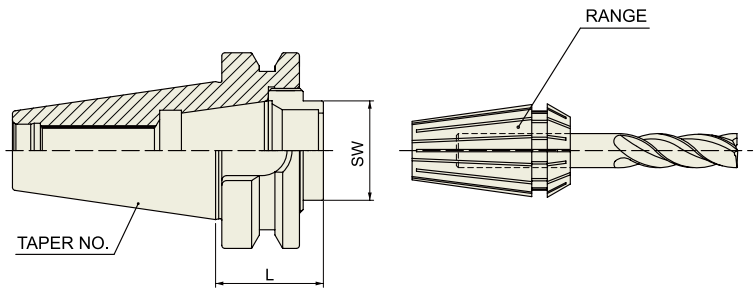
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | L | COLLET SERIES |
|---|---|---|---|---|---|---|
| **BQ010** | 63A | HSK63A - ER16 - 3.94 | 0.019-0.393 | 1.10 | 3.94 | ER16 |
| **BQ012** | | HSK63A - ER20 - 3.94 | 0.039-0.511 | 1.33 | 3.94 | ER20 |
| **BQ014** | | HSK63A - ER25 - 3.94 | 0.039-0.629 | 1.65 | 3.94 | ER25 |
| **BQ016** | | HSK63A - ER32 - 3.94 | 0.078-0.787 | 1.96 | 3.94 | ER32 |
| **BQ018** | | HSK63A - ER40 - 4.72 | 0.118-1.18 | 2.48 | 4.72 | ER40 |
| **BR010** | 100A | HSK100A - ER16 - 3.94 | 0.019-0.393 | 1.10 | 3.94 | ER16 |
| **BR012** | | HSK100A - ER20 - 3.94 | 0.039-0.511 | 1.33 | 3.94 | ER20 |
| **BR014** | | HSK100A - ER25 - 3.94 | 0.039-0.629 | 1.65 | 3.94 | ER25 |
| **BR016** | | HSK100A - ER32 - 3.94 | 0.078-0.787 | 1.96 | 3.94 | ER32 |
| **BR018** | | HSK100A - ER40 - 4.72 | 0.118-1.18 | 2.48 | 4.72 | ER40 |

* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

## ER COLLET CHUCK (SHORT)

CAT/ BT






### ■ ASME B5.50-2009-CAT

Unit : inch

| EDP No. | TAPER No. | MODEL No. | L | ER WRENCH |
|---|---|---|---|---|
| BK020SHT | 40 | CAT40-ER32-SHORT | 1.063 | 32(for Hex. Nut) |
| BL020SHT | 50 | CAT50-ER32-SHORT | 1.063 | 32(for Hex. Nut) |

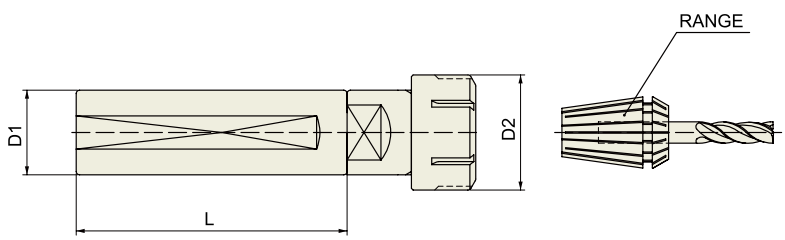
### ■ JIS B6339/MAS 403-BT

Unit : inch

| EDP No. | TAPER No. | MODEL No. | L | ER WRENCH |
|---|---|---|---|---|
| BH020SHT | 40 | BT40-ER32-SHORT | 1.378 | 32(for Hex. Nut) |

## TENSION ER COLLET CHUCK (For TAPPING)

K




### ■ STRAIGHT-K

Unit : inch

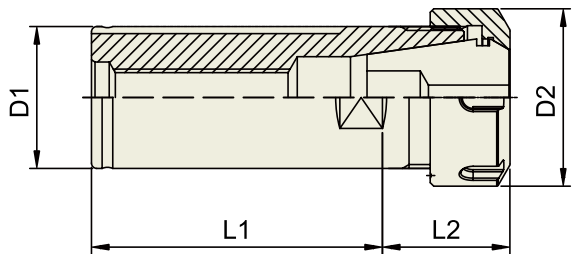
| EDP No. | TAPER No. | MODEL No. | D1 | D2 | L |
|---|---|---|---|---|---|
| BS110 | K | K1-ERT16-2.76 | 1.000 | 1.102 | 2.756 |
| BS111 | | K1-ERT20-3.15 | 1.000 | 1.339 | 3.150 |
| BS112 | | K1 1/4-ERT16-2.76 | 1.250 | 1.102 | 2.756 |
| BS113 | | K1 1/4-ERT20-3.15 | 1.250 | 1.339 | 3.150 |
| BS114 | | K1 1/4-ERT25-3.15 | 1.250 | 1.654 | 3.150 |
| BS115 | | K1 1/4-ERT32-3.15 | 1.250 | 1.969 | 3.150 |

* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

# NC ER COLLET CHUCK

NC






## ■ NC-FOR CNC LATHE

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D1 | D2 | L1 | L2 |
|---|---|---|---|---|---|---|
| **BN110** | NC | NC1 - ER11 | 1.000 | 0.748 | 2.559 | 1.260 |
| **BN111** | | NC1 - ER16 | 1.000 | 1.102 | 2.559 | 1.260 |
| **BN112** | | NC1 - ER20 | 1.000 | 1.339 | 2.559 | 1.260 |
| **BN113** | | NC1 - ER25 | 1.000 | 1.654 | 2.559 | 1.260 |
| **BN114** | | NC1-1/4 - ER20 | 1.250 | 1.339 | 2.756 | 1.260 |
| **BN115** | | NC1-1/4 - ER25 | 1.250 | 1.654 | 2.756 | 1.496 |
| **BN116** | | NC1-1/4 - ER32 | 1.250 | 1.969 | 2.756 | 1.496 |
| **BN117** | | NC1-1/4 - ER40 | 1.250 | 2.480 | 2.953 | 1.496 |
| **BN118** | | NC1-1/2 - ER25 | 1.500 | 1.654 | 2.953 | 2.087 |
| **BN119** | | NC1-1/2 - ER32 | 1.500 | 1.969 | 2.953 | 2.087 |
| **BN120** | | NC1-1/2 - ER40 | 1.500 | 2.480 | 2.953 | 2.087 |

* SUPPLIED WITHOUT WRENCH
* ER COLLETS ON PAGE 962~968 AND NUT/WRENCH/STOP SCREW ON PAGE 961.

## ER NUT

■ FIG.1

| EDP No. | SERIES | TYPE |
|---|---|---|
| ZZ061 | ER11 - NUT | FIG.1 |
| ZZ063 | ER16 - NUT | FIG.1 |
| ZZ066 | ER20 - NUT | FIG.1 |

■ FIG.2

| EDP No. | SERIES | TYPE |
|---|---|---|
| ZZ069 | ER25 - NUT | FIG.2 |
| ZZ072 | ER32 - NUT | FIG.2 |

FIG. 1

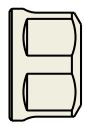
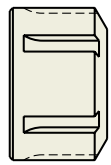


FIG. 2



## ER WRENCH

■ FIG.1

| EDP No. | SERIES | TYPE |
|---|---|---|
| ZZ062 | ER11 | FIG.1 |
| ZZ064 | ER16 | FIG.1 |
| ZZ067 | ER20 | FIG.1 |

■ FIG.2

| EDP No. | SERIES | TYPE |
|---|---|---|
| ZZ070 | ER25 | FIG.2 |
| ZZ073 | ER32 | FIG.2 |



FIG. 1



FIG. 2

## ER STOP SCREW

FIG. 1

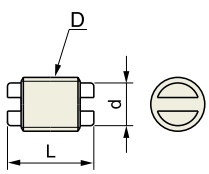
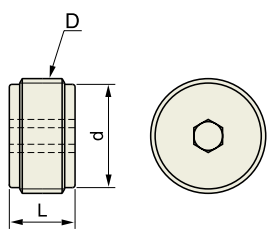



FIG. 2




■ FIG.1

Unit : inch

| EDP No. | SERIES | L | d | D | TYPE |
|---|---|---|---|---|---|
| ZZ060 | ER11 | 0.50 | 0.25 | UN5/16 - 18 | FIG.1 |

■ FIG.2

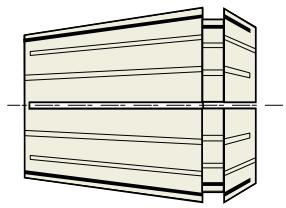
Unit : inch

| EDP No. | SERIES | L | d | D | TYPE |
|---|---|---|---|---|---|
| ZZ065 | ER16 | 0.50 | 0.35 | UN7/16 - 16 | FIG.2 |
| ZZ068 | ER20 | 0.50 | 0.48 | UN9/16 - 16 | FIG.2 |
| ZZ071 | ER25 | 0.50 | 0.60 | UN11/16 - 16 | FIG.2 |
| ZZ074 | ER32 | 0.50 | 0.79 | UN7/8 - 16 | FIG.2 |

# ER COLLET (INCH TYPE)







Unit : inch

| TYPE ER11 | | TYPE ER16 | | TYPE ER20 | | TYPE ER25 | | TYPE ER32 | | TYPE ER40 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY |
| 110116 | 1/16 | 160116 | 1/16 | 200116 | 1/16 | 250116 | 1/16 | 320332 | 3/32 | 400108 | 1/8 |
| 110332 | 3/32 | 160332 | 3/32 | 200332 | 3/32 | 250332 | 3/32 | 320108 | 1/8 | 400532 | 5/32 |
| 110108 | 1/8 | 160108 | 1/8 | 200108 | 1/8 | 250108 | 1/8 | 320532 | 5/32 | 400316 | 3/16 |
| 110532 | 5/32 | 160532 | 5/32 | 200532 | 5/32 | 250532 | 5/32 | 320316 | 3/16 | 400732 | 7/32 |
| 110316 | 3/16 | 160316 | 3/16 | 200316 | 3/16 | 250316 | 3/16 | 320732 | 7/32 | 400104 | 1/4 |
| 110732 | 7/32 | 160732 | 7/32 | 200732 | 7/32 | 250732 | 7/32 | 320104 | 1/4 | 400932 | 9/32 |
| 110104 | 1/4 | 160104 | 1/4 | 200104 | 1/4 | 250104 | 1/4 | 320932 | 9/32 | 400516 | 5/16 |
| | | 160932 | 9/32 | 200932 | 9/32 | 250932 | 9/32 | 320516 | 5/16 | 401132 | 11/32 |
| | | 160516 | 5/16 | 200516 | 5/16 | 250516 | 5/16 | 321132 | 11/32 | 400308 | 3/8 |
| | | 161132 | 11/32 | 201132 | 11/32 | 251132 | 11/32 | 320308 | 3/8 | 401332 | 13/32 |
| | | 160308 | 3/8 | 200308 | 3/8 | 250308 | 3/8 | 321332 | 13/32 | 400716 | 7/16 |
| | | 161332 | 13/32 | 201332 | 13/32 | 251332 | 13/32 | 320716 | 7/16 | 401532 | 15/32 |
| | | | | 200716 | 7/16 | 250716 | 7/16 | 321532 | 15/32 | 400102 | 1/2 |
| | | | | 201532 | 15/32 | 251532 | 15/32 | 320102 | 1/2 | 401732 | 17/32 |
| | | | | 200102 | 1/2 | 250102 | 1/2 | 321732 | 17/32 | 400916 | 9/16 |
| | | | | | | 251732 | 17/32 | 320916 | 9/16 | 401932 | 19/32 |
| | | | | | | 250916 | 9/16 | 321932 | 19/32 | 400508 | 5/8 |
| | | | | | | 251932 | 19/32 | 320508 | 5/8 | 402132 | 21/32 |
| | | | | | | 250508 | 5/8 | 322132 | 21/32 | 401116 | 11/16 |
| | | | | | | | | 321116 | 11/16 | 402332 | 23/32 |
| | | | | | | | | 322332 | 23/32 | 400304 | 3/4 |
| | | | | | | | | 320304 | 3/4 | 402532 | 25/32 |
| | | | | | | | | | | 401316 | 13/16 |
| | | | | | | | | | | 402732 | 27/32 |
| | | | | | | | | | | 400708 | 7/8 |
| | | | | | | | | | | 402932 | 29/32 |
| | | | | | | | | | | 401516 | 15/16 |
| | | | | | | | | | | 403132 | 31/32 |
| | | | | | | | | | | 401000 | 1 |
| ER11S07 | STANDARD SET | ER16S12 | STANDARD SET | ER20S15 | STANDARD SET | ER25S19 | STANDARD SET | ER32S22 | STANDARD SET | ER40S29 | STANDARD SET |
| Ø 1/16" to 1/4" | | Ø 1/16" to 13/32" | | Ø 1/16" to 1/2" | | Ø 1/16" to 5/8" | | Ø 3/32" to 3/4" | | Ø 1/8" to 1" | |
| 7PCS | | 12PCS | | 15PCS | | 19PCS | | 22PCS | | 29PCS | |

*** HIGH PRECISION ER COLLETS(T.I.R ≤ 0.0002" at 3D) ARE AVAILABLE ON REQUEST.**

## ER COLLET (METRIC TYPE)





Unit : mm

| TYPE ER8 | | TYPE ER11 | | TYPE ER16 | | TYPE ER20 | |
|---|---|---|---|---|---|---|---|
| EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE |
| **208010** | 1.0-0.5 | **211010** | 1.0-0.5 | **216010** | 1.0-0.5 | **220010** | 1.0-0.5 |
| **208015** | 1.5-1.0 | **211015** | 1.5-1.0 | **216015** | 1.5-1.0 | **220015** | 1.5-1.0 |
| **208020** | 2.0-1.5 | **211020** | 2.0-1.5 | **216020** | 2.0-1.0 | **220020** | 2.0-1.0 |
| **208025** | 2.5-2.0 | **211025** | 2.5-2.0 | **216025** | 2.5-2.0 | **220025** | 2.5-2.0 |
| **208030** | 3.0-2.5 | **211030** | 3.0-2.5 | **216030** | 3.0-2.0 | **220030** | 3.0-2.0 |
| **208035** | 3.5-3.0 | **211035** | 3.5-3.0 | **216040** | 4.0-3.0 | **220040** | 4.0-3.0 |
| **208040** | 4.0-3.5 | **211040** | 4.0-3.5 | **216050** | 5.0-4.0 | **220050** | 5.0-4.0 |
| **208045** | 4.5-4.0 | **211045** | 4.5-4.0 | **216060** | 6.0-5.0 | **220060** | 6.0-5.0 |
| **208050** | 5.0-4.5 | **211050** | 5.0-4.5 | **216070** | 7.0-6.0 | **220070** | 7.0-6.0 |
| | | **211055** | 5.5-5.0 | **216080** | 8.0-7.0 | **220080** | 8.0-7.0 |
| | | **211060** | 6.0-5.5 | **216090** | 9.0-8.0 | **220090** | 9.0-8.0 |
| | | **211065** | 6.5-6.0 | **216100** | 10.0-9.0 | **220100** | 10.0-9.0 |
| | | **211070** | 7.0-6.5 | | | **220110** | 11.0-10.0 |
| | | | | | | **220120** | 12.0-11.0 |
| | | | | | | **220130** | 13.0-12.0 |
| | | | | | | | |
| 208000 | STANDARD SET | 211000 | STANDARD SET | 216000 | STANDARD SET | 220000 | STANDARD SET |
| Ø 1.0-5.0mm | | Ø 1.0-7.0mm | | Ø 1.0-10.0mm | | Ø 2.0-13.0mm | |
| 9PCS | | 13PCS | | 10PCS | | 12PCS | |
| 108110 | WOODEN TRAY ZWT 8 | 011110 | WOODEN TRAY ZWT 11 | 016110 | WOODEN TRAY ZWT 16 | 020110 | WOODEN TRAY ZWT 20 |

*** HIGH PRECISION ER COLLETS(T.I.R ≤ 0.0002" at 3D) ARE AVAILABLE ON REQUEST.**

# ER COLLET (METRIC TYPE)



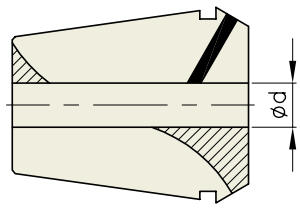
Unit : mm

| TYPE ER25 | | TYPE ER32 | | TYPE ER40 | | TYPE ER50 | |
|---|---|---|---|---|---|---|---|
| EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE | EDP No. | CLAMPING RANGE |
| **225010** | 1.0-1.5 | **232020** | 2.0-1.0 | **240030** | 3.0-2.0 | **250060** | 6.0-4.0 |
| **225015** | 1.5-1.0 | **232025** | 2.5-2.0 | **240040** | 4.0-3.0 | **250080** | 8.0-6.0 |
| **225020** | 2.0-1.0 | **232030** | 3.0-2.0 | **240050** | 5.0-4.0 | **250100** | 10.0-8.0 |
| **225025** | 2.5-2.0 | **232040** | 4.0-3.0 | **240060** | 6.0-5.0 | **250120** | 12.0-10.0 |
| **225030** | 3.0-2.0 | **232050** | 5.0-4.0 | **240070** | 7.0-6.0 | **250140** | 14.0-12.0 |
| **225040** | 4.0-3.0 | **232060** | 6.0-5.0 | **240080** | 8.0-7.0 | **250160** | 16.0-14.0 |
| **225050** | 5.0-4.0 | **232070** | 7.0-6.0 | **240090** | 9.0-8.0 | **250180** | 18.0-16.0 |
| **225060** | 6.0-5.0 | **232080** | 8.0-7.0 | **240100** | 10.0-9.0 | **250200** | 20.0-18.0 |
| **225070** | 7.0-6.0 | **232090** | 9.0-8.0 | **240110** | 11.0-10.0 | **250220** | 22.0-20.0 |
| **225080** | 8.0-7.0 | **232100** | 10.0-9.0 | **240120** | 12.0-11.0 | **250240** | 24.0-22.0 |
| **225090** | 9.0-8.0 | **232110** | 11.0-10.0 | **240130** | 13.0-12.0 | **250250** | 25.0-23.0 |
| **225100** | 10.0-9.0 | **232120** | 12.0-11.0 | **240140** | 14.0-13.0 | **250260** | 26.0-24.0 |
| **225110** | 11.0-10.0 | **232130** | 13.0-12.0 | **240150** | 15.0-14.0 | **250280** | 28.0-26.0 |
| **225120** | 12.0-11.0 | **232140** | 14.0-13.0 | **240160** | 16.0-15.0 | **250300** | 30.0-28.0 |
| **225130** | 13.0-12.0 | **232150** | 15.0-14.0 | **240170** | 17.0-16.0 | **250320** | 32.0-30.0 |
| **225140** | 14.0-13.0 | **232160** | 16.0-15.0 | **240180** | 18.0-17.0 | **250340** | 34.0-32.0 |
| **225150** | 15.0-14.0 | **232170** | 17.0-16.0 | **240190** | 19.0-18.0 | | |
| **225160** | 16.0-15.0 | **232180** | 18.0-17.0 | **240200** | 20.0-19.0 | | |
| | | **232190** | 19.0-18.0 | **240210** | 21.0-20.0 | | |
| | | **232200** | 20.0-19.0 | **240220** | 22.0-21.0 | | |
| | | | | **240230** | 23.0-22.0 | | |
| | | | | **240240** | 24.0-23.0 | | |
| | | | | **240250** | 25.0-24.0 | | |
| | | | | **240260** | 26.0-25.0 | | |
| | | | | **240270** | 27.0-26.0 | | |
| | | | | **240280** | 28.0-27.0 | | |
| | | | | **240290** | 29.0-28.0 | | |
| | | | | **240300** | 30.0-29.0 | | |
| 225000 | STANDARD SET | 232000 | STANDARD SET | 240000 | STANDARD SET | 250000 | STANDARD SET |
| Ø 2.0-16.0mm | | Ø 3.0-20.0mm | | Ø 4.0-26.0mm | | Ø 12.0-34.0mm | |
| 15PCS | | 18PCS | | 23PCS | | 12PCS | |
| 025110 | WOODEN TRAY ZWT 25 | 032110 | WOODEN TRAY ZWT 32 | 040110 | WOODEN TRAY ZWT 40 | 050110 | WOODEN TRAY ZWT 50 |

