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Burrs

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Solid Carbide End Mills

Two Flute

Center Cutting

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Solid Carbide End Mills

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Center Cutting

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NEW! Multi-Flute, Fine Pitch	C20
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C

Burrs End Mills Cutters, Tool Bits

High-Speed Steel End Mills

Two Flute

Center Cutting

Single End	C21
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Multi-Flute

Center Cutting

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Two Flute

Center Cutting

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Micrograin Carbide Burrs

- Used in many industries for stock removal and the removal of burrs.
- Manufactured from micrograin carbide on automated CNC machines.
- TiN coating provides longer tool life.

Single Cut



- General purpose style. Provides good stock removal and a smooth finish on materials like steel, cast iron and ferrous metals.

Double Cut



- Best selling style with heavy stock removal qualities on tough materials.
- Engineered to reduce chip size and pulling action.

Alumacut



- Designed for obtaining a great finish on aluminum, reinforced plastics, soft steels and other soft materials.

TiN Coating



- Titanium Nitride coating provides longer edge retention, corrosion resistance and increases tool life by a factor of three or more.

Chipbreaker



- Made to provide better control and reduce chipping. For use on hard materials like steel alloy 50RC-60RC, carbon steel and cast iron.

Diamond Cut



- Reduces chip size almost to powder and with excellent control on tough treated alloy steels.

**Single Cut, Double Cut, Alumacut and TiN Coated Double Cut Burrs available in stock.
Chipbreaker and Diamond Cut are available on request.**

Carbide & High-Speed Steel Burrs

- A full line of burrs for a wide range of applications
- A wide selection of fluting styles
- Extra-long shanks available
- Miniature burrs
- State-of-the-art CNC precision made
- Made in the U.S.A.

APPLICATIONS & SPEED REFERENCE CHARTS

APPLICATIONS

MATERIAL CUTTING	SUITABILITY		
	Single Cut	Double Cut	Alumacut
Aluminum			■
Brass	■	■	
Bronze	■	■	
Carbon Fiber		■*	
Carbon Steel	■	■	
Cast Iron	■	■	
Copper	■	■	
Fiberglass		■*	
Hard Rubber	■	■	
Inconel	■	■	
Magnesium			■
Plastics	■	■	■
Stainless Steel	■	■	
Steel - 45-55Rc	■	■	
Steel - 55-60Rc	■	■	
Steel - Nickel Chrome	■	■	
Steel - Weldments	■	■	
Titanium	■	■	
Zinc			■

*Diamond cut burrs are recommended for carbon fiber and fiberglass and are available by special order. Double cut burrs may be effective, but they carry a greater risk of shredding the fiber weave.

GENERAL BURR SPEED RECOMMENDATIONS

The following chart is a general and approximate recommendation. Variations to achieve desired results may be necessary.

Burr Diameter	Recommended (RPM)
SOLID CARBIDE	
1/16" or 1.5mm	60,000 - 90,000
1/8" or 3mm	45,000 - 50,000
3/16" or 5mm	35,000 - 40,000
1/4" or 6mm	30,000 - 35,000
CARBIDE HEAD BRAZED TO STEEL SHANK	
3/16" on 1/8" shank	35,000 - 40,000
1/4" on 1/8" shank	25,000 - 30,000
5/16" on 1/4" shank	25,000 - 30,000
3/8" on 1/4" shank	25,000 - 30,000
7/16" on 1/4" shank	20,000 - 25,000
1/2" on 1/4" shank	20,000 - 25,000
5/8" on 1/4" shank	15,000 - 20,000
3/4" on 1/4" shank	15,000 - 20,000
1" on 1/4" shank	12,000 - 18,000

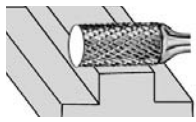
Burrs up to 1/4" head diameter are solid carbide. Sizes larger than 1/4" diameter feature solid carbide heads brazed to heat treated shanks.

GENERAL USE

- Adjust speeds as needed for optimum performance. Use slower speeds for harder materials and cutting with long shank burrs. Use higher speeds for cutting with smaller diameter burrs.
- Do not run above maximum speeds. This will cause premature wear and damage to burr teeth.
- Do not run below minimum speeds. This may cause chipping.
- All other tools and collets should be in good condition. Using worn tools will cause chipping.
- Not for use in portable drill motors.
- Apply constant pressure while cutting.

Micrograin Carbide Burrs

1/4" Shank
Right Hand Cut



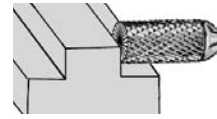
SA

CYLINDRICAL

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TIN COATED
SA-11	1/8 x 1/2	B71201	B71201D	B71201DTN
SA-12	1/8 x 5/8	B71301	B71301D	B71301DTN
SA-14	3/16 x 5/8	B71212	B71212D	B71212DTN
SA-1	1/4 x 5/8	B71202	B71202D	B71202DTN
SA-1L	1/4 x 1	B71202B	B71202BD	B71202BDTN
SA-2	5/16 x 3/4	B71204	B71204D	B71204DTN
SA-3	3/8 x 3/4	B71205	B71205D	B71205DTN
SA-3L	3/8 x 1	B71205B	B71205BD	B71205BDTN
SA-3X	3/8 x 1-1/2	B71205C	B71205CD	B71205CDTN
SA-4	7/16 x 1	B71207	B71207D	B71207DTN
SA-5	1/2 x 1	B71208	B71208D	B71208DTN
SA-6	5/8 x 1	B71209	B71209D	B71209DTN
SA-16	3/4 x 3/4	B71303	B71303D	B71303DTN
SA-7	3/4 x 1	B71210	B71210D	B71210DTN
SA-9	1 x 1	B71211	B71211D	B71211DTN

1 per pack



SB

CYLINDRICAL END CUT

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TIN COATED
SB-11	1/8 x 1/2	B71291	B71291D	B71291DTN
SB-12	1/8 x 5/8	B71391	B71391D	B71391DTN
SB-14	3/16 x 5/8	B71392	B71392D	B71392DTN
SB-1	1/4 x 5/8	B71292	B71292D	B71292DTN
SB-1L	1/4 x 1	B71292B	B71292BD	B71292BDTN
SB-2	5/16 x 3/4	B71293	B71293D	B71293DTN
SB-3	3/8 x 3/4	B71294	B71294D	B71294DTN
SB-3L	3/8 x 1	B71294B	B71294BD	B71294BDTN
SB-3X	3/8 x 1	B71294C	B71294CD	B71294CDTN
SB-4	7/16 x 1	B71295	B71295D	B71295DTN
SB-5	1/2 x 1	B71296	B71296D	B71296DTN
SB-6	5/8 x 1	B71297	B71297D	B71297DTN
SB-16	3/4 x 3/4	B71398	B71398D	B71398DTN
SB-7	3/4 x 1	B71298	B71298D	B71298DTN
SB-9	1 x 1	B71299	B71299D	B71299DTN

1 per pack

Carbide Burrs

C



SC

CYLINDRICAL RADIUS END

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TIN COATED
SC-11	1/8 x 1/2	B71221	B71221D	B71221DTN
SC-12	1/8 x 5/8	B71333	B71333D	B71333DTN
SC-13	5/32 x 5/8	B71233B	B71233BD	B71233BDTN
SC-14	3/16 x 5/8	B71220	B71220D	B71220DTN
SC-1	1/4 x 5/8	B71222	B71222D	B71222DTN
SC-2	5/16 x 3/4	B71224	B71224D	B71224DTN
SC-3	3/8 x 3/4	B71225	B71225D	B71225DTN
SC-3L	3/8 x 1	B71225B	B71225BD	B71225BDTN
SC-3X	3/8 x 1-1/2	B71225C	B71225CD	B71225CDTN
SC-4	7/16 x 1	B71227	B71227D	B71227DTN
SC-5	1/2 x 1	B71228	B71228D	B71228DTN
SC-6	5/8 x 1	B71229	B71229D	B71229DTN
SC-16	3/4 x 3/4	B71229C	B71229CD	B71229CDTN
SC-7	3/4 x 1	B71230	B71230D	B71230DTN
SC-9	1 x 1	B71231	B71231D	B71231DTN

1 per pack



SD

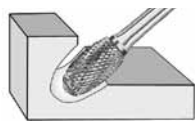
BALL

SHAPE	HEAD DIAMETER	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TIN COATED
SD-11	1/8	B71241	B71241D	B71241DTN
SD-14	3/16	B71350	B71350D	B71350DTN
SD-1	1/4	B71242	B71242D	B71242DTN
SD-2	5/16	B71243	B71243D	B71243DTN
SD-3	3/8	B71244	B71244D	B71244DTN
SD-4	7/16	B71245	B71245D	B71245DTN
SD-5	1/2	B71246	B71246D	B71246DTN
SD-6	5/8	B71247	B71247D	B71247DTN
SD-7	3/4	B71248	B71248D	B71248DTN
SD-9	1	B71249	B71249D	B71249DTN

1 per pack

**Chipbreaker and Diamond Cut
are available on request.**

Micrograin Carbide Burrs - Cont.

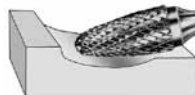


SE

OVAL

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SE-11	3/16 x 5/16	B71319	B71319D	B71319DTN
SE-1	1/4 x 3/8	B71214	B71214D	B71214DTN
SE-3	3/8 x 5/8	B71215	B71215D	B71215DTN
SE-5	1/2 x 7/8	B71216	B71216D	B71216DTN
SE-6	5/8 x 1	B71217	B71217D	B71217DTN
SE-7	3/4 x 1	B71218	B71218D	B71218DTN

1 per pack



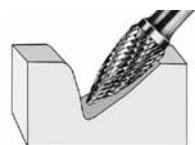
SF

TREE - RADIUS END

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SF-11	1/8 x 1/2	B71252B	B71252BD	B71252BDTN
SF-1	1/4 x 5/8	B71252	B71252D	B71252DTN
SF-3	3/8 x 3/4	B71253	B71253D	B71253DTN
SF-4	7/16 x 1	B71354	B71354D	B71354DTN
SF-13	1/2 x 3/4	B71258	B71258D	B71258DTN
SF-5	1/2 x 1	B71255	B71255D	B71255DTN
SF-6	5/8 x 1	B71256	B71256D	B71256DTN
SF-7	3/4 x 1	B71257	B71257D	B71257DTN
SF-14	3/4 x 1-1/4	B71351	B71351D	B71351DTN
SF-15	3/4 x 1-1/2	B71259	B71259D	B71259DTN

1 per pack

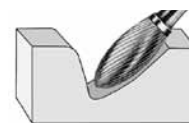


SG

TREE - POINTED END

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SG-1	1/4 x 5/8	B71261	B71261D	B71261DTN
SG-2	5/16 x 3/4	B71262	B71262D	B71262DTN
SG-3	3/8 x 3/4	B71263	B71263D	B71263DTN
SG-13	1/2 x 3/4	B71364	B71364D	B71364DTN
SG-5	1/2 x 1	B71265	B71265D	B71265DTN
SG-6	5/8 x 1	B71266	B71266D	B71266DTN
SG-7	3/4 x 1	B71267	B71267D	B71267DTN
SG-15	3/4 x 1-1/2	B71268	B71268D	B71268DTN

1 per pack

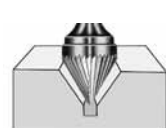


SH

FLAME

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SH-1	1/4 x 5/8	B71271	B71271D	B71271DTN
SH-2	5/16 x 3/4	B71272	B71272D	B71272DTN
SH-5	1/2 x 1-1/4	B71273	B71273D	B71273DTN
SH-6	5/8 x 1-7/16	B71274	B71274D	B71274DTN
SH-7	3/4 x 1-5/8	B71275	B71275D	B71275DTN

1 per pack



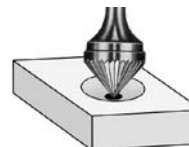
SJ

60° CONE

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SJ-1	1/4 x 3/16	B71260A	B71260AD	B71260ADTN
SJ-2	5/16 x 5/16	B71305	B71305D	B71305DTN
SJ-3	3/8 x 5/16	B71312	B71312D	B71312DTN
SJ-5	1/2 x 7/16	B71313	B71313D	B71313DTN
SJ-6	5/8 x 9/16	B71314	B71314D	B71314DTN
SJ-7	3/4 x 11/16	B71315	B71315D	B71315DTN
SJ-9	1 x 15/16	B71316	B71316D	B71316DTN

1 per pack



SK

90° CONE

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SK-1	1/4 x 1/8	B71321	B71321D	B71321DTN
SK-2	5/16 x 3/16	B71321B	B71321BD	B71321BDTN
SK-3	3/8 x 3/16	B71322	B71322D	B71322DTN
SK-5	1/2 x 1/4	B71323	B71323D	B71323DTN
SK-6	5/8 x 5/16	B71324	B71324D	B71324DTN
SK-7	3/4 x 3/8	B71325	B71325D	B71325DTN
SK-9	1 x 1/2	B71326	B71326D	B71326DTN

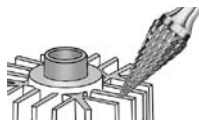
1 per pack

Chipbreaker and Diamond Cut are available on request.

Carbide Burrs

C

Micrograin Carbide Burrs - Cont.



SL 14° TAPER/CONE – RADIUS END

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SL-1	1/4 x 5/8	B71281	B71281D	B71281DTN
SL-2	5/16 x 7/8	B71282	B71282D	B71282DTN
SL-3	3/8 x 1-1/16	B71283	B71283D	B71283DTN
SL-4	1/2 x 1-1/8	B71284	B71284D	B71284DTN
SL-5	5/8 x 1-3/16	B71287A	B71287AD	B71287ADTN
SL-6	5/8 x 1-5/16	B71285	B71285D	B71285DTN
SL-7	3/4 x 1-1/2	B71286	B71286D	B71286DTN

1 per pack

SM TAPER/CONE – POINTED END

SHAPE	HEAD SIZE DIA. x LENGTH	ANGLE	STOCK #		
			SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SM-1	1/4 x 1/2	22°	B71233	B71233D	B71233DTN
SM-2	1/4 x 3/4	14°	B71234	B71234D	B71234DTN
SM-3	1/4 x 1	10°	B71235	B71235D	B71235DTN
SM-4	3/8 x 5/8	28°	B71236	B71236D	B71236DTN
SM-5	1/2 x 7/8	28°	B71237	B71237D	B71237DTN
SM-6	5/8 x 1	31°	B71238	B71238D	B71238DTN

1 per pack



Chipbreaker and Diamond Cut are available on request.

