DORMER

PRECISION

UNION BUTTERFIELD®

Catalog 2017



List Number Index

0

0860 147

1

1215..... 349
1290..... 147
1301..... 369
1500..... 287
1500S 287
1500A 290
1500L..... 296
1500OV 301
1505..... 302
1508..... 298
1511..... 149
1519..... 344
1528..... 287
1534..... 306
1534NE 315
1534NR 311
1541..... 326
1542..... 338
1543..... 334
1544..... 329
1545..... 330
1545A 330
1548..... 331
1549..... 335
1567..... 336
1568..... 332
1572..... 341
1578..... 341
1580..... 321
1580M 322
1582..... 317
1585..... 307
1585A 307
1585NR 313
1585OV 316
1586..... 317
1587..... 318
1588..... 318
1590..... 319
1591..... 319
1592..... 338
1593..... 316
1595..... 298
1599..... 303
1599M 304
1599SB 304
1600..... 303
1629AP 263
1630AP 276
1634..... 309
1641..... 278
1659AP 264
1660AP 277
1671..... 279
1672AP 252
1673AP 257
1674..... 252
1675..... 257
1676AP 267
1677AP 271
1678..... 267
1679..... 271
1681AP 280
1687AP 282
1691AP 281
1697AP 282
1700M 299
1700S 277
1785M 310
1785NR 314
1788M 320
1800..... 477
1813..... 149
1815..... 477
1816..... 477
1900..... 478
1985..... 266
1994..... 345

2

2A 82
2AB..... 82
2ACO 110
209 164
209CO..... 174
229CSET... 351
2010 356
2025 365
2325M..... 366
2510 358
2710M..... 362

3

3300 323
3300M..... 324
3306E 325
3850 350

4

4ASM..... 126
4ASMCO... 134
411..... 501
430..... 501
4500..... 462
4531..... 449
4532..... 456
4533..... 445
4535..... 450
4536..... 455
4537..... 455
4579..... 460
4587..... 465
4588..... 454
4591..... 466
4600..... 467
4602..... 479
4603..... 477
4608..... 478
4702..... 492
4703..... 495
4704..... 496
4705..... 493
4706..... 493

5

5ATL 139
5ATS 167
500-12..... 160
500-6..... 157
501-12..... 160
501-6..... 157
502-12..... 160
502-6..... 157

6

6541 328

7

76HA 196

8

883 429
8007 369

9

905 414
920 409
920K 410
923 408
930 417
940 430
945 424
948 423
960 431
963 411
980 415
981 416
9002 419
9003 420
9008 422
9009 421

A

A002 82
A002S 78
A012 78
A012S 74
A022 120
A088 114
A094 206
A095 207
A097 202
A100 82
A101 90
A108 101
A125 149
A160 186
A170 176
A190 205
A191 205
A217 197
A218 197
A221 198
A225 197
A243 156
A244 156
A245 123
A287 209
A345 170
A350 167
A510 60
A520 53
A530 167
A553 63
A720 130
A900 65
A901 65
A920 56
A921 56
A940 68
A941 68
A951 172
A952 172
A976 71
A977 71
A978 71
ATR41 200

B

B100 468
B101 457
B121 459
B122 453
B157 452
B170 442
B301 470
B334 463
B335 464
B400 437
B411 439
B441 436
B442 438
B481 440
B901 451

C

C110 406
C114COMB. 204
C114COMBC 212
C114COMBP 203
C115COMB. 204
C115COMBC 212
C115COMBP 203
C123 412
C13R10CO ..211
C15L10 208
C15R10 201
C15R10CO ..211
C15R10P... 201
C20R18 202
C20R18P... 202
C21R10CO ..211
C247 425
C252A 205
C252AB.... 205
C26M42CO . 216
C26R15 203
C26R15CO ..211
C26R15P... 203
C26R42 213
C273 427
C29HX10... 210
C29L10 208
C29M40CO . 216
C29R10 201
C29R10CO ..211
C29R10P... 201
C29R40 213
C29R40C... 215
C29R51 217
C33R56 218
C346 418
C502AB.... 205
C60M41CO . 216
C60R18 202
C60R18CO ..211
C60R18P... 202
C60R41 213
C60R41C... 215
C8R56 218
C8R56CO .. 218
C8R57 218
CO500-12 .. 162
CO500-6 ... 162
CO501-12 .. 162
CO501-6 ... 162

D

D33F 187
D33L 187
D33M..... 190
D33W 187
D444 184
DC..... 195
DS-90 191
DS-120 191
DS-142 191

E

E000 261
E000TIN ... 261
E001 261
E002 275
E003 275
E005 258
E006 258
E007 272
E008 272
E011 261
E013 275
E016 258
E018 272
E021 256
E023 270
E025 253
E026 253
E027 268
E028 268
E031 256
E033 270
E035 253
E036 253
E037 268
E038 268
E041 284
E043 286
E061 297
E071 297
E201 265
E252 265
E3302 388
E3302M.... 389
E3302V 388
E3303 396
E3303V 396
E3304 398
E3304M.... 399
E3304MV .. 399
E3304V 398
E4302 386
E4304 397
E500 292
E501 300
E504 305
E513 294
E5302 390
E5304 400
E5304V 400
E547 340
E550 339
E620 342
E621 342
E624 249
E625 242
E626 251
E627 244
E628 250
E629 243
E630 237
E6302 391
E6302V 391
E6304 401
E6304V 401
E631 237
E650 347
E651 346
E653 348
E654 346
E710 327
E711 333
E712 337
E721 327
E764 249
E765 242
E766 251
E767 244
E768 250
E769 243
E770 237
E771 237
E808 245
E809 238
E810 248
E811 241
E812 246
E813 239
E814 236
E815 236
E908 245
E909 238
E910 248
E911 241
E912 246
E913 239
E914 236
E915 236
EB3302 392
EB3302M .. 393
EB3302MV . 393
EB3302V... 392
EB3304 402
EB3304M .. 403
EB3304MV . 403
EB3304V... 402
EB5302 394
EB5304 404
EB5304V... 404
EB6302 395
EB6302V... 395
EB6304 405
EB6304V... 405
EP006H.... 259
EP016H.... 259
EP10 260
EP11 260
EP20 255
EP21 255
EP30 255
EP31 255
EP40 283
EP41 283
EX006H.... 273
EX016H.... 273
EX10 274
EX11 274
EX20 269
EX21 269
EX30 269
EX31 269
EX40 285
EX41 285

F

F201 364
F302 367
F312 368
F320 360
F330 360
F370 363

G

G132 488
G135 480
G136 483
G137 489
G138 490
G142 484
G149 482
G154 481
G171 486
G236 491
G335 480
G338 490
G400 476
G560 483
G570 485
G600 487

H

H853 28
H855 31
H858 34
H860 37
H861 37
HX10 92
HX15 92
HX18 92

K

K520 502
K521 502

L

L10 89
L110 370

M

M40CO 131
M41CO 131
M42CO 131
M51CO 145
M52CO 145

Q

QC0860P... 154
QC1290P... 154
QC21G 106
QC21GM... 109
QC21P..... 106
QC21PM ... 109
QC41G 128
QC41P..... 128
QC91G 142
QC91GM... 144
QC91P..... 142
QC91PM ... 144

R

R10 74
R10A..... 95
R10B..... 98
R10CO 110
R10H..... 101
R10P..... 74
R15 74
R15A..... 95
R15B..... 98
R15CO 110
R15P..... 74
R18 74
R18A..... 95
R18B..... 98
R18CO 110
R18H..... 101
R18P..... 74
R40 117
R40C..... 123
R41 117
R41C..... 123
R42 117
R42C..... 123
R453 46
R454 46
R457 40
R458 40
R459 50
R51 135
R510 44
R51FS..... 141
R52 135
R520 38
R55 135
R56 178
R56CO 183
R57 180
R58 182
R88CO 115
R89CO 115
R950 19
R960 22
R970 25

S

S209 164
S400HA.... 378
S401HA.... 379
S402HA.... 380
S403HA.... 381
S404HA.... 382
S405HA.... 383
S406HA.... 384
S406HB.... 385
S407HA.... 386
SPL-120 ... 194
SPL-90 194
SPLG-120 .. 194
SPLG-90 ... 194
SPR-120 ... 193
SPR-90 193
SPRG-120.. 193
SPRG-90... 193
SPS-120 ... 192
SPS-90 192
SPSG-120.. 192
SPSG-90... 192

T

T400 461
TC9002 419
TC9003 420
TN1500 291
TN1534 306
TN1541 326
TN1543 334
TN1585 307
TN1785 310
TS10 199
TS18 199
TS41 199
TS51 199
TS52 199

U

U1511 343

Table of Contents

004 - 007		Table of Contents
008 - 219		Drills
220 - 351		Taps
352 - 370		Dies
371 - 431		End Mills
432 - 470		Reamers
471 - 497		Countersinks/ Counterbores
498 - 502		Miscellaneous
503 - 585		Technical
586 - 633		Speed/Feed Info EDP # Index

TABLE OF CONTENTS - DRILLS

Application Products

Hydra Replaceable Head
- Heads 19-27
- 3 X D Bodies 28-30
- 5 X D Bodies 31-33
- 8 X D Bodies 34-36

Screws & Screw Drivers 37

Screw Machine Length (Stub)/Short Length
- CDX Carbide 38-39
- Force X Carbide 40-43
- ADX HSS 53-55
- PFX Cobalt Parabolic Flute 56-59

Jobber Length/Standard Length
- CDX Carbide 44-45
- Force X Carbide 46-49
- ADX Solid Design 60-62
- ADX Coolant Thru 63-64
- PFX Cobalt Parabolic Flute 65-67

8xD Length
- Force X Carbide 50-52

Taper Length
- PFX Cobalt Parabolic Flute 68-70

Extra Length
- PFX Cobalt Parabolic Flute 71-73

General Purpose

Jobber Length
- HSS
  - General Purpose 74-91
  - TiN Tipped 78-88
  - Left Hand 89-91
  - HX Heavy Duty, 135° Split Point . . 92-94
  - Aircraft Type A, 118° Split Point . . . 95-97
  - Aircraft Type B, 135° Split Point . . 98-100
  - Quick Spiral 101-105
  - Parabolic Flute 106-109
- Cobalt
  - NAS Type J, 135° Split Point . . . 110-114
- NAS Type D, 135° Split Point 115-116
- Sets 201-212

Screw Machine Length (Stub)
- HSS
  - General Purpose 117-119
  - TiN Tipped 120-122
- NAS Type C, 135° Split Point 123-127
  - Parabolic Flute 128-129
- Cobalt
  - Micro 130
  - Heavy Duty, 135° Split Point . . . 131-134
- Sets 213-216

Taper Length
- HSS
  - General Purpose 135-140
  - High Helix 141
  - Parabolic 142-144
- Cobalt
  - Heavy Duty 145-146
- Sets 217

Extra Length
- HSS
  - Overall Length - 8“ 147-148
  - Overall Length - 12“ 147-148
  - Overall Length - 15“ 149-153
  - Overall Length - 18“ 149-153
  - Parabolic 154-155

Aircraft Extension
- HSS,
  - Type A, Overall Length - 6“ 156
  - Type B, Overall Length - 6“ 156-159
  - Type B, Overall Length - 12“ . . . 160-161
- Cobalt, Type J
  - Overall Length - 6“ 162-163
  - Overall Length - 12“ 162-163

Taper Shank
- HSS, General Purpose
  - Regular 164-173
  - TiN coated 167-169
  - Small Taper 164-166
  - Long Series 167-169
  - Extra length 170-171
- Cobalt, Heavy Duty 174-175

Reduced Shank
- HSS
  - 1/2“ Shank 176-179
  - 1/2" Shank with tri-flats 180-181
  - 3/4“ Shank 182
- Cobalt
  - 1/2“ Shank 183
- Sets 218

Special Purpose Drills
- Carbide Tipped 184-186
- Combined Drill & Countersink 195-198
- Spotting 191-194
- Hexagonal Shank 199
- Tapered Aircraft Router 200

Solid Carbide
- General Purpose 187-190
- Spotting 191
- Combined Drill & Countersink 195

Sets
- Jobber Length 201-212
- Screw Machine Length 213-216
- Taper Length 217
- Reduced Shank 218

TABLE OF CONTENTS - TAPS

Application Products

Spiral Point Taps
- Multi-Application
  - Fractional/Machine Screw . 238-241,252-256
  - Internal Coolant - Inch 252
  - Metric 242-244,257-262
  - Internal Coolant - Metric 257
- Hard Materials
  - Fractional/Machine Screw 263
- Metric 264
  - DDX - High Hook 266

Straight Flute Taps
- For cast iron 236-237,263-265

Spiral Flute Taps
- Multi-Application
  - Fractional/Machine Screw . 245-248,267-270
  - Internal Coolant - Inch 267
- Metric 249-251
  - Internal Coolant, Metric 271
- Hard Materials
  - Fractional/Machine Screw 276
  - Metric 277

Thread Forming Taps
  - Fractional/Machine Screw 278, 280-281
  - Metric 279, 282

Pipe Taps
- Straight Flute 283-284
- Spiral Flute 285-286

General Purpose

Hand Taps (Straight Flute)
- Fractional/Machine Screw
  - Steam Tempered 290
  - Bright/Gold 287-289, 296-298
  - TiN Coated 291
- Metric 292-295
- 8-Pitch 302
- Left Hand 296,300
- Oversize 301
- Optional Flute 298
- For Cast Iron 303-305

Spiral Point Taps
- Relieved Style
  - Fractional/Machine Screw 306-309
  - Metric 310
- Non-Relieved Style
  - Fractional/Machine Screw 311-313
  - Metric 314
- Oversize - Relieved Style
  - Fractional/Machine Screw 316
- Extension - Non-Relieved Style
  - Fractional/Machine Screw 315

Spiral Flute Taps
- 30° Regular Spiral
  - Fractional/Machine Screw 317
- 52° High Spiral
  - Fractional/Machine Screw 318
  - Metric 320
- 40° Spiral - Heavy Duty
  - Fractional/Machine Screw 319

Thread Forming Taps
- Rol-Rite, Spiral Lobe
  - Fractional/Machine Screw 321
  - Metric 322
- Rol-Form, Lube Grooves
  - Fractional/Machine Screw 323
  - Metric 324
- Extension Rol-Form
  - Fractional/ Machine Screw 325

Pipe Taps
- NPT
  - Medium Hook 326-328
- High Hook 330
  - Low Rake 329
  - Spiral Flute 351
  - Interrupted Thread 332-333
- NPTF (Dryseal)
  - Medium Hook 334,337
  - Spiral Flute 335
  - Interrupted Thread 336
- NPS
  - Straight Pipe 338
- NPSF
  - Straight Pipe, Dryseal 338
- Rc (British Standard) 339
- G (British Standard) 340

Special Purpose Taps
- STI (Screw Thread Insert) 341-342
- Nut Style 343
- Pulley Style 344
- Combination Drill & Tap 345-348

Miscellaneous
- Tap Wrench 349-350
- Drill & Tap Sets 351

TABLE OF CONTENTS - DIES

Round Adjustable, Split Type
- Carbon Steel (UNC,UNF,UNS,NPT) 356-357
- HSS (UNC, UNF, M). 358-362
- HSS (BSP) 363

Gun Nosed Dies
- HSS, Left Hand (M) 364

Hex Rethreading Bolt Dies (Dienuts)
- Carbon Steel(UNC,UNF,UNS,NPT,M) . . . 365-366
- HSS (M, MF) 367-368

Die Stocks 369-370

TABLE OF CONTENTS - END MILLS

Application Products

Solid Carbide, center cutting

2-Flute
- Regular Length
  - Square End 378
  - Corner Radius 379
- Long Reach
  - Ball Nose 380

3-Flute
- Regular Length
  - Square End 381
  - Corner Radius 382

4-Flute
- Regular Length, Unequal Helix, Corner Rad
  - For Stainless Steel
    - Cylindrical Shank. 384
    - Weldon Shank 385
  - For Steel
    - Cylindrical Shank. 386

Multi-Flute Finishing
- Long length corner radius. 383

General Purpose

Solid Carbide, Center Cutting

2-Flute
- Square End, Single End
  - Regular 388-389
  - Long 390
  - Extra-Long 391
- Square End, Double End
  - Regular 387
- Ball Nose
  - Regular 392-393
  - Long 394
  - Extra-Long 395

3-Flute
- Square End, Single End
  - Regular 396

4-Flute
- Square End, Single End
  - Regular 398-399
  - Long 400
  - Extra-Long 401
- Square End, Double End
  - Regular 397
- Ball Nose
  - Regular 402-403
  - Long 404
  - Extra-Long 405

HSS and Cobalt Finishing End Mills

2-Flute
- Square End, Single End
  - Regular 406-407,409,411-413
  - Regular, Keyway 410
- Square End, Double End
  - Regular 408
- Ball Nose
  - Regular 414
- High Helix for Aluminum, Square End, Single End
  - Regular 415
  - Long 416

3-Flute
- Square End, Single End
  - Regular 417
  - Long 418

4-Flute
- Square End, Single End
  - Regular 424,431
- Square End, Double End
  - Regular 423

Multi-Flute
- Square End, Single End
  - Regular 425-426,430
  - Long 427-428

Cobalt Roughing End Mills

Fine Profile
- Regular Length
  - Bright. 419
  - TiCN 419
- Long Length
  - Bright. 422

Coarse Profile
- Regular Length
  - Bright. 420
  - TiCN 420
- Long Length
  - Bright. 421

Special Purpose Cutters
- Corner Rounding. 429

TABLE OF CONTENTS - REAMERS

Application Products

Carbide Reamer
- Machine Reamer, Unequal Spacing . . 436-439
- High Precision, Centesimal 440-441

Cobalt Reamer
- High Precision, Centesimal 442-444

General Purpose

High Speed Steel & Cobalt Reamers

Straight Shank
- Chucking, Straight Flute 445-448
- Chucking, Spiral Flute 450-452
- Chucking, Expansion 449
- Car 453

Taper Shank
- Chucking, Straight Flute 455
- Chucking, Spiral Flute 455,457-458
- Chucking, Expansion 456
- Bridge 459-460

Taper Pin, Right Hand Cut
- Straight Flute 465
- Spiral Flute, Left Hand 466
- High Spiral Flute, Left Hand 454
- Hand Reamer, Straight Flute 470

Adjustable Hand Reamer 463-464
Core Drill 461
Taper Pipe 467
Hand 462,468-469

TABLE OF CONTENTS - COUNTERSINKS & COUNTERBORES

COUNTERSINK

60°
Single Flute 477
3-Flute 478
3-Flute, Taper Shank 480
4-Flute 479

82°
Single Flute 477
3-Flute 481

90°
Single Flute 477,482
HSS 3-Flute 483-484,486
HSCO 3-Flute 485
Long Reach 3-Flute 487
Multi-Flute 488
Taper Shank 3-Flute 489-490
Set 3-Flute 491

100°
3-Flute 478,486

COUNTERBORE

Straight Shank, Interchangeable Pilot Type
Short 492

Aircraft Series
Short 493-494
Long 493-494

Taper Shank, Interchangeable Pilot Type
Short 495

Pilots, Detachable 496-497

TABLE OF CONTENTS - MISCELLANEOUS

MISCELLANEOUS

Screw Extractor 499

Drilling & Tapping Fluid 500

Drill Sleeves 501

Tool Bit Blanks 502

HYDRA DRILL



How to Use This Chart:

1) Determine your Workpiece Material from the Application Material Groups (AMG) below.
2) Use the icons to find Product Features.
3) Find the Surface Feet Per Minute (SFM) and Alpha Code.

example: 361 W

361 = SFM
W = Alpha Code used to find your Feed Rate (IPR)

4) To find Cutting Feed Rate, refer to chart below.

Fn	Ø						
	1/2"	19/32"	5/8"	3/4"	1"	1.3/16"	1.1/2"
S	0.004	0.005	0.005	0.006	0.007	0.007	0.009
T	0.005	0.006	0.007	0.007	0.008	0.009	0.010
U	0.008	0.009	0.009	0.009	0.011	0.012	0.014
V	0.011	0.012	0.013	0.013	0.016	0.017	0.020
W	0.015	0.016	0.017	0.018	0.019	0.019	0.020

Application Material Groups (AMG)			Hardness HRC
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB
	4.2 Titanium, alloyed	6AI4V, 6A14V-2Sn, Monel, Monel K	<28
	4.3 Titanium, alloyed	6AI4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38
6.Copper	6.1 Copper	Commercially Pure	<100 HB
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB
	6.4 High Strength Bronze	Ampco 18-25	<49
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---
	8.2 Thermosetting plastics	Bakelit, Pertinax	---
	8.3 Reinforced plastic materials	CFK, GFKAFK	---
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54
10.Graphite	10.1 Standard graphite		---

Visual Index - Drills

Head Style:	R950			R960			R970		
Head Range:	15/32" - 42.00	15/32" - 42.00	13.50 - 30.50	15/32" - 30.50	15/32" - 30.50	13.50 - 30.50	15/32 - 42.00	15/32 - 42.00	13.50 - 42.00
Body Style:	H853	H855	H858	H853	H855	H858	H853	H855	H858
Tool Material:	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
Standard:	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER	DORMER
Depth of Cut:	3XD	5XD	8XD	3XD	5XD	8XD	3XD	5XD	8XD
Finsh/Coating:									
Shank:	DIN 6535HB DIN 6535HE	DIN 6535HB DIN 6535HE	DIN 6535HE	DIN 6535HB DIN 6535HE	DIN 6535HB DIN 6535HE	DIN 6535HE	DIN 6535HB DIN 6535HE	DIN 6535HB DIN 6535HE	DIN 6535HE
Direction of Cut:									
Coolant:									
Range:	12.00 - 42.50	12.00 - 42.50	14.00 - 42.50	12.00 - 42.50	12.00 - 42.50	14.00 - 42.50	12.00 - 42.50	12.00 - 42.50	14.00 - 42.50

Page #	19,28	19,31	19,34	22,28	22,31	22,34	25,28	25,31	25,34	ISO
1.1				361W	361V	328U				P 1
1.2				328W	328V	295U				P 1
1.3	328W	328V	295U							P 2
1.4	279W	279V	246U							P 3
1.5	279W	279V	246U							P 4
1.6	197T	197T	197S							H 1
1.7										H 3
1.8										H 4
2.1				197V	164V	148U				M 1
2.2				164T	164S	131S				M 3
2.3				131T	131S	115S				M 2
2.4	115T	115T	98S							S 2
3.1				394V	374V	348U				K 1
3.2				380V	354V	328U				K 2
3.3	289V	279V	262U							K 3
3.4	289V	279V	262U							K 4
4.1				148T	148T	115S				S 1
4.2				115T	115T	98S				S 2
4.3				98S	98S	82S				S 3
5.1				115T	115T	98S				S 1
5.2				98S	98S	82S				S 2
5.3				82S	82S	66S				S 3
6.1										N 3
6.2										N 4
6.3										N 3
6.4										N 4
7.1										N 1
7.2										N 1
7.3										N 1
7.4										N 2
8.1										O
8.2										O
8.3										O
9.1										H
10.1										O

Visual Index - Drills

Feed Rate Chart - Drills

Alpha Code	Feed in Inches per Revolution (IPR) ± 25% — Ø Diameter															
	1mm/ 1/32"	2mm/ 3/32"	3mm/ 1/8"	4mm/ 5/32"	5mm/ 3/16"	6mm/ 1/4"	8mm/ 5/16"	10mm/ 3/8"	12mm/ 1/2"	15mm/ 9/16"	16mm/ 5/8"	20mm/ 3/4"	25mm/ 1"	30mm/ 1.1/8"	40mm/ 1.5/8"	50mm/ 2"
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090	
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100	
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140	
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200	
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200	
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228				
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291				
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472				

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Drills

Tool Material:	HM	HM	HM	HM	HM	HM	HM	HSS	HSS-E	HSS-E	HSS	HSS-E	HSS-E	HSS-E	HSS-E
Standard:	DIN 6539	DIN 6537 K	DIN 6537 K	DIN 338	DIN 6537 L	DIN 6537 L	DORMER	DIN 1897	DIN ANSI	DIN ANSI	DIN 338	DORMER	DIN ANSI	DIN ANSI	DIN ANSI
Depth of Cut:	2.5XD	3XD	3XD	4XD	5XD	5XD	8XD	2.5XD	3XD	3XD	4XD	5XD	6XD	6XD	10XD
Point Style:	130°	140°	140°	130°	140°	140°	140°	130°	130°	130°	130°	130°	130°	130°	130°
Finish/Coating:	TiN	TiAlN	TiAlN	TiN	TiAlN	TiAlN	TiAlN	TiN		Alcrona Top	TiN	TiAlN Top		Alcrona Top	
Shank:		DIN 6535HA	DIN 6535HA		DIN 6535HA	DIN 6535HA	DIN 6535HA					DIN 6535HA			
Flute Form:	N			N					W	W			W	W	W
Direction of Cut:															
Coolant Through:															
Style:	R520	R458	R457	R510	R454	R453	R459	A520	A920	A921	A510	A553	A900	A901	A940
Range:	3.00 - 16.50	3.00 - 20.00	3.00 - 20.00	3.00 - 14.25	3.00 - 20.00	3.00 - 20.00	3.00 - 16.00	3.00 - 13.00	1.00 - 20.00	2.50 - 16.00	3.00 - 14.00	5.00 - 20.00	1.00 - 20.00	1.50 - 16.00	1.00 - 20.00
Page #	38	40	40	44	46	46	50	53	56	56	60	63	65	65	68
1.1	328X	510W	510W	328W	510V	510V	443V	187M	131J	197M	187M	279L	125H	197J	125F
1.2	295X	440W	460W	295W	440V	460V	394V	154M	112J	171M	154M	230L	108H	164J	108F
1.3	295X	360W	440W	295W	360V	440V	361U	131K	105I	174J	131K	197L	85H	144I	72G
1.4	262X	330V	375V	262W	330V	375V	328U	105I	105I	174J	98H	148H	85H	144I	72G
1.5	180X	245V	295V	180V	245V	295V	262U	69G	75E	125G	69F	92F	69E	108G	56C
1.6	148W	164U	213U	148V	164U	213U	180T	36E	62E	98G	36D	49D	52E	85G	39C
1.7	115U	98U	98U	115T	98U	98U									
1.8	98T	82U	82U	98S	82U	82U									
2.1	164W	148U	246V	164V	148U	246V	246V	98I	49F	56F	92G	131G	49E	56E	49C
2.2		131T	115V		131T	115V	115V	52I	23F	30F	46I	62I	23E	30E	23E
2.3		115T	98U		115T	98U	98U	66G	30D	36D	62G	89G	30C	36C	30B
2.4		115T			115T										
3.1	295Y	295W	394W	295X	295W	394W	394W	157M	112L	174L	138K	230K	79J	190I	
3.2	295Y	295W	394W	295X	295W	394W	394W	121K	85L	138L	105J	164J	62J	154I	52I
3.3	213X	230V	262V	213W	230V	262V	262V	98J	85L	138L	92J	148J	62J	112J	52I
3.4	213X	230V	262V	213W	230V	262V	262V	85F	62J	118J	82F	138F	46I	92I	39H
4.1	197W	164U	180V	148V	164U	180V		112I	98G	157I	105G	148G	72E	115G	59E
4.2	148V	131U	148V		131U	148V		66G	59G	95I	66H	98E	49E	79G	43C
4.3	115U	115T	131U		115T	131U		13B	33C	52E	13B	26C	20C	33E	20C
5.1	164W			164V				56I	49I	79L	56I	82I	46G	72I	
5.2								36G	30G	46I	30E	49E	23G	36I	
5.3								23E	20E	33G	20E	33G	20C	33E	
6.1		328V	410W		328V	410W	410V	131E	213H		131D	230G	213G		213F
6.2		656V	722W		656V	722W	722V	164I	216J		164I	279I	174I		230F
6.3		656V	722W		656V	722W	722V	148K	131J	233J	148I	262I	112H	184I	112G
6.4		262U	328V		262U	328V	328U	66F	102G	164I	66F	115G	98G	157I	98G
7.1	738Z	738W	820W	738Y	738W	820W	935W	180I	246L		164G	230H	197J		174H
7.2	738Z	738W	820W	738Y	738W	820W	935W	164M	148N		164M	328M	148N		148N
7.3	492Y	590V	656V	492X	590V	656V	623V	121K	131N		102I	180I	131N		131N
7.4	213Y	394V	492V	213X	394V	492V	312V	115I	118J	157J	108I	180J	92I	157I	98G
8.1	246Z			246X				213G	180J		213G	295G	180I		180H
8.2	377V			377V				164G	131H		164G		131G		131F
8.3								115F			115F				
9.1															
10.1															

Visual Index - Drills

	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
	DIN ANSI	DIN 1869/1	DIN 1869/2	DIN 1869/3	ANSI	ANSI	ANSI	ANSI	DIN 338	DIN 338	DIN 338	DIN 338	DIN 338	ANSI	DIN 338	ANSI
	10XD	15XD	20XD	25XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD
	130°	130°	130°	130°	118°	118°	118°	118°	118°	118°	118°	118°	118°	118°	118°	135°
	Alcrona Top					ST	TIN	TIN		ST	ST	TIN	TIN		ST	Purple Bronze
	W	W	W	W			N	N	N	N	N	N	N		N	
	A941	A976	A977	A978	R10P R15P R18P	R10 R15 R18	A012	A012S	2A	2AB	A100	A002	A002S	L10	A101	HX10 HX15 HX18
	1.00 - 16.00	1.50 - 14.00	1.50 - 14.00	3.00 - 10.00	N97 - 11/16	N80 - 11/16	N80 - 3/4	1/16 - 1/2	0.15 - 15.00	1.00 - 17.50	0.20 - 20.00	1.00 - 16.00	2.00 - 13.00	1/32 - 1/2	1.00 - 12.00	1/16 - 1/2
	68	71	71	71	74	74	78	78	82	82	82	82	82	89	90	92
1.1	174G	102C	102B	102A	115H	115H	154J	154J	115H	115H	115H	154J	154J	115H	35H	115H
1.2	151G	85C	85B	85A	98H	98H	131J	131J	98H	98H	98H	131J	131J	98H	30H	69H
1.3	118G	72C	72B	72A	82F	82F	115F	115F	82F	82F	82F	115F	115F	82F	25F	75I
1.4	118G	72C	72B	72A	66F	66F	98F	98F	66F	66F	66F	98F	98F	66F	20F	69H
1.5	75D	39A	39A	39A	43E	43E	59F	59F	43E	43E	43E	59F	59F	43E	13E	56F
1.6	56D	33A	33A	33A	30D	30D	33E	33E	30D	30D	30D	33E	33E	30D	9D	
1.7																
1.8																
2.1	56C	39B	39B	39A	49E	49E	66F	66F	49E	49E	49E	66F	66F	49E	15E	105I
2.2	30E	23C	23B	23A	26G	26G	39G	39G	26G	26G	26G	39G	39G	26G	8G	59H
2.3	36B	26A	26A	26A	30C	30C	52C	52C	30C	30C	30C	52C	52C	30C	9C	56F
2.4																
3.1	118I				98H	98H	131J	131J	98H	98H	98H	131J	131J	98H	30H	171L
3.2	98I	75C	75B	75A	79F	79F	98E	98E	79F	79F	79F	98E	98E	79F	24F	89I
3.3	98I	52C	52B	52A	66E	66E	92E	92E	66E	66E	66E	92E	92E	66E	20E	95H
3.4	79H	36A	36A	36A	46E	46E	85E	85E	46E	46E	46E	85E	85E	46E	14E	59F
4.1	82F	49C	49B	49A	75E	75E	75F	75F	75E	75E	75E	75F	75F	75E	23E	95H
4.2	59D	36A	36A	36A	39D	39D	43D	43D	39D	39D	39D	43D	43D	39D	12D	75H
4.3	26D	16A	16A	16A	20B	20B	23B	23B	20B	20B	20B	23B	23B	20B	6B	
5.1					33G	33G	43G	43G	33G	33G	33G	43G	43G	33G	10G	59H
5.2					20E	20E	23E	23E	20E	20E	20E	23E	23E	20E	6E	
5.3					10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	3A	
6.1					108G	108G	164G	164G	108G	108G	108G	164G	164G	108G	33G	
6.2					115I	115I	108I	108I	115I	115I	115I	108I	108I	115I	35I	
6.3	157H	98D	98C	98B	89H	89H	128H	128H	89H	89H	89H	128H	128H	89H	27H	
6.4	138H	89D	89C	89B	52G	52G	98G	98G	52G	52G	52G	98G	98G	52G	16G	
7.1					108J	108J	134K	134K	108J	108J	108J	134K	134K	108J	33J	
7.2					98I	98I	125J	125J	98I	98I	98I	125J	125J	98I	30I	
7.3					89H	89H	108I	108I	89H	89H	89H	108I	108I	89H	27H	
7.4	138H	89D	89C	89B	79F	79F	108I	108I	79F	79F	79F	108I	108I	79F	24F	
8.1					98J	98J	98I	98I	98J	98J	98J	98I	98I	98J	30J	
8.2					92H	92H	164H	164H	92H	92H	92H	164H	164H	92H	28H	
8.3					46F	46F	115F	115F	46F	46F	46F	115F	115F	46F	14F	
9.1					10B	10B	10B	10B	10B	10B	10B	10B	10B	10B	3B	
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS
	ANSI	ANSI	ANSI	DIN 338	ANSI	ANSI	DIN 338	DIN 338	ANSI	DIN 338	NAS 907	ANSI	DIN ANSI	ANSI
	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	3XD	2.5XD	2.5XD	2.5XD
	118°	135°	118°	135°	135°	135°	135°	135°	135°	135°	135°	118°	135°	135°
	ST	ST		ST		TiN		TiN	Bronze	Bronze	Bronze		TiN	ST
			W	W						N			N	
	R10A R15A R18A	R10B R15B R18B	R10H R18H	A108	QC21P	QC21G	QC21PM	QC21GM	R10CO R15CO R18CO	2ACO	R88CO R89CO	R40 R41 R42	A022	R40C R41C R42C
	1/16 - 1/2	1/16 - 1/2	N80 - 1/2	1.00 - 16.00	1/16 - 11/16	1/16 - 1/2	1.50 - 17.50	1.50 - 13.00	N80 - 11/16	1.00 - 13.00	1/16 - 1/2	N60 - 2"	0.50 - 16.00	N60 - 1/2
	95	98	101	101	106	106	109	109	110	110	115	117	120	123
1.1	115J	115J	108I	115I	98F	115F	98F	115F	115J	115J	115J	115J	115K	115J
1.2	98H	98H	92I	98I	59F	69F	59F	69F	98H	98H	98H	98J	105K	98J
1.3	89G	89G		82G	66H	75H	66H	75H	89G	89G	89G	89G	82I	89G
1.4	79F	79F		66F	59F	69F	59F	69F	79F	79F	79F	69G	75H	69G
1.5	56E	56E		43E	46D	56D	46D	56D	56E	56E	56E	46F	52G	46F
1.6	33D	33D		30D					33D	33D	33D	33E	33E	33E
1.7														
1.8														
2.1	72E	72E		49E	89H	105H	89H	105H	72E	72E	72E	52F	49G	52F
2.2	36G	36G		30G	49F	59F	49F	59F	36G	36G	36G	30H	26I	30H
2.3	49C	49C		33D	49D	59D	49D	59D	49C	49C	49C	33D	30E	33D
2.4														
3.1	115H	115H	82F	98H	151H	171H	151H	171H	115H	115H	115H	105J	105K	105J
3.2	92D	92D	66D	79F	79H	89H	79H	89H	92D	92D	92D	89G	82I	89G
3.3	72E	72E	52C	66E	79F	95F	79F	95F	72E	72E	72E	66F	66G	66F
3.4	56E	56E	33C	46E		59D		59D	56E	56E	56E	52F	52G	52F
4.1	92F	92F	49C	82G	89H		89H		92F	92F	92F	89G	82I	89G
4.2	66D	66D		52E	49F		49F		66D	66D	66D	52E	46F	52E
4.3	36C	36C		23B					36C	36C	36C	26C	26C	26C
5.1	49G	49G	23E	39G	49F	59H	49F	59H	49G	49G	49G	43H	43H	43H
5.2	23E	23E		23G					23E	23E	23E	26F	26F	26F
5.3	20B	20B		20E					20B	20B	20B	13B	13B	13B
6.1	125H	125H	115H	108G	89I	98I	89I	98I	125H	125H	125H	118H	118H	118H
6.2	131F	131F	118G	115I	79H	89H	79H	89H	131F	131F	131F	125J	125K	125J
6.3	89H	89H		102H	79H	89H	79H	89H	89H	89H	89H	89I	89I	89I
6.4	69F	69F		52G					69F	69F	69F	52H	52I	52H
7.1	108J	108J	148J	108J	351H	400H	351H	400H	108J	108J	108J	108K	131F	108K
7.2	98I	98I	115J	98I	325H	351H	325H	351H	98I	98I	98I	98J	105K	98J
7.3	98H	98H	98G	89H					98H	98H	98H	98I	105J	98I
7.4	89F	89F	95G	79F	276H	315H	276H	315H	89F	89F	89F	82I	82J	82I
8.1			138J	98J								98K	98K	98K
8.2			131I	92H								115I	115I	115I
8.3			66G	46F								56G	56G	56G
9.1	20C	20C		10B					20C	20C	20C	13C	13C	13C
10.1														

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS	HSS
	ANSI	DIN 1897	ANSI	ANSI	DIN 1899	ANSI	DIN 1897	ANSI	DIN 340	ANSI	ANSI	ANSI	DIN 340	DIN 340	ANSI	ANSI	ANSI
	2.5XD	2.5XD	3XD	3XD	2.5XD	2.5XD	2.5XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD	6XD	12XD	15XD
	135°	135°	135°	135°	118°	135°	135°	118°	118°	118°	135°	135°	135°	135°	135°	118°	118°
	ST	ST		TiN		Bronze	Bronze					TiN		TiN	Bronze		
		N			N		N		N	W							
	A245	4ASM	QC41P	QC41G	A720	M40CO M41CO M42CO	4ASMCO	R51 R52 R55	5ATL	R51FS	QC91P	QC91G	QC91PM	QC91GM	M51CO M52CO	0860 1290	1511 1813
	N40 - 29/64	1.00 - 12.50	1/16 - 11/16	1/16 - 1/2	0.15 - 1.40	N60 - 3/4	2.30 - 12.00	N80 - 1.3/4	1.00 - 31.00	1/16 - 1/2	1/16 - 11/16	1/16 - 1/2	1.50 - 17.00	1.50 - 12.50	1/16 - 1"	1/8 - 3/4	3/16 - 1"
	123	126	128	128	130	131	134	135	139	141	142	142	144	144	145	147	149
1.1	115J	115J	98F	115F	115A	125K	125K	89G	89G		98F	115F	98F	115F	89G	79E	79E
1.2	98J	98J	59F	69F	98A	108H	108H	82G	82G		59F	69F	59F	69F	82G	72E	72E
1.3	89G	89G	66H	75H	89A	98G	98G	66E	66E		66H	75H	66H	75H	66E	52C	52C
1.4	69G	69G	59F	69F	75A	89G	89G	52E	52E		59F	69F	59F	69F	52E	49C	49C
1.5	46F	46F	46D	56D	56A	59F	59F	30D	30D		46D	56D	46D	56D	30D	20A	20A
1.6	33E	33E			33A	36E	36E	20B	20B						20B	16A	16A
1.7																	
1.8																	
2.1	52F	52F	89H	105H	72A	72F	72F	33D	33D		89H	105H	89H	105H	33D	30C	30C
2.2	30H	30H	49F	59F	33A	36H	36H	20F	20F		49F	59F	49F	59F	20F	13E	13E
2.3	33D	33D	49D	59D	49A	49D	49D	13B	13B		49D	59D	49D	59D	13B	26A	26A
2.4																	
3.1	105J	105J	151H	171H	98A	112K	112K	92H	92H		151H	171H	151H	171H	92H	72G	72G
3.2	89G	89G	79H	89H	79A	98F	98F	69E	69E		79H	89H	79H	89H	69E	59D	59D
3.3	66F	66F	79F	95F	66A	72F	72F	49D	49D		79F	95F	79F	95F	49D	43C	43C
3.4	52F	52F		59D	46A	56F	56F	43D	43D			59D		59D	43D	30C	30C
4.1	89G	89G	89H		75A	98G	98G	56E	56E		89H		89H		56E	36D	36D
4.2	52E	52E	49F		56A	59F	59F	30C	30C		49F		49F		30C	30B	30B
4.3	26C	26C			26A	33C	33C	13A	13A						13A	16A	16A
5.1	43H	43H	49F	59H	33A	49H	49H	26F	26F		49F	59H	49F	59H	26F	16E	16E
5.2	26F	26F			23A	30F	30F	13D	13D						13D	13C	13C
5.3	13B	13B			13A	20C	20C	10A	10A						10A	10A	10A
6.1	118H	118H	89I	98I	115A	125I	125I	98E	98E	89I	89I	98I	89I	98I	98E	79D	79D
6.2	125J	125J	79H	89H	131A	131K	131K	105H	105H		79H	89H	79H	89H	105H	108G	108G
6.3	89I	89I	79H	89H	115A	89J	89J	89G	89G		79H	89H	79H	89H	89G	72F	72F
6.4	52H	52H			89A	52I	52I	52E	52E						52E	52D	52D
7.1	108K	108K	351H		115A	115K	115K	105I	105I	348H	351H	400H	351H	400H	105I	79H	79H
7.2	98J	98J	325H		98A	108J	108J	89H	89H	325H	325H	351H	325H	351H	89H	72G	72G
7.3	98I	98I			89A	102I	102I	89G	89G						89G	72F	72F
7.4	82I	82I	276H		89A	98G	98G	82E	82E	276H	276H	315H	276H	315H	82E	66E	66E
8.1	98K	98K			157A	115M	115M	115I	115I						115I	98H	98H
8.2	115I	115I			82A	92K	92K	85G	85G						85G	85F	85F
8.3	56G	56G				56I	56I	39E	39E						39E	33D	33D
9.1	13C	13C				20C	20C	10A	10A						10A	10A	10A
10.1																	

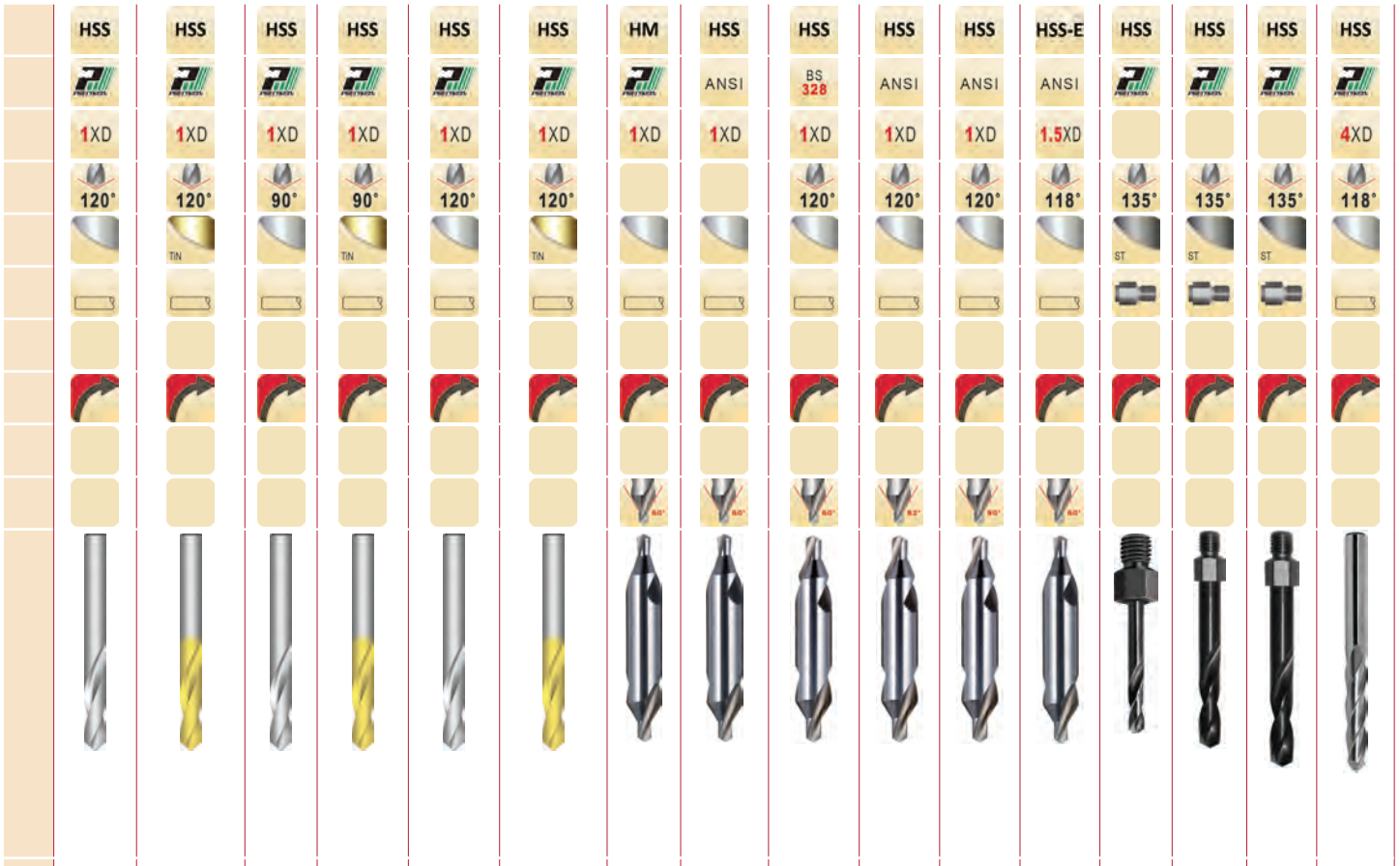
Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E
	BS 328	ANSI	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	NAS 907	ANSI	DIN 345	DIN 345	DIN 341	DIN 1870/1	DIN 1870/1	DIN 1870/2	ANSI
	10XD	10XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	4XD	6XD	10XD	15XD	20XD	4XD
	118°	135°	135°	118°	135°	135°	135°	135°	118°	118°	118°	118°	118°	130°	130°	135°
	ST				ST	ST	Bronze	Bronze	ST	ST	TiN	ST	ST	ST	ST	Bronze
	N		N	N						N	N	N	N	W	W	
	A125	QC0860P QC1290P	A243	A244	500-6 501-6 502-6	500-12 501-12 502-12	CO500-6 CO501-6	CO500-12 CO500-12	209 S209	5ATS	A530	A350	A345	A951	A952	209CO
	1.40 - 1“	1/8 - 1/2	3/32 - 1/4	1/8 - 1/4	N60 - 1/2	3/64 - 1/2	1/16 - 1/4	1/16 - 1/4	1/8 - 2“	5.00 - 50.00	8.50 - 40.00	5.00 - 50.00	8.00 - 50.00	10.00 - 30.00	8.00 - 40.00	1/4 - 1.1/2
	149	154	156	156	157	160	162	162	164	167	167	167	170	172	172	174
1.1	79E	98F							115I	115I	154I	89I	79G	89G	89G	115J
1.2	72E	59F							98I	98I	131I	82I	72G	72G	72G	98H
1.3	52C	66H	82F	82F	82F	82F			82F	82F	98F	66G	56E	62E	62E	89G
1.4	49C	59F	66F	66F	66F	66F			66F	66F	89F	52F	49D	49D	49D	75F
1.5	20A	46D	43E	43E	43E	43E			39E	39E	66E	33E	20C	26C	26C	56E
1.6	16A		30D	30D	30D	30D	20B	20B	30D	30D	33D	20D	16B	20B	20B	33D
1.7																
1.8																
2.1	30C	89H	49E	49E	49E	49E	95H	95H	49E	49E	79E	43E	39C	39C	39C	79E
2.2	13E	49F	26G	26G	26G	26G	56F	56F	30G	30G	43G	13G	13E	20E	20E	36G
2.3	26A	49D	30C	30C	30C	30C	56D	56D	33C	33C	66C	26C	26A	39A	39A	56C
2.4							30D	30D								
3.1	72G	151H	98I	98I	98I	98I	161H	161H	98I	98I	118I	85I	72G	72G	72G	115J
3.2	59D	79H	79F	79F	79F	79F	85H	85H	79E	79E	92E	66F	59D	52D	52D	92G
3.3	43C	79F	66E	66E	66E	66E	85F	85F	66E	66E	89E	59E	43C	43C	43C	72E
3.4	30C		46E	46E	46E	46E	56D	56D	46E	46E	72E	36E	30C	30C	30C	56E
4.1	36D		75F	75F	75F	75F			75F	75F	105F	52F	49D	59D	59D	92G
4.2	30B		39D	39D	39D	39D			43D	43D	59D	30D	30B	33B	33B	66D
4.3	16A		20B	20B	20B	20B	20D	20D	23B	23B	43B	16B	16A	20A	20A	36C
5.1	16E	49F	33G	33G	33G	33G			33G	33G	43G	26G	26E	23E	23E	49G
5.2	13C		20E	20E	20E	20E	20B	20B	23E	23E	20E	13E	13C	16C	16C	23E
5.3	10A		10A	10A	10A	10A	16B	16B	13A	13A	10A	10A	10A	10A	10A	20B
6.1	79D								108F	108F	197G	108F	89D	72D	72D	125L
6.2	108G	79H							115I	115I	180I	115I	108G	108G	108G	131J
6.3	72F	75H	89H	89H	89H	89H			115H	115H	131G	115H	89F	72F	72F	89H
6.4	52D		52G	52G	52G	52G			52F	52F	115E	52F	52D	52D	52D	69F
7.1	79H	348H							85J	85J	180I	108J	108H	98H	98H	108J
7.2	72G	325H							98I	98I	148I	82I	89G	89G	89G	98I
7.3	72F								92H	92H	115G	89H	89F	79F	79F	98H
7.4	66E	276H	79F	79F	79F	79F			75H	75H	92G	82H	79F	72F	72F	89F
8.1	98H	151D							98K	98K	164J	115L	98J	98J	98J	115K
8.2	85F	125D							92J	92J	164H	85J	98H	98H	98H	92J
8.3	33D								46H	46H	115F	39H	33F	33F	33F	66H
9.1	10A		10B	10B	10B	10B			10B	10B	10B	10B	10A	10A	10A	16C
10.1																

Visual Index - Drills

	HSS	HSS	HSS	HSS	HSS-E	HSS HM	HSS HM	HM	HM	HM	HSS	HSS	HSS	HSS	HSS	HSS
	DORMER	ANSI	ANSI	ANSI	ANSI		DIN 338										
	4XD	4XD	4XD	1.5XD	4XD	4XD	4XD	3XD	3XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD	1XD
	118°	118°	118°	118°	118°	118°	118°	118°	118°	90°	90°	90°	120°	120°	90°	90°
	ST	ST	ST	ST	ST Bronze		ST					TiN		TiN		TiN
	N						N										
	A170	R56	R57	R58	R56CO	D444	A160	D33F D33W D33L	D33M	DS-90 DS-120 DS-142	SPS-90	SPSG-90	SPS-120	SPSG-120	SPR-90	SPRG-90
	13.00 - 1.1/2	33/64 - 1.1/2	33/64 - 1.1/2	1" - 2"	33/64 - 1"	N32 - 1/2	4.00 - 16.00	N68 - 1/2	0.80 - 12.00	1/8 - 1/2	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"
	176	178	180	182	183	184	186	187	190	191	192	192	192	192	193	193
1.1	115H	115H	115H	98F	115H	197E	197E	279S	279S	279S	115E	115E	115E	115E	115E	115E
1.2	98H	98H	98H	59F	98H	197E	197E	246S	246S	246S	98E	98E	98E	98E	98E	98E
1.3	82F	82F	82F	66H	82F	180D	180D	246S	246S	246S	89C	89C	89C	89C	89C	89C
1.4	66E	66E	66E	59F	66E	164D	164D	230S	230S	230S	69C	69C	69C	69C	69C	69C
1.5	43D	43D	43D	46D	43D	131C	131C	148S	148S	148S	46C	46C	46C	46C	46C	46C
1.6	30C	30C	30C		30C	121A	121A	148S	148S	148S	33B	33B	33B	33B	33B	33B
1.7								98S	98S	98S						
1.8								98S	98S	98S						
2.1	49D	49D	49D	89H	49D	131B	131B	98S	98S	174S	52C	52C	52C	52C	52C	52C
2.2	23F	23F	23F	49F	23F	115C	115C			148S	30D	30D	30D	30D	30D	30D
2.3	23B	23B	23B	49D	23B	115A	115A				33B	33B	33B	33B	33B	33B
2.4																
3.1	89H	89H	89H	151H	89H	164C	164C	246T	246T	246T	105E	105E	105E	105E	105E	105E
3.2	72E	72E	72E	79H	72E	131A	131A	246T	246T	246T	89C	89C	89C	89C	89C	89C
3.3	62D	62D	62D	79F	62D	115A	115A	180T	180T	180T	66C	66C	66C	66C	66C	66C
3.4	39D	39D	39D		39D	98A	98A	180T	180T	180T	52B	52B	52B	52B	52B	52B
4.1	56E	56E	56E	89H	56E	115A	115A			148T	89C	89C	89C	89C	89C	89C
4.2	30C	30C	30C	49F	30C	115A	115A			115T	39B	39B	39B	39B	39B	39B
4.3	16A	16A	16A		16A	82A	82A			82S	23A	23A	23A	23A	23A	23A
5.1	26F	26F	26F	49F	26F	98A	98A			148T	43D	43D	43D	43D	43D	43D
5.2	13D	13D	13D	23F	13D	82A	82A			98S	26C	26C	26C	26C	26C	26C
5.3	10A	10A	10A	13B	10A	66A	66A			66S	13A	13A	13A	13A	13A	13A
6.1	115F	115F	115F	108F	115F	180D	180D			902V	89D	89D	89D	89D	89D	89D
6.2	108H	108H	108H	115H	108H	230G	230G	820V	820V	820V	108E	108E	108E	108E	108E	108E
6.3	89G	89G	89G	115H	89G	197C	197C	820V	820V	820V	89D	89D	89D	89D	89D	89D
6.4	52F	52F	52F	52F	52F	164C	164C			230T	52D	52D	52D	52D	52D	52D
7.1	108I	108I	108I	85I	108I	164I	164I	656V	656V	656V	108E	108E	108E	108E	108E	108E
7.2	98H	98H	98H	98H	98H	148H	148H	656V	656V	656V	98E	98E	98E	98E	98E	98E
7.3	89G	89G	89G	92H	89G	131G	131G	367V	367V	367V	98D	98D	98D	98D	98D	98D
7.4	72G	72G	72G	75H	72G	115F	115F	197V	197V	197V	82D	82D	82D	82D	82D	82D
8.1	98I	98I	98I	98I	98I			197X	197X	197X	98F	98F	98F	98F	98F	98F
8.2	92G	92G	92G	92I	92G	197E	197E	328V	328V	328V	115E	115E	115E	115E	115E	115E
8.3	46E	46E	46E	46H	46E						56D	56D	56D	56D	56D	56D
9.1	10A	10A	10A	10B	10A	30C	30C				39A	39A	39A	39A	39A	39A
10.1																

Visual Index - Drills



	SPR-120	SPRG-120	SPL-90	SPLG-90	SPL-120	SPLG-120	DC	76HA	A225	A217	A218	A221	TS41	TS10 TS18	TS51 TS52	ATR41
	1/4 - 1“	1/4 - 1/2	1/4 - 1“	1/4 - 1“	1/4 - 5/8	1/4 - 1/2	N0 - N6	N000 - N8	3/64 - 5/16	N1 - N8	N1 - N8	N00 - N8	N40 - N10	N40 - 1/4	N40 - 1/4	Size 1 - 4
	193	193	194	194	194	194	195	196	197	197	197	198	199	199	199	200
1.1	115E	115E	115E	115E	115E	115E	279S	115I	115I	115I	115I	115I	115J	115J	115J	
1.2	98E	98E	98E	98E	98E	98E	246S	98I	98I	98I	98I	98I	98J	98J	98J	
1.3	89C	89C	89C	89C	89C	89C	246S	82G	82G	82G	82G	82G	89G	89G	89G	82F
1.4	69C	69C	69C	69C	69C	69C	230S	66F	66F	66F	66F	66F	69G	69G	69G	66F
1.5	46C	46C	46C	46C	46C	46C	148S	43E	43E	43E	43E	43E	46F	46F	46F	43E
1.6	33B	33B	33B	33B	33B	33B	148S	30D	30D	30D	30D	30D	33E	33E	33E	30D
1.7							98S									
1.8							98S									
2.1	52C	52C	52C	52C	52C	52C		49E	49E	49E	49E	49E	52F	52F	52F	49E
2.2	30D	30D	30D	30D	30D	30D		26G	26G	26G	26G	26G	30H	30H	30H	26G
2.3	33B	33B	33B	33B	33B	33B		33C	33C	33C	33C	33C	33D	33D	33D	30C
2.4																
3.1	105E	105E	105E	105E	105E	105E	246T	98I	98I	98I	98I	98I	105J	105J	105J	98I
3.2	89C	89C	89C	89C	89C	89C	246T	79F	79F	79F	79F	79F	89G	89G	89G	79F
3.3	66C	66C	66C	66C	66C	66C	180T	66E	66E	66E	66E	66E	66F	66F	66F	66E
3.4	52B	52B	52B	52B	52B	52B	180T	46E	46E	46E	46E	46E	52F	52F	52F	46E
4.1	89C	89C	89C	89C	89C	89C		79F	79F	79F	79F	79F	89G	89G	89G	75F
4.2	39B	39B	39B	39B	39B	39B		43D	43D	43D	43D	43D	52E	52E	52E	39D
4.3	23A	23A	23A	23A	23A	23A		23B	23B	23B	23B	23B	26C	26C	26C	20B
5.1	43D	43D	43D	43D	43D	43D		33G	33G	33G	33G	33G	43H	43H	43H	33G
5.2	26C	26C	26C	26C	26C	26C		16E	16E	16E	16E	16E	26F	26F	26F	20E
5.3	13A	13A	13A	13A	13A	13A		13A	13A	13A	13A	13A	13B	13B	13B	10A
6.1	89D	89D	89D	89D	89D	89D		115G	115G	115G	115G	115G	118H	118H	118H	
6.2	108E	108E	108E	108E	108E	108E	820V	108I	108I	108I	108I	108I	125J	125J	125J	
6.3	89D	89D	89D	89D	89D	89D	820V	89H	89H	89H	89H	89H	89I	89I	89I	89H
6.4	52D	52D	52D	52D	52D	52D		52G	52G	52G	52G	52G	52H	52H	52H	52G
7.1	108E	108E	108E	108E	108E	108E	656V	108J	108J	108J	108J	108J	108K	108K	108K	
7.2	98E	98E	98E	98E	98E	98E	656V	98I	98I	98I	98I	98I	98J	98J	98J	
7.3	98D	98D	98D	98D	98D	98D	367V	89H	89H	89H	89H	89H	98I	98I	98I	
7.4	82D	82D	82D	82D	82D	82D	197V	72H	72H	72H	72H	72H	82I	82I	82I	79F
8.1	98F	98F	98F	98F	98F	98F	197X	98J	98J	98J	98J	98J	98K	98K	98K	
8.2	115E	115E	115E	115E	115E	115E	328V	92H	92H	92H	92H	92H	115I	115I	115I	
8.3	56D	56D	56D	56D	56D	56D		46F	46F	46F	46F	46F	56G	56G	56G	
9.1	39A	39A	39A	39A	39A	39A		10B	10B	10B	10B	10B	13C	13C	13C	10B
10.1																