*** HIGH PRECISION ER COLLETS(T.I.R ≤ 0.0002" at 3D) ARE AVAILABLE ON REQUEST.**

## SEALED ER COLLET (INCH TYPE)





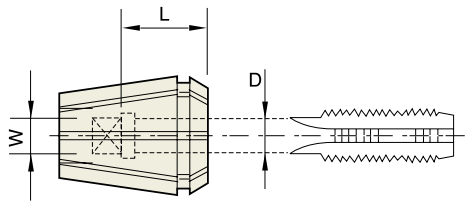

Unit : inch

| TYPE ER11S | | TYPE ER16S | | TYPE ER20S | | TYPE ER25S | | TYPE ER32S | | TYPE ER40S | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY | EDP No. | CLAMPING CAPACITY |
| **110108S** | 1/8 | **160108S** | 1/8 | **200108S** | 1/8 | **250108S** | 1/8 | **320108S** | 1/8 | **400108S** | 1/8 |
| **110532S** | 5/32 | **160532S** | 5/32 | **200532S** | 5/32 | **250532S** | 5/32 | **320532S** | 5/32 | **400532S** | 5/32 |
| **110316S** | 3/16 | **160316S** | 3/16 | **200316S** | 3/16 | **250316S** | 3/16 | **320316S** | 3/16 | **400316S** | 3/16 |
| **110732S** | 7/32 | **160732S** | 7/32 | **200732S** | 7/32 | **250732S** | 7/32 | **320732S** | 7/32 | **400732S** | 7/32 |
| **110104S** | 1/4 | **160104S** | 1/4 | **200104S** | 1/4 | **250104S** | 1/4 | **320104S** | 1/4 | **400104S** | 1/4 |
| | | **160932S** | 9/32 | **200932S** | 9/32 | **250932S** | 9/32 | **320932S** | 9/32 | **400932S** | 9/32 |
| | | **160516S** | 5/16 | **200516S** | 5/16 | **250516S** | 5/16 | **320516S** | 5/16 | **400516S** | 5/16 |
| | | **161132S** | 11/32 | **201132S** | 11/32 | **251132S** | 11/32 | **321132S** | 11/32 | **401132S** | 11/32 |
| | | **160308S** | 3/8 | **200308S** | 3/8 | **250308S** | 3/8 | **320308S** | 3/8 | **400308S** | 3/8 |
| | | **161332S** | 13/32 | **201332S** | 13/32 | **251332S** | 13/32 | **321332S** | 13/32 | **401332S** | 13/32 |
| | | | | **200716S** | 7/16 | **250716S** | 7/16 | **320716S** | 7/16 | **400716S** | 7/16 |
| | | | | **201532S** | 15/32 | **251532S** | 15/32 | **321532S** | 15/32 | **401532S** | 15/32 |
| | | | | **200102S** | 1/2 | **250102S** | 1/2 | **320102S** | 1/2 | **400102S** | 1/2 |
| | | | | | | **251732S** | 17/32 | **321732S** | 17/32 | **401732S** | 17/32 |
| | | | | | | **250916S** | 9/16 | **320916S** | 9/16 | **400916S** | 9/16 |
| | | | | | | **251932S** | 19/32 | **321932S** | 19/32 | **401932S** | 19/32 |
| | | | | | | **250508S** | 5/8 | **320508S** | 5/8 | **400508S** | 5/8 |
| | | | | | | | | **322132S** | 21/32 | **402132S** | 21/32 |
| | | | | | | | | **321116S** | 11/16 | **401116S** | 11/16 |
| | | | | | | | | **322332S** | 23/32 | **402332S** | 23/32 |
| | | | | | | | | **320304S** | 3/4 | **400304S** | 3/4 |
| | | | | | | | | | | **402532S** | 25/32 |
| | | | | | | | | | | **401316S** | 13/16 |
| | | | | | | | | | | **402732S** | 27/32 |
| | | | | | | | | | | **400708S** | 7/8 |
| | | | | | | | | | | **402932S** | 29/32 |
| | | | | | | | | | | **401516S** | 15/16 |
| | | | | | | | | | | **403132S** | 31/32 |
| | | | | | | | | | | **401000S** | 1 |
| ER11S05S | STANDARD SET | ER16S10S | STANDARD SET | ER20S13S | STANDARD SET | ER25S17S | STANDARD SET | ER32S21S | STANDARD SET | ER40S29S | STANDARD SET |
| Ø 1/8" to 1/4" | | Ø 1/8" to 13/32" | | Ø 1/8" to 1/2" | | Ø 1/8" to 5/8" | | Ø 1/8" to 3/4" | | Ø 1/8" to 1" | |
| 5PCS | | 10PCS | | 13PCS | | 17PCS | | 21PCS | | 29PCS | |

*** METRIC SEALED ER COLLETS ARE AVAILABLE ON REQUEST.**

# TAP ER COLLET (INCH TYPE)






## ■ FOR STANDARD TAPS

Unit : inch

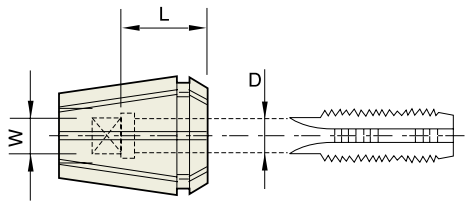
| RD 11TC | | | | | | RD 16TC | | | | | | RD 20TC | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L |
| | Inch | Metric | | | | | Inch | Metric | | | | | Inch | Metric | | | |
| 11TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.472 | 16TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.709 | 20TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.709 |
| 11TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.472 | 16TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.709 | 20TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.709 |
| 11TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.472 | 16TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.709 | 20TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.709 |
| 11TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.551 | 16TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.709 | 20TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.709 |
| 11TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.551 | 16TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.709 | 20TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.709 |
| | | | | | | 16TC3123 | 5/16 | M7+M8 | 0.318 | 0.238 | 0.709 | 20TC3123 | 5/16 | M7+M8 | 0.318 | 0.238 | 0.866 |
| | | | | | | 16TC3224 | 7/16 | - | 0.323 | 0.242 | 0.709 | 20TC3224 | 7/16 | - | 0.323 | 0.242 | 0.866 |
| | | | | | | | | | | | | 20TC3622 | 1/2 | M10 | 0.367 | 0.275 | 0.866 |
| | | | | | | | | | | | | 20TC3828 | 3/8 | M12+M12.5 | 0.381 | 0.286 | 0.866 |

| RD 25TC | | | | | | RD 32TC | | | | | | RD 40TC | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L |
| | Inch | Metric | | | | | Inch | Metric | | | | | Inch | Metric | | | |
| 25TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.709 | 32TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.709 | 40TC1411 | #6 1/8 | M3 | 0.141 | 0.110 | 0.709 |
| 25TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.709 | 32TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.709 | 40TC1613 | #8 5/32 | M4 | 0.168 | 0.131 | 0.709 |
| 25TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.709 | 32TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.709 | 40TC1915 | #10 3/16 | M4.5+M5 | 0.194 | 0.152 | 0.709 |
| 25TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.709 | 32TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.709 | 40TC2216 | #12 7/32 | - | 0.220 | 0.165 | 0.709 |
| 25TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.709 | 32TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.709 | 40TC2519 | #14 1/4 | M6+M6.5 | 0.255 | 0.191 | 0.709 |
| 25TC3123 | 5/16 | M7+M8 | 0.318 | 0.238 | 0.866 | 32TC3123 | 5/16 | M7+M8 | 0.318 | 0.238 | 0.866 | 40TC3123 | 5/16 | M7+M8 | 0.318 | 0.238 | 0.866 |
| 25TC3224 | 7/16 | - | 0.323 | 0.242 | 0.866 | 32TC3224 | 7/16 | - | 0.323 | 0.242 | 0.866 | 40TC3224 | 7/16 | - | 0.323 | 0.242 | 0.866 |
| 25TC3622 | 1/2 | M10 | 0.367 | 0.275 | 0.866 | 32TC3627 | 1/2 | M10 | 0.367 | 0.275 | 0.866 | 40TC3627 | 1/2 | M10 | 0.367 | 0.275 | 0.866 |
| 25TC3828 | 3/8 | M12+M12.5 | 0.381 | 0.286 | 0.866 | 32TC3828 | 3/8 | M12+M12.5 | 0.381 | 0.286 | 0.866 | 40TC3828 | 3/8 | M12+M12.5 | 0.381 | 0.286 | 0.866 |
| 25TC4232 | 9/16 | M14 | 0.429 | 0.322 | 0.984 | 32TC4232 | 9/16 | M14 | 0.429 | 0.322 | 0.984 | 40TC4232 | 9/16 | M14 | 0.429 | 0.322 | 0.984 |
| 25TC4836 | 5/8 | M16 | 0.480 | 0.360 | 0.984 | 32TC4836 | 5/8 | M16 | 0.480 | 0.360 | 0.984 | 40TC4836 | 5/8 | M16 | 0.480 | 0.360 | 0.984 |
| 25TC5440 | 11/16 | M18 | 0.542 | 0.406 | 0.984 | 32TC5440 | 11/16 | M18 | 0.542 | 0.406 | 0.984 | 40TC5440 | 11/16 | M18 | 0.542 | 0.406 | 0.984 |
| 25TC5944 | 3/4 | - | 0.590 | 0.442 | 0.984 | 32TC5944 | 3/4 | - | 0.590 | 0.442 | 0.984 | 40TC5944 | 3/4 | - | 0.590 | 0.442 | 0.984 |
| | | | | | | 32TC6548 | 13/16 | M20 | 0.652 | 0.489 | 0.984 | 40TC6548 | 13/16 | M20 | 0.652 | 0.489 | 0.984 |
| | | | | | | | | | | | | 40TC6952 | 7/8 | M22 | 0.697 | 0.523 | 0.984 |
| | | | | | | | | | | | | 40TC7657 | 15/16 | M24 | 0.760 | 0.570 | 0.984 |
| | | | | | | | | | | | | 40TC8060 | 1 | M25 | 0.800 | 0.600 | 1.102 |

# TAP ER COLLET (INCH TYPE)








## ■ FOR PIPE TAPS

Unit : inch

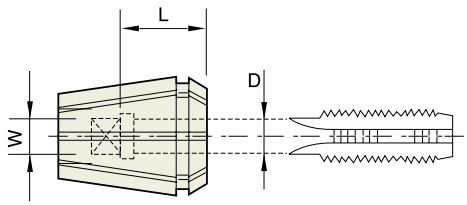
| RD 16TCP | | | | | | RD 20TCP | | | | | | RD 25TCP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L |
| | Inch | Metric | | | | | Inch | Metric | | | | | Inch | Metric | | | |
| 16TP3123 | 1/8(SS) | - | 0.312 | 0.234 | 0.709 | 20TP3123 | 1/8(SS) | - | 0.312 | 0.234 | 0.787 | 25TP3123 | 1/8(SS) | - | 0.312 | 0.234 | 0.787 |
| 16TP4332 | 1/8(LS) | - | 0.437 | 0.328 | 0.709 | 20TP4332 | 1/8(LS) | - | 0.437 | 0.328 | 0.787 | 25TP4332 | 1/8(LS) | - | 0.437 | 0.328 | 0.787 |
| | | | | | | | | | | | | 25TP5642 | 1/4 | - | 0.562 | 0.420 | 0.787 |

| RD 32TCP | | | | | | RD 40TCP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | TAP | | D(Φ) | W(□) | L | EDP No. | TAP | | D(Φ) | W(□) | L |
| | Inch | Metric | | | | | Inch | Metric | | | |
| 32TP3123 | 1/8(SS) | - | 0.312 | 0.234 | 0.787 | 40TP3123 | 1/8(SS) | - | 0.312 | 0.234 | 0.787 |
| 32TP4332 | 1/8(LS) | - | 0.437 | 0.328 | 0.787 | 40TP4332 | 1/8(LS) | - | 0.437 | 0.328 | 0.787 |
| 32TP5642 | 1/4 | - | 0.562 | 0.420 | 0.787 | 40TP5642 | 1/4 | - | 0.562 | 0.420 | 0.787 |
| | | | | | | 40TP7053 | 3/8 | | 0.700 | 0.530 | 0.866 |
| | | | | | | 40TP6851 | 1/2 | | 0.687 | 0.515 | 0.866 |
| | | | | | | 40TP9067 | 3/4 | | 0.906 | 0.679 | 0.945 |

* SS : SHORT SERIES  LS : LONG SERIES

# TAP ER COLLET (METRIC TYPE)






Unit : mm

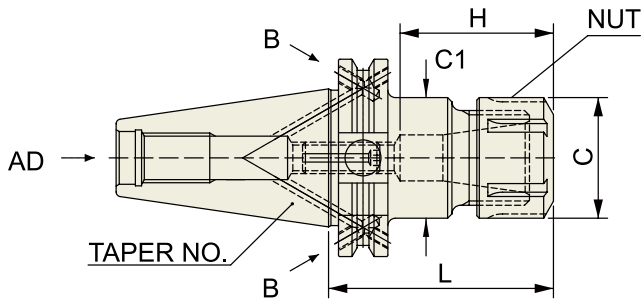
| RDT 16 | | | | | RDT 20 | | | | | RDT 25 | | | | | RDT 32 | | | | | RDT 40 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EDP No. | TAP | D (Φ) | W (□) | L | EDP No. | TAP | D (Φ) | W (□) | L | EDP No. | TAP | D (Φ) | W (□) | L | EDP No. | TAP | D (Φ) | W (□) | L | EDP No. | TAP | D (Φ) | W (□) | L |
| 16T30025 | M2 | 3.0 | 2.5 | 15 | | | | | | | | | | | | | | | | | | | | |
| 16T40032 | M3 | 4.0 | 3.2 | 15 | 20T40032 | M3 | 4.0 | 3.2 | 15 | 25T40032 | M3 | 4.0 | 3.2 | 15 | | | | | | | | | | |
| 16T50040 | M4 | 5.0 | 4.0 | 15 | 20T50040 | M4 | 5.0 | 4.0 | 15 | 25T50032 | M4 | 5.0 | 4.0 | 15 | 32T50040 | M4 | 5.0 | 4.0 | 15 | | | | | |
| 16T55045 | M5 | 5.5 | 4.5 | 15 | 20T55045 | M5 | 5.5 | 4.5 | 15 | 25T55045 | M5 | 5.5 | 4.5 | 15 | 32T55045 | M5 | 5.5 | 4.5 | 15 | | | | | |
| 16T60045 | M6 | 6.0 | 4.5 | 15 | 20T60045 | M6 | 6.0 | 4.5 | 15 | 25T60045 | M6 | 6.0 | 4.5 | 15 | 32T60045 | M6 | 6.0 | 4.5 | 15 | | | | | |
| 16T62050 | M8 | 6.2 | 5.0 | 15 | 20T62050 | M8 | 6.2 | 5.0 | 20 | 25T62050 | M8 | 6.2 | 5.0 | 20 | 32T62050 | M8 | 6.2 | 5.0 | 20 | 40T62050 | M8 | 6.2 | 5.0 | 20 |
| | | | | | 20T70055 | M10 | 7.0 | 5.5 | 20 | 25T70055 | M10 | 7.0 | 5.5 | 20 | 32T70055 | M10 | 7.0 | 5.5 | 20 | 40T70055 | M10 | 7.0 | 5.5 | 20 |
| | | | | | | | | | | 25T85065 | M12 | 8.5 | 6.5 | 20 | 32T85065 | M12 | 8.5 | 6.5 | 20 | 40T85065 | M12 | 8.5 | 6.5 | 25 |
| | | | | | | | | | | 25T10580 | M14 | 10.5 | 8.0 | 20 | 32T10560 | M14 | 10.5 | 8.0 | 20 | 40T10580 | M14 | 10.5 | 8.0 | 25 |
| | | | | | | | | | | | | | | | 32T12510 | M16 | 12.5 | 10.0 | 20 | 40T12510 | M16 | 12.5 | 10.0 | 25 |
| | | | | | | | | | | | | | | | 32T14011 | M18 | 14.0 | 11.0 | 20 | 40T14011 | M18 | 14.0 | 11.0 | 25 |
| | | | | | | | | | | | | | | | | | | | | 40T15012 | M20 | 15.0 | 12.0 | 28 |
| | | | | | | | | | | | | | | | | | | | | 40T17013 | M22 | 17.0 | 13.0 | 28 |
| | | | | | | | | | | | | | | | | | | | | 40T19015 | M24 | 19.0 | 15.0 | 28 |