SN INVERTED CONE

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #		
		SINGLE CUT	DOUBLE CUT	DOUBLE CUT TiN COATED
SN-1	1/4 x 5/16	B71276	B71276D	B71276DTN
SN-2	3/8 x 3/8	B71277	B71277D	B71277DTN
SN-4	1/2 x 1/2	B71278	B71278D	B71278DTN
SN-6	5/8 x 3/4	B71279	B71279D	B71279DTN
SN-7	3/4 x 5/8	B71280	B71280D	B71280DTN

1 per pack

MICROGRAIN CARBIDE BURR SETS



BLOW MOLDED CASE

Expanded



SET DESCRIPTION		STOCK #	
		DOUBLE CUT	DOUBLE CUT TiN COATED
8 Pc. Set	1/4" Shank 1/2" Head Contains one each: SA-5, SC-5, SD-5, SE-5, SF-5, SG-5, SL-4, SM-5	B81	B81TN
8 Pc. Set	1/4" Shank 1/4" Head Contains one each: SA-1, SC-1, SD-1, SE-1 SF-1, SG-1, SL-1, SM-1	B82	B82TN

SET DESCRIPTION		STOCK #
12 Pc. Set	1/4" Shank Burrs Contains one each: SA-1, SA-14, SB-1, SC-1, SC-14, SD-1, SE-1, SF-1, SG-1, SH-1, SJ-1, SL-1 Single Cut Double Cut	B71287 B71287D
16 Pc. Set	1/4" Shank Burrs Contains one each: SA-1, SA-3, SA-5, SC-1, SC-3, SC-5, SD-3, SD-5, SE-3, SF-1, SF-3, SF-5, SG-1, SG-3, SL-3, SL-4 Single Cut Double Cut	B71290 B71290D

Micrograin Carbide Burrs – Long Shank

LONG SHANK BURRS



SHANK DIA. 1/4" • LENGTH 6" • SINGLE CUT • DOUBLE CUT

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #	
		SINGLE CUT	DOUBLE CUT
A - CYLINDRICAL			
SA-1L6	1/4 x 5/8	B71202L	B71202DL
SA-3L6	3/8 x 3/4	B71205L	B71205DL
SA-5L6	1/2 x 1	B71208L	B71208DL
B - CYLINDRICAL END CUT			
SB-1L6	1/4 x 5/8	B71292L	B71292DL
SB-3L6	3/8 x 3/4	B71294L	B71294DL
SB-5L6	1/2 x 1	B71296L	B71296DL
C - CYLINDRICAL RADIUS END			
SC-1L6	1/4 x 5/8	B71222L	B71222DL
SC-3L6	3/8 x 3/4	B71225L	B71225DL
SC-5L6	1/2 x 1	B71228L	B71228DL
D - BALL			
SD-1L6	1/4	B71242L	B71242DL
SD-3L6	3/8	B71244L	B71244DL
SD-5L6	1/2	B71246L	B71246DL
E - OVAL			
SE-1L6	1/4 x 3/8	B71214L	B71214DL
SE-3L6	3/8 x 5/8	B71215L	B71215DL
SE-5L6	1/2 x 7/8	B71216L	B71216DL
F - TREE RADIUS END			
SF-1L6	1/4 x 5/8	B71252L	B71252DL
SF-3L6	3/8 x 3/4	B71253L	B71253DL
SF-5L6	1/2 x 1	B71255L	B71255DL
G - TREE POINTED END			
SG-1L6	1/4 x 5/8	B71261L	B71261DL
SG-3L6	3/8 x 3/4	B71263L	B71263DL
SG-5L6	1/2 x 1	B71265L	B71265DL
H - FLAME			
SH-2L6	5/16 x 3/4	B71272L	B71272DL
SH-5L6	1/2 x 1-1/4	B71273L	B71273DL
L - TAPER CONE POINTED END			
SL-1L6	1/4 x 5/8	B71281L	B71281DL
SL-3L6	3/8 x 1-1/16	B71283L	B71283DL
SL-4L6	5/8 x 1-3/16	B71284L	B71284DL
M - TAPER CONE			
SM-1L6	1/4 x 1/2	B71233L	B71233DL
SM-3L6	1/4 x 1	B71235L	—
SM-5L6	1/2 x 7/8	B71237L	B71237DL

- Features:**
- Long shank burrs are suitable for all hard to reach work.
 - Smaller diameter heads are ideal for small components.
 - Large diameter heads are suitable for deep applications, such as engine block work.



When working with long shank burrs, the burr must be in contact with the workpiece (or inserted in the bore or slot to be machined) before the machine is turned on. As a rule, the tool must remain in contact with the workpiece for as long as the machine is running. Failure to observe this procedure may result in shank failure and hence, an increased accident risk.



Longer shanks up to 10" are available.

1 per pack

Micrograin Carbide Burrs – Miniature Series



Single Cut

- Features:**
- Ideal for delicate work such as engraving.
 - Suitable for use in pencil grinders.
 - Use for deburring, sculpting and removing material in small areas.



1/4" HEAD 1/8" SHANK

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SA-51	1/4 x 1/2	B71203
SB-51	1/4 x 3/16	B71219
SC-51	1/4 x 1/2	B71223
SD-51	1/4 x 7/32	B71240
SE-51	1/4 x 3/8	B71269

1 per pack

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SF-51	1/4 x 1/2	B71250
SG-51	1/4 x 1/2	B71260
SM-51	1/4 x 1/2	B71239
SN-51	1/4 x 1/4	B71445

1 per pack



1/8" HEAD 1/8" SHANK

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SA-41	1/16 x 1/4	B71205G
SA-42	3/32 x 7/16	B71206
SA-43	1/8 x 9/16	B71213
SB-41	1/16 x 1/4	B71232
SB-43	1/8 x 9/16	B71232B
SC-41	3/32 x 7/16	B71226
SC-42	1/8 x 9/16	B71254
SD-41	3/32 x 3/32	B71239B
SD-42	1/8 x 1/8	B71240A
SE-41	1/8 x 7/32	B71270
SF-41	1/8 x 1/4	B71251
SF-42	1/8 x 1/2	B71251B
SG-41	1/8 x 1/4	B71264

1 per pack

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SG-42	1/8 x 5/16	B71264B
SG-43	1/8 x 3/8	B71264C
SG-44	1/8 x 1/2	B71264E
SH-41	1/8 x 1/4	B71271A
SJ-42	1/8 x 3/32	B71401
SK-42	1/8 x 1/16	B71405
SL-41	1/8 x 3/8	B71410
SL-42	1/8 x 1/2	B71415
SM-41	1/8 x 11/32	B71420
SM-42	1/8 x 7/16	B71425
SM-43	1/8 x 5/8	B71430
SN-41	3/32 x 1/8	B71435
SN-42	1/8 x 3/16	B71440

1 per pack



SET DESCRIPTION	STOCK #
8 Pc. Set 1/4" Head 1/8" Shank Contains one each: SA-51, SB-51, SC-51, SD-51, SE-51, SF-51, SG-51, SM-51	B71288
10 Pc. Set 1/8" Head 1/8" Shank Contains one each: SA-42, SA-43, SB-41, SC-41, SC-42, SD-42, SE-41, SF-41, SG-41, SH-41	B71289A

Burrs available TiN coated. Details on request.

Micrograin Carbide Burrs – Alumacut

For Non-Ferrous Metals

- Features:**
- Suitable for deburring softer non-ferrous metals and non-metallic materials.
 - Coarse cut for use on soft, stringy materials such as aluminum, magnesium, plastics, hard rubber, hard woods, etc.
 - Wide clearance and end mill type geometry of the flutes promotes fast stock removal with minimum loading.

1/4" Shank Right Hand Cut

SA/NF



CYLINDRICAL

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SA-1NF	1/4 x 5/8	B71202A
SA-3NF	3/8 x 3/4	B71205A
SA-5NF	1/2 x 1	B71208A
SA-6NF	5/8 x 1	B71209A
SA-7NF	3/4 x 1	B71210A
*SA-7NFR	3/4 x 1	B71210BA

1 per pack *3/8" shank

SC/NF



CYLINDRICAL RADIUS END

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SC-1NF	1/4 x 5/8	B71222A
SC-3NF	3/8 x 3/4	B71225A
SC-5NF	1/2 x 1	B71228A
SC-6NF	5/8 x 1	B71229A
SC-7NF	3/4 x 1	B71230A
*SC-7NFR	3/4 x 1	B71230BA

1 per pack *3/8" shank

SE/NF



OVAL

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SE-1NF	1/4 x 3/8	B71214A
SE-3NF	3/8 x 5/8	B71215A
SE-5NF	1/2 x 7/8	B71216A
SE-6NF	5/8 x 1	B71217A
SE-7NF	3/4 x 1	B71218A

1 per pack

SD/NF



BALL

Expanded

SHAPE	HEAD SIZE DIAMETER	STOCK #
SD-1NF	1/4	B71242A
SD-3NF	3/8	B71244A
SD-5NF	1/2	B71246A
SD-6NF	5/8	B71247A
SD-7NF	3/4	B71248A
*SD-7NFR	3/4	B71248BA

1 per pack *3/8" shank

SF/NF



TREE – RADIUS END

Expanded

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SF-1NF	1/4 x 5/8	B71252A
SF-3NF	3/8 x 3/4	B71253A
SF-5NF	1/2 x 1	B71255A
SF-6NF	5/8 x 1	B71256A
SF-7NF	3/4 x 1	B71257A
*SF-7NFR	3/4 x 1	B71258BA
SF-14NF	3/4 x 1	B71258A

1 per pack *3/8" shank

SL/NF



14° TAPER CONE RADIUS END

NEW!

SHAPE	HEAD SIZE DIA. x LENGTH	STOCK #
SL-1NF	1/4 x 5/8	B71281A
SL-3NF	3/8 x 1-1/16	B71283A
SL-4NF	1/2 x 1-1/8	B71284A
SL-5NF	5/8 x 1-3/16	B71287AA
SL-6NF	5/8 x 1-5/16	B71285A

1 per pack

5 PC. ALUMACUT BURR SET

DESCRIPTION	STOCK #
Contains one each: SA-3NF SA-5NF SD-5NF SE-5NF SF-3NF	B71290A



Carbide Burr Dispenser

Huot. 42 PC. CARBIDE BURR DISPENSER

(Three Drawer Cabinet)



Features:

- Contains 21 of the most popular burr styles.
- All steel welded construction with heavy gauge steel drawers with vinyl dividers.
- Organized dispenser makes burrs readily accessible.
- Dimensions: 14-5/8" W x 7-3/8" D x 7-3/4" H.
- Baked epoxy finish for long life.

Stock # BD42

NEW!

TYPE	QTY.	STOCK #
SA-1 CYLINDRICAL	2	B71202D
SA-3 CYLINDRICAL	2	B71205D
SA-5 CYLINDRICAL	2	B71208D
SC-1 CYLINDRICAL RADIUS END	2	B71222D
SC-3 CYLINDRICAL RADIUS END	2	B71225D
SC-5 CYLINDRICAL RADIUS END	2	B71228D
SD-1 BALL	2	B71242D
SD-3 BALL	2	B71244D
SD-5 BALL	2	B71246D
SE-1 OVAL	2	B71214D
SE-3 OVAL	2	B71215D
SE-5 OVAL	2	B71216D

TYPE	QTY.	STOCK #
SF-1 TREE RADIUS END	2	B71252D
SF-3 TREE RADIUS END	2	B71253D
SF-5 TREE RADIUS END	2	B71255D
SG-1 TREE POINTED END	2	B71261D
SG-5 TREE POINTED END	2	B71265D
SL-1 14° TAPER/CONE RADIUS END	2	B71281D
SL-4 14° TAPER/CONE RADIUS END	2	B71284D
SM-4 TAPER/CONE FLAT END	2	B71236D
SM-5 TAPER/CONE FLAT END	2	B71237D



BURR DISPENSER
Available without tools.

Stock # DIH13200

Note: All burrs in standard dispenser are double cut.

Burr Dispenser • Fiberglass Routers

C

Micrograin Carbide Fiberglass Routers

Straight Shank Diamond Cut



Features:

- Suitable for cutting fiberglass, epoxies and similar composite materials.

STYLE	TOOL DIA.	LENGTH OF CUT	SHANK DIA.	OAL	STOCK #			
					NO END CUT	BURR END	END MILL END	DRILL END
FGR-1	1/16	3/16	1/8	1-1/2	B71701A	B71701B	B71701C	B71701D
FGR-1.1	3/32	3/8	1/8	1-1/2	B71703A	B71703B	B71703C	B71703D
FGR-2	1/8	1/2	1/8	1-1/2	B71705A	B71705B	B71705C	B71705D
FGR-3	3/16	5/8	3/16	2	B71707A	B71707B	B71707C	B71707D
FGR-4	3/16	5/8	1/4	2	B71709A	B71709B	B71709C	B71709D
FGR-5	1/4	3/4	1/4	2	B71711A	B71711B	B71711C	B71711D
FGR-6	1/4	3/4	1/4	2-1/2	B71713A	B71713B	B71713C	B71713D
FGR-6.2	1/4	1	1/4	3	B71715A	B71715B	B71715C	B71715D
FGR-7	5/16	1	5/16	2-1/2	B71717A	B71717B	B71717C	B71717D
FGR-8	3/8	1	3/8	2-1/2	B71719A	B71719B	B71719C	B71719D
FGR-9	1/2	1	1/2	3	B71721A	B71721B	B71721C	B71721D

1 per pack

HSS Burrs • Rotary Files

High-Speed Steel



1/4" Shank Right Hand Cut

Features:

- Recommended for use on non-ferrous and other soft materials.