List Number Index - Drills



Pgs. 8 - 219

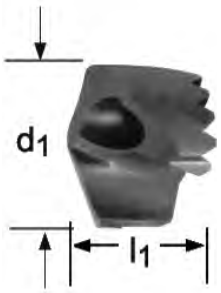
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209 164
1290 147
1511 149
1813 149
209CO 174
2A 82
2AB 82
2ACO 110
4ASM 126
4ASMCO 134
500-12 160
500-6 157
501-12 160
501-6 157
502-12 160
502-6 157
5ATL 139
5ATS 167
76HA 196
A002 82
A012 78
A022 120
A088 114
A094 206
A095 207
A097 202
A100 82
A101 90
A108 101
A125 149
A160 186
A170 176
A190 205
A191 205
A217 197
A218 197
A221 198
A225 197
A243 156
A244 156
A245 123
A287 209
A345 170
A350 167
A510 60
A520 53
A530 167
A553 63
A720 130
A900 65
A901 65
A920 56
A921 56
A940 68
A941 68
A951 172
A952 172
A976 71
A977 71
A978 71
ATR41 200
C114COMB 204
C114COMBC 212
C114COMBP 203
C115COMB 204
C115COMBC 212
C115COMBP 203
C13R10CO 211
C15L10 208
C15R10 201
C15R10CO 211
C15R10P 201
C20R18 202
C20R18P 202
C21R10CO 211
C252A 205
C252AB 205
C26M42CO 216
C26R15 203
C26R15CO 211
C26R15P 203
C26R42 213
C29HX10 210
C29L10 208
C29M40CO 216
C29R10 201
C29R10CO 211
C29R10P 201
C29R40 213
C29R40C 215
C29R51 217
C33R56 218
C502AB 205
C60M41CO 216
C60R18 202
C60R18CO 211
C60R18P 202
C60R41 213
C60R41C 215
C8R56 218
C8R56CO 218
C8R57 218
CO500-12 162
CO500-6 162
CO501-12 162
CO501-6 162
D33F 187
D33L 187
D33M 190
D33W 187
D444 184
DC 195
DS-90 191
DS-120 191
DS-142 191
H853 28
H855 31
H858 34
H860 37
H861 37
HX10 92
HX15 92
HX18 92
L10 89
M40CO 131
M41CO 131
M42CO 131
M51CO 145
M52CO 145
QC0860P 154
QC1290P 154
QC21G 106
QC21GM 109
QC21P 106
QC21PM 109
QC41G 128
QC41P 128
QC91G 142
QC91GM 144
QC91P 142
QC91PM 144
R10 74
R10A 95
R10B 98
R10CO 110
R10H 101
R10P 74
R15 74
R15A 95
R15B 98
R15CO 110
R15P 74
R18 74
R18A 95
R18B 98
R18CO 110
R18H 101
R18P 74
R40 117
R40C 123
R41 117
R41C 123
R42 117
R42C 123
R453 46
R454 46
R457 40
R458 40
R459 50
R51 135
R510 44
R51FS 141
R52 135
R520 38
R55 135
R56 178
R56CO 183
R57 180
R58 182
R88CO 115
R89CO 115
R950 19
R960 22
R970 25
S209 164
SPL-120 194
SPL-90 194
SPLG-120 194
SPLG-90 194
SPR-120 193
SPR-90 193
SPRG-120 193
SPRG-90 193
SPS-120 192
SPS-90 192
SPSG-120 192
SPSG-90 192
TS10 199
TS18 199
TS41 199
TS51 199
TS52 199

Hydra Drill Head

R950

1.3 **1.4** **1.5** **1.6** **2.4** **3.3** **3.4**

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity in a wide range of steels and harder materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R950

Ti-phon

HM

140°



15/32 - 42.00

* For more information on Hydra, see page 522

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
15/32	11.91	0.4688	9.1	1	0010860
	12.00	0.4724	9.1	1	0010877
	12.10	0.4764	9.1	1	0037904
	12.20	0.4803	9.1	1	0037911
31/64	12.30	0.4844	9.1	1	0010884
	12.50	0.4921	9.4	1	0010907
	12.60	0.4961	9.4	1	0037928
1/2	12.70	0.5000	9.4	1	0010914
	12.80	0.5039	9.4	1	0037935
	12.90	0.5079	9.4	1	0037942
	13.00	0.5118	9.7	1	0010921
33/64	13.10	0.5156	9.7	1	0010938
	13.20	0.5197	9.7	1	0037959
17/32	13.49	0.5313	9.7	1	0010945
	13.50	0.5315	10.3	1	0010952
	13.60	0.5354	10.3	1	0037966
	13.70	0.5394	10.3	1	0037973
	13.80	0.5433	10.3	1	0037980
35/64	13.89	0.5469	10.3	1	0010969
	14.00	0.5512	10.3	1	0010983
	14.10	0.5551	10.3	1	0037997
	14.20	0.5591	10.3	1	0038000
9/16	14.29	0.5625	10.3	1	0011003
	14.50	0.5709	10.3	1	0011010
	14.60	0.5748	11.0	1	0038017
37/64	14.68	0.5781	11.0	1	0011140
	14.70	0.5787	11.0	1	0038024
	14.80	0.5827	11.0	1	0038031
	15.00	0.5906	11.0	1	0011201
19/32	15.08	0.5938	11.0	1	0011218
	15.10	0.5945	11.0	1	0038048
	15.20	0.5984	11.0	1	0038055
	15.24	0.6000	11.0	1	0032268

HYDRA DRILL

DORMER

d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
39/64	15.48	0.6094	11.0	1	0011232
	15.50	0.6102	11.0	1	0011362
	15.60	0.6142	11.6	1	0038062
	15.70	0.6181	11.6	1	0038079
5/8	15.88	0.6250	11.6	1	0011379
	16.00	0.6299	11.6	1	0011386
	16.08	0.6331	11.6	1	0032275
	16.10	0.6339	11.6	1	0038086
	16.20	0.6378	11.6	1	0038093
41/64	16.27	0.6406	11.6	1	0011393
	16.30	0.6417	11.6	1	0032282
	16.50	0.6496	11.6	1	0011409
	16.60	0.6535	12.2	1	0038109
21/32	16.67	0.6563	12.2	1	0012161
	16.70	0.6575	12.2	1	0038116
	17.00	0.6693	12.2	1	0012185
43/64	17.07	0.6719	12.2	1	0012215
	17.10	0.6732	12.2	1	0038123
	17.20	0.6772	12.2	1	0038130
11/16	17.46	0.6875	12.2	1	0012239
	17.50	0.6890	12.2	1	0012253
	17.60	0.6929	12.9	1	0032299
	17.70	0.6969	12.9	1	0038147
45/64	17.86	0.7031	12.9	1	0012260
	18.00	0.7087	12.9	1	0012277
	18.10	0.7126	12.9	1	0038154
	18.20	0.7165	12.9	1	0038161
23/32	18.26	0.7188	12.9	1	0012284
	18.50	0.7283	12.9	1	0012307
	18.60	0.7323	13.5	1	0038178
47/64	18.65	0.7344	13.5	1	0012321
	18.70	0.7362	13.5	1	0038185
	18.90	0.7441	13.5	1	0038192
	19.00	0.7480	13.5	1	0012338
3/4	19.05	0.7500	13.5	1	0012345
	19.10	0.7520	13.5	1	0038208
	19.20	0.7559	13.5	1	0038215
	19.25	0.7579	13.5	1	0032305
	19.30	0.7598	13.5	1	0032312
	19.35	0.7618	13.5	1	0032329
49/64	19.45	0.7656	13.5	1	0012376
	19.50	0.7677	13.5	1	0012383
	19.60	0.7717	14.1	1	0038222
	19.70	0.7756	14.1	1	0038239
25/32	19.84	0.7813	14.1	1	0012406
	20.00	0.7874	14.1	1	0012413
51/64	20.24	0.7969	14.1	1	0012437
	20.50	0.8071	14.1	1	0012451
13/16	20.64	0.8125	14.8	1	0012468
	21.00	0.8268	14.8	1	0012475
53/64	21.03	0.8281	14.8	1	0012536
27/32	21.43	0.8438	14.8	1	0012550
	21.50	0.8465	14.8	1	0012574
55/64	21.83	0.8594	15.0	1	0012604
	22.00	0.8661	15.0	1	0012628
7/8	22.22	0.8750	15.0	1	0012635
	22.50	0.8858	15.0	1	0032336
57/64	22.62	0.8906	15.0	1	0012642
	22.70	0.8937	15.0	1	0038246
	23.00	0.9055	15.1	1	0012666
29/32	23.02	0.9063	15.1	1	0012673
59/64	23.42	0.9219	15.1	1	0012680
	23.50	0.9252	15.1	1	0038253
15/16	23.81	0.9375	15.4	1	0012703
	24.00	0.9449	15.4	1	0012727

HYDRA DRILL

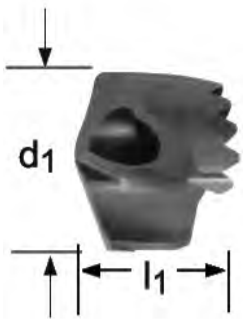
d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R950
61/64	24.21	0.9531	15.4	1	0012741
	24.50	0.9646	15.4	1	0038260
31/32	24.61	0.9688	15.4	1	0012772
	25.00	0.9844	15.8	1	0012819
63/64	25.00	0.9844	15.8	1	0012826
1“	25.40	1.0000	15.8	1	0012833
	25.50	1.0039	15.8	1	0038277
	25.65	1.0098	15.8	1	0032343
1.1/64	25.80	1.0156	15.8	1	0012840
	26.00	1.0236	16.4	1	0013090
1.1/32	26.19	1.0313	16.4	1	0013120
	26.50	1.0433	16.4	1	0038284
1.3/64	26.59	1.0469	16.4	1	0013229
1.1/16	26.99	1.0625	17.1	1	0013243
	27.00	1.0630	17.1	1	0013267
1.5/64	27.38	1.0781	17.1	1	0013274
	27.50	1.0827	17.1	1	0038291
1.3/32	27.78	1.0938	17.1	1	0013281
	28.00	1.1024	17.7	1	0013304
1.7/64	28.18	1.1094	17.7	1	0013311
	28.50	1.1220	17.7	1	0038307
1.1/8	28.58	1.1250	17.7	1	0013328
1.9/64	28.97	1.1406	18.3	1	0013342
	29.00	1.1417	18.3	1	0013366
1.5/32	29.37	1.1563	18.3	1	0013380
	29.50	1.1614	18.3	1	0038314
1.11/64	29.77	1.1719	18.3	1	0013427
	30.00	1.1811	19.0	1	0013434
1.3/16	30.16	1.1875	19.0	1	0013441
	30.50	1.2008	19.0	1	0013465
1.7/32	30.96	1.2188	21.0	1	46104481
	31.00	1.2205	21.0	1	46104482
1.1/4	31.75	1.2500	21.0	1	46104483
	32.00	1.2598	21.0	1	46104484
	32.50	1.2795	21.0	1	46104485
1.19/64	32.94	1.2969	21.0	1	46104486
	33.00	1.2992	21.0	1	46104487
	33.50	1.3189	21.0	1	46104488
	34.00	1.3386	23.0	1	46104489
1.11/32	34.13	1.3438	23.0	1	46104530
	34.50	1.3583	23.0	1	46104531
1.3/8	34.93	1.3750	23.0	1	46104532
	35.00	1.3780	23.0	1	46104533
	36.00	1.4173	23.0	1	46104534
1.27/64	36.12	1.4219	23.0	1	46104535
	36.50	1.4370	23.0	1	46104536
	37.00	1.4567	25.0	1	46104537
1.15/32	37.31	1.4688	25.0	1	46104538
	37.50	1.4764	25.0	1	46104539
	38.00	1.4961	25.0	1	46104540
1.1/2	38.10	1.5000	25.0	1	46104541
	38.50	1.5157	25.0	1	46104542
1.17/32	38.89	1.5313	25.0	1	46104543
	39.00	1.5354	25.0	1	46104544
	39.50	1.5551	25.0	1	46104545
1.9/16	39.69	1.5625	27.0	1	46104546
	40.00	1.5748	27.0	1	46104547
	41.00	1.6142	27.0	1	46104548
1.5/8	41.28	1.6250	27.0	1	46104549
	42.00	1.6535	27.0	1	46104550

Hydra Drill Head

R960

1.1 1.2 2.1 2.2 2.3 3.1 3.2 4.1 4.2 4.3 5.1 5.2 5.3

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. High productivity across a wide range of stainless steel, cast iron & heat resistant materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R960





HM





15/32 - 30.50

✱ For more information on Hydra, see page 522

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
15/32	11.91	0.4688	9.1	1	0013472
	12.00	0.4724	9.1	1	0013489
	12.10	0.4764	9.1	1	0038338
	12.20	0.4803	9.1	1	0038376
31/64	12.30	0.4844	9.1	1	0013496
	12.50	0.4921	9.4	1	0013519
	12.60	0.4961	9.4	1	0038413
1/2	12.70	0.5000	9.4	1	0013526
	12.80	0.5039	9.4	1	0038437
	12.90	0.5079	9.4	1	0038451
	13.00	0.5118	9.7	1	0013533
33/64	13.10	0.5156	9.7	1	0013540
	13.20	0.5197	9.7	1	0038468
17/32	13.49	0.5313	9.7	1	0013557
	13.50	0.5315	10.3	1	0016022
	13.60	0.5354	10.3	1	0038499
	13.70	0.5394	10.3	1	0038529
	13.80	0.5433	10.3	1	0038543
35/64	13.89	0.5469	10.3	1	0016039
	14.00	0.5512	10.3	1	0016046
	14.10	0.5551	10.3	1	0038567
	14.20	0.5591	10.3	1	0038574
9/16	14.29	0.5625	10.3	1	0016053
	14.50	0.5709	10.3	1	0016060
	14.60	0.5748	11.0	1	0038581
37/64	14.68	0.5781	11.0	1	0016077
	14.70	0.5787	11.0	1	0039601
	14.80	0.5827	11.0	1	0039618
	15.00	0.5906	11.0	1	0016084
19/32	15.08	0.5938	11.0	1	0016091
	15.10	0.5945	11.0	1	0039625
	15.20	0.5984	11.0	1	0039632
	15.24	0.6000	11.0	1	0032350

HYDRA DRILL

d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
39/64	15.48	0.6094	11.0	1	0016107
	15.50	0.6102	11.0	1	0016114
	15.60	0.6142	11.6	1	0039649
	15.70	0.6181	11.6	1	0039656
5/8	15.88	0.6250	11.6	1	0016121
	16.00	0.6299	11.6	1	0016138
	16.08	0.6331	11.6	1	0032367
	16.10	0.6339	11.6	1	0039663
	16.20	0.6378	11.6	1	0039670
41/64	16.27	0.6406	11.6	1	0016145
	16.30	0.6417	11.6	1	0032374
	16.50	0.6496	11.6	1	0016152
	16.60	0.6535	12.2	1	0039687
21/32	16.67	0.6563	12.2	1	0016169
	16.70	0.6575	12.2	1	0039694
	17.00	0.6693	12.2	1	0016176
43/64	17.07	0.6719	12.2	1	0016183
	17.10	0.6732	12.2	1	0039700
	17.20	0.6772	12.2	1	0039717
11/16	17.46	0.6875	12.2	1	0016190
	17.50	0.6890	12.2	1	0016503
	17.60	0.6929	12.9	1	0032381
	17.70	0.6969	12.9	1	0039724
45/64	17.86	0.7031	12.9	1	0016640
	18.00	0.7087	12.9	1	0016664
	18.10	0.7126	12.9	1	0039731
	18.20	0.7165	12.9	1	0039748
23/32	18.26	0.7188	12.9	1	0016671
	18.50	0.7283	12.9	1	0016688
	18.60	0.7323	13.5	1	0039755
47/64	18.65	0.7344	13.5	1	0016695
	18.70	0.7362	13.5	1	0039762
	18.90	0.7441	13.5	1	0039779
	19.00	0.7480	13.5	1	0016817
3/4	19.05	0.7500	13.5	1	0016879
	19.10	0.7520	13.5	1	0039786
	19.20	0.7559	13.5	1	0039793
	19.25	0.7579	13.5	1	0032398
	19.30	0.7598	13.5	1	0032404
	19.35	0.7618	13.5	1	0032411
49/64	19.45	0.7656	13.5	1	0016886
	19.50	0.7677	13.5	1	0016947
	19.60	0.7717	14.1	1	0039809
	19.70	0.7756	14.1	1	0039816
25/32	19.84	0.7813	14.1	1	0016954
	20.00	0.7874	14.1	1	0017111
51/64	20.24	0.7969	14.1	1	0017128
	20.50	0.8071	14.1	1	0017159
13/16	20.64	0.8125	14.8	1	0017197
	21.00	0.8268	14.8	1	0017166
53/64	21.03	0.8281	14.8	1	0017203
27/32	21.43	0.8438	14.8	1	0017227
	21.50	0.8465	14.8	1	0017234
55/64	21.83	0.8594	15.0	1	0017241
	22.00	0.8661	15.0	1	0017258
7/8	22.22	0.8750	15.0	1	0017371
	22.50	0.8858	15.0	1	0032428
57/64	22.62	0.8906	15.0	1	0017401
	22.70	0.8937	15.0	1	0039823
	23.00	0.9055	15.1	1	0017425
29/32	23.02	0.9063	15.1	1	0017432
59/64	23.42	0.9219	15.1	1	0017456
	23.50	0.9252	15.1	1	0039830
15/16	23.81	0.9375	15.4	1	0017562
	24.00	0.9449	15.4	1	0017579
61/64	24.21	0.9531	15.4	1	0017586

HYDRA DRILL

DORMER

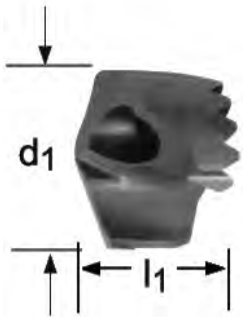
d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R960
	24.50	0.9646	15.4	1	0039847
31/32	24.61	0.9688	15.4	1	0017593
	25.00	0.9844	15.8	1	0017722
63/64	25.00	0.9844	15.8	1	0017746
1“	25.40	1.0000	15.8	1	0017753
	25.50	1.0039	15.8	1	0039854
	25.65	1.0098	15.8	1	0032435
1.1/64	25.80	1.0156	15.8	1	0018958
	26.00	1.0236	16.4	1	0018965
1.1/32	26.19	1.0312	16.4	1	0018972
	26.50	1.0433	16.4	1	0039878
1.3/64	26.59	1.0469	16.4	1	0018989
1.1/16	26.99	1.0625	17.1	1	0018996
	27.00	1.0630	17.1	1	0019009
1.5/64	27.38	1.0781	17.1	1	0019016
	27.50	1.0827	17.1	1	0039885
1.3/32	27.78	1.0938	17.1	1	0019023
	28.00	1.1024	17.7	1	0019030
1.7/64	28.18	1.1094	17.7	1	0019047
	28.50	1.1220	17.7	1	0039892
1.1/8	28.58	1.1250	17.7	1	0019054
1.9/64	28.97	1.1406	18.3	1	0019061
	29.00	1.1417	18.3	1	0019078
1.5/32	29.37	1.1563	18.3	1	0019085
	29.50	1.1614	18.3	1	0039908
1.11/64	29.77	1.1719	18.3	1	0019092
	30.00	1.1811	19.0	1	0019108
1.3/16	30.16	1.1875	19.0	1	0019115
	30.50	1.2008	19.0	1	0019122

Hydra Drill Head

R970

1.1 1.2 2.1 2.2 2.3 3.1 3.2 4.1 4.2 4.3 5.1 5.2 5.3

Replaceable heads in tough micro-grain carbide for quick and easy tool changes. Engineered for high productivity of cast iron materials. Superior hole accuracy and precise repeatable tolerances. Special Ti-phon coating for longer tool life.



R970

Ti-phon

HM

140°



15/32 - 30.50

✱ For more information on Hydra, see page 522

d_1 $\varnothing h_7$ Inch	d_1 $\varnothing h_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
15/32		0.4689	9.1	1	7332946
	12.0	0.4724	9.1	1	7332947
	12.1	0.4764	9.1	1	7332948
	12.2	0.4803	9.1	1	7332949
31/64		0.4844	9.1	1	7332980
	12.5	0.4921	9.4	1	7332981
	12.6	0.4961	9.4	1	7332982
1/2		0.5000	9.4	1	7332983
	12.8	0.5039	9.4	1	7332984
	12.9	0.5079	9.4	1	7332985
	13.0	0.5118	9.7	1	7332986
33/64		0.5156	9.7	1	7332987
	13.2	0.5197	9.7	1	7332988
17/32		0.5313	9.7	1	7332989
	13.5	0.5315	10.3	1	7332990
	13.6	0.5354	10.3	1	7332991
	13.7	0.5394	10.3	1	7332992
	13.8	0.5433	10.3	1	7332993
35/64		0.5469	10.3	1	7332994
	14.0	0.5512	10.3	1	7332995
	14.1	0.5551	10.3	1	7332996
	14.2	0.5591	10.3	1	7332997
9/16		0.5625	10.3	1	7332998
	14.5	0.5709	10.3	1	7332999
	14.6	0.5748	11.0	1	7333000
37/64		0.5781	11.0	1	7333001
	14.7	0.5787	11.0	1	7333002
	14.8	0.5827	11.0	1	7333003
	15.0	0.5906	11.0	1	7333004
19/32		0.5938	11.0	1	7333005
	15.1	0.5945	11.0	1	7333006
	15.2	0.5984	11.0	1	7333007

HYDRA DRILL

DORMER

d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
	15.24	0.6000	11.0	1	7333008
39/64		0.6094	11.0	1	7333009
	15.5	0.6102	11.6	1	7333010
	15.6	0.6142	11.6	1	7333011
	15.7	0.6181	11.6	1	7333012
5/8		0.6250	11.6	1	7333013
	16.0	0.6299	11.6	1	7333014
	16.08	0.6331	11.6	1	7333015
	16.1	0.6339	11.6	1	7333016
	16.2	0.6378	11.6	1	7333017
41/64		0.6406	11.6	1	7333018
	16.3	0.6417	11.6	1	7333019
	16.5	0.6496	11.6	1	7333020
	16.6	0.6535	12.2	1	7333021
21/32		0.6563	12.2	1	7333022
	16.7	0.6575	12.2	1	7333023
	17.0	0.6693	12.2	1	7333024
43/64		0.6719	12.2	1	7333025
	17.1	0.6732	12.2	1	7333026
	17.2	0.6772	12.2	1	7333027
11/16		0.6875	12.2	1	7333028
	17.5	0.6890	12.2	1	7333029
	17.6	0.6929	12.9	1	7333030
	17.7	0.6969	12.9	1	7333031
45/64		0.7031	12.9	1	7333032
	18.0	0.7087	12.9	1	7333033
	18.1	0.7126	12.9	1	7333034
	18.2	0.7165	12.9	1	7333035
23/32		0.7188	12.9	1	7333036
	18.5	0.7283	12.9	1	7333037
	18.6	0.7323	13.5	1	7333038
47/64		0.7344	13.5	1	7333039
	18.7	0.7362	13.5	1	7333040
	18.9	0.7441	13.5	1	7333041
	19.0	0.7480	13.5	1	7333042
3/4		0.7500	13.5	1	7333043
	19.1	0.7520	13.5	1	7333044
	19.2	0.7559	13.5	1	7333045
	19.25	0.7579	13.5	1	7333046
	19.3	0.7598	13.5	1	7333047
	19.35	0.7618	13.5	1	7333048
49/64		0.7656	13.5	1	7333049
	19.5	0.7677	13.5	1	7333050
	19.6	0.7717	14.1	1	7333051
	19.7	0.7756	14.1	1	7333052
25/32		0.7813	14.1	1	7333053
	20.0	0.7874	14.1	1	7333054
51/64		0.7969	14.1	1	7333055
	20.5	0.8071	14.1	1	7333056
13/16		0.8125	14.8	1	7333057
	21.0	0.8268	14.8	1	7333058
53/64		0.8281	14.8	1	7333059
27/32		0.8438	14.8	1	7333060
	21.5	0.8465	14.8	1	7333061
55/64		0.8594	15.0	1	7333062
	22.0	0.8661	15.0	1	7333063
7/8		0.8750	15.0	1	7333064
	22.5	0.8858	15.0	1	7333065
57/64		0.8906	15.0	1	7333066
	22.7	0.8937	15.0	1	7333067
	23.0	0.9055	15.1	1	7333068
29/32		0.9063	15.1	1	7333069
59/64		0.9219	15.1	1	7333070
	23.5	0.9252	15.1	1	7333071
15/16		0.9375	15.4	1	7333072
	24.0	0.9449	15.4	1	7333073

HYDRA DRILL

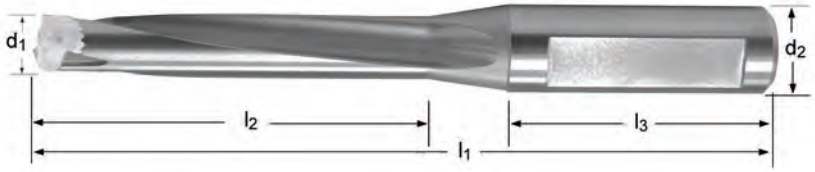
d_1 Øh$_7$ Inch	d_1 Øh$_7$ mm	d_1 decimal Inch	l_1 mm	Pack Qty	R970
61/64		0.9531	15.4	1	7333074
	24.5	0.9646	15.4	1	7333075
31/32		0.9688	15.4	1	7333076
	25.0	0.9843	15.8	1	7333077
63/64		0.9844	15.8	1	7333078
1		1.0000	15.8	1	7333079
	25.5	1.0039	15.8	1	7333080
	25.65	1.0098	15.8	1	7333081
1.1/64		1.0156	15.8	1	7333082
	26.0	1.0236	16.4	1	7333083
1.1/32		1.0313	16.4	1	7333084
	26.5	1.0433	16.4	1	7333085
1.3/64		1.0469	16.4	1	7333086
1.1/16		1.0625	17.1	1	7333087
	27.0	1.0630	17.1	1	7333088
1.5/64		1.0781	17.1	1	7333089
	27.5	1.0827	17.1	1	7333090
1.3/32		1.0938	17.1	1	7333091
	28.0	1.1024	17.7	1	7333092
1.7/64		1.1094	17.7	1	7333093
	28.5	1.1220	17.7	1	7333094
1.1/8		1.1250	17.7	1	7333095
1.9/64		1.1406	18.3	1	7333096
	29.0	1.1417	18.3	1	7333097
1.5/32		1.1563	18.3	1	7333098
	29.5	1.1614	18.3	1	7333099
1.11/64		1.1719	18.3	1	7333100
	30.0	1.1811	19.0	1	7333101
1.3/16		1.1875	19.0	1	7333102
	30.5	1.2008	19.0	1	7333103
1.7/32		1.2188	21.0	1	7333104
	31.0	1.2205	21.0	1	7333105
1.1/4		1.2500	21.0	1	7333106
	32.0	1.2598	21.0	1	7333107
	32.5	1.2795	21.0	1	7333108
1.19/64		1.2968	21.0	1	7333109
	33.0	1.2992	21.0	1	7333110
	33.5	1.3189	21.0	1	7333111
	34.0	1.3386	23.0	1	7333112
1.11/32		1.3438	23.0	1	7333113
	34.5	1.3583	23.0	1	7333114
1.3/8		1.3750	23.0	1	7333115
	35.0	1.3780	23.0	1	7333116
	36.0	1.4173	23.0	1	7333117
1.27/64		1.4219	23.0	1	7333118
	36.5	1.4370	23.0	1	7333119
	37.0	1.4567	25.0	1	7333120
1.15/32		1.4688	25.0	1	7333121
	37.5	1.4764	25.0	1	7333122
	38.0	1.4961	25.0	1	7333123
1.1/2		1.5000	25.0	1	7333124
	38.5	1.5157	25.0	1	7333125
1.17/32		1.5313	25.0	1	7333126
	39.0	1.5354	25.0	1	7333127
	39.5	1.5551	25.0	1	7333128
1.9/16		1.5625	27.0	1	7333129
	40.0	1.5748	27.0	1	7333130
	41.0	1.6142	27.0	1	7333131
1.5/8		1.6250	27.0	1	7333132
	42.0	1.6535	27.0	1	7333133

DORMER

3xD Hydra Bodies

H853

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

* For more information on Hydra, see page 522

H853
Coolant Through

DIN 6535HB
DIN 6535HE

3XD

HSS

140°



12.00 - 42.50

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 $Øh_6$ inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 $Øh_6$ mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15/32	0010860	0013472	7332946	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.0	0010877	0013489	7332947	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.1	0037904	0038338	7332948	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.2	0037911	0038376	7332949	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
31/64	0010884	0013496	7332980	5/8	44.0	105.0	48.0	0033043	16.0	44.0	105.0	48.0	0017777
12.5	0010907	0013519	7332981	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.6	0037928	0038413	7332982	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
1/2	0010914	0013526	7332983	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.8	0037935	0038437	7332984	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
12.9	0037942	0038451	7332985	5/8	44.0	105.0	48.0	0033050	16.0	44.0	105.0	48.0	0017791
13.0	0010921	0013533	7332986	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
33/64	0010938	0013540	7332987	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
13.2	0037959	0038468	7332988	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
17/32	0010945	0013557	7332989	5/8	47.0	110.0	48.0	0033067	16.0	47.0	110.0	48.0	0017906
13.5	0010952	0016022	7332990	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.6	0037966	0038499	7332991	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.7	0037973	0038529	7332992	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
13.8	0037980	0038543	7332993	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
35/64	0010969	0016039	7332994	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.0	0010983	0016046	7332995	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.1	0037997	0038567	7332996	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.2	0038000	0038574	7332997	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
9/16	0011003	0016053	7332998	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.5	0011010	0016060	7332999	3/4	52.5	116.5	48.0	0033074	16.0	52.5	116.5	48.0	0017913
14.6	0038017	0038581	7333000	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
37/64	0011140	0016077	7333001	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
14.7	0038024	0039601	7333002	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
14.8	0038031	0039618	7333003	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.0	0011201	0016084	7333004	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
19/32	0011218	0016091	7333005	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.1	0038048	0039625	7333006	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.2	0038055	0039632	7333007	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.24	0032268	0032350	7333008	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
39/64	0011232	0016107	7333009	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293
15.5	0011362	0016114	7333010	3/4	55.5	126.5	50.0	0033081	20.0	55.5	126.5	50.0	0018293

HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15.6	0038062	0039649	7333011	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
15.7	0038079	0039656	7333012	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
5/8	0011379	0016121	7333013	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.0	0011386	0016138	7333014	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.08	0032275	0032367	7333015	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.1	0038086	0039663	7333016	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.2	0038093	0039670	7333017	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
41/64	0011393	0016145	7333018	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.3	0032282	0032374	7333019	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.5	0011409	0016152	7333020	3/4	59.5	131.5	50.0	0033098	20.0	59.5	131.5	50.0	0018316
16.6	0038109	0039687	7333021	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
21/32	0012161	0016169	7333022	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
16.7	0038116	0039694	7333023	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.0	0012185	0016176	7333024	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
43/64	0012215	0016183	7333025	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.1	0038123	0039700	7333026	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.2	0038130	0039717	7333027	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
11/16	0012239	0016190	7333028	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.5	0012253	0016503	7333029	3/4	62.5	136.5	50.0	0033104	20.0	62.5	136.5	50.0	0018323
17.6	0032299	0032381	7333030	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
17.7	0038147	0039724	7333031	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
45/64	0012260	0016640	7333032	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.0	0012277	0016664	7333033	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.1	0038154	0039731	7333034	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.2	0038161	0039748	7333035	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
23/32	0012284	0016671	7333036	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.5	0012307	0016688	7333037	3/4	66.5	141.5	50.0	0033111	20.0	66.5	141.5	50.0	0018330
18.6	0038178	0039755	7333038	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
47/64	0012321	0016695	7333039	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
18.7	0038185	0039762	7333040	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
18.9	0038192	0039779	7333041	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.0	0012338	0016817	7333042	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
3/4	0012345	0016879	7333043	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.1	0038208	0039786	7333044	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.2	0038215	0039793	7333045	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.25	0032305	0032398	7333046	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.3	0032312	0032404	7333047	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.35	0032329	0032411	7333048	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
49/64	0012376	0016886	7333049	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.5	0012383	0016947	7333050	1	69.5	156.5	56.0	0033128	25.0	69.5	156.5	56.0	0018347
19.6	0038222	0039809	7333051	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
19.7	0038239	0039816	7333052	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
25/32	0012406	0016954	7333053	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
20.0	0012413	0017111	7333054	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
51/64	0012437	0017128	7333055	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
20.5	0012451	0017159	7333056	1	73.5	156.5	56.0	0033135	25.0	73.5	156.5	56.0	0018354
13/16	0012468	0017197	7333057	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
21.0	0012475	0017166	7333058	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
53/64	0012536	0017203	7333059	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
27/32	0012550	0017227	7333060	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
21.5	0012574	0017234	7333061	1	76.5	156.5	56.0	0033142	25.0	76.5	156.5	56.0	0018361
55/64	0012604	0017241	7333062	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.0	0012628	0017258	7333063	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
7/8	0012635	0017371	7333064	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.5	0032336	0032428	7333065	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
57/64	0012642	0017401	7333066	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
22.7	0038246	0039823	7333067	1	80.1	161.5	56.0	0033159	25.0	80.1	161.5	56.0	0018378
23.0	0012666	0017425	7333068	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
29/32	0012673	0017432	7333069	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
59/64	0012680	0017456	7333070	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385
23.5	0038253	0039830	7333071	1	82.5	160.5	56.0	0033166	25.0	82.5	160.5	56.0	0018385

HYDRA DRILL

DORMER

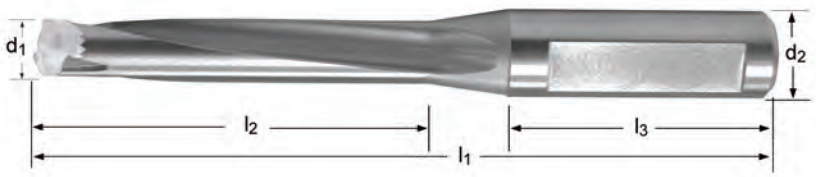
Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	3xD Hydra Body - Fractional Shank					3xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ inch	l_2 mm	l_1 mm	l_3 mm	H853 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H853 EDP#
15/16	0012703	0017562	7333072	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
24.0	0012727	0017579	7333073	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
61/64	0012741	0017586	7333074	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
24.5	0038260	0039847	7333075	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
31/32	0012772	0017593	7333076	1	86.2	170.2	60.0	0033173	32.0	86.2	170.2	60.0	0018392
25.0	0012819	0017722	7333077	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
63/64	0012826	0017746	7333078	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
1	0012833	0017753	7333079	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
25.5	0038277	0039854	7333080	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
25.65	0032343	0032435	7333081	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
1.1/64	0012840	0018958	7333082	1.1/4	88.0	170.0	60.0	0033180	32.0	88.0	170.0	60.0	0018408
26.0	0013090	0018965	7333083	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.1/32	0013120	0018972	7333084	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
26.5	0038284	0039878	7333085	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.3/64	0013229	0018989	7333086	1.1/4	92.0	175.0	60.0	0033197	32.0	92.0	175.0	60.0	0018415
1.1/16	0013243	0018996	7333087	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
27.0	0013267	0019009	7333088	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
1.5/64	0013274	0019016	7333089	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
27.5	0038291	0039885	7333090	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
1.3/32	0013281	0019023	7333091	1.1/4	94.0	175.0	60.0	0033210	32.0	94.0	175.0	60.0	0018422
28.0	0013304	0019030	7333092	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.7/64	0013311	0019047	7333093	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
28.5	0038307	0039892	7333094	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.1/8	0013328	0019054	7333095	1.1/4	97.0	180.0	60.0	0033227	32.0	97.0	180.0	60.0	0018439
1.9/64	0013342	0019061	7333096	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
29.0	0013366	0019078	7333097	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
1.5/32	0013380	0019085	7333098	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
29.5	0038314	0039908	7333099	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
1.11/64	0013427	0019092	7333100	1.1/4	100.0	185.0	60.0	0033234	32.0	100.0	185.0	60.0	0018446
30.0	0013434	0019108	7333101	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
1.3/16	0013441	0019115	7333102	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
30.5	0013465	0019122	7333103	1.1/4	104.0	185.0	60.0	0033425	32.0	104.0	185.0	60.0	0018453
1.7/32	46104481	—	7333104	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
31.00	46104482	—	7333105	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
1.1/4	46104483	—	7333106	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
32.00	46104484	—	7333107	—	—	—	—	—	32.0	111.5	196.5	60.0	46111405
32.50	46104485	—	7333108	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
1.19/64	46104486	—	7333109	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
33.00	46104487	—	7333110	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
33.50	46104488	—	7333111	—	—	—	—	—	32.0	116.5	201.5	60.0	46111406
34.00	46104489	—	7333112	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
1.11/32	46104530	—	7333113	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
34.50	46104531	—	7333114	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
1.3/8	46104532	—	7333115	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
35.00	46104533	—	7333116	—	—	—	—	—	40.0	121.5	216.5	70.0	46111407
36.00	46104534	—	7333117	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
1.27/64	46104535	—	7333118	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
36.50	46104536	—	7333119	—	—	—	—	—	40.0	125.5	221.5	70.0	46111408
37.00	46104537	—	7333120	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
1.15/32	46104538	—	7333121	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
37.50	46104539	—	7333122	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
38.00	46104540	—	7333123	—	—	—	—	—	40.0	131.5	226.5	70.0	46111409
1.1/2	46104541	—	7333124	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
38.50	46104542	—	7333125	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
1.17/32	46104543	—	7333126	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
39.00	46104544	—	7333127	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
39.50	46104545	—	7333128	—	—	—	—	—	40.0	136.5	231.5	70.0	46111410
1.9/16	46104546	—	7333129	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
40.00	46104547	—	7333130	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
41.00	46104548	—	7333131	—	—	—	—	—	40.0	146.5	246.5	70.0	46111411
1.5/8	46104549	—	7333132	—	—	—	—	—	40.0	151.5	251.5	70.0	46111412
42.00	46104550	—	7333133	—	—	—	—	—	40.0	151.5	251.5	70.0	46111412

HYDRA DRILL

5xD Hydra Bodies

H855

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

* For more information on Hydra, see page 522

H855 Coolant Through

DIN 6535HB
DIN 6535HE

5XD

HSS

140°



12.00 - 42.50

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
15/32	0010860	0013472	7332946	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.0	0010877	0013489	7332947	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.1	0037904	0038338	7332948	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.2	0037911	0038376	7332949	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
31/64	0010884	0013496	7332980	5/8	69.0	130.0	48.0	0033586	16.0	69.0	130.0	48.0	0018460
12.5	0010907	0013519	7332981	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.6	0037928	0038413	7332982	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
1/2	0010914	0013526	7332983	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.8	0037935	0038437	7332984	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
12.9	0037942	0038451	7332985	5/8	69.0	130.0	48.0	0034095	16.0	69.0	130.0	48.0	0018477
13.0	0010921	0013533	7332986	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
33/64	0010938	0013540	7332987	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
13.2	0037959	0038468	7332988	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
17/32	0010945	0013557	7332989	5/8	74.0	140.0	48.0	0034132	16.0	74.0	140.0	48.0	0018484
13.5	0010952	0016022	7332990	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.6	0037966	0038499	7332991	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.7	0037973	0038529	7332992	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
13.8	0037980	0038543	7332993	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
35/64	0010969	0016039	7332994	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.0	0010983	0016046	7332995	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.1	0037997	0038567	7332996	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.2	0038000	0038574	7332997	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
9/16	0011003	0016053	7332998	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.5	0011010	0016060	7332999	3/4	81.5	146.5	48.0	0034699	16.0	81.5	146.5	48.0	0018491
14.6	0038017	0038581	7333000	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
37/64	0011140	0016077	7333001	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
14.7	0038024	0039601	7333002	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
14.8	0038031	0039618	7333003	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.0	0011201	0016084	7333004	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
19/32	0011218	0016091	7333005	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507

HYDRA DRILL

DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
15.1	0038048	0039625	7333006	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.2	0038055	0039632	7333007	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.24	0032268	0032350	7333008	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
39/64	0011232	0016107	7333009	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.5	0011362	0016114	7333010	3/4	86.5	156.5	50.0	0034705	20.0	86.5	156.5	50.0	0018507
15.6	0038062	0039649	7333011	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
15.7	0038079	0039656	7333012	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
5/8	0011379	0016121	7333013	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.0	0011386	0016138	7333014	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.08	0032275	0032367	7333015	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.1	0038086	0039663	7333016	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.2	0038093	0039670	7333017	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
41/64	0011393	0016145	7333018	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.3	0032282	0032374	7333019	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.5	0011409	0016152	7333020	3/4	92.5	166.5	50.0	0034712	20.0	92.5	166.5	50.0	0018514
16.6	0038109	0039687	7333021	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
21/32	0012161	0016169	7333022	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
16.7	0038116	0039694	7333023	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.0	0012185	0016176	7333024	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
43/64	0012215	0016183	7333025	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.1	0038123	0039700	7333026	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.2	0038130	0039717	7333027	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
11/16	0012239	0016190	7333028	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.5	0012253	0016503	7333029	3/4	97.5	171.5	50.0	0034736	20.0	97.5	171.5	50.0	0018521
17.6	0032299	0032381	7333030	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
17.7	0038147	0039724	7333031	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
45/64	0012260	0016640	7333032	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.0	0012277	0016664	7333033	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.1	0038154	0039731	7333034	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.2	0038161	0039748	7333035	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
23/32	0012284	0016671	7333036	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.5	0012307	0016688	7333037	3/4	103.5	176.5	50.0	0034743	20.0	103.5	176.5	50.0	0018538
18.6	0038178	0039755	7333038	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
47/64	0012321	0016695	7333039	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
18.7	0038185	0039762	7333040	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
18.9	0038192	0039779	7333041	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.0	0012338	0016817	7333042	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
3/4	0012345	0016879	7333043	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.1	0038208	0039786	7333044	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.2	0038215	0039793	7333045	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.25	0032305	0032398	7333046	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.3	0032312	0032404	7333047	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.35	0032329	0032411	7333048	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
49/64	0012376	0016886	7333049	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.5	0012383	0016947	7333050	1	108.5	191.5	56.0	0034798	25.0	108.5	191.5	56.0	0018545
19.6	0038222	0039809	7333051	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
19.7	0038239	0039816	7333052	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
25/32	0012406	0016954	7333053	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
20.0	0012413	0017111	7333054	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
51/64	0012437	0017128	7333055	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
20.5	0012451	0017159	7333056	1	114.5	196.5	56.0	0034804	25.0	114.5	196.5	56.0	0018552
13/16	0012468	0017197	7333057	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
21.0	0012475	0017166	7333058	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
53/64	0012536	0017203	7333059	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
27/32	0012550	0017227	7333060	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
21.5	0012574	0017234	7333061	1	119.5	196.5	56.0	0034811	25.0	119.5	196.5	56.0	0018569
55/64	0012604	0017241	7333062	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.0	0012628	0017258	7333063	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
7/8	0012635	0017371	7333064	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.5	0032336	0032428	7333065	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
57/64	0012642	0017401	7333066	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
22.7	0038246	0039823	7333067	1	125.1	201.1	56.0	0034835	25.0	125.1	201.1	56.0	0018576
23.0	0012666	0017425	7333068	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
29/32	0012673	0017432	7333069	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583

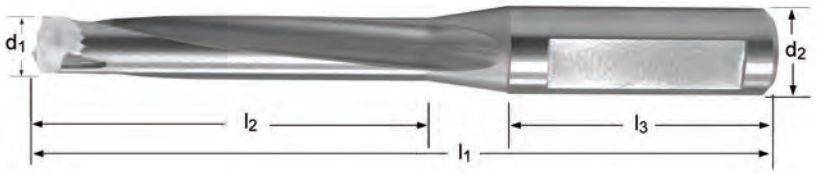
HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	5xD Hydra Body - Fractional Shank					5xD Hydra Body - Metric Shank				
				d_2 Øh_6 inch	l_2 mm	l_1 mm	l_3 mm	H855 EDP#	d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H855 EDP#
59/64	0012680	0017456	7333070	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
23.5	0038253	0039830	7333071	1	129.5	210.5	56.0	0034842	25.0	129.5	210.5	56.0	0018583
15/16	0012703	0017562	7333072	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
24.0	0012727	0017579	7333073	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
61/64	0012741	0017586	7333074	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
24.5	0038260	0039847	7333075	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
31/32	0012772	0017593	7333076	1	135.2	220.2	60.0	0034859	32.0	135.2	220.2	60.0	0018590
25.0	0012819	0017722	7333077	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
63/64	0012826	0017746	7333078	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
1	0012833	0017753	7333079	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
25.5	0038277	0039854	7333080	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
25.65	0032343	0032435	7333081	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
1.1/64	0012840	0018958	7333082	1.1/4	140.0	225.0	60.0	0034866	32.0	140.0	225.0	60.0	0018606
26.0	0013090	0018965	7333083	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.1/32	0013120	0018972	7333084	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
26.5	0038284	0039878	7333085	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.3/64	0013229	0018989	7333086	1.1/4	146.0	230.0	60.0	0034873	32.0	146.0	230.0	60.0	0018613
1.1/16	0013243	0018996	7333087	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
27.0	0013267	0019009	7333088	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
1.5/64	0013274	0019016	7333089	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
27.5	0038291	0039885	7333090	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
1.3/32	0013281	0019023	7333091	1.1/4	151.0	235.0	60.0	0034897	32.0	151.0	235.0	60.0	0018620
28.0	0013304	0019030	7333092	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.7/64	0013311	0019047	7333093	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
28.5	0038307	0039892	7333094	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.1/8	0013328	0019054	7333095	1.1/4	157.0	240.0	60.0	0034903	32.0	157.0	240.0	60.0	0018637
1.9/64	0013342	0019061	7333096	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
29.0	0013366	0019078	7333097	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
1.5/32	0013380	0019085	7333098	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
29.5	0038314	0039908	7333099	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
1.11/64	0013427	0019092	7333100	1.1/4	162.0	245.0	60.0	0034934	32.0	162.0	245.0	60.0	0018644
30.0	0013434	0019108	7333101	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
1.3/16	0013441	0019115	7333102	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
30.5	0013465	0019122	7333103	1.1/4	167.0	255.0	60.0	0034965	32.0	167.0	255.0	60.0	0018651
1.7/32	46104481	—	7333104	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
31.00	46104482	—	7333105	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
1.1/4	46104483	—	7333106	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
32.00	46104484	—	7333107	—	—	—	—	—	32.0	176.5	261.5	60.0	46111413
32.50	46104485	—	7333108	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
1.19/64	46104486	—	7333109	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
33.00	46104487	—	7333110	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
33.50	46104488	—	7333111	—	—	—	—	—	32.0	186.5	271.5	60.0	46111414
34.00	46104489	—	7333112	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
1.11/32	46104530	—	7333113	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
34.50	46104531	—	7333114	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
1.3/8	46104532	—	7333115	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
35.00	46104533	—	7333116	—	—	—	—	—	40.0	196.5	291.5	70.0	46111415
36.00	46104534	—	7333117	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
1.27/64	46104535	—	7333118	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
36.50	46104536	—	7333119	—	—	—	—	—	40.0	201.5	296.5	70.0	46111416
37.00	46104537	—	7333120	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
1.15/32	46104538	—	7333121	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
37.50	46104539	—	7333122	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
38.00	46104540	—	7333123	—	—	—	—	—	40.0	211.5	306.5	70.0	46111417
1.1/2	46104541	—	7333124	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
38.50	46104542	—	7333125	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
1.17/32	46104543	—	7333126	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
39.00	46104544	—	7333127	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
39.50	46104545	—	7333128	—	—	—	—	—	40.0	211.5	316.5	70.0	46111418
1.9/16	46104546	—	7333129	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
40.00	46104547	—	7333130	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
41.00	46104548	—	7333131	—	—	—	—	—	40.0	226.5	325.5	70.0	46111419
1.5/8	46104549	—	7333132	—	—	—	—	—	40.0	236.5	336.5	70.0	46111420
42.00	46104550	—	7333133	—	—	—	—	—	40.0	236.5	336.5	70.0	46111420

8xD Hydra Bodies

H858

Cylindrical shank with flat for multi-purpose tool holding. Allows accurate clamping for reliable use of internal coolant.



Four (4) screws and one (1) screwdriver are included with a drill body

H858 Coolant Through

DIN 6535HB
DIN 6535HE

8XD

HSS

140°



13.50 - 42.00

* For more information on Hydra, see page 522

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank				
				d_2 Øh$_6$ mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
13.5	0010952	0016022	7332990	16.0	124.5	191.5	48.0	0018668
13.6	0037966	0038499	7332991	16.0	124.5	191.5	48.0	0018668
13.7	0037973	0038529	7332992	16.0	124.5	191.5	48.0	0018668
13.8	0037980	0038543	7332993	16.0	124.5	191.5	48.0	0018668
35/64	0010969	0016039	7332994	16.0	124.5	191.5	48.0	0018668
14.0	0010983	0016046	7332995	16.0	124.5	191.5	48.0	0018668
14.1	0037997	0038567	7332996	16.0	124.5	191.5	48.0	0018668
14.2	0038000	0038574	7332997	16.0	124.5	191.5	48.0	0018668
9/16	0011003	0016053	7332998	16.0	124.5	191.5	48.0	0018668
14.5	0011010	0016060	7332999	16.0	124.5	191.5	48.0	0018668
14.6	0038017	0038581	7333000	20.0	133.5	201.5	50.0	0018675
37/64	0011140	0016077	7333001	20.0	133.5	201.5	50.0	0018675
14.7	0038024	0039601	7333002	20.0	133.5	201.5	50.0	0018675
14.8	0038031	0039618	7333003	20.0	133.5	201.5	50.0	0018675
15.0	0011201	0016084	7333004	20.0	133.5	201.5	50.0	0018675
19/32	0011218	0016091	7333005	20.0	133.5	201.5	50.0	0018675
15.1	0038048	0039625	7333006	20.0	133.5	201.5	50.0	0018675
15.2	0038055	0039632	7333007	20.0	133.5	201.5	50.0	0018675
15.24	0032268	0032350	7333008	20.0	133.5	201.5	50.0	0018675
39/64	0011232	0016107	7333009	20.0	133.5	201.5	50.0	0018675
15.5	0011362	0016114	7333010	20.0	133.5	201.5	50.0	0018675
15.6	0038062	0039649	7333011	20.0	141.5	211.5	50.0	0018682
15.7	0038079	0039656	7333012	20.0	141.5	211.5	50.0	0018682
5/8	0011379	0016121	7333013	20.0	141.5	211.5	50.0	0018682
16.0	0011386	0016138	7333014	20.0	141.5	211.5	50.0	0018682
16.08	0032275	0032367	7333015	20.0	141.5	211.5	50.0	0018682
16.1	0038086	0039663	7333016	20.0	141.5	211.5	50.0	0018682
16.2	0038093	0039670	7333017	20.0	141.5	211.5	50.0	0018682
41/64	0011393	0016145	7333018	20.0	141.5	211.5	50.0	0018682
16.3	0032282	0032374	7333019	20.0	141.5	211.5	50.0	0018682

HYDRA DRILL

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
16.5	0011409	0016152	7333020	20.0	141.5	211.5	50.0	0018682
16.6	0038109	0039687	7333021	20.0	150.5	221.5	50.0	0018699
21/32	0012161	0016169	7333022	20.0	150.5	221.5	50.0	0018699
16.7	0038116	0039694	7333023	20.0	150.5	221.5	50.0	0018699
17.0	0012185	0016176	7333024	20.0	150.5	221.5	50.0	0018699
43/64	0012215	0016183	7333025	20.0	150.5	221.5	50.0	0018699
17.1	0038123	0039700	7333026	20.0	150.5	221.5	50.0	0018699
17.2	0038130	0039717	7333027	20.0	150.5	221.5	50.0	0018699
11/16	0012239	0016190	7333028	20.0	150.5	221.5	50.0	0018699
17.5	0012253	0016503	7333029	20.0	150.5	221.5	50.0	0018699
17.6	0032299	0032381	7333030	20.0	158.5	226.5	50.0	0018705
17.7	0038147	0039724	7333031	20.0	158.5	226.5	50.0	0018705
45/64	0012260	0016640	7333032	20.0	158.5	226.5	50.0	0018705
18.0	0012277	0016664	7333033	20.0	158.5	226.5	50.0	0018705
18.1	0038154	0039731	7333034	20.0	158.5	226.5	50.0	0018705
18.2	0038161	0039748	7333035	20.0	158.5	226.5	50.0	0018705
23/32	0012284	0016671	7333036	20.0	158.5	226.5	50.0	0018705
18.5	0012307	0016688	7333037	20.0	158.5	226.5	50.0	0018705
18.6	0038178	0039755	7333038	25.0	167.5	251.5	56.0	0018712
47/64	0012321	0016695	7333039	25.0	167.5	251.5	56.0	0018712
18.7	0038185	0039762	7333040	25.0	167.5	251.5	56.0	0018712
18.9	0038192	0039779	7333041	25.0	167.5	251.5	56.0	0018712
19.0	0012338	0016817	7333042	25.0	167.5	251.5	56.0	0018712
3/4	0012345	0016879	7333043	25.0	167.5	251.5	56.0	0018712
19.1	0038208	0039786	7333044	25.0	167.5	251.5	56.0	0018712
19.2	0038215	0039793	7333045	25.0	167.5	251.5	56.0	0018712
19.25	0032305	0032398	7333046	25.0	167.5	251.5	56.0	0018712
19.3	0032312	0032404	7333047	25.0	167.5	251.5	56.0	0018712
19.35	0032329	0032411	7333048	25.0	167.5	251.5	56.0	0018712
49/64	0012376	0016886	7333049	25.0	167.5	251.5	56.0	0018712
19.5	0012383	0016947	7333050	25.0	167.5	251.5	56.0	0018712
19.6	0038222	0039809	7333051	25.0	175.5	264.5	56.0	0018729
19.7	0038239	0039816	7333052	25.0	175.5	264.5	56.0	0018729
25/32	0012406	0016954	7333053	25.0	175.5	264.5	56.0	0018729
20.0	0012413	0017111	7333054	25.0	175.5	264.5	56.0	0018729
51/64	0012437	0017128	7333055	25.0	175.5	264.5	56.0	0018729
20.5	0012451	0017159	7333056	25.0	175.5	264.5	56.0	0018729
13/16	0012468	0017197	7333057	25.0	184.5	266.5	56.0	0018736
21.0	0012475	0017166	7333058	25.0	184.5	266.5	56.0	0018736
53/64	0012536	0017203	7333059	25.0	184.5	266.5	56.0	0018736
27/32	0012550	0017227	7333060	25.0	184.5	266.5	56.0	0018736
21.5	0012574	0017234	7333061	25.0	184.5	266.5	56.0	0018736
55/64	0012604	0017241	7333062	25.0	192.1	271.1	56.0	0018743
22.0	0012628	0017258	7333063	25.0	192.1	271.1	56.0	0018743
7/8	0012635	0017371	7333064	25.0	192.1	271.1	56.0	0018743
22.5	0032336	0032428	7333065	25.0	192.1	271.1	56.0	0018743
57/64	0012642	0017401	7333066	25.0	192.1	271.1	56.0	0018743
22.7	0038246	0039823	7333067	25.0	192.1	271.1	56.0	0018743
23.0	0012666	0017425	7333068	25.0	200.5	280.5	56.0	0018750
29/32	0012673	0017432	7333069	25.0	200.5	280.5	56.0	0018750
59/64	0012680	0017456	7333070	25.0	200.5	280.5	56.0	0018750
23.5	0038253	0039830	7333071	25.0	200.5	280.5	56.0	0018750
15/16	0012703	0017562	7333072	32.0	208.2	295.2	60.0	0018767
24.0	0012727	0017579	7333073	32.0	208.2	295.2	60.0	0018767
61/64	0012741	0017586	7333074	32.0	208.2	295.2	60.0	0018767
24.5	0038260	0039847	7333075	32.0	208.2	295.2	60.0	0018767
31/32	0012772	0017593	7333076	32.0	208.2	295.2	60.0	0018767
25.0	0012819	0017722	7333077	32.0	217.0	300.0	60.0	0018774
63/64	0012826	0017746	7333078	32.0	217.0	300.0	60.0	0018774
1	0012833	0017753	7333079	32.0	217.0	300.0	60.0	0018774
25.5	0038277	0039854	7333080	32.0	217.0	300.0	60.0	0018774
25.65	0032343	0032435	7333081	32.0	217.0	300.0	60.0	0018774
1.1/64	0012840	0018958	7333082	32.0	217.0	300.0	60.0	0018774
26.0	0013090	0018965	7333083	32.0	225.0	310.0	60.0	0018781
1.1/32	0013120	0018972	7333084	32.0	225.0	310.0	60.0	0018781

HYDRA DRILL

DORMER

Hydra Head d_1 Ø	Hydra Head R950 EDP#	Hydra Head R960 EDP#	Hydra Head R970 EDP#	8xD Hydra Body - Metric Shank				
				d_2 Øh_6 mm	l_2 mm	l_1 mm	l_3 mm	H858 EDP#
26.5	0038284	0039878	7333085	32.0	225.0	310.0	60.0	0018781
1.3/64	0013229	0018989	7333086	32.0	225.0	310.0	60.0	0018781
1.1/16	0013243	0018996	7333087	32.0	234.0	320.0	60.0	0018798
27.0	0013267	0019009	7333088	32.0	234.0	320.0	60.0	0018798
1.5/64	0013274	0019016	7333089	32.0	234.0	320.0	60.0	0018798
27.5	0038291	0039885	7333090	32.0	234.0	320.0	60.0	0018798
1.3/32	0013281	0019023	7333091	32.0	234.0	320.0	60.0	0018798
28.0	0013304	0019030	7333092	32.0	242.0	325.0	60.0	0018804
1.7/64	0013311	0019047	7333093	32.0	242.0	325.0	60.0	0018804
28.5	0038307	0039892	7333094	32.0	242.0	325.0	60.0	0018804
1.1/8	0013328	0019054	7333095	32.0	242.0	325.0	60.0	0018804
1.9/64	0013342	0019061	7333096	32.0	251.0	335.0	60.0	0018811
29.0	0013366	0019078	7333097	32.0	251.0	335.0	60.0	0018811
1.5/32	0013380	0019085	7333098	32.0	251.0	335.0	60.0	0018811
29.5	0038314	0039908	7333099	32.0	251.0	335.0	60.0	0018811
1.11/64	0013427	0019092	7333100	32.0	251.0	335.0	60.0	0018811
30.0	0013434	0019108	7333101	32.0	259.0	345.0	60.0	0018828
1.3/16	0013441	0019115	7333102	32.0	259.0	345.0	60.0	0018828
30.5	0013465	0019122	7333103	32.0	259.0	345.0	60.0	0018828
1.7/32	46104481	—	7333104	32.0	271.5	356.5	60.0	46111421
31.00	46104482	—	7333105	32.0	271.5	356.5	60.0	46111421
1.1/4	46104483	—	7333106	32.0	271.5	356.5	60.0	46111421
32.00	46104484	—	7333107	32.0	271.5	356.5	60.0	46111421
32.50	46104485	—	7333108	40.0	286.5	371.5	60.0	46111422
1.19/64	46104486	—	7333109	40.0	286.5	371.5	60.0	46111422
33.00	46104487	—	7333110	40.0	286.5	371.5	60.0	46111422
33.50	46104488	—	7333111	40.0	286.5	371.5	60.0	46111422
34.00	46104489	—	7333112	40.0	301.5	396.5	70.0	46111423
1.11/32	46104530	—	7333113	40.0	301.5	396.5	70.0	46111423
34.50	46104531	—	7333114	40.0	301.5	396.5	70.0	46111423
1.3/8	46104532	—	7333115	40.0	301.5	396.5	70.0	46111423
35.00	46104533	—	7333116	40.0	301.5	396.5	70.0	46111423
36.00	46104534	—	7333117	40.0	311.5	406.5	70.0	46111424
1.27/64	46104535	—	7333118	40.0	311.5	406.5	70.0	46111424
36.50	46104536	—	7333119	40.0	311.5	406.5	70.0	46111424
37.00	46104537	—	7333120	40.0	326.5	421.5	70.0	46111425
1.15/32	46104538	—	7333121	40.0	326.5	421.5	70.0	46111425
37.50	46104539	—	7333122	40.0	326.5	421.5	70.0	46111425
38.00	46104540	—	7333123	40.0	326.5	421.5	70.0	46111425
1.1/2	46104541	—	7333124	40.0	336.5	431.5	70.0	46111426
38.50	46104542	—	7333125	40.0	336.5	431.5	70.0	46111426
1.17/32	46104543	—	7333126	40.0	336.5	431.5	70.0	46111426
39.00	46104544	—	7333127	40.0	336.5	431.5	70.0	46111426
39.50	46104545	—	7333128	40.0	336.5	431.5	70.0	46111426
1.9/16	46104546	—	7333129	40.0	351.5	451.5	70.0	46111427
40.00	46104547	—	7333130	40.0	351.5	451.5	70.0	46111427
41.00	46104548	—	7333131	40.0	351.5	451.5	70.0	46111427
1.5/8	46104549	—	7333132	40.0	361.5	461.5	70.0	46111428
42.00	46104550	—	7333133	40.0	361.5	461.5	70.0	46111428