# DUAL CONTACT SK SLIM CHUCK

CCT








| CCT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD/B |

## ■ CCT (CAT DUAL CONTACT)

Unit : inch

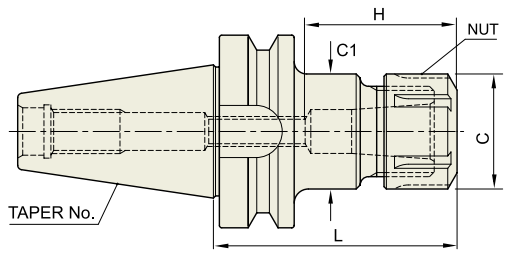
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | C | C1 | H | | COLLET |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Min. | Max. | |
| TB020 | 40 | CCT40 AD/B - SKA6-3.54 | 0.036-0.236 | 3.540 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TB021 | | CCT40 AD/B - SKA6-4.72 | 0.036-0.236 | 4.720 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TB022 | | CCT40 AD/B - SKA6-5.90 | 0.036-0.236 | 5.900 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TB023 | | CCT40 AD/B - SKA10-3.54 | 0.068-0.394 | 3.540 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TB024 | | CCT40 AD/B - SKA10-4.72 | 0.068-0.394 | 4.720 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TB025 | | CCT40 AD/B - SKA10-5.90 | 0.068-0.394 | 5.900 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TB026 | | CCT40 AD/B - SKA13-3.54 | 0.108-0.512 | 3.540 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TB027 | | CCT40 AD/B - SKA13-4.72 | 0.108-0.512 | 4.720 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TB028 | | CCT40 AD/B - SKA13-5.90 | 0.108-0.512 | 5.900 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TB029 | | CCT40 AD/B - SKA16-3.54 | 0.108-0.630 | 3.540 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TB030 | | CCT40 AD/B - SKA16-4.72 | 0.108-0.630 | 4.720 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TB031 | | CCT40 AD/B - SKA16-5.90 | 0.108-0.630 | 5.900 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TB032 | | CCT40 AD/B - SKA20-3.54 | 0.138-0.787 | 3.540 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TB033 | | CCT40 AD/B - SKA20-4.72 | 0.138-0.787 | 4.720 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TB034 | | CCT40 AD/B - SKA20-5.90 | 0.138-0.787 | 5.900 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TB035 | | CCT40 AD/B - SKA25-3.54 | 0.630-1.000 | 3.540 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TB036 | | CCT40 AD/B - SKA25-4.72 | 0.630-1.000 | 4.720 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TB037 | | CCT40 AD/B - SKA25-5.90 | 0.630-1.000 | 5.900 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TC020 | 50 | CCT50 AD/B - SKA6-4.13 | 0.036-0.236 | 4.130 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TC021 | | CCT50 AD/B - SKA6-5.31 | 0.036-0.236 | 5.310 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TC022 | | CCT50 AD/B - SKA6-6.50 | 0.036-0.236 | 6.500 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TC023 | | CCT50 AD/B - SKA6-7.68 | 0.036-0.236 | 7.680 | 0.787 | 0.768 | 0.827 | 1.378 | SKC6 |
| TC024 | | CCT50 AD/B - SKA10-4.13 | 0.068-0.394 | 4.130 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TC025 | | CCT50 AD/B - SKA10-5.31 | 0.068-0.394 | 5.310 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TC026 | | CCT50 AD/B - SKA10-6.50 | 0.068-0.394 | 6.500 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TC027 | | CCT50 AD/B - SKA10-7.68 | 0.068-0.394 | 7.680 | 1.102 | 1.083 | 1.181 | 1.969 | SKC10 |
| TC028 | | CCT50 AD/B - SKA13-4.13 | 0.108-0.512 | 4.130 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TC029 | | CCT50 AD/B - SKA13-5.31 | 0.108-0.512 | 5.310 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TC030 | | CCT50 AD/B - SKA13-6.50 | 0.108-0.512 | 6.500 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TC031 | | CCT50 AD/B - SKA13-7.68 | 0.108-0.512 | 7.680 | 1.299 | 1.299 | 1.220 | 2.559 | SKC13 |
| TC032 | | CCT50 AD/B - SKA16-4.13 | 0.108-0.630 | 4.130 | 1.575 | 1.575 | 1.772 | 2.362 | SKC16 |
| TC033 | | CCT50 AD/B - SKA16-5.31 | 0.108-0.630 | 5.310 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TC034 | | CCT50 AD/B - SKA16-6.50 | 0.108-0.630 | 6.500 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TC035 | | CCT50 AD/B - SKA16-7.68 | 0.108-0.630 | 7.680 | 1.575 | 1.575 | 1.772 | 2.756 | SKC16 |
| TC036 | | CCT50 AD/B - SKA20-4.13 | 0.138-0.787 | 4.130 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TC037 | | CCT50 AD/B - SKA20-5.31 | 0.138-0.787 | 5.310 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TC038 | | CCT50 AD/B - SKA20-6.50 | 0.138-0.787 | 6.500 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TC039 | | CCT50 AD/B - SKA20-7.68 | 0.138-0.787 | 7.680 | 1.909 | 1.909 | 1.850 | 3.150 | SKC20 |
| TC040 | | CCT50 AD/B - SKA25-4.13 | 0.630-1.000 | 4.130 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TC041 | | CCT50 AD/B - SKA25-5.31 | 0.630-1.000 | 5.310 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TC042 | | CCT50 AD/B - SKA25-6.50 | 0.630-1.000 | 6.500 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |
| TC043 | | CCT50 AD/B - SKA25-7.68 | 0.630-1.000 | 7.680 | 2.165 | 2.165 | 2.165 | 3.346 | SKC25 |

* SK COLLET ON PAGE 973~975.

# DUAL CONTACT SK SLIM CHUCK

# CBT






| CBT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

## ■ CBT (BT DUAL CONTACT)

Unit : mm

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | C | C1 | H | | COLLET |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Min. | Max. | |
| TD100 | 30 | CBT30 - SKA06-60 | 0.9-6.0 | 60 | 20 | 19.5 | 21 | 35 | SKC6 |
| TD102 | | CBT30 - SKA06-90 | 0.9-6.0 | 90 | 20 | 19.5 | 21 | 35 | SKC6 |
| TD104 | | CBT30 - SKA10-60 | 1.75-10.0 | 60 | 28 | 27.5 | 30 | 50 | SKC10 |
| TD106 | | CBT30 - SKA10-90 | 1.75-10.0 | 90 | 28 | 27.5 | 30 | 50 | SKC10 |
| TD108 | | CBT30 - SKA13-60 | 2.75-13.0 | 60 | 33 | 33 | 31 | 65 | SKC13 |
| TD110 | | CBT30 - SKA13-90 | 2.75-13.0 | 90 | 33 | 33 | 31 | 65 | SKC13 |
| TD112 | | CBT30 - SKA16-60 | 2.75-16.0 | 60 | 40 | 40 | 45 | 60 | SKC16 |
| TD114 | | CBT30 - SKA16-90 | 2.75-16.0 | 90 | 40 | 40 | 45 | 60 | SKC16 |
| TD116 | | CBT30 - SKA20-60 | 4.0-20.0 | 60 | 48.5 | 48.5 | 65 | 75 | SKC20 |
| TD118 | | CBT30 - SKA20-90 | 4.0-20.0 | 90 | 48.5 | 48.5 | 65 | 75 | SKC20 |
| TD120 | | CBT30 - SKA25-90 | 16.0-25.4 | 90 | 55 | 55 | 55 | 75 | SKC25 |
| TE100 | 40 | CBT40 - SKA06-90 | 0.9-6.0 | 90 | 20 | 19.5 | 21 | 35 | SKC6 |
| TE102 | | CBT40 - SKA06-120 | 0.9-6.0 | 120 | 20 | 19.5 | 21 | 35 | SKC6 |
| TE104 | | CBT40 - SKA06-150 | 0.9-6.0 | 150 | 20 | 19.5 | 21 | 35 | SKC6 |
| TE106 | | CBT40 - SKA10-90 | 1.75-10.0 | 90 | 28 | 27.5 | 30 | 50 | SKC10 |
| TE108 | | CBT40 - SKA10-120 | 1.75-10.0 | 120 | 28 | 27.5 | 30 | 50 | SKC10 |
| TE110 | | CBT40 - SKA10-150 | 1.75-10.0 | 150 | 28 | 27.5 | 30 | 50 | SKC10 |
| TE112 | | CBT40 - SKA13-90 | 2.75-13.0 | 90 | 33 | 33 | 31 | 65 | SKC13 |
| TE114 | | CBT40 - SKA13-120 | 2.75-13.0 | 120 | 33 | 33 | 31 | 65 | SKC13 |
| TE116 | | CBT40 - SKA13-150 | 2.75-13.0 | 150 | 33 | 40 | 31 | 65 | SKC13 |
| TE118 | | CBT40 - SKA16-90 | 2.75-16.0 | 90 | 40 | 40 | 45 | 70 | SKC16 |
| TE121 | | CBT40 - SKA16-120 | 2.75-16.0 | 120 | 40 | 40 | 45 | 70 | SKC16 |
| TE122 | | CBT40 - SKA16-150 | 2.75-16.0 | 150 | 40 | 40 | 45 | 70 | SKC16 |
| TE124 | | CBT40 - SKA20-90 | 4.0-20.0 | 90 | 48.5 | 48.5 | 47 | 80 | SKC20 |
| TE126 | | CBT40 - SKA20-120 | 4.0-20.0 | 120 | 48.5 | 48.5 | 47 | 80 | SKC20 |
| TE128 | | CBT40 - SKA20-150 | 4.0-20.0 | 150 | 48.5 | 48.5 | 47 | 80 | SKC20 |
| TE130 | | CBT40 - SKA25-90 | 16.0-25.4 | 90 | 55 | 55 | 55 | 85 | SKC25 |
| TE132 | | CBT40 - SKA25-120 | 16.0-25.4 | 120 | 55 | 55 | 55 | 85 | SKC25 |
| TE134 | | CBT40 - SKA25-150 | 16.0-25.4 | 150 | 55 | 55 | 55 | 85 | SKC25 |

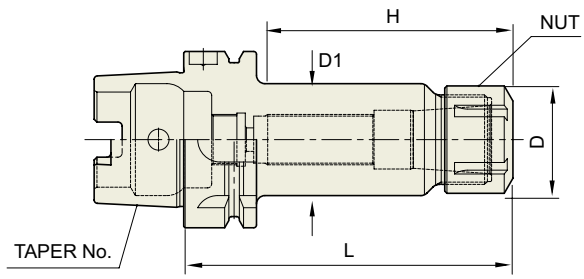
* SK COLLET ON PAGE 973~975.

# DUAL CONTACT SK SLIM CHUCK

HSK








| DIN69893 - HSK | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | - | 2.5 | 25,000 | AD |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

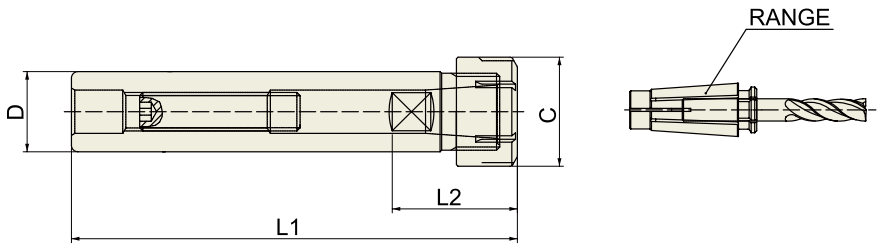
Unit : mm

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | D | D1 | L | H | | COLLET |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Min. | Max. | |
| TQ100 | 63A | HSK63A - SKA06-100 | 0.75-6.0 | 20 | 19.5 | 100 | 21 | 35 | SKC6 |
| TQ102 | | HSK63A - SKA10-100 | 1.75-10.0 | 28 | 27.5 | 100 | 30 | 50 | SKC10 |
| TQ104 | | HSK63A - SKA13-100 | 2.75-13.0 | 33 | 33 | 100 | 31 | 65 | SKC13 |
| TQ106 | | HSK63A - SKA16-120 | 2.75-16.0 | 40 | 40 | 120 | 45 | 70 | SKC16 |
| TQ108 | | HSK63A - SKA20-120 | 4.0-20.0 | 48.5 | 48.5 | 120 | 65 | 75 | SKC20 |
| TQ110 | | HSK63A - SKA25-150 | 16.0-25.4 | 55 | 55 | 150 | 55 | 85 | SKC25 |
| TR100 | 100A | HSK100A - SKA06-120 | 0.75-6.0 | 20 | 19.5 | 120 | 21 | 35 | SKC6 |
| TR102 | | HSK100A - SKA10-150 | 1.75-10.0 | 28 | 27.5 | 150 | 30 | 50 | SKC10 |
| TR104 | | HSK100A - SKA13-150 | 2.75-13.0 | 33 | 40 | 150 | 31 | 65 | SKC13 |
| TR106 | | HSK100A - SKA16-150 | 2.75-16.0 | 40 | 40 | 150 | 45 | 70 | SKC16 |
| TR108 | | HSK100A - SKA20-150 | 4.0-20.0 | 48.5 | 48.5 | 150 | 65 | 75 | SKC20 |
| TR110 | | HSK100A - SKA25-160 | 16.0-25.4 | 55 | 55 | 160 | 55 | 85 | SKC25 |

* SK COLLET ON PAGE 973~975.

# STRAIGHT SK SLIM CHUCK

K




## ■ STRAIGHT-K

Unit : inch

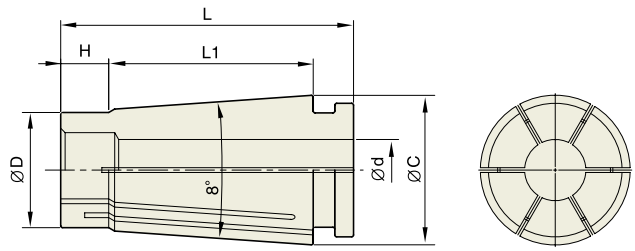
| EDP No. | TAPER No. | MODEL No. | D | C | L1 | L2 |
|---|---|---|---|---|---|---|
| TS020 | K3/4 | K3/4 - SKA6-100 | 0.750 | 0.787 | 3.937 | 0.827-1.378 |
| TS021 | | K3/4 - SKA6-140 | 0.750 | 0.787 | 5.512 | 0.827-1.378 |
| TS022 | | K3/4 - SKA10-100 | 0.750 | 1.102 | 3.937 | 1.181-1.969 |
| TS023 | | K3/4 - SKA10-140 | 0.750 | 1.102 | 5.512 | 1.181-1.969 |
| TS030 | K1 | K1 - SKA6-100 | 1.000 | 0.787 | 3.937 | 0.827-1.378 |
| TS031 | | K1 - SKA6-140 | 1.000 | 0.787 | 5.512 | 0.827-1.378 |
| TS032 | | K1 - SKA10-100 | 1.000 | 1.102 | 3.937 | 1.181-1.969 |
| TS033 | | K1 - SKA10-150 | 1.000 | 1.102 | 5.906 | 1.181-1.969 |
| TS034 | | K1 - SKA13-100 | 1.000 | 1.299 | 3.937 | 1.220-2.559 |
| TS035 | | K1 - SKA13-150 | 1.000 | 1.299 | 5.906 | 1.220-2.559 |
| TS040 | K1 1/4 | K1 1/4 - SKA10-100 | 1.250 | 1.102 | 3.937 | 1.181-1.969 |
| TS041 | | K1 1/4 - SKA10-150 | 1.250 | 1.102 | 5.906 | 1.181-1.969 |
| TS042 | | K1 1/4 - SKA13-100 | 1.250 | 1.299 | 3.937 | 1.220-2.559 |
| TS043 | | K1 1/4 - SKA13-150 | 1.250 | 1.299 | 5.906 | 1.220-2.559 |
| TS044 | | K1 1/4 - SKA16-100 | 1.250 | 1.575 | 3.937 | 1.575-2.756 |
| TS045 | | K1 1/4 - SKA16-150 | 1.250 | 1.575 | 5.906 | 1.575-2.756 |
| TS046 | | K1 1/4 - SKA20-100 | 1.250 | 1.909 | 3.937 | 1.850-3.150 |
| TS047 | | K1 1/4" - SKA20-150 | 1.250 | 1.909 | 5.906 | 1.850-3.150 |

* SK COLLET ON PAGE 973~975.

## SK COLLET (METRIC TYPE)








□ T.I.R of standard collet is 5Um at 3D.
(Special collet with 3Um T.I.R at 3D is available upon request.)