SHAPE	HEAD SIZE DIA. x LENGTH IN.	STOCK #
A - CYLINDRICAL		
A-100	1/8 x 1/2	BH74201
A-106	1/4 x 1	BH74202
A-107	1/4 x 1-1/2	BH74203
A-109	3/8 x 1	BH74204
A-110	3/8 x 1-1/2	BH74205
A-111	1/2 x 1	BH74206
A-112	1/2 x 1-1/2	BH74207
A-114	5/8 x 1	BH74208
A-116	3/4 x 3/4	BH74209
A-118	1 x 1	BH74210
B - BALL SHAPE		
B-600	1/8 x 1/8	BH74215
B-602	1/4 x 1/4	BH74216
B-603	5/16 x 5/16	BH74217
B-604	3/8 x 3/8	BH74218
B-606	1/2 x 1/2	BH74219
B-609	3/4 x 3/4	BH74220
R - TREE-RADIUS NOSE		
R-503	1/4 x 3/4	BH74221
R-507	1/2 x 1-1/8	BH74222
R-509	3/4 x 1-1/4	BH74223
R-511	1-1/8 x 1-3/4	BH74224
T - TREE POINTED		
T-521	1/4 x 3/4	BH74226
T-523	3/8 x 3/4	BH74227
T-525	1/2 x 3/4	BH74228
T-527	1/2 x 1-1/8	BH74229
T-529	5/8 x 1	BH74230
I - INVERTED CONE		
I-471	1/2 x 1/2	BH74235
I-472	3/4 x 1/2	BH74236
D - DEBURRING		
D-404	1/2 x 60° ANGLE	BH74238
D-406	5/8 x 60° ANGLE	BH74239

1 per pack



SHAPE	HEAD SIZE DIA. x LENGTH IN.	STOCK #
AE - CYLINDRICAL END CUT		
AE-100	1/8 x 1/2	BH74240
AE-106	1/4 x 1	BH74241
AE-107	1/4 x 1-1/2	BH74242
AE-109	3/8 x 1	BH74243
AE-110	3/8 x 1-1/2	BH74244
AE-111	1/2 x 1	BH74245
AE-112	1/2 x 1-1/2	BH74246
AE-114	5/8 x 1	BH74247
AE-116	3/4 x 3/4	BH74248
AE-118	1 x 1	BH74249
C - CYLINDRICAL ROUND		
C-700	1/8 x 1/2	BH74251
C-710	1/4 x 1	BH74252
C-714	3/8 x 1	BH74254
C-716	3/8 x 1-1/2	BH74255
C-718	1/2 x 1	BH74256
C-722	5/8 x 1	BH74257
Q - OLIVE SHAPED		
Q-901	3/16 x 5/16	BH74261
Q-903	1/4 x 7/16	BH74262
Q-905	3/8 x 5/8	BH74263
Q-909	1/2 x 7/8	BH74264
Q-911	5/8 x 1	BH74265
Q-913	3/4 x 1	BH74266
Q-915	1 x 1-3/8	BH74267
H - CONE SHAPE		
H-223	1/4 x 1/2	BH74270
H-226	1/4 x 3/4	BH74271
H-229	1/4 x 1	BH74272
H-232	1/4 x 1-1/4	BH74273
H-235	5/16 x 1	BH74274
H-238	3/8 x 5/8	BH74275
H-241	1/2 x 7/8	BH74276
H-244	5/8 x 1	BH74277
H-245	1 x 1-3/8	BH74278

1 per pack

7 PC. SUPER HSS BURR SET

DESCRIPTION	STOCK #
Contains one each: A-116 B-606 C-722 Q-915 T-529 H-244 R-507	BH7



HSS Burrs • Rotary Files



ZIP / BURR™ SYSTEM

Zip / Burr™ “B” Set for “B” Series Blades



- Takes all “B” series blades.
- Includes one B-10 blade and one B-20 blade.
- Handle has storage compartment for spare blades.
- Holder telescopes from 1/2" to 5".
- Blade can be inserted at 90° for deburring cross holes.
- Handle has lifetime guarantee.

Complete Zip / Burr “B” Set	1 Per Pack	DT22600
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Zip / Burr™ Heavy Duty “E” Set for “E” Series Blades



- Same features as “B” set but takes all heavy duty “E” series blades.
- Blade can't be inserted at 90°.
- Includes one E-100 blade, one E-200 blade and one E-300 blade.

Complete Zip / Burr “E” Set	1 Per Pack	DT22620
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MULTI / BURR DEBURRING TOOLS

Multi / Burr-5



- Blades can be stored in lightweight plastic handle.
- Blades easily changed by depressing locking button.
- Comes with **five** blades— one each of E-100, E-200, E-350 E-101 and E-102.
- Handle has lifetime guarantee.

Plastic handle complete w/ 5 blades	1 Per Pack	DT22022
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SLIM-GRIP DEBURRING TOOLS

Slim-Grip Disposable Burr



- Handles almost every deburring job.
- Useable for removing burrs from steel and aluminum.
- Consists of Heavy Duty E-100 blade, handle, and handy pocket clip.

Slim-Grip Disposable Burr	Box of 10	DT22050
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REVERSIBLE COUNTERSINK



- Large reversible countersink includes one R-2 blade and has a range of 13/64" - 11/32".

Complete Standard Reversible Countersink	1 Per Pack	DT22465
R-2 Standard Blade Only	1 Per Pack	DT22139

BLADES FOR DEBURRING TOOL

STANDARD DUTY “B” SERIES

	BLADES PER PKG.	STOCK #
B-10	10 HSS for steel & aluminum.	DT22110
B-10A	10 HSS for steel, aluminum and plastic.	DT22109
B-20	10 HSS for brass & cast iron; can rotate clockwise and counterclockwise.	DT22120
B-30	10 HSS; removes internal & external burrs simultaneously from holes drilled into tubing & sheet metal.	DT22130
B-60	10 HSS; for internal deburring, especially for inaccessible locations.	DT22135

HEAVY DUTY “E” SERIES

E-100	10 Heavy Duty HSS for steel & aluminum.	DT22025
E-100A	10 Heavy Duty M42 steel. Good for plastic & hard materials.	DT22034
E-1500	10 Heavy Duty HSS for holes as small as 1/16" dia. in steel and aluminum.	DT22046
E-200	10 Heavy Duty HSS for brass and cast iron.	DT22030
E-300	10 Heavy Duty HSS; removes internal and external burrs simultaneously from holes drilled into tubing & sheet metal.	DT22040

10 Blades per pack

End Mills – Information & Coatings

The End Mill is the most-used tool in the tool crib arsenal in any machine shop. It is used for **milling, profiling, contouring, slotting, counterboring, drilling** and **reaming**.



END MILL TYPES

- Finishing end mills
- Square end mills
- Ball end mills
- Taper body mills
- Roughing end mills (Coarse tooth & fine tooth)

END MILL MATERIALS

- High-speed steel (HSS)
- Cobalt-M42 (8% cobalt HSS)
- Powder metal (PM) cobalt
- Solid carbide (micrograin)
- Carbide tipped

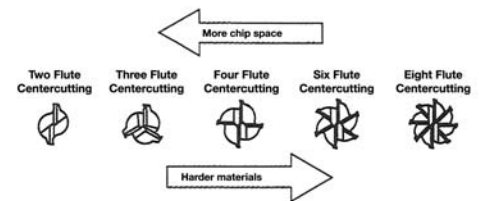
Standard Helix Angle is 30° Mill dia. Tolerance +0.000 -0.002	
Max. Operating Temperature	
Uncoated	750°F
TiN	1110°F
TiAlN	1450°F

END MILL SELECTION SUMMARY

- Select the **shortest** possible end mill for the greatest rigidity.
- Select two or three flutes for slotting or heavy stock removal.
- Select multiple flutes for finishing and greater rigidity.
- Use the largest diameter possible for added strength and rigidity.
- Apply **coatings** for higher feeds, speeds and tool life.
- Use cobalt, PM/Plus and carbide for **tougher** and **harder** materials, and for high production applications.

FLUTE TYPE

- **Two Flute:** The two-flute end mill has the greatest amount of flute space allowing for **more chip carrying capacity**. Used primarily in slotting and pocketing of non-ferrous materials where chip removal is a concern.
- **Three Flute:** While this tool has the same flute space as two flutes, it has a larger cross-sectional area providing for **greater strength** and the ability to pocket and slot both ferrous and non-ferrous materials.
- **Four/Multiple Flute:** Ideal for peripheral and finish milling. The additional flutes allow **faster feed rates**, but due to the reduced flute space, chip removal may be a problem. Produces a much **finer finish** than two and three flute tools.



MILLING FORMULAE

RPM = SFM x 3.82/tool diameter

IPM = RPM x number of flutes x chip load

Chip load = IPM/RPM x number of flutes

SFM = .262 x tool diameter x RPM

- **Revolutions per minute (RPM):** Number of revolutions the cutter has in one minute.
- **Inches per minute (IPM):** Number of inches the cutter passes through the workpiece in one minute.
- **Chip load:** Amount each flute cuts during a single revolution of the cutting tool.
- **Surface feet per minute (SFM):** Number of feet a given point on the circumference of the cutter travels per minute. This is the measure of cutting speed of the end mill used in the United States.

SURFACE TREATMENT AND COATINGS

Description	Characteristics	Application
TiN	<ul style="list-style-type: none"> • Titanium Nitride: Gold color, General Purpose coating. • Consists of a very hard coating on surface of tool. • Provides excellent wear resistance with good lubricity. • Reduces friction and prevents galling. 	<ul style="list-style-type: none"> • Recommended for ferrous and non-metallic materials.
TiCN	<ul style="list-style-type: none"> • Titanium Carbonitride: Blue-Grey color, abrasion resistant coating. • Consists of an extremely hard coating on surface of tool. • Provides excellent wear resistance. 	<ul style="list-style-type: none"> • Recommended for Silicon Aluminum, brass and bronze applications, cast iron and alloy steels. • Very effective at higher speeds.
AlTiN	<ul style="list-style-type: none"> • Aluminum Titanium Nitride: Blue-Black color, multi-layered high heat-resistant coating. • Provides excellent wear resistance. • Forms an aluminum oxide layer at high speeds and elevated temperatures. 	<ul style="list-style-type: none"> • Recommended for semi and dry milling applications in high temperature alloys and hardened steel materials. • Very effective at higher speeds and in some tapping applications.

Micrograin Solid Carbide End Mills

30° Right Hand Helix Right Hand Cut

- Features:**
- Micrograin solid carbide end mills provide outstanding performance and allow optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
 - Designed for aggressive milling of most materials.



Two Flute, Single End, Center Cutting

Square End



Regular Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/32	1/8	3/32	1-1/2	SC61300	SC61300AL
3/64	1/8	1/8	1-1/2	SC61300A	SC61300AAL
1/16	1/8	1/4	1-1/2	SC61301	SC61301AL
5/64	1/8	1/4	1-1/2	SC61302	SC61302AL
3/32	1/8	3/8	1-1/2	SC61303	SC61303AL
7/64	1/8	3/8	1-1/2	SC61304	SC61304AL
1/8	1/8	1/2	1-1/2	SC61305	SC61305AL
9/64	3/16	9/16	2	SC61306	SC61306AL
5/32	3/16	9/16	2	SC61307	SC61307AL
11/64	3/16	9/16	2	SC61308	SC61308AL
3/16	3/16	5/8	2	SC61309	SC61309AL
13/64	1/4	5/8	2-1/2	SC61310	SC61310AL
7/32	1/4	5/8	2-1/2	SC61311	SC61311AL
15/64	1/4	3/4	2-1/2	SC61312	SC61312AL
1/4	1/4	3/4	2-1/2	SC61313	SC61313AL
17/64	5/16	7/8	2-1/2	SC61314	SC61314AL
9/32	5/16	7/8	2-1/2	SC61315	SC61315AL
19/64	5/16	7/8	2-1/2	SC61316	SC61316AL
5/16	5/16	7/8	2-1/2	SC61317	SC61317AL

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
21/64	3/8	7/8	2-1/2	SC61318	SC61318AL
11/32	3/8	7/8	2-1/2	SC61319	SC61319AL
23/64	3/8	7/8	2-1/2	SC61320	SC61320AL
3/8	3/8	7/8	2-1/2	SC61321	SC61321AL
25/64	7/16	7/8	2-1/2	SC61322	SC61322AL
13/32	7/16	7/8	2-1/2	SC61323	SC61323AL
27/64	7/16	7/8	2-1/2	SC61324	SC61324AL
7/16	7/16	1	2-1/2	SC61325	SC61325AL
29/64	1/2	1	3	SC61326	SC61326AL
15/32	1/2	1	3	SC61327	SC61327AL
31/64	1/2	1	3	SC61328	SC61328AL
1/2	1/2	1	3	SC61329	SC61329AL
9/16	9/16	1-1/4	3-1/2	SC61330	SC61330AL
5/8	5/8	1-1/4	3-1/2	SC61331	SC61331AL
11/16	3/4	1-1/2	4	SC61332	SC61332AL
3/4	3/4	1-1/2	4	SC61333	SC61333AL
7/8	7/8	1-1/2	4	SC61334	SC61334AL
1	1	1-1/2	4	SC61335	SC61335AL

1 per tube

30° Right Hand Helix Right Hand Cut

30° Right Hand Helix Right Hand Cut

Two Flute, Single End, Center Cutting

Two Flute, Single End, Center Cutting

Square End



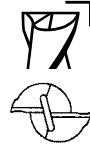
X-Long Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/8	1/8	3/4	2	SCL61351	SCL61351AL
3/16	3/16	1-1/8	3	SCL61353	SCL61353AL
1/4	1/4	1-1/2	4	SCL61355	SCL61355AL
5/16	5/16	1-5/8	4	SCL61357	SCL61357AL
3/8	3/8	2	4	SCL61359	SCL61359AL
7/16	7/16	2	4	SCL61361	SCL61361AL
1/2	1/2	3	6	SCL61364	SCL61364AL
5/8	5/8	3	6	SCL61366	SCL61366AL
3/4	3/4	3	6	SCL61368	SCL61368AL
1	1	3	6	SCL61370	SCL61370AL

1 per tube

Square End



Stub Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/16	1/8	1/8	1-1/2	SCS61341	SCS61341AL
3/32	1/8	3/16	1-1/2	SCS61342	SCS61342AL
1/8	1/8	1/4	1-1/2	SCS61343	SCS61343AL
5/32	3/16	5/16	2	SCS61344	SCS61344AL
3/16	3/16	3/8	2	SCS61345	SCS61345AL
7/32	1/4	7/16	2	SCS61346	SCS61346AL
1/4	1/4	1/2	2	SCS61347	SCS61347AL
5/16	5/16	1/2	2	SCS61348	SCS61348AL
3/8	3/8	5/8	2	SCS61349	SCS61349AL
7/16	7/16	5/8	3	SCS61350	SCS61350AL
1/2	1/2	5/8	2-1/2	SCS61351	SCS61351AL
5/8	5/8	3/4	3	SCS61352	SCS61352AL
3/4	3/4	1	3	SCS61353	SCS61353AL

1 per tube

Micrograin Solid Carbide End Mills

30° Right Hand Helix, Right Hand Cut

Two Flute, Single End, Metric with Metric Shanks

Square End



- Features:**
- Micrograin solid carbide end mills provide outstanding performance and allow optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
 - Designed for aggressive milling of most materials.



TOLERANCE $\pm 0.000/-0.002$

Regular Length

Expanded

MILL DIA. MM	SHANK DIA. MM	FLUTE LENGTH	OAL MM	STOCK #	
				UNCOATED	AITIN COATED
2.00	3.00	6	38	SCM91302	SCM91302AL
2.50	3.00	7	38	SCM91304	SCM91304AL
3.00	3.00	12	38	SCM91306	SCM91306AL
3.50	4.00	12	50	SCM91308	SCM91308AL
4.00	4.00	14	50	SCM91310	SCM91310AL
4.50	5.00	14	50	SCM91312	SCM91312AL
5.00	5.00	16	50	SCM91314	SCM91314AL
6.00	6.00	19	63	SCM91316	SCM91316AL
7.00	8.00	19	63	SCM91318	SCM91318AL
8.00	8.00	19	63	SCM91320	SCM91320AL

MILL DIA. MM	SHANK DIA. MM	FLUTE LENGTH	OAL MM	STOCK #	
				UNCOATED	AITIN COATED
9.00	10.00	22	70	SCM91322	SCM91322AL
10.00	10.00	22	70	SCM91324	SCM91324AL
11.00	11.00	25	70	SCM91325	SCM91325AL
12.00	12.00	25	75	SCM91326	SCM91326AL
14.00	14.00	30	88	SCM91327	SCM91327AL
16.00	16.00	32	88	SCM91328	SCM91328AL
18.00	18.00	36	100	SCM91329	SCM91329AL
20.00	20.00	38	100	SCM91330	SCM91330AL
22.00	22.00	38	100	SCM91331	SCM91331AL

1 per tube

30° Right Hand Helix Right Hand Cut

Two Flute, Single End, Ball Nose, Center Cutting

Ball End



- Features:**
- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
 - Ball nose geometry for inside corner radius and CNC contouring.