Screws & Screw Driver

H860
Set of 2 Hydra Screws

H861
Hydra Drill Screw Driver



NOTE: Four (4) screws and one (1) screwdriver are included with a drill body

H860	H861
	
N1 - N7	N1 - N6

* For more information on Hydra, see page 522

H860	H861	For Hydra Head Range	Pack Qty	H860	H861
H860N1	H861N1	15/32 - 15.5	1	0018835	0018897
H860N2	H861N2	15.6 - 18.5	1	0018842	0018903
H860N3	H861N3	18.6 - 21.5	1	0018859	0018910
H860N3	H861N3	55/64 - 31/32	1	0018866	0018910
H860N4	H861N4	25.0 - 1.3/32	1	0018873	0018927
H860N5	H861N5	28.0 - 33.5	1	0018880	0018934
H860N6	H861N6	34.0 - 42.0	1	46111949	46260354

CDX SOLID CARBIDE DRILL

DORMER

Multi-Application, Screw Machine Length, Parallel Shank

R520

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 7.1 7.2 7.3 7.4 8.1 8.2

CDX

R520

DIN 6539

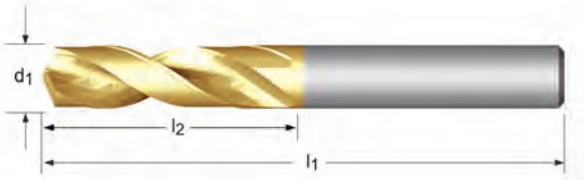
2.5XD

HM

130°

3.00 - 16.50

Heavy-Duty design. Self centering Split Point for easier penetration. TiN coating increases wear resistance and improves tool life.



d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R520
	3.00	0.1181	16	46	1	0116067
	3.10	0.1220	18	49	1	0116074
1/8	3.18	0.1250	18	49	1	0210666
	3.20	0.1260	18	49	1	0116081
	3.30	0.1299	18	49	1	0116098
	3.40	0.1339	20	52	1	0116104
	3.50	0.1378	20	52	1	0116111
	3.60	0.1417	20	52	1	0116128
	3.70	0.1457	20	52	1	0116135
	3.80	0.1496	22	55	1	0116142
	3.90	0.1535	22	55	1	0116159
	4.00	0.1575	22	55	1	0116166
	4.10	0.1614	22	55	1	0116173
	4.20	0.1654	22	55	1	0116180
	4.30	0.1693	24	58	1	0116197
	4.40	0.1732	24	58	1	0116203
	4.50	0.1772	24	58	1	0116210
	4.60	0.1811	24	58	1	0116227
	4.70	0.1850	24	58	1	0116234
	4.80	0.1890	26	62	1	0116241
	4.90	0.1929	26	62	1	0116258
	5.00	0.1969	26	62	1	0116265
	5.10	0.2008	26	62	1	0116272
	5.20	0.2047	26	62	1	0116289
	5.30	0.2087	26	62	1	0116296
	5.40	0.2126	28	66	1	0116302
	5.50	0.2165	28	66	1	0116319
	5.60	0.2205	28	66	1	0116326
	5.70	0.2244	28	66	1	0116333
	5.80	0.2283	28	66	1	0116340
	5.90	0.2323	28	66	1	0116357
	6.00	0.2362	28	66	1	0116364
	6.10	0.2402	31	70	1	0116371

CDX SOLID CARBIDE DRILL

d_1 $\emptyset h_7$ Inch	d_1 $\emptyset h_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R520
	6.20	0.2441	31	70	1	0116388
	6.30	0.2480	31	70	1	0116395
1/4	6.35	0.2500	31	70	1	0210741
	6.40	0.2520	31	70	1	0116401
	6.50	0.2559	31	70	1	0116418
	6.60	0.2598	31	70	1	0346402
	6.70	0.2638	31	70	1	0346419
	6.80	0.2677	34	74	1	0116425
	6.90	0.2717	34	74	1	0116432
	7.00	0.2756	34	74	1	0116449
	7.10	0.2795	34	74	1	0346426
	7.20	0.2835	34	74	1	0346433
	7.30	0.2874	34	74	1	0116456
	7.40	0.2913	34	74	1	0116463
	7.50	0.2953	34	74	1	0116470
	7.60	0.2992	37	79	1	0346440
	7.70	0.3031	37	79	1	0346457
	7.80	0.3071	37	79	1	0116487
	7.90	0.3110	37	79	1	0346464
5/16	7.94	0.3125	37	79	1	0210789
	8.00	0.3150	37	79	1	0116494
	8.10	0.3189	37	79	1	0346471
	8.20	0.3228	37	79	1	0346488
	8.30	0.3268	37	79	1	0346495
	8.40	0.3307	37	79	1	0346501
	8.50	0.3346	37	79	1	0116500
	8.60	0.3386	40	84	1	0346518
	8.70	0.3425	40	84	1	0216866
	8.80	0.3465	40	84	1	0346525
	8.90	0.3504	40	84	1	0346532
	9.00	0.3543	40	84	1	0116517
	9.10	0.3583	40	84	1	0346549
	9.20	0.3622	40	84	1	0116524
	9.30	0.3661	40	84	1	0116531
	9.40	0.3701	40	84	1	0216873
	9.50	0.3740	40	84	1	0116548
3/8	9.52	0.3750	43	89	1	0210826
	9.60	0.3780	43	89	1	0346556
	9.70	0.3819	43	89	1	0346563
	9.80	0.3858	43	89	1	0346570
	9.90	0.3898	43	89	1	0346587
	10.00	0.3937	43	89	1	0115923
	10.10	0.3976	43	89	1	0346778
	10.20	0.4016	43	89	1	0115930
	10.30	0.4055	43	89	1	0216880
	10.40	0.4094	43	89	1	0115947
	10.50	0.4134	43	89	1	0115954
	11.00	0.4331	47	95	1	0115961
7/16	11.11	0.4375	47	95	1	0210864
	11.20	0.4409	47	95	1	0216897
	11.50	0.4528	47	95	1	0115978
	12.00	0.4724	51	102	1	0115985
	12.50	0.4921	51	102	1	0115992
1/2	12.70	0.5000	51	102	1	0210901
	13.00	0.5118	51	102	1	0116005
	13.50	0.5315	54	107	1	0216903
	14.00	0.5512	54	107	1	0116012
	14.20	0.5591	56	111	1	0216910
	14.25	0.5610	56	111	1	0216927
	14.50	0.5709	56	111	1	0116029
	15.00	0.5906	56	111	1	0116036
	15.10	0.5945	58	115	1	0216934
5/8	15.88	0.6250	58	115	1	0210925
	16.00	0.6299	58	115	1	0116043
	16.50	0.6496	60	119	1	0116050

FORCE X SOLID CARBIDE DRILL

Multi-Application, Short Length, Reinforced Shank

R458

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

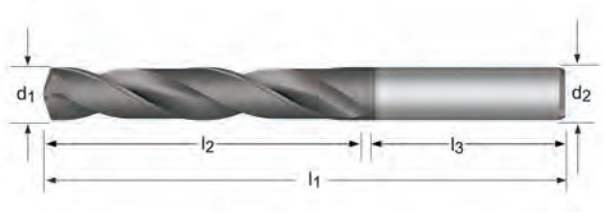
Self centering 4-facet split point and CTW flute construction for enhanced penetration rate. TiAlN coating increases wear resistance and improves tool life at high RPM.

R457

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 3.1 3.2 3.3 3.4
4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

Coolant through clears chips away from the cutting edge. Self centering 4-facet split point for enhanced penetration rates. TiAlN coating increases surface hardness and improves tool life at high RPM.

High productivity in a wide range of materials



R458	R457
DIN 6537 K	DIN 6537 K
3XD	3XD
HM	HM
140°	140°
TiAlN	TiAlN
	
	Coolant Through
3.00 - 20.00	3.00 - 20.00

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
	3.00	0.1181	20	62	36	6	1	0615324	0614884
	3.10	0.1220	20	62	36	6	1	0626443	0626115
1/8	3.18	0.1252	20	62	36	6	1	0624845	0624432
	3.20	0.1260	20	62	36	6	1	0626450	0626122
30	3.26	0.1283	20	62	36	6	1	0042267	0041833
	3.30	0.1299	20	62	36	6	1	0615331	0614891
	3.40	0.1339	20	62	36	6	1	0615348	0614907
29	3.45	0.1358	20	62	36	6	1	0042274	0041840
	3.50	0.1378	20	62	36	6	1	0615355	0614914
28	3.57	0.1406	20	62	36	6	1	0042281	0041857
9/64	3.57	0.1406	20	62	36	6	1	0625224	0624814
	3.60	0.1417	20	62	36	6	1	0626467	0626139
27	3.66	0.1441	20	62	36	6	1	0042298	0041864
	3.70	0.1457	20	62	36	6	1	0626474	0626146
26	3.73	0.1469	24	66	36	6	1	0626481	0041871
25	3.80	0.1496	24	66	36	6	1	0626498	0041888
24	3.86	0.1520	24	66	36	6	1	0042328	0041895
	3.90	0.1535	24	66	36	6	1	0626504	0626160
23	3.91	0.1539	24	66	36	6	1	0042335	0041901
5/32	3.97	0.1563	24	66	36	6	1	0625163	0624753
22	3.99	0.1571	24	66	36	6	1	0042342	0041918
	4.00	0.1575	24	66	36	6	1	0615362	0614921
21	4.04	0.1591	24	66	36	6	1	0042359	0041925
	4.05	0.1594	24	66	36	6	1	—	0626177
20	4.09	0.1610	24	66	36	6	1	0042366	0041932
	4.10	0.1614	24	66	36	6	1	0626511	0626184
	4.20	0.1654	24	66	36	6	1	0615379	0614938
19	4.22	0.1661	24	66	36	6	1	0042373	0041949
	4.30	0.1693	24	66	36	6	1	0615386	0614945
18	4.31	0.1697	24	66	36	6	1	0042380	0041956
11/64	4.37	0.1720	24	66	36	6	1	0624876	0624463
17	4.39	0.1728	24	66	36	6	1	0042397	0041963
	4.40	0.1732	24	66	36	6	1	0135013	0134832

FORCE X SOLID CARBIDE DRILL

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
16	4.50	0.1772	24	66	36	6	1	0615393	0041970
15	4.57	0.1799	24	66	36	6	1	0042410	0041987
	4.60	0.1811	24	66	36	6	1	0626528	0626191
14	4.62	0.1819	24	66	36	6	1	0042427	0041994
13	4.70	0.1850	24	66	36	6	1	0135020	0042007
3/16	4.76	0.1874	28	66	36	6	1	0625033	0624623
12	4.80	0.1890	28	66	36	6	1	0135037	0042014
11	4.85	0.1909	28	66	36	6	1	0042458	0042021
	4.90	0.1929	28	66	36	6	1	0135044	0622070
10	4.92	0.1937	28	66	36	6	1	0042465	0042038
9	4.98	0.1961	28	66	36	6	1	0042472	0042045
	5.00	0.1969	28	66	36	6	1	0615409	0614969
	5.05	0.1988	28	66	36	6	1	—	0626214
8	5.06	0.1992	28	66	36	6	1	0042489	0042052
	5.10	0.2008	28	66	36	6	1	0615416	0614976
7	5.11	0.2012	28	66	36	6	1	0042496	0042069
13/64	5.16	0.2031	28	66	36	6	1	0624890	0624487
6	5.18	0.2039	28	66	36	6	1	0042502	0042076
	5.20	0.2047	28	66	36	6	1	0135051	0134856
5	5.22	0.2055	28	66	36	6	1	0042519	0042083
	5.30	0.2087	28	66	36	6	1	7361260	7361237
4	5.31	0.2091	28	66	36	6	1	0042526	0042090
	5.40	0.2126	28	66	36	6	1	7361261	7361238
3	5.41	0.2130	28	66	36	6	1	0042533	0042106
	5.50	0.2165	28	66	36	6	1	0615423	0614983
7/32	5.56	0.2189	28	66	36	6	1	0625194	0624784
	5.60	0.2205	28	66	36	6	1	0626535	0626221
2	5.61	0.2209	28	66	36	6	1	0042540	0042113
	5.70	0.2244	28	66	36	6	1	0626542	0626238
1	5.79	0.2280	28	66	36	6	1	0042557	0042120
	5.80	0.2283	28	66	36	6	1	0626559	0626245
	5.90	0.2323	28	66	36	6	1	7361262	7361239
A	5.94	0.2339	28	66	36	6	1	0042564	0042137
15/64	5.95	0.2343	28	66	36	6	1	0624913	0624500
	6.00	0.2362	28	66	36	6	1	0615430	0614990
B	6.03	0.2374	34	79	36	8	1	7361263	7361240
	6.05	0.2382	34	79	36	8	1	—	0626252
	6.10	0.2402	34	79	36	8	1	0626566	0626269
C	6.15	0.2421	34	79	36	8	1	7361264	7361241
	6.20	0.2441	34	79	36	8	1	0135068	0134863
D	6.25	0.2461	34	79	36	8	1	0042571	0042144
	6.30	0.2480	34	79	36	8	1	0626573	0626276
1/4	6.35	0.2500	34	79	36	8	1	0624838	0624425
E	6.35	0.2500	34	79	36	8	1	7361265	7361242
	6.40	0.2520	34	79	36	8	1	0135075	0134870
	6.50	0.2559	34	79	36	8	1	0615447	0615003
F	6.53	0.2571	34	79	36	8	1	7361266	7361243
	6.60	0.2598	34	79	36	8	1	0626580	0626283
G	6.63	0.2610	34	79	36	8	1	7361267	7361244
	6.70	0.2638	34	79	36	8	1	0135082	0134887
17/64	6.75	0.2657	34	79	36	8	1	0624937	0624524
H	6.76	0.2661	34	79	36	8	1	0042588	0042151
	6.80	0.2677	34	79	36	8	1	0615454	0615010
	6.90	0.2717	34	79	36	8	1	0615461	0615027
I	6.91	0.2720	34	79	36	8	1	7361268	7361245
	7.00	0.2756	34	79	36	8	1	0615478	0615034
J	7.04	0.2772	41	79	36	8	1	7361269	7361246
	7.10	0.2795	41	79	36	8	1	0626597	0626290
K	7.14	0.2811	41	79	36	8	1	7361270	7361247
9/32	7.14	0.2811	41	79	36	8	1	0625217	0624807
	7.20	0.2835	41	79	36	8	1	7361271	7361248
	7.30	0.2874	41	79	36	8	1	0626603	0626306
L	7.37	0.2902	41	79	36	8	1	0042595	0042168
	7.40	0.2913	41	79	36	8	1	0615485	0615041
M	7.49	0.2949	41	79	36	8	1	0042601	0042175
	7.50	0.2953	41	79	36	8	1	0615492	0615058

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
19/64	7.54	0.2969	41	79	36	8	1	0624951	0624548
	7.60	0.2992	41	79	36	8	1	0626610	0626313
N	7.67	0.3020	41	79	36	8	1	0042618	0042182
	7.70	0.3031	41	79	36	8	1	0135099	0134894
	7.80	0.3071	41	79	36	8	1	0626627	0626320
	7.90	0.3110	41	79	36	8	1	0135105	0134900
5/16	7.94	0.3126	41	79	36	8	1	0625156	0624746
	8.00	0.3150	41	79	36	8	1	0615508	0615065
O	8.03	0.3161	47	89	40	10	1	0042625	0042199
	8.05	0.3169	47	89	40	10	1	—	0626337
	8.10	0.3189	47	89	40	10	1	0626634	0626689
	8.20	0.3228	47	89	40	10	1	0135112	0134917
P	8.20	0.3228	47	89	40	10	1	7361272	7361249
	8.30	0.3268	47	89	40	10	1	7361273	7361250
21/64	8.33	0.3280	47	89	40	10	1	0624975	0624562
	8.40	0.3307	47	89	40	10	1	0135129	0134924
Q	8.43	0.3319	47	89	40	10	1	0042632	0042205
	8.50	0.3346	47	89	40	10	1	0615515	0615072
	8.60	0.3386	47	89	40	10	1	0615522	0615089
R	8.61	0.3390	47	89	40	10	1	7361274	7361251
	8.70	0.3425	47	89	40	10	1	0615539	0615096
11/32	8.73	0.3437	47	89	40	10	1	0624869	0624456
	8.80	0.3465	47	89	40	10	1	0626641	0626344
S	8.84	0.3480	47	89	40	10	1	7361275	7361252
	8.90	0.3504	47	89	40	10	1	7361276	0134931
	9.00	0.3543	47	89	40	10	1	0615546	0615102
T	9.09	0.3579	47	89	40	10	1	0042649	0042212
	9.10	0.3583	47	89	40	10	1	0626658	0626351
23/64	9.13	0.3594	47	89	40	10	1	0624999	0624586
	9.20	0.3622	47	89	40	10	1	7361277	7361253
	9.30	0.3661	47	89	40	10	1	0615553	0615119
U	9.35	0.3681	47	89	40	10	1	0042656	0042229
	9.40	0.3701	47	89	40	10	1	0135136	0134948
	9.50	0.3740	47	89	40	10	1	0615560	0615126
3/8	9.52	0.3748	47	89	40	10	1	0625057	0624647
V	9.58	0.3772	47	89	40	10	1	7361278	7361254
	9.60	0.3780	47	89	40	10	1	0626665	0626368
	9.70	0.3819	47	89	40	10	1	0135143	0629062
	9.80	0.3858	47	89	40	10	1	0626672	0626375
W	9.80	0.3858	47	89	40	10	1	7361279	7361255
	9.90	0.3898	47	89	40	10	1	0135150	0134955
25/64	9.92	0.3906	47	89	40	10	1	0625002	0624593
	10.00	0.3937	47	89	40	10	1	0615133	0614693
	10.05	0.3957	55	102	45	12	1	—	0625958
X	10.08	0.3969	55	102	45	12	1	0042663	0042236
	10.10	0.3976	55	102	45	12	1	0626382	0625965
	10.20	0.4016	55	102	45	12	1	0615140	0614709
Y	10.26	0.4039	55	102	45	12	1	0042670	0042243
	10.30	0.4055	55	102	45	12	1	0615157	0614716
13/32	10.32	0.4063	55	102	45	12	1	0624883	0624470
	10.40	0.4094	55	102	45	12	1	0615164	0614723
Z	10.49	0.4130	55	102	45	12	1	0042687	0042250
	10.50	0.4134	55	102	45	12	1	0615171	0614730
	10.60	0.4173	55	102	45	12	1	0626399	0625972
	10.70	0.4213	55	102	45	12	1	7361280	—
27/64	10.72	0.4220	55	102	45	12	1	0625019	0624609
	10.80	0.4252	55	102	45	12	1	0042694	7361256
	10.90	0.4291	55	102	45	12	1	7361281	—
	11.00	0.4331	55	102	45	12	1	0615188	0614747
	11.10	0.4370	55	102	45	12	1	7361282	—
7/16	11.11	0.4374	55	102	45	12	1	0625187	0624777
	11.20	0.4409	55	102	45	12	1	0615195	0614754
	11.30	0.4449	55	102	45	12	1	7361283	7361257
	11.40	0.4488	55	102	45	12	1	0135167	0134962

FORCE X SOLID CARBIDE DRILL

d_1 Ø "/Nr.	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R458	R457
	11.50	0.4528	55	102	45	12	1	0615201	0614761
29/64	11.51	0.4531	55	102	45	12	1	0625026	0624616
	11.60	0.4567	55	102	45	12	1	0135174	0134979
	11.70	0.4606	55	102	45	12	1	7361284	—
	11.80	0.4646	55	102	45	12	1	0626405	0625989
	11.90	0.4685	55	102	45	12	1	7361285	—
15/32	11.91	0.4689	55	102	45	12	1	0624906	0624494
	12.00	0.4724	55	102	45	12	1	0615218	0614778
	12.05	0.4744	60	107	45	14	1	—	0625996
	12.10	0.4764	60	107	45	14	1	0626412	0626009
	12.20	0.4803	60	107	45	14	1	0615225	0614785
31/64	12.30	0.4843	60	107	45	14	1	0625064	0624654
	12.50	0.4921	60	107	45	14	1	0615232	0614792
1/2	12.70	0.5000	60	107	45	14	1	0626429	0626016
	12.80	0.5039	60	107	45	14	1	0135181	0134986
	13.00	0.5118	60	107	45	14	1	0615249	0614808
33/64	13.10	0.5157	60	107	45	14	1	0625071	0624661
	13.30	0.5236	60	107	45	14	1	7361286	7361258
17/32	13.49	0.5311	60	107	45	14	1	0624920	0624517
	13.50	0.5315	60	107	45	14	1	0615256	0614815
	13.80	0.5433	60	107	45	14	1	0135198	0134993
35/64	13.89	0.5469	60	107	45	14	1	0625088	0624678
	14.00	0.5512	60	107	45	14	1	0615263	0614822
	14.25	0.5610	65	115	48	16	1	0615270	0614839
9/16	14.29	0.5626	65	115	48	16	1	0625200	0624791
	14.50	0.5709	65	115	48	16	1	0615287	0614846
37/64	14.68	0.5780	65	115	48	16	1	0625095	0624685
	14.80	0.5827	65	115	48	16	1	0622032	0135006
	15.00	0.5906	65	115	48	16	1	0615294	0614853
19/32	15.08	0.5937	65	115	48	16	1	0624944	0624531
	15.10	0.5945	65	115	48	16	1	0626436	0626023
	15.30	0.6024	65	115	48	16	1	7361287	7361259
39/64	15.48	0.6094	65	115	48	16	1	0625101	0624692
	15.50	0.6102	65	115	48	16	1	0615300	0614860
	15.80	0.6220	65	115	48	16	1	0135204	0622049
5/8	15.88	0.6252	65	115	48	16	1	0625170	0624760
	16.00	0.6299	65	115	48	16	1	0615317	0614877
41/64	16.27	0.6406	73	123	48	18	1	0625118	0624708
	16.50	0.6496	73	123	48	18	1	0135211	0626030
21/32	16.67	0.6563	73	123	48	18	1	0624968	0624555
	17.00	0.6693	73	123	48	18	1	0135228	0626047
43/64	17.07	0.6720	73	123	48	18	1	0625125	0624715
11/16	17.46	0.6874	73	123	48	18	1	0624852	0624449
	17.50	0.6890	73	123	48	18	1	0135235	0626054
	17.80	0.7008	73	123	48	18	1	0135273	—
45/64	17.86	0.7031	73	123	48	18	1	0625132	0624722
	18.00	0.7087	73	123	48	18	1	0135280	0626061
23/32	18.26	0.7189	79	131	50	20	1	0624982	0624579
	18.50	0.7283	79	131	50	20	1	0135297	0626078
47/64	18.65	0.7343	79	131	50	20	1	0625149	0624739
	18.80	0.7402	79	131	50	20	1	—	0622056
	19.00	0.7480	79	131	50	20	1	0135327	0626085
3/4	19.05	0.7500	79	131	50	20	1	0625040	0624630
	19.50	0.7677	79	131	50	20	1	0135334	0626092
	19.80	0.7795	79	131	50	20	1	0135341	0622063
	20.00	0.7874	79	131	50	20	1	0135358	0626108

CDX SOLID CARBIDE DRILL

DORMER

Multi-Application, Jobber Length, Parallel Shank

R510

CDX

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 3.1 3.2 3.3 3.4 4.1 5.1
7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty design. Self centering Split Point for easier penetration.
TiN coating increases wear resistance and improves tool life.



R510

DIN 338

4XD

HM

130°



3.00 - 14.25

d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R510
	3.00	0.1181	33	61	1	0115657
1/8	3.18	0.1250	36	65	1	0380802
	3.20	0.1260	36	65	1	0148990
	3.30	0.1299	36	65	1	0115664
	3.40	0.1339	39	70	1	0115671
	3.50	0.1378	39	70	1	0115688
	3.70	0.1457	39	70	1	0216781
	3.90	0.1535	43	75	1	0345245
	4.00	0.1575	43	75	1	0115695
	4.10	0.1614	43	75	1	0115701
	4.20	0.1654	43	75	1	0115718
	4.30	0.1693	47	80	1	0115725
	4.50	0.1772	47	80	1	0115732
	4.60	0.1811	47	80	1	0216798
	4.70	0.1850	47	80	1	0216804
3/16	4.76	0.1875	52	86	1	0380949
	4.90	0.1929	52	86	1	0115749
	5.00	0.1969	52	86	1	0115756
	5.10	0.2008	52	86	1	0115763
	5.50	0.2165	57	93	1	0115770
	5.60	0.2205	57	93	1	0216811
	5.70	0.2244	57	93	1	0216828
	6.00	0.2362	57	93	1	0115787
1/4	6.35	0.2500	63	101	1	0381038
	6.50	0.2559	63	101	1	0115794
	6.60	0.2598	63	101	1	0345252
	6.80	0.2677	69	109	1	0115800
	6.90	0.2717	69	109	1	0115817
	7.00	0.2756	69	109	1	0115824
	7.30	0.2874	69	109	1	0115831
	7.40	0.2913	69	109	1	0115848
	7.50	0.2953	69	109	1	0115855
	7.80	0.3071	75	117	1	0345269

CDX SOLID CARBIDE DRILL

d_1 $Øh_7$ Inch	d_1 $Øh_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	R510
	7.90	0.3110	75	117	1	0345276
5/16	7.94	0.3125	75	117	1	0380963
	8.00	0.3150	75	117	1	0115862
	8.50	0.3346	75	117	1	0115879
	8.70	0.3425	81	125	1	0149003
	8.80	0.3465	81	125	1	0345283
	9.00	0.3543	81	125	1	0115886
	9.20	0.3622	81	125	1	0115893
	9.30	0.3661	81	125	1	0115909
	9.40	0.3701	81	125	1	0216835
	9.50	0.3740	81	125	1	0115916
3/8	9.52	0.3750	87	133	1	0381045
	9.90	0.3898	87	133	1	0345290
	10.00	0.3937	87	133	1	0115558
	10.20	0.4016	87	133	1	0115565
	10.30	0.4055	87	133	1	0216842
	10.40	0.4094	87	133	1	0115572
	10.50	0.4134	87	133	1	0115589
	10.80	0.4252	94	142	1	0345306
	11.00	0.4331	94	142	1	0115596
7/16	11.11	0.4375	94	142	1	0380987
	11.20	0.4409	94	142	1	0216859
	11.50	0.4528	94	142	1	0115602
	12.00	0.4724	101	151	1	0115619
1/2	12.70	0.5000	101	151	1	0381021
	13.00	0.5118	101	151	1	0115626
	14.00	0.5512	108	160	1	0115633
	14.25	0.5610	114	169	1	0115640

FORCE X SOLID CARBIDE DRILL

DORMER

Multi-Application, Standard Length, Reinforced Shank

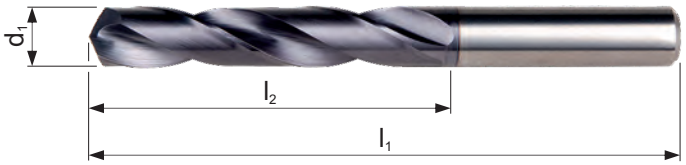
R454 Self centering 4-facet split point and CTW flute construction for enhanced penetration rate. TiAlN coating increases wear resistance, improves tool life at high RPM.

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

R453 Coolant through clears chips away from the cutting edge. Self centering 4-facet split point and CTW flute construction for enhanced penetration rates. TiAlN coating increases surface hardness, improves tool life at high RPM.

1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 2.1 2.2 2.3 2.4 3.1 3.2 3.3
3.4 4.1 4.2 4.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4

High productivity in a wide range of materials



R454	R453
DIN 6537 L	DIN 6537 L
5XD	5XD
HM	HM
140°	140°
TiAlN	TiAlN
	
	Coolant Through
3.00 - 20.00	3.00 - 20.00

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
	3.00	0.1181	28	66	36	6	1	0614433	0614051
	3.10	0.1220	28	66	36	6	1	0625712	0625385
1/8	3.18	0.1252	28	66	36	6	1	0624029	0623619
	3.20	0.1260	28	66	36	6	1	0625729	0625392
30	3.26	0.1283	28	66	36	6	1	0041406	0040393
	3.30	0.1299	28	66	36	6	1	0614440	0616147
	3.40	0.1339	28	66	36	6	1	0614457	0614068
29	3.45	0.1358	28	66	36	6	1	0041413	0040409
	3.50	0.1378	28	66	36	6	1	0614464	0614075
28	3.57	0.1406	28	66	36	6	1	0041420	0040416
9/64	3.57	0.1406	28	66	36	6	1	0624401	0623992
	3.60	0.1417	28	66	36	6	1	0625736	0625408
27	3.66	0.1441	28	66	36	6	1	0041437	0040423
	3.70	0.1457	28	66	36	6	1	0625743	0625415
26	3.73	0.1469	36	74	36	6	1	0041444	0040430
25	3.80	0.1496	36	74	36	6	1	0625750	0625422
24	3.86	0.1520	36	74	36	6	1	0041468	0040454
	3.90	0.1535	36	74	36	6	1	0625767	0628911
23	3.91	0.1539	36	74	36	6	1	0041475	0040461
5/32	3.97	0.1563	36	74	36	6	1	0624340	0623930
22	3.99	0.1571	36	74	36	6	1	0041482	0040478
	4.00	0.1575	36	74	36	6	1	0614471	0614082
21	4.04	0.1591	36	74	36	6	1	0041499	0040485
	4.05	0.1594	36	74	36	6	1	—	0625439
20	4.09	0.1610	36	74	36	6	1	0041505	0040492
	4.10	0.1614	36	74	36	6	1	0625774	0625446
	4.20	0.1654	36	74	36	6	1	0614488	0616154
19	4.22	0.1661	36	74	36	6	1	0041512	0040508
	4.30	0.1693	36	74	36	6	1	0614495	0614099
18	4.31	0.1697	36	74	36	6	1	0041529	0040515
11/64	4.37	0.1720	36	74	36	6	1	0624050	0623640
17	4.39	0.1728	36	74	36	6	1	0041536	0040522
	4.40	0.1732	36	74	36	6	1	0134450	0134191

FORCE X SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
	4.50	0.1772	36	74	36	6	1	0614501	0614105
16	4.50	0.1772	36	74	36	6	1	0041543	0040539
15	4.57	0.1799	36	74	36	6	1	0041550	0040546
	4.60	0.1811	36	74	36	6	1	0625781	0625453
14	4.62	0.1819	36	74	36	6	1	0041567	0040553
13	4.70	0.1850	36	74	36	6	1	0625798	0625460
3/16	4.76	0.1874	44	82	36	6	1	0624210	0623800
12	4.80	0.1890	44	82	36	6	1	0134467	0134207
11	4.85	0.1909	44	82	36	6	1	0041598	0040584
	4.90	0.1929	44	82	36	6	1	0134474	0134214
10	4.92	0.1937	44	82	36	6	1	0041604	0040591
9	4.98	0.1961	44	82	36	6	1	0041611	0040607
	5.00	0.1969	44	82	36	6	1	0614518	0614112
	5.05	0.1988	44	82	36	6	1	—	0625477
8	5.06	0.1992	44	82	36	6	1	0041628	0040614
	5.10	0.2008	44	82	36	6	1	0614525	0614129
7	5.11	0.2012	44	82	36	6	1	0041635	0040621
13/64	5.16	0.2031	44	82	36	6	1	0624074	0623664
6	5.18	0.2039	44	82	36	6	1	0041642	0040638
	5.20	0.2047	44	82	36	6	1	0134481	0134221
5	5.22	0.2055	44	82	36	6	1	0041659	0040645
	5.30	0.2087	44	82	36	6	1	—	7361201
4	5.31	0.2091	44	82	36	6	1	0041666	0040652
	5.40	0.2126	44	82	36	6	1	—	7361202
3	5.41	0.2130	44	82	36	6	1	0041673	0040669
	5.50	0.2165	44	82	36	6	1	0614532	0614136
7/32	5.56	0.2189	44	82	36	6	1	0624371	0623961
	5.60	0.2205	44	82	36	6	1	0625804	0625484
2	5.61	0.2209	44	82	36	6	1	0041680	0040676
	5.70	0.2244	44	82	36	6	1	0625811	0625491
1	5.79	0.2280	44	82	36	6	1	0041697	0040683
	5.80	0.2283	44	82	36	6	1	0625828	0625507
	5.90	0.2323	44	82	36	6	1	—	7361203
A	5.94	0.2339	44	82	36	6	1	0041703	0040690
15/64	5.95	0.2343	44	82	36	6	1	0624098	0623688
	6.00	0.2362	44	82	36	6	1	0614549	0614143
B	6.03	0.2374	53	91	36	8	1	7361224	7361204
	6.05	0.2382	53	91	36	8	1	—	0625514
	6.10	0.2402	53	91	36	8	1	0625835	0625521
C	6.15	0.2421	53	91	36	8	1	7361225	7361205
	6.20	0.2441	53	91	36	8	1	0134498	0134238
D	6.25	0.2461	53	91	36	8	1	0041710	0040706
	6.30	0.2480	53	91	36	8	1	0625842	0625538
1/4	6.35	0.2500	53	91	36	8	1	0624012	0623602
E	6.35	0.2500	53	91	36	8	1	7361226	7361206
	6.40	0.2520	53	91	36	8	1	0134504	0134245
	6.50	0.2559	53	91	36	8	1	0614556	0614150
F	6.53	0.2571	53	91	36	8	1	7361227	7361207
	6.60	0.2598	53	91	36	8	1	0625859	0625545
G	6.63	0.2610	53	91	36	8	1	7361228	7361208
	6.70	0.2638	53	91	36	8	1	0614563	0134252
17/64	6.75	0.2657	53	91	36	8	1	0624111	0623701
H	6.76	0.2661	53	91	36	8	1	0041727	0041291
	6.80	0.2677	53	91	36	8	1	0614570	0616116
	6.90	0.2717	53	91	36	8	1	0614587	0614167
I	6.91	0.2720	53	91	36	8	1	7361229	7361209
	7.00	0.2756	53	91	36	8	1	0614594	0614174
J	7.04	0.2772	53	91	36	8	1	7361230	7361210
	7.10	0.2795	53	91	36	8	1	0625866	0625552
K	7.14	0.2811	53	91	36	8	1	7361231	7361211
9/32	7.14	0.2811	53	91	36	8	1	0624395	0623985
	7.20	0.2835	53	91	36	8	1	—	7361212
	7.30	0.2874	53	91	36	8	1	0625873	0625569
L	7.37	0.2902	53	91	36	8	1	0041734	0041307
	7.40	0.2913	53	91	36	8	1	0614600	0616161

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
M	7.49	0.2949	53	91	36	8	1	0041741	0041314
	7.50	0.2953	53	91	36	8	1	0614617	0614181
19/64	7.54	0.2969	53	91	36	8	1	0624135	0623725
	7.60	0.2992	53	91	36	8	1	0625880	0625576
N	7.67	0.3020	53	91	36	8	1	0041758	0041321
	7.70	0.3031	53	91	36	8	1	0134511	0134306
	7.80	0.3071	53	91	36	8	1	0625897	0625583
	7.90	0.3110	53	91	36	8	1	0134528	0134313
5/16	7.94	0.3126	53	91	36	8	1	0624333	0623923
	8.00	0.3150	53	91	36	8	1	0614624	0614198
O	8.03	0.3161	61	103	40	10	1	0041765	0041338
	8.05	0.3169	61	103	40	10	1	—	0625590
	8.10	0.3189	61	103	40	10	1	0625903	0625606
	8.20	0.3228	61	103	40	10	1	0134535	0134320
P	8.20	0.3228	61	103	40	10	1	7361232	7361213
	8.30	0.3268	61	103	40	10	1	—	7361214
21/64	8.33	0.3280	61	103	40	10	1	0624159	0623749
	8.40	0.3307	61	103	40	10	1	0134542	0134337
Q	8.43	0.3319	61	103	40	10	1	0041772	0041345
	8.50	0.3346	61	103	40	10	1	0614631	0614204
	8.60	0.3386	61	103	40	10	1	0614648	0616178
R	8.61	0.3390	61	103	40	10	1	7361233	7361215
	8.70	0.3425	61	103	40	10	1	0614655	0614211
11/32	8.73	0.3437	61	103	40	10	1	0624043	0623633
	8.80	0.3465	61	103	40	10	1	0625910	0625613
S	8.84	0.3480	61	103	40	10	1	7361234	7361216
	8.90	0.3504	61	103	40	10	1	0134559	0134344
	9.00	0.3543	61	103	40	10	1	0614662	0614228
T	9.09	0.3579	61	103	40	10	1	0041789	0041352
	9.10	0.3583	61	103	40	10	1	0625927	0625620
23/64	9.13	0.3594	61	103	40	10	1	0624173	0623763
	9.20	0.3622	61	103	40	10	1	—	7361217
	9.30	0.3661	61	103	40	10	1	0614679	0616123
U	9.35	0.3681	61	103	40	10	1	0041796	0041369
	9.40	0.3701	61	103	40	10	1	0134566	0134351
	9.50	0.3740	61	103	40	10	1	0614686	0614235
3/8	9.52	0.3748	61	103	40	10	1	0624234	0623824
V	9.58	0.3772	61	103	40	10	1	7361235	7361218
	9.60	0.3780	61	103	40	10	1	0625934	0625637
	9.70	0.3819	61	103	40	10	1	0134573	0629055
	9.80	0.3858	61	103	40	10	1	0625941	0625644
W	9.80	0.3858	61	103	40	10	1	7361236	7361219
	9.90	0.3898	61	103	40	10	1	0134580	0134368
25/64	9.92	0.3906	61	103	40	10	1	0624180	0623770
	10.00	0.3937	61	103	40	10	1	0614242	0613870
	10.05	0.3957	70	118	45	12	1	—	0625231
X	10.08	0.3969	70	118	45	12	1	0041802	0041376
	10.10	0.3976	70	118	45	12	1	0625651	0625248
	10.20	0.4016	70	118	45	12	1	0614259	0613887
Y	10.26	0.4039	70	118	45	12	1	0041819	0041383
	10.30	0.4055	70	118	45	12	1	0614266	0613894
13/32	10.32	0.4063	70	118	45	12	1	0624067	0623657
	10.40	0.4094	70	118	45	12	1	0614273	0616130
Z	10.49	0.4130	70	118	45	12	1	0041826	0041390
	10.50	0.4134	70	118	45	12	1	0614280	0613900
	10.60	0.4173	70	118	45	12	1	0625668	0625255
27/64	10.72	0.4220	70	118	45	12	1	0624197	0623787
	10.80	0.4252	70	118	45	12	1	—	7361220
	11.00	0.4331	70	118	45	12	1	0614297	0613917
7/16	11.11	0.4374	70	118	45	12	1	0624364	0623954
	11.20	0.4409	70	118	45	12	1	0614303	0613924
	11.30	0.4449	70	118	45	12	1	—	7361221
	11.40	0.4488	70	118	45	12	1	0134597	0134375
	11.50	0.4528	70	118	45	12	1	0614310	0613931

FORCE X SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R454	R453
29/64	11.51	0.4531	70	118	45	12	1	0624203	0623794
	11.60	0.4567	70	118	45	12	1	0134603	0134382
	11.80	0.4646	70	118	45	12	1	0625675	0625262
15/32	11.91	0.4689	70	118	45	12	1	0624081	0623671
	12.00	0.4724	70	118	45	12	1	0614327	0613948
	12.05	0.4744	76	124	45	14	1	—	0625279
	12.10	0.4764	76	124	45	14	1	0625682	—
	12.20	0.4803	76	124	45	14	1	0614334	0613955
31/64	12.30	0.4843	76	124	45	14	1	0624241	0623831
	12.50	0.4921	76	124	45	14	1	0614341	0613962
	12.70	0.5000	76	124	45	14	1	0625699	0625286
1/2	12.70	0.5000	76	124	45	14	1	0624005	0623596
	12.80	0.5039	76	124	45	14	1	0134610	0134399
	13.00	0.5118	76	124	45	14	1	0614358	0613979
33/64	13.10	0.5157	76	124	45	14	1	0624258	0623848
	13.30	0.5236	76	124	45	14	1	—	7361222
17/32	13.49	0.5311	76	124	45	14	1	0624104	0623695
	13.50	0.5315	76	124	45	14	1	0614365	0613986
	13.80	0.5433	76	124	45	14	1	0134627	0134405
35/64	13.89	0.5469	76	124	45	14	1	0624265	0623855
	14.00	0.5512	76	124	45	14	1	0614372	0613993
	14.25	0.5610	82	133	48	16	1	0614389	0614006
9/16	14.29	0.5626	82	133	48	16	1	0624388	0623978
	14.50	0.5709	82	133	48	16	1	0614396	0614013
37/64	14.68	0.5780	82	133	48	16	1	0624272	0623862
	14.80	0.5827	82	133	48	16	1	0134634	0134412
	15.00	0.5906	82	133	48	16	1	0614402	0614020
19/32	15.08	0.5937	82	133	48	16	1	0624128	0623718
	15.10	0.5945	82	133	48	16	1	0625705	0625293
	15.30	0.6024	82	133	48	16	1	—	7361223
39/64	15.48	0.6094	82	133	48	16	1	0624289	0623879
	15.50	0.6102	82	133	48	16	1	0614419	0614037
	15.80	0.6220	82	133	48	16	1	0134641	0134429
5/8	15.88	0.6252	82	133	48	16	1	0624357	0623947
	16.00	0.6299	82	133	48	16	1	0614426	0614044
41/64	16.27	0.6406	91	143	48	18	1	0624296	0623886
	16.50	0.6496	91	143	48	18	1	0134658	0625309
21/32	16.67	0.6563	91	143	48	18	1	0624142	0623732
	17.00	0.6693	91	143	48	18	1	0134665	0625316
43/64	17.07	0.6720	91	143	48	18	1	0624302	0623893
11/16	17.46	0.6874	91	143	48	18	1	0624036	0623626
	17.50	0.6890	91	143	48	18	1	0134672	0625323
	17.80	0.7008	91	143	48	18	1	0134689	0134436
45/64	17.86	0.7031	91	143	48	18	1	0624319	0623909
	18.00	0.7087	91	143	48	18	1	0134696	0625330
23/32	18.26	0.7189	99	153	50	20	1	0624166	0623756
	18.50	0.7283	99	153	50	20	1	0134702	0625347
47/64	18.65	0.7343	99	153	50	20	1	0624326	0623916
	19.00	0.7480	99	153	50	20	1	0134719	0625354
3/4	19.05	0.7500	99	153	50	20	1	0624227	0623817
	19.50	0.7677	99	153	50	20	1	0134726	0625361
	19.80	0.7795	99	153	50	20	1	0134733	0134443
	20.00	0.7874	99	153	50	20	1	0134740	0625378

FORCE X SOLID CARBIDE DRILL

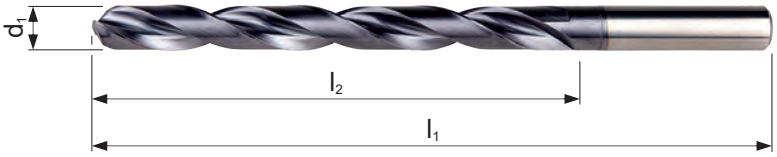
DORMER

Multi-Application, 8xD, Reinforced Shank

R459 Coolant through clears chips away from the cutting edge. Self centering 4-flute split point and CTW flute construction for enhanced penetration rates. TiAlN coating increases surface hardness, improves tool life at high RPM.

1.1 **1.2** **1.3** **1.4** **1.5** **1.6** **2.1** **2.2** **2.3** **3.1** **3.2** **3.3** **3.4**
6.1 **6.2** **6.3** **6.4** **7.1** **7.2** **7.3** **7.4**

High productivity in a wide range of materials



R459













Coolant Through

3.00 - 16.00

d_1 Øm_7 Inch	d_1 Øm_7 mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh_6 mm	Pack Qty	R459
	3.00	0.1181	37	79	36	6	1	46718973
	3.10	0.1220	37	79	36	6	1	46718974
1/8	3.18	0.1252	37	79	36	6	1	46718975
	3.20	0.1260	37	79	36	6	1	46718976
	3.30	0.1299	37	79	36	6	1	46718977
	3.40	0.1339	37	79	36	6	1	46718978
	3.50	0.1378	37	79	36	6	1	46718979
9/64	3.57	0.1406	37	79	36	6	1	46718990
	3.60	0.1417	37	79	36	6	1	46718991
	3.70	0.1457	37	79	36	6	1	46718992
	3.80	0.1496	48	90	36	6	1	46718993
	3.90	0.1535	48	90	36	6	1	46718994
5/32	3.97	0.1563	48	90	36	6	1	46718995
	4.00	0.1575	48	90	36	6	1	46718996
	4.10	0.1614	48	90	36	6	1	46718997
	4.20	0.1654	48	90	36	6	1	46718998
	4.30	0.1693	48	90	36	6	1	46718999
11/64	4.37	0.1720	48	90	36	6	1	46719000
	4.40	0.1732	48	90	36	6	1	46719001
	4.50	0.1772	48	90	36	6	1	46719002
	4.60	0.1811	48	90	36	6	1	46719003
	4.70	0.1850	62	104	36	6	1	46719004
3/16	4.76	0.1874	62	104	36	6	1	46719005
	4.80	0.1890	62	104	36	6	1	46719006
	4.90	0.1929	62	104	36	6	1	46719007
	5.00	0.1969	62	104	36	6	1	46719008
	5.10	0.2008	62	104	36	6	1	46719009
13/64	5.16	0.2031	62	104	36	6	1	46719010
	5.20	0.2047	62	104	36	6	1	46719011
	5.30	0.2087	62	104	36	6	1	46719012
	5.40	0.2126	62	104	36	6	1	46719013
	5.50	0.2165	62	104	36	6	1	46719014

FORCE X SOLID CARBIDE DRILL

d_1 $Øm_7$ Inch	d_1 $Øm_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $Øh_6$ mm	Pack Qty	R459
7/32	5.56	0.2189	62	104	36	6	1	46719015
	5.60	0.2205	62	104	36	6	1	46719016
	5.70	0.2244	62	104	36	6	1	46719017
	5.80	0.2283	62	104	36	6	1	46719018
	5.90	0.2323	62	104	36	6	1	46719019
15/64	5.95	0.2343	62	104	36	6	1	46719020
	6.00	0.2362	62	104	36	6	1	46719021
	6.10	0.2402	84	126	36	8	1	46719022
	6.20	0.2441	84	126	36	8	1	46719023
	6.30	0.2480	84	126	36	8	1	46719024
1/4	6.35	0.2500	84	126	36	8	1	46719025
	6.40	0.2520	84	126	36	8	1	46719026
	6.50	0.2559	84	126	36	8	1	46719027
	6.60	0.2598	84	126	36	8	1	46719028
	6.70	0.2638	84	126	36	8	1	46719029
17/64	6.75	0.2657	84	126	36	8	1	46719030
	6.80	0.2677	84	126	36	8	1	46719031
	6.90	0.2717	84	126	36	8	1	46719032
	7.00	0.2756	84	126	36	8	1	46719033
	7.10	0.2795	84	126	36	8	1	46719034
9/32	7.14	0.2811	84	126	36	8	1	46719035
	7.20	0.2835	84	126	36	8	1	46719036
	7.30	0.2874	84	126	36	8	1	46719037
	7.40	0.2913	84	126	36	8	1	46719038
	7.50	0.2953	84	126	36	8	1	46719039
19/64	7.54	0.2969	84	126	36	8	1	46719040
	7.60	0.2992	84	126	36	8	1	46719041
	7.70	0.3031	84	126	36	8	1	46719042
	7.80	0.3071	84	126	36	8	1	46719043
	7.90	0.3110	84	126	36	8	1	46719044
5/16	7.94	0.3126	84	126	36	8	1	46719045
	8.00	0.3150	84	126	36	8	1	46719046
	8.10	0.3189	106	152	40	10	1	46719047
	8.20	0.3228	106	152	40	10	1	46719048
	8.30	0.3268	106	152	40	10	1	46719049
21/64	8.33	0.3280	106	152	40	10	1	46719050
	8.40	0.3307	106	152	40	10	1	46719051
	8.50	0.3346	106	152	40	10	1	46719052
	8.60	0.3386	106	152	40	10	1	46719053
	8.70	0.3425	106	152	40	10	1	46719054
11/32	8.73	0.3437	106	152	40	10	1	46719055
	8.80	0.3465	106	152	40	10	1	46719056
	8.90	0.3504	106	152	40	10	1	46719057
	9.00	0.3543	106	152	40	10	1	46719058
	9.10	0.3583	106	152	40	10	1	46719059
23/64	9.13	0.3594	106	152	40	10	1	46719060
	9.20	0.3622	106	152	40	10	1	46719061
	9.30	0.3661	106	152	40	10	1	46719062
	9.40	0.3701	106	152	40	10	1	46719063
	9.50	0.3740	106	152	40	10	1	46719064
3/8	9.53	0.3748	106	152	40	10	1	46719065
	9.60	0.3780	106	152	40	10	1	46719066
	9.70	0.3819	106	152	40	10	1	46719067
	9.80	0.3858	106	152	40	10	1	46719068
	9.90	0.3898	106	152	40	10	1	46719069
25/64	9.92	0.3906	106	152	40	10	1	46719070
	10.00	0.3937	106	152	40	10	1	46719071
	10.20	0.4016	128	180	45	12	1	46719072
	10.30	0.4055	128	180	45	12	1	46719073
13/32	10.32	0.4063	128	180	45	12	1	46719074
	10.40	0.4094	128	180	45	12	1	46719075
	10.50	0.4134	128	180	45	12	1	46719076
27/64	10.72	0.4220	128	180	45	12	1	46719077
	10.80	0.4252	128	180	45	12	1	46719078

FORCE X SOLID CARBIDE DRILL

DORMER

d_1 Øm$_7$ Inch	d_1 Øm$_7$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh$_6$ mm	Pack Qty	R459
	11.00	0.4331	128	180	45	12	1	46719079
7/16	11.11	0.4374	128	180	45	12	1	46719080
	11.20	0.4409	128	180	45	12	1	46719081
	11.30	0.4449	128	180	45	12	1	46719082
	11.50	0.4528	128	180	45	12	1	46719083
29/64	11.51	0.4531	128	180	45	12	1	46719084
	11.80	0.4646	128	180	45	12	1	46719085
15/32	11.91	0.4689	128	180	45	12	1	46719086
	12.00	0.4724	128	180	45	12	1	46719087
	12.20	0.4803	151	202	48	14	1	46719088
31/64	12.30	0.4843	151	202	48	14	1	46719089
	12.50	0.4921	151	202	48	14	1	46719090
1/2	12.70	0.5000	151	202	48	14	1	46719091
	12.80	0.5039	151	202	48	14	1	46719092
	13.00	0.5118	151	202	48	14	1	46719093
33/64	13.10	0.5157	151	202	48	14	1	46719094
17/32	13.49	0.5311	151	202	48	14	1	46719095
	13.50	0.5315	151	202	48	14	1	46719096
35/64	13.89	0.5469	151	202	48	14	1	46719097
	14.00	0.5512	151	202	48	14	1	46719098
	14.25	0.5610	172	227	48	16	1	46719099
9/16	14.29	0.5626	172	227	48	16	1	46719100
	14.50	0.5709	172	227	48	16	1	46719101
37/64	14.68	0.5780	172	227	48	16	1	46719102
	15.00	0.5906	172	227	48	16	1	46719103
19/32	15.08	0.5937	172	227	48	16	1	46719104
	15.10	0.5945	172	227	48	16	1	46719105
39/64	15.48	0.6094	172	227	48	16	1	46719106
	15.50	0.6102	172	227	48	16	1	46719107
5/8	15.88	0.6252	172	227	48	16	1	46719108
	16.00	0.6299	172	227	48	16	1	46719109

ADX SCREW MACHINE DRILL

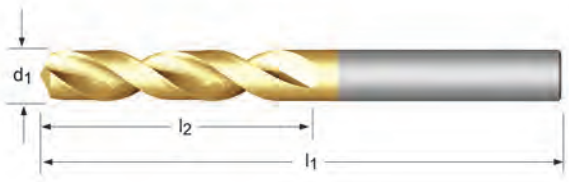
Multi-Application, Screw Machine Length

ADX

A520

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3

Low thrust design. Notched point improves chip formation for enhanced penetration rate. TiN coating increases wear resistance and improves tool life.



A520

DIN 1897

2.5XD

HSS

130°



3.00 - 13.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	3.00	0.1181	16	46	1	0038901
	3.10	0.1220	18	49	1	0038918
1/8	3.18	0.1250	18	49	1	0171264
	3.20	0.1260	18	49	1	0038925
	3.30	0.1299	18	49	1	0038932
	3.40	0.1339	20	52	1	0038949
	3.50	0.1378	20	52	1	0038956
9/64	3.57	0.1406	20	52	1	0171271
	3.60	0.1417	20	52	1	0038963
	3.70	0.1457	20	52	1	0038970
	3.80	0.1496	22	55	1	0038987
	3.90	0.1535	22	55	1	0038994
5/32	3.97	0.1563	22	55	1	0171288
	4.00	0.1575	22	55	1	0039007
	4.10	0.1614	22	55	1	0039014
	4.20	0.1654	22	55	1	0039021
	4.30	0.1693	24	58	1	0039038
11/64	4.37	0.1719	24	58	1	0171295
	4.40	0.1732	24	58	1	0039045
	4.50	0.1772	24	58	1	0039052
	4.60	0.1811	24	58	1	0039069
	4.70	0.1850	24	58	1	0039076
3/16	4.76	0.1875	26	62	1	0171301
	4.80	0.1890	26	62	1	0039083
	4.90	0.1929	26	62	1	0039090
	5.00	0.1969	26	62	1	0039106
	5.10	0.2008	26	62	1	0039113
13/64	5.16	0.2031	26	62	1	0171318
	5.20	0.2047	26	62	1	0039120
	5.30	0.2087	26	62	1	0039137
	5.40	0.2126	28	66	1	0039144
	5.50	0.2165	28	66	1	0039151
7/32	5.56	0.2188	28	66	1	0171325

ADX SCREW MACHINE DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	5.60	0.2205	28	66	1	0039168
	5.70	0.2244	28	66	1	0039175
	5.80	0.2283	28	66	1	0039182
	5.90	0.2323	28	66	1	0039199
15/64	5.95	0.2344	28	66	1	0171332
	6.00	0.2362	28	66	1	0039205
	6.10	0.2402	31	70	1	0039212
	6.20	0.2441	31	70	1	0039229
	6.30	0.2480	31	70	1	0039236
1/4	6.35	0.2500	31	70	1	0171349
	6.40	0.2520	31	70	1	0039243
	6.50	0.2559	31	70	1	0039250
	6.60	0.2598	31	70	1	0039267
	6.70	0.2638	31	70	1	0039274
17/64	6.75	0.2656	34	74	1	0171356
	6.80	0.2677	34	74	1	0039281
	6.90	0.2717	34	74	1	0039298
	7.00	0.2756	34	74	1	0039304
	7.10	0.2795	34	74	1	0039311
9/32	7.14	0.2812	34	74	1	0171363
	7.20	0.2835	34	74	1	0039328
	7.30	0.2874	34	74	1	0039335
	7.40	0.2913	34	74	1	0039342
	7.50	0.2953	34	74	1	0039359
19/64	7.54	0.2969	37	79	1	0171370
	7.60	0.2992	37	79	1	0039366
	7.70	0.3031	37	79	1	0039373
	7.80	0.3071	37	79	1	0039380
	7.90	0.3110	37	79	1	0039397
5/16	7.94	0.3125	37	79	1	0171387
	8.00	0.3150	37	79	1	0039403
	8.10	0.3189	37	79	1	0039410
	8.20	0.3228	37	79	1	0039427
	8.30	0.3268	37	79	1	0039434
21/64	8.33	0.3281	37	79	1	0171394
	8.40	0.3307	37	79	1	0039441
	8.50	0.3346	37	79	1	0039458
	8.60	0.3386	40	84	1	0039465
	8.70	0.3425	40	84	1	0039472
11/32	8.73	0.3437	40	84	1	0171400
	8.80	0.3465	40	84	1	0039489
	8.90	0.3504	40	84	1	0039496
	9.00	0.3543	40	84	1	0039502
	9.10	0.3583	40	84	1	0039519
23/64	9.13	0.3594	40	84	1	0171417
	9.20	0.3622	40	84	1	0039526
	9.30	0.3661	40	84	1	0039533
	9.40	0.3701	40	84	1	0039540
	9.50	0.3740	40	84	1	0039557
3/8	9.52	0.3750	43	89	1	0171424
	9.60	0.3780	43	89	1	0039564
	9.70	0.3819	43	89	1	0039571
	9.80	0.3858	43	89	1	0039588
	9.90	0.3898	43	89	1	0039595
25/64	9.92	0.3906	43	89	1	0171431
	10.00	0.3937	43	89	1	0038598
	10.10	0.3976	43	89	1	0038604
	10.20	0.4016	43	89	1	0038611
	10.30	0.4055	43	89	1	0038628
13/32	10.32	0.4063	43	89	1	0171448
	10.40	0.4094	43	89	1	0038635
	10.50	0.4134	43	89	1	0038642
	10.60	0.4173	43	89	1	0038659
	10.70	0.4213	47	95	1	0038666
27/64	10.72	0.4219	47	95	1	0171455
	10.80	0.4252	47	95	1	0038673

ADX SCREW MACHINE DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A520
	10.90	0.4291	47	95	1	0038680
	11.00	0.4331	47	95	1	0038697
	11.10	0.4370	47	95	1	0038703
7/16	11.11	0.4375	47	95	1	0171462
	11.20	0.4409	47	95	1	0038710
	11.30	0.4449	47	95	1	0038727
	11.40	0.4488	47	95	1	0038734
	11.50	0.4528	47	95	1	0038741
29/64	11.51	0.4531	47	95	1	0171479
	11.60	0.4567	47	95	1	0038758
	11.70	0.4606	47	95	1	0038765
	11.80	0.4646	47	95	1	0038772
	11.90	0.4685	51	102	1	0038789
15/32	11.91	0.4688	51	102	1	0171486
	12.00	0.4724	51	102	1	0038796
	12.10	0.4764	51	102	1	0038802
	12.20	0.4803	51	102	1	0038819
	12.30	0.4843	51	102	1	0038826
31/64	12.30	0.4843	51	102	1	0171493
	12.40	0.4882	51	102	1	0038833
	12.50	0.4921	51	102	1	0038840
	12.60	0.4961	51	102	1	0038857
	12.70	0.5000	51	102	1	0038864
1/2	12.70	0.5000	51	102	1	0171509
	12.80	0.5039	51	102	1	0038871
	12.90	0.5079	51	102	1	0038888
	13.00	0.5118	51	102	1	0038895

PFX SCREW MACHINE DRILL

DORMER

Multi-Application, Premium Cobalt Screw Machine Length - Parabolic Flute

for Advanced Chip Removal

A920

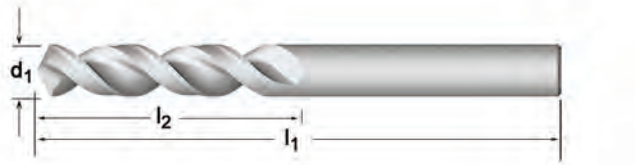
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

A921

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched Point improves chip formation. Premium cobalt base material combined with AlCrN-Top coating increases lubricity and wear resistance which improves tool life.