Unit : mm

| EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 306010 | SKC 6 | SKC6 - 1 | 0.9 - 1.0 | 310020 | SKC 10 | SKC10 - 2 | 1.75 - 2.0 | 313030 | SKC 13 | SKC13 - 3 | 2.75 - 3.0 |
| 306015 | | SKC6 - 1.5 | 1.3 - 1.5 | 310025 | | SKC10 - 2.5 | 2.25 - 2.5 | 313035 | | SKC13 - 3.5 | 3.0 - 3.5 |
| 306020 | | SKC6 - 2 | 1.8 - 2.0 | 310030 | | SKC10 - 3 | 2.75 - 3.0 | 313040 | | SKC13 - 4 | 3.5 - 4.0 |
| 306025 | | SKC6 - 2.5 | 2.3 - 2.5 | 310035 | | SKC10 - 3.5 | 3.0 - 3.5 | 313045 | | SKC13 - 4.5 | 4.0 - 4.5 |
| 306030 | | SKC6 - 3 | 2.8 - 3.0 | 310040 | | SKC10 - 4 | 3.5 - 4.0 | 313050 | | SKC13 - 5 | 4.5 - 5.0 |
| 306035 | | SKC6 - 3.5 | 3.0 - 3.5 | 310045 | | SKC10 - 4.5 | 4.0 - 4.5 | 313055 | | SKC13 - 5.5 | 5.0 - 5.5 |
| 306040 | | SKC6 - 4 | 3.5 - 4.0 | 310050 | | SKC10 - 5 | 4.5 - 5.0 | 313060 | | SKC13 - 6 | 5.5 - 6.0 |
| 306045 | | SKC6 - 4.5 | 4.0 - 4.5 | 310055 | | SKC10 - 5.5 | 5.0 - 5.5 | 313065 | | SKC13 - 6.5 | 6.0 - 6.5 |
| 306050 | | SKC6 - 5 | 4.5 - 5.0 | 310060 | | SKC10 - 6 | 5.5 - 6.0 | 313070 | | SKC13 - 7 | 6.5 - 7.0 |
| 306055 | | SKC6 - 5.5 | 5.0 - 5.5 | 310065 | | SKC10 - 6.5 | 6.0 - 6.5 | 313075 | | SKC13 - 7.5 | 7.0 - 7.5 |
| 306060 | | SKC6 - 6 | 5.5 - 6.0 | 310070 | | SKC10 - 7 | 6.5 - 7.0 | 313080 | | SKC13 - 8 | 7.5 - 8.0 |
| | | | | 310075 | | SKC10 - 7.5 | 7.0 - 7.5 | 313085 | | SKC13 - 8.5 | 8.0 - 8.5 |
| | | | | 310080 | | SKC10 - 8 | 7.5 - 8.0 | 313090 | | SKC13 - 9 | 8.5 - 9.0 |
| | | | | 310085 | | SKC10 - 8.5 | 8.0 - 8.5 | 313095 | | SKC13 - 9.5 | 9.0 - 9.5 |
| | | | | 310090 | | SKC10 - 9 | 8.5 - 9.0 | 313100 | | SKC13 - 10 | 9.5 - 10.0 |
| | | | | 310095 | | SKC10 - 9.5 | 9.0 - 9.5 | 313105 | | SKC13 - 10.5 | 10.0 - 10.5 |
| | | | | 310100 | | SKC10 - 10 | 9.5 - 10.0 | 313110 | | SKC13 - 11 | 10.5 - 11.0 |
| | | | | | | | | 313115 | | SKC13 - 11.5 | 11.0 - 11.5 |
| | | | | | | | | 313120 | | SKC13 - 12 | 11.5 - 12.0 |
| | | | | | | | | 313125 | | SKC13 - 12.5 | 12.0 - 12.5 |
| | | | | | | | | 313130 | | SKC13 - 13 | 12.5 - 13.0 |

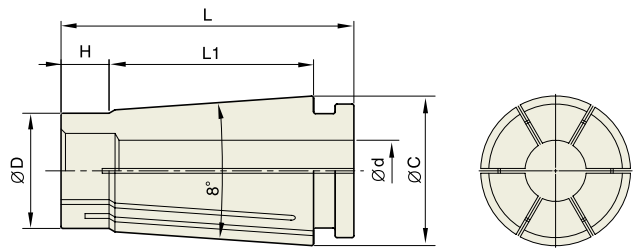
### ■ SKC COLLET Dimension

Unit : mm

| TYPE | D | L | L1 | H | C |
|---|---|---|---|---|---|
| SKC6 | 7.5 | 25.7 | 17.6 | 3.8 | 10 |
| SKC10 | 12 | 32 | 21.3 | 5 | 15 |
| SKC13 | 15.4 | 39 | 28.3 | 5.5 | 20 |
| SKC16 | 18.8 | 46 | 32 | 8 | 24 |
| SKC20 | 22.5 | 54.2 | 41 | 8 | 29 |
| SKC25 | 28.9 | 58.2 | 43 | 8.5 | 35 |

# SK COLLET (METRIC TYPE)






□ T.I.R of standard collet is 5Um at 3D.
(Special collet with 3Um T.I.R at 3D is available upon request.)

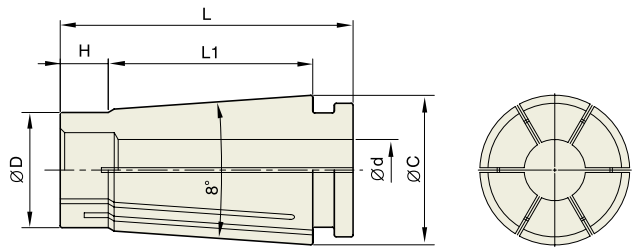
Unit : mm

| EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 316030 | SKC 16 | SKC16 - 3 | 2.75 - 3.0 | 323040 | SKC 20 | SKC20 - 4 | 3.5 - 4.0 | 325165 | SKC 25 | SKC25 - 16.5 | 16.0 - 16.5 |
| 316035 | | SKC16 - 3.5 | 3.0 - 3.5 | 323045 | | SKC20 - 4.5 | 4.0 - 4.5 | 325170 | | SKC25 - 17 | 16.5 - 17.0 |
| 316040 | | SKC16 - 4 | 3.5 - 4.0 | 323050 | | SKC20 - 5 | 4.5 - 5.0 | 325175 | | SKC25 - 17.5 | 17.0 - 17.5 |
| 316045 | | SKC16 - 4.5 | 4.0 - 4.5 | 323055 | | SKC20 - 5.5 | 5.0 - 5.5 | 325180 | | SKC25 - 18 | 17.5 - 18.0 |
| 316050 | | SKC16 - 5 | 4.5 - 5.0 | 323060 | | SKC20 - 6 | 5.5 - 6.0 | 325185 | | SKC25 - 18.5 | 18.0 - 18.5 |
| 316055 | | SKC16 - 5.5 | 5.0 - 5.5 | 323065 | | SKC20 - 6.5 | 6.0 - 6.5 | 325190 | | SKC25 - 19 | 18.5 - 19.0 |
| 316060 | | SKC16 - 6 | 5.5 - 6.0 | 323070 | | SKC20 - 7 | 6.5 - 7.0 | 325195 | | SKC25 - 19.5 | 19.0 - 19.5 |
| 316605 | | SKC16 - 6.5 | 6.0 - 6.5 | 323075 | | SKC20 - 7.5 | 7.0 - 7.5 | 325200 | | SKC25 - 20 | 19.5 - 20.0 |
| 316070 | | SKC16 - 7 | 6.5 - 7.0 | 323080 | | SKC20 - 8 | 7.5 - 8.0 | 325205 | | SKC25 - 20.5 | 20.0 - 20.5 |
| 316075 | | SKC16 - 7.5 | 7.0 - 7.5 | 323085 | | SKC20 - 8.5 | 8.0 - 8.5 | 325210 | | SKC25 - 21 | 20.5 - 21.0 |
| 316080 | | SKC16 - 8 | 7.5 - 8.0 | 323090 | | SKC20 - 9 | 8.5 - 9.0 | 325215 | | SKC25 - 21.5 | 21.0 - 21.5 |
| 316085 | | SKC16 - 8.5 | 8.0 - 8.5 | 323095 | | SKC20 - 9.5 | 9.0 - 9.5 | 325220 | | SKC25 - 22 | 21.5 - 22.0 |
| 316090 | | SKC16 - 9 | 8.5 - 9.0 | 323100 | | SKC20 - 10 | 9.5 - 10.0 | 325225 | | SKC25 - 22.5 | 22.0 - 22.5 |
| 316095 | | SKC16 - 9.5 | 9.0 - 9.5 | 323105 | | SKC20 - 10.5 | 10.0 - 10.5 | 325230 | | SKC25 - 23 | 22.5 - 23.0 |
| 316100 | | SKC16 - 10 | 9.5 - 10.0 | 323110 | | SKC20 - 11 | 10.5 - 11.0 | 325235 | | SKC25 - 23.5 | 23.0 - 23.5 |
| 316105 | | SKC16 - 10.5 | 10.0 - 10.5 | 323115 | | SKC20 - 11.5 | 11.0 - 11.5 | 325240 | | SKC25 - 24 | 23.5 - 24.0 |
| 316110 | | SKC16 - 11 | 10.5 - 11.0 | 323120 | | SKC20 - 12 | 11.5 - 12.0 | 325245 | | SKC25 - 24.5 | 24.0 - 24.5 |
| 316115 | | SKC16 - 11.5 | 10.0 - 11.5 | 323125 | | SKC20 - 12.5 | 12.0 - 12.5 | 325250 | | SKC25 - 25 | 24.5 - 25.0 |
| 316120 | | SKC16 - 12 | 11.5 - 12.0 | 323130 | | SKC20 - 13 | 12.5 - 13.0 | 325254 | | SKC25 - 25.4 | 25.0 - 25.4 |
| 316125 | | SKC16 - 12.5 | 12.0 - 12.5 | 323135 | | SKC20 - 13.5 | 13.0 - 13.5 | | | | |
| 316130 | | SKC16 - 13 | 12.5 - 13.0 | 323140 | | SKC20 - 14 | 13.5 - 14.0 | | | | |
| 316135 | | SKC16 - 13.5 | 13.0 - 13.5 | 323145 | | SKC20 - 14.5 | 14.0 - 14.5 | | | | |
| 316140 | | SKC16 - 14 | 13.5 - 14.0 | 323150 | | SKC20 - 15 | 14.5 - 15.0 | | | | |
| 316145 | | SKC16 - 14.5 | 14.0 - 14.5 | 323155 | | SKC20 - 15.5 | 15.0 - 15.5 | | | | |
| 316150 | | SKC16 - 15 | 14.5 - 15.0 | 323160 | | SKC20 - 16 | 15.5 - 16.0 | | | | |
| 316155 | | SKC16 - 15.5 | 15.0 - 15.5 | 323165 | | SKC20 - 16.5 | 16.0 - 16.5 | | | | |
| 316160 | | SKC16 - 16 | 15.5 - 16.0 | 323170 | | SKC20 - 17 | 16.5 - 17.0 | | | | |
| | | | | 323175 | | SKC20 - 17.5 | 17.0 - 17.5 | | | | |
| | | | | 323180 | | SKC20 - 18 | 17.5 - 18.0 | | | | |
| | | | | 323185 | | SKC20 - 18.5 | 18.0 - 18.5 | | | | |
| | | | | 323190 | | SKC20 - 19 | 18.5 - 19.0 | | | | |
| | | | | 323195 | | SKC20 - 19.5 | 19.0 - 19.5 | | | | |
| | | | | 323200 | | SKC20 - 20.0 | 19.5 - 20.0 | | | | |

# SK COLLET (INCH TYPE)








□ T.I.R of standard collet is 0.00020" at 3D.
(Special collet with 0.00012" T.I.R at 3D is available upon request.)

Unit : inch

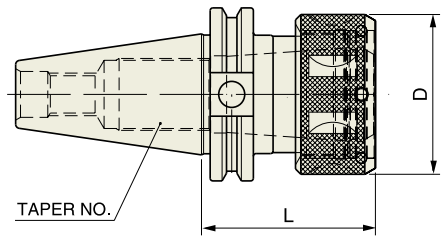
| EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d1) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d1) |
|---|---|---|---|---|---|---|---|
| **3060108A** | SKC6 | SKC6 - 1/8A | 0.125 | **3100108A** | SKC10 | SKC10 - 1/8A | 0.125 |
| **3060316A** | | SKC6 - 3/16A | 0.187 | **3100316A** | | SKC10 - 3/16A | 0.187 |
| | | | | **3100104A** | | SKC10 - 1/4A | 0.25 |
| | | | | **3100516A** | | SKC10 - 5/16A | 0.312 |
| | | | | **3100308A** | | SKC10 - 3/8A | 0.375 |
| | | | | | | | |

| EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d1) | EDP No. | TYPE | MODEL No. | CLAMPING RANGE (d1) |
|---|---|---|---|---|---|---|---|
| **3160108A** | SKC16 | SKC16 - 1/8A | 0.125 | **3250316A** | SKC25 | SKC25 - 3/16A | 0.187 |
| **3160316A** | | SKC16 - 3/16A | 0.187 | **3250104A** | | SKC25 - 1/4A | 0.25 |
| **3160104A** | | SKC16 - 1/4A | 0.25 | **3250516A** | | SKC25 - 5/16A | 0.312 |
| **3160516A** | | SKC16 - 5/16A | 0.312 | **3250308A** | | SKC25 - 3/8A | 0.375 |
| **3160308A** | | SKC16 - 3/8A | 0.375 | **3250716A** | | SKC25 - 7/16A | 0.437 |
| **3160716A** | | SKC16 - 7/16A | 0.437 | **3250102A** | | SKC25 - 1/2A | 0.5 |
| **3160102A** | | SKC16 - 1/2A | 0.5 | **3250508A** | | SKC25 - 5/8A | 0.625 |
| **3160916A** | | SKC16 - 9/16A | 0.562 | **3250304A** | | SKC25 - 3/4A | 0.75 |
| **3160508A** | | SKC16 - 5/8A | 0.625 | | | | |
| | | | | | | | |

# TG COLLET CHUCK

CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | AD |

■ **ASME B5.50-2009-CAT**

## TG75

■ **STANDARD**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| VK012 | 40 | CAT40 - TG75 - 2.50 | 0.047-0.750 | 2.50 | 1.81 | 75TG |

■ **EXTENDED**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| VK312 | 40 | CAT40 - TG75 - 3.00 | 0.047-0.750 | 3.00 | 1.81 | 75TG |

## TG100

■ **STANDARD**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| OK014 | 40 | CAT40 - TG100 - 3.25 | 0.063-1.000 | 3.25 | 2.36 | 100TG |
| OL014 | 50 | CAT50 - TG100 - 3.25 | 0.063-1.000 | 3.25 | 2.36 | 100TG |

■ **EXTENDED**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| OK314 | 40 | CAT40 - TG100 - 4.50 | 0.063-1.000 | 4.50 | 2.36 | 100TG |
| OL314 | 50 | CAT50 - TG100 - 5.50 | 0.063-1.000 | 5.50 | 2.36 | 100TG |

## TG150

■ **STANDARD**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| UL052 | 50 | CAT50 - TG150 - 3.50 | 0.500 - 1.500 | 3.50 | 3.43 | 150TG |

■ **EXTENDED**

Unit : inch

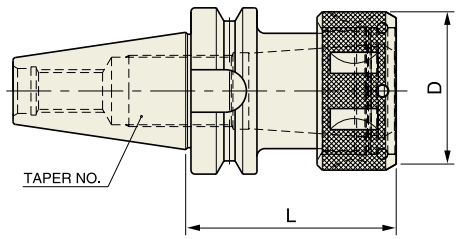
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| UL352 | 50 | CAT50 - TG150 - 6.00 | 0.500 - 1.500 | 6.00 | 3.43 | 150TG |

* TG NUT : SWISS MADE PRECISION TG NUT
* WRENCHES ON PAGE 978.

# TG COLLET CHUCK








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | AD |

■ JIS B6339/MAS 403-BT

## TG75

■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| VH012 | 40 | BT40 - TG75 - 3.00 | 0.047-0.750 | 3.00 | 1.81 | 75TG |

## TG100

■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| OH014 | 40 | BT40 - TG100 - 3.50 | 0.063-1.000 | 3.50 | 2.36 | 100TG |
| OI014 | 50 | BT50 - TG100 - 3.50 | 0.063-1.000 | 3.50 | 2.36 | 100TG |

■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| OH314 | 40 | BT40 - TG100 - 5.50 | 0.063-1.000 | 5.50 | 2.36 | 100TG |
| OI314 | 50 | BT50 - TG100 - 6.00 | 0.063-1.000 | 6.00 | 2.36 | 100TG |

## TG150

■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| UI052 | 50 | BT50 - TG150 - 4.00 | 0.500 - 1.500 | 4.00 | 3.43 | 150TG |

■ EXTENDED

Unit : inch

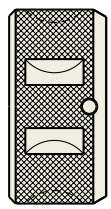
| EDP No. | TAPER No. | MODEL No. | CLAMPING RANGE | L | D | COLLET SERIES |
|---|---|---|---|---|---|---|
| UI352 | 50 | BT50 - TG150 - 6.00 | 0.500 - 1.500 | 6.00 | 3.43 | 150TG |

* TG NUT : SWISS MADE PRECISION TG NUT
* WRENCHES ON PAGE 978.

## TG NUT

### ■ TG NUT

| EDP No. | SERIES |
|---|---|
| ZZ084 | TG75 - NUT |
| ZZ081 | TG100 - NUT |
| ZZ087 | TG150 - NUT |



## TG WRENCH

### ■ TG WRENCH

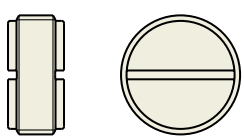
| EDP No. | SERIES |
|---|---|
| ZZ085 | TG75 |
| ZZ082 | TG100 |
| ZZ088 | TG150 |



## TG STOP SCREW

### ■ TG STOP SCREW

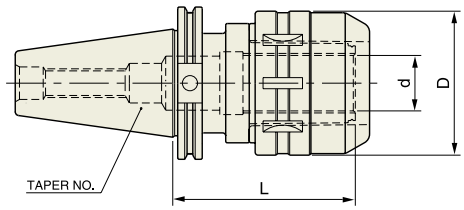
| EDP No. | SERIES |
|---|---|
| ZZ086 | TG75 |
| ZZ083 | TG100 |
| ZZ089 | TG150 |



## MILLING CHUCK CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

■ **ASME B5.50-2009-CAT**

■ **STANDARD**

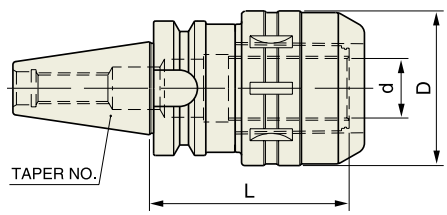
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| LK010 | 40 | CAT40 - C 3/4 - 4.13 | 0.750 | 2.050 | 4.13 |
| LK014 | | CAT40 - C 1" - 4.13 | 1.000 | 2.360 | 4.13 |
| LK017 | | CAT40 - C 1 1/4 - 4.13 | 1.250 | 2.835 | 4.13 |
| LL010 | 50 | CAT50 - C 3/4 - 4.13 | 0.750 | 2.050 | 4.13 |
| LL014 | | CAT50 - C 1" - 4.13 | 1.000 | 2.360 | 4.13 |
| LL017 | | CAT50 - C 1 1/4 - 4.13 | 1.250 | 2.835 | 4.13 |

* COLLETS / WRENCHS FOR MILLING CHUCKS ON PAGE 983.

## MILLING CHUCK BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

■ **JIS B6339/MAS 403-BT**

■ **STANDARD**

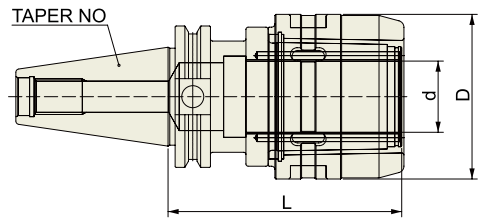
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| LH010 | 40 | BT40 - C3/4 - 3.56 | 0.750 | 2.050 | 3.56 |
| LH014 | | BT40 - C1 - 4.13 | 1.000 | 2.360 | 4.13 |
| LH017 | | BT40 - C1 1/4 - 4.13 | 1.250 | 2.835 | 4.13 |
| LI010 | 50 | BT50 - C 3/4 - 4.13 | 0.750 | 2.050 | 4.13 |
| LI014 | | BT50 - C 1"4.13 | 1.000 | 2.360 | 4.13 |
| LI017 | | BT50 - C 1 1/4 - 4.13 | 1.250 | 2.835 | 4.13 |

* COLLETS / WRENCHS FOR MILLING CHUCKS ON PAGE 983.