Regular Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/32	1/8	3/32	1-1/2	SCB61365	SCB61365AL
3/64	1/8	1/8	1-1/2	SCB61366	SCB61366AL
1/16	1/8	1/4	1-1/2	SCB61367	SCB61367AL
5/64	1/8	1/4	1-1/2	SCB61368	SCB61368AL
3/32	1/8	3/8	1-1/2	SCB61369	SCB61369AL
7/64	1/8	3/8	1-1/2	SCB61370	SCB61370AL
1/8	1/8	1/2	1-1/2	SCB61371	SCB61371AL
5/32	3/16	9/16	2	SCB61372	SCB61372AL
3/16	3/16	5/8	2	SCB61373	SCB61373AL
7/32	1/4	5/8	2-1/2	SCB61374	SCB61374AL
1/4	1/4	3/4	2-1/2	SCB61375	SCB61375AL

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
9/32	5/16	7/8	2-1/2	SCB61376	SCB61376AL
5/16	5/16	7/8	2-1/2	SCB61377	SCB61377AL
3/8	3/8	7/8	2-1/2	SCB61378	SCB61378AL
7/16	7/16	1	2-1/2	SCB61379	SCB61379AL
1/2	1/2	1	3	SCB61380	SCB61380AL
9/16	9/16	1-1/4	3-1/2	SCB61381	SCB61381AL
5/8	5/8	1-1/4	3-1/2	SCB61382	SCB61382AL
3/4	3/4	1-1/2	4	SCB61383	SCB61383AL
7/8	7/8	1-1/2	4	SCB61384	SCB61384AL
1	1	1-1/2	4	SCB61385	SCB61385AL

1 per tube

Micrograin Solid Carbide End Mills

30° Right Hand Helix Right Hand Cut

- Features:**
- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
 - Designed for aggressive milling of most materials.



Two Flute, Double End, Center Cutting



Regular Length Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/32	1/8	3/32	2	DEC66801	DEC66801AL
3/64	1/8	1/8	2	DEC66802	DEC66802AL
1/16	1/8	3/16	2	DEC66803	DEC66803AL
3/32	1/8	1/4	2	DEC66804	DEC66804AL
1/8	1/8	3/8	2	DEC66805	DEC66805AL
5/32	3/16	7/16	2-1/2	DEC66807	DEC66807AL
3/16	3/16	1/2	2-1/2	DEC66809	DEC66809AL
7/32	1/4	9/16	2-1/2	DEC66811	DEC66811AL
1/4	1/4	5/8	2-1/2	DEC66813	DEC66813AL
5/16	5/16	3/4	3-1/2	DEC66815	DEC66815AL
3/8	3/8	3/4	3-1/2	DEC66817	DEC66817AL
7/16	7/16	7/8	4	DEC66819	DEC66819AL
1/2	1/2	1	4	DEC66821	DEC66821AL

1 per tube

Two Flute, Double End, Center Cutting



Stub Length Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/32	1/8	1/16	1-1/2	DEC66830	DEC66830AL
3/64	1/8	3/32	1-1/2	DEC66831	DEC66831AL
1/16	1/8	1/8	1-1/2	DEC66832	DEC66832AL
3/32	1/8	3/16	1-1/2	DEC66833	DEC66833AL
1/8	1/8	1/4	1-1/2	DEC66839	DEC66839AL
5/32	3/16	5/16	2	DEC66841	DEC66841AL
3/16	3/16	3/8	2	DEC66843	DEC66843AL
7/32	1/4	1/2	2-1/2	DEC66845	DEC66845AL
1/4	1/4	1/2	2-1/2	DEC66847	DEC66847AL
5/16	5/16	1/2	2-1/2	DEC66849	DEC66849AL
3/8	3/8	1/2	2-1/2	DEC66851	DEC66851AL
7/16	7/16	1/2	2-1/2	DEC66853	DEC66853AL
1/2	1/2	5/8	3	DEC66855	DEC66855AL

1 per tube

Solid Carbide End Mills

C

60° High Helix, Right Hand Cut

- Features:**
- Increased cutting edge engagement reduces vibration and improves surface finish.
 - Engineered for plunging, slotting and peripheral milling applications.

Three Flute, Single End, Center Cutting



Regular Length Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/4	1/4	3/4	2-1/2	SCH91628	SCH91628AL
5/16	5/16	13/16	2-1/2	SCH91630	SCH91630AL
3/8	3/8	1	2-1/2	SCH91632	SCH91632AL
1/2	1/2	1	3	SCH91636	SCH91636AL
5/8	5/8	1-1/4	3-1/2	SCH91640	SCH91640AL
3/4	3/4	1-1/2	4	SCH91642	SCH91642AL

1 per tube

Micrograin Solid Carbide End Mills

30° Right Hand Helix Right Hand Cut

- Features:**
- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
 - Designed for aggressive milling of most materials.



Four Flute, Single End, Center Cutting

Square End



Regular Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/32	1/8	3/32	1-1/2	SC60600	SC60600AL
3/64	1/8	1/8	1-1/2	SC60600A	SC60600AAL
1/16	1/8	1/4	1-1/2	SC60601	SC60601AL
5/64	1/8	1/4	1-1/2	SC60602	SC60602AL
3/32	1/8	3/8	1-1/2	SC60603	SC60603AL
7/64	1/8	3/8	1-1/2	SC60604	SC60604AL
1/8	1/8	1/2	1-1/2	SC60605	SC60605AL
9/64	3/16	9/16	2	SC60606	SC60606AL
5/32	3/16	9/16	2	SC60607	SC60607AL
11/64	3/16	9/16	2	SC60608	SC60608AL
3/16	3/16	5/8	2	SC60609	SC60609AL
13/64	1/4	5/8	2-1/2	SC60610	SC60610AL
7/32	1/4	5/8	2-1/2	SC60611	SC60611AL
15/64	1/4	3/4	2-1/2	SC60612	SC60612AL
1/4	1/4	3/4	2-1/2	SC60613	SC60613AL
17/64	5/16	7/8	2-1/2	SC60614	SC60614AL
9/32	5/16	7/8	2-1/2	SC60615	SC60615AL
19/64	5/16	7/8	2-1/2	SC60616	SC60616AL
5/16	5/16	7/8	2-1/2	SC60617	SC60617AL

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
21/64	3/8	7/8	2-1/2	SC60618	SC60618AL
11/32	3/8	7/8	2-1/2	SC60619	SC60619AL
23/64	3/8	7/8	2-1/2	SC60620	SC60620AL
3/8	3/8	7/8	2-1/2	SC60621	SC60621AL
25/64	7/16	7/8	2-1/2	SC60622	SC60622AL
13/32	7/16	7/8	2-1/2	SC60623	SC60623AL
27/64	7/16	7/8	2-1/2	SC60624	SC60624AL
7/16	7/16	1	2-1/2	SC60625	SC60625AL
29/64	1/2	1	3	SC60626	SC60626AL
15/32	1/2	1	3	SC60627	SC60627AL
31/64	1/2	1	3	SC60628	SC60628AL
1/2	1/2	1	3	SC60629	SC60629AL
9/16	9/16	1-1/4	3-1/2	SC60630	SC60630AL
5/8	5/8	1-1/4	3-1/2	SC60631	SC60631AL
11/16	3/4	1-1/2	4	SC60632	SC60632AL
3/4	3/4	1-1/2	4	SC60633	SC60633AL
7/8	7/8	1-1/2	4	SC60634	SC60634AL
1	1	1-1/2	4	SC60635	SC60635AL

1 per tube

30° Right Hand Helix Right Hand Cut

Four Flute, Single End, Center Cutting

Square End



X-Long Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/8	1/8	3/4	2	SCL60651	SCL60651AL
3/16	3/16	1-1/8	3	SCL60653	SCL60653AL
1/4	1/4	1-1/2	4	SCL60655	SCL60655AL
5/16	5/16	1-5/8	4	SCL60657	SCL60657AL
3/8	3/8	2	4	SCL60659	SCL60659AL
7/16	7/16	2	4	SCL60661	SCL60661AL
1/2	1/2	3	6	SCL60664	SCL60664AL
5/8	5/8	3	6	SCL60666	SCL60666AL
3/4	3/4	3	6	SCL60668	SCL60668AL
1	1	3	6	SCL60670	SCL60670AL

1 per tube

30° Right Hand Helix Right Hand Cut

Four Flute, Single End, Center Cutting

Square End



Stub Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/16	1/8	1/8	1-1/2	SCS60641	SCS60641AL
3/32	1/8	3/16	1-1/2	SCS60642	SCS60642AL
1/8	1/8	1/4	1-1/2	SCS60643	SCS60643AL
5/32	3/16	5/16	2	SCS60644	SCS60644AL
3/16	3/16	3/8	2	SCS60645	SCS60645AL
7/32	1/4	7/16	2	SCS60646	SCS60646AL
1/4	1/4	1/2	2	SCS60647	SCS60647AL
5/16	5/16	1/2	2	SCS60648	SCS60648AL
3/8	3/8	5/8	2	SCS60649	SCS60649AL
7/16	7/16	5/8	3	SCS60650	SCS60650AL
1/2	1/2	5/8	2-1/2	SCS60651	SCS60651AL
5/8	5/8	3/4	3	SCS60652	SCS60652AL
3/4	3/4	1	3	SCS60653	SCS60653AL

1 per tube

Micrograin Solid Carbide End Mills

30° Right Hand Helix
Right Hand Cut

Four Flute, Single End,
Metric with Metric Shanks



TOLERANCE $+0.000/-0.002$



Regular Length

Expanded

MILL DIA. MM	SHANK DIA. MM	FLUTE LENGTH	OAL MM	STOCK #	
				UNCOATED	AITIN COATED
2.00	3.00	6	38	SCM91602	SCM91602AL
2.50	3.00	7	38	SCM91604	SCM91604AL
3.00	3.00	12	38	SCM91606	SCM91606AL
3.50	4.00	12	50	SCM91608	SCM91608AL
4.00	4.00	14	50	SCM91610	SCM91610AL
4.50	5.00	14	50	SCM91612	SCM91612AL
5.00	5.00	16	50	SCM91614	SCM91614AL
6.00	6.00	19	63	SCM91616	SCM91616AL
7.00	8.00	19	63	SCM91618	SCM91618AL
8.00	8.00	19	63	SCM91620	SCM91620AL
9.00	10.00	22	70	SCM91622	SCM91622AL
10.00	10.00	22	70	SCM91624	SCM91624AL
11.00	11.00	25	70	SCM91625	SCM91625AL
12.00	12.00	25	75	SCM91626	SCM91626AL
14.00	14.00	30	88	SCM91627	SCM91627AL
16.00	16.00	32	88	SCM91628	SCM91628AL
18.00	18.00	36	100	SCM91629	SCM91629AL
20.00	20.00	38	100	SCM91630	SCM91630AL
22.00	22.00	38	100	SCM91631	SCM91631AL

1 per tube

30° Right Hand Helix
Right Hand Cut

Four Flute, Single End,
Ball Nose, Center Cutting



Features:

- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
- Ball nose geometry for inside corner radius and CNC contouring.



Regular Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/32	1/8	3/32	1-1/2	SCB60665	SCB60665AL
3/64	1/8	1/8	1-1/2	SCB60666	SCB60666AL
1/16	1/8	1/4	1-1/2	SCB60667	SCB60667AL
5/64	1/8	1/4	1-1/2	SCB60668	SCB60668AL
3/32	1/8	3/8	1-1/2	SCB60669	SCB60669AL
7/64	1/8	3/8	1-1/2	SCB60670	SCB60670AL
1/8	1/8	1/2	1-1/2	SCB60671	SCB60671AL
3/16	3/16	5/8	2	SCB60672	SCB60672AL
1/4	1/4	3/4	2-1/2	SCB60673	SCB60673AL
5/16	5/16	7/8	2-1/2	SCB60674	SCB60674AL
3/8	3/8	7/8	2-1/2	SCB60675	SCB60675AL
7/16	7/16	1	2-1/2	SCB60676	SCB60676AL
1/2	1/2	1	3	SCB60677	SCB60677AL
5/8	5/8	1-1/4	3-1/2	SCB60678	SCB60678AL
3/4	3/4	1-1/2	4	SCB60679	SCB60679AL
1	1	1-1/2	4	SCB60680	SCB60680AL

1 per tube

Solid Carbide End Mills

Micrograin Solid Carbide Corner Radius End Mills

Corner Radius
Right Hand Cut

- Features:
- Used for generating corner radius on workpiece, eliminating sharp corners.
 - Promotes additional strength, longer tool life, resulting in greater productivity.
 - Designed for a wide range of ferrous materials, including stainless steels and high temperature alloys.

Four Flute, Single End



Regular Length

NEW!

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #					
				.015 RADIUS		.030 RADIUS		.060 RADIUS	
				UNCOATED	AITIN COATED	UNCOATED	AITIN COATED	UNCOATED	AITIN COATED
1/8	1/8	1/2	1-1/2	CRM71505	CRM71505AL	CRM73005	CRM73005AL	CRM70605	CRM70605AL
3/16	3/16	5/8	2	CRM71509	CRM71509AL	CRM73009	CRM73009AL	CRM70609	CRM70609AL
1/4	1/4	3/4	2-1/2	CRM71513	CRM71513AL	CRM73013	CRM73013AL	CRM70613	CRM70613AL
5/16	5/16	13/16	2-1/2	CRM71517	CRM71517AL	CRM73017	CRM73017AL	CRM70617	CRM70617AL
3/8	3/8	1	2-1/2	CRM71521	CRM71521AL	CRM73021	CRM73021AL	CRM70621	CRM70621AL
1/2	1/2	1	3	CRM71529	CRM71529AL	CRM73029	CRM73029AL	CRM70629	CRM70629AL
5/8	5/8	1-1/4	3-1/2	CRM71531	CRM71531AL	CRM73031	CRM73031AL	CRM70631	CRM70631AL
3/4	3/4	1-1/2	4	CRM71533	CRM71533AL	CRM73033	CRM73033AL	CRM70633	CRM70633AL

1 per tube

Micrograin Solid Carbide End Mills

**30° Right Hand Helix,
Right Hand Cut**

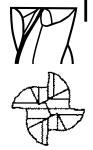


Four Flute, Double End, Center Cutting

Features:

- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
- Designed for aggressive milling of most materials.