PFX

A920	A921
DIN ANSI	DIN ANSI
3XD	3XD
HSS-E	HSS-E
130°	130°
	
1.00 - 20.00	2.50 - 16.00

d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	1.00	0.0394	6	26	1	0050217	—
	1.10	0.0433	7	28	1	0050262	—
3/64	1.19	0.0469	13	35	1	0211427	—
	1.20	0.0472	8	30	1	0050309	—
	1.25	0.0492	8	30	1	0211434	—
	1.30	0.0512	8	30	1	0050316	—
	1.35	0.0531	9	32	1	0211458	—
	1.40	0.0551	9	32	1	0050323	—
	1.50	0.0591	9	32	1	0050347	—
	1.55	0.0610	10	34	1	0211489	—
1/16	1.59	0.0625	16	41	1	0050644	—
	1.60	0.0630	10	34	1	0050668	—
	1.70	0.0669	10	34	1	0050675	—
	1.75	0.0689	11	36	1	0211502	—
	1.80	0.0709	11	36	1	0050682	—
	1.90	0.0748	11	36	1	0050699	—
5/64	1.98	0.0781	17	43	1	0050705	—
	2.00	0.0787	12	38	1	0050712	—
	2.10	0.0827	12	38	1	0050729	—
	2.15	0.0846	13	40	1	0211571	—
	2.20	0.0866	13	40	1	0050743	—
	2.30	0.0906	13	40	1	0050750	—
	2.35	0.0925	14	43	1	0211601	—
3/32	2.38	0.0937	19	41	1	0050767	—
	2.40	0.0945	14	43	1	0050781	—
	2.50	0.0984	14	43	1	0050804	0052488
	2.60	0.1024	14	43	1	0050811	0052495
	2.70	0.1063	16	46	1	0050828	0212509
7/64	2.78	0.1094	21	46	1	0050835	0212523
	2.80	0.1102	16	46	1	0050842	—
	2.90	0.1142	16	46	1	0050859	0212561
	3.00	0.1181	16	46	1	0050866	0052501
	3.10	0.1220	18	49	1	0050873	0052518

PFX SCREW MACHINE DRILL

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
1/8	3.18	0.1250	22	48	1	0050880	0212592
	3.20	0.1260	18	49	1	0050897	0052525
	3.30	0.1299	18	49	1	0050903	0052532
	3.40	0.1339	20	52	1	0050910	0052549
	3.50	0.1378	20	52	1	0050927	0052556
9/64	3.57	0.1406	24	49	1	0050934	0212622
	3.60	0.1417	20	52	1	0050941	0052563
	3.70	0.1457	20	52	1	0050958	0052570
	3.80	0.1496	22	55	1	0050965	0052587
	3.90	0.1535	22	55	1	0050972	0052594
5/32	3.97	0.1563	25	52	1	0050989	0212677
	4.00	0.1575	22	55	1	0051009	0052600
	4.10	0.1614	22	55	1	0051016	0052617
	4.20	0.1654	22	55	1	0051023	0052624
	4.30	0.1693	24	58	1	0051030	0052631
11/64	4.37	0.1719	27	54	1	0051047	0286012
	4.40	0.1732	24	58	1	0051054	0052648
	4.50	0.1772	24	58	1	0051061	0052655
	4.60	0.1811	24	58	1	0051078	0052662
	4.70	0.1850	24	58	1	0051085	0052679
3/16	4.76	0.1875	29	56	1	0051092	0335635
	4.80	0.1890	26	62	1	0051108	0052686
	4.90	0.1929	26	62	1	0051115	0052693
	5.00	0.1969	26	62	1	0051122	0052709
	5.10	0.2008	26	62	1	0051139	0052716
13/64	5.16	0.2031	30	57	1	0051146	0441336
	5.20	0.2047	26	62	1	0051153	0052723
	5.30	0.2087	26	62	1	0051160	0052730
	5.40	0.2126	28	66	1	0051177	0052747
	5.50	0.2165	28	66	1	0051191	0052754
7/32	5.56	0.2188	32	60	1	0051207	0632956
	5.60	0.2205	28	66	1	0051214	0052761
	5.70	0.2244	28	66	1	0051221	0052778
	5.80	0.2283	28	66	1	0051238	0052785
	5.90	0.2323	28	66	1	0051245	0052792
15/64	5.95	0.2344	33	62	1	0051269	0632994
	6.00	0.2362	28	66	1	0051276	0052808
	6.10	0.2402	31	70	1	0051283	0052815
	6.20	0.2441	31	70	1	0051290	0052822
	6.30	0.2480	31	70	1	0051306	0052839
1/4	6.35	0.2500	35	64	1	0051313	0633038
	6.40	0.2520	31	70	1	0051320	0052846
	6.50	0.2559	31	70	1	0051337	0052853
	6.60	0.2598	31	70	1	0051344	0052860
	6.70	0.2638	31	70	1	0051351	0052877
17/64	6.75	0.2656	37	67	1	0051368	0633069
	6.80	0.2677	34	74	1	0051375	0052884
	6.90	0.2717	34	74	1	0051382	0052891
	7.00	0.2756	34	74	1	0051429	0052907
	7.10	0.2795	34	74	1	0051436	0052914
9/32	7.14	0.2812	38	68	1	0051443	0633106
	7.20	0.2835	34	74	1	0051450	0052921
	7.30	0.2874	34	74	1	0051467	0052938
	7.40	0.2913	34	74	1	0051474	0052945
	7.50	0.2953	34	74	1	0051481	0052952
19/64	7.54	0.2969	40	70	1	0051498	0633137
	7.60	0.2992	37	79	1	0051504	0052969
	7.70	0.3031	37	79	1	0051511	0052976
	7.80	0.3071	37	79	1	0051528	0053089
	7.90	0.3110	37	79	1	0051535	0053096
5/16	7.94	0.3125	41	71	1	0051542	0633151
	8.00	0.3150	37	79	1	0051566	0053102
	8.10	0.3189	37	79	1	0051580	0053119
	8.20	0.3228	37	79	1	0051603	0053133
	8.30	0.3268	37	79	1	0051610	0053157
21/64	8.33	0.3281	43	75	1	0051627	0633175

PFX SCREW MACHINE DRILL

DORMER

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	8.40	0.3307	37	79	1	0051634	0053249
	8.50	0.3346	37	79	1	0051658	0053256
	8.60	0.3386	40	84	1	0051665	0053263
	8.70	0.3425	40	84	1	0051672	0053270
11/32	8.73	0.3437	43	76	1	0051689	0633205
	8.80	0.3465	40	84	1	0051702	0053287
	8.90	0.3504	40	84	1	0051719	0053294
	9.00	0.3543	40	84	1	0051726	0053300
	9.10	0.3583	40	84	1	0051733	0053317
23/64	9.13	0.3594	44	78	1	0051740	0633236
	9.20	0.3622	40	84	1	0051757	0053324
	9.30	0.3661	40	84	1	0051764	0053331
	9.40	0.3701	40	84	1	0051771	0053348
	9.50	0.3740	40	84	1	0051788	0053355
3/8	9.52	0.3750	46	79	1	0051795	0633250
	9.60	0.3780	43	89	1	0051801	0053362
	9.70	0.3819	43	89	1	0051818	0053379
	9.80	0.3858	43	89	1	0051825	0053386
	9.90	0.3898	43	89	1	0051832	0053393
25/64	9.92	0.3906	48	83	1	0051849	0633274
	10.00	0.3937	43	89	1	0051856	0053409
	10.20	0.4016	43	89	1	0051863	0053416
	10.30	0.4055	43	89	1	0051870	0053423
13/32	10.32	0.4063	49	84	1	0051887	0633304
	10.50	0.4134	43	89	1	0051900	0053447
27/64	10.72	0.4219	51	86	1	0051917	0633328
	10.80	0.4252	47	95	1	0051924	0053454
	11.00	0.4331	47	95	1	0051931	0053461
7/16	11.11	0.4375	52	87	1	0051948	0633342
	11.50	0.4528	47	95	1	0051962	0053485
29/64	11.51	0.4531	54	90	1	0051979	0633366
	11.80	0.4646	47	95	1	0051986	0053492
15/32	11.91	0.4688	54	92	1	0051993	0633373
	12.00	0.4724	51	102	1	0052006	0053508
	12.20	0.4803	51	102	1	0052013	—
31/64	12.30	0.4843	56	94	1	0052020	0633380
	12.50	0.4921	51	102	1	0052037	0053522
1/2	12.70	0.5000	57	95	1	0052044	0633397
	13.00	0.5118	51	102	1	0052068	0053546
33/64	13.10	0.5156	60	98	1	0212257	0633410
	13.50	0.5315	54	107	1	0052075	0053553
35/64	13.89	0.5469	64	102	1	0212264	0633427
	14.00	0.5512	54	107	1	0052082	0053560
9/16	14.29	0.5625	64	102	1	0212271	0633434
	14.50	0.5709	56	111	1	0052099	0053577
37/64	14.68	0.5781	67	105	1	0212288	0633441
	14.75	0.5807	56	111	1	0212295	0633458
	15.00	0.5906	56	111	1	0052105	0053584
19/32	15.08	0.5937	67	105	1	0212301	0633465
39/64	15.48	0.6094	70	108	1	0212318	0633472
	15.50	0.6102	58	115	1	0052112	0053591
5/8	15.88	0.6250	70	108	1	0212325	0633489
	16.00	0.6299	58	115	1	0052129	0053607
41/64	16.27	0.6406	73	114	1	0212332	—
	16.50	0.6496	60	119	1	0212349	—
21/32	16.67	0.6563	73	114	1	0212356	—
	16.75	0.6594	60	119	1	0212363	—
	17.00	0.6693	60	119	1	0052136	—
43/64	17.07	0.6719	73	117	1	0212370	—
11/16	17.46	0.6875	73	117	1	0212387	—
	17.50	0.6890	62	123	1	0052143	—
45/64	17.86	0.7031	76	121	1	0212394	—
	18.00	0.7087	62	123	1	0052457	—
23/32	18.26	0.7188	76	121	1	0212400	—
	18.50	0.7283	64	127	1	0212417	—
47/64	18.65	0.7344	79	127	1	0212424	—

PFX SCREW MACHINE DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A920	A921
	19.00	0.7480	64	127	1	0052464	—
3/4	19.05	0.7500	79	127	1	0212431	—
49/64	19.45	0.7656	83	130	1	0212448	—
	19.50	0.7677	66	131	1	0212455	—
25/32	19.84	0.7813	83	130	1	0212462	—
	20.00	0.7874	66	131	1	0052471	—

ADX JOBBER LENGTH DRILL

DORMER

Multi-Application, Jobber Length

ADX

A510

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3

Low thrust design. Notched point improves chip formation for enhanced penetration rate. TiN coating increases wear resistance and improves tool life.



A510

DIN 338

4XD

HSS

130°



3.00 - 14.00

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	3.00	0.1181	33	61	1	0036495
	3.10	0.1220	36	65	1	0036501
1/8	3.18	0.1250	36	65	1	0168974
	3.20	0.1260	36	65	1	0036518
	3.30	0.1299	36	65	1	0036525
	3.40	0.1339	39	70	1	0036532
	3.50	0.1378	39	70	1	0036549
9/64	3.57	0.1406	39	70	1	0168981
	3.60	0.1417	39	70	1	0036556
	3.70	0.1457	39	70	1	0036563
	3.80	0.1496	43	75	1	0036570
	3.90	0.1535	43	75	1	0036587
5/32	3.97	0.1563	43	75	1	0168998
	4.00	0.1575	43	75	1	0036594
	4.10	0.1614	43	75	1	0036600
	4.20	0.1654	43	75	1	0036617
	4.30	0.1693	47	80	1	0036624
11/64	4.37	0.1719	47	80	1	0169001
	4.40	0.1732	47	80	1	0036631
	4.50	0.1772	47	80	1	0036648
	4.60	0.1811	47	80	1	0036655
	4.70	0.1850	47	80	1	0036662
3/16	4.76	0.1875	52	86	1	0169018
	4.80	0.1890	52	86	1	0036679
	4.90	0.1929	52	86	1	0036686
	5.00	0.1969	52	86	1	0036693
	5.10	0.2008	52	86	1	0036709
13/64	5.16	0.2031	52	86	1	0169025
	5.20	0.2047	52	86	1	0036716
	5.30	0.2087	52	86	1	0036723
	5.40	0.2126	57	93	1	0036730
	5.50	0.2165	57	93	1	0036747
7/32	5.56	0.2188	57	93	1	0169032

ADX JOBBER LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	5.60	0.2205	57	93	1	0036754
	5.70	0.2244	57	93	1	0036761
	5.80	0.2283	57	93	1	0036778
	5.90	0.2323	57	93	1	0036785
15/64	5.95	0.2344	57	93	1	0169049
	6.00	0.2362	57	93	1	0036792
	6.10	0.2402	63	101	1	0036808
	6.20	0.2441	63	101	1	0036815
	6.30	0.2480	63	101	1	0036822
1/4	6.35	0.2500	63	101	1	0169056
	6.40	0.2520	63	101	1	0036839
	6.50	0.2559	63	101	1	0036846
	6.60	0.2598	63	101	1	0036853
	6.70	0.2638	63	101	1	0036860
17/64	6.75	0.2656	69	109	1	0169063
	6.80	0.2677	69	109	1	0036877
	6.90	0.2717	69	109	1	0036884
	7.00	0.2756	69	109	1	0036891
	7.10	0.2795	69	109	1	0036907
9/32	7.14	0.2812	69	109	1	0169070
	7.20	0.2835	69	109	1	0036914
	7.30	0.2874	69	109	1	0036921
	7.40	0.2913	69	109	1	0036938
	7.50	0.2953	69	109	1	0036945
19/64	7.54	0.2969	75	117	1	0169087
	7.60	0.2992	75	117	1	0036952
	7.70	0.3031	75	117	1	0036969
	7.80	0.3071	75	117	1	0036976
	7.90	0.3110	75	117	1	0036983
5/16	7.94	0.3125	75	117	1	0169094
	8.00	0.3150	75	117	1	0036990
	8.10	0.3189	75	117	1	0037003
	8.20	0.3228	75	117	1	0037010
	8.30	0.3268	75	117	1	0037027
21/64	8.33	0.3281	75	117	1	0169100
	8.40	0.3307	75	117	1	0037034
	8.50	0.3346	75	117	1	0037041
	8.60	0.3386	81	125	1	0037058
	8.70	0.3425	81	125	1	0037065
11/32	8.73	0.3437	81	125	1	0169117
	8.80	0.3465	81	125	1	0037072
	8.90	0.3504	81	125	1	0037089
	9.00	0.3543	81	125	1	0037096
	9.10	0.3583	81	125	1	0037102
23/64	9.13	0.3594	81	125	1	0169124
	9.20	0.3622	81	125	1	0037119
	9.30	0.3661	81	125	1	0037126
	9.40	0.3701	81	125	1	0037133
	9.50	0.3740	81	125	1	0037140
3/8	9.52	0.3750	87	133	1	0169131
	9.60	0.3780	87	133	1	0037157
	9.70	0.3819	87	133	1	0037164
	9.80	0.3858	87	133	1	0037171
	9.90	0.3898	87	133	1	0037188
25/64	9.92	0.3906	87	133	1	0169148
	10.00	0.3937	87	133	1	0036174
	10.10	0.3976	87	133	1	0036181
	10.20	0.4016	87	133	1	0036198
	10.30	0.4055	87	133	1	0036204
13/32	10.32	0.4063	87	133	1	0169155
	10.40	0.4094	87	133	1	0036211
	10.50	0.4134	87	133	1	0036228
	10.60	0.4173	87	133	1	0036235
	10.70	0.4213	94	142	1	0036242
27/64	10.72	0.4219	94	142	1	0169162
	10.80	0.4252	94	142	1	0036259

ADX JOBBER LENGTH DRILL

DORMER

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A510
	10.90	0.4291	94	142	1	0036266
	11.00	0.4331	94	142	1	0036273
	11.10	0.4370	94	142	1	0036280
7/16	11.11	0.4375	94	142	1	0169179
	11.20	0.4409	94	142	1	0036297
	11.30	0.4449	94	142	1	0036303
	11.40	0.4488	94	142	1	0036310
	11.50	0.4528	94	142	1	0036327
29/64	11.51	0.4531	94	142	1	0169186
	11.60	0.4567	94	142	1	0036334
	11.70	0.4606	94	142	1	0036341
	11.80	0.4646	94	142	1	0036358
	11.90	0.4685	101	151	1	0036365
15/32	11.91	0.4688	101	151	1	0169193
	12.00	0.4724	101	151	1	0036372
	12.10	0.4764	101	151	1	0036389
	12.20	0.4803	101	151	1	0036396
	12.30	0.4843	101	151	1	0036402
31/64	12.30	0.4843	101	151	1	0169209
	12.40	0.4882	101	151	1	0036419
	12.50	0.4921	101	151	1	0036426
	12.60	0.4961	101	151	1	0036433
	12.70	0.5000	101	151	1	0036440
1/2	12.70	0.5000	101	151	1	0169216
	12.80	0.5039	101	151	1	0036457
	12.90	0.5079	101	151	1	0036464
	13.00	0.5118	101	151	1	0036471
	14.00	0.5512	108	160	1	0036488

ADX STANDARD LENGTH DRILL

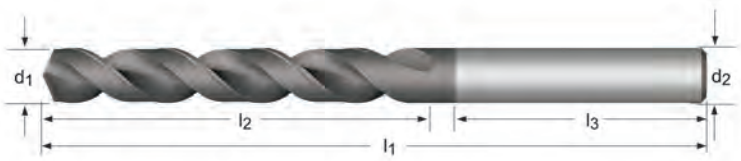
Multi-Application, Premium Cobalt Coolant Feed w/ Reinforced Shank

ADX

A553

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1		

Notched point improves chip formation. Low thrust design. Cobalt base material & TiAlN-Top coating increases wear resistance and improves tool life.



A553

DORMER

5XD

HSS-E

130°



5.00 - 20.00

d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 $\emptyset h_6$ mm	Pack Qty	A553
5.00	0.1969	36	79	36	6	1	0391204
5.20	0.2047	38	79	36	6	1	0391228
5.50	0.2165	40	79	36	6	1	0391242
6.00	0.2362	43	79	36	6	1	0391280
6.30	0.2480	46	87	36	8	1	0391297
6.50	0.2559	47	87	36	8	1	0391303
6.80	0.2677	48	87	36	8	1	0391327
6.90	0.2717	48	87	36	8	1	0391334
7.00	0.2756	48	87	36	8	1	0391341
7.40	0.2913	54	94	36	8	1	0391365
7.50	0.2953	54	94	36	8	1	0391372
8.00	0.3150	58	94	36	8	1	0391402
8.50	0.3346	75	130	40	10	1	0391419
8.70	0.3425	75	130	40	10	1	0391426
9.00	0.3543	75	130	40	10	1	0391433
9.50	0.3740	75	130	40	10	1	0391457
10.00	0.3937	75	130	40	10	1	0390795
10.20	0.4016	87	150	45	12	1	0390801
10.30	0.4055	87	150	45	12	1	0390818
10.50	0.4134	87	150	45	12	1	0390825
11.00	0.4330	94	150	45	12	1	0390849
11.30	0.4449	94	150	45	12	1	0390856
11.50	0.4528	94	150	45	12	1	0390863
12.00	0.4724	94	150	45	12	1	0390870
12.50	0.4921	101	160	45	14	1	0390887
13.00	0.5118	101	160	45	14	1	0390894
13.50	0.5315	101	160	45	14	1	0390924
14.00	0.5512	101	160	45	14	1	0390948
14.25	0.5610	108	170	48	16	1	0390955
14.50	0.5709	108	170	48	16	1	0390962
15.00	0.5906	108	170	48	16	1	0390986
15.25	0.6004	108	170	48	16	1	0391006
15.50	0.6102	108	170	48	16	1	0391013

ADX STANDARD LENGTH DRILL

DORMER

d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	l_3 mm	d_2 Øh$_6$ mm	Pack Qty	A553
16.00	0.6299	108	170	48	16	1	0391037
16.50	0.6496	125	190	48	18	1	0391051
17.00	0.6693	125	190	48	18	1	0391075
17.50	0.6890	130	190	48	18	1	0391099
17.75	0.6988	130	190	48	18	1	0391105
18.00	0.7087	130	190	48	18	1	0391112
19.00	0.7480	135	200	50	20	1	0391150
19.25	0.7579	140	200	50	20	1	0391167
20.00	0.7874	140	200	50	20	1	0391198

PFX JOBBER LENGTH DRILL

Premium Cobalt Jobber Length - Parabolic Flute *for Advanced Chip Removal*

PFX

A900

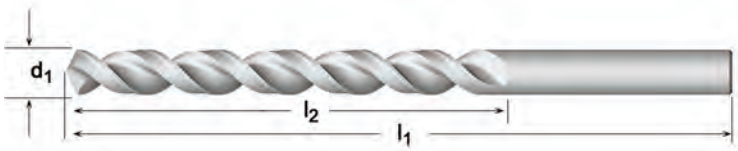
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched Point improves chip formation. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

A901

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium Cobalt base material combined with AlCrN-Top coating increases lubricity and wear resistance which improves tool life.



A900	A901
DIN ANSI	DIN ANSI
6XD	6XD
HSS-E	HSS-E
130°	130°
	
1.00 - 20.00	1.50 - 16.00

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	1.00	0.0394	12	34	1	0046289	—
	1.10	0.0433	14	36	1	0046296	—
3/64	1.19	0.0469	19	44	1	0633540	—
	1.20	0.0472	16	38	1	0046302	—
	1.25	0.0492	16	36	1	0633557	—
	1.30	0.0512	16	38	1	0046319	—
	1.40	0.0551	18	40	1	0046326	—
	1.50	0.0591	18	40	1	0046333	0047781
	1.55	0.0610	20	43	1	0633601	0634547
1/16	1.59	0.0625	22	48	1	0046340	0634554
	1.60	0.0630	20	43	1	0046357	0634561
	1.70	0.0669	20	43	1	0046364	—
	1.75	0.0689	22	46	1	0633625	0634592
	1.80	0.0709	22	46	1	0046371	0634615
	1.90	0.0748	22	46	1	0046388	0634639
5/64	1.98	0.0781	25	51	1	0046395	0634653
	2.00	0.0787	24	49	1	0046401	0047798
	2.10	0.0827	24	49	1	0046418	0634691
	2.15	0.0846	27	53	1	0633694	0634707
	2.20	0.0866	27	53	1	0046425	—
	2.30	0.0906	27	53	1	0046432	—
3/32	2.38	0.0937	32	57	1	0046449	0634752
	2.40	0.0945	30	57	1	0046456	0634769
	2.50	0.0984	30	57	1	0046463	0047804
	2.60	0.1024	30	57	1	0046470	0047811
	2.70	0.1063	33	61	1	0046487	0634820
7/64	2.78	0.1094	38	67	1	0046494	0634844
	2.80	0.1102	33	61	1	0046500	—
	2.90	0.1142	33	61	1	0046517	0634882
	3.00	0.1181	33	61	1	0046524	0047828
	3.10	0.1220	36	65	1	0046531	0047835
1/8	3.18	0.1250	41	70	1	0046548	0634912
	3.20	0.1260	36	65	1	0046555	0047842
	3.30	0.1299	36	65	1	0046562	0047859

PFX JOBBER LENGTH DRILL

DORMER

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	3.40	0.1339	39	70	1	0046579	0047866
	3.50	0.1378	39	70	1	0046586	0047873
9/64	3.57	0.1406	44	73	1	0046593	0634943
	3.60	0.1417	39	70	1	0046609	0047880
	3.70	0.1457	39	70	1	0046616	0047897
	3.80	0.1496	43	75	1	0046623	0047903
	3.90	0.1535	43	75	1	0046630	0047910
5/32	3.97	0.1563	51	79	1	0046647	0634998
	4.00	0.1575	43	75	1	0046654	0047927
	4.10	0.1614	43	75	1	0046661	0047934
	4.20	0.1654	43	75	1	0046678	0047941
	4.30	0.1693	47	80	1	0046685	0047958
11/64	4.37	0.1719	54	83	1	0046692	0635056
	4.40	0.1732	47	80	1	0046708	0047965
	4.50	0.1772	47	80	1	0046715	0047972
	4.60	0.1811	47	80	1	0046722	0047989
	4.70	0.1850	47	80	1	0046739	0047996
3/16	4.76	0.1875	59	89	1	0046746	0635094
	4.80	0.1890	52	86	1	0046753	0048009
	4.90	0.1929	52	86	1	0046760	0048016
	5.00	0.1969	52	86	1	0046777	0048023
	5.10	0.2008	52	86	1	0046784	0048030
13/64	5.16	0.2031	62	92	1	0046807	0635155
	5.20	0.2047	52	86	1	0046814	0048047
	5.30	0.2087	52	86	1	0046821	0048054
	5.40	0.2126	57	93	1	0046838	0048061
	5.50	0.2165	57	93	1	0046845	0048078
7/32	5.56	0.2188	64	95	1	0046852	0635209
	5.60	0.2205	57	93	1	0046869	0048085
	5.70	0.2244	57	93	1	0046876	0048092
	5.80	0.2283	57	93	1	0046883	0048108
	5.90	0.2323	57	93	1	0046890	0048115
15/64	5.95	0.2344	67	98	1	0046906	0635247
	6.00	0.2362	57	93	1	0046913	0048122
	6.10	0.2402	63	101	1	0046920	0048139
	6.20	0.2441	63	101	1	0046937	0048146
	6.30	0.2480	63	101	1	0046944	0048153
1/4	6.35	0.2500	70	102	1	0046951	0635285
	6.40	0.2520	63	101	1	0046968	0048160
	6.50	0.2559	63	101	1	0046975	0048177
	6.60	0.2598	63	101	1	0046999	0048184
	6.70	0.2638	63	101	1	0047002	0048191
17/64	6.75	0.2656	73	105	1	0047019	0635315
	6.80	0.2677	69	109	1	0047026	0048207
	6.90	0.2717	69	109	1	0047033	0048214
	7.00	0.2756	69	109	1	0047057	0048221
	7.10	0.2795	69	109	1	0047064	0048238
9/32	7.14	0.2812	75	108	1	0047071	0635353
	7.20	0.2835	69	109	1	0047088	0048245
	7.30	0.2874	69	109	1	0047095	0048252
	7.40	0.2913	69	109	1	0047101	0048269
	7.50	0.2953	69	109	1	0047118	0048276
19/64	7.54	0.2969	78	111	1	0047125	0635384
	7.60	0.2992	75	117	1	0047132	0048283
	7.70	0.3031	75	117	1	0047149	0048290
	7.80	0.3071	75	117	1	0047156	0048306
	7.90	0.3110	75	117	1	0047163	0048313
5/16	7.94	0.3125	81	114	1	0047170	0635407
	8.00	0.3150	75	117	1	0047187	0048320
	8.10	0.3189	75	117	1	0047194	0048337
	8.20	0.3228	75	117	1	0047200	0048344
	8.30	0.3268	75	117	1	0047217	0048351
21/64	8.33	0.3280	84	117	1	0047224	0635421
	8.40	0.3307	75	117	1	0047231	0048368
	8.50	0.3346	75	117	1	0047255	0048375
	8.60	0.3386	81	125	1	0047262	0048382

PFX JOBBER LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A900	A901
	8.70	0.3425	81	125	1	0047286	0048399
11/32	8.73	0.3437	87	121	1	0047293	0635452
	8.80	0.3465	81	125	1	0047309	0048405
	8.90	0.3504	81	125	1	0047316	0048412
	9.00	0.3543	81	125	1	0047323	0048429
	9.10	0.3583	81	125	1	0047330	0048436
23/64	9.13	0.3594	89	124	1	0047347	0635483
	9.20	0.3622	81	125	1	0047354	0048443
	9.30	0.3661	81	125	1	0047361	0048450
	9.40	0.3701	81	125	1	0047378	0048467
	9.50	0.3740	81	125	1	0047385	0048474
3/8	9.52	0.3750	92	127	1	0047392	0635506
	9.60	0.3780	87	133	1	0047408	0048481
	9.70	0.3819	87	133	1	0047415	0048498
	9.80	0.3858	87	133	1	0047422	0048504
	9.90	0.3898	87	133	1	0047439	0048627
25/64	9.92	0.3906	95	130	1	0047446	0635520
	10.00	0.3937	87	133	1	0047453	0048641
	10.20	0.4016	87	133	1	0047460	0048863
	10.30	0.4055	87	133	1	0047477	0048870
13/32	10.32	0.4063	98	133	1	0047484	0635551
	10.40	0.4094	87	133	1	0047491	0048955
	10.50	0.4134	87	133	1	0047507	0049013
27/64	10.72	0.4219	100	137	1	0047514	0635575
	10.80	0.4252	94	142	1	0047521	0049198
	11.00	0.4331	94	142	1	0047538	0049235
7/16	11.11	0.4375	103	140	1	0047545	0635599
	11.50	0.4528	94	142	1	0047569	0049280
29/64	11.51	0.4531	106	143	1	0047576	0635612
	11.80	0.4646	94	142	1	0047583	0049297
15/32	11.91	0.4688	110	146	1	0047590	0635629
	12.00	0.4724	101	151	1	0047606	0049303
31/64	12.30	0.4843	111	149	1	0047620	0635636
	12.50	0.4921	101	151	1	0047637	0049594
1/2	12.70	0.5000	101	151	1	0047644	46073789
	13.00	0.5118	101	151	1	0047668	0049655
33/64	13.10	0.5156	122	168	1	0634318	0635650
	13.50	0.5315	108	160	1	0047675	0049662
35/64	13.89	0.5469	122	168	1	0634325	0635667
	14.00	0.5512	108	160	1	0047682	0049686
9/16	14.29	0.5625	122	168	1	0634332	0635674
	14.50	0.5709	114	169	1	0047699	0049709
37/64	14.68	0.5781	122	168	1	0634349	0635681
	15.00	0.5906	114	169	1	0047705	0049723
19/32	15.08	0.5937	132	181	1	0634363	0635704
39/64	15.48	0.6094	132	181	1	0634370	0635711
	15.50	0.6102	120	178	1	0047712	0050132
5/8	15.88	0.6250	132	181	1	0634387	0635728
	16.00	0.6299	120	178	1	0047729	0050170
41/64	16.27	0.6406	132	181	1	0634394	—
	16.50	0.6496	125	184	1	0634400	—
21/32	16.67	0.6562	132	181	1	0634417	—
	17.00	0.6693	125	184	1	0047736	—
43/64	17.07	0.6719	143	194	1	0634431	—
11/16	17.46	0.6875	143	194	1	0634448	—
	17.50	0.6890	130	191	1	0047743	—
45/64	17.86	0.7031	130	191	1	0634455	—
	18.00	0.7087	130	191	1	0047750	—
23/32	18.26	0.7187	130	191	1	0634462	—
	18.50	0.7283	135	198	1	0634479	—
47/64	18.65	0.7344	135	198	1	0634486	—
	19.00	0.7480	135	198	1	0047767	—
3/4	19.05	0.7500	135	198	1	0634493	—
49/64	19.45	0.7656	135	198	1	0634509	—
	19.50	0.7677	140	205	1	0634516	—
25/32	19.84	0.7812	140	205	1	0634523	—
	20.00	0.7874	140	205	1	0047774	—

PFX TAPER LENGTH DRILL

DORMER

Premium Cobalt, Taper Length - Parabolic Flute *for Advanced Chip Removal*

PFX

A940

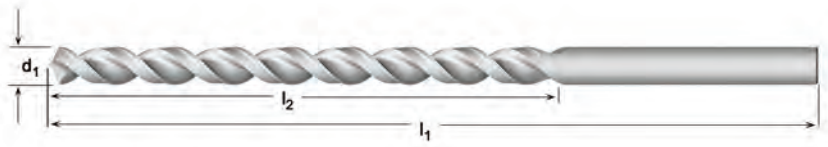
1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 2.1 | 2.2 | 2.3 | 3.2 | 3.3 | 3.4 | 4.1 | 4.2 | 4.3
6.1 | 6.2 | 6.3 | 6.4 | 7.1 | 7.2 | 7.3 | 7.4 | 8.1 | 8.2

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

A941

1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 2.1 | 2.2 | 2.3 | 3.1 | 3.2 | 3.3 | 3.4 | 4.1 | 4.2
4.3 | 6.3 | 6.4 | 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt base material combined with AlCrN-Top Coating increases lubricity and wear resistance which improves tool life.



A940	A941
DIN ANSI	DIN ANSI
10XD	10XD
HSS-E	HSS-E
130°	130°
	
1.00 - 20.00	1.00 - 16.00

d_1 $\varnothing h_8$ Inch	d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	1.00	0.0394	33	56	1	0053614	0059371
	1.10	0.0433	37	60	1	0053621	—
3/64	1.19	0.0469	29	57	1	0635735	0635803
	1.20	0.0472	41	65	1	0053638	—
	1.30	0.0512	41	65	1	0053645	—
	1.40	0.0551	45	70	1	0053751	—
	1.50	0.0591	45	70	1	0053768	0059388
1/16	1.59	0.0625	44	76	1	0053775	0635810
	1.60	0.0630	50	76	1	0054253	—
	1.70	0.0669	50	76	1	0054260	—
	1.80	0.0709	53	80	1	0054383	—
	1.90	0.0748	53	80	1	0054390	—
5/64	1.98	0.0781	51	95	1	0054406	0635827
	2.00	0.0787	56	85	1	0054604	0059401
	2.10	0.0827	56	85	1	0054611	—
	2.20	0.0866	59	90	1	0054628	—
	2.30	0.0906	59	90	1	0054710	—
3/32	2.38	0.0937	57	108	1	0054727	0635834
	2.40	0.0945	62	95	1	0054734	—
	2.50	0.0984	62	95	1	0054789	0059418
	2.60	0.1024	62	95	1	0054796	—
	2.70	0.1063	66	100	1	0054802	—
7/64	2.78	0.1094	64	117	1	0054833	0635841
	2.80	0.1102	66	100	1	0054840	—
	2.90	0.1142	66	100	1	0054857	—
	3.00	0.1181	66	100	1	0054871	0059432
	3.10	0.1220	69	106	1	0055465	0059449
1/8	3.18	0.1250	70	130	1	0055472	0635858
	3.20	0.1260	69	106	1	0055533	0059463
	3.30	0.1299	69	106	1	0055540	0059654
	3.40	0.1339	73	112	1	0055588	0059661
	3.50	0.1378	73	112	1	0055595	0059838
9/64	3.57	0.1406	76	137	1	0055618	0635865

PFX TAPER LENGTH DRILL

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	3.60	0.1417	73	112	1	0055625	0059944
	3.70	0.1457	73	112	1	0055632	0059968
	3.80	0.1496	78	119	1	0056011	0059982
	3.90	0.1535	78	119	1	0056028	0060216
5/32	3.97	0.1563	76	137	1	0056165	0635872
	4.00	0.1575	78	119	1	0056172	0060223
	4.10	0.1614	78	119	1	0056226	0060315
	4.20	0.1654	78	119	1	0056233	0060322
	4.30	0.1693	82	126	1	0056257	0060377
11/64	4.37	0.1719	86	146	1	0056264	0635889
	4.40	0.1732	82	126	1	0056271	0060384
	4.50	0.1772	82	126	1	0056288	0060414
	4.60	0.1811	82	126	1	0056295	0060421
	4.70	0.1850	82	126	1	0056301	0060445
3/16	4.76	0.1875	86	146	1	0056318	0635896
	4.80	0.1890	87	132	1	0056561	0060452
	4.90	0.1929	87	132	1	0056615	0060476
	5.00	0.1969	87	132	1	0056646	0060490
	5.10	0.2008	87	132	1	0056820	0060513
13/64	5.16	0.2031	92	152	1	0056882	0635902
	5.20	0.2047	87	132	1	0056974	0060605
	5.30	0.2087	87	132	1	0057001	0060612
	5.40	0.2126	91	139	1	0057056	0060674
	5.50	0.2165	91	139	1	0057780	0060681
7/32	5.56	0.2188	92	152	1	0057797	0635919
	5.60	0.2205	91	139	1	0057810	0060728
	5.70	0.2244	91	139	1	0057827	0060735
	5.80	0.2283	91	139	1	0057834	0060766
	5.90	0.2323	91	139	1	0057841	0060773
15/64	5.95	0.2344	95	156	1	0057858	0635926
	6.00	0.2362	91	139	1	0057865	0060797
	6.10	0.2402	97	148	1	0057872	0060889
	6.20	0.2441	97	148	1	0058145	0060940
	6.30	0.2480	97	148	1	0058152	0060995
1/4	6.35	0.2500	95	156	1	0058169	0635933
	6.40	0.2520	97	148	1	0058176	0061022
	6.50	0.2559	97	148	1	0058183	0061046
	6.60	0.2598	97	148	1	0058190	0061053
	6.70	0.2638	97	148	1	0058206	0061091
17/64	6.75	0.2656	98	159	1	0058213	0635940
	6.80	0.2677	102	156	1	0058220	0061107
	6.90	0.2717	102	156	1	0058237	0061114
	7.00	0.2756	102	156	1	0058244	0061121
	7.10	0.2795	102	156	1	0058251	0061138
9/32	7.14	0.2812	98	159	1	0058268	0635957
	7.20	0.2835	102	156	1	0058275	0061145
	7.30	0.2874	102	156	1	0058282	0061152
	7.40	0.2913	102	156	1	0058299	0061169
	7.50	0.2953	102	156	1	0058305	0061176
19/64	7.54	0.2969	102	162	1	0058312	0635964
	7.60	0.2992	109	165	1	0058343	0061183
	7.70	0.3031	109	165	1	0058350	0061190
	7.80	0.3071	109	165	1	0058374	0061206
	7.90	0.3110	109	165	1	0058381	0061213
5/16	7.94	0.3125	102	162	1	0058398	0635971
	8.00	0.3150	109	165	1	0058404	0061220
	8.10	0.3189	109	165	1	0058411	0061237
	8.20	0.3228	109	165	1	0058435	0061244
	8.30	0.3268	109	165	1	0058442	0061251
21/64	8.33	0.3281	105	165	1	0058473	0635988
	8.40	0.3307	109	165	1	0058503	0061268
	8.50	0.3346	109	165	1	0058510	0061275
	8.60	0.3386	115	175	1	0058558	0061282
	8.70	0.3425	115	175	1	0058572	0061299
11/32	8.73	0.3438	105	165	1	0058589	0635995
	8.80	0.3465	115	175	1	0058596	0061305

PFX TAPER LENGTH DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A940	A941
	8.90	0.3504	115	175	1	0058602	0061312
	9.00	0.3543	115	175	1	0058626	0061329
	9.10	0.3583	115	175	1	0058633	0061336
23/64	9.13	0.3594	108	171	1	0058640	0636008
	9.20	0.3622	115	175	1	0058657	0061343
	9.30	0.3661	115	175	1	0058664	0061350
	9.40	0.3701	115	175	1	0058671	0061367
	9.50	0.3740	115	175	1	0058688	0061374
3/8	9.52	0.3750	108	171	1	0058695	0636015
	9.60	0.3780	121	184	1	0058701 [1]	0061381 [1]
	9.70	0.3819	121	184	1	0058718 [1]	0061398 [1]
	9.80	0.3858	121	184	1	0058725 [1]	0061404 [1]
	9.90	0.3898	121	184	1	0058732 [1]	0061411 [1]
25/64	9.92	0.3906	111	178	1	0058749 [1]	0636022 [1]
	10.00	0.3937	121	184	1	0058756 [1]	0061428 [1]
	10.20	0.4016	121	184	1	0058763 [1]	0061435 [1]
	10.30	0.4055	121	184	1	0058770 [1]	0061442 [1]
13/32	10.32	0.4063	111	178	1	0058787 [1]	0636039 [1]
	10.50	0.4134	121	184	1	0058800 [1]	0061466 [1]
27/64	10.72	0.4219	117	184	1	0058817 [1]	0636046 [1]
	11.00	0.4331	128	195	1	0058831 [1]	0061480 [1]
7/16	11.11	0.4375	117	184	1	0058855 [1]	0636053 [1]
	11.20	0.4409	128	195	1	0058862 [1]	0061497 [1]
	11.50	0.4528	128	195	1	0058886 [1]	0061633 [1]
29/64	11.51	0.4531	121	190	1	0058893 [1]	0636060 [1]
	11.80	0.4646	128	195	1	0058909 [1]	0061657 [1]
15/32	11.91	0.4688	121	190	1	0058916 [1]	0636077 [1]
	12.00	0.4724	134	205	1	0058923 [1]	0061688 [1]
	12.20	0.4803	134	205	1	0058930 [1]	0061718 [1]
31/64	12.30	0.4843	121	197	1	0058978 [1]	0636084 [1]
	12.50	0.4921	134	205	1	0058985 [1]	0061749 [1]
1/2	12.70	0.5000	121	197	1	0058992 [1]	0636091 [1]
	13.00	0.5118	134	205	1	0059012 [1]	0061817 [1]
33/64	13.10	0.5156	121	203	1	0059043 [1]	0636107 [1]
17/32	13.49	0.5311	121	203	1	0059050 [1]	—
	13.50	0.5315	140	214	1	0059067 [1]	0061848 [1]
35/64	13.89	0.5469	124	210	1	0635742 [1]	0636114 [1]
	14.00	0.5512	140	214	1	0059081 [1]	0061862 [1]
9/16	14.29	0.5625	124	210	1	0059111 [1]	0636121 [1]
	14.50	0.5709	144	220	1	0059128 [1]	0061886 [1]
37/64	14.68	0.5781	124	222	1	0059166 [1]	0636138 [1]
	15.00	0.5906	144	220	1	0059180 [1]	0061909 [1]
19/32	15.08	0.5937	124	222	1	0059203 [1]	0636145 [1]
39/64	15.48	0.6094	124	222	1	0635759 [1]	0636152 [1]
	15.50	0.6102	149	227	1	0059210 [1]	0061916 [1]
5/8	15.88	0.6250	124	222	1	0059227 [1]	0636169 [1]
	16.00	0.6299	149	227	1	0059234 [1]	0061930 [1]
41/64	16.27	0.6406	130	229	1	0635766 [1]	—
	16.50	0.6496	154	235	1	0059241 [1]	—
21/32	16.67	0.6563	130	229	1	0059258 [1]	—
	17.00	0.6693	154	235	1	0059265 [1]	—
43/64	17.07	0.6719	137	235	1	0635773 [1]	—
11/16	17.46	0.6875	137	235	1	0059272 [1]	—
	17.50	0.6890	158	241	1	0059289 [1]	—
45/64	17.86	0.7031	143	241	1	0059296 [1]	—
	18.00	0.7087	158	241	1	0059302 [1]	—
23/32	18.26	0.7188	143	241	1	0059326 [1]	—
47/64	18.65	0.7344	149	248	1	0059333 [1]	—
	19.00	0.7480	162	247	1	0059340 [1]	—
3/4	19.05	0.7500	149	248	1	0059357 [1]	—
49/64	19.45	0.7656	152	251	1	0635780 [1]	—
25/32	19.84	0.7812	152	251	1	0635797 [1]	—
	20.00	0.7874	166	254	1	0059364 [1]	—

[1] <10xD

PFX Premium Cobalt, Extra Length - Parabolic Flute *for Advanced Chip Removal*

A976

A977

A978

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.2 3.3 3.4 4.1 4.2 4.3 6.3 6.4 7.4

Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premuim cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.



PFX

A976	A977	A978
DIN 1869/1	DIN 1869/2	DIN 1869/3
15XD	20XD	25XD
HSS-E	HSS-E	HSS-E
130°	130°	130°
		
1.50 - 14.00	1.50 - 14.00	3.00 - 10.00

d_1 Øh8 Inch	d_1 Øh8 mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	1.50	0.0591	100	150	1	—	0347386 [1)]	—
	1.50	0.0591	75	115	1	0347362	—	—
1/16	1.59	0.0625	100	150	1	—	0347393 [1)]	—
	2.00	0.0787	110	160	1	—	0347409 [1)]	—
	2.00	0.0787	85	125	1	0148501	—	—
	2.10	0.0827	85	125	1	0279724	—	—
	2.20	0.0866	90	135	1	0148518	—	—
	2.30	0.0906	90	135	1	0279717	—	—
3/32	2.38	0.0937	115	170	1	—	0347416 [1)]	—
	2.40	0.0945	95	140	1	0279731	—	—
	2.50	0.0984	95	140	1	0148525	—	—
	2.60	0.1024	95	140	1	0279748	—	—
	2.70	0.1063	100	150	1	0279755	—	—
	2.80	0.1102	100	150	1	0279762	—	—
	2.90	0.1142	100	150	1	0279779	—	—
	3.00	0.1181	100	150	1	0148532	—	—
	3.00	0.1181	130	190	1	—	0148709	—
	3.00	0.1181	160	240	1	—	—	0347324 [1)]
	3.10	0.1220	105	155	1	0279786	—	—
1/8	3.18	0.1250	105	155	1	0347072	—	—
1/8	3.18	0.1250	135	200	1	—	0347218	—
	3.20	0.1260	105	155	1	0279793	—	—
	3.30	0.1299	105	155	1	0148549	—	—
	3.40	0.1339	115	165	1	0279809	—	—
	3.50	0.1378	115	165	1	0148556	—	—
	3.50	0.1378	145	210	1	—	0148716	—
	3.50	0.1378	180	265	1	—	—	0148853
	3.60	0.1417	115	165	1	0279816	—	—
	3.70	0.1457	115	165	1	0148563	—	—

[1)] Dormer Standard

PFX EXTRA LENGTH DRILL

DORMER

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	3.80	0.1496	120	175	1	0279823	—	—
	3.90	0.1535	120	175	1	0279830	—	—
5/32	3.97	0.1563	120	175	1	0347089	—	—
	4.00	0.1575	120	175	1	0148570	—	—
	4.00	0.1575	150	220	1	—	0148723	—
	4.00	0.1575	190	280	1	—	—	0148860
	4.10	0.1614	120	175	1	0279847	—	—
	4.20	0.1654	120	175	1	0279854	—	—
	4.30	0.1693	125	185	1	0279861	—	—
	4.40	0.1732	125	185	1	0279878	—	—
	4.50	0.1772	125	185	1	0148587	—	—
	4.50	0.1772	160	235	1	—	0148730	—
	4.50	0.1772	200	295	1	—	—	0148877
	4.60	0.1811	125	185	1	0279885	—	—
	4.70	0.1850	125	185	1	0279892	—	—
3/16	4.76	0.1875	135	195	1	0347935	—	—
3/16	4.76	0.1875	170	245	1	—	0347225	—
	4.80	0.1890	135	195	1	0279908	—	—
	4.90	0.1929	135	195	1	0279915	—	—
	5.00	0.1969	135	195	1	0148594	—	—
	5.00	0.1969	170	245	1	—	0148747	—
	5.00	0.1969	210	315	1	—	—	0148884
	5.10	0.2008	135	195	1	0279922	—	—
	5.20	0.2047	135	195	1	0279939	—	—
	5.30	0.2087	135	195	1	0279946	—	—
	5.40	0.2126	140	205	1	0279953	—	—
	5.50	0.2165	140	205	1	0148600	—	—
	5.50	0.2165	180	260	1	—	0148754	—
	5.50	0.2165	225	330	1	—	—	0148891
	5.60	0.2205	140	205	1	0279960	—	—
	5.70	0.2244	140	205	1	0279977	—	—
	5.80	0.2283	140	205	1	0279984	—	—
	5.90	0.2323	140	205	1	0279991	—	—
	6.00	0.2362	140	205	1	0148617	—	—
	6.00	0.2362	180	260	1	—	0148761	—
	6.00	0.2362	225	330	1	—	—	0148907
	6.10	0.2402	150	215	1	0280003	—	—
	6.20	0.2441	150	215	1	0280010	—	—
	6.30	0.2480	150	215	1	0280027	—	—
1/4	6.35	0.2500	150	215	1	0347096	—	—
1/4	6.35	0.2500	190	275	1	—	0347232	—
1/4	6.35	0.2500	235	350	1	—	—	0347331
	6.40	0.2520	150	215	1	0280034	—	—
	6.50	0.2559	150	215	1	0148624	—	—
	6.50	0.2559	190	275	1	—	0148778	—
	6.50	0.2559	235	350	1	—	—	0148914
	6.60	0.2598	150	215	1	0280041	—	—
	6.70	0.2638	150	215	1	0280058	—	—
	6.80	0.2677	155	225	1	0280065	—	—
	6.90	0.2717	155	225	1	0280072	—	—
	7.00	0.2756	155	225	1	0148631	—	—
	7.00	0.2756	200	290	1	—	0148785	—
	7.00	0.2756	250	370	1	—	—	0148921
	7.50	0.2953	155	225	1	0148648	—	—
	7.50	0.2953	200	290	1	—	0148792	—
	7.50	0.2953	250	370	1	—	—	0148938
5/16	7.94	0.3125	165	240	1	0347102	—	—
	8.00	0.3150	165	240	1	0148655	—	—
	8.00	0.3150	210	305	1	—	0148808	—
	8.00	0.3150	265	390	1	—	—	0148945
	8.50	0.3346	165	240	1	0148662	—	—
	8.50	0.3346	210	305	1	—	0148815	—
	8.50	0.3346	265	390	1	—	—	0148952
11/32	8.73	0.3437	175	250	1	0347119	—	—
11/32	8.73	0.3437	220	320	1	—	0347249	—
	9.00	0.3543	175	250	1	0148679	—	—

PFX EXTRA LENGTH DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A976	A977	A978
	9.00	0.3543	220	320	1	—	0148822	—
	9.00	0.3543	280	410	1	—	—	0148969
	9.50	0.3740	175	250	1	0148686	—	—
	9.50	0.3740	220	320	1	—	0148839	—
	9.50	0.3740	280	410	1	—	—	0148976
3/8	9.52	0.3750	185	265	1	0347126	—	—
	10.00	0.3937	185	265	1	0148693	—	—
	10.00	0.3937	235	340	1	—	0148846	—
	10.00	0.3937	295	430	1	—	—	0148983
	10.50	0.4134	185	265	1	0347133	—	—
	10.50	0.4134	235	340	1	—	0347256	—
	11.00	0.4331	195	280	1	0347140	—	—
	11.00	0.4331	250	365	1	—	0347263	—
7/16	11.11	0.4375	195	280	1	0347379	—	—
	11.50	0.4528	195	280	1	0347157	—	—
	11.50	0.4528	250	365	1	—	0347270	—
	12.00	0.4724	205	295	1	0347164	—	—
	12.00	0.4724	260	375	1	—	0347287	—
	12.50	0.4921	205	295	1	0347171	—	—
	12.50	0.4921	260	375	1	—	0347294	—
1/2	12.70	0.5000	205	295	1	0347188	—	—
	13.00	0.5118	205	295	1	0347195	—	—
	13.00	0.5118	260	375	1	—	0347300	—
	14.00	0.5512	215	310	1	0347201	—	—
	14.00	0.5512	270	390	1	—	0347317 [1)]	—

JOBBER DRILL

General Purpose Jobber Length

✱ *Sets Available on pgs. 197-200*

R10P - *Fractional Sizes*
R15P - *Letter Sizes*
R18P - *Wire Gauge Sizes*

Bright Finish improves chip flow in soft or non-ferrous materials

R10 - *Fractional Sizes*
R15 - *Letter Sizes*
R18 - *Wire Gauge Sizes*

Steam Oxide reduces wear and chip welding in harder ferrous materials for increased wear resistance and lubricity.



	R10P R15P R18P	R10 R15 R18
	ANSI	ANSI
	4XD	4XD
	HSS	HSS
	118°	118°
		
	N97 - 11/16	N80 - 11/16

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	97		0.0059	1/16	3/4	12	018697	—
	96		0.0063	1/16	3/4	12	018696	—
	95		0.0067	1/16	3/4	12	018695	—
	94		0.0071	1/16	3/4	12	018694	—
	93		0.0075	1/16	3/4	12	018693	—
	92		0.0079	1/16	3/4	12	018692	—
	91		0.0083	5/64	3/4	12	018691	—
	90		0.0087	5/64	3/4	12	018690	—
	89		0.0091	5/64	3/4	12	018689	—
	88		0.0095	5/64	3/4	12	018688	—
	87		0.0100	5/64	3/4	12	018687	—
	86		0.0105	3/32	3/4	12	018686	—
	85		0.0110	3/32	3/4	12	018685	—
	84		0.0115	3/32	3/4	12	018684	—
	83		0.0120	3/32	3/4	12	018683	—
	82		0.0125	3/32	3/4	12	018682	—
	81		0.0130	3/32	3/4	12	018681	—
	80		0.0135	1/8	3/4	12	018680	018080
	79		0.0145	1/8	3/4	12	018679	018079
1/64			0.0156	3/16	3/4	12	010601	010001
	78		0.0160	3/16	7/8	12	018678	018078
	77		0.0180	3/16	7/8	12	018677	018077
	76		0.0200	3/16	7/8	12	018676	018076
	75		0.0210	1/4	1“	12	018675	018075
	74		0.0225	1/4	1“	12	018674	018074
	73		0.0240	5/16	1.1/8	12	018673	018073
	72		0.0250	5/16	1.1/8	12	018672	018072
	71		0.0260	3/8	1.1/4	12	018671	018071
	70		0.0280	3/8	1.1/4	12	018670	018070
	69		0.0292	1/2	1.3/8	12	018669	018069

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	68		0.0310	1/2	1.3/8	12	018668	018068
1/32			0.0313	1/2	1.3/8	12	010602	010002
	67		0.0320	1/2	1.3/8	12	018667	018067
	66		0.0330	1/2	1.3/8	12	018666	018066
	65		0.0350	5/8	1.1/2	12	018665	018065
	64		0.0360	5/8	1.1/2	12	018664	018064
	63		0.0370	5/8	1.1/2	12	018663	018063
	62		0.0380	5/8	1.1/2	12	018662	018062
	61		0.0390	11/16	1.5/8	12	018661	018061
	60		0.0400	11/16	1.5/8	12	018660	018060
	59		0.0410	11/16	1.5/8	12	018659	018059
	58		0.0420	11/16	1.5/8	12	018658	018058
	57		0.0430	3/4	1.3/4	12	018657	018057
	56		0.0465	3/4	1.3/4	12	018656	018056
3/64			0.0469	3/4	1.3/4	12	010603	010003
	55		0.0520	7/8	1.7/8	12	018655	018055
	54		0.0550	7/8	1.7/8	12	018654	018054
	53		0.0595	7/8	1.7/8	12	018653	018053
1/16			0.0625	7/8	1.7/8	12	010604	010004
	52		0.0635	7/8	1.7/8	12	018652	018052
	51		0.0670	1“	2“	12	018651	018051
	50		0.0700	1“	2“	12	018650	018050
	49		0.0730	1“	2“	12	018649	018049
	48		0.0760	1“	2“	12	018648	018048
5/64			0.0781	1“	2“	12	010605	010005
	47		0.0785	1“	2“	12	018647	018047
	46		0.0810	1.1/8	2.1/8	12	018646	018046
	45		0.0820	1.1/8	2.1/8	12	018645	018045
	44		0.0860	1.1/8	2.1/8	12	018644	018044
	43		0.0890	1.1/4	2.1/4	12	018643	018043
	42		0.0935	1.1/4	2.1/4	12	018642	018042
3/32			0.0938	1.1/4	2.1/4	12	010606	010006
	41		0.0960	1.3/8	2.3/8	12	018641	018041
	40		0.0980	1.3/8	2.3/8	12	018640	018040
	39		0.0995	1.3/8	2.3/8	12	018639	018039
	38		0.1015	1.7/16	2.1/2	12	018638	018038
	37		0.1040	1.7/16	2.1/2	12	018637	018037
	36		0.1065	1.7/16	2.1/2	12	018636	018036
7/64			0.1094	1.1/2	2.5/8	12	010607	010007
	35		0.1100	1.1/2	2.5/8	12	018635	018035
	34		0.1110	1.1/2	2.5/8	12	018634	018034
	33		0.1130	1.1/2	2.5/8	12	018633	018033
	32		0.1160	1.5/8	2.3/4	12	018632	018032
	31		0.1200	1.5/8	2.3/4	12	018631	018031
1/8			0.1250	1.5/8	2.3/4	12	010608	010008
	30		0.1285	1.5/8	2.3/4	12	018630	018030
	29		0.1360	1.3/4	2.7/8	12	018629	018029
	28		0.1405	1.3/4	2.7/8	12	018628	018028
9/64			0.1406	1.3/4	2.7/8	12	010609	010009
	27		0.1440	1.7/8	3“	12	018627	018027
	26		0.1470	1.7/8	3“	12	018626	018026
	25		0.1495	1.7/8	3“	12	018625	018025
	24		0.1520	2“	3.1/8	12	018624	018024
	23		0.1540	2“	3.1/8	12	018623	018023
5/32			0.1563	2“	3.1/8	12	010610	010010
	22		0.1570	2“	3.1/8	12	018622	018022
	21		0.1590	2.1/8	3.1/4	12	018621	018021
	20		0.1610	2.1/8	3.1/4	12	018620	018020
	19		0.1660	2.1/8	3.1/4	12	018619	018019
	18		0.1695	2.1/8	3.1/4	12	018618	018018
11/64			0.1719	2.1/8	3.1/4	12	010611	010011
	17		0.1730	2.3/16	3.3/8	12	018617	018017
	16		0.1770	2.3/16	3.3/8	12	018616	018016

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
	15		0.1800	2.3/16	3.3/8	12	018615	018015
	14		0.1820	2.3/16	3.3/8	12	018614	018014
	13		0.1850	2.5/16	3.1/2	12	018613	018013
3/16			0.1875	2.5/16	3.1/2	12	010612	010012
	12		0.1890	2.5/16	3.1/2	12	018612	018012
	11		0.1910	2.5/16	3.1/2	12	018611	018011
	10		0.1935	2.7/16	3.5/8	12	018610	018010
	9		0.1960	2.7/16	3.5/8	12	018609	018009
	8		0.1990	2.7/16	3.5/8	12	018608	018008
	7		0.2010	2.7/16	3.5/8	12	018607	018007
13/64			0.2031	2.7/16	3.5/8	12	010613	010013
	6		0.2040	2.1/2	3.3/4	12	018606	018006
	5		0.2055	2.1/2	3.3/4	12	018605	018005
	4		0.2090	2.1/2	3.3/4	12	018604	018004
	3		0.2130	2.1/2	3.3/4	12	018603	018003
7/32			0.2188	2.1/2	3.3/4	12	010614	010014
	2		0.2210	2.5/8	3.7/8	12	018602	018002
	1		0.2280	2.5/8	3.7/8	12	018601	018001
		A	0.2340	2.5/8	3.7/8	12	015601	015001
15/64			0.2344	2.5/8	3.7/8	12	010615	010015
		B	0.2380	2.3/4	4“	12	015602	015002
		C	0.2421	2.3/4	4“	12	015603	015003
		D	0.2461	2.3/4	4“	12	015604	015004
		E	0.2500	2.3/4	4“	12	015605	015005
1/4			0.2500	2.3/4	4“	12	010616	010016
		F	0.2571	2.7/8	4.1/8	12	015606	015006
		G	0.2610	2.7/8	4.1/8	12	015607	015007
17/64			0.2656	2.7/8	4.1/8	12	010617	010017
		H	0.2661	2.7/8	4.1/8	12	015608	015008
		I	0.2720	2.7/8	4.1/8	12	015609	015009
		J	0.2772	2.7/8	4.1/8	12	015610	015010
		K	0.2811	2.15/16	4.1/4	12	015611	015011
9/32			0.2813	2.15/16	4.1/4	12	010618	010018
		L	0.2902	2.15/16	4.1/4	12	015612	015012
		M	0.2949	3.1/16	4.3/8	12	015613	015013
19/64			0.2969	3.1/16	4.3/8	12	010619	010019
		N	0.3020	3.1/16	4.3/8	12	015614	015014
5/16			0.3125	3.3/16	4.1/2	6	010620	010020
		O	0.3161	3.3/16	4.1/2	6	015615	015015
		P	0.3228	3.5/16	4.5/8	6	015616	015016
21/64			0.3281	3.5/16	4.5/8	6	010621	010021
		Q	0.3319	3.7/16	4.3/4	6	015617	015017
		R	0.3390	3.7/16	4.3/4	6	015618	015018
11/32			0.3437	3.7/16	4.3/4	6	010622	010022
		S	0.3480	3.1/2	4.7/8	6	015619	015019
		T	0.3580	3.1/2	4.7/8	6	015620	015020
23/64			0.3594	3.1/2	4.7/8	6	010623	010023
		U	0.3680	3.5/8	5“	6	015621	015021
3/8			0.3750	3.5/8	5“	6	010624	010024
		V	0.3772	3.5/8	5“	6	015622	015022
		W	0.3858	3.3/4	5.1/8	6	015623	015023
25/64			0.3906	3.3/4	5.1/8	6	010625	010025
		X	0.3969	3.3/4	5.1/8	6	015624	015024
		Y	0.4039	3.7/8	5.1/4	6	015625	015025
13/32			0.4063	3.7/8	5.1/4	6	010626	010026
		Z	0.4130	3.7/8	5.1/4	6	015626	015026
27/64			0.4219	3.15/16	5.3/8	6	010627	010027
7/16			0.4375	4.1/16	5.1/2	6	010628	010028
29/64			0.4531	4.3/16	5.5/8	6	010629	010029
15/32			0.4687	4.5/16	5.3/4	6	010630	010030
31/64			0.4844	4.3/8	5.7/8	6	010631	010031
1/2			0.5000	4.1/2	6“	6	010632	010032
33/64			0.5156	4.13/16	6.5/8	1	010633	010033

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10P R15P R18P	R10 R15 R18
17/32			0.5313	4.13/16	6.5/8	1	010634	010034
35/64			0.5469	4.13/16	6.5/8	1	010635	010035
9/16			0.5625	4.13/16	6.5/8	1	010636	010036
37/64			0.5781	4.13/16	6.5/8	1	010637	010037
19/32			0.5937	5.3/16	7.1/8	1	010638	010038
39/64			0.6094	5.3/16	7.1/8	1	010639	010039
5/8			0.6250	5.3/16	7.1/8	1	010640	010040
41/64			0.6406	5.3/16	7.1/8	1	010641	010041
21/32			0.6563	5.3/16	7.1/8	1	010642	010042
43/64			0.6719	5.5/8	7.5/8	1	010643	010043
11/16			0.6875	5.5/8	7.5/8	1	010644	010044

DORMER

General Purpose Jobber Length, Fractional

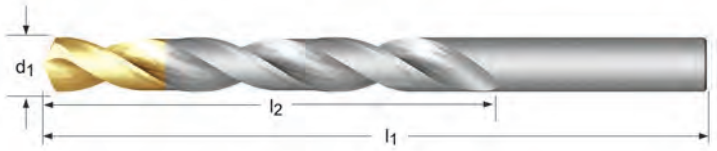
∗ *Sets Available on pg. 180*

A012

Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases surface hardness and improves tool life.