# DUAL CONTACT HIGH SPEED MILLING CHUCK CCT






| CCT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 20,000 | - |

## ■ CCT (CAT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| LB020 | 40 | CCT40 - C3/4-4.13HS | 0.750 | 2.050 | 4.13 |
| LB022 | | CCT40 - C1-4.13HS | 1.000 | 2.360 | 4.13 |
| LB024 | | CCT40 - C1 1/4-4.13HS | 1.250 | 2.835 | 4.13 |
| LB026 | | CCT40 - C1 1/4-5.31HS | 1.250 | 2.835 | 5.31 |
| LC020 | 50 | CCT50 - C3/4-4.13HS | 0.750 | 2.050 | 4.13 |
| LC022 | | CCT50 - C1-4.13HS | 1.000 | 2.360 | 4.13 |
| LC024 | | CCT50 - C1 1/4-4.13HS | 1.250 | 2.835 | 4.13 |
| LC026 | | CCT50 - C1 1/4-5.31HS | 1.250 | 2.835 | 5.31 |
| LC028 | | CCT50 - C1 1/4-6.5HS | 1.250 | 2.835 | 6.50 |

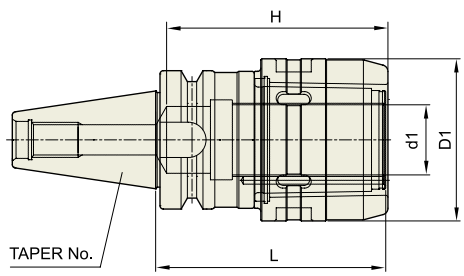
* COLLETS / WRENCHS FOR MILLING CHUCKS ON PAGE 983.

# DUAL CONTACT HIGH SPEED MILLING CHUCK

CBT

MILLING CHUCK






| CBT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 20,000 | - |

## ■ CBT (BT DUAL CONTACT)

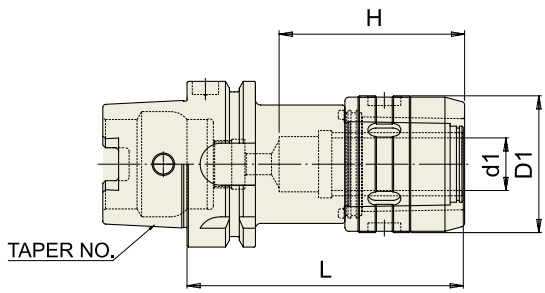
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | L |
|---|---|---|---|---|---|
| LE020 | 40 | CBT40 - C3/4-3.15HS | 0.750 | 2.050 | 3.15 |
| LE022 | | CBT40 - C3/4-4.13HS | 0.750 | 2.050 | 4.13 |
| LE024 | | CBT40 - C1-4.13HS | 1.000 | 2.360 | 4.13 |
| LE026 | | CBT40 - C1 1/4-3.54HS | 1.250 | 2.835 | 3.54 |
| LE028 | | CBT40 - C1 1/4-4.13HS | 1.250 | 2.835 | 4.13 |
| LE030 | | CBT40 - C1 1/4-5.31HS | 1.250 | 2.835 | 5.31 |

* COLLETS / WRENCHS FOR MILLING CHUCKS ON PAGE 983.

# DUAL CONTACT HIGH SPEED MILLING CHUCK HSK






| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | - | 6.3 | 20,000 | - |

## ■ DIN 69893/ISO 12164-1-HSK FORM A

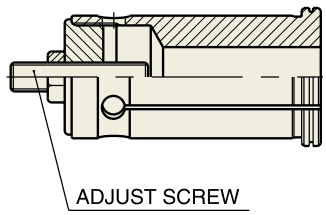
Unit : inch

| EDP No. | TAPER No. | MODEL No. | d1 | D1 | L |
|---|---|---|---|---|---|
| LQ020 | 63A | HSK63A - C3/4-4.13HS | 0.750 | 2.050 | 4.13 |
| LQ022 | | HSK63A - C1-4.72HS | 1.000 | 2.360 | 4.72 |
| LQ024 | | HSK63A - C1 1/4-5.31HS | 1.250 | 2.835 | 5.31 |
| LR020 | 100A | HSK100A - C3/4-4.33HS | 0.750 | 2.050 | 4.33 |
| LR022 | | HSK100A - C1-5.12HS | 1.000 | 2.360 | 5.12 |
| LR024 | | HSK100A - C1 1/4-5.31HS | 1.250 | 2.835 | 5.31 |

* COLLETS / WRENCHS FOR MILLING CHUCKS ON PAGE 983.

## MILLING CHUCK COLLET






Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MZ002 | C3/4 | 1/4 |
| MZ003 | C3/4 | 5/16 |
| MZ004 | C3/4 | 3/8 |
| MZ006 | C3/4 | 1/2 |
| MZ008 | C3/4 | 5/8 |

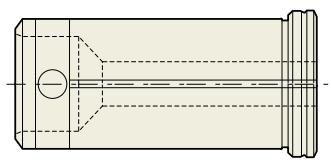
Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MZ102 | C1 | 1/4 |
| MZ103 | C1 | 5/16 |
| MZ104 | C1 | 3/8 |
| MZ106 | C1 | 1/2 |
| MZ108 | C1 | 5/8 |
| MZ110 | C1 | 3/4 |

Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MZ302 | C1 1/4 | 1/4 |
| MZ303 | C1 1/4 | 5/16 |
| MZ304 | C1 1/4 | 3/8 |
| MZ306 | C1 1/4 | 1/2 |
| MZ308 | C1 1/4 | 5/8 |
| MZ310 | C1 1/4 | 3/4 |
| MZ312 | C1 1/4 | 7/8 |
| MZ314 | C1 1/4 | 1" |





Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MY002 | C3/4 | 1/4 |
| MY003 | C3/4 | 5/16 |
| MY004 | C3/4 | 3/8 |
| MY006 | C3/4 | 1/2 |
| MY008 | C3/4 | 5/8 |

Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MY102 | C1 | 1/4 |
| MY103 | C1 | 5/16 |
| MY104 | C1 | 3/8 |
| MY106 | C1 | 1/2 |
| MY108 | C1 | 5/8 |
| MY110 | C1 | 3/4 |

Unit : inch

| EDP No. | TYPE | D |
|---|---|---|
| MY302 | C1 1/4 | 1/4 |
| MY303 | C1 1/4 | 5/16 |
| MY304 | C1 1/4 | 3/8 |
| MY306 | C1 1/4 | 1/2 |
| MY308 | C1 1/4 | 5/8 |
| MY310 | C1 1/4 | 3/4 |
| MY312 | C1 1/4 | 7/8 |
| MY314 | C1 1/4 | 1" |

## WRENCH

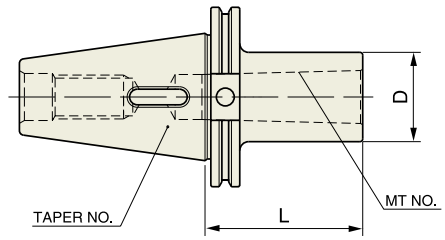
Unit : inch

| EDP No. | SERIES |
|---|---|
| ZZ056 | C3/4 |
| ZZ057 | C1 |
| ZZ058 | C1 1/4 |



## MORSE TAPER ADAPTER CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD |

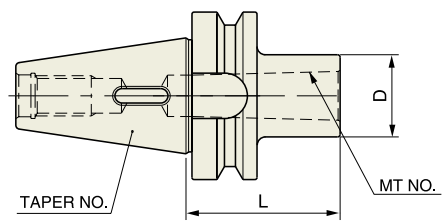
■ **ASME B5.50-2009-CAT**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | MT NO. | D | L |
|---|---|---|---|---|---|
| CK037 | 40 | CAT40 - MTA 1 - 1.75 | #1 | 1.00 | 1.75 |
| CK038 | | CAT40 - MTA 2 - 2.00 | #2 | 1.75 | 2.00 |
| CK039 | | CAT40 - MTA 3 - 2.75 | #3 | 1.75 | 2.75 |
| CK040 | | CAT40 - MTA 4 - 3.63 | #4 | 1.75 | 3.63 |
| CL038 | 50 | CAT50 - MTA 2 - 1.38 | #2 | 2.75 | 1.38 |
| CL039 | | CAT50 - MTA 3 - 1.88 | #3 | 1.57 | 1.88 |
| CL040 | | CAT50 - MTA 4 - 2.75 | #4 | 1.97 | 2.75 |
| CL041 | | CAT50 - MTA 5 - 4.06 | #5 | 2.48 | 4.06 |

## MORSE TAPER ADAPTER BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD |

■ **JIS B6339/MAS 403-BT**

Unit : inch

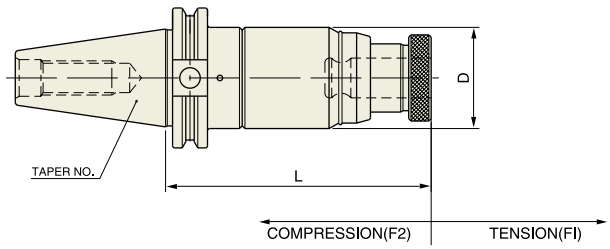
| EDP No. | TAPER No. | MODEL No. | MT NO. | D | L |
|---|---|---|---|---|---|
| CH037 | 40 | BT40 - MTA 1 - 1.75 | #1 | 1.00 | 1.75 |
| CH038 | | BT40 - MTA 2 - 2.36 | #2 | 1.26 | 2.36 |
| CH039 | | BT40 - MTA 3 - 2.95 | #3 | 1.57 | 2.95 |
| CH040 | | BT40 - MTA 4 - 3.74 | #4 | 1.97 | 3.74 |
| CI038 | 50 | BT50 - MTA 2 - 2.36 | #2 | 1.26 | 2.36 |
| CI039 | | BT50 - MTA 3 - 2.95 | #3 | 1.58 | 2.95 |
| CI040 | | BT50 - MTA 4 - 3.74 | #4 | 1.97 | 3.74 |
| CI041 | | BT50 - MTA 5 - 4.13 | #5 | 2.55 | 4.13 |

# TAPPING CHUCK

CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

## ■ ASME B5.50-2009-CAT

## ■ TO USE TAP ADAPTER QCT12

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JK048 | 40 | CAT40 - TC #1 - 4.56 | 1.77 | 4.56 | 0.591 | 0.197 |
| JL048 | 50 | CAT50 - TC #1 - 4.56 | 1.77 | 4.56 | 0.591 | 0.197 |

## ■ TO USE TAP ADAPTER QCT24

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JK049 | 40 | CAT40 - TC #2 - 6.47 | 2.48 | 6.47 | 0.787 | 0.197 |
| JL049 | 50 | CAT50 - TC #2 - 5.82 | 2.48 | 5.82 | 0.787 | 0.197 |

## ■ TO USE TAP ADAPTER QCT32

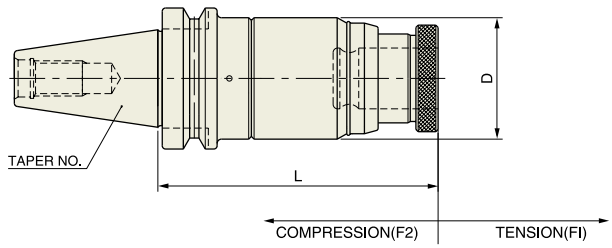
Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JL050 | 50 | CAT50 - TC #3 - 7.75 | 3.86 | 7.75 | 0.984 | 0.394 |

* TAP ADAPTERS ARE ON PAGE 988.

# TAPPING CHUCK BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

## ■ JIS B6339/MAS 403-BT

## ■ TO USE TAP ADAPTER QCT12

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JH048 | 40 | BT40 - TC #1 - 4.53 | 1.77 | 4.53 | 0.591 | 0.197 |
| JI048 | 50 | BT50 - TC #1 - 4.64 | 1.77 | 4.64 | 0.591 | 0.197 |

## ■ TO USE TAP ADAPTER QCT24

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JH049 | 40 | BT40 - TC #2 - 6.72 | 2.48 | 6.72 | 0.787 | 0.197 |
| JI049 | 50 | BT50 - TC #2 - 6.72 | 2.48 | 6.72 | 0.787 | 0.197 |

## ■ TO USE TAP ADAPTER QCT38

Unit : inch

| EDP No. | TAPER No. | MODEL No. | D | L | F1 | F2 |
|---|---|---|---|---|---|---|
| JI050 | 50 | BT50 - TC #3 - 8.33 | 3.86 | 8.33 | 0.984 | 0.394 |

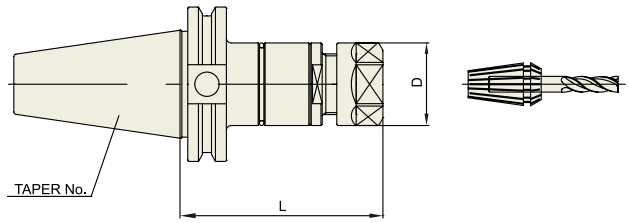
* TAP ADAPTERS ARE ON PAGE 988.

# SYNCHRO TAPPING ER CHUCK

CAT

TAPPING CHUCK






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | AD/B |

## ■ ASME B5.50-2009-CAT

Unit : mm

| EDP No. | TAPER No. | MODEL No. | TAP SIZE | CLAMPING RANGE | NUT | D | L |
|---|---|---|---|---|---|---|---|
| JK060SYT | 40 | CAT40AD/B-SYTER12-79 | M3-M12 | 3.5-10 | ER16 | 28 | 79 |
| JK062SYT | | CAT40AD/B-SYTER16-85 | M3-M16 | 3.5-10 | ER20 | 35 | 85 |
| JK064SYT | | CAT40AD/B-SYTER20-90 | M3-M20 | 3.5-16 | ER25 | 42 | 90 |
| JK066SYT | | CAT40AD/B-SYTER27-100 | M4-M27 | 3.5-16 | ER32 | 50 | 100 |
| JK068SYT | | CAT40AD/B-SYTER33-105 | M4-M33 | 7-16 | ER40 | 63 | 105 |
| JL060SYT | 50 | CAT50AD/B-SYTER12-79 | M3-M12 | 3.5-10 | ER16 | 28 | 79 |
| JL062SYT | | CAT50AD/B-SYTER16-85 | M3-M16 | 3.5-10 | ER20 | 35 | 85 |
| JL064SYT | | CAT50AD/B-SYTER20-90 | M3-M20 | 3.5-16 | ER25 | 42 | 90 |
| JL066SYT | | CAT50AD/B-SYTER27-100 | M4-M27 | 3.5-16 | ER32 | 50 | 100 |
| JL068SYT | | CAT50AD/B-SYTER33-105 | M4-M33 | 7-16 | ER40 | 63 | 105 |

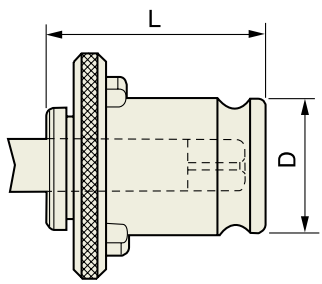
* BT(JIS B6339/MAS-403), HSK(DIN 69893/ISO 12164-1) AND K-STRAIGHT TAPER PRODUCTS ARE AVAILABLE.
  FOR DETAILS, PLEASE DISCUSS SEPARATELY.

* FEATURE :
  - TO COMPENSATE FOR SYNCHRONIZATION ERRORS TO EXTEND TAP LIFE AND TO IMPROVE THREAD QUALITY
  - TO COMPENSATE FOR PITCH TOLERANCES OF TAPS.
  - FOR MACHINE WITH SYNCHRONIZED SPINDLE.

* APPLICABLE TAP ER COLLETS ON PAGE 966~968.

# QUICK CHANGE TAP ADAPTER






## ■ POSITIVE DRIVE-SOLID TYPE

Unit : inch

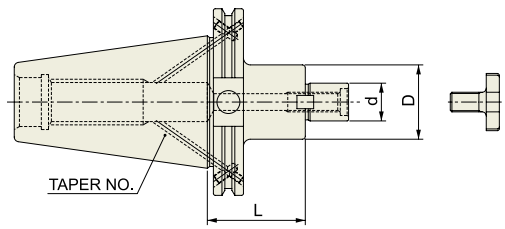
| EDP No. | ADAPTER SIZE | TAP SIZE RANGE | TAP SIZE | TAP DIA | TAP SQUARE |
|---|---|---|---|---|---|
| QCT12001 | QCT 12 | 0-9/16" | # 0-6 | 0.141 | 0.110 |
| QCT12002 | | | # 8 | 0.168 | 0.131 |
| QCT12003 | | | # 10 | 0.194 | 0.152 |
| QCT12004 | | | # 12 | 0.220 | 0.165 |
| QCT12005 | | | 1/4 | 0.255 | 0.191 |
| QCT12006 | | | 5/16 | 0.318 | 0.238 |
| QCT12007 | D = 19mm/0.748" L = 28.5mm/1.122" | | 3/8 | 0.381 | 0.286 |
| QCT12008 | | | 7/16 | 0.323 | 0.242 |
| QCT12009 | | | 1/2 | 0.367 | 0.275 |
| QCT12010 | | | 9/16 | 0.429 | 0.322 |
| QCT12011 | | 1/8" PIPE | 1/8pss | 0.3125 | 0.234 |
| QCT12012 | | | 1/8pls | 0.4370 | 0.328 |
| QCT24001 | QCT 24 | 5/16-7/8" | 5/16 | 0.318 | 0.238 |
| QCT24002 | | | 3/8 | 0.381 | 0.286 |
| QCT24003 | | | 7/16 | 0.323 | 0.242 |
| QCT24004 | | | 1/2 | 0.367 | 0.275 |
| QCT24005 | | | 9/16 | 0.429 | 0.322 |
| QCT24006 | | | 5/8 | 0.480 | 0.360 |
| QCT24007 | D = 31mm/1.220" L = 46mm/1.811" | | 11/16 | 0.542 | 0.406 |
| QCT24008 | | | 3/4 | 0.590 | 0.421 |
| QCT24009 | | | 13/16 | 0.652 | 0.489 |
| QCT24010 | | | 7/8 | 0.697 | 0.523 |
| QCT24011 | | 1/4" - 3/8" 1/2" PIPE | 1/4p | 0.5620 | 0.420 |
| QCT24012 | | | 3/8p | 0.7000 | 0.531 |
| QCT24013 | | | 1/2p | 0.6875 | 0.515 |
| QCT32001 | QCT 32 | 13/16-1-3/8" | 13/16 | 0.652 | 0.489 |
| QCT32002 | | | 7/8 | 0.697 | 0.523 |
| QCT32003 | | | 15/16 | 0.760 | 0.570 |
| QCT32004 | | | 1 | 0.800 | 0.600 |
| QCT32005 | D = 48mm/1.890" L = 69.5mm/2.736" | | 1-1/8 | 0.896 | 0.672 |
| QCT32006 | | | 1-1/4 | 1.021 | 0.766 |
| QCT32007 | | | 1-3/8 | 1.108 | 0.831 |
| QCT32008 | | 1/2/3/4 & 1" PIPE | 1/2p | 0.6875 | 0.515 |
| QCT32009 | | | 3/4p | 0.9060 | 0.679 |
| QCT32010 | | | 1p | 1.1250 | 0.843 |