Square End



Regular Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/32	1/8	3/32	2	DEC66861	DEC66861AL
3/64	1/8	1/8	2	DEC66862	DEC66862AL
1/16	1/8	3/16	2	DEC66863	DEC66863AL
3/32	1/8	1/4	2	DEC66864	DEC66864AL
1/8	1/8	3/8	2	DEC66865	DEC66865AL
5/32	3/16	7/16	2-1/2	DEC66867	DEC66867AL
3/16	3/16	1/2	2-1/2	DEC66869	DEC66869AL
7/32	1/4	9/16	2-1/2	DEC66871	DEC66871AL
1/4	1/4	5/8	2-1/2	DEC66873	DEC66873AL
5/16	5/16	3/4	3-1/2	DEC66875	DEC66875AL
3/8	3/8	3/4	3-1/2	DEC66877	DEC66877AL
7/16	7/16	7/8	4	DEC66879	DEC66879AL
1/2	1/2	1	4	DEC66881	DEC66881AL

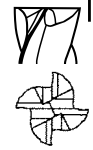
1 per tube

Four Flute, Double End, Center Cutting

Features:

- Micrograin solid carbide end mills provide outstanding performance and allows optimum cutting speeds and feeds, high rigidity and minimum tool deflection.
- Designed for aggressive milling of most materials.

Square End



Stub Length

Expanded

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #	
				UNCOATED	AITIN COATED
1/32	1/8	1/16	1-1/2	DEC66883	DEC66883AL
3/64	1/8	3/32	1-1/2	DEC66885	DEC66885AL
1/16	1/8	1/8	1-1/2	DEC66887	DEC66887AL
3/32	1/8	3/16	1-1/2	DEC66889	DEC66889AL
1/8	1/8	1/4	1-1/2	DEC66891	DEC66891AL
5/32	3/16	5/16	2	DEC66892	DEC66892AL
3/16	3/16	3/8	2	DEC66893	DEC66893AL
7/32	1/4	1/2	2-1/2	DEC66894	DEC66894AL
1/4	1/4	1/2	2-1/2	DEC66895	DEC66895AL
5/16	5/16	1/2	2-1/2	DEC66896	DEC66896AL
3/8	3/8	1/2	2-1/2	DEC66897	DEC66897AL
7/16	7/16	1/2	2-1/2	DEC66898	DEC66898AL
1/2	1/2	5/8	3	DEC66899	DEC66899AL

1 per tube

Solid Carbide End Mills

C

Micrograin Solid Carbide High Performance End Mills

Variable Helix Finishing Right Hand Spiral Right Hand Cut

Features:

- Variable indexed flute-to-flute reduces vibrations, allowing increased feeds and speeds.
- Eccentric-radial O.D. relieved for increased tool strength, allowing greater feeds and speeds.
- Standard with AITiN coating for heavy fast metal removal rates.
- Can be used dry.
- Shank O.D. coolant groove in each flute to maximize cooling & chip evacuation velocity.

Four Flute



Regular Length

NEW!

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #
				AITIN COATED
1/8	1/8	3/8	1-1/2	HPSC60605AL
3/16	3/16	7/16	2	HPSC60609AL
1/4	1/4	5/8	2-1/2	HPSC60613AL
5/16	5/16	13/16	2-1/2	HPSC60617AL
3/8	3/8	7/8	2-1/2	HPSC60621AL
7/16	7/16	1	2-3/4	HPSC60625AL
1/2	1/2	1	3	HPSC60629AL
5/8	5/8	1-1/4	3-1/2	HPSC60631AL
3/4	3/4	1-1/2	4	HPSC60633AL
1	1	1-1/2	4	HPSC60635AL

1 per tube

Four Flute, Ball Nose



Regular Length

NEW!

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OAL	STOCK #
				AITIN COATED
1/8	1/8	3/8	1-1/2	HPSCB60671AL
3/16	3/16	7/16	2	HPSCB60672AL
1/4	1/4	5/8	2-1/2	HPSCB60673AL
5/16	5/16	13/16	2-1/2	HPSCB60674AL
3/8	3/8	7/8	2-1/2	HPSCB60675AL
7/16	7/16	1	2-3/4	HPSCB60676AL
1/2	1/2	1	3	HPSCB60677AL
5/8	5/8	1-1/4	3-1/2	HPSCB60678AL
3/4	3/4	1-1/2	4	HPSCB60679AL
1	1	1-1/2	4	HPSCB60680AL

1 per tube

Micrograin Solid Carbide Roughing End Mills

Right Hand Helix Right Hand Cut



- Features:**
- Provides excellent roughing with reduced heat in the cut for hard material.
 - Form relieved on high strength carbide for excellent profile milling.
 - Suitable for profiling, plunging, and ramping roughing operations in all types of hard material.
 - Fine profile.
 - Small corner radius for strength.

COARSE PITCH

FINE PITCH

Four Flute, Coarse Pitch



Regular Length

NEW!

Multi-Flute, Fine Pitch



Regular Length

NEW!

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	STOCK #	
				UNCOATED	AITiN COATED
1/4	1/4	3/4	2-1/2	SCREM50801	SCREM50801AL
5/16	5/16	3/4	2-1/2	SCREM50802	SCREM50802AL
3/8	3/8	1	2-1/2	SCREM50803	SCREM50803AL
7/16	7/16	1	3	SCREM50803A	SCREM50803AAL
1/2	1/2	1-1/4	3	SCREM50804	SCREM50804AL
5/8	5/8	1-1/4	3-1/2	SCREM50806	SCREM50806AL
3/4	3/4	1-1/2	4	SCREM50811	SCREM50811AL
1	1	1-1/2	4	SCREM50818	SCREM50818AL
Long Length					
1/4	1/4	1-1/8	3	SCREM50829	SCREM50829AL
3/8	3/8	1-1/4	3	SCREM50830	SCREM50830AL
1/2	1/2	2	4	SCREM50831	SCREM50831AL
5/8	5/8	2-1/4	5	SCREM50832	SCREM50832AL
3/4	3/4	2-1/4	5	SCREM50833	SCREM50833AL
1	1	2-1/4	5	SCREM50841	SCREM50841AL

1 per tube

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STOCK #	
					UNCOATED	AITiN COATED
1/4	1/4	3/4	2-1/2	3	SCREM60901	SCREM60901AL
5/16	5/16	3/4	2-1/2	3	SCREM60902	SCREM60902AL
3/8	3/8	7/8	2-1/2	3	SCREM60903	SCREM60903AL
1/2	1/2	1	3	4	SCREM60904	SCREM60904AL
5/8	5/8	1-1/4	3-1/2	4	SCREM60906	SCREM60906AL
3/4	3/4	1-1/2	4	4	SCREM60911	SCREM60911AL
1	1	1-1/2	4	6	SCREM60918	SCREM60918AL

1 per tube

SOLID CARBIDE ROUGHERS – SPEEDS & FEEDS

MATERIAL	HARDNESS HRc	SFM UNCOATED	SFM ALTiN COATED	CHIP LOAD PER TOOTH	
				1/4" - 1/2"	1/2" - 1"
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	< 19	258 - 345	430 - 575	.0015 - .003	.003 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	20 - 30	210 - 258	350 - 430	.0015 - .003	.003 - .0045
LOW AND PLAIN CARBON, ALLOY & TOOL STEELS	31 - 40	126 - 192	210 - 320	.0011 - .0021	.0021 - .0032
AUESTENITIC STAINLESS STEELS, 200 & 300 SERIES 135-275	< 28	150 - 300	250 - 500	.0010 - .0025	.0025 - .0040
FERRITIC, MARTENSITIC 400, 500 & PH STAINLESS STEELS	< 35	135 - 258	225 - 430	.0015 - .0030	.0030 - .0045
TITANIUM ALLOYS	32 - 43	75 - 129	125 - 215	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	< 32	39 - 87	65 - 145	.0009 - .0018	.0018 - .0027
NICKEL-BASED HIGH TEMPERATURE ALLOYS	32 - 50	33 - 66	55 - 110	.0009 - .0018	.0018 - .0027
COBALT-BASED HIGH TEMPERATURE ALLOYS	< 45	27 - 45	45 - 75	.0009 - .0018	.0018 - .0027

Weldon Shank
30° Right Hand Helix
Right Hand Cut



Two Flute, Single End, Center Cutting

- Used for general purpose milling operations including profiling, slotting, keyways, pockets and plunge cutting.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
				ALFA USA
1/8	3/8	3/8	2-5/16	SE151301
3/16	3/8	7/16	2-5/16	SE151302
1/4	3/8	1/2	2-5/16	SE151303
5/16	3/8	9/16	2-5/16	SE151304
3/8	3/8	9/16	2-5/16	SE151305
7/16	3/8	13/16	2-1/2	SE151306
1/2	3/8	13/16	2-1/2	SE151307
1/2	1/2	1	3	SE151308
9/16	1/2	1-1/8	3-1/8	SE151309
5/8	1/2	1-1/8	3-1/8	SE151310
5/8	5/8	1-5/16	3-7/16	SE151311
11/16	1/2	1-5/16	3-5/16	SE151312
11/16	5/8	1-5/16	3-7/16	SE151313
3/4	1/2	1-5/16	3-5/16	SE151314
3/4	5/8	1-5/16	3-7/16	SE151315
3/4	3/4	1-5/16	3-9/16	SE151316
13/16	3/4	1-1/2	3-3/4	SE151317
7/8	5/8	1-1/2	3-5/8	SE151318
7/8	3/4	1-1/2	3-3/4	SE151319
7/8	7/8	1-1/2	3-3/4	SE151320
15/16	3/4	1-1/2	3-3/4	SE151321
1	3/4	1-1/2	3-3/4	SE151324
1	1	1-5/8	4-1/8	SE151325
1-1/8	3/4	1-1/2	3-7/8	SE151326
1-1/8	1	1-5/8	4-1/8	SE151327
1-1/4	3/4	1-1/2	3-7/8	SE151328
1-1/4	1	1-5/8	4-1/8	SE151329
1-1/4	1-1/4	1-5/8	4-1/8	SE151330
1-3/8	3/4	1-1/2	3-7/8	SE151331
1-3/8	1	1-5/8	4-1/8	SE151332
1-1/2	3/4	1-1/2	3-7/8	SE151334
1-1/2	1	1-5/8	4-1/8	SE151335
1-1/2	1-1/4	1-5/8	4-1/8	SE151336
1-5/8	1-1/4	1-5/8	4-1/8	SE151338
1-3/4	3/4	1-1/2	3-7/8	SE151339
1-3/4	1-1/4	1-5/8	4-1/8	SE151340
1-7/8	1-1/4	1-5/8	4-1/8	SE151341
2	3/4	1-1/2	3-7/8	SE151342
2	1-1/4	1-5/8	4-1/8	SE151344

1 per tube

Two Flute, Single End, Center Cutting

- Used for general purpose milling including profiling, slotting, keyways, pockets and plunge cutting.
- Provides an alternative length of cut for deep milling and profiling applications.



Long Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
				ALFA USA
3/8	3/8	1-1/2	3-1/4	SEL151351
1/2	1/2	2	4	SEL151352
5/8	5/8	2	4-1/8	SEL151353
3/4	3/4	2-1/4	4-1/2	SEL151354
7/8	7/8	2-1/2	4-3/4	SEL151355
1	1	3	5-1/2	SEL151356
1-1/8	1	3	5-1/2	SEL151357
1-1/4	1	3	5-1/2	SEL151358
1-1/4	1-1/4	3	5-1/2	SEL151359
1-3/8	1	3	5-1/2	SEL151360
1-1/2	1-1/4	3	5-1/2	SEL151361
1-5/8	1-1/4	3	5-1/2	SEL151362
1-3/4	1-1/4	3	5-1/2	SEL151363
1-7/8	1-1/4	3	5-1/2	SEL151364
2	1-1/4	3	5-1/2	SEL151365

1 per tube

Two Flute, Single End, Ball Nose, Center Cutting

- Used for all general purpose radius and slot milling, die sinking and profile milling.
- Also designed to plunge cut.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
				ALFA USA
1/8	3/8	3/8	2-5/16	SEB151371
3/16	3/8	1/2	2-3/8	SEB151372
1/4	3/8	5/8	2-7/16	SEB151373
5/16	3/8	3/4	2-1/2	SEB151374
3/8	3/8	3/4	2-1/2	SEB151375
7/16	1/2	1	3	SEB151376
1/2	1/2	1	3	SEB151377
9/16	1/2	1	3-1/16	SEB151378
5/8	1/2	1-3/8	3-3/8	SEB151379
5/8	5/8	1-3/8	3-1/2	SEB151380
3/4	1/2	1-5/8	3-5/8	SEB151381
3/4	3/4	1-5/8	3-7/8	SEB151382
7/8	7/8	2	4-1/4	SEB151383
1	1	2-1/4	4-3/4	SEB151384
1-1/8	1	2-1/4	4-3/4	SEB151385
1-1/4	1-1/4	2-1/2	5	SEB151386
1-1/2	1-1/4	2-1/2	5	SEB151387

1 per tube

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.

HSS End Mills

Weldon Shank
30° Right Hand Helix
Right Hand Cut



Two Flute, Double End, Center Cutting

- Used for general purpose milling operations including profiling, slotting, keyways, pockets and plunge cutting.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
				ALFA USA
1/8	3/8	3/8	3-1/16	DE150731
5/32	3/8	7/16	3-1/8	DE150732
3/16	3/8	7/16	3-1/8	DE150733
7/32	3/8	1/2	3-1/8	DE150734
1/4	3/8	1/2	3-1/8	DE150735
9/32	3/8	9/16	3-1/8	DE150736
5/16	3/8	9/16	3-1/8	DE150737
11/32	3/8	9/16	3-1/8	DE150738
3/8	3/8	9/16	3-1/8	DE150739
13/32	1/2	13/16	3-3/4	DE150740
7/16	1/2	13/16	3-3/4	DE150741
15/32	1/2	13/16	3-3/4	DE150742
1/2	1/2	13/16	3-3/4	DE150743
9/16	5/8	1-1/8	4-1/2	DE150744
5/8	5/8	1-1/8	4-1/2	DE150745
11/16	3/4	1-5/16	5	DE150746
3/4	3/4	1-5/16	5	DE150747
13/16	7/8	1-9/16	5-1/2	DE150748
7/8	7/8	1-9/16	5-1/2	DE150749
15/16	1	1-5/8	5-7/8	DE150750
1	1	1-5/8	5-7/8	DE150751

1 per tube

Two Flute, Double End, Ball Nose, Center Cutting

- Used for contour or pocket milling where the ball end is required to produce a radius in the work piece.
- Can be used for general purpose milling including slots, keyways, pockets and plunge cutting.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
				ALFA USA
1/8	3/8	3/8	3-1/16	DEB150761
3/16	3/8	7/16	3-1/8	DEB150762
1/4	3/8	1/2	3-1/8	DEB150763
5/16	3/8	9/16	3-1/8	DEB150764
3/8	3/8	9/16	3-1/8	DEB150765
7/16	1/2	13/16	3-3/4	DEB150766
1/2	1/2	13/16	3-3/4	DEB150767
5/8	5/8	1-1/8	4-1/2	DEB150768
3/4	3/4	1-5/16	5	DEB150769
7/8	7/8	1-9/16	5-1/2	DEB150770
1	1	1-5/8	5-7/8	DEB150771

1 per tube

HSS End Mills

C

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.