A012S

Select A012 sizes available in a pouch pack.
1/16 thru 3/16 2 per pack
13/64 thru 1/2 1 per pack



A012	A012S
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
	
N80 - 3/4	1/16 - 1/2

∗ *Bright / No split point Below N46*

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
	80		0.34	0.0135	1/8	3/4	10	0574256 *	—
	79		0.37	0.0145	1/8	3/4	10	0574249 *	—
1/64			0.40	0.0156	3/16	3/4	10	0573952 *	—
	78		0.41	0.0160	3/16	7/8	10	0574232 *	—
	77		0.46	0.0180	3/16	7/8	10	0574225 *	—
	76		0.51	0.0200	3/16	7/8	10	0574218 *	—
	75		0.53	0.0210	1/4	1“	10	0574201 *	—
	74		0.57	0.0225	1/4	1“	10	0574195 *	—
	73		0.61	0.0240	5/16	1.1/8	10	0574188 *	—
	72		0.64	0.0250	5/16	1.1/8	10	0574171 *	—
	71		0.66	0.0260	3/8	1.1/4	10	0574164 *	—
	70		0.71	0.0280	3/8	1.1/4	10	0574157 *	—
	69		0.742	0.0292	1/2	1.3/8	10	0574140 *	—
	68		0.79	0.0310	1/2	1.3/8	10	0574133 *	—
1/32			0.79	0.0313	1/2	1.3/8	10	0573969 *	—
	67		0.81	0.0320	1/2	1.3/8	10	0574126 *	—
	66		0.84	0.0330	1/2	1.3/8	10	0574119 *	—
	65		0.89	0.0350	5/8	1.1/2	10	0574102 *	—
	64		0.91	0.0360	5/8	1.1/2	10	0574096 *	—
	63		0.94	0.0370	5/8	1.1/2	10	0574089 *	—
	62		0.97	0.0380	5/8	1.1/2	10	0574072 *	—
	61		0.99	0.0390	11/16	1.5/8	10	0574065 *	—
	60		1.02	0.0400	11/16	1.5/8	10	0574058 *	—
	59		1.04	0.0410	11/16	1.5/8	10	0574041 *	—
	58		1.07	0.0420	11/16	1.5/8	10	0574034 *	—
	57		1.09	0.0430	3/4	1.3/4	10	0574027 *	—
	56		1.18	0.0465	3/4	1.3/4	10	0574010 *	—
3/64			1.19	0.0469	3/4	1.3/4	10	0573976 *	—
	55		1.32	0.0520	7/8	1.7/8	10	0574003 *	—
	54		1.40	0.0550	7/8	1.7/8	10	0573990 *	—
	53		1.51	0.0595	7/8	1.7/8	10	0573983 *	—
1/16			1.59	0.0625	7/8	1.7/8	2	—	46524892 *

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
1/16			1.59	0.0625	7/8	1.7/8	10	0578636 *	—
	52		1.61	0.0635	7/8	1.7/8	10	0578704 *	—
	51		1.70	0.0669	1“	2“	10	0578698 *	—
	50		1.78	0.0700	1“	2“	10	0578681 *	—
	49		1.85	0.0730	1“	2“	10	0578674 *	—
	48		1.93	0.0760	1“	2“	10	0578667 *	—
5/64			1.98	0.0781	1“	2“	2	—	46524893 *
5/64			1.98	0.0781	1“	2“	10	0578643 *	—
	47		1.99	0.0785	1“	2“	10	0578650 *	—
	46		2.06	0.0810	1.1/8	2.1/8	10	0571705	—
	45		2.08	0.0820	1.1/8	2.1/8	10	0571699	—
	44		2.18	0.0860	1.1/8	2.1/8	10	0571682	—
	43		2.26	0.0890	1.1/4	2.1/4	10	0571675	—
	42		2.38	0.0935	1.1/4	2.1/4	10	0571668	—
3/32			2.38	0.0938	1.1/4	2.1/4	2	—	46524894
3/32			2.38	0.0938	1.1/4	2.1/4	10	0572061	—
	41		2.44	0.0960	1.3/8	2.3/8	10	0571651	—
	40		2.49	0.0980	1.3/8	2.3/8	10	0571644	—
	39		2.53	0.0995	1.3/8	2.3/8	10	0571620	—
	38		2.58	0.1015	1.7/16	2.1/2	10	0571613	—
	37		2.64	0.1040	1.7/16	2.1/2	10	0571606	—
	36		2.71	0.1065	1.7/16	2.1/2	10	0571590	—
7/64			2.78	0.1094	1.1/2	2.5/8	2	—	46524895
7/64			2.78	0.1094	1.1/2	2.5/8	10	0572184	—
	35		2.79	0.1100	1.1/2	2.5/8	10	0571583	—
	34		2.82	0.1110	1.1/2	2.5/8	10	0571576	—
	33		2.87	0.1130	1.1/2	2.5/8	10	0571569	—
	32		2.95	0.1160	1.5/8	2.3/4	10	0571552	—
	31		3.05	0.1200	1.5/8	2.3/4	10	0571545	—
1/8			3.18	0.1250	1.5/8	2.3/4	2	—	46524896
1/8			3.18	0.1250	1.5/8	2.3/4	10	0571897	—
	30		3.26	0.1285	1.5/8	2.3/4	10	0571538	—
	29		3.45	0.1360	1.3/4	2.7/8	10	0571514	—
	28		3.57	0.1405	1.3/4	2.7/8	10	0571507	—
9/64			3.57	0.1405	1.3/4	2.7/8	2	—	46524897
9/64			3.57	0.1406	1.3/4	2.7/8	10	0572214	—
	27		3.66	0.1440	1.7/8	3“	10	0571491	—
	26		3.73	0.1470	1.7/8	3“	10	0571484	—
	25		3.80	0.1495	1.7/8	3“	10	0571477	—
	24		3.86	0.1520	2“	3.1/8	10	0571460	—
	23		3.91	0.1540	2“	3.1/8	10	0571453	—
5/32	5/32		3.97	0.1563	2“	3.1/8	2	—	46524898
5/32			3.97	0.1563	2“	3.1/8	10	0572146	—
	22		3.99	0.1570	2“	3.1/8	10	0571446	—
	21		4.04	0.1590	2.1/8	3.1/4	10	0571439	—
	20		4.09	0.1610	2.1/8	3.1/4	10	0571422	—
	19		4.22	0.1660	2.1/8	3.1/4	10	0571408	—
	18		4.31	0.1695	2.1/8	3.1/4	10	0571392	—
11/64			4.37	0.1719	2.1/8	3.1/4	2	—	46524899
11/64			4.37	0.1719	2.1/8	3.1/4	10	0571910	—
	17		4.39	0.1730	2.3/16	3.3/8	10	0571385	—
	16		4.50	0.1770	2.3/16	3.3/8	10	0571378	—
	15		4.57	0.1800	2.3/16	3.3/8	10	0571361	—
	14		4.62	0.1820	2.3/16	3.3/8	10	0571354	—
	13		4.70	0.1850	2.5/16	3.1/2	10	0571347	—
3/16			4.76	0.1875	2.5/16	3.1/2	2	—	46524900
3/16			4.76	0.1875	2.5/16	3.1/2	10	0572054	—
	12		4.80	0.1890	2.5/16	3.1/2	10	0571330	—
	11		4.85	0.1910	2.5/16	3.1/2	10	0571323	—
	10		4.92	0.1935	2.7/16	3.5/8	10	0571316	—
	9		4.98	0.1960	2.7/16	3.5/8	10	0571750	—
	8		5.06	0.1990	2.7/16	3.5/8	10	0571743	—
	7		5.11	0.2010	2.7/16	3.5/8	10	0571736	—
13/64			5.16	0.2031	2.7/16	3.5/8	1	—	46524901
13/64			5.16	0.2031	2.7/16	3.5/8	10	0571934	—

JOBBER DRILL

DORMER

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
	6		5.18	0.2040	2.1/2	3.3/4	10	0571729	—
	5		5.22	0.2055	2.1/2	3.3/4	10	0571712	—
	4		5.31	0.2090	2.1/2	3.3/4	10	0571637	—
	3		5.41	0.2130	2.1/2	3.3/4	10	0571521	—
7/32			5.56	0.2188	2.1/2	3.3/4	1	—	46524902
7/32			5.56	0.2188	2.1/2	3.3/4	10	0572177	—
	2		5.61	0.2210	2.5/8	3.7/8	10	0571415	—
	1		5.79	0.2280	2.5/8	3.7/8	10	0571309	—
		A	5.94	0.2340	2.5/8	3.7/8	10	0571163	—
15/64			5.95	0.2344	2.5/8	3.7/8	1	—	46524903
15/64			5.95	0.2344	2.5/8	3.7/8	10	0571958	—
		B	6.03	0.2380	2.3/4	4“	10	0571170	—
		C	6.15	0.2420	2.3/4	4“	10	0571187	—
		D	6.25	0.2460	2.3/4	4“	10	0571194	—
1/4			6.35	0.2500	2.3/4	4“	1	—	46524904
1/4			6.35	0.2500	2.3/4	4“	10	0571125	—
		E	6.35	0.2500	2.3/4	4“	10	0571200	—
		F	6.53	0.2570	2.7/8	4.1/8	10	0571217	—
		G	6.63	0.2610	2.7/8	4.1/8	10	0571224	—
17/64			6.75	0.2656	2.7/8	4.1/8	1	—	46524905
17/64			6.75	0.2656	2.7/8	4.1/8	10	0571972	—
		H	6.76	0.2660	2.7/8	4.1/8	10	0571231	—
		I	6.91	0.2720	2.7/8	4.1/8	10	0571248	—
		J	7.04	0.2770	2.7/8	4.1/8	10	0571255	—
		K	7.14	0.2810	2.15/16	4.1/4	10	0571262	—
9/32			7.14	0.2813	2.15/16	4.1/4	1	—	46524906
9/32			7.14	0.2813	2.15/16	4.1/4	10	0572207	—
		L	7.37	0.2900	2.15/16	4.1/4	10	0571279	—
		M	7.49	0.2950	3.1/16	4.3/8	10	0571286	—
19/64			7.54	0.2968	3.1/16	4.3/8	1	—	46524907
19/64			7.54	0.2968	3.1/16	4.3/8	10	0571996	—
		N	7.67	0.3020	3.1/16	4.3/8	10	0571293	—
5/16			7.94	0.3125	3.3/16	4.1/2	1	—	46524908
5/16			7.94	0.3125	3.3/16	4.1/2	10	0572139	—
		O	8.03	0.3160	3.3/16	4.1/2	10	0571767	—
		P	8.20	0.3230	3.5/16	4.5/8	10	0571774	—
21/64			8.33	0.3281	3.5/16	4.5/8	1	—	46524909
21/64			8.33	0.3281	3.5/16	4.5/8	10	0572009	—
		Q	8.43	0.3320	3.7/16	4.3/4	10	0571781	—
		R	8.61	0.3390	3.7/16	4.3/4	10	0571798	—
11/32			8.73	0.3437	3.7/16	4.3/4	1	—	46524910
11/32			8.73	0.3437	3.7/16	4.3/4	10	0571903	—
		S	8.84	0.3480	3.1/2	4.7/8	10	0571804	—
		T	9.09	0.3580	3.1/2	4.7/8	10	0571811	—
23/64			9.13	0.3594	3.1/2	4.7/8	1	—	46524911
23/64			9.13	0.3594	3.1/2	4.7/8	10	0572016	—
		U	9.35	0.3680	3.5/8	5“	10	0571828	—
3/8			9.52	0.3750	3.5/8	5“	1	—	46524912
3/8			9.52	0.3750	3.5/8	5“	10	0572078	—
		V	9.58	0.3770	3.5/8	5“	10	0571835	—
		W	9.80	0.3860	3.3/4	5.1/8	10	0571842	—
25/64			9.92	0.3906	3.3/4	5.1/8	1	—	46524913
25/64			9.92	0.3906	3.3/4	5.1/8	10	0572023	—
		X	10.08	0.3970	3.3/4	5.1/8	5	0571859	—
		Y	10.26	0.4040	3.7/8	5.1/4	5	0571866	—
13/32			10.32	0.4063	3.7/8	5.1/4	1	—	46524914
13/32			10.32	0.4063	3.7/8	5.1/4	5	0571927	—
		Z	10.49	0.4130	3.7/8	5.1/4	5	0571873	—
27/64			10.72	0.4219	3.15/16	5.3/8	1	—	46524915
27/64			10.72	0.4219	3.15/16	5.3/8	5	0572030	—
7/16			11.11	0.4375	4.1/16	5.1/2	1	—	46524916
7/16			11.11	0.4375	4.1/16	5.1/2	5	0572160	—
29/64			11.51	0.4531	4.3/16	5.5/8	1	—	46524917
29/64			11.51	0.4531	4.3/16	5.5/8	5	0572047	—
15/32			11.91	0.4687	4.5/16	5.3/4	1	—	46524918
15/32			11.91	0.4687	4.5/16	5.3/4	5	0571941	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A012	A012S
31/64			12.30	0.4844	4.3/8	5.7/8	1	—	46524919
31/64			12.30	0.4844	4.3/8	5.7/8	5	0572085	—
1/2			12.70	0.5000	4.1/2	6“	1	—	46524920
1/2			12.70	0.5000	4.1/2	6“	5	0571880	—
33/64			13.10	0.5156	4.13/16	6.5/8	1	0572092	—
17/32			13.49	0.5313	4.13/16	6.5/8	1	0571965	—
35/64			13.89	0.5469	4.13/16	6.5/8	1	0572108	—
9/16			14.29	0.5625	4.13/16	6.5/8	1	0572191	—
37/64			14.68	0.5781	4.13/16	6.5/8	1	0572115	—
19/32			15.08	0.5937	5.3/16	7.1/8	1	0571989	—
39/64			15.48	0.6094	5.3/16	7.1/8	1	0572122	—
5/8			15.88	0.6250	5.3/16	7.1/8	1	0572153	—
21/32			16.67	0.6563	5.3/16	7.1/8	1	0578728	—
11/16			17.46	0.6875	5.5/8	7.5/8	1	0578711	—
45/64			17.86	0.7031	5.5/8	7.5/8	1	0578742	—
23/32			18.26	0.7188	5.5/8	7.5/8	1	0578735	—
47/64			18.65	0.7344	6“	8“	1	0578766	—
3/4			19.05	0.7500	6“	8“	1	0578759	—

JOBBER DRILL

General Purpose Jobber Length, DIN Standard

2A Bright Finish improves chip flow in soft or non-ferrous materials

2AB
A100 Steam Oxide for increased wear resistance & lubricity.

A002
A002S Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

- ✱ *Bright Below 2mm*
- ✱ *No split point below 2mm*



2A	2AB	A100	A002	A002S
DIN 338	DIN 338	DIN 338	DIN 338	DIN 338
4XD	4XD	4XD	4XD	4XD
HSS	HSS	HSS	HSS	HSS
118°	118°	118°	118°	118°
				
0.15 - 15.00	1.00 - 17.50	0.20 - 20.00	1.00 - 16.00	1.00 - 16.00

d_1 $\varnothing h_8$ mm	d_1 $\varnothing h_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
0.15		0.0059	1.5	19	016215	—	—	—	—
0.16		0.0063	1.5	19	016216	—	—	—	—
0.17		0.0067	1.5	19	016217	—	—	—	—
0.18		0.0070	1.5	19	016218	—	—	—	—
0.19		0.0075	1.5	19	016219	—	—	—	—
0.20		0.0078	2.5	19	016002	—	0000021	—	—
0.21		0.0083	2.5	19	016221	—	—	—	—
0.22		0.0087	2.5	19	016222	—	—	—	—
0.23		0.0091	2.5	19	016223	—	—	—	—
0.24		0.0094	2.5	19	016224	—	—	—	—
0.25		0.0098	3	19	016225	—	0000038	—	—
0.26		0.0102	3	19	016226	—	—	—	—
0.27		0.0106	3	19	016227	—	—	—	—
0.28		0.0110	3	19	016228	—	—	—	—
0.29		0.0114	3	19	016229	—	—	—	—
0.30		0.0118	3	19	016003	—	0000045	—	—
0.32		0.0126	4	19	016232	—	0000052	—	—
	80	0.0135	4	19		—	0029480	—	—
0.34		0.0134	4	19	016234	—	—	—	—
0.35		0.0138	4	19	016235	—	0000069	—	—
0.36		0.0142	4	19	016236	—	—	—	—
	79	0.0145	4	19		—	0029466	—	—
0.38		0.0150	4	19	016238	—	0000076	—	—
	1/64	0.0156	5	20		—	0001219	—	—
0.40		0.0157	5	20	016004	—	0000083	—	—
	78	0.0160	5	20		—	0029459	—	—
0.42		0.0165	5	20	016242	—	0000090	—	—
0.44		0.0173	5	20	016244	—	—	—	—
0.45		0.0177	5	20	016245	—	0000106	—	—
	77	0.0180	5	20		—	0029442	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $\emptyset h_8$ mm	d_1 $\emptyset h_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
0.46		0.0181	5	20	016246	—	—	—	—
0.48		0.0189	5	20	016248	—	0000113	—	—
0.50		0.0197	6	22	016005	—	0000120	—	—
	76	0.0200	6	22	—	—	0029435	—	—
0.52		0.0205	6	22	—	—	0000137	—	—
	75	0.0210	6	22	—	—	0029428	—	—
0.55		0.0217	7	24	016250	—	0000144	—	—
	74	0.0225	7	24	—	—	0029411	—	—
0.58		0.0228	7	24	—	—	0000151	—	—
0.60		0.0236	7	24	016006	—	0000168	—	—
	73	0.0240	8	26	—	—	0029404	—	—
0.62		0.0244	8	26	—	—	0000175	—	—
	72	0.0250	8	26	—	—	0029398	—	—
0.65		0.0256	8	26	016251	—	0000182	—	—
	71	0.0260	8	26	—	—	0029381	—	—
0.68		0.0268	9	28	—	—	0000199	—	—
0.70		0.0276	9	28	016007	—	0000205	—	—
	70	0.0280	9	28	—	—	0029374	—	—
0.72		0.0283	9	28	—	—	0000212	—	—
	69	0.0292	9	28	—	—	0029350	—	—
0.75		0.0295	9	28	016252	—	0000229	—	—
0.78		0.0307	10	30	—	—	0000236	—	—
	68	0.0310	10	30	—	—	0029343	—	—
	1/32	0.0313	10	30	—	—	0001059	—	—
0.80		0.0315	10	30	016008	—	0000243	—	—
	67	0.0320	10	30	—	—	0029336	—	—
0.82		0.0323	10	30	—	—	0000250	—	—
	66	0.0330	10	30	—	—	0029329	—	—
0.85		0.0335	10	30	016253	—	0000267	—	—
0.88		0.0346	11	32	—	—	0000274	—	—
	65	0.0350	11	32	—	—	0029312	—	—
0.90		0.0354	11	32	016009	—	0000281	—	—
	64	0.0360	11	32	—	—	0029305	—	—
0.92		0.0362	11	32	—	—	0000298	—	—
	63	0.0370	11	32	—	—	0029299	—	—
0.95		0.0374	11	32	016254	—	0000304	—	—
	62	0.0380	12	34	—	—	0029282	—	—
0.98		0.0386	12	34	—	—	0000311	—	—
	61	0.0390	12	34	—	—	0029275	—	—
1.00		0.0394	12	34	016010	029010	0000328	0376782	—
	60	0.0400	12	34	—	—	0029268	—	—
	59	0.0410	12	34	—	—	0029244	—	—
1.05		0.0413	12	34	—	—	0000335	—	—
	58	0.0420	14	36	—	—	0029237	—	—
	57	0.0430	14	36	—	—	0029220	—	—
1.10		0.0433	14	36	016011	029011	0000342	0376799	—
1.15		0.0453	14	36	016256	029256	0000359	—	—
	56	0.0465	14	36	—	—	0029213	—	—
	3/64	0.0469	16	38	—	—	0001783	0376928	—
1.20		0.0472	16	38	016012	029012	0000366	0376805	—
1.25		0.0492	16	38	016257	029257	0000373	—	—
1.30		0.0512	16	38	016013	029013	0000380	0376812	—
	55	0.0520	16	38	—	—	0029206	—	—
1.35		0.0531	18	40	016258	029258	0000397	—	—
	54	0.0550	18	40	—	—	0029190	—	—
1.40		0.0551	18	40	016014	029014	0000403	0376829	—
1.45		0.0571	18	40	016259	029259	0000410	—	—
1.50		0.0591	18	40	016015	029015	0000427	0376836	—
	53	0.0595	20	43	—	—	0029183	—	—
1.55		0.0610	20	43	016260	029260	0000434	—	—
	1/16	0.0625	20	43	—	—	0000786	0376881	—
1.60		0.0630	20	43	016016	029016	0000441	0376843	—

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JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
	52	0.0635	20	43	—	—	0029176	—	—
1.65		0.0650	20	43	016261	—	0000458	—	—
1.70		0.0669	20	43	016017	029017	0000465	0376850	—
	51	0.0670	22	46	—	—	0029169	—	—
1.75		0.0689	22	46	016262	029262	0000472	—	—
	50	0.0700	22	46	—	—	0029152	—	—
1.80		0.0709	22	46	016018	029018	0000489	0376867	—
1.85		0.0728	22	46	—	—	0000496	—	—
	49	0.0730	22	46	—	—	0029138	—	—
1.90		0.0748	22	46	016019	029019	0000502	0376874	—
	48	0.0760	24	49	—	—	0029121	—	—
1.95		0.0768	24	49	46790303	029264	0000519	—	—
	5/64	0.0781	24	49	—	—	0002100	0376935	—
	47	0.0785	24	49	—	—	0029114	—	—
2.00		0.0787	24	49	016020	029020	0001332	0376041	46524831
2.05		0.0807	24	49	—	—	0001349	—	—
	46	0.0810	24	49	—	—	0029107	—	—
	45	0.0820	24	49	—	—	0029091	—	—
2.10		0.0827	24	49	016021	029021	0001356	0376058	—
2.15		0.0846	27	53	016266	—	0001363	—	—
	44	0.0860	27	53	—	—	0029084	—	—
2.20		0.0866	27	53	016022	029022	0001370	0376898	—
2.25		0.0886	27	53	016267	—	0001387	—	—
	43	0.0890	27	53	—	—	0029077	—	—
2.30		0.0906	27	53	016023	029023	0001394	0376904	—
2.35		0.0925	27	53	016268	029268	0001400	—	—
	42	0.0935	30	57	—	—	0029060	—	—
	3/32	0.0937	30	57	—	—	0001752	0376119	—
2.40		0.0945	30	57	016024	029024	0001417	0376911	—
	41	0.0960	30	57	—	—	0029053	—	—
2.45		0.0965	30	57	—	—	0001424	—	—
	40	0.0980	30	57	—	—	0029046	—	—
2.50		0.0984	30	57	016025	029025	0001431	0376065	46524832
	39	0.0995	30	57	—	—	0029022	—	—
2.55		0.1004	30	57	—	—	001448	—	—
	38	0.1015	30	57	—	—	0029015	—	—
2.60		0.1024	30	57	016026	029026	0001455	0376072	—
	37	0.1040	30	57	—	—	0029008	—	—
2.65		0.1043	30	57	—	—	0001462	—	—
2.70		0.1063	33	61	016027	029027	0001479	0376089	—
	36	0.1065	33	61	—	—	0028995	—	—
2.75		0.1083	33	61	016270	—	0001486	—	—
	7/64	0.1093	33	61	—	—	0002384	0376126	—
	35	0.1100	33	61	—	—	0028988	—	—
2.82		0.1102	33	61	—	—	0001493	0376096	—
	34	0.1110	33	61	—	—	0028971	—	—
2.85		0.1122	33	61	—	—	0001509	—	—
	33	0.1130	33	61	—	—	0028964	—	—
2.90		0.1142	33	61	016029	029029	0001516	0376102	—
	32	0.1160	33	61	—	—	0028957	—	—
2.95		0.1161	33	61	—	—	0001523	—	—
3.00		0.1181	33	61	016030	029030	0001608	0350577	46524833
	31	0.1200	36	65	—	—	0028940	—	—
3.10		0.1220	36	65	016031	029031	0001615	0350584	—
3.15		0.1240	36	65	—	—	0001622	—	—
	1/8	0.1250	36	65	—	—	0001264	0350591	46524834
3.20		0.1260	36	65	016032	029032	0001639	0350607	46524835
3.25		0.1280	36	65	016271	029271	0001646	0605356	—
	30	0.1285	36	65	—	—	0028933	—	—
3.30		0.1299	36	65	016033	029033	0001653	0350614	46524836
3.40		0.1339	39	70	016034	029034	0001660	0350621	—
	29	0.1360	39	70	—	—	0028919	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
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A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
3.50		0.1378	39	70	016035	029035	0001677	0350638	46524837
	28	0.1405	39	70	—	—	0028902	—	—
	9/64	0.1406	39	70	—	—	0002650	0350645	—
3.60		0.1417	39	70	016036	029036	0001684	0350652	—
	27	0.1440	39	70	—	—	0028896	—	—
3.70		0.1457	39	70	016037	029037	0001691	0350669	—
	26	0.1470	39	70	—	—	0028889	—	—
3.75		0.1476	39	70	—	—	0001707	—	—
	25	0.1495	43	75	—	—	0028872	—	—
3.80		0.1496	43	75	—	—	0001714	0350676	—
	24	0.1520	43	75	—	—	0028865	—	—
3.90		0.1535	43	75	—	—	0001721	0350683	—
	23	0.1540	43	75	—	—	0028858	—	—
	5/32	0.1562	43	75	—	—	0002094	0350690	46524838
	22	0.1570	43	75	—	—	0028841	—	—
4.00		0.1575	43	75	016040	029040	0001820	0350706	46524839
	21	0.1590	43	75	—	—	0028834	—	—
	20	0.1610	43	75	—	—	0028827	—	—
4.10		0.1614	43	75	016041	029041	0001837	0350713	46524860
4.20		0.1654	43	75	016042	029042	0001844	0350720	46524861
	19	0.1660	43	75	—	—	0028803	—	—
4.25		0.1673	43	75	—	—	0001851	—	—
4.30		0.1693	47	80	—	—	0001868	0350737	—
4.30		0.1693	47	80	016043	029043	0001868	0350737	—
	18	0.1695	47	80	—	—	0028797	—	—
	11/64	0.1719	47	80	—	—	0000793	0350744	—
	17	0.1730	47	80	—	—	0028780	—	—
4.40		0.1732	47	80	016044	029044	0001875	0350751	—
	16	0.1770	47	80	—	—	0028773	—	—
4.50		0.1772	47	80	016045	029045	0001882	0350768	46524862
	15	0.1800	47	80	—	—	0028766	—	—
4.60		0.1811	47	80	016046	029046	0001899	0350775	—
	14	0.1820	47	80	—	—	0028759	—	—
4.70		0.1850	47	80	—	—	0001905	0350782	—
	13	0.1850	47	80	—	—	0028742	—	—
4.75		0.1870	47	80	—	—	0001912	—	—
	3/16	0.1875	52	86	—	—	0001738	0350799	46524863
	12	0.1890	52	86	—	—	0028735	—	—
4.80		0.1890	52	86	016048	029048	0001929	0350805	—
	11	0.1910	52	86	—	—	0028728	—	—
4.90		0.1929	52	86	—	—	0001936	0350812	—
	10	0.1935	52	86	—	—	0028711	—	—
	9	0.1960	52	86	—	—	0029497	—	—
5.00		0.1968	52	86	016050	029050	0001967	0350829	46524864
	8	0.1990	52	86	—	—	0029473	—	—
5.10		0.2008	52	86	016051	029051	0001974	0350836	—
	7	0.2010	52	86	—	—	0029367	—	—
	13/64	0.2031	52	86	—	—	0001073	0350843	46524865
	6	0.2040	52	86	—	—	0029251	—	—
5.20		0.2047	52	86	016052	029052	0001981	0350850	—
	5	0.2055	52	86	—	—	0029145	—	—
5.25		0.2067	52	86	—	—	0001998	—	—
5.30		0.2087	52	86	016053	029053	0002001	0350867	—
	4	0.2090	57	93	—	—	0029039	—	—
5.40		0.2126	57	93	016054	029054	0002018	0350874	—
	3	0.2130	57	93	—	—	0028926	—	—
5.50		0.2165	57	93	016055	029055	0002025	0350881	46524866
	7/32	0.2187	57	93	—	—	0002377	0350898	46524867
5.60		0.2205	57	93	016056	029056	0002032	0350904	—
	2	0.2210	57	93	—	—	0028810	—	—
5.70		0.2244	57	93	016057	029057	0002049	0350911	—
5.75		0.2264	57	93	016276	029276	0002056	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
	1	0.2280	57	93	—	—	0028704	—	—
5.80		0.2283	57	93	016058	029058	0002063	0350928	—
5.90		0.2323	57	93	—	—	0002070	0350935	—
	A	0.2340	57	93	—	—	0028568	—	—
	15/64	0.2344	57	93	—	—	0001189	0350942	—
6.00		0.2362	57	93	016060	029060	0002124	0350959	46524868
	B	0.2380	63	101	—	—	0028575	—	—
6.10		0.2402	63	101	016061	029061	0002131	0350966	—
	C	0.2420	63	101	—	—	0028582	—	—
6.20		0.2441	63	101	016062	029062	0002148	0350973	—
	D	0.2460	63	101	—	—	0028599	—	—
6.25		0.2461	63	101	—	—	0002155	—	—
6.30		0.2480	63	101	016063	029063	0002162	0350980	—
	1/4	0.2500	63	101	—	—	0001080	0350997	46524869
	E	0.2500	63	101	—	—	0028605	—	—
6.40		0.2520	63	101	016064	029064	0002179	0351000	—
6.50		0.2559	63	101	016065	029065	0002186	0351017	46524870
	F	0.2570	63	101	—	—	0028612	—	—
6.60		0.2598	63	101	016066	029066	0002193	0351024	—
	G	0.2610	63	101	—	—	0028629	—	—
6.70		0.2638	63	101	016067	029067	0002209	0351031	—
	17/64	0.2656	69	109	—	—	0001257	0351048	46524871
6.75		0.2657	69	109	016278	029278	0002216	—	—
	H	0.2660	69	109	—	—	0028636	—	—
6.80		0.2677	69	109	016068	029068	0002223	0351055	46524872
6.90		0.2717	69	109	—	—	0002230	0351062	—
	I	0.2720	69	109	—	—	0028643	—	—
7.00		0.2756	69	109	016070	029070	0002247	0351079	46524873
	J	0.2770	69	109	—	—	0028650	—	—
7.10		0.2795	69	109	—	—	0002254	0351086	—
	K	0.2810	69	109	—	—	0028667	—	—
	9/32	0.2812	69	109	—	—	0002643	0351093	—
7.20		0.2835	69	109	016072	029072	0002261	0351109	—
7.25		0.2854	69	109	016279	029279	0002278	—	—
7.30		0.2874	69	109	016073	029073	0002285	0351116	—
	L	0.2900	69	109	—	—	0028674	—	—
7.40		0.2913	69	109	016074	029074	0002292	0351123	—
	M	0.2950	69	109	—	—	0028681	—	—
7.50		0.2953	69	109	016075	029075	0002308	0351130	46524874
	19/64	0.2968	75	117	—	—	0001325	0351147	—
7.60		0.2992	75	117	016076	029076	0002315	0351154	—
	N	0.3020	75	117	—	—	0028698	—	—
7.70		0.3031	75	117	—	—	0002322	0351161	—
7.75		0.3051	75	117	—	—	0002339	—	—
7.80		0.3071	75	117	016078	029078	0002346	0351178	—
7.85		0.3091	75	117	—	029281	—	—	—
7.90		0.3110	75	117	016079	029079	0002353	0351185	—
	5/16	0.3125	75	117	—	—	0002087	0351192	46524875
8.00		0.3150	75	117	016080	029080	0002391	0351208	46524876
	O	0.3160	75	117	—	—	0029503	—	—
8.10		0.3189	75	117	016081	029081	0002407	0351215	—
	P	0.3230	75	117	—	—	0029510	—	—
8.20		0.3228	75	117	016082	029082	0002414	0351222	46524877
8.25		0.3248	75	117	016282	029282	0002421	—	—
8.30		0.3268	75	117	—	—	0002438	0351239	—
	21/64	0.3281	75	117	—	—	0001554	0351246	—
8.40		0.3307	75	117	016084	029084	0002445	0351253	—
	Q	0.3320	75	117	—	—	0029527	—	—
8.50		0.3346	75	117	016085	029085	0002452	0351260	46524878
8.60		0.3386	81	125	016086	029086	0002469	0351277	—
	R	0.3390	81	125	—	—	0029534	—	—
8.70		0.3425	81	125	016087	029087	0002476	—	—
	11/32	0.3437	81	125	—	—	0000779	0351291	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

d_1 $\emptyset h_8$ mm	d_1 $\emptyset h_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
8.75		0.3445	81	125	016283	029283	0002483	—	—
8.80		0.3465	81	125	016088	029088	0002490	0351307	—
	S	0.3480	81	125	—	—	0029541	—	—
8.90		0.3504	81	125	016089	029089	0002506	0351314	—
9.00		0.3543	81	125	016090	029090	0002513	0351321	46524879
	T	0.3580	81	125	—	—	0029558	—	—
9.10		0.3583	81	125	—	—	0002520	0351338	—
	23/64	0.3594	81	125	—	—	0001561	0351345	—
9.20		0.3622	81	125	—	—	0002537	0351352	—
9.25		0.3642	81	125	—	—	0002544	—	—
9.30		0.3661	81	125	016093	029093	0002551	0351369	—
	U	0.3680	81	125	—	—	0029565	—	—
9.40		0.3701	81	125	016094	029094	0002568	0351376	—
9.50		0.3740	81	125	016095	029095	0002575	0351383	46524880
	3/8	0.3750	87	133	—	—	0001806	0351390	46524881
	V	0.3770	87	133	—	—	0029572	—	—
9.60		0.3780	87	133	016096	029096	0002582	0351406	—
9.70		0.3819	87	133	016097	029097	0002599	0351413	—
9.75		0.3839	87	133	—	—	0002605	—	—
9.80		0.3858	87	133	016098	029098	0002612	0351420	—
	W	0.3860	87	133	—	—	0029589	—	—
9.90		0.3898	87	133	016099	029099	0002629	0351437	—
	25/64	0.3906	87	133	—	—	0001578	0351444	—
10.00		0.3937	87	133	016100	029100	0000526	0351451	46524882
	X	0.3970	87	133	—	—	0029596	—	—
10.10		0.3976	87	133	—	—	0000533	0351468	—
10.20		0.4016	87	133	016102	029102	0000540	0351475	46524883
10.25		0.4035	87	133	—	—	0000557	—	—
	Y	0.4040	87	133	—	—	0029602	—	—
10.30		0.4055	87	133	016103	029103	0000564	0351482	—
	13/32	0.4062	87	133	—	—	0001066	0351499	—
10.40		0.4094	87	133	—	—	0000571	0351505	—
	Z	0.4130	87	133	—	—	0029619	—	—
10.50		0.4134	87	133	016105	029105	0000588	0351512	46524884
10.60		0.4173	87	133	016106	—	0000595	0351529	—
10.70		0.4213	94	142	—	—	0000601	0351536	—
	27/64	0.4219	94	142	—	—	0001585	0351543	—
10.75		0.4232	94	142	—	—	0000618	—	—
10.80		0.4252	94	142	016108	029108	0000625	0351550	—
10.90		0.4291	94	142	016109	029109	0000632	0351567	—
11.00		0.4331	94	142	016110	029110	0000649	0351574	46524885
11.10		0.4370	94	142	—	—	0000656	0351581	—
	7/16	0.4375	94	142	—	—	0002360	0351598	—
11.20		0.4409	94	142	016112	029112	0000663	0351604	—
11.25		0.4429	94	142	—	—	0000670	—	—
11.30		0.4449	94	142	016113	029113	0000687	0351611	—
11.40		0.4488	94	142	016114	029114	0000694	0351628	—
11.50		0.4528	94	142	016115	029115	0000700	0351635	46524886
	29/64	0.4531	94	142	—	—	0001592	0351642	—
11.60		0.4567	94	142	—	—	0000717	0351659	—
11.70		0.4606	94	142	016117	029117	0000724	0351666	—
11.75		0.4626	94	142	—	—	0000731	—	—
11.80		0.4646	94	142	016118	029118	0000748	0351673	—
11.90		0.4685	101	151	—	—	0000755	0351680	—
	15/32	0.4687	101	151	—	—	0001172	0351697	—
12.00		0.4724	101	151	016120	029120	0000816	0351703	46524887
12.10		0.4764	101	151	016121	029121	0000823	0351710	—
12.20		0.4803	101	151	016122	029122	0000830	0351727	—
12.25		0.4823	101	151	—	—	0000847	—	—
12.30		0.4843	101	151	—	—	0000854	0351734	—
	31/64	0.4843	101	151	—	—	0001745	0351741	—
12.40		0.4882	101	151	—	—	0000861	0351758	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

d_1 $Øh_8$ mm	d_1 $Øh_8$ "/Nr./letter	d_1 decimal Inch	l_2 mm	l_1 mm	2A	2AB	A100	A002	A002S
12.50		0.4921	101	151	016125	029125	0000878	0351765	46524888
12.60		0.4961	101	151	—	—	0000885	0351772	—
	1/2	0.5000	101	151	—	—	0000809	0351789	46524889
12.70		0.5000	101	151	—	029127	0000892	0351796	—
12.75		0.5020	101	151	—	—	0000908	—	—
12.80		0.5039	101	151	016128	029128	0000915	0351802	—
12.90		0.5079	101	151	—	029129	0000922	0351819	—
13.00		0.5118	101	151	016130	029130	0000939	0351826	46524890
	33/64	0.5156	101	151	—	—	0001769	0385333	—
13.10		0.5157	101	151	—	—	0000946	0385180	—
13.20		0.5197	101	151	—	—	0000953	0385524	—
13.25		0.5217	108	160	—	—	0000960	0385579	—
13.30		0.5236	108	160	—	—	0000977	0385197	—
13.40		0.5276	108	160	—	—	0000984	0385531	—
	17/32	0.5313	108	160	—	—	0001240	0385319	—
13.50		0.5315	108	160	034135	016135	0000991	0385548	—
13.60		0.5354	108	160	—	—	0001004	0385203	—
13.70		0.5394	108	160	—	—	0001011	0385210	—
13.75		0.5413	108	160	—	—	0001028	0385586	—
13.80		0.5433	108	160	—	—	0001035	0385227	—
	35/64	0.5469	108	160	—	—	0001776	0385340	—
13.90		0.5472	108	160	—	—	0001042	0385494	—
14.00		0.5512	108	160	034140	016140	0001097	0384497	—
14.25		0.5610	114	169	—	—	0001103	0385234	—
	9/16	0.5625	114	169	—	—	0002636	0385388	—
14.50		0.5709	114	169	034145	016145	0001110	0385241	—
	37/64	0.5781	114	169	—	—	0001790	0385357	—
14.75		0.5807	114	169	—	—	0001127	0385258	—
15.00		0.5906	114	169	034150	016150	0001134	0385265	—
	19/32	0.5937	120	178	—	—	0001318	0385326	—
15.25		0.6004	120	178	—	—	0001141	0385272	—
	39/64	0.6094	120	178	—	—	0001813	0385364	—
15.50		0.6102	120	178	—	016155	0001158	0385289	—
15.75		0.6201	120	178	—	—	0001165	0385296	—
	5/8	0.6250	120	178	—	—	0002117	0385371	—
16.00		0.6299	120	178	—	016160	0001196	0385302	—
	41/64	0.6406	125	184	—	—	0001943	—	—
16.50		0.6496	125	184	—	016165	0001202	—	—
	21/32	0.6562	125	184	—	—	0001547	—	—
17.00		0.6693	125	184	—	016170	0001226	—	—
	43/64	0.6719	130	191	—	—	0001950	—	—
	11/16	0.6875	130	191	—	—	0000762	—	—
17.50		0.6890	130	191	—	016175	0001233	—	—
18.00		0.7087	130	191	—	—	0001271	—	—
18.50		0.7283	135	198	—	—	0001288	—	—
19.00		0.7480	135	198	—	—	0001295	—	—
19.50		0.7677	140	205	—	—	0001301	—	—
20.00		0.7874	140	205	—	—	0001530	—	—

Package quantities: **2A and 2AB:** 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**
A100 and A002: 0.20mm - 10.00mm = **10**; X - 13.00mm = **5**; 33/64 and above = **1**
A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

JOBBER DRILL

General Purpose Jobber Length - Left Hand

L10 Left hand helix for use in machines where spindle is counter-clockwise & can be used to remove broken parts without damaging threaded holes. Bright Finish improves chip flow in soft or non-ferrous materials



L10

ANSI

4XD

HSS

118°



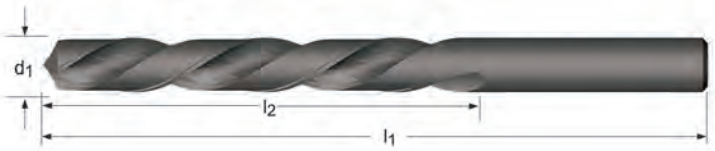
1/32 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	L10
1/32	0.0313	1/2	1.3/8	12	010902
3/64	0.0469	3/4	1.3/4	12	010903
1/16	0.0625	7/8	1.7/8	12	010904
5/64	0.0781	1“	2“	12	010905
3/32	0.0938	1.1/4	2.1/4	12	010906
7/64	0.1094	1.1/2	2.5/8	12	010907
1/8	0.1250	1.5/8	2.3/4	12	010908
9/64	0.1406	1.3/4	2.7/8	12	010909
5/32	0.1563	2“	3.1/8	12	010910
11/64	0.1719	2.1/8	3.1/4	12	010911
3/16	0.1875	2.5/16	3.1/2	12	010912
13/64	0.2031	2.7/16	3.5/8	12	010913
7/32	0.2188	2.1/2	3.3/4	12	010914
15/64	0.2344	2.5/8	3.7/8	12	010915
1/4	0.2500	2.3/4	4“	12	010916
17/64	0.2656	2.7/8	4.1/8	12	010917
9/32	0.2813	2.15/16	4.1/4	12	010918
19/64	0.2969	3.1/16	4.3/8	12	010919
5/16	0.3125	3.3/16	4.1/2	6	010920
21/64	0.3281	3.5/16	4.5/8	6	010921
11/32	0.3437	3.7/16	4.3/4	6	010922
23/64	0.3594	3.1/2	4.7/8	6	010923
3/8	0.3750	3.5/8	5“	6	010924
25/64	0.3906	3.3/4	5.1/8	6	010925
13/32	0.4063	3.7/8	5.1/4	6	010926
27/64	0.4219	3.15/16	5.3/8	6	010927
7/16	0.4375	4.1/16	5.1/2	6	010928
29/64	0.4531	4.3/16	5.5/8	6	010929
15/32	0.4687	4.5/16	5.3/4	6	010930
31/64	0.4844	4.3/8	5.7/8	6	010931
1/2	0.5000	4.1/2	6“	6	010932

DORMER

General Purpose Jobber Length - Left Hand

A101 Left hand helix for use in machines where spindle is counter-clockwise & can be used to remove broken parts without damaging threaded holes.



A101

DIN 338

4XD

HSS

118°



1.00 - 12.00

d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	A101
1.00	0.0394	12	34	0002667
1.10	0.0433	14	36	0002674
1.20	0.0472	16	38	0002681
1.25	0.0492	16	38	0002698
1.30	0.0512	16	38	0002704
1.40	0.0551	18	40	0002711
1.50	0.0591	18	40	0002728
1.60	0.0630	20	43	0002735
1.70	0.0669	20	43	0002742
1.80	0.0709	22	46	0002766
1.90	0.0748	22	46	0002773
2.00	0.0787	24	49	0002803
2.10	0.0827	24	49	0002810
2.20	0.0866	27	53	0002827
2.30	0.0906	27	53	0002834
2.40	0.0945	30	57	0002841
2.50	0.0984	30	57	0002858
2.60	0.1024	30	57	0002865
2.70	0.1063	33	61	0002872
2.80	0.1102	33	61	0002889
2.90	0.1142	33	61	0002896
3.00	0.1181	33	61	0002902
3.20	0.1260	36	65	0002919
3.30	0.1299	36	65	0002926
3.50	0.1378	39	70	0002933
3.80	0.1496	43	75	0002940
4.00	0.1575	43	75	0002957
4.20	0.1654	43	75	0002964
4.50	0.1772	47	80	0002971
4.80	0.1890	52	86	0002988
5.00	0.1969	52	86	0002995
5.10	0.2008	52	86	0003008
5.20	0.2047	52	86	0003015

JOBBER DRILL

d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	A101
5.50	0.2165	57	93	0003022
6.00	0.2362	57	93	0003039
6.50	0.2559	63	101	0003046
7.00	0.2756	69	109	0003053
7.50	0.2953	69	109	0003060
8.00	0.3150	75	117	0003077
8.50	0.3346	75	117	0003084
9.00	0.3543	81	125	0003091
10.00	0.3937	87	133	0002780
11.00	0.4331	94	142	0149027
12.00	0.4724	101	151	0002797

JOBBER DRILL

Heavy Duty Jobber Length (HX Series)

* *HX10 set available on pg. 206*

HX10 - *Fractional Sizes*

HX18 - *Wire Gauge Sizes*

HX15 - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Stronger and more Rigid. Unique surface treatment for improved wear resistance in hard ferrous alloys.





d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
1/16			0.0625	7/8	1.7/8	12	022004	—	—
	52		0.0635	7/8	1.7/8	12	—	022152	—
	51		0.0670	1“	2“	12	—	022151	—
	50		0.0700	1“	2“	12	—	022150	—
	49		0.0730	1“	2“	12	—	022149	—
	48		0.0760	1“	2“	12	—	022148	—
5/64			0.0781	1“	2“	12	022005	—	—
	47		0.0785	1“	2“	12	—	022147	—
	46		0.0810	1.1/8	2.1/8	12	—	022146	—
	45		0.0820	1.1/8	2.1/8	12	—	022145	—
	44		0.0860	1.1/8	2.1/8	12	—	022144	—
	43		0.0890	1.1/4	2.1/4	12	—	022143	—
	42		0.0935	1.1/4	2.1/4	12	—	022142	—
3/32			0.0938	1.1/4	2.1/4	12	022006	—	—
	41		0.0960	1.3/8	2.3/8	12	—	022141	—
	40		0.0980	1.3/8	2.3/8	12	—	022140	—
	39		0.0995	1.3/8	2.3/8	12	—	022139	—
	38		0.1015	1.7/16	2.1/2	12	—	022138	—
	37		0.1040	1.7/16	2.1/2	12	—	022137	—
	36		0.1065	1.7/16	2.1/2	12	—	022136	—
7/64			0.1094	1.1/2	2.5/8	12	022007	—	—
	35		0.1100	1.1/2	2.5/8	12	—	022135	—
	34		0.1110	1.1/2	2.5/8	12	—	022134	—
	33		0.1130	1.1/2	2.5/8	12	—	022133	—
	32		0.1160	1.5/8	2.3/4	12	—	022132	—
	31		0.1200	1.5/8	2.3/4	12	—	022131	—
1/8			0.1250	1.5/8	2.3/4	12	022008	—	—
	30		0.1285	1.5/8	2.3/4	12	—	022130	—
	29		0.1360	1.3/4	2.7/8	12	—	022129	—
	28		0.1405	1.3/4	2.7/8	12	—	022128	—
9/64			0.1406	1.3/4	2.7/8	12	022009	—	—
	27		0.1440	1.7/8	3“	12	—	022127	—
	26		0.1470	1.7/8	3“	12	—	022126	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
	25		0.1495	1.7/8	3“	12	—	022125	—
	24		0.1520	2“	3.1/8	12	—	022124	—
	23		0.1540	2“	3.1/8	12	—	022123	—
5/32			0.1563	2“	3.1/8	12	022010	—	—
	22		0.1570	2“	3.1/8	12	—	022122	—
	21		0.1590	2.1/8	3.1/4	12	—	022121	—
	20		0.1610	2.1/8	3.1/4	12	—	022120	—
	19		0.1660	2.1/8	3.1/4	12	—	022119	—
	18		0.1695	2.1/8	3.1/4	12	—	022118	—
11/64			0.1719	2.1/8	3.1/4	12	022011	—	—
	17		0.1730	2.3/16	3.3/8	12	—	022117	—
	16		0.1770	2.3/16	3.3/8	12	—	022116	—
	15		0.1800	2.3/16	3.3/8	12	—	022115	—
	14		0.1820	2.3/16	3.3/8	12	—	022114	—
	13		0.1850	2.5/16	3.1/2	12	—	022113	—
3/16			0.1875	2.5/16	3.1/2	12	022012	—	—
	12		0.1890	2.5/16	3.1/2	12	—	022112	—
	11		0.1910	2.5/16	3.1/2	12	—	022111	—
	10		0.1935	2.7/16	3.5/8	12	—	022110	—
	9		0.1960	2.7/16	3.5/8	12	—	022109	—
	8		0.1990	2.7/16	3.5/8	12	—	022108	—
	7		0.2010	2.7/16	3.5/8	12	—	022107	—
13/64			0.2031	2.7/16	3.5/8	12	022013	—	—
	6		0.2040	2.1/2	3.3/4	12	—	022106	—
	5		0.2055	2.1/2	3.3/4	12	—	022105	—
	4		0.2090	2.1/2	3.3/4	12	—	022104	—
	3		0.2130	2.1/2	3.3/4	12	—	022103	—
7/32			0.2188	2.1/2	3.3/4	12	022014	—	—
	2		0.2210	2.5/8	3.7/8	12	—	022102	—
	1		0.2280	2.5/8	3.7/8	12	—	022101	—
		A	0.2340	2.5/8	3.7/8	12	—	—	022201
15/64			0.2344	2.5/8	3.7/8	12	022015	—	—
		B	0.2374	2.3/4	4“	12	—	—	022202
		C	0.2421	2.3/4	4“	12	—	—	022203
		D	0.2461	2.3/4	4“	12	—	—	022204
		E	0.2500	2.3/4	4“	12	—	—	022205
1/4			0.2500	2.3/4	4“	12	022016	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	022206
		G	0.2610	2.7/8	4.1/8	12	—	—	022207
17/64			0.2656	2.7/8	4.1/8	12	0022017	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	022208
		I	0.2720	2.7/8	4.1/8	12	—	—	022209
		J	0.2772	2.7/8	4.1/8	12	—	—	022210
		K	0.2811	2.15/16	4.1/4	12	—	—	022211
9/32			0.2813	2.15/16	4.1/4	12	022018	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	022212
		M	0.2949	3.1/16	4.3/8	12	—	—	022213
19/64			0.2969	3.1/16	4.3/8	12	022019	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	022214
5/16			0.3125	3.3/16	4.1/2	6	022020	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	022215
		P	0.3228	3.5/16	4.5/8	6	—	—	022216
21/64			0.3281	3.5/16	4.5/8	6	022021	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	022217
		R	0.3390	3.7/16	4.3/4	6	—	—	022218
11/32			0.3437	3.7/16	4.3/4	6	022022	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	022219
		T	0.3580	3.1/2	4.7/8	6	—	—	022220
23/64			0.3594	3.1/2	4.7/8	6	022023	—	—
		U	0.3680	3.5/8	5“	6	—	—	022221
3/8			0.3750	3.5/8	5“	6	022024	—	—
		V	0.3772	3.5/8	5“	6	—	—	022222
		W	0.3858	3.3/4	5.1/8	6	—	—	022223
25/64			0.3906	3.3/4	5.1/8	6	022025	—	—
		X	0.3969	3.3/4	5.1/8	6	—	—	022224
		Y	0.4039	3.7/8	5.1/4	6	—	—	022225

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	HX10	HX18	HX15
13/32			0.4063	3.7/8	5.1/4	6	022026	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	022226
27/64			0.4219	3.15/16	5.3/8	6	022027	—	—
7/16			0.4375	4.1/16	5.1/2	6	022028	—	—
29/64			0.4531	4.3/16	5.5/8	6	022029	—	—
15/32			0.4687	4.5/16	5.3/4	6	022030	—	—
31/64			0.4844	4.3/8	5.7/8	6	022031	—	—
1/2			0.5000	4.1/2	6“	6	022032	—	—

JOBBER DRILL

General Purpose Jobber Length (NAS 907 Type A)

R10A - *Fractional Sizes*

R18A - *Wire Gauge Sizes*

R15A - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration.
Steam oxide surface treatment for increased wear resistance & lubricity



R10A	R18A	R15A
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS	HSS	HSS
118°	118°	118°
		