# SHELL MILL ARBOR

CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ ASME B5.50-2009-CAT

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | L | D |
|---|---|---|---|---|---|
| EK006B | 40 | CAT40 AD/B - SMA 1/2 - 1.50 | 0.500 | 1.50 | 1.44 |
| EK010B | | CAT40 AD/B - SMA 3/4 - 1.50 | 0.750 | 1.50 | 1.69 |
| EK014B | | CAT40 AD/B - SMA 1 - 2.00 | 1.000 | 2.00 | 2.19 |
| EK017B | | CAT40 AD/B - SMA 1 1/4 - 2.00 | 1.250 | 2.00 | 2.75 |
| EK021B | | CAT40 AD/B - SMA 1 1/2 - 3.00 | 1.500 | 3.00 | 3.81 |
| EL010B | 50 | CAT50 AD/B - SMA 3/4 - 1.50 | 0.750 | 1.50 | 1.69 |
| EL014B | | CAT50 AD/B - SMA 1 - 2.00 | 1.000 | 2.00 | 2.19 |
| EL017B | | CAT50 AD/B - SMA 1 1/4 - 2.00 | 1.250 | 2.00 | 2.75 |
| EL021B | | CAT50 AD/B - SMA 1 1/2 - 2.50 | 1.500 | 2.50 | 3.81 |
| EL029B | | CAT50 AD/B - SMA 2 - 3.00 | 2.000 | 3.00 | 4.88 |

## ■ EXTENDED

Unit : inch

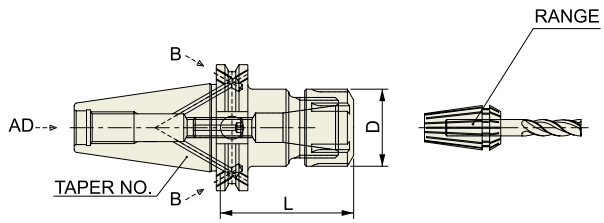
| EDP No. | TAPER No. | MODEL No. | d | L | D |
|---|---|---|---|---|---|
| EK306B | 40 | CAT40 AD/B - SMA 1/2 - 3.50 | 0.500 | 3.50 | 1.44 |
| EK310B | | CAT40 AD/B - SMA 3/4 - 3.50 | 0.750 | 3.50 | 1.69 |
| EK314B | | CAT40 AD/B - SMA 1 - 4.00 | 1.000 | 4.00 | 2.19 |
| EK317B | | CAT40 AD/B - SMA 1 1/4 - 4.00 | 1.250 | 4.00 | 2.75 |
| EK321B | | CAT40 AD/B - SMA 1 1/2 - 4.00 | 1.500 | 4.00 | 3.81 |
| EL310B | 50 | CAT50 AD/B - SMA 3/4 - 3.50 | 0.750 | 3.50 | 1.69 |
| EL314B | | CAT50 AD/B - SMA 1 - 4.00 | 1.000 | 4.00 | 2.19 |
| EL317B | | CAT50 AD/B - SMA 1 1/4 - 4.00 | 1.250 | 4.00 | 2.75 |
| EL321B | | CAT50 AD/B - SMA 1 1/2 - 4.00 | 1.500 | 4.00 | 3.81 |
| EL329B | | CAT50 AD/B - SMA 2 - 4.00 | 2.000 | 4.00 | 4.88 |

* HIGH BALANCED SHELL MILL ARBORS ARE AVAILABLE ON REQUEST.
* DRIVE KEY / LOCK SCREW FOR SHELL MILL ARBORS ON PAGE 993.

# SHELL MILL ARBOR

BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 6.3 | 15,000 | AD/B |

## ■ JIS B6339/MAS 403-BT

## ■ STANDARD

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | L | D |
|---|---|---|---|---|---|
| EH006B | 40 | BT40 AD/B - SMA 1/2 - 1.75 | 0.500 | 1.75 | 1.44 |
| EH010B | | BT40 AD/B - SMA 3/4 - 1.77 | 0.750 | 1.77 | 1.69 |
| EH014B | | BT40 AD/B - SMA 1 - 1.77 | 1.000 | 1.77 | 2.19 |
| EH017B | | BT40 AD/B - SMA 1 1/4 - 1.81 | 1.250 | 1.81 | 2.75 |
| EH021B | | BT40 AD/B - SMA 1 1/2 - 2.36 | 1.500 | 2.36 | 3.81 |
| EI010 | 50 | BT50 - SMA 3/4 - 1.75 | 0.750 | 1.75 | 1.69 |
| EI014 | | BT50 - SMA 1 - 1.75 | 1.000 | 1.75 | 2.19 |
| EI017 | | BT50 - SMA 1 1/4 - 1.75 | 1.250 | 1.75 | 2.75 |
| EI021 | | BT50 - SMA 1/2 - 1.75 | 1.500 | 1.75 | 3.81 |
| EI029 | | BT50 - SMA 2 - 3.00 | 2.000 | 3.00 | 4.88 |

## ■ EXTENDED

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | L | D |
|---|---|---|---|---|---|
| EH306B | 40 | BT40 AD/B - SMA 1/2 - 3.50 | 0.500 | 3.50 | 1.44 |
| EH310B | | BT40 AD/B - SMA 3/4 - 4.13 | 0.750 | 4.13 | 1.69 |
| EH314B | | BT40 AD/B - SMA 1 - 4.13 | 1.000 | 4.13 | 2.19 |
| EH317B | | BT40 AD/B - SMA 1 1/4 - 4.13 | 1.250 | 4.13 | 2.75 |
| EH321B | | BT40 AD/B - SMA 1 1/2 - 4.72 | 1.500 | 4.72 | 3.81 |
| EI310 | 50 | BT50 - SMA 3/4 - 3.50 | 0.750 | 3.50 | 1.69 |
| EI314 | | BT50 - SMA 1 - 4.00 | 1.000 | 4.00 | 2.19 |
| EI317 | | BT50 - SMA 1 1/4 - 4.00 | 1.250 | 4.00 | 2.75 |
| EI321 | | BT50 - SMA 1 1/2 - 4.00 | 1.500 | 4.00 | 3.81 |
| EI329 | | BT50 - SMA 2 - 4.00 | 2.000 | 4.00 | 4.88 |

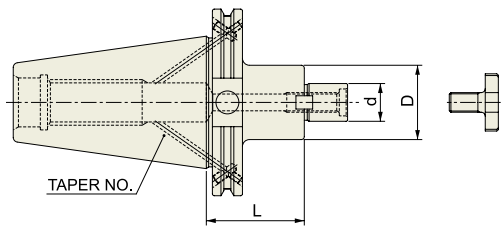
* HIGH BALANCED SHELL MILL ARBORS ARE AVAILABLE ON REQUEST.
* DRIVE KEY / LOCK SCREW FOR SHELL MILL ARBORS ON PAGE 993.

# DUAL CONTACT SHELL MILL ARBOR

CCT

SHELL MILL ARBOR






| CCT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD/B |

## ■ CCT (CAT DUAL CONTACT)

Unit : inch

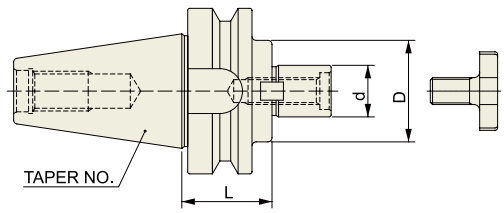
| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| EB020 | 40 | CCT40 AD/B - SMA1/2-2.36 | 0.500 | 1.438 | 2.360 |
| EB022 | | CCT40 AD/B - SMA1/2-4.72 | 0.500 | 1.438 | 4.720 |
| EB024 | | CCT40 AD/B - SMA3/4-2.36 | 0.750 | 1.688 | 2.360 |
| EB026 | | CCT40 AD/B - SMA3/4-4.72 | 0.750 | 1.688 | 4.720 |
| EB028 | | CCT40 AD/B - SMA1-2.36 | 1.000 | 2.188 | 2.360 |
| EB030 | | CCT40 AD/B - SMA1-4.72 | 1.000 | 2.188 | 4.720 |
| EB032 | | CCT40 AD/B - SMA1-1/4-2.36 | 1.250 | 2.750 | 2.360 |
| EB034 | | CCT40 AD/B - SMA1-1/4-4.72 | 1.250 | 2.750 | 4.720 |
| EC020 | 50 | CCT50 AD/B - SMA1/2-2.95 | 0.500 | 1.438 | 2.950 |
| EC022 | | CCT50 AD/B - SMA1/2-4.72 | 0.500 | 1.438 | 4.720 |
| EC024 | | CCT50 AD/B - SMA3/4-2.95 | 0.750 | 1.688 | 2.950 |
| EC026 | | CCT50 AD/B - SMA3/4-4.72 | 0.750 | 1.688 | 4.720 |
| EC028 | | CCT50 AD/B - SMA1-2.95 | 1.000 | 2.188 | 2.950 |
| EC030 | | CCT50 AD/B - SMA1-4.72 | 1.000 | 2.188 | 4.720 |
| EC032 | | CCT50 AD/B - SMA1-1/4-2.95 | 1.250 | 2.750 | 2.950 |
| EC034 | | CCT50 AD/B - SMA1-1/4-4.72 | 1.250 | 2.750 | 4.720 |
| EC036 | | CCT50 AD/B - SMA1-1/2-2.95 | 1.500 | 3.813 | 2.950 |
| EC038 | | CCT50 AD/B - SMA1-1/2-4.72 | 1.500 | 3.813 | 4.720 |

* DRIVE KEY / LOCK SCREW FOR SHELL MILL ARBORS ON PAGE 993.

# DUAL CONTACT SHELL MILL ARBOR

# CBT






| CBT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | 2.5 | 25,000 | AD |

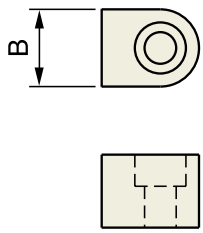
## ■ CBT (BT DUAL CONTACT)

Unit : inch

| EDP No. | TAPER No. | MODEL No. | d | D | L |
|---|---|---|---|---|---|
| ED100 | 30 | CBT30 - SMA1/2-1.97 | 0.500 | 1.438 | 1.970 |
| ED102 | | CBT30 - SMA3/4-1.97 | 0.750 | 1.688 | 1.970 |
| ED104 | | CBT30 - SMA1-1.97 | 1.000 | 2.188 | 1.970 |
| ED106 | | CBT30 - SMA1-1/4-1.97 | 1.250 | 2.750 | 1.970 |
| EE100 | 40 | CBT40 - SMA1/2-2.36 | 0.500 | 1.438 | 2.360 |
| EE102 | | CBT40 - SMA3/4-2.36 | 0.750 | 1.688 | 2.360 |
| EE104 | | CBT40 - SMA1-2.36 | 1.000 | 2.188 | 2.360 |
| EE106 | | CBT40 - SMA1-1/4-2.36 | 1.250 | 2.750 | 2.360 |

* DRIVE KEY / LOCK SCREW FOR SHELL MILL ARBORS ON PAGE 993.

## SHELL MILL DRIVE KEY

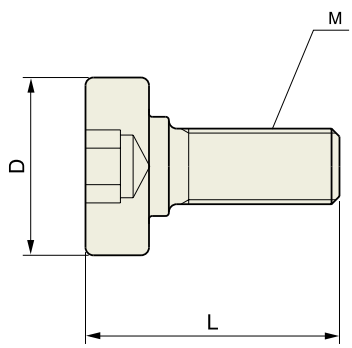



■ **SHELL MILL DRIVE KEY**

Unit : inch

| EDP No. | SERIES | B |
|---|---|---|
| **ZZ021** | SMA 1/2 - KEY | 0.25 |
| **ZZ022** | SMA 3/4 - KEY | 0.312 |
| **ZZ023** | SMA 1" - KEY | 0.375 |
| **ZZ024** | SMA 1 1/4 - KEY | 0.5 |
| **ZZ025** | SMA 1 1/2 - KEY | 0.625 |
| **ZZ026** | SMA 2" - KEY | 0.75 |

## SHELL MILL LOCK SCREW




■ **SHELL MILL LOCK SCREW**

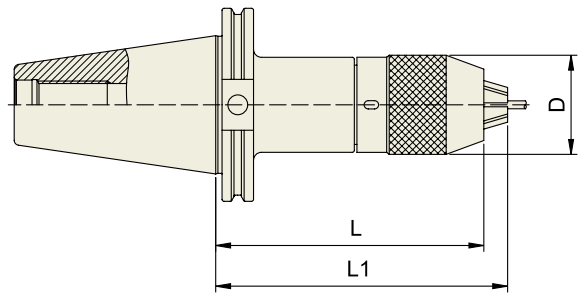
Unit : inch

| EDP No. | TYPE(M) | L | D | SERIES |
|---|---|---|---|---|
| **ZZ031** | UNF 1/4 - 28 | 0.906 | 0.618 | SMA 1/2 - SCREW |
| **ZZ032** | UNF 3/8 - 24 | 1.26 | 0.882 | SMA 3/4 - SCREW |
| **ZZ033** | UNF 1/2 - 20 | 1.69 | 1.181 | SMA 1" - SCREW |
| **ZZ034** | UNF 5/8 - 18 | 2.05 | 1.5 | SMA 1 1/4 - SCREW |
| **ZZ035** | UNF 3/4 - 16 | 2.36 | 1.88 | SMA 1 1/2 - SCREW |
| **ZZ036** | UN 1" - 14 | 2.52 | 2.5 | SMA 2" - SCREW |

# NC DRILL CHUCK

CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

## ■ ASME B5.50-2009-CAT

Unit : inch

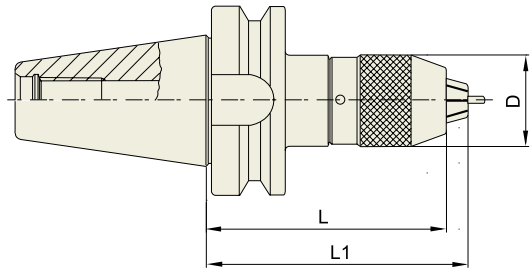
| EDP No. | TAPER No. | MODEL No. | D | L | L1 |
|---|---|---|---|---|---|
| RK020 | 40 | CAT40 - NPU8-2.76 | 1.437 | 2.756 | 2.980 |
| RK022 | | CAT40 - NPU8-4.33 | 1.437 | 4.331 | 4.555 |
| RK024 | | CAT40 - NPU8-5.91 | 1.437 | 5.906 | 5.906 |
| RK026 | | CAT40 - NPU13-3.54 | 1.984 | 3.543 | 3.937 |
| RK028 | | CAT40 - NPU13-5.12 | 1.984 | 5.118 | 5.512 |
| RK030 | | CAT40 - NPU13-5.91 | 1.984 | 5.906 | 6.299 |
| RL020 | 50 | CAT50 - NPU8-3.54 | 1.437 | 3.543 | 3.768 |
| RL022 | | CAT50 - NPU8-4.33 | 1.437 | 4.331 | 4.555 |
| RL024 | | CAT50 - NPU8-6.69 | 1.437 | 6.693 | 6.917 |
| RL026 | | CAT50 - NPU13-3.94 | 1.984 | 3.937 | 4.331 |
| RL028 | | CAT50 - NPU13-5.12 | 1.984 | 5.118 | 5.512 |
| RL030 | | CAT50 - NPU13-5.91 | 1.984 | 5.906 | 6.299 |
| RL032 | | CAT50 - NPU13-6.69 | 1.984 | 6.693 | 7.087 |

# NC DRILL CHUCK

BT








| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

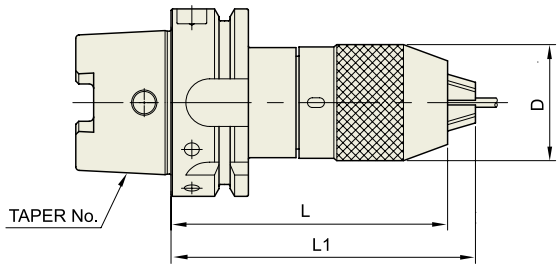
## ■ JIS B6339/MAS 403-BT

Unit : mm

| EDP No. | TAPER No. | MODEL No. | RANGE | D | L(MIN) | L1(MAX) |
|---|---|---|---|---|---|---|
| RG100 | 30 | BT30 - NPU 8-70 | 0.3~8 | 36.5 | 70 | 75.7 |
| RG102 | | BT30 - NPU 13-100 | 1~13 | 50.4 | 100 | 110 |
| RH100 | 40 | BT40 - NPU 8-70 | 0.3~8 | 36.5 | 70 | 75.7 |
| RH102 | | BT40 - NPU 8-110 | 0.3~8 | 36.5 | 110 | 115.7 |
| RH104 | | BT40 - NPU 8-150 | 0.3~8 | 36.5 | 150 | 155.7 |
| RH106 | | BT40 - NPU 13-90 | 1~13 | 50.4 | 90 | 95.7 |
| RH108 | | BT40 - NPU 13-130 | 1~13 | 50.4 | 130 | 140 |
| RH110 | | BT40 - NPU 13-150 | 1~13 | 50.4 | 150 | 160 |

* CHUCKING LENGTH
  - NPU8 : 20mm
  - NPU13 : 28mm

## DUAL CONTACT NC DRILL CHUCK — HSK




| DIN 69893 - HSK | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | - | - | - | - |

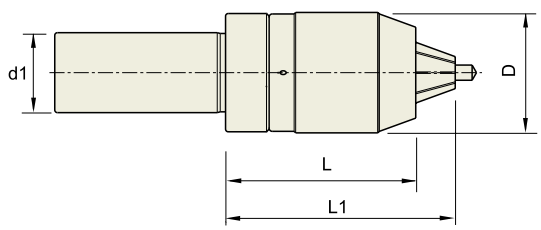
■ **DIN 69893/ISO 12164-1-HSK FORM A**

Unit : mm

| EDP No. | TAPER No. | MODEL No. | CAPACITY | D | L(MIN) | L1(MAX) |
|---|---|---|---|---|---|---|
| **RQ100** | 63A | HSK63A - NPU 8-125 | 0.3 - 8 | 36.5 | 125 | 130.7 |
| **RQ102** | | HSK63A - NPU13-150 | 1 - 13 | 50.4 | 150 | 160 |
| **RR100** | 100A | HSK100A - NPU 8-130 | 0.3 - 8 | 36.5 | 130 | 135.7 |
| **RR102** | | HSK100A - NPU13-150 | 1 - 13 | 50.4 | 150 | 160 |

## STRAIGHT NC DRILL CHUCK — K






■ **STRAIGHT-K**

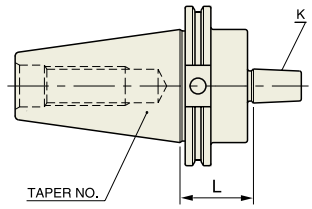
Unit : mm

| EDP No. | TYPE | MODEL No. | RANGE | D | L(MIN) | L1(MAX) | d1 |
|---|---|---|---|---|---|---|---|
| **RS100** | 32 | K32 - NPU 8-70 | 0.3~8 | 36.5 | 70 | 75.7 | 32.0 |
| **RS102** | | K32 - NPU 13-100 | 1~13 | 50.4 | 100 | 110 | 32.0 |
| **RS104** | 42 | K42 - NPU 8-70 | 0.3~8 | 36.5 | 70 | 75.7 | 42.0 |
| **RS106** | | K42 - NPU 13-100 | 1~13 | 50.4 | 100 | 110 | 42.0 |

## JACOBS TAPER ARBOR CAT








| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

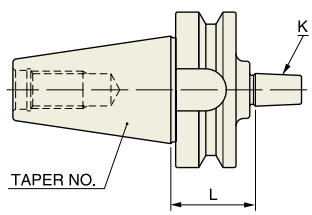
■ **ASME B5.50-2009-CAT**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | K | L |
|---|---|---|---|---|
| GK042 | 40 | CAT40 - JTA 1 - 1.50 | #1 | 1.50 |
| GK043 | | CAT40 - JTA 2 - 1.50 | #2 | 1.50 |
| GK044 | | CAT40 - JTA 3 - 1.50 | #3 | 1.50 |
| GK045 | | CAT40 - JTA 4 - 1.50 | #4 | 1.50 |
| GK046 | | CAT40 - JTA 6 - 1.50 | #6 | 1.50 |
| GK047 | | CAT40 - JTA 33 - 1.50 | #33 | 1.50 |
| GL042 | 50 | CAT50 - JTA 1 - 1.50 | #1 | 1.50 |
| GL043 | | CAT50 - JTA 2 - 1.50 | #2 | 1.50 |
| GL044 | | CAT50 - JTA 3 - 1.50 | #3 | 1.50 |
| GL045 | | CAT50 - JTA 4 - 1.50 | #4 | 1.50 |
| GL046 | | CAT50 - JTA 6 - 1.50 | #6 | 1.50 |
| GL047 | | CAT50 - JTA 33 - 1.50 | #33 | 1.50 |

## JACOBS TAPER ARBOR BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

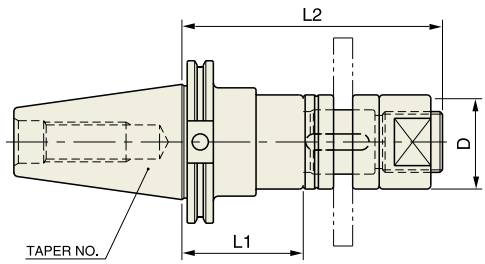
■ **JIS B6339/MAS 403-BT**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | K | L |
|---|---|---|---|---|
| GH042 | 40 | BT40 - JTA 1 - 1.34 | #1 | 1.34 |
| GH043 | | BT40 - JTA 2 - 1.77 | #2 | 1.77 |
| GH044 | | BT40 - JTA 3 - 1.77 | #3 | 1.77 |
| GH045 | | BT40 - JTA 4 - 1.77 | #4 | 1.77 |
| GH046 | | BT40 - JTA 6 - 1.77 | #6 | 1.77 |
| GH047 | | BT40 - JTA 33 - 1.77 | #33 | 1.77 |
| GI042 | 50 | BT50 - JTA 1 - 1.80 | #1 | 1.80 |
| GI043 | | BT50 - JTA 2 - 1.77 | #2 | 1.77 |
| GI044 | | BT50 - JTA 3 - 1.77 | #3 | 1.77 |
| GI045 | | BT50 - JTA 4 - 1.77 | #4 | 1.77 |
| GI046 | | BT50 - JTA 6 - 1.77 | #6 | 1.77 |
| GI047 | | BT50 - JTA 33 - 1.77 | #33 | 1.77 |

## STUB ARBOR CAT






| ASME B5.50 - CAT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

■ **ASME B5.50-2009-CAT**

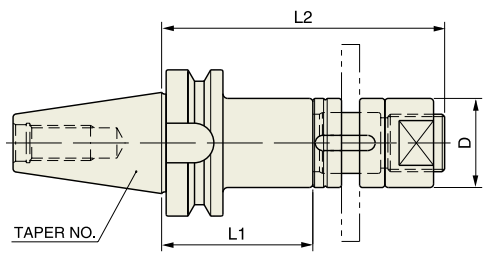
■ **STANDARD**

Unit : inch

| EDP No. | TAPER No. | MODEL No. | CUTTER SIZE I.D | L1 | D | L2 |
|---|---|---|---|---|---|---|
| PK014 | 40 | CAT40 - STUB 1 - 4.00 | 1.000 | 4.00 | 1.56 | 6.25 |
| PK017 | | CAT40 - STUB 1 1/4 - 4.00 | 1.250 | 4.00 | 1.87 | 6.50 |
| PK021 | | CAT40 - STUB 1 1/2 - 4.00 | 1.500 | 4.00 | 2.12 | 6.75 |
| PL014 | 50 | CAT50 - STUB 1 - 4.00 | 1.000 | 4.00 | 1.56 | 6.25 |
| PL017 | | CAT50 - STUB 1 1/4 - 4.00 | 1.250 | 4.00 | 1.87 | 6.50 |
| PL021 | | CAT50 - STUB 1 1/2 - 4.00 | 1.500 | 4.00 | 2.12 | 6.75 |

## STUB ARBOR BT






| JIS B6339 - BT | Taper Accuracy | G Value | RPM | Coolant System |
|---|---|---|---|---|
| | AT3 | - | - | - |

■ **JIS B6339/MAS 403-BT**

■ **STANDARD**

Unit : inch

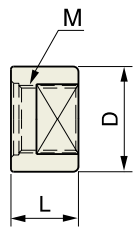
| EDP No. | TAPER No. | MODEL No. | CUTTER SIZE I.D | L1 | D | L2 |
|---|---|---|---|---|---|---|
| PH014 | 40 | BT40 - STUB 1 - 3.00 | 1.000 | 3.00 | 1.56 | 5.25 |
| PH017 | | BT40 - STUB 1 1/4 - 3.00 | 1.250 | 3.00 | 1.87 | 5.50 |
| PH021 | | BT40 - STUB 1 1/2 - 3.00 | 1.500 | 3.00 | 2.12 | 5.75 |
| PI014 | 50 | BT50 - STUB 1 - 4.00 | 1.000 | 4.00 | 1.56 | 6.25 |
| PI017 | | BT50 - STUB 1 1/4 - 4.00 | 1.250 | 4.00 | 1.87 | 6.50 |
| PI021 | | BT50 - STUB 1 1/2 - 4.00 | 1.500 | 4.00 | 2.12 | 6.75 |

* NUTS / KEY / SPACER FOR STUB ARBORS ON PAGE 999.

## NUT

Unit : inch

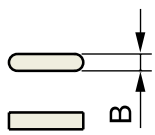
| EDP No. | TYPE(M) | L | D | SERIES |
|---|---|---|---|---|
| ZZ041 | UNF 1 -12 | 1.00 | 1.56 | STUB 1" |
| ZZ046 | UNF1 1/4-12 | 1.25 | 1.87 | STUB 1 1/4 |
| ZZ052 | UNF1 1/2-12 | 1.50 | 2.12 | STUB 1 1/2 |



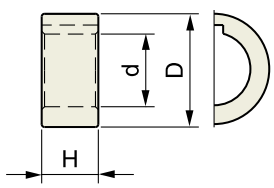

## KEY

Unit : inch

| EDP No. | SERIES | B |
|---|---|---|
| ZZ042 | STUB 1 | 0.25 |
| ZZ047 | STUB 1 1/4 | 0.312 |
| ZZ054 | STUB 1 1/2 | 0.375 |




## SPACER



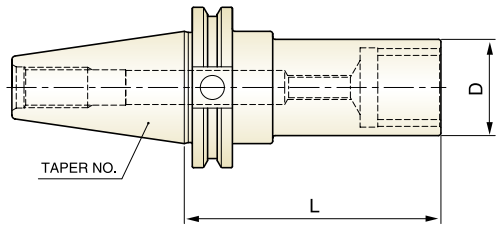

Unit : inch

| EDP No. | TYPE | H | D | d | SERIES |
|---|---|---|---|---|---|
| ZZ043 | 1/4 - SPACER | 0.25 | 1.56 | 1.00 | STUB 1" |
| ZZ044 | 3/8 - SPACER | 0.375 | 1.56 | 1.00 | STUB 1" |
| ZZ045 | 3/4 - SPACER | 0.75 | 1.56 | 1.00 | STUB 1" |

| EDP No. | TYPE | H | D | d | SERIES |
|---|---|---|---|---|---|
| ZZ048 | 1/4 - SPACER | 0.25 | 1.87 | 1.25 | STUB 1 1/4 |
| ZZ049 | 3/8 - SPACER | 0.375 | 1.87 | 1.25 | STUB 1 1/4 |
| ZZ050 | 3/4 - SPACER | 0.75 | 1.87 | 1.25 | STUB 1 1/4 |

| EDP No. | TYPE | H | D | d | SERIES |
|---|---|---|---|---|---|
| ZZ037 | 1/4 - SPACER | 0.25 | 2.12 | 1.50 | STUB 1 1/2 |
| ZZ038 | 3/8 - SPACER | 0.375 | 2.12 | 1.50 | STUB 1 1/2 |
| ZZ039 | 3/4 - SPACER | 0.75 | 2.12 | 1.50 | STUB 1 1/2 |

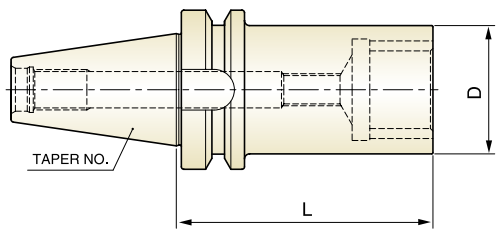
## SLITTING SAW ARBOR — CAT




■ STANDARD

| EDP No. | Type | TAPER No. | Collet Series | L | D |
|---|---|---|---|---|---|
| QK014 | CAT40-SSA1˝- 4.00 | 40 | 1.000 | 4.00 | 1.50 |
| QK017 | CAT40-SSA1 1/4 - 4.00 | 40 | 1.250 | 4.00 | 2.00 |
| QL014 | CAT50-SSA1˝- 4.00 | 50 | 1.000 | 4.00 | 1.50 |
| QL017 | CAT50-SSA1 1/4 - 4.00 | 50 | 1.250 | 4.00 | 2.00 |

## SLITTING SAW ARBOR — BT

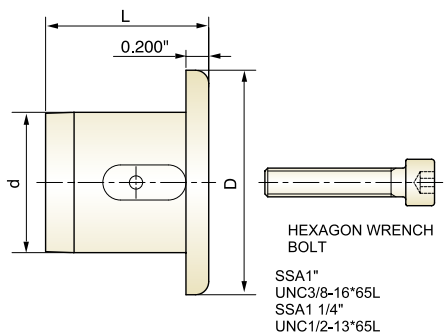



■ STANDARD

| EDP No. | Type | TAPER No. | Collet Series | L | D |
|---|---|---|---|---|---|
| QH014 | BT40 - SSA 1˝ - 4.00 | 40 | 1.000 | 4.00 | 1.50 |
| QH017 | BT40 - SSA 1 1/4 - 4.00 | 40 | 1.250 | 4.00 | 2.00 |

## CAP — CAT /BT

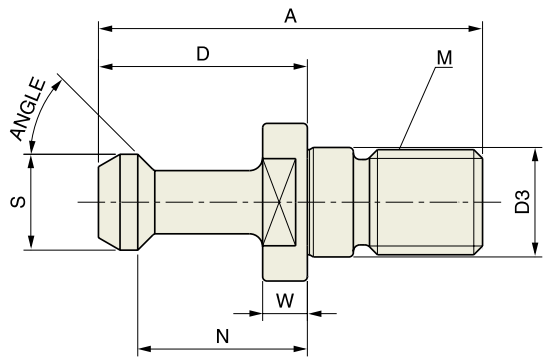
| EDP No. | Type | L | D | d |
|---|---|---|---|---|
| ZZ051 | SSA 1˝ | 1.02 | 1.50 | 1.00 |
| ZZ053 | SSA 1 1/4˝ | 1.30 | 2.00 | 1.25 |



## PULL STUD








| EDP NO. | MODEL No. | Angle | S | P | D3 | A | N | D | W | M |
|---|---|---|---|---|---|---|---|---|---|---|
| **SK661** | CAT-40 ANSI C | 45° | 0.740 | 0.490 | 0.490 | 1.500 | 0.440 | 0.640 | 0.120 | 5/8-11 |
| **SL661** | CAT-50 ANSI C | 45° | 1.140 | 0.820 | 0.820 | 2.300 | 0.700 | 1.000 | 0.200 | 1-8 |
| **SK561** | CAT-40 ANSI | 45° | 0.740 | 0.490 | 0.490 | 1.500 | 0.440 | 0.640 | 0.120 | 5/8-11 |
| **SL561** | CAT-50 ANSI | 45° | 1.140 | 0.820 | 0.820 | 2.300 | 0.700 | 1.000 | 0.200 | 1-8 |
| **SK761** | CAT-40 TYPE I | 45° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SK762** | CAT-40 TYPE II | 60° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SK763** | CAT-40 TYPE " | 90° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SK861** | CAT-40 TYPE "C | 45° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SK862** | CAT-40 TYPE "C | 60° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SK863** | CAT-40 TYPE "C | 90° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.120 | 5/8-11 |
| **SL761** | CAT-50 TYPE " | 45° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SL762** | CAT-50 TYPE " | 60° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SL763** | CAT-50 TYPE " | 90° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SL861** | CAT-50 TYPE "C | 45° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SL862** | CAT-50 TYPE "C | 60° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SL863** | CAT-50 TYPE "C | 90° | 0.906 | 0.669 | 0.827 | 3.346 | 1.377 | 1.772 | 0.390 | 1-8 |
| **SH061** | BT-40 PS 1 | 45° | 0.590 | 0.394 | 0.669 | 2.360 | 1.102 | 1.378 | 0.230 | M16 |
| **SI061** | BT-50 PS 5 | 45° | 0.905 | 0.669 | 0.984 | 3.346 | 1.377 | 1.772 | 0.390 | M24 |
| **SH062** | BT-40 PS 2 | 60° | 0.590 | 0.394 | 0.669 | 2.360 | 1.102 | 1.378 | 0.230 | M16 |
| **SI062** | BT-50 PS 6 | 60° | 0.905 | 0.669 | 0.984 | 3.346 | 1.377 | 1.772 | 0.390 | M24 |
| **SH063** | BT-40 PS 8 | 90° | 0.590 | 0.394 | 0.669 | 2.360 | 1.102 | 1.378 | 0.230 | M16 |
| **SI063** | BT-50 PS O | 90° | 0.905 | 0.669 | 0.984 | 3.346 | 1.377 | 1.772 | 0.390 | M24 |
| **SK161** | CAT-40 TYPE " | 45° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |
| **SK162** | CAT-40 TYPE " | 60° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |
| **SK163** | CAT-40 TYPE " | 90° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |
| **SK261** | CAT-40 TYPE "C | 45° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |
| **SK262** | CAT-40 TYPE "C | 60° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |
| **SK263** | CAT-40 TYPE "C | 90° | 0.590 | 0.394 | 0.512 | 2.250 | 0.990 | 1.266 | 0.236 | 5/8-11 |

* SUFFIX "C" IN MODEL NO. IS THROUGH COOLANT TYPE .
* IMPROPER SELECTION OF PULL STUDS CAN CAUSE SERIOUS DAMAGE AND POSSIBLE INJURY.
  PLEASE MAKE SURE THE MACHINE ACCEPTS THE PULL STUD YOU SELECT.

# TOOL CLAMP

| EDP No. | MODEL No. | SHANK FLANGE TYPE |
|---|---|---|
| **RK099** | TCT-40 | CAT-40 |
| **RH099** | TBT-40 | BT-40 |
| **RL099** | TCT-50 | CAT-50 |
| **RM099** | TBT-50 | BT-50 |

*AVAILABLE IN ALL TAPERS.