Weldon Shank
30° Right Hand Helix
Right Hand Cut



Multi-Flute, Single End, Center Cutting

- Used for general purpose milling operations including profiling, slotting, keyways, pockets and plunge cutting.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/8	3/8	3/8	4	2-5/16	SECC151031
3/16	3/8	1/2	4	2-3/8	SECC151032
1/4	3/8	5/8	4	2-7/16	SECC151033
5/16	3/8	3/4	4	2-1/2	SECC151034
3/8	3/8	3/4	4	2-1/2	SECC151035
1/2	1/2	1-1/4	4	3-1/4	SECC151036
5/8	5/8	1-5/8	4	3-3/4	SECC151037
3/4	3/4	1-5/8	4	3-7/8	SECC151038
7/8	7/8	1-7/8	4	4-1/8	SECC151039
1	1	2	4	4-1/2	SECC151040
1-1/8	1	2	4	4-1/2	SECC151042
1-1/4	1-1/4	2	4	4-1/2	SECC151043
1-1/4	1-1/4	2	6	4-1/2	SECC151044
1-1/2	1-1/4	2	4	4-1/2	SECC151047
1-1/2	1-1/4	2	6	4-1/2	SECC151048
1-1/2	1-1/4	3	4	5-1/2	SECC151049
1-3/4	1-1/4	2	6	4-1/2	SECC151051
2	1-1/4	2	6	4-1/2	SECC151052

Long Length

NEW!

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/4	3/8	1-1/4	4	3-1/16	SECCL151033
5/16	3/8	1-3/8	4	3-1/8	SECCL151034
3/8	3/8	1-1/2	4	3-1/4	SECCL151035
1/2	1/2	2	4	4	SECCL151036
5/8	5/8	2-1/2	4	4-5/8	SECCL151037
3/4	3/4	3	4	5-1/4	SECCL151038
7/8	7/8	3-1/2	4	5-3/4	SECCL151039
1	1	4	4	6-1/2	SECCL151041
1-1/4	1-1/4	4	4	6-1/2	SECCL151043
1-1/4	1-1/4	4	6	6-1/2	SECCL151044
1-1/2	1-1/4	4	4	6-1/2	SECCL151045
1-1/2	1-1/4	4	6	6-1/2	SECCL151046
2	1-1/4	4	6	6-1/2	SECCL151054

X-Long Length

NEW!

1/4	3/8	1-3/4	4	3-9/16	SECCXL151033
5/16	3/8	2	4	3-3/4	SECCXL151034
3/8	3/8	2-1/2	4	4-1/4	SECCXL151035
1/2	1/2	3	4	5	SECCXL151036
5/8	5/8	4	4	6-1/8	SECCXL151037
3/4	3/4	4	4	6-1/4	SECCXL151038
7/8	7/8	5	4	7-1/4	SECCXL151039
1	1	6	4	8-1/2	SECCXL151041
1-1/4	1-1/4"	6	6	8-1/2	SECCXL151044

1 per tube

Multi-Flute, Single End, Ball Nose, Center Cutting

- Used for all general purpose radius and slot milling, die sinking and profile milling. Also designed to plunge cut.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/4	3/8	3/4	4	2-9/16	SEB150730
5/16	3/8	1	4	2-3/4	SEB150730A
3/8	3/8	1	4	2-3/4	SEB150731
1/2	1/2	1-1/2	4	3-1/2	SEB150732
5/8	5/8	1-3/4	4	3-7/8	SEB150733
3/4	3/4	1-1/2	4	3-3/4	SEB150734
1	1	2	4	4-1/2	SEB150735

Long Length

NEW!

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/4	3/8	1-1/4	4	3-1/16	SEBL150730
5/16	3/8	1-1/2	4	3-1/4	SEBL150730A
3/8	3/8	1-1/2	4	3-1/4	SEBL150731
1/2	1/2	2	4	4	SEBL150732
5/8	5/8	2-1/2	4	4-5/8	SEBL150733
3/4	3/4	2-1/4	4	4-1/2	SEBL150734
1	1	3	4	5-1/2	SEBL150735

X-Long Length

NEW!

1/4	3/8	1-1/2	4	3-5/16	SEBXL150730
3/8	3/8	2-1/2	4	4-5/16	SEBXL150731
1/2	1/2	3	4	5	SEBXL150732
5/8	5/8	3	4	5-1/8	SEBXL150733
3/4	3/4	3-3/4	4	6	SEBXL150734
1	1	4	4	6-1/2	SEBXL150735

1 per tube

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.

HSS End Mills

Weldon Shank
30° Right Hand Helix
Right Hand Cut

Multi-Flute, Single End, Non-Center Cutting

- Used for general purpose milling including profile milling and producing open-ended slots or pockets where a plunge feed-in is not required.



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK # ALFA USA
1/8	3/8	3/8	4	2-5/16	SE150651
3/16	3/8	1/2	4	2-3/8	SE150652
1/4	3/8	5/8	4	2-7/16	SE150653
5/16	3/8	3/4	4	2-1/2	SE150654
3/8	3/8	3/4	4	2-1/2	SE150655
7/16	3/8	1	4	2-11/16	SE150656
1/2	3/8	1	4	2-11/16	SE150657
1/2	1/2	1-1/4	4	3-1/4	SE150658
9/16	1/2	1-3/8	4	3-3/8	SE150659
5/8	1/2	1-3/8	4	3-3/8	SE150660
5/8	5/8	1-5/8	4	3-3/4	SE150661
11/16	1/2	1-5/8	4	3-5/8	SE150662
11/16	5/8	1-5/8	4	3-3/4	SE150663
3/4	1/2	1-5/8	4	3-5/8	SE150664
3/4	5/8	1-5/8	4	3-3/4	SE150665
3/4	3/4	1-5/8	4	3-7/8	SE150666
13/16	3/4	1-7/8	4	4-1/8	SE150667
7/8	5/8	1-7/8	6	4	SE150668
7/8	3/4	1-7/8	4	4-1/8	SE150669
7/8	7/8	1-7/8	4	4-1/8	SE150670
15/16	3/4	1-7/8	4	4-1/8	SE150671
1	5/8	1-7/8	6	4	SE150673
1	3/4	1-7/8	4	4-1/8	SE150674
1	1	2	4	4-1/2	SE150675
1-1/8	3/4	1-1/2	6	3-7/8	SE150676
1-1/8	1	2	6	4-1/2	SE150677
1-1/4	3/4	1-1/2	6	3-7/8	SE150678
1-1/4	1	2	6	4-1/2	SE150679
1-1/4	1-1/4	2	4	4-1/2	SE150680
1-1/4	1-1/4	2	6	4-1/2	SE150681
1-3/8	3/4	1-1/2	6	3-7/8	SE150682
1-3/8	1	2	6	4-1/2	SE150683
1-1/2	3/4	1-1/2	6	3-7/8	SE150684
1-1/2	1	2	6	4-1/2	SE150685
1-1/2	1-1/4	2	4	4-1/2	SE150686
1-1/2	1-1/4	2	6	4-1/2	SE150687
1-5/8	1-1/4	2	6	4-1/2	SE150689
1-3/4	3/4	1-1/2	6	3-7/8	SE150690
1-3/4	1-1/4	2	4	4-1/2	SE150691
1-3/4	1-1/4	2	6	4-1/2	SE150692
1-7/8	1-1/4	2	6	4-1/2	SE150693
2	3/4	1-1/2	8	3-7/8	SE150694
2	1-1/4	2	4	4-1/2	SE150695
2	1-1/4	2	6	4-1/2	SE150696

1 per tube

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.



Multi-Flute, Single End, Non-Center Cutting

- Provides an alternative length of cut for deep milling and profiling applications.



Long Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK # ALFA USA
1/4	3/8	1-1/4	4	3-1/16	SEL150701
5/16	3/8	1-3/8	4	3-1/8	SEL150702
3/8	3/8	1-1/2	4	3-1/4	SEL150703
7/16	1/2	1-3/4	4	3-3/4	SEL150704
1/2	1/2	2	4	4	SEL150705
5/8	5/8	2-1/2	4	4-5/8	SEL150706
3/4	3/4	3	4	5-1/4	SEL150707
7/8	7/8	3-1/2	4	5-3/4	SEL150708
1	1	4	4	6-1/2	SEL150709
1-1/8	1	4	6	6-1/2	SEL150710
1-1/4	1	4	6	6-1/2	SEL150711
1-1/4	1-1/4	4	4	6-1/2	SEL150712
1-1/4	1-1/4	4	6	6-1/2	SEL150713
1-1/2	1	4	6	6-1/2	SEL150715
1-1/2	1-1/4	4	6	6-1/2	SEL150716
1-3/4	1-1/4	4	6	6-1/2	SEL150717
2	1-1/4	4	6	6-1/2	SEL150718

1 per tube

Multi-Flute, Double End, Non-Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK # ALFA USA
1/8	3/8	3/8	4	3-1/16	DE151401
5/32	3/8	7/16	4	3-1/8	DE151402
3/16	3/8	1/2	4	3-1/4	DE151403
7/32	3/8	9/16	4	3-1/4	DE151404
1/4	3/8	5/8	4	3-3/8	DE151405
9/32	3/8	11/16	4	3-3/8	DE151406
5/16	3/8	3/4	4	3-1/2	DE151407
11/32	3/8	3/4	4	3-1/2	DE151408
3/8	3/8	3/4	4	3-1/2	DE151409
13/32	1/2	1	4	4-1/8	DE151410
7/16	1/2	1	4	4-1/8	DE151411
15/32	1/2	1	4	4-1/8	DE151412
1/2	1/2	1	4	4-1/8	DE151413
9/16	5/8	1-3/8	4	5	DE151414
5/8	5/8	1-3/8	4	5	DE151415
11/16	3/4	1-5/8	4	5-5/8	DE151416
3/4	3/4	1-5/8	4	5-5/8	DE151417
13/16	7/8	1-7/8	4	6-1/8	DE151418
7/8	7/8	1-7/8	4	6-1/8	DE151419
15/16	1	1-7/8	4	6-3/8	DE151420
1	1	1-7/8	4	6-3/8	DE151421

1 per tube

HSS End Mills – Miniature



Right Hand Cut

Two Flute, Double End, Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
1/32	3/16	3/32	2-1/4	DE50753
1/16	3/16	7/32	2-1/4	DE50754
5/64	3/16	1/4	2-1/4	DE50755
3/32	3/16	5/16	2-1/4	DE50756
7/64	3/16	11/32	2-1/4	DE50757
1/8	3/16	3/8	2-1/4	DE50758
9/64	3/16	13/32	2-1/4	DE50759
5/32	3/16	7/16	2-1/4	DE50760
11/64	3/16	15/32	2-1/4	DE50761
3/16	3/16	1/2	2-1/4	DE50762

1 per pack

Four Flute, Double End, Regular End



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #
1/16	3/16	5/16	2-1/4	DE51423
5/64	3/16	5/16	2-1/4	DE51424
3/32	3/16	5/16	2-1/4	DE51425
7/64	3/16	5/16	2-1/4	DE51426
1/8	3/16	3/8	2-1/4	DE51427
9/64	3/16	3/8	2-1/4	DE51428
5/32	3/16	7/16	2-1/4	DE51429
11/64	3/16	7/16	2-1/4	DE51430
3/16	3/16	1/2	2-1/4	DE51431

1 per pack

Features: • For cutting and finishing in hard-to-reach applications.



Long Length

1/16	3/16	7/32	2-1/2	DE50754L
5/64	3/16	1/4	2-1/2	DE50755L
3/32	3/16	9/32	2-5/8	DE50756L
7/64	3/16	9/32	2-5/8	DE50757L
1/8	3/16	3/4	3-1/8	DE50758L
9/64	3/16	3/4	3-1/8	DE50759L
5/32	3/16	7/8	3-1/4	DE50760L
11/64	3/16	7/8	3-1/4	DE50761L
3/16	3/16	1	3-3/8	DE50762L

1 per pack



Long Length

5/64	3/16	1/4	2-5/8	DE51424L
3/32	3/16	9/32	2-5/8	DE51425L
7/64	3/16	9/32	2-5/8	DE51426L
1/8	3/16	3/4	3-1/8	DE51427L
9/64	3/16	3/4	3-1/8	DE51428L
5/32	3/16	7/8	3-1/4	DE51429L
11/64	3/16	7/8	3-1/4	DE51430L
3/16	3/16	1	3-3/8	DE51431L

1 per pack

Features: • Most cost-effective option for shallow milling.
• Shorter length improves rigidity of tool.



Stub Length

1/32	3/16	3/64	2	DE50753S
1/16	3/16	3/32	2	DE50754S
5/64	3/16	1/8	2	DE50755S
3/32	3/16	9/64	2	DE50756S
7/64	3/16	5/32	2	DE50757S
1/8	3/16	3/16	2	DE50758S
9/64	3/16	7/32	2	DE50759S
5/32	3/16	15/64	2	DE50760S
11/64	3/16	1/4	2	DE50761S
3/16	3/16	9/32	2	DE50762S

1 per pack



Stub Length

1/16	3/16	3/32	2	DE51423S
5/64	3/16	1/8	2	DE51424S
3/32	3/16	9/64	2	DE51425S
7/64	3/16	5/32	2	DE51426S
1/8	3/16	3/16	2	DE51427S
9/64	3/16	7/32	2	DE51428S
5/32	3/16	15/64	2	DE51429S
11/64	3/16	1/4	2	DE51430S
3/16	3/16	9/32	2	DE51431S

1 per pack

Cobalt M42 End Mills

Weldon Shank
30° Right Hand Helix
Right Hand Cut



- Features:**
- Designed for tougher cutting assignments on high-strength, high-temp steels and exotic materials or for extended production runs in conventional and non-conventional milling operations.
 - Used for general purpose milling including profiling, slotting, keyways, pockets and plunge cutting.