1/16 - 1/2	N52 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
1/16			0.0625	7/8	1.7/8	12	010104	—	—
	52		0.0635	7/8	1.7/8	12	—	018152	—
	51		0.0670	1“	2“	12	—	018151	—
	50		0.0700	1“	2“	12	—	018150	—
	49		0.0730	1“	2“	12	—	018149	—
	48		0.0760	1“	2“	12	—	018148	—
5/64			0.0781	1“	2“	12	010105	—	—
	47		0.0785	1“	2“	12	—	018147	—
	46		0.0810	1.1/8	2.1/8	12	—	018146	—
	45		0.0820	1.1/8	2.1/8	12	—	018145	—
	44		0.0860	1.1/8	2.1/8	12	—	018144	—
	43		0.0890	1.1/4	2.1/4	12	—	018143	—
	42		0.0935	1.1/4	2.1/4	12	—	018142	—
3/32			0.0938	1.1/4	2.1/4	12	010106	—	—
	41		0.0960	1.3/8	2.3/8	12	—	018141	—
	40		0.0980	1.3/8	2.3/8	12	—	018140	—
	39		0.0995	1.3/8	2.3/8	12	—	018139	—
	38		0.1015	1.7/16	2.1/2	12	—	018138	—
	37		0.1040	1.7/16	2.1/2	12	—	018137	—
	36		0.1065	1.7/16	2.1/2	12	—	018136	—
7/64			0.1094	1.1/2	2.5/8	12	010107	—	—
	35		0.1100	1.1/2	2.5/8	12	—	018135	—
	34		0.1110	1.1/2	2.5/8	12	—	018134	—
	33		0.1130	1.1/2	2.5/8	12	—	018133	—
	32		0.1160	1.5/8	2.3/4	12	—	018132	—
	31		0.1200	1.5/8	2.3/4	12	—	018131	—
1/8			0.1250	1.5/8	2.3/4	12	010108	—	—
	30		0.1285	1.5/8	2.3/4	12	—	018130	—
	29		0.1360	1.3/4	2.7/8	12	—	018129	—
	28		0.1405	1.3/4	2.7/8	12	—	018128	—
9/64			0.1406	1.3/4	2.7/8	12	010109	—	—
	27		0.1440	1.7/8	3“	12	—	018127	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
	26		0.1470	1.7/8	3“	12	—	018126	—
	25		0.1495	1.7/8	3“	12	—	018125	—
	24		0.1520	2“	3.1/8	12	—	018124	—
	23		0.1540	2“	3.1/8	12	—	018123	—
5/32			0.1563	2“	3.1/8	12	010110	—	—
	22		0.1570	2“	3.1/8	12	—	018122	—
	21		0.1590	2.1/8	3.1/4	12	—	018121	—
	20		0.1610	2.1/8	3.1/4	12	—	018120	—
	19		0.1660	2.1/8	3.1/4	12	—	018119	—
	18		0.1695	2.1/8	3.1/4	12	—	018118	—
11/64			0.1719	2.1/8	3.1/4	12	010111	—	—
	17		0.1730	2.3/16	3.3/8	12	—	018117	—
	16		0.1770	2.3/16	3.3/8	12	—	018116	—
	15		0.1800	2.3/16	3.3/8	12	—	018115	—
	14		0.1820	2.3/16	3.3/8	12	—	018114	—
	13		0.1850	2.5/16	3.1/2	12	—	018113	—
3/16			0.1875	2.5/16	3.1/2	12	010112	—	—
	12		0.1890	2.5/16	3.1/2	12	—	018112	—
	11		0.1910	2.5/16	3.1/2	12	—	018111	—
	10		0.1935	2.7/16	3.5/8	12	—	018110	—
	9		0.1960	2.7/16	3.5/8	12	—	018109	—
	8		0.1990	2.7/16	3.5/8	12	—	018108	—
	7		0.2010	2.7/16	3.5/8	12	—	018107	—
13/64			0.2031	2.7/16	3.5/8	12	010113	—	—
	6		0.2040	2.1/2	3.3/4	12	—	018106	—
	5		0.2055	2.1/2	3.3/4	12	—	018105	—
	4		0.2090	2.1/2	3.3/4	12	—	018104	—
	3		0.2130	2.1/2	3.3/4	12	—	018103	—
7/32			0.2188	2.1/2	3.3/4	12	010114	—	—
	2		0.2210	2.5/8	3.7/8	12	—	018102	—
	1		0.2280	2.5/8	3.7/8	12	—	018101	—
		A	0.2340	2.5/8	3.7/8	12	—	—	015101
15/64			0.2344	2.5/8	3.7/8	12	010115	—	—
		B	0.2374	2.3/4	4“	12	—	—	015102
		C	0.2421	2.3/4	4“	12	—	—	015103
		D	0.2461	2.3/4	4“	12	—	—	015104
		E	0.2500	2.3/4	4“	12	—	—	015105
1/4			0.2500	2.3/4	4“	12	010116	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	015106
		G	0.2610	2.7/8	4.1/8	12	—	—	015107
17/64			0.2656	2.7/8	4.1/8	12	010117	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	015108
		I	0.2720	2.7/8	4.1/8	12	—	—	015109
		J	0.2772	2.7/8	4.1/8	12	—	—	015110
		K	0.2811	2.15/16	4.1/4	12	—	—	015111
9/32			0.2813	2.15/16	4.1/4	12	010118	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	015112
		M	0.2949	3.1/16	4.3/8	12	—	—	015113
19/64			0.2969	3.1/16	4.3/8	12	010119	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	015114
5/16			0.3125	3.3/16	4.1/2	6	010120	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	015115
		P	0.3228	3.5/16	4.5/8	6	—	—	015116
21/64			0.3281	3.5/16	4.5/8	6	010121	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	015117
		R	0.3390	3.7/16	4.3/4	6	—	—	015118
11/32			0.3437	3.7/16	4.3/4	6	010122	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	015119
		T	0.3580	3.1/2	4.7/8	6	—	—	015120
23/64			0.3594	3.1/2	4.7/8	6	010123	—	—
		U	0.3680	3.5/8	5“	6	—	—	015121
3/8			0.3750	3.5/8	5“	6	010124	—	—
		V	0.3772	3.5/8	5“	6	—	—	015122
		W	0.3858	3.3/4	5.1/8	6	—	—	015123
25/64			0.3906	3.3/4	5.1/8	6	0010125	—	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10A	R18A	R15A
		X	0.3969	3.3/4	5.1/8	6	—	—	015124
		Y	0.4039	3.7/8	5.1/4	6	—	—	015125
13/32			0.4063	3.7/8	5.1/4	6	010126	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	015126
27/64			0.4219	3.15/16	5.3/8	6	010127	—	—
7/16			0.4375	4.1/16	5.1/2	6	010128	—	—
29/64			0.4531	4.3/16	5.5/8	6	010129	—	—
15/32			0.4687	4.5/16	5.3/4	6	010130	—	—
31/64			0.4844	4.3/8	5.7/8	6	010131	—	—
1/2			0.5000	4.1/2	6“	6	010132	—	—

JOBBER DRILL

Heavy Duty Jobber Length (NAS 907 Type B)

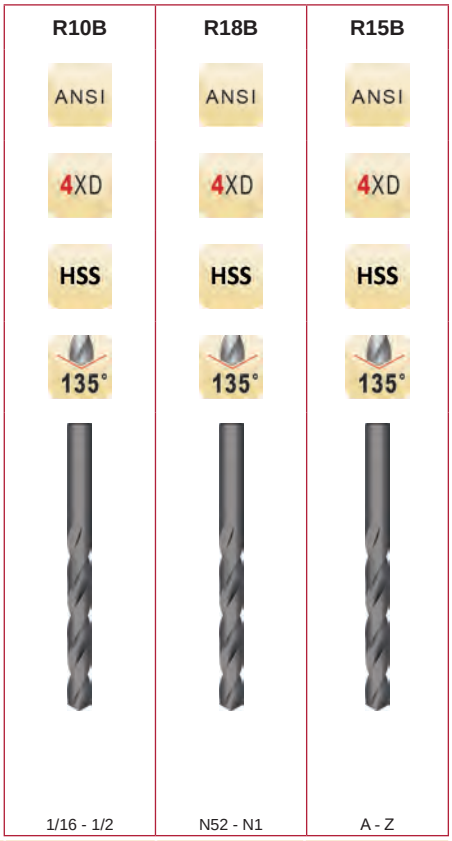
R10B - *Fractional Sizes*

R18B - *Wire Gauge Sizes*

R15B - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance & lubricity. Recommended for tougher ferrous materials.





d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
1/16			0.0625	7/8	1.7/8	12	010204	—	—
	52		0.0635	7/8	1.7/8	12	—	018252	—
	51		0.0670	1“	2“	12	—	018251	—
	50		0.0700	1“	2“	12	—	018250	—
	49		0.0730	1“	2“	12	—	018249	—
	48		0.0760	1“	2“	12	—	018248	—
5/64			0.0781	1“	2“	12	010205	—	—
	47		0.0785	1“	2“	12	—	018247	—
	46		0.0810	1.1/8	2.1/8	12	—	018246	—
	45		0.0820	1.1/8	2.1/8	12	—	018245	—
	44		0.0860	1.1/8	2.1/8	12	—	018244	—
	43		0.0890	1.1/4	2.1/4	12	—	018243	—
	42		0.0935	1.1/4	2.1/4	12	—	018242	—
3/32			0.0938	1.1/4	2.1/4	12	010206	—	—
	41		0.0960	1.3/8	2.3/8	12	—	018241	—
	40		0.0980	1.3/8	2.3/8	12	—	018240	—
	39		0.0995	1.3/8	2.3/8	12	—	018239	—
	38		0.1015	1.7/16	2.1/2	12	—	018238	—
	37		0.1040	1.7/16	2.1/2	12	—	018237	—
	36		0.1065	1.7/16	2.1/2	12	—	018236	—
7/64			0.1094	1.1/2	2.5/8	12	010207	—	—
	35		0.1100	1.1/2	2.5/8	12	—	018235	—
	34		0.1110	1.1/2	2.5/8	12	—	018234	—
	33		0.1130	1.1/2	2.5/8	12	—	018233	—
	32		0.1160	1.5/8	2.3/4	12	—	018232	—
	31		0.1200	1.5/8	2.3/4	12	—	018231	—
1/8			0.1250	1.5/8	2.3/4	12	010208	—	—
	30		0.1285	1.5/8	2.3/4	12	—	018230	—
	29		0.1360	1.3/4	2.7/8	12	—	018229	—
	28		0.1405	1.3/4	2.7/8	12	—	018228	—
9/64			0.1406	1.3/4	2.7/8	12	010209	—	—
	27		0.1440	1.7/8	3“	12	—	018227	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
	26		0.1470	1.7/8	3“	12	—	018226	—
	25		0.1495	1.7/8	3“	12	—	018225	—
	24		0.1520	2“	3.1/8	12	—	018224	—
	23		0.1540	2“	3.1/8	12	—	018223	—
5/32			0.1563	2“	3.1/8	12	010210	—	—
	22		0.1570	2“	3.1/8	12	—	018222	—
	21		0.1590	2.1/8	3.1/4	12	—	018221	—
	20		0.1610	2.1/8	3.1/4	12	—	018220	—
	19		0.1660	2.1/8	3.1/4	12	—	018219	—
	18		0.1695	2.1/8	3.1/4	12	—	018218	—
11/64			0.1719	2.1/8	3.1/4	12	010211	—	—
	17		0.1730	2.3/16	3.3/8	12	—	018217	—
	16		0.1770	2.3/16	3.3/8	12	—	018216	—
	15		0.1800	2.3/16	3.3/8	12	—	018215	—
	14		0.1820	2.3/16	3.3/8	12	—	018214	—
	13		0.1850	2.5/16	3.1/2	12	—	018213	—
3/16			0.1875	2.5/16	3.1/2	12	010212	—	—
	12		0.1890	2.5/16	3.1/2	12	—	018212	—
	11		0.1910	2.5/16	3.1/2	12	—	018211	—
	10		0.1935	2.7/16	3.5/8	12	—	018210	—
	9		0.1960	2.7/16	3.5/8	12	—	018209	—
	8		0.1990	2.7/16	3.5/8	12	—	018208	—
	7		0.2010	2.7/16	3.5/8	12	—	018207	—
13/64			0.2031	2.7/16	3.5/8	12	010213	—	—
	6		0.2040	2.1/2	3.3/4	12	—	018206	—
	5		0.2055	2.1/2	3.3/4	12	—	018205	—
	4		0.2090	2.1/2	3.3/4	12	—	018204	—
	3		0.2130	2.1/2	3.3/4	12	—	018203	—
7/32			0.2188	2.1/2	3.3/4	12	010214	—	—
	2		0.2210	2.5/8	3.7/8	12	—	018202	—
	1		0.2280	2.5/8	3.7/8	12	—	018201	—
		A	0.2340	2.5/8	3.7/8	12	—	—	015201
15/64			0.2344	2.5/8	3.7/8	12	010215	—	—
		B	0.2380	2.3/4	4“	12	—	—	015202
		C	0.2421	2.3/4	4“	12	—	—	015203
		D	0.2461	2.3/4	4“	12	—	—	015204
		E	0.2500	2.3/4	4“	12	—	—	015205
1/4			0.2500	2.3/4	4“	12	010216	—	—
		F	0.2571	2.7/8	4.1/8	12	—	—	015206
		G	0.2610	2.7/8	4.1/8	12	—	—	015207
17/64			0.2656	2.7/8	4.1/8	12	010217	—	—
		H	0.2661	2.7/8	4.1/8	12	—	—	015208
		I	0.2720	2.7/8	4.1/8	12	—	—	015209
		J	0.2772	2.7/8	4.1/8	12	—	—	015210
		K	0.2811	2.15/16	4.1/4	12	—	—	015211
9/32			0.2813	2.15/16	4.1/4	12	010218	—	—
		L	0.2902	2.15/16	4.1/4	12	—	—	015212
		M	0.2949	3.1/16	4.3/8	12	—	—	015213
19/64			0.2969	3.1/16	4.3/8	12	010219	—	—
		N	0.3020	3.1/16	4.3/8	12	—	—	015214
5/16			0.3125	3.3/16	4.1/2	6	010220	—	—
		O	0.3161	3.3/16	4.1/2	6	—	—	015215
		P	0.3228	3.5/16	4.5/8	6	—	—	015216
21/64			0.3281	3.5/16	4.5/8	6	010221	—	—
		Q	0.3319	3.7/16	4.3/4	6	—	—	015217
		R	0.3390	3.7/16	4.3/4	6	—	—	015218
11/32			0.3437	3.7/16	4.3/4	6	010222	—	—
		S	0.3480	3.1/2	4.7/8	6	—	—	015219
		T	0.3580	3.1/2	4.7/8	6	—	—	015220
23/64			0.3594	3.1/2	4.7/8	6	010223	—	—
		U	0.3680	3.5/8	5“	6	—	—	015221
3/8			0.3750	3.5/8	5“	6	010224	—	—
		V	0.3772	3.5/8	5“	6	—	—	015222
		W	0.3858	3.3/4	5.1/8	6	—	—	015223
25/64			0.3906	3.3/4	5.1/8	6	010225	—	—
		X	0.3969	3.3/4	5.1/8	6	—	—	015224

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R10B	R18B	R15B
		Y	0.4039	3.7/8	5.1/4	6	—	—	015225
13/32			0.4063	3.7/8	5.1/4	6	010226	—	—
		Z	0.4130	3.7/8	5.1/4	6	—	—	015226
27/64			0.4219	3.15/16	5.3/8	6	010227	—	—
7/16			0.4375	4.1/16	5.1/2	6	010228	—	—
29/64			0.4531	4.3/16	5.5/8	6	010229	—	—
15/32			0.4687	4.5/16	5.3/4	6	010230	—	—
31/64			0.4844	4.3/8	5.7/8	6	010231	—	—
1/2			0.5000	4.1/2	6“	6	010232	—	—

High Helix Jobber Length

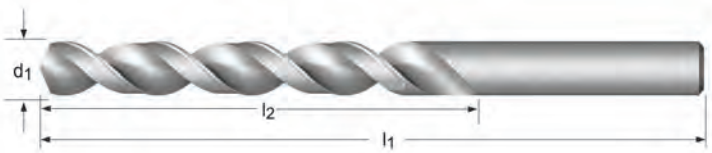
R10H - *Fractional Sizes*

R18H - *Wire Gauge Sizes*

High Helix and Bright Finish for better chip flow in soft or non-ferrous materials.

A108 - *Fractional & Metric Sizes*

Low thrust design self centering Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity. Fast spiral for stainless.



R10H	R18H	A108
ANSI	ANSI	DIN 338
4XD	4XD	4XD
HSS	HSS	HSS
118°	118°	135°
		
1/32 - 1/2	N80 - N1	1.00 - 16.00

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
	80		0.0135	1/8		3/4		12	—	018580	—
	79		0.0145	1/8		3/4		12	—	018579	—
	78		0.0160	3/16		7/8		12	—	018578	—
	77		0.0180	3/16		7/8		12	—	018577	—
	76		0.0200	3/16		7/8		12	—	018576	—
	75		0.0210	1/4		1“		12	—	018575	—
	74		0.0225	1/4		1“		12	—	018574	—
	73		0.0240	5/16		1.1/8		12	—	018573	—
	72		0.0250	5/16		1.1/8		12	—	018572	—
	71		0.0260	3/8		1.1/4		12	—	018571	—
	70		0.0280	3/8		1.1/4		12	—	018570	—
	69		0.0292	1/2		1.3/8		12	—	018569	—
	68		0.0310	1/2		1.3/8		12	—	018568	—
1/32			0.0313	1/2		1.3/8		12	010502	—	—
	67		0.0320	1/2		1.3/8		12	—	018567	—
	66		0.0330	1/2		1.3/8		12	—	018566	—
	65		0.0350	5/8		1.1/2		12	—	018565	—
	64		0.0360	5/8		1.1/2		12	—	018564	—
	63		0.0370	5/8		1.1/2		12	—	018563	—
	62		0.0380	5/8		1.1/2		12	—	018562	—
	61		0.0390	11/16		1.5/8		12	—	018561	—
		1.00	0.0394		12		34	10	—	—	0007549
	60		0.0400	11/16		1.5/8		12	—	018560	—
	59		0.0410	11/16		1.5/8		12	—	018559	—
	58		0.0420	11/16		1.5/8		12	—	018558	—
	57		0.0430	3/4		1.3/4		12	—	018557	—
		1.10	0.0433		14		36	10	—	—	0007556
	56		0.0465	3/4		1.3/4		12	—	018556	—
3/64			0.0469	3/4		1.3/4		12	010503	—	—
		1.20	0.0472		16		38	10	—	—	0007563
		1.30	0.0512		16		38	10	—	—	0007570
	55		0.0520	7/8		1.7/8		12	—	018555	—
	54		0.0550	7/8		1.7/8		12	—	018554	—

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
		1.40	0.0551		18		40	10	—	—	0007587
		1.50	0.0591		18		40	10	—	—	0007594
	53		0.0595	7/8		1.7/8		12	—	018553	—
1/16			0.0625	7/8		1.7/8		12	010504	—	
1/16			0.0625		20		43	10	—	—	0007723
		1.60	0.0630		20		43	10	—	—	0007600
	52		0.0635	7/8		1.7/8		12	—	018552	
		1.70	0.0669		20		43	10	—	—	0007617
	51		0.0670	1“		2“		12	—	018551	—
	50		0.0700	1“		2“		12	—	018550	—
		1.80	0.0709		22		46	10	—	—	0007624
	49		0.0730	1“		2“		12	—	018549	—
		1.90	0.0748		22		46	10	—	—	0007631
	48		0.0760	1“		2“		12	—	018548	—
5/64			0.0781	1“		2“		12	010505	—	—
5/64			0.0781		24		49	10	—	—	0008478
	47		0.0785	1“		2“		12	—	018547	—
		2.00	0.0787		24		49	10	—	—	0007969
	46		0.0810	1.1/8		2.1/8		12	—	018546	—
	45		0.0820	1.1/8		2.1/8		12	—	018545	—
		2.10	0.0827		24		49	10	—	—	0007976
	44		0.0860	1.1/8		2.1/8		12	—	018544	—
		2.20	0.0866		27		53	10	—	—	0007983
	43		0.0890	1.1/4		2.1/4		12	—	018543	—
		2.30	0.0906		27		53	10	—	—	0007990
	42		0.0935	1.1/4		2.1/4		12	—	018542	—
3/32			0.0938	1.1/4		2.1/4		12	010506	—	—
3/32			0.0938		30		57	10	—	—	0008232
		2.40	0.0945		30		57	10	—	—	0008003
	41		0.0960	1.3/8		2.3/8		12	—	018541	—
	40		0.0980	1.3/8		2.3/8		12	—	018540	—
		2.50	0.0984		30		57	10	—	—	0008010
	39		0.0995	1.3/8		2.3/8		12	—	018539	—
	38		0.1015	1.7/16		2.1/2		12	—	018538	—
		2.60	0.1024		30		57	10	—	—	0008027
	37		0.1040	1.7/16		2.1/2		12	—	018537	—
		2.70	0.1063		33		61	10	—	—	0008034
	36		0.1065	1.7/16		2.1/2		12	—	018536	—
7/64			0.1094	1.1/2		2.5/8		12	010507	—	—
7/64			0.1094		33		61	10	—	—	0008706
	35		0.1100	1.1/2		2.5/8		12	—	018535	—
		2.80	0.1102		33		61	10	—	—	0008041
	34		0.1110	1.1/2		2.5/8		12	—	018534	—
	33		0.1130	1.1/2		2.5/8		12	—	018533	—
		2.90	0.1142		33		61	10	—	—	0008058
	32		0.1160	1.5/8		2.3/4		12	—	018532	—
		3.00	0.1181		33		61	10	—	—	0008119
	31		0.1200	1.5/8		2.3/4		12	—	018531	—
		3.10	0.1220		36		65	10	—	—	0008126
1/8			0.1250	1.5/8		2.3/4		12	010508	—	—
1/8			0.1250		36		65	10	—	—	0007945
		3.20	0.1260		36		65	10	—	—	0008133
	30		0.1285	1.5/8		2.3/4		12	—	018530	—
		3.30	0.1299		36		65	10	—	—	0008140
		3.40	0.1339		39		70	10	—	—	0008157
	29		0.1360	1.3/4		2.7/8		12	—	018529	—
		3.50	0.1378		39		70	10	—	—	0008164
	28		0.1405	1.3/4		2.7/8		12	—	018528	—
9/64			0.1406	1.3/4		2.7/8		12	010509	—	—
9/64			0.1406		39		70	10	—	—	0008928
		3.60	0.1417		39		70	10	—	—	0008171
	27		0.1440	1.7/8		3“		12	—	018527	—
		3.70	0.1457		39		70	10	—	—	0008188
	26		0.1470	1.7/8		3“		12	—	018526	—
	25		0.1495	1.7/8		3“		12	—	018525	—
		3.80	0.1496		43		75	10	—	—	0008195

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
	24		0.1520	2“		3.1/8		12	—	018524	—
		3.90	0.1535		43		75	10	—	—	0008201
	23		0.1540	2“		3.1/8		12		018523	—
5/32			0.1563	2“		3.1/8		12	010510	—	—
5/32			0.1563		43		75	10	—	—	0008461
	22		0.1570	2“		3.1/8		12	—	018522	—
		4.00	0.1575		43		75	10	—	—	0008256
	21		0.1590	2.1/8		3.1/4		12	—	018521	—
	20		0.1610	2.1/8		3.1/4		12	—	018520	—
		4.10	0.1614		43		75	10	—	—	0008263
		4.20	0.1654		43		75	10	—	—	0008270
	19		0.1660	2.1/8		3.1/4		12	—	018519	—
		4.30	0.1693		47		80	10	—	—	0008287
	18		0.1695	2.1/8		3.1/4		12	—	018518	—
11/64			0.1719	2.1/8		3.1/4		12	010511	—	—
11/64			0.1719		47		80	10	—	—	0007730
	17		0.1730	2.3/16		3.3/8		12	—	018517	—
		4.40	0.1732		47		80	10	—	—	0008294
	16		0.1770	2.3/16		3.3/8		12	—	018516	—
		4.50	0.1772		47		80	10	—	—	0008300
	15		0.1800	2.3/16		3.3/8		12	—	018515	—
		4.60	0.1811		47		80	10	—	—	0008317
	14		0.1820	2.3/16		3.3/8		12	—	018514	—
	13		0.1850	2.5/16		3.1/2		12	—	018513	—
		4.70	0.1850		47		80	10	—	—	0008324
3/16			0.1875	2.5/16		3.1/2		12	010512	—	—
3/16			0.1875		52		86	10	—	—	0008218
	12		0.1890	2.5/16		3.1/2		12	—	018512	—
		4.80	0.1890		52		86	10	—	—	0008331
	11		0.1910	2.5/16		3.1/2		12	—	018511	—
		4.90	0.1929		52		86	10	—	—	0008348
	10		0.1935	2.7/16		3.5/8		12	—	018510	—
	10		0.1935		52		86	10	—	—	46305901
	9		0.1960	2.7/16		3.5/8		12	—	018509	—
		5.00	0.1969		52		86	10	—	—	0008355
	8		0.1990	2.7/16		3.5/8		12	—	018508	—
		5.10	0.2008		52		86	10	—	—	0008362
	7		0.2010	2.7/16		3.5/8		12	—	018507	—
13/64			0.2031	2.7/16		3.5/8		12	010513	—	—
13/64			0.2031		52		86	10	—	—	0007839
	6		0.2040	2.1/2		3.3/4		12	—	018506	—
		5.20	0.2047		52		86	10	—	—	0008379
	5		0.2055	2.1/2		3.3/4		12	—	018505	—
		5.30	0.2087		52		86	10	—	—	0008386
	4		0.2090	2.1/2		3.3/4		12	—	018504	—
		5.40	0.2126		57		93	10	—	—	0008393
	3		0.2130	2.1/2		3.3/4		12	—	018503	—
		5.50	0.2165		57		93	10	—	—	0008409
7/32			0.2188	2.1/2		3.3/4		12	010514	—	—
7/32			0.2188					10	—	—	0008690
		5.60	0.2205		57		93	10	—	—	0008416
	2		0.2210	2.5/8		3.7/8		12	—	018502	—
		5.70	0.2244		57		93	10	—	—	0008423
	1		0.2280	2.5/8		3.7/8		12	—	018501	—
		5.80	0.2283		57		93	10	—	—	0008430
		5.90	0.2323		57		93	10	—	—	0008447
15/64			0.2344	2.5/8		3.7/8		12	010515	—	—
15/64			0.2344		57		93	10	—	—	46305902
		6.00	0.2362		57		93	10	—	—	0008485
		6.10	0.2402		63		101	10	—	—	0008492
		6.20	0.2441		63		101	10	—	—	0008508
		6.30	0.2480		63		101	10	—	—	0008515
1/4			0.2500	2.3/4		4“		12	010516	—	—
1/4			0.2500		63		101	10	—	—	0007846
		6.40	0.2520		63		101	10	—	—	0008522

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
		6.50	0.2559		63		101	10	—	—	0008539
		6.60	0.2598		63		101	10	—	—	0008546
		6.70	0.2638		63		101	10	—	—	0008553
17/64			0.2656	2.7/8		4.1/8		12	010517	—	—
17/64			0.2656		69		109	10	—	—	46305903
		6.80	0.2677		69		109	10	—	—	0008560
		6.90	0.2717		69		109	10	—	—	0008577
		7.00	0.2756		69		109	10	—	—	0008584
		7.10	0.2795		69		109	10	—	—	0008591
9/32			0.2813	2.15/16		4.1/4		12	010518	—	—
9/32			0.2813		69		109	10	—	—	0008911
		7.20	0.2835		69		109	10	—	—	0008607
		7.30	0.2874		69		109	10	—	—	0008614
		7.40	0.2913		69		109	10	—	—	0008621
		7.50	0.2953		69		109	10	—	—	0008638
19/64			0.2969	3.1/16		4.3/8		12	010519	—	—
19/64			0.2969		75		117	10	—	—	46305904
		7.60	0.2992		75		117	10	—	—	0008645
		7.70	0.3031		75		117	10	—	—	0008652
		7.80	0.3071		75		117	10	—	—	0008669
		7.90	0.3110		75		117	10	—	—	0008676
5/16			0.3125	3.3/16		4.1/2		6	010520	—	—
5/16			0.3125		75		117	10	—	—	0008454
		8.00	0.3150		75		117	10	—	—	0008713
		8.10	0.3189		75		117	10	—	—	0008720
		8.20	0.3228		75		117	10	—	—	0008737
		8.30	0.3268		75		117	10	—	—	0008744
21/64			0.3281	3.5/16		4.5/8		6	010521	—	—
21/64			0.3281		75		117	10	—	—	46305905
		8.40	0.3307		75		117	10	—	—	0008751
		8.50	0.3346		75		117	10	—	—	0008768
		8.60	0.3386		81		125	10	—	—	0008775
		8.70	0.3425		81		125	10	—	—	0008782
11/32			0.3437	3.7/16		4.3/4		6	010522	—	—
11/32			0.3437		81		125	10	—	—	0007716
		8.80	0.3465		81		125	10	—	—	0008799
		8.90	0.3504		81		125	10	—	—	0008805
		9.00	0.3543		81		125	10	—	—	0008812
		9.10	0.3583		81		125	10	—	—	0008829
23/64			0.3594	3.1/2		4.7/8		6	010523	—	—
23/64			0.3594		81		125	10	—	—	46305906
		9.20	0.3622		81		125	10	—	—	0008836
		9.30	0.3661		81		125	10	—	—	0008843
		9.40	0.3701		81		125	10	—	—	0008850
		9.50	0.3740		81		125	10	—	—	0008867
3/8			0.3750	3.5/8		5“		6	010524	—	—
3/8			0.3750		87		133	10	—	—	0008249
		9.60	0.3780		87		133	10	—	—	0008874
		9.70	0.3819		87		133	10	—	—	0008881
		9.80	0.3858		87		133	10	—	—	0008898
		9.90	0.3898		87		133	10	—	—	0008904
25/64			0.3906	3.3/4		5.1/8		6	010525	—	—
25/64			0.3906		87		133	10	—	—	46305907
		10.00	0.3937		87		133	10	—	—	0007648
		10.20	0.4016		87		133	5	—	—	0007655
13/32			0.4063	3.7/8		5.1/4		6	010526	—	—
13/32			0.4063		87		133	5	—	—	0007822
		10.50	0.4134		87		133	5	—	—	0007662
27/64			0.4219	3.15/16		5.3/8		6	010527	—	—
27/64			0.4219		94		142	5	—	—	46305908
		10.80	0.4252		94		142	5	—	—	0007679
		11.00	0.4331		94		142	5	—	—	0007686
7/16			0.4375	4.1/16		5.1/2		6	010528	—	—
7/16			0.4375		94		142	5	—	—	0008683
		11.50	0.4528		94		142	5	—	—	0007693

JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10H	R18H	A108
29/64			0.4531	4.3/16		5.5/8		6	010529	—	—
29/64			0.4531		94		142	5	—	—	46305909
		11.80	0.4646		94		142	5	—	—	0007709
15/32			0.4687	4.5/16		5.3/4		6	010530	—	—
15/32			0.4687		101		151	5	—	—	0007907
		12.00	0.4724		101		151	5	—	—	0007754
31/64			0.4844	4.3/8		5.7/8		6	010531	—	—
31/64			0.4844		101		151	5	—	—	46305920
		12.50	0.4921		101		151	5	—	—	0007778
1/2			0.5000	4.1/2		6		5	0010532	—	—
1/2			0.5000		101		151	5	—	—	0007747
		12.80	0.5039		101		151	5	—	—	0007785
		12.90	0.5079		101		151	5	—	—	0007792
		13.00	0.5118		101		151	5	—	—	0007808
		13.50	0.5315		108		160	5	—	—	0007815
		14.00	0.5512		108		160	5	—	—	0007853
		14.50	0.5709		114		169	1	—	—	0007860
		15.00	0.5906		114		169	1	—	—	0007877
		15.25	0.6004		120		178	1	—	—	0007884
		15.50	0.6102		120		178	1	—	—	0007891
		16.00	0.6299		120		178	1	—	—	0007921

JOBBER DRILL

General Purpose Jobber Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC21P Bright Finish improves chip flow in soft or non-ferrous materials.

QC21G TiN Coating increases wear resistance and improves tool life.



					QC21P	QC21G
					ANSI	ANSI
					4XD	4XD
					HSS	HSS
					135°	135°
						
					1/16 - 11/16	1/16 - 1/2
d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
1/16	0.0625	7/8	1.7/8	12	015804	081704
52	0.0635	7/8	1.7/8	12	019452	080552
51	0.0670	1“	2“	12	019451	080551
50	0.0700	1“	2“	12	019450	080550
49	0.0730	1“	2“	12	019449	080549
48	0.0760	1“	2“	12	019448	080548
5/64	0.0781	1“	2“	12	015805	081705
47	0.0785	1“	2“	12	019447	080547
46	0.0810	1.1/8	2.1/8	12	019446	080546
45	0.0820	1.1/8	2.1/8	12	019445	080545
44	0.0860	1.1/8	2.1/8	12	019444	080544
43	0.0890	1.1/4	2.1/4	12	019443	080543
42	0.0935	1.1/4	2.1/4	12	019442	080542
3/32	0.0938	1.1/4	2.1/4	12	015806	081706
41	0.0960	1.3/8	2.3/8	12	019441	080541
40	0.0980	1.3/8	2.3/8	12	019440	080540
39	0.0995	1.3/8	2.3/8	12	019439	080539
38	0.1015	1.7/16	2.1/2	12	019438	080538
37	0.1040	1.7/16	2.1/2	12	019437	080537
36	0.1065	1.7/16	2.1/2	12	019436	080536
7/64	0.1094	1.1/2	2.5/8	12	015807	081707
35	0.1100	1.1/2	2.5/8	12	019435	080535
34	0.1110	1.1/2	2.5/8	12	019434	080534
33	0.1130	1.1/2	2.5/8	12	019433	080533
32	0.1160	1.5/8	2.3/4	12	019432	080532
31	0.1200	1.5/8	2.3/4	12	019431	080531
1/8	0.1250	1.5/8	2.3/4	12	015808	081708
30	0.1285	1.5/8	2.3/4	12	019430	080530
29	0.1360	1.3/4	2.7/8	12	019429	080529
28	0.1405	1.3/4	2.7/8	12	019428	080528
9/64	0.1406	1.3/4	2.7/8	12	015809	081709
27	0.1440	1.7/8	3“	12	019427	080527
26	0.1470	1.7/8	3“	12	019426	080526

JOBBER DRILL

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
25	0.1495	1.7/8	3“	12	019425	080525
24	0.1520	2“	3.1/8	12	019424	080524
23	0.1540	2“	3.1/8	12	019423	080523
5/32	0.1563	2“	3.1/8	12	015810	081710
22	0.1570	2“	3.1/8	12	019422	080522
21	0.1590	2.1/8	3.1/4	12	019421	080521
20	0.1610	2.1/8	3.1/4	12	019420	080520
19	0.1660	2.1/8	3.1/4	12	019419	080519
18	0.1695	2.1/8	3.1/4	12	019418	080518
11/64	0.1719	2.1/8	3.1/4	12	015811	081711
17	0.1730	2.3/16	3.3/8	12	019417	080517
16	0.1770	2.3/16	3.3/8	12	019416	080516
15	0.1800	2.3/16	3.3/8	12	019415	080515
14	0.1820	2.3/16	3.3/8	12	019414	080514
13	0.1850	2.5/16	3.1/2	12	019413	080513
3/16	0.1875	2.5/16	3.1/2	12	015812	081712
12	0.1890	2.5/16	3.1/2	12	019412	080512
11	0.1910	2.5/16	3.1/2	12	019411	080511
10	0.1935	2.7/16	3.5/8	12	019410	080510
9	0.1960	2.7/16	3.5/8	12	019409	080509
8	0.1990	2.7/16	3.5/8	12	019408	080508
7	0.2010	2.7/16	3.5/8	12	019407	080507
13/64	0.2031	2.7/16	3.5/8	12	015813	081713
6	0.2040	2.1/2	3.3/4	12	019406	080506
5	0.2055	2.1/2	3.3/4	12	019405	080505
4	0.2090	2.1/2	3.3/4	12	019404	080504
3	0.2130	2.1/2	3.3/4	12	019403	080503
7/32	0.2188	2.1/2	3.3/4	12	015814	081714
2	0.2210	2.5/8	3.7/8	12	019402	080502
1	0.2280	2.5/8	3.7/8	12	019401	080501
A	0.2340	2.5/8	3.7/8	12	019301	—
15/64	0.2344	2.5/8	3.7/8	12	015815	081715
B	0.2374	2.3/4	4“	12	019302	—
C	0.2421	2.3/4	4“	12	019303	—
D	0.2461	2.3/4	4“	12	019304	—
1/4	0.2500	2.3/4	4“	12	015816	081716
F	0.2571	2.7/8	4.1/8	12	019306	—
G	0.2610	2.7/8	4.1/8	12	019307	—
17/64	0.2656	2.7/8	4.1/8	12	015817	081717
H	0.2661	2.7/8	4.1/8	12	019308	—
I	0.2720	2.7/8	4.1/8	12	019309	—
J	0.2772	2.7/8	4.1/8	12	019310	—
K	0.2811	2.15/16	4.1/4	12	019311	—
9/32	0.2813	2.15/16	4.1/4	12	015818	081718
L	0.2902	2.15/16	4.1/4	12	019312	—
M	0.2949	3.1/16	4.3/8	12	019313	—
19/64	0.2969	3.1/16	4.3/8	12	015819	081719
N	0.3020	3.1/16	4.3/8	12	019314	—
5/16	0.3125	3.3/16	4.1/2	6	015820	081720
O	0.3161	3.3/16	4.1/2	6	019315	—
P	0.3228	3.5/16	4.5/8	6	019316	—
21/64	0.3281	3.5/16	4.5/8	6	015821	081721
Q	0.3319	3.7/16	4.3/4	6	019317	—
R	0.3390	3.7/16	4.3/4	6	019318	—
11/32	0.3437	3.7/16	4.3/4	6	015822	081722
S	0.3480	3.1/2	4.7/8	6	019319	—
T	0.3580	3.1/2	4.7/8	6	019320	—
23/64	0.3594	3.1/2	4.7/8	6	015823	081723
U	0.3680	3.5/8	5“	6	019321	—
3/8	0.3750	3.5/8	5“	6	015824	081724
V	0.3772	3.5/8	5“	6	019322	—
W	0.3858	3.3/4	5.1/8	6	019323	—
25/64	0.3906	3.3/4	5.1/8	6	015825	081725
X	0.3969	3.3/4	5.1/8	6	019324	—
Y	0.4039	3.7/8	5.1/4	6	019325	—
13/32	0.4063	3.7/8	5.1/4	6	015826	081726

JOBBER DRILL

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC21P	QC21G
Z	0.4130	3.7/8	5.1/4	6	019326	—
27/64	0.4219	3.15/16	5.3/8	6	015827	081727
7/16	0.4375	4.1/16	5.1/2	6	015828	081728
29/64	0.4531	4.3/16	5.5/8	6	015829	081729
15/32	0.4687	4.5/16	5.3/4	6	015830	081730
31/64	0.4844	4.3/8	5.7/8	6	015831	081731
1/2	0.5000	4.1/2	6“	6	015832	081732
33/64	0.5156	4.13/16	6.5/8	1	015833	—
17/32	0.5313	4.13/16	6.5/8	1	015834	—
35/64	0.5469	4.13/16	6.5/8	1	015835	—
9/16	0.5625	4.13/16	6.5/8	1	015836	—
37/64	0.5781	4.13/16	6.5/8	1	015837	—
19/32	0.5937	5.3/16	7.1/8	1	015838	—
39/64	0.6094	5.3/16	7.1/8	1	015839	—
5/8	0.6250	5.3/16	7.1/8	1	015840	—
41/64	0.6406	5.3/16	7.1/8	1	015841	—
21/32	0.6563	5.3/16	7.1/8	1	015842	—
43/64	0.6719	5.5/8	7.5/8	1	015843	—
11/16	0.6875	5.5/8	7.5/8	1	015844	—

JOBBER DRILL

General Purpose Jobber Length Parabolic Flute, Metric

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC21PM Bright Finish improves chip flow in soft or non-ferrous materials.

QC21GM TiN Coating increases wear resistance and improves tool life.



QC21PM	QC21GM
DIN 338	DIN 338
4XD	4XD
HSS	HSS
135°	135°
	
1.50 - 17.50	1.50 - 13.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	QC21PM	QC21GM
1.50	0.0591	18	40	12	013115	019815
2.00	0.0787	24	49	12	013120	019820
2.50	0.0984	30	57	12	013125	019825
3.00	0.1181	33	61	12	013130	019830
3.50	0.1378	39	70	12	013135	—
4.00	0.1575	43	75	12	013140	019840
4.50	0.1772	47	80	12	013145	—
5.00	0.1969	52	86	12	013150	019850
5.20	0.2047	52	86	12	013152	019852
5.50	0.2165	57	93	12	013155	019855
5.60	0.2205	57	93	12	013156	019856
6.00	0.2362	57	93	12	013160	019860
6.50	0.2559	63	101	12	013165	019865
6.80	0.2677	69	109	12	013168	019868
7.00	0.2756	69	109	12	013170	019870
7.50	0.2953	69	109	12	013175	019875
8.00	0.3150	75	117	6	013180	019880
8.20	0.3228	75	117	6	013182	019882
8.50	0.3346	75	117	6	013185	019885
8.60	0.3386	81	125	6	013186	019886
9.00	0.3543	81	125	6	013190	019890
9.50	0.3740	81	125	6	013195	019895
10.00	0.3937	87	133	6	014900	019900
10.50	0.4134	87	133	6	014905	019905
11.00	0.4331	94	142	6	014910	019910
11.50	0.4528	94	142	6	014915	—
12.00	0.4724	101	151	6	014920	019920
12.50	0.4921	101	151	6	014925	019925
13.00	0.5118	101	151	1	014930	019930
13.50	0.5315	108	160	1	014935	—
14.00	0.5512	108	160	1	014940	—
14.50	0.5709	114	169	1	014945	—
15.00	0.5906	114	169	1	014950	—
15.50	0.6102	120	178	1	014955	—
16.00	0.6299	120	178	1	014960	—
16.50	0.6496	125	184	1	014965	—
17.00	0.6693	125	184	1	014970	—
17.50	0.6890	130	191	1	014975	—

COBALT JOBBER DRILL

Heavy Duty Jobber Length (NAS 907 Type J)

R10CO - *Fractional Sizes*

R18CO - *Wire Gauge Sizes*

R15CO - *Letter Sizes*

2ACO - *Metric Sizes*

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance & lubricity. For enhanced tool life in ferrous materials



R10CO	R18CO	R15CO	2ACO
ANSI	ANSI	ANSI	DIN 338
4XD	4XD	4XD	4XD
HSS-E	HSS-E	HSS-E	HSS-E
135°	135°	135°	135°
			
1/64 - 11/16	N80 - N1	A - Z	1.00 - 13.00

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
	80			0.0135	1/8		3/4		12	— [1]	018380	—	—
	79			0.0145	1/8		3/4		12	— [1]	018379	—	—
1/64				0.0156	3/16		3/4		12	010301 [1]	—	—	—
	78			0.0160	3/16		7/8		12	— [1]	018378	—	—
	77			0.0180	3/16		7/8		12	— [1]	018377	—	—
	76			0.0200	3/16		7/8		12	— [1]	018376	—	—
	75			0.0210	1/4		1“		12	— [1]	018375	—	—
	74			0.0225	1/4		1“		12	— [1]	018374	—	—
	73			0.0240	5/16		1.1/8		12	— [1]	018373	—	—
	72			0.0250	5/16		1.1/8		12	— [1]	018372	—	—
	71			0.0260	3/8		1.1/4		12	— [1]	018371	—	—
	70			0.0280	3/8		1.1/4		12	— [1]	018370	—	—
	69			0.0292	1/2		1.3/8		12	— [1]	018369	—	—
	68			0.0310	1/2		1.3/8		12	— [1]	018368	—	—
1/32				0.0313	1/2		1.3/8		12	010302 [1]	—	—	—
	67			0.0320	1/2		1.3/8		12	— [1]	018367	—	—
	66			0.0330	1/2		1.3/8		12	— [1]	018366	—	—
	65			0.0350	5/8		1.1/2		12	— [1]	018365	—	—
	64			0.0360	5/8		1.1/2		12	— [1]	018364	—	—
	63			0.0370	5/8		1.1/2		12	— [1]	018363	—	—
	62			0.0380	5/8		1.1/2		12	— [1]	018362	—	—
	61			0.0390	11/16		1.5/8		12	— [1]	018361	—	—
			1.00	0.0394		12		34	12	—	—	—	016410
	60			0.0400	11/16		1.5/8		12	—	018360	—	—
	59			0.0410	11/16		1.5/8		12	—	018359	—	—
			1.05	0.0413		12		34	12	—	—	—	016355
	58			0.0420	11/16		1.5/8		12	—	018358	—	—
	57			0.0430	3/4		1.3/4		12	—	018357	—	—
			1.10	0.0433		14		36	12	—	—	—	016411
			1.15	0.0453		14		36	12	—	—	—	016356
	56			0.0465	3/4		1.3/4		12	—	018356	—	—
3/64				0.0469	3/4		1.3/4		12	010303	—	—	—

[1] No Split Point

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			1.20	0.0472		16		38	12	—	—	—	016412
			1.25	0.0492		16		38	12	—	—	—	016357
			1.30	0.0512		16		38	12	—	—	—	016413
	55			0.0520	7/8		1.7/8		12	—	018355	—	—
			1.35	0.0531		18		40	12	—	—	—	016358
			1.40	0.0551		18		40	12	—	—	—	016414
	54			0.0550	7/8		1.7/8		12	—	018354	—	—
			1.45	0.0571		18		40	12	—	—	—	016359
			1.50	0.0591		18		40	12	—	—	—	016415
	53			0.0595	7/8		1.7/8		12	—	018353	—	—
			1.55	0.0610		20		43	12	—	—	—	016360
1/16				0.0625	7/8		1.7/8		12	010304	—	—	—
			1.60	0.0630		20		43	12	—	—	—	016416
	52			0.0635	7/8		1.7/8		12	—	018352	—	—
			1.65	0.0650		20		43	12	—	—	—	016361
			1.70	0.0669		20		43	12	—	—	—	016417
	51			0.0670	1“		2“		12	—	018351	—	—
			1.75	0.0689		22		46	12	—	—	—	016362
	50			0.0700	1“		2“		12	—	018350	—	—
			1.80	0.0709		22		46	12	—	—	—	016418
			1.85	0.0728		22		46	12	—	—	—	016363
	49			0.0730	1“		2“		12	—	018349	—	—
			1.90	0.0748		22		46	12	—	—	—	016419
	48			0.0760	1“		2“		12	—	018348	—	—
			1.95	0.0768		24		49	12	—	—	—	016364
5/64				0.0781	1“		2“		12	010305	—	—	—
	47			0.0785	1“		2“		12	—	018347	—	—
			2.00	0.0787		24		49	12	—	—	—	016420
			2.05	0.0807		24		49	12	—	—	—	016365
	46			0.0810	1.1/8		2.1/8		12	—	018346	—	—
	45			0.0820	1.1/8		2.1/8		12	—	018345	—	—
			2.10	0.0827		24		49	12	—	—	—	016421
	44			0.0860	1.1/8		2.1/8		12	—	018344	—	—
			2.20	0.0866		27		53	12	—	—	—	016422
	43			0.0890	1.1/4		2.1/4		12	—	018343	—	—
			2.30	0.0906		27		53	12	—	—	—	016423
			2.35	0.0925		27		53	12	—	—	—	016368
	42			0.0935	1.1/4		2.1/4		12	—	018342	—	—
3/32				0.0938	1.1/4		2.1/4		12	010306	—	—	—
			2.40	0.0945		30		57	12	—	—	—	016424
	41			0.0960	1.3/8		2.3/8		12	—	018341	—	—
	40			0.0980	1.3/8		2.3/8		12	—	018340	—	—
			2.50	0.0984		30		57	12	—	—	—	016425
	39			0.0995	1.3/8		2.3/8		12	—	018339	—	—
	38			0.1015	1.7/16		2.1/2		12	—	018338	—	—
			2.60	0.1024		30		57	12	—	—	—	016426
	37			0.1040	1.7/16		2.1/2		12	—	018337	—	—
			2.70	0.1063		33		61	12	—	—	—	016427
	36			0.1065	1.7/16		2.1/2		12	—	018336	—	—
7/64				0.1094	1.1/2		2.5/8		12	010307	—	—	—
	35			0.1100	1.1/2		2.5/8		12	—	018335	—	—
			2.80	0.1102		33		61	12	—	—	—	016428
	34			0.1110	1.1/2		2.5/8		12	—	018334	—	—
	33			0.1130	1.1/2		2.5/8		12	—	018333	—	—
			2.90	0.1142		33		61	12	—	—	—	016429
	32			0.1160	1.5/8		2.3/4		12	—	018332	—	—
			3.00	0.1181		33		61	12	—	—	—	016430
	31			0.1200	1.5/8		2.3/4		12	—	018331	—	—
			3.10	0.1220		36		65	12	—	—	—	016431
1/8				0.1250	1.5/8		2.3/4		12	010308	—	—	—
			3.20	0.1260		36		65	12	—	—	—	016432
			3.25	0.1280		36		65	12	—	—	—	016371
	30			0.1285	1.5/8		2.3/4		12	—	018330	—	—
			3.30	0.1299		36		65	12	—	—	—	016433
			3.40	0.1339		39		70	12	—	—	—	016434
	29			0.1360	1.3/4		2.7/8		12	—	018329	—	—

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			3.50	0.1378		39		70	12	—	—	—	016435
	28			0.1405	1.3/4		2.7/8		12	—	018328	—	—
9/64				0.1406	1.3/4		2.7/8		12	010309	—	—	—
			3.60	0.1417		39		70	12	—	—	—	016436
	27			0.1440	1.7/8		3“		12	—	018327	—	—
			3.70	0.1457		39		70	12	—	—	—	016437
	26			0.1470	1.7/8		3“		12	—	018326	—	—
			3.75	0.1476		39		70	12	—	—	—	016372
			3.80	0.1496		43		75	12	—	—	—	016438
	25			0.1495	1.7/8		3“		12	—	018325	—	—
	24			0.1520	2“		3.1/8		12	—	018324	—	—
	23			0.1540	2“		3.1/8		12	—	018323	—	—
5/32				0.1563	2“		3.1/8		12	010310	—	—	—
	22			0.1570	2“		3.1/8		12	—	018322	—	—
			4.00	0.1575		43		75	12	—	—	—	016440
	21			0.1590	2.1/8		3.1/4		12	—	018321	—	—
	20			0.1610	2.1/8		3.1/4		12	—	018320	—	—
			4.10	0.1614		43		75	12	—	—	—	016441
			4.20	0.1654		43		75	12	—	—	—	016442
	19			0.1660	2.1/8		3.1/4		12	—	018319	—	—
			4.25	0.1673		43		75	12	—	—	—	016373
			4.30	0.1693		47		80	12	—	—	—	016443
	18			0.1695	2.1/8		3.1/4		12	—	018318	—	—
11/64				0.1719	2.1/8		3.1/4		12	010311	—	—	—
	17			0.1730	2.3/16		3.3/8		12	—	018317	—	—
			4.40	0.1732		47		80	12	—	—	—	016444
			4.50	0.1772		47		80	12	—	—	—	016445
	16			0.1770	2.3/16		3.3/8		12	—	018316	—	—
	15			0.1800	2.3/16		3.3/8		12	—	018315	—	—
	14			0.1820	2.3/16		3.3/8		12	—	018314	—	—
			4.70	0.1850		47		80	12	—	—	—	016447
	13			0.1850	2.5/16		3.1/2		12	—	018313	—	—
3/16				0.1875	2.5/16		3.1/2		12	010312	—	—	—
			4.80	0.1890		52		86	12	—	—	—	016448
	12			0.1890	2.5/16		3.1/2		12	—	018312	—	—
	11			0.1910	2.5/16		3.1/2		12	—	018311	—	—
	10			0.1935	2.7/16		3.5/8		12	—	018310	—	—
	9			0.1960	2.7/16		3.5/8		12	—	018309	—	—
			5.00	0.1969		52		86	12	—	—	—	016450
	8			0.1990	2.7/16		3.5/8		12	—	018308	—	—
			5.10	0.2008		52		86	12	—	—	—	016451
	7			0.2010	2.7/16		3.5/8		12	—	018307	—	—
13/64				0.2031	2.7/16		3.5/8		12	010313	—	—	—
	6			0.2040	2.1/2		3.3/4		12	—	018306	—	—
			5.20	0.2047		52		86	12	—	—	—	016452
	5			0.2055	2.1/2		3.3/4		12	—	018305	—	—
			5.25	0.2067		52		86	12	—	—	—	016375
			5.30	0.2087		52		86	12	—	—	—	016453
	4			0.2090	2.1/2		3.3/4		12	—	018304	—	—
	3			0.2130	2.1/2		3.3/4		12	—	018303	—	—
			5.50	0.2165		57		93	12	—	—	—	016455
7/32				0.2188	2.1/2		3.3/4		12	010314	—	—	—
			5.60	0.2205		57		93	12	—	—	—	016456
	2			0.2210	2.5/8		3.7/8		12	—	018302	—	—
			5.70	0.2244		57		93	12	—	—	—	016457
	1			0.2280	2.5/8		3.7/8		12	—	018301	—	—
			5.90	0.2323		57		93	12	—	—	—	016459
		A		0.2340	2.5/8		3.7/8		12	—	—	015301	—
15/64				0.2344	2.5/8		3.7/8		12	010315	—	—	—
			6.00	0.2362		57		93	12	—	—	—	016460
		B		0.2374	2.3/4		4“		12	—	—	015302	—
			6.10	0.2402		63		101	12	—	—	—	016461
		C		0.2421	2.3/4		4“		12	—	—	015303	—
			6.20	0.2441		63		101	12	—	—	—	016462
		D		0.2461	2.3/4		4“		12	—	—	015304	—
			6.30	0.2480		63		101	12	—	—	—	016463

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
		E		0.2500	2.3/4		4“		12	—	—	015305	—
1/4				0.2500	2.3/4		4“		12	010316	—	—	—
			6.40	0.2520		63		101	12	—	—	—	016464
			6.50	0.2559		63		101	12	—	—	—	016465
		F		0.2571	2.7/8		4.1/8		12	—	—	015306	—
			6.60	0.2598		63		101	12	—	—	—	016466
		G		0.2610	2.7/8		4.1/8		12	—	—	015307	—
			6.70	0.2638		63		101	12	—	—	—	016467
17/64				0.2656	2.7/8		4.1/8		12	010317	—	—	—
		H		0.2661	2.7/8		4.1/8		12	—	—	015308	—
			6.80	0.2677		69		109	12	—	—	—	016468
			6.90	0.2717		69		109	12	—	—	—	016469
		I		0.2720	2.7/8		4.1/8		12	—	—	015309	—
			7.00	0.2756		69		109	12	—	—	—	016470
		J		0.2772	2.7/8		4.1/8		12	—	—	015310	—
			7.10	0.2795		69		109	12	—	—	—	016471
		K		0.2811	2.15/16		4.1/4		12	—	—	015311	—
9/32				0.2813	2.15/16		4.1/4		12	010318	—	—	—
			7.20	0.2835		69		109	12	—	—	—	016472
			7.25	0.2854		69		109	12	—	—	—	016379
			7.30	0.2874		69		109	12	—	—	—	016473
		L		0.2902	2.15/16		4.1/4		12	—	—	015312	—
		M		0.2949	3.1/16		4.3/8		12	—	—	015313	—
			7.50	0.2953		69		109	12	—	—	—	016475
19/64				0.2969	3.1/16		4.3/8		12	010319	—	—	—
		N		0.3020	3.1/16		4.3/8		12	—	—	015314	—
			7.80	0.3071		75		117	12	—	—	—	016478
			7.90	0.3110		75		117	12	—	—	—	016479
5/16				0.3125	3.3/16		4.1/2		6	010320	—	—	—
			8.00	0.3150		75		117	6	—	—	—	016480
		O		0.3161	3.3/16		4.1/2		6	—	—	015315	—
			8.20	0.3228		75		117	6	—	—	—	016482
		P		0.3228	3.5/16		4.5/8		6	—	—	015316	—
21/64				0.3281	3.5/16		4.5/8		6	010321	—	—	—
			8.40	0.3307		75		117	6	—	—	—	016484
		Q		0.3319	3.7/16		4.3/4		6	—	—	015317	—
			8.50	0.3346		75		117	6	—	—	—	016485
		R		0.3390	3.7/16		4.3/4		6	—	—	015318	—
11/32				0.3437	3.7/16		4.3/4		6	010322	—	—	—
			8.80	0.3465		81		125	6	—	—	—	016488
		S		0.3480	3.1/2		4.7/8		6	—	—	015319	—
			8.90	0.3504		81		125	6	—	—	—	016489
			9.00	0.3543		81		125	6	—	—	—	016490
		T		0.3580	3.1/2		4.7/8		6	—	—	015320	—
			9.10	0.3583		81		125	6	—	—	—	016491
23/64				0.3594	3.1/2		4.7/8		6	010323	—	—	—
			9.20	0.3622		81		125	6	—	—	—	016492
			9.30	0.3661		81		125	6	—	—	—	016493
		U		0.3680	3.5/8		5“		6	—	—	015321	—
			9.40	0.3701		81		125	6	—	—	—	016494
			9.50	0.3740		81		125	6	—	—	—	016495
3/8				0.3750	3.5/8		5“		6	010324	—	—	—
		V		0.3772	3.5/8		5“		6	—	—	015322	—
			9.60	0.3780		87		133	6	—	—	—	016496
			9.70	0.3819		87		133	6	—	—	—	016497
			9.80	0.3858		87		133	6	—	—	—	016498
		W		0.3858	3.3/4		5.1/8		6	—	—	015323	—
25/64				0.3906	3.3/4		5.1/8		6	010325	—	—	—
			10.00	0.3937		87		133	6	—	—	—	016300
		X		0.3969	3.3/4		5.1/8		6	—	—	015324	—
			10.20	0.4016		87		133	6	—	—	—	016302
		Y		0.4039	3.7/8		5.1/4		6	—	—	015325	—
13/32				0.4063	3.7/8		5.1/4		6	010326	—	—	—
		Z		0.4130	3.7/8		5.1/4		6	—	—	015326	—
			10.50	0.4134		87		133	6	—	—	—	016305
27/64				0.4219	3.15/16		5.3/8		6	010327	—	—	—

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 Ø mm	d_1 decimal Inch	l_2 Inch	l_2 mm	l_1 Inch	l_1 mm	Pack Qty	R10CO	R18CO	R15CO	2ACO
			10.80	0.4252		94		142	6	—	—	—	016308
			11.00	0.4331		94		142	6	—	—	—	016310
7/16				0.4375	4.1/16		5.1/2		6	010328	—	—	—
			11.20	0.4409		94		142	6	—	—	—	016312
			11.50	0.4528		94		142	6	—	—	—	016315
29/64				0.4531	4.3/16		5.5/8		6	010329	—	—	—
			11.80	0.4646		94		142	6	—	—	—	016318
15/32				0.4687	4.5/16		5.3/4		6	010330	—	—	—
			12.00	0.4724		101		151	6	—	—	—	016320
			12.20	0.4803		101		151	6	—	—	—	016322
31/64				0.4844	4.3/8		5.7/8		6	010331	—	—	—
			12.50	0.4921		101		151	6	—	—	—	016325
1/2				0.5000	4.1/2		6“		6	010332	—	—	—
			13.00	0.5118		101		151	1	—	—	—	016330
33/64				0.5156	4.13/16		6.5/8		1	010333	—	—	—
17/32				0.5313	4.13/16		6.5/8		1	010334	—	—	—
35/64				0.5469	4.13/16		6.5/8		1	010335	—	—	—
9/16				0.5625	4.13/16		6.5/8		1	010336	—	—	—
37/64				0.5781	4.13/16		6.5/8		1	010337	—	—	—
19/32				0.5937	5.3/16		7.1/8		1	010338	—	—	—
39/64				0.6094	5.3/16		7.1/8		1	010339	—	—	—
5/8				0.6250	5.3/16		7.1/8		1	010340	—	—	—
41/64				0.6406	5.3/16		7.1/8		1	010341	—	—	—
21/32				0.6563	5.3/16		7.1/8		1	010342	—	—	—
43/64				0.6719	5.5/8		7.5/8		1	010343	—	—	—
11/16				0.6875	5.5/8		7.5/8		1	010344	—	—	—

COBALT JOBBER DRILL

Heavy Duty Jobber Length (NAS 907 Type D)

R88CO - *Fractional Sizes*

R89CO - *Wire Gauge Sizes*

Low thrust design self centering Split Point for easier penetration. Shorter Flute Lengths. Cobalt base material with Bronze Oxide for wear resistance and lubricity.