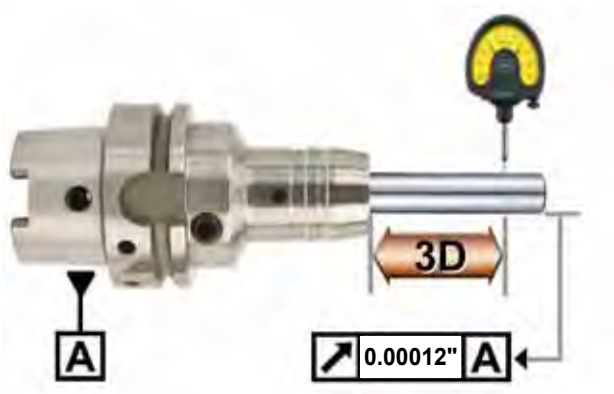


## FEATURES :

* ACCESS BOTH ENDS OF YOUR TOOL HOLDERS SIMULTANEOUSLY
* MINIMIZES TOOL HOLDERS HANDLING
* SPEEDS UP YOUR OPERATIONS
* CONVENIENT

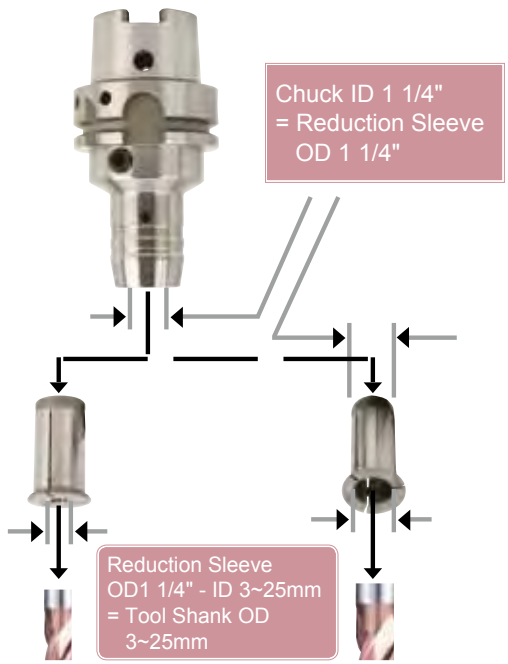
## HYDRAULIC CHUCK

### 01 High precision T.I.R : ≤ 0.00012" (Without Reduction Sleeve)

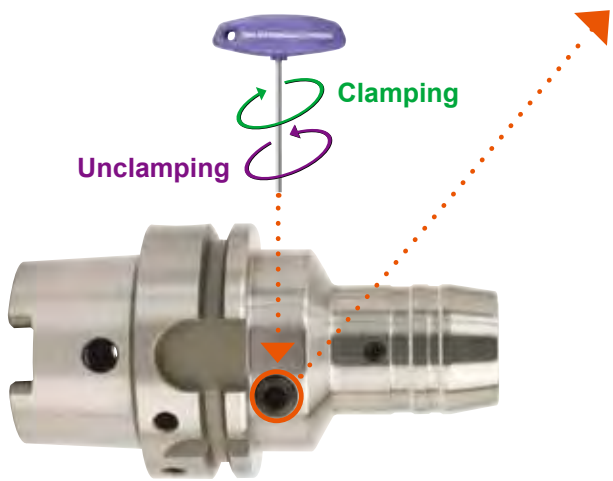



- Less than 0.00012" T.I.R
  - Suitable for high-speed precision machining

### 02 Flexible use of cutting tools by using reduction sleeves

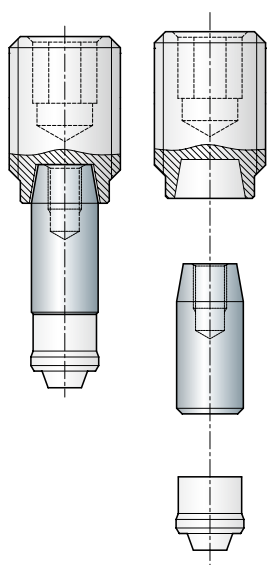



### 03 Easy Tool Change




- Easy clamping and unclamping by use of T wrench
  - Reducing tool change time

**CLAMPING SCREW**



PATENT
Clamping Screw

PATENT
Piston Pin

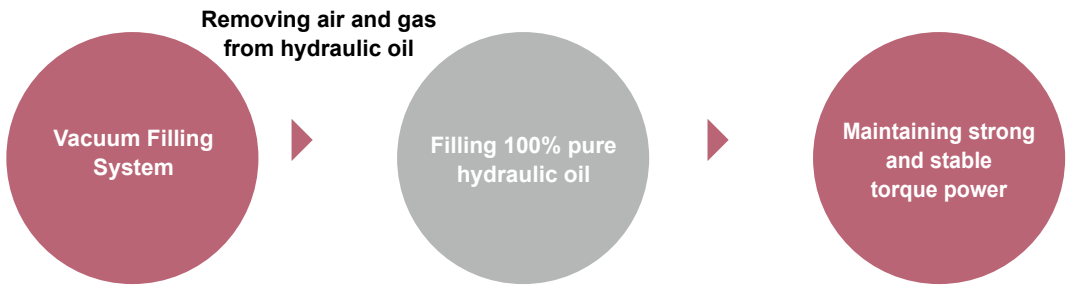
Oil Seal

# HYDRAULIC CHUCK

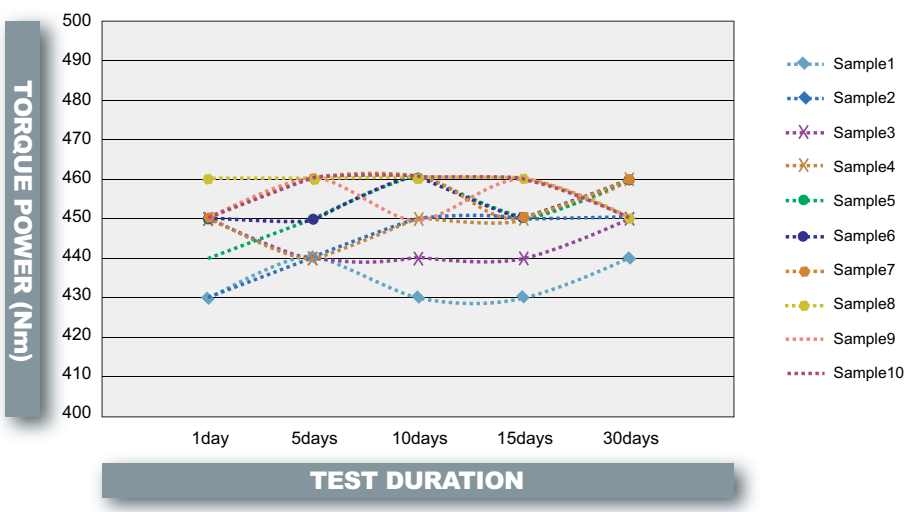
## 04 Strong Torque Power

| Hydraulic Chuck ID (mm) | Tool Shank OD (mm) | Applicable RPM | Minimum clamping depth (mm) | Min. Torque Power (Nm) |
|---|---|---|---|---|
| 6 | 6 | 25,000 | 27 | 16 |
| 8 | 8 | 25,000 | 27 | 23 |
| 10 | 10 | 25,000 | 32 | 45 |
| 12 | 12 | 25,000 | 27 | 90 |
| 14 | 14 | 25,000 | 37 | 110 |
| 16 | 16 | 25,000 | 42 | 185 |
| 18 | 18 | 25,000 | 42 | 240 |
| 20 | 20 | 25,000 | 42 | 330 |
| 25 | 25 | 25,000 | 48 | 400 |
| 32 | 32 | 25,000 | 55 | 650 |

- **Tool holder ID Tolerance : H6**
- **Operating Temperature : 68~122 °F**
- **Maximum oil pressure of coolant oil**




## 05 Test of torque power and hydraulic oil leakage




- TEST Model : BT40AD/B-HC20S-72.5
- No oil leakage for long period ⇒ Maintaining stable torque power

# HYDRAULIC CHUCK

## Radial tool length pre-setting type

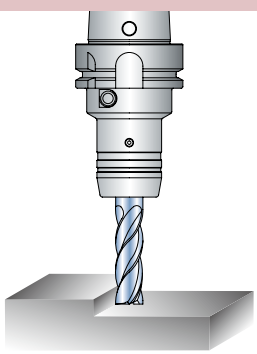
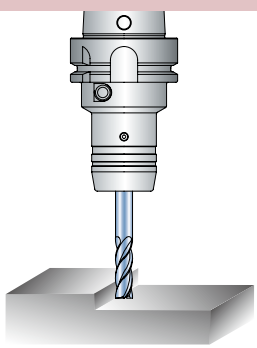
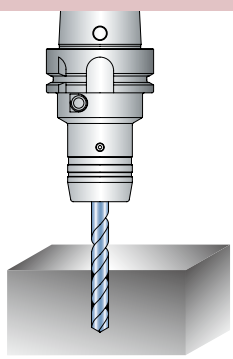
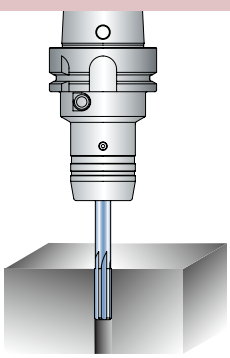
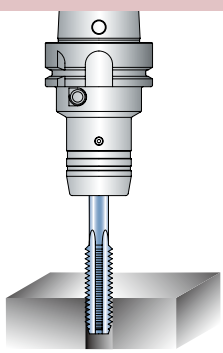
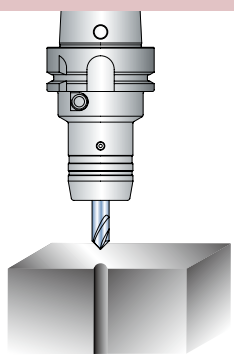
- Easy to adjust pre-setting length of cutting tool (Saving time to pre-set cutting tool to one fifth compared with conventional Hydraulic Chuck)
- Precise adjustment of cutting tool length
- Designed to separate tool length adjustment screw from clamping screw





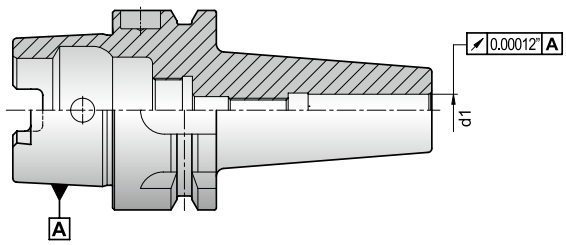

Adjustable range of
cutting tool length : 0~0.394"

## APPLICATION

| Milling | High Speed Cutting | Fine Drilling |
|---|---|---|
|  |  |  |
| **Reaming** | **Tapping & Thread Milling** | **Chamfering** |
|  |  |  |

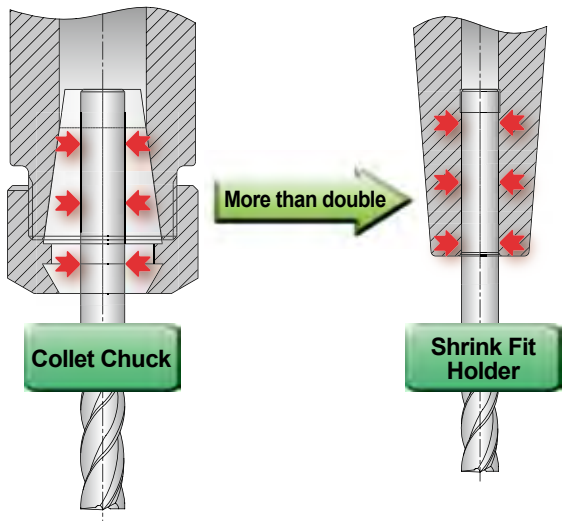
## SHRINK FIT HOLDER

### 01 High Precision ID Run-out : ≤0.00012"



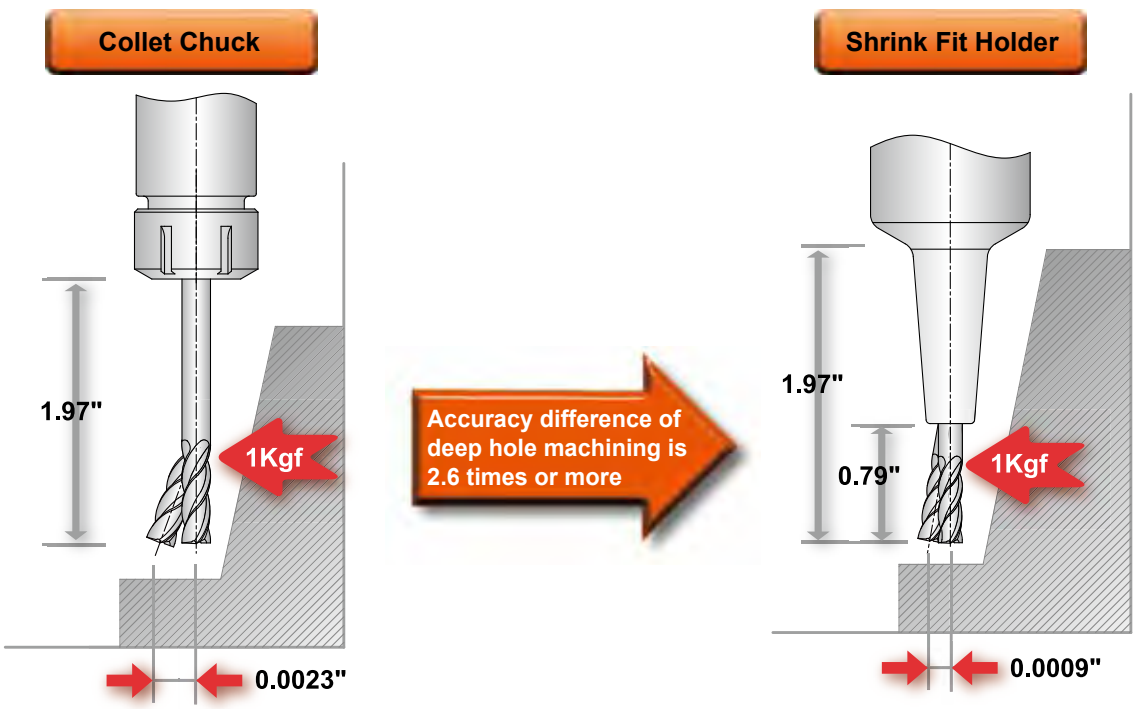

• Less than 0.00012" of Tool Holder accuracy at I.D.

### 02 Strong and consistent torque power




• Achieving strong torque power by integration of chuck and tool

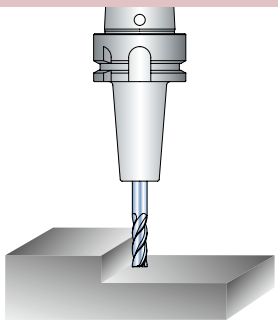
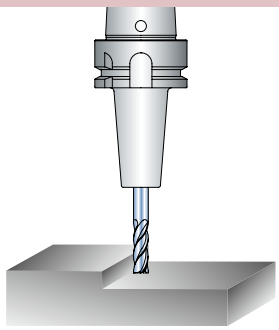
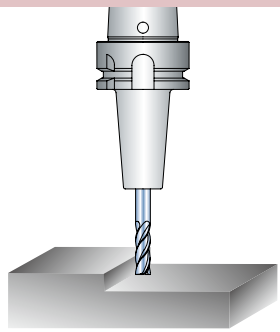
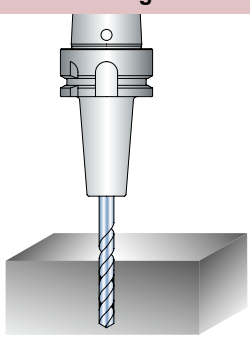
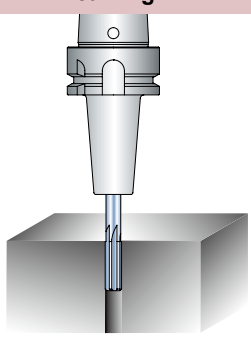
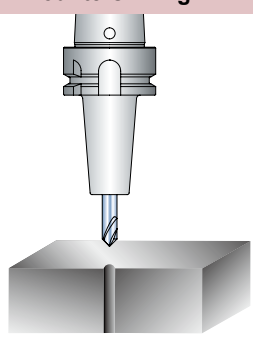
### 03 Deep hole Machining




• Suitable for high-speed precision deep hole machining

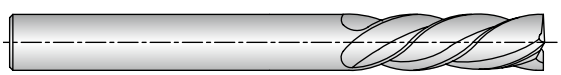
# SHRINK FIT HOLDER

## APPLICATION

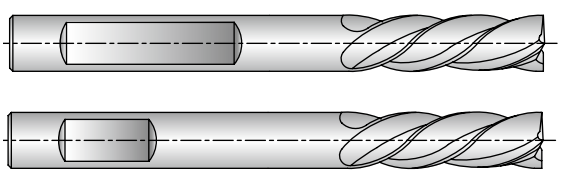
| Rough Milling | Finish Milling | High Speed Cutting |
|---|---|---|
|  |  |  |
| **Drilling** | **Reaming** | **Countersinking** |
|  |  |  |

## 04 Shank type of cutting tool

**Straight shank**



**One weldon flat shaft type**



• One Weldon flat shaft type tool is usable, but there is a possibility that the I.D of shrink fit holder may be deformed.

## 05 Material of cutting tool



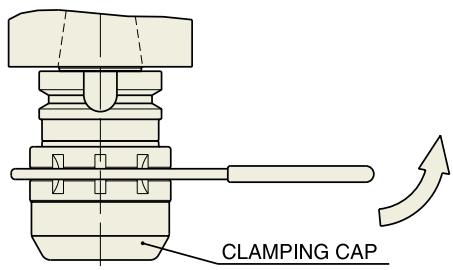
# MILLING CHUCK

## SPECIAL FEATURES

### TOOL CLAMPING

For complete tool clamping, clamping cap should be fully turned up to the point where the bottom of clamping cap touches the flange of tool holder.

**CLAMPING**



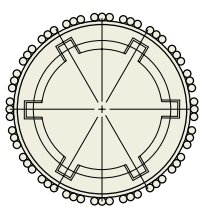

### HOLDING POWER

Thicker body structure od clamping cap assures strong holding power maximum durability and smooth movement of needle bearings 300 kgf holding force.

### ACCURACY

Slots on the inside of bore help prevent excessive oil and grime from building up between shank of end mill and inside of bore which increases accuracy and holding power.

**STRUCTURE**



### DURABILITY

Special engineered steels and alloys are used in the bearing and stop seal to increase life and reduce maintenance.

## T.I.R and TOLEARANCE

### T.I.R (Total Indicated Run-out)

HYDRAULIC CHUCK
Concentric to 0.00012"  T.I.R (at 3D)

SHRINK FIT HOLDER
Concentric to 0.00012" T.I.R (at I.D)

ER COLLET CHUCK
Concentric to 0.0002" T.I.R (at I.D)

END MILL HOLDER
Concentric to 0.0002" T.I.R (at I.D)

SLITTING SAW ARBOR
Face perpendicular to taper within 0.0002" T.I.R (at I.D)

STUB ARBOR
Face perpendicular to taper within 0.0002" T.I.R (at I.D)

SHELL MILL ARBOR
Face perpendicular to taper within 0.0001" T.I.R
Out diameter to taper within 0.0002" T.I.R

MORSE & JACOBS TAPER ARBOR
Concentric to 0.0003" T.I.R

* To put tool precisely on spindle center line for getting correct  T.I.R.

---

**01** **AT3 or better  accuracy on all shank tapers**

**02** **Accurate and rigid tool holder mounting to spindle**

| TAPER | AT3 |
|---|---|
| #30 | 0.000078" |
| #40 | 0.00012" |
| #50 | 0.00016" |

**03** **The bore diameter of all tool holders is controlled by H5 grade tolerance limit.**

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