Two Flute, Single End, Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #	
				ALFA	USA
1/8	3/8	3/8	2-5/16	CO51301	
3/16	3/8	7/16	2-5/16	CO51302	
1/4	3/8	1/2	2-5/16	CO51303	
5/16	3/8	9/16	2-5/16	CO51304	
3/8	3/8	9/16	2-5/16	CO51305	
7/16	3/8	13/16	2-1/2	CO51306	
1/2	3/8	13/16	2-1/2	CO51307	
1/2	1/2	1	3	CO51308	
9/16	1/2	1-1/8	3-1/8	CO51309	
5/8	1/2	1-1/8	3-1/8	CO51310	
5/8	5/8	1-5/16	3-7/16	CO51311	
3/4	1/2	1-5/16	3-5/16	CO51314	
3/4	5/8	1-5/16	3-7/16	CO51315	
3/4	3/4	1-5/16	3-9/16	CO51316	
7/8	5/8	1-1/2	3-5/8	CO51318	
7/8	7/8	1-1/2	3-3/4	CO51320	
1	5/8	1-1/2	3-5/8	CO51323	
1	3/4	1-1/2	3-3/4	CO51324	
1	1	1-5/8	4-1/8	CO51325	
1-1/4	1-1/4	1-5/8	4-1/8	CO51330	
1-1/2	1-1/4	1-5/8	4-1/8	CO51336	
2	1-1/4	1-5/8	4-1/8	CO51343	

1 per tube

Two Flute, Double End, Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	OVERALL LENGTH	STOCK #	
				ALFA	USA
1/8	3/8	3/8	3-1/16	CO50731	
5/32	3/8	7/16	3-1/8	CO50732	
3/16	3/8	7/16	3-1/8	CO50733	
7/32	3/8	1/2	3-1/8	CO50734	
1/4	3/8	1/2	3-1/8	CO50735	
9/32	3/8	9/16	3-1/8	CO50736	
5/16	3/8	9/16	3-1/8	CO50737	
3/8	3/8	9/16	3-1/8	CO50739	
13/32	1/2	13/16	3-3/4	CO50740	
7/16	1/2	13/16	3-3/4	CO50741	
1/2	1/2	13/16	3-3/4	CO50743	
9/16	5/8	1-1/8	4-1/2	CO50744	
5/8	5/8	1-1/8	4-1/2	CO50745	
3/4	3/4	1-5/16	5	CO50747	
7/8	7/8	1-9/16	5-1/2	CO50749	
1	1	1-5/8	5-7/8	CO50751	

1 per tube

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.

Cobalt M42 End Mills - Cont.

Weldon Shank
30° Right Hand Helix
Right Hand Cut



- Features:**
- Designed for tougher cutting assignments on high-strength, high-temp steels and exotic materials or for extended production runs in conventional and non-conventional milling operations.
 - Used for general purpose milling including profiling, slotting, keyways, pockets and plunge cutting.

Multi-Flute, Single End, Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/8	3/8	3/8	4	2-5/16	CO50651
3/16	3/8	1/2	4	2-3/8	CO50652
1/4	3/8	5/8	4	2-7/16	CO50653
5/16	3/8	3/4	4	2-1/2	CO50654
3/8	3/8	3/4	4	2-1/2	CO50655
1/2	1/2	1-1/4	4	3-1/4	CO50658
5/8	5/8	1-5/8	4	3-3/4	CO50661
3/4	3/4	1-5/8	4	3-7/8	CO50666
7/8	7/8	1-7/8	4	4-1/8	CO50667
1	1	2	4	4-1/2	CO50675
1-1/4	1-1/4	2	4	4-1/2	CO50680
1-1/4	1-1/4	2	6	4-1/2	CO50681
1-1/2	1-1/4	2	4	4-1/2	CO50686
1-1/2	1-1/4	2	6	4-1/2	CO50687
2	1-1/4	2	6	4-1/2	CO50688
Long Length					
3/8	3/8	1-1/2	4	3-1/4	CO50655L
1/2	1/2	2	4	4	CO50658L
5/8	5/8	2-1/2	4	4-5/8	CO50661L
3/4	3/4	3	4	5-1/4	CO50666L
1	1	4	4	6-1/2	CO50675L
1-1/4	1-1/4	4	4	6-1/2	CO50680L
1-1/4	1-1/4	4	6	6-1/2	CO50681L

1 per tube

Multi-Flute, Double End, Center Cutting



Regular Length

MILL DIA.	SHANK DIA.	FLUTE LENGTH	NO. FLTS	OVERALL LENGTH	STOCK #
					ALFA USA
1/8	3/8	3/8	4	3-1/16	CO51401
3/16	3/8	1/2	4	3-1/4	CO51403
1/4	3/8	5/8	4	3-3/8	CO51405
5/16	3/8	3/4	4	3-1/2	CO51407
3/8	3/8	3/4	4	3-1/2	CO51409
1/2	1/2	1	4	4-1/8	CO51413
5/8	5/8	1-3/8	4	5	CO51415
3/4	3/4	1-5/8	4	5-5/8	CO51417

1 per tube

All end mills available TiN, TiCN, AlTiN and TiAlN coated. Details on request.

TOOLS NOT INCLUDED



DIH13300
 DIH13325
 (Lockable)

END MILL DISPENSER

(Three Drawers)

Dimensions: 26" W x 12" D x 9-5/16" H



DESCRIPTION	WEIGHT	STOCK #
FOR TWO FLUTE END MILLS Holds sizes 1/16" to 1" Lockable, stackable	37 lbs.	DIH13300
FOR FOUR FLUTE END MILLS Holds sizes 1/16" to 1" Lockable, stackable	37 lbs.	DIH13325

Cobalt M42 Roughing End Mills

**30° Right Hand Helix
Right Hand Cut
Sinusoidal Tooth Form**



- Features:**
- A sinusoidal chipbreaker form, which produces small chips, allowing them to run at faster feed rates than conventional tools, resulting in high material removal rates.
 - Designed to machine difficult and abrasive materials ranging from medium to the highest hardness levels machinable by high-speed steel.
 - 8% cobalt content assures high edge hardness at elevated temperatures.
 - Large core diameter provides rigidity and reduces deflection.
 - Can be used for general purpose rough milling including profiling and open ended slots.

COARSE PITCH

**Multi-Flute,
Coarse Pitch,
Non-Center Cutting**



**Multi-Flute, Ball Nose,
Coarse Pitch,
Center Cutting**



Regular Length

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STOCK #
1/4	3/8	5/8	2-7/16	3	REM50801
5/16	3/8	3/4	2-1/2	3	REM50802
3/8	3/8	3/4	2-1/2	4	REM50803
5/8	5/8	1-5/8	3-3/4	4	REM50806
3/4	3/4	1-5/8	3-7/8	4	REM50811
7/8	3/4	1-7/8	4-1/8	5	REM50813
1	1	2	4-1/2	5	REM50818
1-1/8	1	2	4-1/2	6	REM50819
1-1/4	1-1/4	2	4-1/2	6	REM50822
1-1/2	1-1/4	2	4-1/2	6	REM50823
2	1-1/4	2	4-1/2	8	REM50825
2	2	4	7-3/4	8	REM50828

Medium & Long Length

1/2	1/2	2	4	4	REM50831
5/8	5/8	2-1/2	4-5/8	4	REM50832
3/4	3/4	3	5-1/4	4	REM50833
7/8	3/4	3-1/2	5-3/4	5	REM50834
1	1	4	6-1/2	5	REM50841
1-1/4	1-1/4	4	6-1/2	6	REM50842
1-1/2	1-1/4	4	6-1/2	6	REM50843
2	1-1/4	4	6-1/2	8	REM50845
2	2	8	11-3/4	8	REM50846
2	2	10	13-3/4	8	REM50847
2	2	12	15-3/4	8	REM50848

1 per pack

Regular, Medium & Long Length

CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STOCK #
1/2	1/2	1-1/4	3-1/4	4	REM50881
1/2	1/2	2	4	4	REM50882
5/8	5/8	1-5/8	3-3/4	4	REM50883
5/8	5/8	2-1/2	4-5/8	4	REM50884
3/4	3/4	1-5/8	3-7/8	4	REM50885
3/4	3/4	3	5-1/4	4	REM50886
1	1	2	4-1/2	5	REM50888
1	1	4	6-1/2	5	REM50889
1-1/4	1-1/4	2	4-1/2	6	REM50890
1-1/4	1-1/4	4	6-1/2	6	REM50891
1-1/2	1-1/4	2	4-1/2	6	REM50892
1-1/2	1-1/4	4	6-1/2	6	REM50893

1 per pack

**Multi-Flute, Shell Type,
20° Right Hand Helix,
Right Hand Cut,
Non-Center
Cutting**



**Multi-Flute, For Bridgeport,
Coarse Pitch**



CUTTER DIA.	SHANK DIA.	LENGTH OF CUT	OAL	NO. OF FLUTES	STOCK #
1	3/4	1-7/8	4-1/8	5	REM51134
1	3/4	4	6-1/4	5	REM51135
1-1/4	3/4	2	4-1/4	6	REM51138
1-1/4	3/4	4	6-1/4	6	REM51139
1-1/2	3/4	2-1/4	4-1/2	6	REM51141
1-1/2	3/4	4	6-1/4	6	REM51142

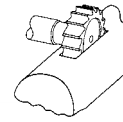
1 per pack

CUTTER DIA.	LENGTH OF CUT	HOLE OF CUT	NO. OF FLUTES	STOCK #
2	2	3/4	8	REM50853
2-1/4	2	1	8	REM50857
2-1/2	2	1	8	REM50861
2-3/4	2	1	8	REM50865
3	2	1-1/4	10	REM50869
3-1/2	2	1-1/4	10	REM50871
4	2-1/4	1-1/2	12	REM50872
4-1/2	2-1/4	1-1/2	14	REM50873
5	2-1/4	1-1/2	14	REM50874
5-1/2	2-1/4	2	16	REM50875
6	2-1/4	2	16	REM50876

1 per pack

HSS Cutters

Straight Teeth with 1/2" Dia. Shank



• Suitable for cutting smaller woodruff keysets.

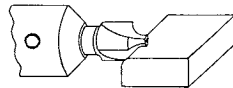
WOODRUFF KEYSEAT CUTTERS

OLD STANDARD	AMERICAN STANDARD	NOMINAL DIA.	FACE WIDTH	OAL	STOCK #
1	204	1/2	1/16	2-1/16	WKC51761
2	304	1/2	3/32	2-3/32	WKC51762
3	305	5/8	3/32	2-3/32	WKC51763
4	404	1/2	1/8	2-1/8	WKC51764
5	405	5/8	1/8	2-1/8	WKC51765
7	406	3/4	1/8	2-1/8	WKC51766
6	505	5/8	5/32	2-5/32	WKC51767
61	605	5/8	3/16	2-3/16	WKC51768
8	506	3/4	5/32	2-5/32	WKC51769
91	806	3/4	1/4	2-1/4	WKC51770
10	507	7/8	5/32	2-5/32	WKC51771
9	606	3/4	3/16	2-3/16	WKC51772
11	607	7/8	3/16	2-3/16	WKC51773
12	707	7/8	7/32	2-7/32	WKC51774
13	608	1	3/16	2-3/16	WKC51775
14	708	1	7/32	2-7/32	WKC51776
152	1208	1	3/8	2-3/8	WKC51777
16	609	1-1/8	3/16	2-3/16	WKC51778

OLD STANDARD	AMERICAN STANDARD	NOMINAL DIA.	FACE WIDTH	OAL	STOCK #
A	807	7/8	1/4	2-1/4	WKC51779
15	808	1	1/4	2-1/4	WKC51780
17	709	1-1/8	7/32	2-7/32	WKC51781
18	809	1-1/8	1/4	2-1/4	WKC51782
19	610	1-1/4	3/16	2-3/16	WKC51783
20	710	1-1/4	7/32	2-7/32	WKC51784
21	810	1-1/4	1/4	2-1/4	WKC51785
22	811	1-3/8	1/4	2-1/4	WKC51786
24	812	1-1/2	1/4	2-1/4	WKC51787
B	1008	1	5/16	2-5/16	WKC51788
C	1009	1-1/8	5/16	2-5/16	WKC51789
D	1010	1-1/4	5/16	2-5/16	WKC51790
23	1011	1-3/8	5/16	2-5/16	WKC51791
25	1012	1-1/2	5/16	2-5/16	WKC51792
E	1210	1-1/4	3/8	2-3/8	WKC51793
F	1211	1-3/8	3/8	2-3/8	WKC51794
G	1212	1-1/2	3/8	2-3/8	WKC51795

1 per pack

CORNER ROUNDING CUTTERS

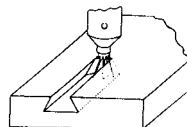


• Suitable for milling convex quarter circles on the edge of all types of materials.

RADIUS	SHANK DIA.	HEAD DIA.	OAL	STOCK #
1/16"	3/8"	7/16"	2-1/2"	CREM51702
3/32"	3/8"	1/2"	2-1/2"	CREM51703
1/8"	1/2"	5/8"	3"	CREM51704
5/32"	1/2"	3/4"	3"	CREM51705
3/16"	1/2"	7/8"	3"	CREM51706
1/4"	1/2"	1"	3"	CREM51708
5/16"	1/2"	1-1/8"	3-1/4"	CREM51711
3/8"	1/2"	1-1/4"	3-1/2"	CREM51714
7/16"	3/4"	1-3/8"	3-3/4"	CREM51716
1/2"	3/4"	1-1/2"	3-7/8"	CREM51717

1 per pack

DOVETAIL CUTTERS



• Suitable for dovetail milling in all types of materials.

ANGLE	CUTTER		SHANK DIA.	OAL	STOCK #
	DIA.	WIDTH			
60°	1/2"	1/4"	3/8"	2-1/8"	DTC51731
45°	1/2"	5/32"	3/8"	2-1/8"	DTC51732
60°	3/4"	5/16"	3/8"	2-1/8"	DTC51733
45°	3/4"	1/4"	3/8"	2-1/8"	DTC51734
60°	1-3/8"	9/16"	5/8"	2-7/8"	DTC51735
45°	1-3/8"	7/16"	5/8"	2-7/8"	DTC51736
60°	1-7/8"	13/16"	7/8"	3-1/4"	DTC51737
45°	1-7/8"	5/8"	7/8"	3-1/4"	DTC51738
60°	2-1/4"	1-1/16"	1"	3-3/4"	DTC51739
45°	2-1/4"	5/8"	1"	3-3/4"	DTC51740

1 per pack

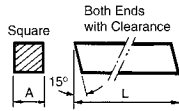
High-Speed Steel Cobalt Steel • Ground



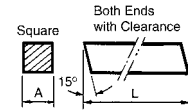
Features:

- Designed for long lasting accurate performance and machining accuracy.
- Precisely controlled heat treatment process gives uniform hardness throughout.
- These cost effective tools offer high resistance to abrasion and even shock associated with interrupted cuts.