R88CO	R89CO
NAS 907	NAS 907
3XD	3XD
HSS-E	HSS-E
135°	135°
	
1/16 - 1/2	N52 - N3

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R88CO	R89CO
1/16		0.0625	7/16	1.7/8	12	058704	—
	52	0.0635	7/16	1.7/8	12	—	058852
	51	0.0670	1/2	2“	12	—	058851
	50	0.0700	1/2	2“	12	—	058850
	49	0.0730	1/2	2“	12	—	058849
5/64		0.0781	1/2	2“	12	058705	—
	46	0.0810	9/16	2.1/8	12	—	058846
	45	0.0820	9/16	2.1/8	12	—	058845
	44	0.0860	9/16	2.1/8	12	—	058844
	43	0.0890	5/8	2.1/4	12	—	058843
	42	0.0935	5/8	2.1/4	12	—	058842
3/32		0.0938	5/8	2.1/4	12	058706	—
	41	0.0960	5/8	2.3/8	12	—	058841
	40	0.0980	13/16	2.3/8	12	—	058840
	39	0.0995	13/16	2.3/8	12	—	058839
	36	0.1065	13/16	2.1/2	12	—	058836
7/64		0.1094	13/16	2.5/8	12	058707	—
	31	0.1200	7/8	2.3/4	12	—	058831
1/8		0.1250	7/8	2.3/4	12	058708	—
	30	0.1285	15/16	2.3/4	12	—	058830
	29	0.1360	15/16	2.7/8	12	—	058829
9/64		0.1406	15/16	2.7/8	12	058709	—
	27	0.1440	1“	3“	12	—	058827
	26	0.1470	1“	3“	12	—	058826
	25	0.1495	1“	3“	12	—	058825
	24	0.1520	1“	3.1/8	12	—	058824
5/32		0.1563	1“	3.1/8	12	058710	—
	22	0.1570	1.1/16	3.1/8	12	—	058822
	21	0.1590	1.1/16	3.1/4	12	—	058821
	20	0.1610	1.1/16	3.1/4	12	—	058820
11/64		0.1719	1.1/16	3.1/4	12	058711	—
	16	0.1770	1.1/8	3.3/8	12	—	058816
	13	0.1850	1.1/8	3.1/2	12	—	058813

COBALT JOBBER DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R88CO	R89CO
3/16		0.1875	1.1/8	3.1/2	12	058712	—
	12	0.1890	1.1/8	3.1/2	12	—	058812
	11	0.1910	1.3/16	3.1/2	12	—	058811
	10	0.1935	1.3/16	3.5/8	12	—	058810
	9	0.1960	1.3/16	3.5/8	12	—	058809
	8	0.1990	1.3/16	3.5/8	12	—	058808
	7	0.2010	1.3/16	3.5/8	12	—	058807
13/64		0.2031	1.3/16	3.5/8	12	058713	—
	6	0.2040	1.1/4	3.3/4	12	—	058806
	5	0.2055	1.1/4	3.3/4	12	—	058805
	3	0.2130	1.1/4	3.3/4	12	—	058803
7/32		0.2188	1.1/4	3.3/4	12	058714	—
15/64		0.2344	1.5/16	3.7/8	12	058715	—
1/4		0.2500	1.3/8	4“	12	058716	—
17/64		0.2656	1.7/16	4.1/8	12	058717	—
9/32		0.2813	1.1/2	4.1/4	12	058718	—
19/64		0.2969	1.9/16	4.3/8	12	058719	—
5/16		0.3125	1.5/8	4.1/2	6	058720	—
21/64		0.3281	1.11/16	4.5/8	6	058721	—
11/32		0.3437	1.11/16	4.3/4	6	058722	—
23/64		0.3594	1.3/4	4.7/8	6	058723	—
3/8		0.3750	1.13/16	5“	6	058724	—
25/64		0.3906	1.7/8	5.1/8	6	058725	—
13/32		0.4063	1.15/16	5.1/4	6	058726	—
27/64		0.4219	2“	5.3/8	6	058727	—
7/16		0.4375	2.1/16	5.1/2	6	058728	—
29/64		0.4531	2.1/8	5.5/8	6	058729	—
15/32		0.4687	2.1/8	5.3/4	6	058730	—
31/64		0.4844	2.3/16	5.7/8	6	058731	—
1/2		0.5000	2.1/4	6“	6	058732	—

SCREW MACHINE DRILL

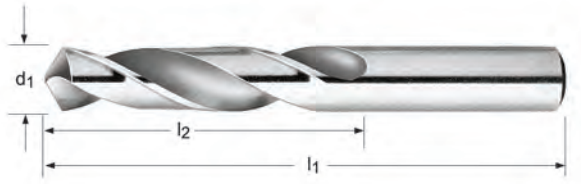
General Purpose Screw Machine Length

R40 - *Fractional Sizes*

R41 - *Wire Gauge Sizes*

R42 - *Letter Sizes*

Bright Finish improves chip flow in soft or non-ferrous materials



R40	R41	R42
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS	HSS	HSS
118°	118°	118°
		
3/64 - 2“	N60 - N1	A - Z

[1] *Sizes 45/64 and larger are steam oxide*
[2] *1” reduced shank*
[3] *1-1/4” reduced shank*
[4] *1-1/2” reduced shank*

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
	60		0.0400	1/2	1.3/8	12	—	041060	—
	59		0.0410	1/2	1.3/8	12	—	041059	—
	58		0.0420	1/2	1.3/8	12	—	041058	—
	57		0.0430	1/2	1.3/8	12	—	041057	—
	56		0.0465	1/2	1.3/8	12	—	041056	—
3/64			0.0469	1/2	1.3/8	12	040003	—	—
	55		0.0520	5/8	1.5/8	12	—	041055	—
	54		0.0550	5/8	1.5/8	12	—	041054	—
	53		0.0595	5/8	1.5/8	12	—	041053	—
1/16			0.0625	5/8	1.5/8	12	040004	—	—
	52		0.0635	11/16	1.11/16	12	—	041052	—
	51		0.0670	11/16	1.11/16	12	—	041051	—
	50		0.0700	11/16	1.11/16	12	—	041050	—
	49		0.0730	11/16	1.11/16	12	—	041049	—
	48		0.0760	11/16	1.11/16	12	—	041048	—
5/64			0.0781	11/16	1.11/16	12	040005	—	—
	47		0.0785	11/16	1.11/16	12	—	041047	—
	46		0.0810	3/4	1.3/4	12	—	041046	—
	45		0.0820	3/4	1.3/4	12	—	041045	—
	44		0.0860	3/4	1.3/4	12	—	041044	—
	43		0.0890	3/4	1.3/4	12	—	041043	—
	42		0.0935	3/4	1.3/4	12	—	041042	—
3/32			0.0938	3/4	1.3/4	12	040006	—	—
	41		0.0960	13/16	1.13/16	12	—	041041	—
	40		0.0980	13/16	1.13/16	12	—	041040	—
	39		0.0995	13/16	1.13/16	12	—	041039	—
	38		0.1015	13/16	1.13/16	12	—	041038	—
	37		0.1040	13/16	1.13/16	12	—	041037	—
	36		0.1065	13/16	1.13/16	12	—	041036	—
7/64			0.1094	13/16	1.13/16	12	040007	—	—
	35		0.1100	7/8	1.7/8	12	—	041035	—
	34		0.1110	7/8	1.7/8	12	—	041034	—
	33		0.1130	7/8	1.7/8	12	—	041033	—
	32		0.1160	7/8	1.7/8	12	—	041032	—

SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
	31		0.1200	7/8	1.7/8	12	—	041031	—
1/8			0.1250	7/8	1.7/8	12	040008	—	—
	30		0.1285	15/16	1.15/16	12	—	041030	—
	29		0.1360	15/16	1.15/16	12	—	041029	—
	28		0.1405	15/16	1.15/16	12	—	041028	—
9/64			0.1406	15/16	1.15/16	12	040009	—	—
	27		0.1440	1“	2.1/16	12	—	041027	—
	26		0.1470	1“	2.1/16	12	—	041026	—
	25		0.1495	1“	2.1/16	12	—	041025	—
	24		0.1520	1“	2.1/16	12	—	041024	—
	23		0.1540	1“	2.1/16	12	—	041023	—
5/32			0.1563	1“	2.1/16	12	040010	—	—
	22		0.1570	1.1/16	2.1/8	12	—	041022	—
	21		0.1590	1.1/16	2.1/8	12	—	041021	—
	20		0.1610	1.1/16	2.1/8	12	—	041020	—
	19		0.1660	1.1/16	2.1/8	12	—	041019	—
	18		0.1695	1.1/16	2.1/8	12	—	041018	—
11/64			0.1719	1.1/16	2.1/8	12	040011	—	—
	17		0.1730	1.1/8	2.3/16	12	—	041017	—
	16		0.1770	1.1/8	2.3/16	12	—	041016	—
	15		0.1800	1.1/8	2.3/16	12	—	041015	—
	14		0.1820	1.1/8	2.3/16	12	—	041014	—
	13		0.1850	1.1/8	2.3/16	12	—	041013	—
3/16			0.1875	1.1/8	2.3/16	12	040012	—	—
	12		0.1890	1.3/16	2.1/4	12	—	041012	—
	11		0.1910	1.3/16	2.1/4	12	—	041011	—
	10		0.1935	1.3/16	2.1/4	12	—	041010	—
	9		0.1960	1.3/16	2.1/4	12	—	041009	—
	8		0.1990	1.3/16	2.1/4	12	—	041008	—
	7		0.2010	1.3/16	2.1/4	12	—	041007	—
13/64			0.2031	1.3/16	2.1/4	12	040013	—	—
	6		0.2040	1.1/4	2.3/8	12	—	041006	—
	5		0.2055	1.1/4	2.3/8	12	—	041005	—
	4		0.2090	1.1/4	2.3/8	12	—	041004	—
	3		0.2130	1.1/4	2.3/8	12	—	041003	—
7/32			0.2188	1.1/4	2.3/8	12	040014	—	—
	2		0.2210	1.5/16	2.7/16	12	—	041002	—
	1		0.2280	1.5/16	2.7/16	12	—	041001	—
		A	0.2340	1.5/16	2.7/16	12	—	—	042001
15/64			0.2344	1.5/16	2.7/16	12	040015	—	—
		B	0.2374	1.3/8	2.1/2	12	—	—	042002
		C	0.2421	1.3/8	2.1/2	12	—	—	042003
		D	0.2461	1.3/8	2.1/2	12	—	—	042004
		E	0.2500	1.3/8	2.1/2	12	—	—	042005
1/4			0.2500	1.3/8	2.1/2	12	040016	—	—
		F	0.2571	1.7/16	2.5/8	12	—	—	042006
		G	0.2610	1.7/16	2.5/8	12	—	—	042007
17/64			0.2656	1.7/16	2.5/8	12	040017	—	—
		H	0.2661	1.1/2	2.11/16	12	—	—	042008
		I	0.2720	1.1/2	2.11/16	12	—	—	042009
		J	0.2772	1.1/2	2.11/16	12	—	—	042010
		K	0.2811	1.1/2	2.11/16	12	—	—	042011
9/32			0.2813	1.1/2	2.11/16	12	040018	—	—
		L	0.2902	1.9/16	2.3/4	12	—	—	042012
		M	0.2949	1.9/16	2.3/4	12	—	—	042013
19/64			0.2969	1.9/16	2.3/4	12	040019	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042014
5/16			0.3125	1.5/8	2.13/16	6	040020	—	—
		O	0.3161	1.11/16	2.15/16	6	—	—	042015
		P	0.3228	1.11/16	2.15/16	6	—	—	042016
21/64			0.3281	1.11/16	2.15/16	6	040021	—	—
		Q	0.3319	1.11/16	3“	6	—	—	042017
		R	0.3390	1.11/16	3“	6	—	—	042018
11/32			0.3437	1.11/16	3“	6	040022	—	—
		S	0.3480	1.3/4	3.1/16	6	—	—	042019

SCREW MACHINE DRILL

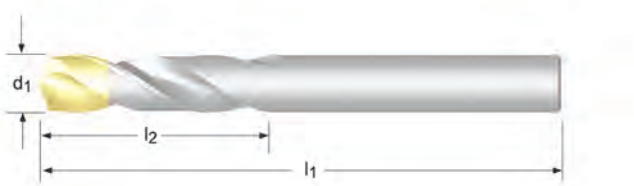
d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40	R41	R42
		T	0.3580	1.3/4	3.1/16	6	—	—	042020
23/64			0.3594	1.3/4	3.1/16	6	040023	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042021
3/8			0.3750	1.13/16	3.1/8	6	040024	—	—
		V	0.3772	1.7/8	3.1/4	6	—	—	042022
		W	0.3858	1.7/8	3.1/4	6	—	—	042023
25/64			0.3906	1.7/8	3.1/4	6	040025	—	—
		X	0.3969	1.15/16	3.5/16	6	—	—	042024
		Y	0.4039	1.15/16	3.5/16	6	—	—	042025
13/32			0.4063	1.15/16	3.5/16	6	040026	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042026
27/64			0.4219	2“	3.3/8	6	040027	—	—
7/16			0.4375	2.1/16	3.7/16	6	040028	—	—
29/64			0.4531	2.1/8	3.9/16	6	040029	—	—
15/32			0.4687	2.1/8	3.5/8	6	040030	—	—
31/64			0.4844	2.3/16	3.11/16	6	040031	—	—
1/2			0.5000	2.1/4	3.3/4	6	040032	—	—
33/64			0.5156	2.3/8	3.7/8	1	040033	—	—
17/32			0.5313	2.3/8	3.7/8	1	040034	—	—
35/64			0.5469	2.1/2	4“	1	040035	—	—
9/16			0.5625	2.1/2	4“	1	040036	—	—
37/64			0.5781	2.5/8	4.1/8	1	040037	—	—
19/32			0.5937	2.5/8	4.1/8	1	040038	—	—
39/64			0.6094	2.3/4	4.1/4	1	040039	—	—
5/8			0.6250	2.3/4	4.1/4	1	040040	—	—
41/64			0.6406	2.7/8	4.1/2	1	040041	—	—
21/32			0.6563	2.7/8	4.1/2	1	040042	—	—
43/64			0.6719	2.7/8	4.5/8	1	040043	—	—
11/16			0.6875	2.7/8	4.5/8	1	040044	—	—
45/64			0.7031	3“	4.3/4	1	040545 [1]	—	—
23/32			0.7188	3“	4.3/4	1	040546 [1]	—	—
47/64			0.7344	3.1/8	5“	1	040547 [1]	—	—
3/4			0.7500	3.1/8	5“	1	040548 [1]	—	—
49/64			0.7656	3.1/4	5.1/8	1	040549 [1]	—	—
25/32			0.7813	3.1/4	5.1/8	1	040550 [1]	—	—
51/64			0.7969	3.3/8	5.1/4	1	040551 [1]	—	—
13/16			0.8125	3.3/8	5.1/4	1	040552 [1]	—	—
53/64			0.8281	3.1/2	5.3/8	1	040553 [1]	—	—
27/32			0.8438	3.1/2	5.3/8	1	040554 [1]	—	—
55/64			0.8594	3.1/2	5.1/2	1	040555 [1]	—	—
7/8			0.8750	3.1/2	5.1/2	1	040556 [1]	—	—
57/64			0.8906	3.5/8	5.5/8	1	040557 [1]	—	—
29/32			0.9063	3.5/8	5.5/8	1	040558 [1]	—	—
59/64			0.9219	3.3/4	5.3/4	1	040559 [1]	—	—
15/16			0.9375	3.3/4	5.3/4	1	040560 [1]	—	—
61/64			0.9531	3.7/8	5.7/8	1	040561 [1]	—	—
31/32			0.9688	3.7/8	5.7/8	1	040562 [1]	—	—
63/64			0.9844	4“	6“	1	040563 [1]	—	—
1“			1.0000	4“	6“	1	040600 [1]	—	—
1.1/16			1.0625	4“	6.1/4	1	040604 [1] [2]	—	—
1.1/8			1.1250	4“	6.3/8	1	040608 [1] [2]	—	—
1.3/16			1.1875	4.1/4	6.5/8	1	040612 [1] [2]	—	—
1.1/4			1.2500	4.3/8	6.3/4	1	040616 [1] [2]	—	—
1.5/16			1.3125	4.3/8	7“	1	040620 [1] [3]	—	—
1.3/8			1.3750	4.1/2	7.1/8	1	040624 [1] [3]	—	—
1.7/16			1.4375	4.3/4	7.3/8	1	040628 [1] [3]	—	—
1.1/2			1.5000	4.7/8	7.1/2	1	040632 [1] [3]	—	—
1.9/16			1.5625	4.7/8	7.3/4	1	040636 [1] [4]	—	—
1.5/8			1.6250	4.7/8	7.3/4	1	040640 [1] [4]	—	—
1.3/4			1.7500	5.1/8	8“	1	040648 [1] [4]	—	—
1.13/16			1.8125	5.3/8	8.1/4	1	040652 [1] [4]	—	—
1.7/8			1.8750	5.3/8	8.1/4	1	040656 [1] [4]	—	—
1.15/16			1.9375	5.5/8	8.1/2	1	040660 [1] [4]	—	—
2“			2.0000	5.5/8	8.1/2	1	040700 [1] [4]	—	—

DORMER

General Purpose Screw Machine Length

A022 Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.

Metric sizes to DIN1897 lengths.
Fractional sizes to ANSI lengths.



A022

DIN ANSI

2.5XD

HSS

135°



0.50 - 16.00

∗ *2mm and smaller are bright with no split point*

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	0.50	0.0197	3	20	10	0600382
	0.60	0.0236	3.5	21	10	0600399
	0.70	0.0276	4.5	23	10	0600405
1/32	0.79	0.0313	13	35	10	0600542
	0.80	0.0315	5	24	10	0600412
	0.90	0.0354	5.5	25	10	0600429
	1.00	0.0394	6	26	10	0600436
	1.10	0.0433	7	28	10	0600443
3/64	1.19	0.0469	13	35	10	0600559
	1.20	0.0472	8	30	10	0600450
	1.30	0.0512	8	30	10	0600467
	1.40	0.0551	9	32	10	0600474
	1.50	0.0591	9	32	10	0600481
1/16	1.59	0.0625	16	41	10	0600535
	1.60	0.0630	10	34	10	0600498
	1.70	0.0669	10	34	10	0600504
	1.80	0.0709	11	36	10	0600511
	1.90	0.0748	11	36	10	0600528
5/64	1.98	0.0781	17	43	10	0600566
	2.00	0.0787	12	38	10	0600115
	2.10	0.0827	12	38	10	0600122
	2.20	0.0866	13	40	10	0600139
	2.25	0.0886	13	40	10	0600146
	2.30	0.0906	13	40	10	0600153
3/32	2.38	0.0937	20	45	10	0600238
	2.40	0.0945	14	43	10	0600160
	2.50	0.0984	14	43	10	0600177
	2.60	0.1024	14	43	10	0600184
	2.65	0.1043	14	43	10	0600191
	2.70	0.1063	16	46	10	0600207
7/64	2.78	0.1094	22	47	10	0600245
	2.80	0.1102	16	46	10	0600214
	2.90	0.1142	16	46	10	0600221

DORMER SCREW MACHINE DRILL

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	3.00	0.1181	16	46	10	0588697
	3.10	0.1220	18	49	10	0589083
1/8	3.18	0.1250	23	49	10	0588727
	3.20	0.1260	18	49	10	0589090
	3.25	0.1280	18	49	10	0589106
	3.30	0.1299	18	49	10	0589113
	3.40	0.1339	20	52	10	0589120
	3.50	0.1378	20	52	10	0589137
9/64	3.57	0.1406	25	50	10	0589878
	3.60	0.1417	20	52	10	0589144
	3.70	0.1457	20	52	10	0589151
	3.80	0.1496	22	55	10	0589168
	3.90	0.1535	22	55	10	0589175
5/32	3.97	0.1563	26	53	10	0589410
	4.00	0.1575	22	55	10	0589205
	4.10	0.1614	22	55	10	0589212
	4.20	0.1654	22	55	10	0589229
	4.30	0.1693	24	58	10	0589236
11/64	4.37	0.1719	28	55	10	0588932
	4.40	0.1732	24	58	10	0589243
	4.50	0.1772	24	58	10	0589250
	4.60	0.1811	24	58	10	0589267
	4.70	0.1850	24	58	10	0589274
3/16	4.76	0.1875	30	57	10	0589182
	4.80	0.1890	26	62	10	0589281
	4.90	0.1929	26	62	10	0589298
	5.00	0.1969	26	62	10	0589304
	5.10	0.2008	26	62	10	0589311
13/64	5.16	0.2031	31	58	10	0589014
	5.20	0.2047	26	62	10	0589328
	5.30	0.2087	26	62	10	0589335
	5.40	0.2126	28	66	10	0589342
	5.50	0.2165	28	66	10	0589359
7/32	5.56	0.2188	33	61	10	0589649
	5.60	0.2205	28	66	10	0589366
	5.70	0.2244	28	66	10	0589373
	5.80	0.2283	28	66	10	0589380
	5.90	0.2323	28	66	10	0589397
15/64	5.95	0.2344	34	63	10	0589069
	6.00	0.2362	28	66	10	0589434
	6.10	0.2402	31	70	10	0589441
	6.20	0.2441	31	70	10	0589458
	6.30	0.2480	31	70	10	0589465
1/4	6.35	0.2500	36	65	10	0588710
	6.40	0.2520	31	70	10	0589472
	6.50	0.2559	31	70	10	0589489
	6.60	0.2598	31	70	10	0589496
	6.70	0.2638	31	70	10	0589502
	6.80	0.2677	34	74	10	0589519
	6.90	0.2717	34	74	10	0589526
	7.00	0.2756	34	74	10	0589533
	7.10	0.2795	34	74	10	0589540
9/32	7.14	0.2813	40	70	10	0589861
	7.20	0.2835	34	74	10	0589557
	7.30	0.2874	34	74	10	0589564
	7.40	0.2913	34	74	10	0589571
	7.50	0.2953	34	74	10	0589588
	7.60	0.2992	37	79	10	0589595
	7.70	0.3031	37	79	10	0589601
	7.80	0.3071	37	79	10	0589618
	7.90	0.3110	37	79	10	0589625
5/16	7.94	0.3125	43	73	10	0589403
	8.00	0.3150	37	79	10	0589656
	8.10	0.3189	37	79	10	0589663
	8.20	0.3228	37	79	10	0589670
	8.30	0.3268	37	79	10	0589687

SCREW MACHINE DRILL

DORMER

d_1 Øh$_8$ Inch	d_1 Øh$_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A022
	8.40	0.3307	37	79	10	0589694
	8.50	0.3346	37	79	10	0589700
	8.60	0.3386	40	84	10	0589717
	8.70	0.3425	40	84	10	0589724
11/32	8.73	0.3438	45	78	10	0588925
	8.80	0.3465	40	84	10	0589731
	8.90	0.3504	40	84	10	0589748
	9.00	0.3543	40	84	10	0589755
	9.10	0.3583	40	84	10	0589762
	9.20	0.3622	40	84	10	0589779
	9.30	0.3661	40	84	10	0589786
	9.40	0.3701	40	84	10	0589793
	9.50	0.3740	40	84	10	0589809
3/8	9.52	0.3750	48	81	10	0589199
	9.60	0.3780	43	89	10	0589816
	9.70	0.3819	43	89	10	0589823
	9.80	0.3858	43	89	10	0589830
	9.90	0.3898	43	89	10	0589847
	10.00	0.3937	43	89	10	0588734
	10.10	0.3976	43	89	5	0588741
	10.20	0.4016	43	89	5	0588758
	10.30	0.4055	43	89	5	0588765
13/32	10.32	0.4062	51	86	5	0589007
	10.40	0.4094	43	89	5	0588772
	10.50	0.4134	43	89	5	0588789
	10.60	0.4173	43	89	5	0588796
	10.70	0.4213	47	95	5	0588802
	10.80	0.4252	47	95	5	0588819
	10.90	0.4291	47	95	5	0588826
	11.00	0.4331	47	95	5	0588833
	11.10	0.4370	47	95	5	0588840
7/16	11.11	0.4375	54	89	5	0589632
	11.20	0.4409	47	95	5	0588857
	11.30	0.4449	47	95	5	0588864
	11.50	0.4528	47	95	5	0588871
	11.60	0.4567	47	95	5	0588888
	11.70	0.4606	47	95	5	0588895
	11.80	0.4646	47	95	5	0588901
	11.90	0.4685	51	102	5	0588918
	12.00	0.4724	51	102	5	0588949
	12.10	0.4764	51	102	5	0588956
	12.20	0.4803	51	102	5	0588963
	12.50	0.4921	51	102	5	0588970
1/2	12.70	0.5000	60	98	5	0588703
	13.00	0.5118	51	102	5	0588987
	13.50	0.5315	54	107	1	0588994
	14.00	0.5512	54	107	1	0589021
9/16	14.29	0.5625	67	105	1	0589854
	14.50	0.5709	56	111	1	0589038
	15.00	0.5906	56	111	1	0589045
	15.50	0.6102	58	115	1	0589052
5/8	15.88	0.6250	73	111	1	0589427
	16.00	0.6299	58	115	1	0589076

SCREW MACHINE DRILL

Heavy Duty Screw Machine Length (NAS 907 Type C)

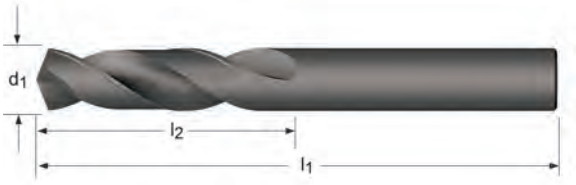
R40C - *Fractional Sizes*

R41C - *Wire Gauge Sizes*

R42C - *Letter Sizes*

A245 - *This fractional style is an outgoing product. Limited quantities available. When stock is depleted please use identical style R40C*

Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance and lubricity.



R40C	R41C	R42C	A245
ANSI	ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD	2.5XD
HSS	HSS	HSS	HSS
135°	135°	135°	135°
			* Outgoing product
			
1/16 - 1/2	N60 - N1	A - Z	N40 - 29/64

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C	A245
	60		0.0400	1/2	1.3/8	12	—	041860 [1]	—	—
	59		0.0410	1/2	1.3/8	12	—	041859 [1]	—	—
	58		0.0420	1/2	1.3/8	12	—	041858 [1]	—	—
	57		0.0430	1/2	1.3/8	12	—	041857 [1]	—	—
	56		0.0465	1/2	1.3/8	12	—	041856 [1]	—	—
	55		0.0520	5/8	1.5/8	12	—	041855 [1]	—	—
	54		0.0550	5/8	1.5/8	12	—	041854 [1]	—	—
	53		0.0595	5/8	1.5/8	12	—	041853 [1]	—	—
1/16			0.0625	5/8	1.5/8	12	040804	—	—	—
	52		0.0635	11/16	1.11/16	12	—	041852	—	—
	51		0.0670	11/16	1.11/16	12	—	041851	—	—
	50		0.0700	11/16	1.11/16	12	—	041850	—	—
	49		0.0730	11/16	1.11/16	12	—	041849	—	—
	48		0.0760	11/16	1.11/16	12	—	041848	—	—
5/64			0.0781	11/16	1.11/16	12	040805	—	—	—
	47		0.0785	11/16	1.11/16	12	—	041847	—	—
	46		0.0810	3/4	1.3/4	12	—	041846	—	—
	45		0.0820	3/4	1.3/4	12	—	041845	—	—
	44		0.0860	3/4	1.3/4	12	—	041844	—	—
	43		0.0890	3/4	1.3/4	12	—	041843	—	—
	42		0.0935	3/4	1.3/4	12	—	041842	—	—
3/32			0.0938	3/4	1.3/4	12	040806	—	—	—
	41		0.0960	13/16	1.13/16	12	—	041841	—	—
	40		0.0980	13/16	1.13/16	12	—	041840	—	0234341
	39		0.0995	13/16	1.13/16	12	—	041839	—	—
	38		0.1015	13/16	1.13/16	12	—	041838	—	—
	37		0.1040	13/16	1.13/16	12	—	041837	—	—
	36		0.1065	13/16	1.13/16	12	—	041836	—	—
7/64			0.1094	13/16	1.13/16	12	040807	—	—	—
	35		0.1100	7/8	1.7/8	12	—	041835	—	—
	34		0.1110	7/8	1.7/8	12	—	041834	—	—
	33		0.1130	7/8	1.7/8	12	—	041833	—	—

[1] Not Split Point

SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C	A245
	32		0.1160	7/8	1.7/8	12	—	041832	—	—
	31		0.1200	7/8	1.7/8	12	—	041831	—	0234242
1/8			0.1250	7/8	1.7/8	12	040808	—	—	0234914
	30		0.1285	15/16	1.15/16	12	—	041830	—	0234235
	29		0.1360	15/16	1.15/16	12	—	041829	—	0234211
	28		0.1405	15/16	1.15/16	12	—	041828	—	0234204
9/64			0.1406	15/16	1.15/16	12	040809	—	—	0235386
	27		0.1440	1“	2.1/16	12	—	041827	—	0234198
	26		0.1470	1“	2.1/16	12	—	041826	—	0234181
	25		0.1495	1“	2.1/16	12	—	041825	—	0234174
	24		0.1520	1“	2.1/16	12	—	041824	—	0234167
	23		0.1540	1“	2.1/16	12	—	041823	—	0234150
5/32			0.1563	1“	2.1/16	12	040810	—	—	0235232
	22		0.1570	1.1/16	2.1/8	12	—	041822	—	—
	21		0.1590	1.1/16	2.1/8	12	—	041821	—	0234136
	20		0.1610	1.1/16	2.1/8	12	—	041820	—	0234129
	19		0.1660	1.1/16	2.1/8	12	—	041819	—	0234105
	18		0.1695	1.1/16	2.1/8	12	—	041818	—	0234099
11/64			0.1719	1.1/16	2.1/8	12	040811	—	—	0234792
	17		0.1730	1.1/8	2.3/16	12	—	041817	—	—
	16		0.1770	1.1/8	2.3/16	12	—	041816	—	—
	15		0.1800	1.1/8	2.3/16	12	—	041815	—	—
	14		0.1820	1.1/8	2.3/16	12	—	041814	—	—
	13		0.1850	1.1/8	2.3/16	12	—	041813	—	—
3/16			0.1875	1.1/8	2.3/16	12	040812	—	—	0235065
	12		0.1890	1.3/16	2.1/4	12	—	041812	—	—
	11		0.1910	1.3/16	2.1/4	12	—	041811	—	0234020
	10		0.1935	1.3/16	2.1/4	12	—	041810	—	0234013
	9		0.1960	1.3/16	2.1/4	12	—	041809	—	0234594
	8		0.1990	1.3/16	2.1/4	12	—	041808	—	0234587
	7		0.2010	1.3/16	2.1/4	12	—	041807	—	0234570
13/64			0.2031	1.3/16	2.1/4	12	040813	—	—	0234846
	6		0.2040	1.1/4	2.3/8	12	—	041806	—	—
	5		0.2055	1.1/4	2.3/8	12	—	041805	—	0234440
	4		0.2090	1.1/4	2.3/8	12	—	041804	—	—
	3		0.2130	1.1/4	2.3/8	12	—	041803	—	—
7/32			0.2188	1.1/4	2.3/8	12	040814	—	—	0235331
	2		0.2210	1.5/16	2.7/16	12	—	041802	—	0234112
	1		0.2280	1.5/16	2.7/16	12	—	041801	—	0234006
		A	0.2340	1.5/16	2.7/16	12	—	—	042801	—
15/64			0.2344	1.5/16	2.7/16	12	040815	—	—	—
		B	0.2380	1.3/8	2.1/2	12	—	—	042802	—
		C	0.2420	1.3/8	2.1/2	12	—	—	042803	—
		D	0.2460	1.3/8	2.1/2	12	—	—	042804	—
		E	0.2500	1.3/8	2.1/2	12	—	—	042805	—
1/4			0.2500	1.3/8	2.1/2	12	040816	—	—	0234853
		F	0.2570	1.7/16	2.5/8	12	—	—	042806	0235447
		G	0.2610	1.7/16	2.5/8	12	—	—	042807	—
17/64			0.2656	1.7/16	2.5/8	12	040817	—	—	0234907
		H	0.2660	1.1/2	2.11/16	12	—	—	042808	—
		I	0.2720	1.1/2	2.11/16	12	—	—	042809	—
		J	0.2770	1.1/2	2.11/16	12	—	—	042810	—
		K	0.2810	1.1/2	2.11/16	12	—	—	042811	—
9/32			0.2813	1.1/2	2.11/16	12	040818	—	—	0235379
		L	0.2900	1.9/16	2.3/4	12	—	—	042812	—
		M	0.2950	1.9/16	2.3/4	12	—	—	042813	—
19/64			0.2969	1.9/16	2.3/4	12	040819	—	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042814	—
5/16			0.3125	1.5/8	2.13/16	6	040820	—	—	0235218
		O	0.3160	1.11/16	2.15/16	6	—	—	042815	—
		P	0.3230	1.11/16	2.15/16	6	—	—	042816	—
21/64			0.3281	1.11/16	2.15/16	6	040821	—	—	—
		Q	0.3320	1.11/16	3“	6	—	—	042817	—
		R	0.3390	1.11/16	3“	6	—	—	042818	—
11/32			0.3437	1.11/16	3“	6	040822	—	—	—
		S	0.3480	1.3/4	3.1/16	6	—	—	042819	—

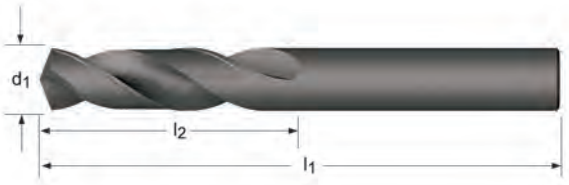
SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R40C	R41C	R42C	A245
		T	0.3580	1.3/4	3.1/16	6	—	—	042820	—
23/64			0.3594	1.3/4	3.1/16	6	040823	—	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042821	—
3/8			0.3750	1.13/16	3.1/8	6	040824	—	—	0235140
		V	0.3770	1.7/8	3.1/4	6	—	—	042822	—
		W	0.3860	1.7/8	3.1/4	6	—	—	042823	—
25/64			0.3906	1.7/8	3.1/4	6	040825	—	—	0235003
		X	0.3970	1.15/16	3.5/16	6	—	—	042824	—
		Y	0.4040	1.15/16	3.5/16	6	—	—	042825	—
13/32			0.4063	1.15/16	3.5/16	6	040826	—	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042826	—
27/64			0.4219	2“	3.3/8	6	040827	—	—	—
7/16			0.4375	2.1/16	3.7/16	6	040828	—	—	—
29/64			0.4531	2.1/8	3.9/16	6	040829	—	—	0235041
15/32			0.4687	2.1/8	3.5/8	6	040830	—	—	—
31/64			0.4844	2.3/16	3.11/16	6	040831	—	—	—
1/2			0.5000	2.1/4	3.3/4	6	040832	—	—	—

SCREW MACHINE DRILL

Heavy Duty Screw Machine Length (NAS 907 Type C), Metric

4ASM Low thrust design self centering Split Point for easier penetration.
Steam Oxide surface treatment for increased wear resistance & lubricity.



4ASM

DIN 1897

2.5XD

HSS

135°



1.00 - 12.50

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASM
1.00	0.0394	6	22	12	046100 [1]
1.25	0.0492	8	30	12	046125 [1]
1.30	0.0512	8	30	12	046130 [1]
1.65	0.0650	11	34	12	046165
2.00	0.0787	12	38	12	046200
2.30	0.0906	13	40	12	046230
2.40	0.0945	14	43	12	046240
2.50	0.0984	14	43	12	046250
3.00	0.1181	16	46	12	046300
3.10	0.1220	18	49	12	046310
3.20	0.1260	18	49	12	046320
3.30	0.1299	18	49	12	046330
3.40	0.1339	20	52	12	046340
3.50	0.1378	20	52	12	046350
3.70	0.1457	20	52	12	046370
4.00	0.1575	22	55	12	046400
4.20	0.1654	22	55	12	046420
4.50	0.1772	24	58	12	046450
5.00	0.1969	26	62	12	046500
5.50	0.2165	28	66	12	046550
5.70	0.2244	28	66	12	046570
5.80	0.2283	28	66	12	046580
6.00	0.2362	28	66	12	046600
6.20	0.2441	31	70	12	046620
6.40	0.2520	31	70	12	046640
6.50	0.2559	31	70	12	046650
6.60	0.2598	31	70	12	046660
6.80	0.2677	34	74	12	046680
6.90	0.2717	34	74	12	046690
7.00	0.2756	34	74	12	046700
7.20	0.2835	34	74	12	046720
7.50	0.2953	37	79	12	046750

[1] Not Split Point

SCREW MACHINE DRILL

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASM
8.00	0.3150	37	79	6	046800
8.10	0.3189	37	79	6	046810
8.40	0.3307	37	79	6	046840
8.50	0.3346	37	79	6	046850
8.70	0.3425	40	84	6	046870
9.00	0.3543	40	84	6	046900
9.10	0.3583	40	84	6	046910
9.20	0.3622	40	84	6	046920
9.30	0.3661	40	84	6	046930
9.50	0.3740	40	84	6	046950
9.70	0.3819	43	89	6	046970
10.00	0.3937	43	89	6	047000
10.20	0.4016	43	89	6	047002
10.50	0.4134	43	89	6	047005
10.80	0.4252	47	95	6	047008
11.00	0.4331	47	95	6	047110
11.20	0.4409	47	95	6	047112
11.50	0.4528	47	95	6	047115
11.80	0.4646	47	95	6	047118
12.00	0.4724	51	102	6	047200
12.20	0.4803	51	102	6	047220
12.50	0.4921	51	102	6	047250

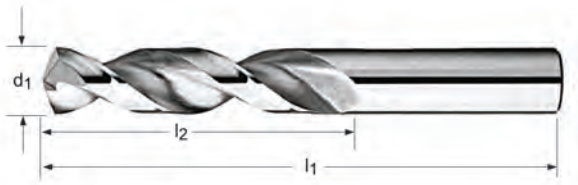
SCREW MACHINE DRILL

General Purpose Screw Machine Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for eaisier penetration.

QC41P Bright Finish improves chip flow in soft or non-ferrous materials.

QC41G TiN Coating increases wear resistance and improves tool life.



	QC41P	QC41G
	ANSI	ANSI
	3XD	3XD
	HSS	HSS
	135°	135°
		
	1/16 - 11/16	1/16 - 1/2

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC41P	QC41G
1/16	0.0625	5/8	1.5/8	12	058304	062304
5/64	0.0781	11/16	1.11/16	12	058305	062305
3/32	0.0938	3/4	1.3/4	12	058306	062306
40	0.0980	13/16	1.13/16	12	060040	061440
39	0.0995	13/16	1.13/16	12	060039	061439
38	0.1015	13/16	1.13/16	12	060038	061438
37	0.1040	13/16	1.13/16	12	060037	061437
36	0.1065	13/16	1.13/16	12	060036	061436
7/64	0.1094	13/16	1.13/16	12	058307	062307
35	0.1100	7/8	1.7/8	12	060035	061435
34	0.1110	7/8	1.7/8	12	060034	061434
33	0.1130	7/8	1.7/8	12	060033	061433
32	0.1160	7/8	1.7/8	12	060032	061432
31	0.1200	7/8	1.7/8	12	060031	061431
1/8	0.1250	7/8	1.7/8	12	058308	062308
30	0.1285	15/16	1.15/16	12	060030	061430
29	0.1360	15/16	1.15/16	12	060029	061429
28	0.1405	15/16	1.15/16	12	060028	061428
9/64	0.1406	15/16	1.15/16	12	058309	062309
27	0.1440	1“	2.1/16	12	060027	061427
26	0.1470	1“	2.1/16	12	060026	061426
25	0.1495	1“	2.1/16	12	060025	061425
24	0.1520	1“	2.1/16	12	060024	061424
23	0.1540	1“	2.1/16	12	060023	061423
5/32	0.1563	1“	2.1/16	12	058310	062310
22	0.1570	1.1/16	2.1/8	12	060022	061422
21	0.1590	1.1/16	2.1/8	12	060021	061421
20	0.1610	1.1/16	2.1/8	12	060020	061420
19	0.1660	1.1/16	2.1/8	12	060019	061419
18	0.1695	1.1/16	2.1/8	12	060018	061418
11/64	0.1719	1.1/16	2.1/8	12	058311	062311
17	0.1730	1.1/8	2.3/16	12	060017	061417
16	0.1770	1.1/8	2.3/16	12	060016	061416

SCREW MACHINE DRILL

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC41P	QC41G
15	0.1800	1.1/8	2.3/16	12	060015	061415
14	0.1820	1.1/8	2.3/16	12	060014	061414
13	0.1850	1.1/8	2.3/16	12	060013	061413
3/16	0.1875	1.1/8	2.3/16	12	058312	062312
12	0.1890	1.3/16	2.1/4	12	060012	061412
11	0.1910	1.3/16	2.1/4	12	060011	061411
10	0.1935	1.3/16	2.1/4	12	060010	061410
9	0.1960	1.3/16	2.1/4	12	060009	061409
8	0.1990	1.3/16	2.1/4	12	060008	061408
7	0.2010	1.3/16	2.1/4	12	060007	061407
13/64	0.2031	1.3/16	2.1/4	12	058313	062313
6	0.2040	1.1/4	2.3/8	12	060006	061406
5	0.2055	1.1/4	2.3/8	12	060005	061405
4	0.2090	1.1/4	2.3/8	12	060004	061404
3	0.2130	1.1/4	2.3/8	12	060003	061403
7/32	0.2188	1.1/4	2.3/8	12	058314	062314
2	0.2210	1.5/16	2.7/16	12	060002	061402
1	0.2280	1.5/16	2.7/16	12	060001	061401
15/64	0.2344	1.5/16	2.7/16	12	058315	062315
1/4	0.2500	1.3/8	2.1/2	12	058316	062316
17/64	0.2656	1.7/16	2.5/8	12	058317	062317
9/32	0.2812	1.1/2	2.11/16	12	058318	062318
19/64	0.2969	1.9/16	2.3/4	12	058319	062319
5/16	0.3125	1.5/8	2.13/16	6	058320	062320
21/64	0.3281	1.11/16	2.15/16	6	058321	062321
11/32	0.3437	1.11/16	3“	6	058322	062322
23/64	0.3594	1.3/4	3.1/16	6	058323	062323
3/8	0.3750	1.13/16	3.1/8	6	058324	062324
25/64	0.3906	1.7/8	3.1/4	6	058325	062325
13/32	0.4063	1.15/16	3.5/16	6	058326	062326
27/64	0.4219	2“	3.3/8	6	058327	062327
7/16	0.4375	2.1/16	3.7/16	6	058328	062328
29/64	0.4531	2.1/8	3.9/16	6	058329	062329
15/32	0.4687	2.1/8	3.5/8	6	058330	062330
31/64	0.4844	2.3/16	3.3/4	6	058331	062331
1/2	0.5000	2.1/4	3.3/4	6	058332	062332
33/64	0.5156	2.3/8	3.7/8	1	058333	—
17/32	0.5313	2.3/8	3.7/8	1	058334	—
35/64	0.5469	2.1/2	4“	1	058335	—
9/16	0.5625	2.1/2	4“	1	058336	—
37/64	0.5781	2.5/8	4.1/8	1	058337	—
19/32	0.5937	2.5/8	4.1/8	1	058338	—
5/8	0.6250	2.3/4	4.1/4	1	058340	—
11/16	0.6875	2.7/8	4.5/8	1	058344	—

DORMER

MICRO - Screw Machine Length Drills

A720

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

Smallest size range available. Bright finish improves chip flow in soft or non-ferrous materials. Good wear resistance in abrasive or hard materials.



A720

DIN 1899

2.5XD

HSS-E

118°

0.15 - 1.40

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	d_2 Ø mm	Pack Qty	A720
0.15	0.0059	1.0	25	1	10	0044988
0.16	0.0063	1.4	25	1	10	0566961
0.17	0.0067	1.4	25	1	10	0612057
0.18	0.0070	1.4	25	1	10	0044995
0.20	0.0078	1.8	25	1	10	0045008
0.22	0.0087	1.8	25	1	10	0045015
0.25	0.0098	2.2	25	1	10	0045022
0.27	0.0106	2.2	25	1	10	0566978
0.28	0.0110	2.2	25	1	10	0045039
0.30	0.0118	2.2	25	1	10	0045046
0.35	0.0138	2.8	25	1	10	0045053
0.38	0.0150	2.8	25	1	10	0045060
0.39	0.0154	3.6	25	1	10	0045077
0.40	0.0157	3.6	25	1	10	0045084
0.45	0.0177	3.6	25	1	10	0045107
0.50	0.0197	4.0	25	1	10	0045114
0.55	0.0217	4.5	25	1	10	0612064
0.60	0.0236	4.5	25	1	10	0045121
0.62	0.0244	5.0	25	1	10	0612071
0.65	0.0256	5.0	25	1	10	0612088
0.70	0.0276	5.6	25	1	10	0615577
0.75	0.0295	5.6	25	1	10	0612101
0.80	0.0315	6.3	25	1.5	10	0615584
0.85	0.0335	6.3	25	1.5	10	0612125
0.90	0.0354	7.1	25	1.5	10	0615591
0.95	0.0374	7.1	25	1.5	10	0612149
1.00	0.0394	8.0	25	1.5	10	0615607
1.05	0.0413	8.0	25	1.5	10	0612163
1.10	0.0433	9.0	25	1.5	10	0615614
1.20	0.0472	10.0	25	1.5	10	0615621
1.30	0.0512	10.0	25	1.5	10	0615638
1.40	0.0551	11.2	25	1.5	10	0615645

COBALT SCREW MACHINE DRILL

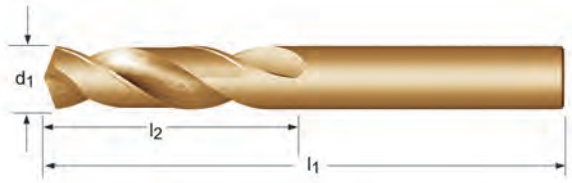
Heavy Duty Screw Machine Length

M40CO - *Fractional Sizes*

M41CO - *Wire Gauge Sizes*

M42CO - *Letter Sizes*

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity.



M40CO	M41CO	M42CO
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
		
1/16 - 3/4	N60 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
	60		0.0400	1/2	1.3/8	12	—	041360 [1]	—
	59		0.0410	1/2	1.3/8	12	—	041359 [1]	—
	58		0.0420	1/2	1.3/8	12	—	041358 [1]	—
	57		0.0430	1/2	1.3/8	12	—	041357 [1]	—
	56		0.0465	1/2	1.3/8	12	—	041356 [1]	—
	55		0.0520	5/8	1.5/8	12	—	041355 [1]	—
	54		0.0550	5/8	1.5/8	12	—	041354 [1]	—
	53		0.0595	5/8	1.5/8	12	—	041353 [1]	—
1/16			0.0625	5/8	1.5/8	12	040304	—	—
	52		0.0635	11/16	1.11/16	12	—	041352	—
	51		0.0670	11/16	1.11/16	12	—	041351	—
	50		0.0700	11/16	1.11/16	12	—	041350	—
	49		0.0730	11/16	1.11/16	12	—	041349	—
	48		0.0760	11/16	1.11/16	12	—	041348	—
5/64			0.0781	11/16	1.11/16	12	040305	—	—
	47		0.0785	11/16	1.11/16	12	—	041347	—
	46		0.0810	3/4	1.3/4	12	—	041346	—
	45		0.0820	3/4	1.3/4	12	—	041345	—
	44		0.0860	3/4	1.3/4	12	—	041344	—
	43		0.0890	3/4	1.3/4	12	—	041343	—
	42		0.0935	3/4	1.3/4	12	—	041342	—
3/32			0.0938	3/4	1.3/4	12	040306	—	—
	41		0.0960	13/16	1.13/16	12	—	041341	—
	40		0.0980	13/16	1.13/16	12	—	041340	—
	39		0.0995	13/16	1.13/16	12	—	041339	—
	38		0.1015	13/16	1.13/16	12	—	041338	—
	37		0.1040	13/16	1.13/16	12	—	041337	—
	36		0.1065	13/16	1.13/16	12	—	041336	—
7/64			0.1094	13/16	1.13/16	12	040307	—	—
	35		0.1100	7/8	1.7/8	12	—	041335	—
	34		0.1110	7/8	1.7/8	12	—	041334	—
	33		0.1130	7/8	1.7/8	12	—	041333	—

[1] Not Split Point

COBALT SCREW MACHINE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
	32		0.1160	7/8	1.7/8	12	—	041332	—
	31		0.1200	7/8	1.7/8	12	—	041331	—
1/8			0.1250	7/8	1.7/8	12	040308	—	—
	30		0.1285	15/16	1.15/16	12	—	041330	—
	29		0.1360	15/16	1.15/16	12	—	041329	—
	28		0.1405	15/16	1.15/16	12	—	041328	—
9/64			0.1406	15/16	1.15/16	12	040309	—	—
	27		0.1440	1“	2.1/16	12	—	041327	—
	26		0.1470	1“	2.1/16	12	—	041326	—
	25		0.1495	1“	2.1/16	12	—	041325	—
	24		0.1520	1“	2.1/16	12	—	041324	—
	23		0.1540	1“	2.1/16	12	—	041323	—
5/32			0.1563	1“	2.1/16	12	040310	—	—
	22		0.1570	1.1/16	2.1/8	12	—	041322	—
	21		0.1590	1.1/16	2.1/8	12	—	041321	—
	20		0.1610	1.1/16	2.1/8	12	—	041320	—
	19		0.1660	1.1/16	2.1/8	12	—	041319	—
	18		0.1695	1.1/16	2.1/8	12	—	041318	—
11/64			0.1719	1.1/16	2.1/8	12	040311	—	—
	17		0.1730	1.1/8	2.3/16	12	—	041317	—
	16		0.1770	1.1/8	2.3/16	12	—	041316	—
	15		0.1800	1.1/8	2.3/16	12	—	041315	—
	14		0.1820	1.1/8	2.3/16	12	—	041314	—
	13		0.1850	1.1/8	2.3/16	12	—	041313	—
3/16			0.1875	1.1/8	2.3/16	12	040312	—	—
	12		0.1890	1.3/16	2.1/4	12	—	041312	—
	11		0.1910	1.3/16	2.1/4	12	—	041311	—
	10		0.1935	1.3/16	2.1/4	12	—	041310	—
	9		0.1960	1.3/16	2.1/4	12	—	041309	—
	8		0.1990	1.3/16	2.1/4	12	—	041308	—
	7		0.2010	1.3/16	2.1/4	12	—	041307	—
13/64			0.2031	1.3/16	2.1/4	12	040313	—	—
	6		0.2040	1.1/4	2.3/8	12	—	041306	—
	5		0.2055	1.1/4	2.3/8	12	—	041305	—
	4		0.2090	1.1/4	2.3/8	12	—	041304	—
	3		0.2130	1.1/4	2.3/8	12	—	041303	—
7/32			0.2188	1.1/4	2.3/8	12	040314	—	—
	2		0.2210	1.5/16	2.7/16	12	—	041302	—
	1		0.2280	1.5/16	2.7/16	12	—	041301	—
		A	0.2340	1.5/16	2.7/16	12	—	—	042301
15/64			0.2344	1.5/16	2.7/16	12	040315	—	—
		B	0.2380	1.3/8	2.1/2	12	—	—	042302
		C	0.2420	1.3/8	2.1/2	12	—	—	042303
		D	0.2460	1.3/8	2.1/2	12	—	—	042304
		E	0.2500	1.3/8	2.1/2	12	—	—	042305
1/4			0.2500	1.3/8	2.1/2	12	040316	—	—
		F	0.2570	1.7/16	2.5/8	12	—	—	042306
		G	0.2610	1.7/16	2.5/8	12	—	—	042307
17/64			0.2656	1.7/16	2.5/8	12	040317	—	—
		H	0.2660	1.1/2	2.11/16	12	—	—	042308
		I	0.2720	1.1/2	2.11/16	12	—	—	042309
		J	0.2770	1.1/2	2.11/16	12	—	—	042310
		K	0.2810	1.1/2	2.11/16	12	—	—	042311
9/32			0.2813	1.1/2	2.11/16	12	040318	—	—
		L	0.2900	1.9/16	2.3/4	12	—	—	042312
		M	0.2950	1.9/16	2.3/4	12	—	—	042313
19/64			0.2969	1.9/16	2.3/4	12	040319	—	—
		N	0.3020	1.5/8	2.13/16	12	—	—	042314
5/16			0.3125	1.5/8	2.13/16	6	040320	—	—
		O	0.3160	1.11/16	2.15/16	6	—	—	042315
		P	0.3230	1.11/16	2.15/16	6	—	—	042316
21/64			0.3281	1.11/16	2.15/16	6	040321	—	—
		Q	0.3320	1.11/16	3“	6	—	—	042317
		R	0.3390	1.11/16	3“	6	—	—	042318
11/32			0.3437	1.11/16	3“	6	040322	—	—
		S	0.3480	1.3/4	3.1/16	6	—	—	042319

COBALT SCREW MACHINE DRILL

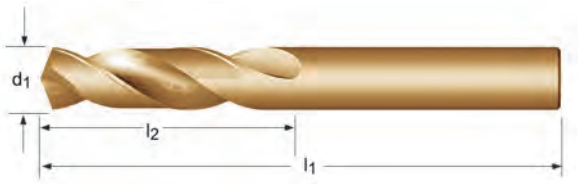
d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M40CO	M41CO	M42CO
		T	0.3580	1.3/4	3.1/16	6	—	—	042320
23/64			0.3594	1.3/4	3.1/16	6	040323	—	—
		U	0.3680	1.13/16	3.1/8	6	—	—	042321
3/8			0.3750	1.13/16	3.1/8	6	040324	—	—
		V	0.3770	1.7/8	3.1/4	6	—	—	042322
		W	0.3860	1.7/8	3.1/4	6	—	—	042323
25/64			0.3906	1.7/8	3.1/4	6	040325	—	—
		X	0.3970	1.15/16	3.5/16	6	—	—	042324
		Y	0.4040	1.15/16	3.5/16	6	—	—	042325
13/32			0.4063	1.15/16	3.5/16	6	040326	—	—
		Z	0.4130	2“	3.3/8	6	—	—	042326
27/64			0.4219	2“	3.3/8	6	040327	—	—
7/16			0.4375	2.1/16	3.7/16	6	040328	—	—
29/64			0.4531	2.1/8	3.9/16	6	040329	—	—
15/32			0.4687	2.1/8	3.5/8	6	040330	—	—
31/64			0.4844	2.3/16	3.11/16	6	040331	—	—
1/2			0.5000	2.1/4	3.3/4	6	040332	—	—
33/64			0.5156	2.3/8	3.7/8	1	046033	—	—
17/32			0.5313	2.3/8	3.7/8	1	046034	—	—
35/64			0.5469	2.1/2	4“	1	046035	—	—
9/16			0.5625	2.1/2	4“	1	046036	—	—
37/64			0.5781	2.5/8	4.1/8	1	046037	—	—
19/32			0.5937	2.5/8	4.1/8	1	046038	—	—
39/64			0.6094	2.3/4	4.1/4	1	046039	—	—
5/8			0.6250	2.3/4	4.1/4	1	046040	—	—
41/64			0.6406	2.7/8	4.1/2	1	046041	—	—
21/32			0.6563	2.7/8	4.1/2	1	046042	—	—
43/64			0.6719	2.7/8	4.5/8	1	046043	—	—
11/16			0.6875	2.7/8	4.5/8	1	046044	—	—
45/64			0.7031	3“	4.3/4	1	046045	—	—
23/32			0.7188	3“	4.3/4	1	046046	—	—
47/64			0.7344	3.1/8	5“	1	046047	—	—
3/4			0.7500	3.1/8	5“	1	046048	—	—

COBALT SCREW MACHINE DRILL

Heavy Duty Screw Machine Length, Metric

4ASMCO

Low thrust design self centering Split Point for easier penetration.
Cobalt base material with Bronze Oxide for wear resistance and lubricity.



4ASMCO

DIN 1897

2.5XD

HSS-E

135°



2.30 - 12.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	4ASMCO
2.30	0.0906	13	40	12	032230
2.50	0.0984	14	43	12	032250
3.00	0.1181	16	46	12	032300
3.10	0.1220	18	49	12	032310
3.20	0.1260	18	49	12	032320
3.30	0.1299	18	49	12	032330
3.40	0.1339	20	52	12	032340
3.50	0.1378	20	52	12	032350
3.60	0.1417	20	52	12	032360
3.70	0.1457	20	52	12	032370
4.00	0.1575	22	55	12	032400
4.10	0.1614	22	55	12	032410
4.20	0.1654	22	55	12	032420
4.70	0.1850	24	58	12	032470
4.80	0.1890	26	62	12	032480
4.90	0.1929	26	62	12	032490
5.00	0.1969	26	62	12	032500
5.10	0.2008	26	62	12	032510
5.50	0.2165	28	66	12	032550
5.70	0.2244	28	66	12	032570
6.00	0.2362	28	66	12	032600
6.40	0.2520	31	70	12	032640
6.50	0.2559	31	70	12	032650
6.80	0.2677	34	74	12	032680
7.00	0.2756	34	74	12	032700
8.00	0.3150	37	79	6	032800
8.50	0.3346	37	79	6	032850
9.50	0.3740	40	84	6	032950
9.80	0.3858	43	89	6	032980
10.00	0.3937	43	89	6	033000
10.20	0.4016	43	89	6	033002
10.50	0.4134	43	89	6	033005
11.00	0.4331	47	95	6	033110
11.20	0.4409	47	95	6	033112
11.50	0.4528	47	95	6	033115
12.00	0.4724	51	102	6	033200

TAPER LENGTH DRILL

General Purpose Taper Length

R51 - *Fractional Sizes*

R52 - *Wire Gauge Sizes*

R55 - *Letter Sizes*

Bright finish improves chip flow in soft or non-ferrous materials.
Longer flute and Overall length for depth and reach.