HIGH-SPEED STEEL SQUARE TOOL BITS BOTH ENDS BEVELED



COBALT STEEL M-35 SQUARE TOOL BITS BOTH ENDS BEVELED



Features:

- Useable for general purpose applications.
- Unique tungsten-molybdenum high-speed steel tool bit provides excellent strength and toughness.
- Ideally suited for a wide variety of applications in ferrous and non-ferrous alloys.

Features:

- Useable for the toughest applications.
- Manufactured from premium cobalt M-35 high-speed steel, these tools are designed to provide the best wear resistance on difficult-to-machine alloys and heat treated, high-strength steels.
- For production applications where higher speeds for feeds are desired with mild materials.



SIZE A	OVERALL LENGTH L	STOCK #
		HSS
3/16	2-1/2	TBHS60803
1/4	2-1/2	TBHS60805
1/4	4	TBHS60806
5/16	2-1/2	TBHS60807
3/8	3	TBHS60809
7/16	3-1/2	TBHS60811
1/2	4	TBHS60813
1/2	6	TBHS60814
5/8	4-1/2	TBHS60815
3/4	5	TBHS60817
7/8	6	TBHS60819
1	7	TBHS60821

3/16" to 1/2", 5 per pack,
5/8" and above, 1 per pack

SIZE A	OVERALL LENGTH L	STOCK #
		COBALT
3/16	2-1/2	TBCS60803
1/4	2-1/2	TBCS60805
1/4	4	TBCS60806
5/16	2-1/2	TBCS60807
3/8	3	TBCS60809
7/16	3-1/2	TBCS60811
1/2	4	TBCS60813
1/2	6	TBCS60814
5/8	4-1/2	TBCS60815
3/4	5	TBCS60817
7/8	6	TBCS60819
1	7	TBCS60821

3/16" to 1/2", 5 per pack,
5/8" and above, 1 per pack

Carbide Tipped Tool Bits

Grade C2 for Cast Iron &
Non-Ferrous Metals Grade C5 for Steel



STYLE "AR & AL" Straight Turning Tool



STYLE "BR & BL" Lead angle Turning Tool



SIZE SQ x LENGTH	ANSI #	RIGHT HAND		ANSI #	LEFT HAND		ANSI #	RIGHT HAND		ANSI #	LEFT HAND	
		STOCK #			STOCK #			STOCK #			STOCK #	
		C2	C5		C2	C5		C2	C5		C2	C5
1/4" x 2"	AR4	TBAR4C2	TBAR4C5	AL4	TBAL4C2	TBAL4C5	BR4	TBBR4C2	TBBR4C5	BL4	TBBL4C2	TBBL4C5
5/16" x 2-1/4"	AR5	TBAR5C2	TBAR5C5	AL5	TBAL5C2	TBAL5C5	BR5	TBBR5C2	TBBR5C5	BL5	TBBL5C2	TBBL5C5
3/8" x 2-1/2"	AR6	TBAR6C2	TBAR6C5	AL6	TBAL6C2	TBAL6C5	BR6	TBBR6C2	TBBR6C5	BL6	TBBL6C2	TBBL6C5
7/16" x 3"	AR7	TBAR7C2	TBAR7C5	AL7	TBAL7C2	TBAL7C5	BR7	TBBR7C2	TBBR7C5	BL7	TBBL7C2	TBBL7C5
1/2" x 3-1/2"	AR8	TBAR8C2	TBAR8C5	AL8	TBAL8C2	TBAL8C5	BR8	TBBR8C2	TBBR8C5	BL8	TBBL8C2	TBBL8C5
5/8" x 4"	AR10	TBAR10C2	TBAR10C5	AL10	TBAL10C2	TBAL10C5	BR10	TBBR10C2	TBBR10C5	BL10	TBBL10C2	TBBL10C5
3/4" x 4-1/2"	AR12	TBAR12C2	TBAR12C5	AL12	TBAL12C2	TBAL12C5	BR12	TBBR12C2	TBBR12C5	BL12	TBBL12C2	TBBL12C5

1/4" to 3/8", 10 per pack, 7/16" to 3/4", 5 per pack

STYLE "D" 80° POINTED NOSE TOOL



STYLE "C" SQUARE NOSE TOOL



STYLE "E" 60° THREADING TOOL



SIZE SQ x LENGTH	ANSI #	STOCK #	
		C2	C5
1/4" x 2"	D4	TBD4C2	TBD4C5
5/16" x 2-1/4"	D5	TBD5C2	TBD5C5
3/8" x 2-1/2"	D6	TBD6C2	TBD6C5
7/16" x 3"	D7	TBD7C2	TBD7C5
1/2" x 3-1/2"	D8	TBD8C2	TBD8C5
5/8" x 4"	D10	TBD10C2	TBD10C5
3/4" x 4-1/2"	D12	TBD12C2	TBD12C5

1/4" to 3/8", 10 per pack, 7/16" to 3/4", 5 per pack

ANSI #	STOCK #	
	C2	C5
C4	TBC4C2	TBC4C5
C5	TBC5C2	TBC5C5
C6	TBC6C2	TBC6C5
C7	TBC7C2	TBC7C5
C8	TBC8C2	TBC8C5
C10	TBC10C2	TBC10C5
C12	TBC12C2	TBC12C5

ANSI #	STOCK #	
	C2	C5
E4	TBE4C2	TBE4C5
E5	TBE5C2	TBE5C5
E6	TBE6C2	TBE6C5
E7	TBE7C2	TBE7C5
E8	TBE8C2	TBE8C5
E10	TBE10C2	TBE10C5
E12	TBE12C2	TBE12C5

STYLE "FR & FL" END CUTTING OFFSET TOOL



STYLE "GR & GL" SIDE CUTTING OFFSET TOOL



SIZE SQ x LENGTH	ANSI #	RIGHT HAND		ANSI #	LEFT HAND	
		STOCK #			STOCK #	
		C2	C5		C2	C5
1/2" x 3-1/2"	FR8	TBFR8C2	TBFR8C5	FL8	TBFL8C2	TBFL8C5
5/8" x 4"	FR10	TBFR10C2	TBFR10C5	FL10	TBFL10C2	TBFL10C5
3/4" x 4-1/2"	-	-	-	-	-	-

1/2" to 3/4", 4/5 per pack

ANSI #	RIGHT HAND		ANSI #	LEFT HAND	
	STOCK #			STOCK #	
	C2	C5		C2	C5
GR8	TBGR8C2	TBGR8C5	GL8	TBGL8C2	TBGL8C5
GR10	TBGR10C2	TBGR10C5	GL10	TBGL10C2	TBGL10C5
GR12	TBGR12C2	TBGR12C5	GL12	-	TBGL12C5

STYLE "CTR & CTL" CUT-OFF TOOL

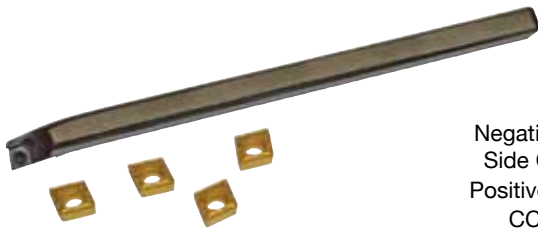


SIZE SQ x H x LENGTH	ANSI #	TIP WIDTH	STOCK #	
			C2	C5
			RIGHT HAND	
1/2" x 1" x 5"	CTR11	1/8"	TBCTR11C2	TBCTR11C5
	CTR22	3/16"	TBCTR22C2	TBCTR22C5
	CTR33	1/4"	TBCTR33C2	TBCTR33C5
LEFT HAND				
1/2" x 1" x 5"	CTL11	1/8"	TBCTL11C2	TBCTL11C5
	CTL22	3/16"	TBCTL22C2	TBCTL22C5
	CTL33	1/4"	TBCTL33C2	TBCTL33C5

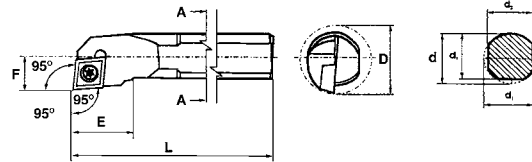
5 per pack

Indexable Insert Boring Bars

Screw-On Type



Negative 5° End and Side Cutting Angle
Positive 80° Diamond
CCMT Inserts



Individual Boring Bars supplied without inserts.

BORING BAR STYLE	SHANK SIZE	MIN. BORE	LENGTH L	CENTER LINE F	INSERTS STYLE	STOCK #		LOCKING SCREW	TORX KEY
						RH	LH	STOCK #	STOCK #
SCLCR/L 4-2	.315"	.354	4"	.1875	CCMT	BB870042R	BB870042L	SC2504	T7
SCLCR/L 6-2	3/8"	.468	6"	.2500	-21.51	BB870062R	BB870062L	SC2506	
SCLCR/L 8-3	1/2"	.600	7"	.3120	CCMT	BB870083R	BB870083L	SC4008	T8
SCLCR/L 10-3	5/8"	.866	8"	.4060		BB870103R	BB870103L		
SCLCR/L 12-3	3/4"	.920	10"	.5000		BB870123R	BB870123L		
SCLCR/L 16-3	1"	1.120	12"	.6094		BB870163R	BB870163L		

1 per pack

25 per pack

REPLACEMENT CARBIDE INSERTS

STYLE	COATING	MATERIALS	APPLICATIONS	STOCK #
STAINLESS STEEL				
CCMT 21.51	TiAlN	Steels, Stainless, Cast Irons, HRSA	Milling, Turning, Drilling, Threading	BBR310
CCMT 32.51	TiAlN			BBR320
CCMT 32.52	TiAlN			BBR330
SHARP EDGE				
CCGT 21.51	Uncoated	Aluminum, Fiberglass, Plastic, Teflon, Brass	Turning	BBR410
CCGT 32.51	Uncoated			BBR420
CCGT 32.52	Uncoated			BBR430

10 per pack

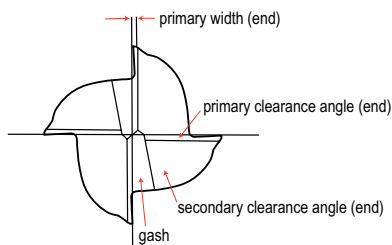
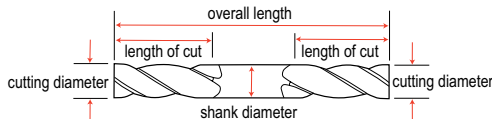
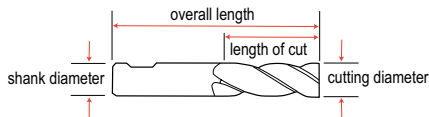
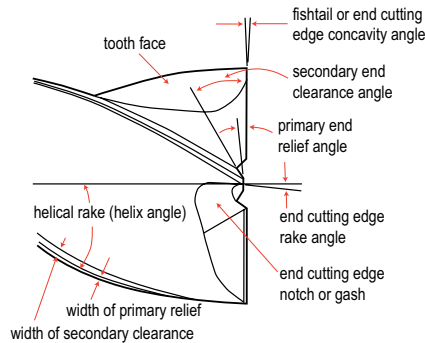
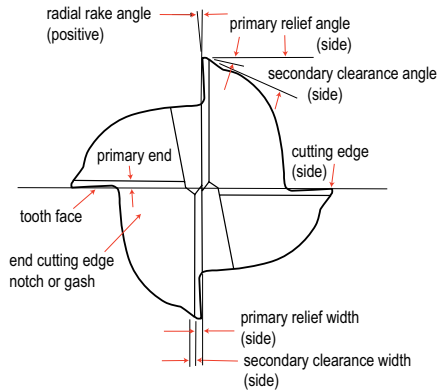
INDEXABLE BORING BAR SETS

IN FITTED WOODEN BOX

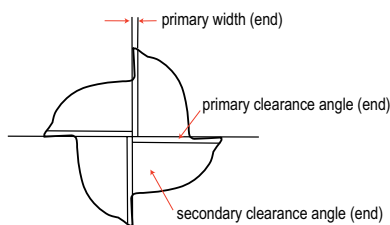


BB870500

SET QTY.	BORING BAR SIZES	INSERTS IN SET	ACCESSORIES	STOCK #
11 Pc.	1 each .315", 3/8", 1/2"	6 Pcs. CCM215L	1 Screw 1 Key	BB870500
13 Pc.	1 each 3/8", 1/2", 5/8"	2 Pcs. CCMT21.51 4 Pcs. CCMT32.52	2 Screws 2 Keys	BB870515
11 Pc.	1 each 1/2", 5/8", 3/4"	6 Pcs. CCMT32.52	1 Screw 1 Key	BB870510
19 Pc.	1 ea. .315", 3/8", 1/2", 5/8", 3/4"	4 Pcs. CCMT21.51 6 Pcs. CCMT32.52	2 Screws 2 Keys	BB870505



Center Cutting End View



Non-Center Cutting End View

An end mill is a straight or tapered shank milling cutter, which extends or projects from the milling machine spindle unobstructed. It is one of the most versatile and most-used of the cutting tools in any machine shop. It is capable of milling, drilling, reaming, planning, shaping, contour cutting and more. Improvements in cutting efficiency through both design and material changes have only increased the use of this style of tool.

Axial Relief: The relief, measured in the axial direction, between a plane perpendicular to the axis at the cutting edge and the relieved surface.

Clearance (Secondary Relief): The additional space provided behind the relieved land. Eliminates undesirable contact between the mill and the workpiece.

Cutting Edge: The leading edge of the cutter tooth.

Flute: The chip space between the back of one tooth and the face of the following tooth.

Gash: The secondary cuts on a mill. Provides chip room.

Heel: The back edge of the relieved land.

Helical Rake: The angle between the tool axis and a tangent plane at a given point on the flute face.

Helix Angle: The cutting edge angle made by a helical cutting edge with a plane containing the axis of a cylindrical mill. When viewed from the cutter end of the mill, the flute will move clockwise for a right hand helix.

Hook: A concave condition of a tooth face. The rake of a hooked tooth face must be determined at a given point.

Land: Used to define the width of a specified surface.

Left Hand Cut: When viewed from the cutting end of the mill, a clockwise rotation of the mill is required to cut.

Length of Cut: The effective axial length of the relieved peripheral cutting edge.

Radial Rake: The angle between the tooth face and a radial line passing through the cutting edge in a plane perpendicular to the cutting axis.

Rake: The angular relationship between a reference plane or line and the tooth face or a tangent to the tooth face at a given point.

Relief: The result of the removal of tool material behind or adjacent to the cutting edge. Provides clearance and prevents rubbing.

Relief Angle: The angle formed between a relieved surface and a point on the cutting edge, or a given plane tangent to the axis.

Right Hand Cut: When viewed from the cutting end of the mill, a counterclockwise rotation is required to cut. Most end mills are right hand cut.

Shank: The projecting portion of a cutter which locates and drives the cutter from the machine spindle.

Tooth Face: The surface of the tooth on which the chip forms.