∗ *Sizes 45/64 and larger are steam oxide*



R51	R52	R55
ANSI	ANSI	ANSI
6XD	6XD	6XD
HSS	HSS	HSS
118°	118°	118°
		
1/64 - 1.3/4	N80 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
	80		0.0135	5/16	1.1/2	12	—	052080	—
	79		0.0145	5/16	1.1/2	12	—	052079	—
1/64			0.0156	5/16	1.1/2	12	051001	—	—
	78		0.0160	5/16	1.1/2	12	—	052078	—
	77		0.0180	5/16	1.1/2	12	—	052077	—
	76		0.0200	5/16	1.1/2	12	—	052076	—
	75		0.0210	5/16	1.1/2	12	—	052075	—
	74		0.0225	5/16	1.1/2	12	—	052074	—
	73		0.0240	5/16	1.1/2	12	—	052073	—
	72		0.0250	5/16	1.1/2	12	—	052072	—
	71		0.0260	3/4	2“	12	—	052071	—
	70		0.0280	3/4	2“	12	—	052070	—
	69		0.0292	3/4	2“	12	—	052069	—
	68		0.0310	3/4	2“	12	—	052068	—
1/32			0.0313	3/4	2“	12	051002	—	—
	67		0.0320	3/4	2“	12	—	052067	—
	66		0.0330	3/4	2“	12	—	052066	—
	65		0.0350	3/4	2“	12	—	052065	—
	64		0.0360	3/4	2“	12	—	052064	—
	63		0.0370	3/4	2“	12	—	052063	—
	62		0.0380	3/4	2“	12	—	052062	—
	61		0.0390	1.1/8	2.1/4	12	—	052061	—
	60		0.0400	1.1/8	2.1/4	12	—	052060	—
	59		0.0410	1.1/8	2.1/4	12	—	052059	—
	58		0.0420	1.1/8	2.1/4	12	—	052058	—
	57		0.0430	1.1/8	2.1/4	12	—	052057	—
	56		0.0465	1.1/8	2.1/4	12	—	052056	—
3/64			0.0469	1.1/8	2.1/4	12	051003	—	—
	55		0.0520	1.3/4	3“	12	—	052055	—
	54		0.0550	1.3/4	3“	12	—	052054	—
	53		0.0595	1.3/4	3“	12	—	052053	—
1/16			0.0625	1.3/4	3“	12	051004	—	—

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
	52		0.0635	2“	3.3/4	12	—	052052	—
	51		0.0670	2“	3.3/4	12	—	052051	—
	50		0.0700	2“	3.3/4	12	—	052050	—
	49		0.0730	2“	3.3/4	12	—	052049	—
	48		0.0760	2“	3.3/4	12	—	052048	—
5/64			0.0781	2“	3.3/4	12	051005	—	—
	47		0.0785	2.1/4	4.1/4	12	—	052047	—
	46		0.0810	2.1/4	4.1/4	12	—	052046	—
	45		0.0820	2.1/4	4.1/4	12	—	052045	—
	44		0.0860	2.1/4	4.1/4	12	—	052044	—
	43		0.0890	2.1/4	4.1/4	12	—	052043	—
	42		0.0935	2.1/4	4.1/4	12	—	052042	—
3/32			0.0938	2.1/4	4.1/4	12	051006	—	—
	41		0.0960	2.1/2	4.5/8	12	—	052041	—
	40		0.0980	2.1/2	4.5/8	12	—	052040	—
	39		0.0995	2.1/2	4.5/8	12	—	052039	—
	38		0.1015	2.1/2	4.5/8	12	—	052038	—
	37		0.1040	2.1/2	4.5/8	12	—	052037	—
	36		0.1065	2.1/2	4.5/8	12	—	052036	—
7/64			0.1094	2.1/2	4.5/8	12	051007	—	—
	35		0.1100	2.3/4	5.1/8	12	—	052035	—
	34		0.1110	2.3/4	5.1/8	12	—	052034	—
	33		0.1130	2.3/4	5.1/8	12	—	052033	—
	32		0.1160	2.3/4	5.1/8	12	—	052032	—
	31		0.1200	2.3/4	5.1/8	12	—	052031	—
1/8			0.1250	2.3/4	5.1/8	12	051008	—	—
	30		0.1285	3“	5.3/8	12	—	052030	—
	29		0.1360	3“	5.3/8	12	—	052029	—
	28		0.1405	3“	5.3/8	12	—	052028	—
9/64			0.1406	3“	5.3/8	12	051009	—	—
	27		0.1440	3“	5.3/8	12	—	052027	—
	26		0.1470	3“	5.3/8	12	—	052026	—
	25		0.1495	3“	5.3/8	12	—	052025	—
	24		0.1520	3“	5.3/8	12	—	052024	—
	23		0.1540	3“	5.3/8	12	—	052023	—
5/32			0.1563	3“	5.3/8	12	051010	—	—
	22		0.1570	3.3/8	5.3/4	12	—	052022	—
	21		0.1590	3.3/8	5.3/4	12	—	052021	—
	20		0.1610	3.3/8	5.3/4	12	—	052020	—
	19		0.1660	3.3/8	5.3/4	12	—	052019	—
	18		0.1695	3.3/8	5.3/4	12	—	052018	—
11/64			0.1719	3.3/8	5.3/4	12	051011	—	—
	17		0.1730	3.3/8	5.3/4	12	—	052017	—
	16		0.1770	3.3/8	5.3/4	12	—	052016	—
	15		0.1800	3.3/8	5.3/4	12	—	052015	—
	14		0.1820	3.3/8	5.3/4	12	—	052014	—
	13		0.1850	3.3/8	5.3/4	12	—	052013	—
3/16			0.1875	3.3/8	5.3/4	12	051012	—	—
	12		0.1890	3.5/8	6“	12	—	052012	—
	11		0.1910	3.5/8	6“	12	—	052011	—
	10		0.1935	3.5/8	6“	12	—	052010	—
	9		0.1960	3.5/8	6“	12	—	052009	—
	8		0.1990	3.5/8	6“	12	—	052008	—
	7		0.2010	3.5/8	6“	12	—	052007	—
13/64			0.2031	3.5/8	6“	12	051013	—	—
	6		0.2040	3.5/8	6“	12	—	052006	—
	5		0.2055	3.5/8	6“	12	—	052005	—
	4		0.2090	3.5/8	6“	12	—	052004	—
	3		0.2130	3.5/8	6“	12	—	052003	—
7/32			0.2188	3.5/8	6“	12	051014	—	—
	2		0.2210	3.3/4	6.1/8	12	—	052002	—
	1		0.2280	3.3/4	6.1/8	12	—	052001	—
		A	0.2340	3.3/4	6.1/8	12	—	—	055001
15/64			0.2344	3.3/4	6.1/8	12	051015	—	—
		B	0.2380	3.3/4	6.1/8	12	—	—	055002
		C	0.2420	3.3/4	6.1/8	12	—	—	055003

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
		D	0.2460	3.3/4	6.1/8	12	—	—	055004
		E	0.2500	3.3/4	6.1/8	12	—	—	055005
1/4			0.2500	3.3/4	6.1/8	12	051016	—	—
		F	0.2570	3.7/8	6.1/4	12	—	—	055006
		G	0.2610	3.7/8	6.1/4	6	—	—	055007
17/64			0.2656	3.7/8	6.1/4	6	051017	—	—
		H	0.2660	3.7/8	6.1/4	6	—	—	—
		I	0.2720	3.7/8	6.1/4	6	—	—	055009
		J	0.2770	3.7/8	6.1/4	6	—	—	055010
		K	0.2810	3.7/8	6.1/4	6	—	—	055011
9/32			0.2813	3.7/8	6.1/4	6	051018	—	—
		L	0.2900	4“	6.3/8	6	—	—	055012
		M	0.2950	4“	6.3/8	6	—	—	055013
19/64			0.2969	4“	6.3/8	6	051019	—	—
		N	0.3020	4“	6.3/8	6	—	—	055014
5/16			0.3125	4“	6.3/8	6	051020	—	—
		O	0.3161	4.1/8	6.1/2	6	—	—	055015
		P	0.3230	4.1/8	6.1/2	6	—	—	055016
21/64			0.3281	4.1/8	6.1/2	6	051021	—	—
		Q	0.3320	4.1/8	6.1/2	6	—	—	055017
		R	0.3390	4.1/8	6.1/2	6	—	—	055018
11/32			0.3437	4.1/8	6.1/2	6	051022	—	—
		S	0.3480	4.1/4	6.3/4	6	—	—	055019
		T	0.3580	4.1/4	6.3/4	6	—	—	055020
23/64			0.3594	4.1/4	6.3/4	6	051023	—	—
		U	0.3680	4.1/4	6.3/4	6	—	—	055021
3/8			0.3750	4.1/4	6.3/4	6	051024	—	—
		V	0.3770	4.3/8	7“	6	—	—	055022
		W	0.3860	4.3/8	7“	6	—	—	055023
25/64			0.3906	4.3/8	7“	6	051025	—	—
		X	0.3970	4.3/8	7“	6	—	—	055024
		Y	0.4040	4.3/8	7“	6	—	—	055025
13/32			0.4063	4.3/8	7“	6	051026	—	—
		Z	0.4130	4.5/8	7.1/4	6	—	—	055026
27/64			0.4219	4.5/8	7.1/4	6	051027	—	—
7/16			0.4375	4.5/8	7.1/4	6	051028	—	—
29/64			0.4531	4.3/4	7.1/2	6	051029	—	—
15/32			0.4687	4.3/4	7.1/2	6	051030	—	—
31/64			0.4844	4.3/4	7.3/4	6	051031	—	—
1/2			0.5000	4.3/4	7.3/4	6	051032	—	—
33/64			0.5156	4.3/4	8“	1	051033	—	—
17/32			0.5313	4.3/4	8“	1	051034	—	—
35/64			0.5469	4.7/8	8.1/4	1	051035	—	—
9/16			0.5625	4.7/8	8.1/4	1	051036	—	—
37/64			0.5781	4.7/8	8.3/4	1	051037	—	—
19/32			0.5937	4.7/8	8.3/4	1	051038	—	—
39/64			0.6094	4.7/8	8.3/4	1	051039	—	—
5/8			0.6250	4.7/8	8.3/4	1	051040	—	—
41/64			0.6406	5.1/8	9“	1	051041	—	—
21/32			0.6563	5.1/8	9“	1	051042	—	—
43/64			0.6719	5.3/8	9.1/4	1	051043	—	—
11/16			0.6875	5.3/8	9.1/4	1	051044	—	—
45/64			0.7031	5.5/8	9.1/2	1	051045 [1)]	—	—
23/32			0.7188	5.5/8	9.1/2	1	051046 [1)]	—	—
47/64			0.7344	5.7/8	9.3/4	1	051047 [1)]	—	—
3/4			0.7500	5.7/8	9.3/4	1	051048 [1)]	—	—
49/64			0.7656	6“	9.7/8	1	051049 [1)]	—	—
25/32			0.7813	6“	9.7/8	1	051050 [1)]	—	—
51/64			0.7969	6.1/8	10“	1	051051 [1)]	—	—
13/16			0.8125	6.1/8	10“	1	051052 [1)]	—	—
53/64			0.8281	6.1/8	10“	1	051053 [1)]	—	—
27/32			0.8438	6.1/8	10“	1	051054 [1)]	—	—
55/64			0.8594	6.1/8	10“	1	051055 [1)]	—	—
7/8			0.8750	6.1/8	10“	1	051056 [1)]	—	—
57/64			0.8906	6.1/8	10“	1	051057 [1)]	—	—

[1)] *steam oxide*

TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51	R52	R55
29/32			0.9063	6.1/8	10“	1	051058 [1)]	—	—
59/64			0.9219	6.1/8	10.3/4	1	051059 [1)]	—	—
15/16			0.9375	6.1/8	10.3/4	1	051060 [1)]	—	—
61/64			0.9531	6.3/8	11“	1	051061 [1)]	—	—
31/32			0.9688	6.3/8	11“	1	051062 [1)]	—	—
63/64			0.9844	6.3/8	11“	1	051063 [1)]	—	—
1“			1.0000	6.3/8	11“	1	051100 [1)]	—	—
1.1/64			1.0156	6.1/2	11.1/8	1	051101 [1)]	—	—
1.1/32			1.0312	6.1/2	11.1/8	1	051102 [1)]	—	—
1.3/64			1.0469	6.5/8	11.1/4	1	051103 [1)]	—	—
1.1/16			1.0625	6.5/8	11.1/4	1	051104 [1)]	—	—
1.5/64			1.0781	6.7/8	11.1/2	1	051105 [1)]	—	—
1.3/32			1.0937	6.7/8	11.1/2	1	051106 [1)]	—	—
1.7/64			1.1094	7.1/8	11.3/4	1	051107 [1)]	—	—
1.1/8			1.1250	7.1/8	11.3/4	1	051108 [1)]	—	—
1.9/64			1.1406	7.1/4	11.7/8	1	051109 [1)]	—	—
1.5/32			1.1563	7.1/4	11.7/8	1	051110 [1)]	—	—
1.11/64			1.1719	7.3/8	12“	1	051111 [1)]	—	—
1.3/16			1.1875	7.3/8	12“	1	051112 [1)]	—	—
1.13/64			1.2031	7.1/2	12.1/8	1	051113 [1)]	—	—
1.7/32			1.2187	7.1/2	12.1/8	1	051114 [1)]	—	—
1.15/64			1.2344	7.7/8	12.1/2	1	051115 [1)]	—	—
1.1/4			1.2500	7.7/8	12.1/2	1	051116 [1)]	—	—
1.5/16			1.3125	8.5/8	14.1/4	1	051120 [1)]	—	—
1.3/8			1.3750	8.7/8	14.1/2	1	051124 [1)]	—	—
1.7/16			1.4375	9.1/8	14.3/4	1	051128 [1)]	—	—
1.1/2			1.5000	9.3/8	15“	1	051132 [1)]	—	—
1.9/16			1.5625	9.5/8	15.1/4	1	051136 [1)]	—	—
1.5/8			1.6250	9.7/8	15.5/8	1	051140 [1)]	—	—
1.3/4			1.7500	10.1/2	16.1/4	1	051148 [1)]	—	—

[1)] *steam oxide*

TAPER LENGTH DRILL

General Purpose Taper Length, Metric

5ATL Bright Finish improves chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.

∗ *18mm and larger are steam oxide*



5ATL

DIN 340

6XD

HSS

118°



1.00 - 31.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	5ATL
1.00	0.0394	33	56	12	056100
1.20	0.0472	41	65	12	056120
1.25	0.0492	41	65	12	056125
1.30	0.0512	41	65	12	056130
1.40	0.0551	45	70	12	056140
1.50	0.0591	45	70	12	056150
1.60	0.0630	50	76	12	056160
1.70	0.0669	50	76	12	056170
1.80	0.0709	53	80	12	056180
1.90	0.0748	53	80	12	056190
2.00	0.0787	56	85	12	056200
2.10	0.0827	56	85	12	056210
2.15	0.0846	59	90	12	056215
2.20	0.0866	59	90	12	056220
2.30	0.0906	59	90	12	056230
2.40	0.0945	62	95	12	056240
2.50	0.0984	62	95	12	056250
3.00	0.1181	66	100	12	056300
3.10	0.1220	69	106	12	056310
3.20	0.1260	69	106	12	056320
3.30	0.1299	69	106	12	056330
3.40	0.1339	73	112	12	056340
3.50	0.1378	73	112	12	056350
3.60	0.1417	73	112	12	056360
3.70	0.1457	73	112	12	056370
3.80	0.1496	78	119	12	056380
4.00	0.1575	78	119	12	056400
4.20	0.1654	78	119	12	056420
4.30	0.1693	82	126	12	056430
4.50	0.1772	82	126	12	056450
4.60	0.1811	82	126	12	056460
4.80	0.1890	87	132	12	056480

TAPER LENGTH DRILL

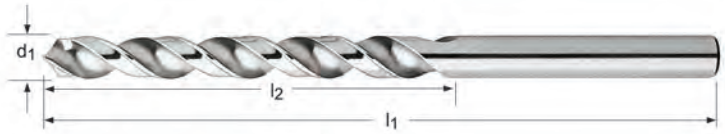
d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	5ATL
5.00	0.1969	87	132	12	056500
5.50	0.2165	91	139	12	056550
5.60	0.2205	91	139	12	056560
5.70	0.2244	91	139	12	056570
6.00	0.2362	91	139	12	056600
6.40	0.2520	97	148	6	056640
6.50	0.2559	97	148	6	056650
6.80	0.2677	102	156	6	056680
7.00	0.2756	102	156	6	056770
7.20	0.2835	102	156	6	056720
7.50	0.2953	102	156	6	056750
7.80	0.3071	109	165	6	056780
8.00	0.3150	109	165	6	056800
8.20	0.3228	109	165	6	056820
8.50	0.3346	109	165	6	056850
9.00	0.3543	115	175	6	056900
9.20	0.3622	115	175	6	056920
9.50	0.3740	115	175	6	056950
9.80	0.3858	121	184	6	056980
10.00	0.3937	121	184	6	057100
10.20	0.4016	121	184	6	057102
10.50	0.4134	121	184	6	057105
11.00	0.4331	128	195	6	057110
11.20	0.4409	128	195	6	057112
11.50	0.4528	128	195	6	057115
12.00	0.4724	134	205	6	057120
12.50	0.4921	134	205	6	057125
13.00	0.5118	134	205	1	057130
13.50	0.5315	140	214	1	057135
13.80	0.5433	140	214	1	057138
14.00	0.5512	140	214	1	057140
14.50	0.5709	144	220	1	057145
15.00	0.5906	144	220	1	057150
15.50	0.6102	149	227	1	057155
16.00	0.6299	149	227	1	057160
16.50	0.6496	154	235	1	057165
17.00	0.6693	154	235	1	057170
17.50	0.6890	158	241	1	057175
18.00	0.7087	158	241	1	057180 [1)]
18.50	0.7283	162	247	1	057185 [1)]
19.00	0.7480	162	247	1	057190 [1)]
19.50	0.7677	166	254	1	057195 [1)]
20.00	0.7874	166	254	1	057200 [1)]
20.50	0.8071	171	261	1	057205 [1)]
21.00	0.8268	171	261	1	057210 [1)]
21.50	0.8465	176	268	1	057215 [1)]
22.00	0.8661	176	268	1	057220 [1)]
22.50	0.8858	180	275	1	057225 [1)]
23.00	0.9055	180	275	1	057230 [1)]
23.50	0.9252	180	275	1	057235 [1)]
24.00	0.9449	185	282	1	057240 [1)]
24.50	0.9646	185	282	1	057245 [1)]
25.00	0.9843	185	282	1	057250 [1)]
25.50	1.0039	190	290	1	057255 [1)]
26.00	1.0236	190	290	1	057260 [1)]
26.50	1.0433	190	290	1	057265 [1)]
27.00	1.0630	195	298	1	057270 [1)]
28.00	1.1024	195	298	1	057280 [1)]
28.50	1.1220	201	307	1	057285 [1)]
29.00	1.1417	201	307	1	057290 [1)]
29.50	1.1614	201	307	1	057295 [1)]
30.00	1.1811	201	307	1	057300 [1)]
30.50	1.2008	207	316	1	057305 [1)]
31.00	1.2205	207	316	1	057310 [1)]

[1)] *steam oxide*

TAPER LENGTH DRILL

High Helix Taper Length

R51FS High Helix and Bright Finish for better chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.



R51FS

ANSI

6XD

HSS

118°



1/16 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	R51FS
1/16	0.0625	1.3/4	3“	12	051504
5/64	0.0781	2“	3.3/4	12	051505
3/32	0.0938	2.1/4	4.1/4	12	051506
7/64	0.1094	2.1/2	4.5/8	12	051507
1/8	0.1250	2.3/4	5.1/8	12	051508
9/64	0.1406	3“	5.3/8	12	051509
5/32	0.1563	3“	5.3/8	12	051510
11/64	0.1719	3.3/8	5.3/4	12	051511
3/16	0.1875	3.3/8	5.3/4	12	051512
13/64	0.2031	3.5/8	6“	12	051513
7/32	0.2188	3.5/8	6“	12	051514
15/64	0.2344	3.3/4	6.1/8	12	051515
1/4	0.2500	3.3/4	6.1/8	12	051516
17/64	0.2656	3.7/8	6.1/4	6	051517
9/32	0.2813	3.7/8	6.1/4	6	051518
19/64	0.2969	4“	6.3/8	6	051519
5/16	0.3125	4“	6.3/8	6	051520
21/64	0.3281	4.1/8	6.1/2	6	051521
11/32	0.3437	4.1/8	6.1/2	6	051522
23/64	0.3594	4.1/4	6.3/4	6	051523
3/8	0.3750	4.1/4	6.3/4	6	051524
25/64	0.3906	4.3/8	7“	6	051525
13/32	0.4063	4.3/8	7“	6	051526
27/64	0.4219	4.5/8	7.1/4	6	051527
7/16	0.4375	4.5/8	7.1/4	6	051528
29/64	0.4531	4.3/4	7.1/2	6	051529
15/32	0.4687	4.3/4	7.1/2	6	051530
31/64	0.4844	4.3/4	7.3/4	6	051531
1/2	0.5000	4.3/4	7.3/4	6	051532

TAPER LENGTH DRILL

General Purpose Taper Length Parabolic Flute

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC91P Bright Finish improves chip flow in soft or non-ferrous materials.

QC91G TiN Coating increases wear resistance and improves tool life.



	QC91P	QC91G
	ANSI	ANSI
	6XD	6XD
	HSS	HSS
	135°	135°
		
	1/16 - 11/16	1/16 - 1/2

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC91P	QC91G
1/16	0.0625	1.3/4	3“	12	057904	055904
52	0.0635	2“	3.3/4	12	059452	050952
51	0.0670	2“	3.3/4	12	059451	050951
50	0.0700	2“	3.3/4	12	059450	050950
49	0.0730	2“	3.3/4	12	059449	050949
48	0.0760	2“	3.3/4	12	059448	—
5/64	0.0781	2“	3.3/4	12	057905	055905
47	0.0785	2.1/4	4.1/4	12	059447	050947
46	0.0810	2.1/4	4.1/4	12	059446	050946
45	0.0820	2.1/4	4.1/4	12	059445	050945
44	0.0860	2.1/4	4.1/4	12	059444	050944
43	0.0890	2.1/4	4.1/4	12	059443	050943
42	0.0935	2.1/4	4.1/4	12	059442	050942
3/32	0.0938	2.1/4	4.1/4	12	057906	055906
41	0.0960	2.1/2	4.5/8	12	059441	050941
40	0.0980	2.1/2	4.5/8	12	059440	050940
39	0.0995	2.1/2	4.5/8	12	059439	050939
38	0.1015	2.1/2	4.5/8	12	059438	050938
37	0.1040	2.1/2	4.5/8	12	059437	050937
36	0.1065	2.1/2	4.5/8	12	059436	050936
7/64	0.1094	2.1/2	4.5/8	12	057907	055907
35	0.1100	2.3/4	5.1/8	12	059435	050935
34	0.1110	2.3/4	5.1/8	12	059434	050934
33	0.1130	2.3/4	5.1/8	12	059433	—
32	0.1160	2.3/4	5.1/8	12	059432	050932
31	0.1200	2.3/4	5.1/8	12	059431	050931
1/8	0.1250	2.3/4	5.1/8	12	057908	055908
30	0.1285	3“	5.3/8	12	059430	050930
29	0.1360	3“	5.3/8	12	059429	050929
28	0.1405	3“	5.3/8	12	059428	050928
9/64	0.1406	3“	5.3/8	12	057909	055909
27	0.1440	3“	5.3/8	12	059427	—
26	0.1470	3“	5.3/8	12	059426	050926

TAPER LENGTH DRILL

d_1 Ø "/Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC91P	QC91G
25	0.1495	3“	5.3/8	12	059425	050925
24	0.1520	3“	5.3/8	12	059424	050924
23	0.1540	3“	5.3/8	12	059423	—
5/32	0.1563	3“	5.3/8	12	057910	055910
22	0.1570	3.3/8	5.3/4	12	059422	—
21	0.1590	3.3/8	5.3/4	12	059421	050921
20	0.1610	3.3/8	5.3/4	12	059420	050920
19	0.1660	3.3/8	5.3/4	12	059419	050919
18	0.1695	3.3/8	5.3/4	12	059418	050918
11/64	0.1719	3.3/8	5.3/4	12	057911	055911
17	0.1730	3.3/8	5.3/4	12	059417	050917
16	0.1770	3.3/8	5.3/4	12	059416	050916
15	0.1800	3.3/8	5.3/4	12	059415	050915
14	0.1820	3.3/8	5.3/4	12	059414	050914
13	0.1850	3.3/8	5.3/4	12	059413	050913
3/16	0.1875	3.3/8	5.3/4	12	057912	055912
12	0.1890	3.5/8	6“	12	059412	—
11	0.1910	3.5/8	6“	12	059411	050911
10	0.1935	3.5/8	6“	12	059410	—
9	0.1960	3.5/8	6“	12	059409	050909
8	0.1990	3.5/8	6“	12	059408	050908
7	0.2010	3.5/8	6“	12	059407	050907
13/64	0.2031	3.5/8	6“	12	057913	055913
6	0.2040	3.5/8	6“	12	059406	050906
5	0.2055	3.5/8	6“	12	059405	050905
4	0.2090	3.5/8	6“	12	059404	050904
3	0.2130	3.5/8	6“	12	059403	050903
7/32	0.2188	3.5/8	6“	12	057914	055914
2	0.2210	3.3/4	6.1/8	12	059402	050902
1	0.2280	3.3/4	6.1/8	12	059401	—
15/64	0.2344	3.3/4	6.1/8	12	057915	055915
1/4	0.2500	3.3/4	6.1/8	12	057916	055916
17/64	0.2656	3.7/8	6.1/4	6	057917	055917
9/32	0.2813	3.7/8	6.1/4	6	057918	055918
19/64	0.2969	4“	6.3/8	6	057919	055919
5/16	0.3125	4“	6.3/8	6	057920	055920
21/64	0.3281	4.1/8	6.1/2	6	057921	055921
11/32	0.3437	4.1/8	6.1/2	6	057922	055922
23/64	0.3594	4.1/4	6.3/4	6	057923	—
3/8	0.3750	4.1/4	6.3/4	6	057924	055924
25/64	0.3906	4.3/8	7“	6	057925	055925
13/32	0.4063	4.3/8	7“	6	057926	055926
27/64	0.4219	4.5/8	7.1/4	6	057927	055927
7/16	0.4375	4.5/8	7.1/4	6	057928	055928
29/64	0.4531	4.3/4	7.1/2	6	057929	055929
15/32	0.4687	4.3/4	7.1/2	6	057930	—
31/64	0.4844	4.3/4	7.3/4	6	057931	—
1/2	0.5000	4.3/4	7.3/4	6	057932	055932
33/64	0.5156	4.3/4	8“	1	057933	—
17/32	0.5313	4.3/4	8“	1	057934	—
35/64	0.5469	4.7/8	8.1/4	1	057935	—
9/16	0.5625	4.7/8	8.1/4	1	057936	—
37/64	0.5781	4.7/8	8.3/4	1	057937	—
19/32	0.5937	4.7/8	8.3/4	1	057938	—
5/8	0.6250	4.7/8	8.3/4	1	057940	—
21/32	0.6563	5.1/8	9“	1	057942	—
11/16	0.6875	5.3/8	9.1/4	1	057944	—

TAPER LENGTH DRILL

General Purpose Taper Length Parabolic Flute, Metric

Heavy-Duty Parabolic Flute design for efficient chip evacuation. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration.

QC91PM Bright Finish improves chip flow in soft or non-ferrous materials.

QC91GM TiN Coating increases wear resistance and improves tool life.



QC91PM	QC91GM
DIN 340	DIN 340
6XD	6XD
HSS	HSS
135°	135°
	
1.50 - 17.00	1.50 - 12.50

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	QC91PM	QC91GM
1.50	0.0591	45	70	12	050015	050215
2.00	0.0787	56	85	12	050020	050220
2.50	0.0984	62	95	12	050025	050225
3.00	0.1181	66	100	12	050030	050230
3.50	0.1378	73	112	12	050035	050235
4.00	0.1575	78	119	12	050040	050240
4.50	0.1772	82	126	12	050045	050245
5.00	0.1969	87	132	12	050050	050250
5.20	0.2047	87	132	12	050052	050252
5.50	0.2165	91	139	12	050055	050255
6.00	0.2362	91	139	12	050060	050260
6.50	0.2559	97	148	6	050065	050265
6.80	0.2677	102	156	6	050068	—
7.00	0.2756	102	156	6	050070	050270
8.00	0.3150	109	165	6	050080	050280
8.20	0.3228	109	165	6	050082	—
8.50	0.3346	109	165	6	050085	050285
8.60	0.3386	115	175	6	050086	050286
9.00	0.3543	115	175	6	050090	050290
9.50	0.3740	115	175	6	050095	—
10.00	0.3937	121	184	6	050100	050300
10.50	0.4134	121	184	6	050105	050305
11.00	0.4331	128	195	6	050110	—
12.00	0.4724	134	205	6	050120	050320
12.50	0.4921	134	205	6	050125	050325
13.00	0.5118	134	205	1	050130	—
13.50	0.5315	140	214	1	050135	—
14.00	0.5512	140	214	1	050140	—
15.00	0.5906	144	220	1	050150	—
15.50	0.6102	149	227	1	050155	—
16.00	0.6299	149	227	1	050160	—
17.00	0.6693	154	235	1	050170	—

COBALT TAPER LENGTH DRILL

Heavy Duty Taper Length

M51CO - *Fractional Sizes*

M52CO - *Wire Gauge Sizes*

Low thrust design Heavy Duty self centering Split Point for easier penetration.
Cobalt base material with Bronze Oxide for wear resistance and lubricity.



M51CO	M52CO
ANSI	ANSI
6XD	6XD
HSS-E	HSS-E
135°	135°
	
1/16 - 1"	N40 - N1

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M51CO	M52CO
1/16		0.0625	1.3/4	3“	12	051304	—
5/64		0.0781	2“	3.3/4	12	051305	—
3/32		0.0938	2.1/4	4.1/4	12	051306	—
	40	0.0980	2.1/2	4.5/8	12	—	052340
	39	0.0995	2.1/2	4.5/8	12	—	052339
	36	0.1065	2.1/2	4.5/8	12	—	052336
7/64		0.1094	2.1/2	4.5/8	12	051307	—
	35	0.1100	2.3/4	5.1/8	12	—	052335
	34	0.1110	2.3/4	5.1/8	12	—	052334
	33	0.1130	2.3/4	5.1/8	12	—	052333
	32	0.1160	2.3/4	5.1/8	12	—	052332
	31	0.1200	2.3/4	5.1/8	12	—	052331
1/8		0.1250	2.3/4	5.1/8	12	051308	—
	30	0.1285	3“	5.3/8	12	—	052330
	29	0.1360	3“	5.3/8	12	—	052329
	28	0.1405	3“	5.3/8	12	—	052328
9/64		0.1406	3“	5.3/8	12	051309	—
	27	0.1440	3“	5.3/8	12	—	052327
	26	0.1470	3“	5.3/8	12	—	052326
	25	0.1495	3“	5.3/8	12	—	052325
	24	0.1520	3“	5.3/8	12	—	052324
5/32		0.1563	3“	5.3/8	12	051310	—
	22	0.1570	3.3/8	5.3/4	12	—	052322
	21	0.1590	3.3/8	5.3/4	12	—	052321
	20	0.1610	3.3/8	5.3/4	12	—	052320
	19	0.1660	3.3/8	5.3/4	12	—	052319
	18	0.1695	3.3/8	5.3/4	12	—	052318
11/64		0.1719	3.3/8	5.3/4	12	051311	—
	17	0.1730	3.3/8	5.3/4	12	—	052317
	16	0.1770	3.3/8	5.3/4	12	—	052316
	15	0.1800	3.3/8	5.3/4	12	—	052315
	14	0.1820	3.3/8	5.3/4	12	—	052314

COBALT TAPER LENGTH DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	M51CO	M52CO
	13	0.1850	3.3/8	5.3/4	12	—	052313
3/16		0.1875	3.3/8	5.3/4	12	051312	—
	12	0.1890	3.5/8	6“	12	—	052312
	11	0.1910	3.5/8	6“	12	—	052311
	10	0.1935	3.5/8	6“	12	—	052310
	9	0.1960	3.5/8	6“	12	—	052309
	8	0.1990	3.5/8	6“	12	—	052308
	7	0.2010	3.5/8	6“	12	—	052307
13/64		0.2031	3.5/8	6“	12	051313	—
	5	0.2055	3.5/8	6“	12	—	052305
	4	0.2090	3.5/8	6“	12	—	052304
	3	0.2130	3.5/8	6“	12	—	052303
7/32		0.2188	3.5/8	6“	12	051314	—
	2	0.2210	3.3/4	6.1/8	12	—	052302
	1	0.2280	3.3/4	6.1/8	12	—	052301
15/64		0.2344	3.3/4	6.1/8	12	051315	—
1/4		0.2500	3.3/4	6.1/8	12	051316	—
17/64		0.2656	3.7/8	6.1/4	6	051317	—
9/32		0.2813	3.7/8	6.1/4	6	051318	—
19/64		0.2969	4“	6.3/8	6	051319	—
5/16		0.3125	4“	6.3/8	6	051320	—
21/64		0.3281	4.1/8	6.1/2	6	051321	—
11/32		0.3437	4.1/8	6.1/2	6	051322	—
23/64		0.3594	4.1/4	6.3/4	6	051323	—
3/8		0.3750	4.1/4	6.3/4	6	051324	—
25/64		0.3906	4.3/8	7“	6	051325	—
13/32		0.4063	4.3/8	7“	6	051326	—
27/64		0.4219	4.5/8	7.1/4	6	051327	—
7/16		0.4375	4.5/8	7.1/4	6	051328	—
29/64		0.4531	4.3/4	7.1/2	6	051329	—
15/32		0.4687	4.3/4	7.1/2	6	051330	—
31/64		0.4844	4.3/4	7.3/4	6	051331	—
1/2		0.5000	4.3/4	7.3/4	6	051332	—
33/64		0.5156	4.3/4	8“	1	051333 [1)]	—
17/32		0.5313	4.3/4	8“	1	051334 [1)]	—
35/64		0.5469	4.7/8	8.1/4	1	051335 [1)]	—
9/16		0.5625	4.7/8	8.1/4	1	051336 [1)]	—
37/64		0.5781	4.7/8	8.3/4	1	051337 [1)]	—
19/32		0.5937	4.7/8	8.3/4	1	051338 [1)]	—
39/64		0.6094	4.7/8	8.3/4	1	051339 [1)]	—
5/8		0.6250	4.7/8	8.3/4	1	051340 [1)]	—
41/64		0.6406	5.1/8	9“	1	051341 [1)]	—
21/32		0.6563	5.1/8	9“	1	051342 [1)]	—
43/64		0.6719	5.3/8	9.1/4	1	051343 [1)]	—
11/16		0.6875	5.3/8	9.1/4	1	051344 [1)]	—
45/64		0.7031	5.5/8	9.1/2	1	051345 [1)]	—
23/32		0.7188	5.5/8	9.1/2	1	051346 [1)]	—
47/64		0.7344	5.7/8	9.3/4	1	051347 [1)]	—
3/4		0.7500	5.7/8	9.3/4	1	051348 [1)]	—
49/64		0.7656	6“	9.7/8	1	051349 [1)]	—
25/32		0.7813	6“	9.7/8	1	051350 [1)]	—
51/64		0.7969	6.1/8	10“	1	051351 [1)]	—
13/16		0.8125	6.1/8	10“	1	051352 [1)]	—
53/64		0.8281	6.1/8	10“	1	051353 [1)]	—
27/32		0.8438	6.1/8	10“	1	051354 [1)]	—
55/64		0.8594	6.1/8	10“	1	051355 [1)]	—
7/8		0.8750	6.1/8	10“	1	051356 [1)]	—
57/64		0.8906	6.1/8	10“	1	051357 [1)]	—
29/32		0.9063	6.1/8	10“	1	051358 [1)]	—
59/64		0.9219	6.1/8	10.3/4	1	051359 [1)]	—
15/16		0.9375	6.1/8	10.3/4	1	051360 [1)]	—
61/64		0.9531	6.3/8	11“	1	051361 [1)]	—
31/32		0.9688	6.3/8	11“	1	051362 [1)]	—
63/64		0.9844	6.3/8	11“	1	051363 [1)]	—
1“		1.0000	6.3/8	11“	1	051364 [1)]	—

[1)] Notched Point

EXTRA LENGTH DRILL

General Purpose Extra Length

0860 8“ Overall length

1290 12“ Overall length

Bright Finish improves chip flow in soft or non-ferrous materials



0860	1290
ANSI	ANSI
12XD	12XD
HSS	HSS
118°	118°
	
1/8 - 1/2	1/8 - 3/4

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	0860	1290
1/8	0.1250	6“	8“	1	057408	—
1/8	0.1250	9“	12“	1	—	059608
9/64	0.1406	9“	12“	1	—	059609
5/32	0.1563	6“	8“	1	057410	—
5/32	0.1563	9“	12“	1	—	059610
11/64	0.1719	9“	12“	1	—	059611
3/16	0.1875	6“	8“	1	057412	—
3/16	0.1875	9“	12“	1	—	059612
13/64	0.2031	9“	12“	1	—	059613
7/32	0.2188	6“	8“	1	057414	—
7/32	0.2188	9“	12“	1	—	059614
15/64	0.2344	9“	12“	1	—	059615
1/4	0.2500	6“	8“	1	057416	—
1/4	0.2500	9“	12“	1	—	059616
17/64	0.2656	9“	12“	1	—	059617
9/32	0.2813	6“	8“	1	057418	—
9/32	0.2813	9“	12“	1	—	059618
19/64	0.2969	9“	12“	1	—	059619
5/16	0.3125	6“	8“	1	057420	—
5/16	0.3125	9“	12“	1	—	059620
21/64	0.3281	9“	12“	1	—	059621
11/32	0.3437	6“	8“	1	057422	—
11/32	0.3437	9“	12“	1	—	059622
23/64	0.3594	9“	12“	1	—	059623
3/8	0.3750	6“	8“	1	057424	—
3/8	0.3750	9“	12“	1	—	059624
25/64	0.3906	9“	12“	1	—	059625
13/32	0.4063	6“	8“	1	057426	—
13/32	0.4063	9“	12“	1	—	059626
27/64	0.4219	9“	12“	1	—	059627
7/16	0.4375	6“	8“	1	057428	—
7/16	0.4375	9“	12“	1	—	059628

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	0860	1290
29/64	0.4531	9“	12“	1	—	059629
15/32	0.4687	6“	8“	1	057430	—
15/32	0.4687	9“	12“	1	—	059630
31/64	0.4844	9“	12“	1	—	059631
1/2	0.5000	6“	8“	1	057432	—
1/2	0.5000	9“	12“	1	—	059632
33/64	0.5156	9“	12“	1	—	059633 [1)]
17/32	0.5313	9“	12“	1	—	059634 [1)]
35/64	0.5469	9“	12“	1	—	059635 [1)]
9/16	0.5625	9“	12“	1	—	059636 [1)]
37/64	0.5781	9“	12“	1	—	059637 [1)]
19/32	0.5937	9“	12“	1	—	059638 [1)]
39/64	0.6094	9“	12“	1	—	059639 [1)]
5/8	0.6250	9“	12“	1	—	059640 [1)]
21/32	0.6563	9“	12“	1	—	059642 [1)]
11/16	0.6875	9“	12“	1	—	059644 [1)]
23/32	0.7188	9“	12“	1	—	059646 [1)]
3/4	0.7500	9“	12“	1	—	059648 [1)]

1) 33/64 and larger are steam oxide

EXTRA LENGTH DRILL

General Purpose Extra Length

1511 Bright Finish improves chip flow in soft or non-ferrous materials

1813

A125 Steam Oxide for increased wear resistance & lubricity.



1813 Series - 33/64 and larger are steam oxide
1511 Series - 17/32 and larger are steam oxide

1511	1813	A125
ANSI	ANSI	BS 328
15XD	15XD	10XD
HSS	HSS	HSS
118°	118°	118°
		
3/16 - 1“	1/4 - 1“	1.4mm - 1“

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh$_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
	0.0551	1.40			100	160	1	—	—	0019832
	0.0591	1.50			100	160	1	—	—	0019856
	0.0591	1.50			80	125	1	—	—	0019849
1/16	0.0625	1.59			100	160	1	—	—	0173664
1/16	0.0625	1.59			80	125	1	—	—	0173657
	0.0709	1.80			100	160	1	—	—	0019863
5/64	0.0781	1.98			100	160	1	—	—	0173688
5/64	0.0781	1.98			80	125	1	—	—	0173671
	0.0787	2.00			100	160	1	—	—	0020074
	0.0787	2.00			80	125	1	—	—	0020067
	0.0866	2.20			100	160	1	—	—	0020036
3/32	0.0938	2.38			100	160	1	—	—	0173701
3/32	0.0938	2.38			80	125	1	—	—	0173695
	0.0984	2.50			100	160	1	—	—	0020050
	0.0984	2.50			80	125	1	—	—	0020043
7/64	0.1094	2.78			100	160	1	—	—	0173725
7/64	0.1094	2.78			80	125	1	—	—	0173718
	0.1181	3.00			100	160	1	—	—	0020128
	0.1181	3.00			150	200	1	—	—	0020135
	0.1181	3.00			200	250	1	—	—	0020142
1/8	0.1250	3.18			100	160	1	—	—	0173732
1/8	0.1250	3.18			150	200	1	—	—	0173749
1/8	0.1250	3.18			200	250	1	—	—	0173756
1/8	0.1250	3.18			250	310	1	—	—	0173763
	0.1299	3.30			100	160	1	—	—	0020081
	0.1378	3.50			100	160	1	—	—	0020098
	0.1378	3.50			150	200	1	—	—	0020104
	0.1378	3.50			200	250	1	—	—	0020111
9/64	0.1406	3.57			100	160	1	—	—	0173770
9/64	0.1406	3.57			150	200	1	—	—	0173787
9/64	0.1406	3.57			250	310	1	—	—	0214398
5/32	0.1563	3.97			100	160	1	—	—	0173794

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh$_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
5/32	0.1563	3.97			150	200	1	—	—	0173800
5/32	0.1563	3.97			200	250	1	—	—	0173817
5/32	0.1563	3.97			250	310	1	—	—	0173824
	0.1575	4.00			100	160	1	—	—	0020197
	0.1575	4.00			150	200	1	—	—	0020203
	0.1575	4.00			200	250	1	—	—	0020210
	0.1575	4.00			250	310	1	—	—	0020227
11/64	0.1719	4.37			100	160	1	—	—	0173831
11/64	0.1719	4.37			150	200	1	—	—	0173848
11/64	0.1719	4.37			250	310	1	—	—	0214404
	0.1772	4.50			100	160	1	—	—	0020159
	0.1772	4.50			150	200	1	—	—	0020166
	0.1772	4.50			200	250	1	—	—	0020173
	0.1772	4.50			250	310	1	—	—	0020180
3/16	0.1875	4.76			100	160	1	—	—	0173855
3/16	0.1875	4.76			150	200	1	—	—	0173862
3/16	0.1875	4.76			200	250	1	—	—	0173879
3/16	0.1875	4.76			250	310	1	—	—	0173886
3/16	0.1875	4.76			300	400	1	—	—	0173893
3/16	0.1875		11“	15“			1	059512	—	—
	0.1969	5.00			100	160	1	—	—	0020265
	0.1969	5.00			150	200	1	—	—	0020272
	0.1969	5.00			200	250	1	—	—	0020289
	0.1969	5.00			250	310	1	—	—	0020296
	0.1969	5.00			300	400	1	—	—	0020302
13/64	0.2031	5.16			150	200	1	—	—	0173909
13/64	0.2031	5.16			200	250	1	—	—	0173916
13/64	0.2031	5.16			250	310	1	—	—	0173923
	0.2165	5.50			150	200	1	—	—	0020234
	0.2165	5.50			200	250	1	—	—	0020241
	0.2165	5.50			250	310	1	—	—	0020258
7/32	0.2188	5.56			150	200	1	—	—	0173930
7/32	0.2188	5.56			200	250	1	—	—	0173947
7/32	0.2188	5.56			250	310	1	—	—	0173954
15/64	0.2344	5.95			150	200	1	—	—	0173961
15/64	0.2344	5.95			200	250	1	—	—	0173978
15/64	0.2344	5.95			250	310	1	—	—	0214442
	0.2362	6.00			150	200	1	—	—	0020340
	0.2362	6.00			200	250	1	—	—	0020357
	0.2362	6.00			250	310	1	—	—	0020364
	0.2362	6.00			300	400	1	—	—	0020371
1/4	0.2500	6.35			150	200	1	—	—	0173985
1/4	0.2500	6.35			200	250	1	—	—	0173992
1/4	0.2500	6.35			250	310	1	—	—	0174005
1/4	0.2500	6.35			300	400	1	—	—	0174012
1/4	0.2500	6.35			400	460	1	—	—	0174029
1/4	0.2500		11“	15“			1	059516	—	—
1/4	0.2500		13“	18“			1	—	059716	—
	0.2559	6.50			150	200	1	—	—	0020319
	0.2559	6.50			200	250	1	—	—	0020326
	0.2559	6.50			250	310	1	—	—	0020333
17/64	0.2656	6.75			150	200	1	—	—	0174036
17/64	0.2656	6.75			200	250	1	—	—	0174043
17/64	0.2656	6.75			400	460	1	—	—	0214466
17/64	0.2656		13“	18“			1	—	059717	—
	0.2756	7.00			150	200	1	—	—	0020418
	0.2756	7.00			200	250	1	—	—	0020425
	0.2756	7.00			250	310	1	—	—	0020432
9/32	0.2813	7.14			150	200	1	—	—	0174050
9/32	0.2813	7.14			200	250	1	—	—	0174067
9/32	0.2813	7.14			250	310	1	—	—	0174074
9/32	0.2813	7.14			400	460	1	—	—	0214473
9/32	0.2813		13“	18“			1	—	059718	—
	0.2953	7.50			150	200	1	—	—	0020388
	0.2953	7.50			200	250	1	—	—	0020395
	0.2953	7.50			250	310	1	—	—	0020401

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh_8 mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
19/64	0.2969	7.54			250	310	1	—	—	0214480
19/64	0.2969	7.54			400	460	1	—	—	0214497
19/64	0.2969		13“	18“			1	—	059719	—
5/16	0.3125	7.94			150	200	1	—	—	0174081
5/16	0.3125	7.94			200	250	1	—	—	0174098
5/16	0.3125	7.94			250	310	1	—	—	0174104
5/16	0.3125	7.94			300	400	1	—	—	0174111
5/16	0.3125	7.94			400	460	1	—	—	0174128
5/16	0.3125		11“	15“			1	059520	—	—
5/16	0.3125		13“	18“			1	—	059720	—
	0.3150	8.00			200	250	1	—	—	0020463
	0.3150	8.00			250	310	1	—	—	0020470
	0.3150	8.00			300	400	1	—	—	0020487
21/64	0.3281	8.33			250	310	1	—	—	0174135
21/64	0.3281	8.33			400	460	1	—	—	0214503
21/64	0.3281		13“	18“			1	—	059721	—
	0.3346	8.50			200	250	1	—	—	0020449
	0.3346	8.50			250	310	1	—	—	0020456
11/32	0.3437	8.73			200	250	1	—	—	0174142
11/32	0.3437	8.73			250	310	1	—	—	0174159
11/32	0.3437	8.73			300	400	1	—	—	0174166
11/32	0.3437	8.73			400	460	1	—	—	0214510
11/32	0.3437		11“	15“			1	059522	—	—
11/32	0.3437		13“	18“			1	—	059722	—
	0.3543	9.00			200	250	1	—	—	0020517
	0.3543	9.00			250	310	1	—	—	0020524
	0.3543	9.00			300	400	1	—	—	0020531
23/64	0.3594	9.13			250	310	1	—	—	0174180
23/64	0.3594	9.13			400	460	1	—	—	0214527
23/64	0.3594		13“	18“			1	—	059723	—
	0.3740	9.50			200	250	1	—	—	0020494
	0.3740	9.50			250	310	1	—	—	0020500
3/8	0.3750	9.52			200	250	1	—	—	0174197
3/8	0.3750	9.52			250	310	1	—	—	0174203
3/8	0.3750	9.52			300	400	1	—	—	0174210
3/8	0.3750	9.52			400	460	1	—	—	0174227
3/8	0.3750		11“	15“			1	059524	—	—
3/8	0.3750		13“	18“			1	—	059724	—
25/64	0.3906	9.92			250	310	1	—	—	0214534
25/64	0.3906	9.92			400	460	1	—	—	0214541
25/64	0.3906		13“	18“			1	—	059725	—
	0.3937	10.00			200	250	1	—	—	0019900
	0.3937	10.00			250	310	1	—	—	0019917
	0.3937	10.00			300	400	1	—	—	0019924
13/32	0.4063	10.32			200	250	1	—	—	0174234
13/32	0.4063	10.32			250	310	1	—	—	0174241
13/32	0.4063	10.32			400	460	1	—	—	0214558
13/32	0.4063		13“	18“			1	—	059726	—
	0.4134	10.50			200	250	1	—	—	0019870
	0.4134	10.50			250	310	1	—	—	0019887
	0.4134	10.50			300	400	1	—	—	0019894
27/64	0.4219	10.72			250	310	1	—	—	0214565
27/64	0.4219		13“	18“			1	—	059727	—
	0.4331	11.00			200	250	1	—	—	0019931
	0.4331	11.00			250	310	1	—	—	0019948
	0.4331	11.00			300	400	1	—	—	0019955
7/16	0.4375	11.11			200	250	1	—	—	0174265
7/16	0.4375	11.11			250	310	1	—	—	0174272
7/16	0.4375	11.11			300	400	1	—	—	0174289
7/16	0.4375	11.11			400	460	1	—	—	0214589
7/16	0.4375		11“	15“			1	059528	—	—
7/16	0.4375		13“	18“			1	—	059728	—
29/64	0.4531	11.51			250	310	1	—	—	0214596
29/64	0.4531	11.51			400	460	1	—	—	0214602
29/64	0.4531		13“	18“			1	—	059729	—
15/32	0.4688	11.91			200	250	1	—	—	0174296

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh_8 mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
15/32	0.4687	11.91			250	310	1	—	—	0174302
15/32	0.4687	11.91			400	460	1	—	—	0214619
15/32	0.4687		13“	18“			1	—	059730	—
	0.4724	12.00			200	250	1	—	—	0019962
	0.4724	12.00			250	310	1	—	—	0019979
	0.4724	12.00			300	400	1	—	—	0019986
31/64	0.4844	12.30			250	310	1	—	—	0214626
31/64	0.4844	12.30			400	460	1	—	—	0214633
31/64	0.4844		13“	18“			1	—	059731	—
1/2	0.5000	12.70			200	250	1	—	—	0174319
1/2	0.5000	12.70			250	310	1	—	—	0174326
1/2	0.5000	12.70			300	400	1	—	—	0174333
1/2	0.5000	12.70			400	460	1	—	—	0174340
1/2	0.5000		11“	15“			1	059532	—	—
1/2	0.5000		13“	18“			1	—	059732	—
	0.5118	13.00			250	310	1	—	—	0019993
	0.5118	13.00			300	400	1	—	—	0020005
33/64	0.5156	13.10			250	310	1	—	—	0214640
33/64	0.5156	13.10			400	460	1	—	—	0214657
33/64	0.5156		13“	18“			1	—	059733	—
17/32	0.5313	13.49			250	310	1	—	—	0214664
17/32	0.5313	13.49			400	460	1	—	—	0214671
17/32	0.5313		11“	15“			1	059534	—	—
17/32	0.5313		13“	18“			1	—	059734	—
35/64	0.5469	13.89			250	310	1	—	—	0214688
35/64	0.5469	13.89			400	460	1	—	—	0214695
35/64	0.5469		13“	18“			1	—	059735	—
	0.5512	14.00			250	310	1	—	—	0020012
	0.5512	14.00			300	400	1	—	—	0020029
9/16	0.5625	14.29			250	310	1	—	—	0214701
9/16	0.5625	14.29			400	460	1	—	—	0214718
9/16	0.5625		11“	15“			1	059536	—	—
9/16	0.5625		13“	18“			1	—	059736	—
37/64	0.5781	14.68			250	310	1	—	—	0214725
37/64	0.5781		13“	18“			1	—	059737	—
19/32	0.5937	15.08			250	310	1	—	—	0214749
19/32	0.5937	15.08			400	460	1	—	—	0214756
19/32	0.5937		13“	18“			1	—	059738	—
39/64	0.6094	15.48			250	310	1	—	—	0214763
39/64	0.6094	15.48			400	460	1	—	—	0214770
39/64	0.6094		13“	18“			1	—	059739	—
5/8	0.6250	15.88			250	310	1	—	—	0214787
5/8	0.6250	15.88			400	460	1	—	—	0214794
5/8	0.6250		11“	15“			1	059540	—	—
5/8	0.6250		13“	18“			1	—	059740	—
21/32	0.6563	16.67			250	310	1	—	—	0214800
21/32	0.6563	16.67			400	460	1	—	—	0214817
21/32	0.6563		11“	15“			1	059542	—	—
21/32	0.6563		13“	18“			1	—	059742	—
11/16	0.6875	17.46			250	310	1	—	—	0214824
11/16	0.6875	17.46			400	460	1	—	—	0214831
11/16	0.6875		11“	15“			1	059544	—	—
11/16	0.6875		13“	18“			1	—	059744	—
23/32	0.7188	18.26			250	310	1	—	—	0214848
23/32	0.7188	18.26			400	460	1	—	—	0214855
23/32	0.7188		11“	15“			1	059546	—	—
23/32	0.7188		13“	18“			1	—	059746	—
3/4	0.7500	19.05			250	310	1	—	—	0214862
3/4	0.7500	19.05			400	460	1	—	—	0214879
3/4	0.7500		11“	15“			1	059548	—	—
3/4	0.7500		13“	18“			1	—	059748	—
25/32	0.7813	19.84			400	460	1	—	—	0214886
25/32	0.7813		11“	15“			1	059550	—	—
25/32	0.7813		13“	18“			1	—	059750	—
13/16	0.8125	20.64			400	460	1	—	—	0214893
13/16	0.8125		11“	15“			1	059552	—	—

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	d_1 Øh$_8$ mm	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	1511	1813	A125
13/16	0.8125		13“	18“			1	—	059752	—
7/8	0.8750	22.22			400	460	1	—	—	0214909
7/8	0.8750		11“	15“			1	059554	—	—
7/8	0.8750		13“	18“			1	—	059756	—
15/16	0.9375	23.81			400	460	1	—	—	0214916
15/16	0.9375		11“	15“			1	059556	—	—
15/16	0.9375		13“	18“			1	—	059760	—
1“	1.0000	25.40			400	460	1	—	—	0214923
1“	1.0000		11“	15“			1	059558	—	—
1“	1.0000		13“	18“			1	—	059764	—

EXTRA LENGTH DRILL

General Purpose Extra Length Parabolic Flute

QC0860P 8“ Overall length

QC1290P 12“ Overall length

Heavy-Duty Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Low thrust design self centering Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.



QC0860P	QC1290P
ANSI	ANSI
10XD	10XD
HSS	HSS
135°	135°
	
1/8 - 1/2	1/8 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC0860P	QC1290P
1/8	0.1250	6“	8“	1	055608	—
1/8	0.1250	9“	12“	1	—	060308
9/64	0.1406	6“	8“	1	055609	—
9/64	0.1406	9“	12“	1	—	060309
5/32	0.1563	6“	8“	1	055610	—
5/32	0.1563	9“	12“	1	—	060310
11/64	0.1719	6“	8“	1	055611	—
11/64	0.1719	9“	12“	1	—	060311
3/16	0.1875	6“	8“	1	055612	—
3/16	0.1875	9“	12“	1	—	060312
13/64	0.2031	6“	8“	1	055613	—
13/64	0.2031	9“	12“	1	—	060313
7/32	0.2188	6“	8“	1	055614	—
7/32	0.2188	9“	12“	1	—	060314
15/64	0.2344	6“	8“	1	055615	—
15/64	0.2344	9“	12“	1	—	060315
1/4	0.2500	6“	8“	1	055616	—
1/4	0.2500	9“	12“	1	—	060316
17/64	0.2656	6“	8“	1	055617	—
17/64	0.2656	9“	12“	1	—	060317
9/32	0.2813	6“	8“	1	055618	—
9/32	0.2813	9“	12“	1	—	060318
19/64	0.2969	6“	8“	1	055619	—
19/64	0.2969	9“	12“	1	—	060319
5/16	0.3125	6“	8“	1	055620	—
5/16	0.3125	9“	12“	1	—	060320
21/64	0.3281	6“	8“	1	055621	—
21/64	0.3281	9“	12“	1	—	060321
11/32	0.3437	6“	8“	1	055622	—
11/32	0.3437	9“	12“	1	—	060322
23/64	0.3594	6“	8“	1	055623	—
23/64	0.3594	9“	12“	1	—	060323
3/8	0.3750	6“	8“	1	055624	—

EXTRA LENGTH DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	QC0860P	QC1290P
3/8	0.3750	9“	12“	1	—	060324
25/64	0.3906	6“	8“	1	055625	—
25/64	0.3906	9“	12“	1	—	060325
13/32	0.4063	6“	8“	1	055626	—
13/32	0.4063	9“	12“	1	—	060326
27/64	0.4219	6“	8“	1	055627	—
27/64	0.4219	9“	12“	1	—	060327
7/16	0.4375	6“	8“	1	055628	—
7/16	0.4375	9“	12“	1	—	060328
29/64	0.4531	6“	8“	1	055629	—
15/32	0.4687	6“	8“	1	055630	—
15/32	0.4687	9“	12“	1	—	060330
31/64	0.4844	6“	8“	1	055631	—
1/2	0.5000	6“	8“	1	055632	—
1/2	0.5000	9“	12“	1	—	060332

Aircraft Extension (NAS 907)

A243 (NAS 907 Type B) Low thrust design self centering 135° Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.

A244 (NAS 907 Type A) Low thrust design self centering 118° Split Point for easier penetration. Bright Finish improves chip flow in soft or non-ferrous materials.



A243	A244
NAS 907	NAS 907
4XD	4XD
HSS	HSS
135°	118°
	
3/32 - 1/4	1/8 - 1/4

d_1 $\varnothing h_8$ Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	A243	A244
3/32	0.0938	1.1/4	6“	10	0240458	—
40	0.0980	1.3/8	6“	10	0241141	—
1/8	0.1250	1.5/8	6“	10	0240434	0375914
30	0.1285	1.5/8	6“	10	0241035	—
5/32	0.1563	2“	6“	10	0240465	0375938
21	0.1590	2.1/8	6“	10	0240939	—
20	0.1610	2.1/8	6“	10	0240922	—
3/16	0.1875	2.5/16	6“	10	0240441	0375921
11	0.1910	2.5/16	6“	10	0240823	—
10	0.1935	2.7/16	6“	10	0240816	—
1/4	0.2500	2.3/4	6“	10	0240410	0375907

AIRCRAFT EXTENSION DRILL

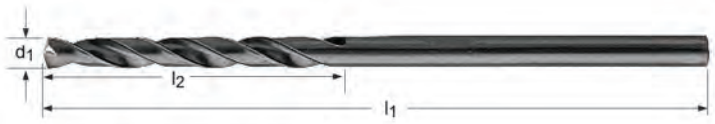
Aircraft Extension (NAS 907 Type B)

500-6 - *Fractional Sizes*

501-6 - *Wire Gauge Sizes*

502-6 - *Letter Sizes*

Low thrust design self centering 135° Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity. 6“ overall length.



500-6	501-6	502-6
NAS 907	NAS 907	NAS 907
4XD	4XD	4XD
HSS	HSS	HSS
135°	135°	135°
		
3/64 - 1/2	N60 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
	60		0.0400	11/16	6“	12	—	058160 [1]	—
	59		0.0410	11/16	6“	12	—	058159 [1]	—
	58		0.0420	11/16	6“	12	—	058158 [1]	—
	57		0.0430	3/4	6“	12	—	058157 [1]	—
	56		0.0465	3/4	6“	12	—	058156 [1]	—
3/64			0.0469	3/4	6“	12	058003	—	—
	55		0.0520	7/8	6“	12	—	058155 [1]	—
	54		0.0550	7/8	6“	12	—	058154 [1]	—
	53		0.0595	7/8	6“	12	—	058153 [1]	—
1/16			0.0625	7/8	6“	12	058004	—	—
	52		0.0635	7/8	6“	12	—	058152	—
	51		0.0670	1“	6“	12	—	058151	—
	50		0.0700	1“	6“	12	—	058150	—
	49		0.0730	1“	6“	12	—	058149	—
	48		0.0760	1“	6“	12	—	058148	—
5/64			0.0781	1“	6“	12	058005	—	—
	47		0.0785	1“	6“	12	—	058147	—
	46		0.0810	1.1/8	6“	12	—	058146	—
	45		0.0820	1.1/8	6“	12	—	058145	—
	44		0.0860	1.1/8	6“	12	—	058144	—
	43		0.0890	1.1/4	6“	12	—	058143	—
	42		0.0935	1.1/4	6“	12	—	058142	—
3/32			0.0938	1.1/4	6“	12	058006	—	—
	41		0.0960	1.3/8	6“	12	—	058141	—
	40		0.0980	1.3/8	6“	12	—	058140	—
	39		0.0995	1.3/8	6“	12	—	058139	—
	38		0.1015	1.7/16	6“	12	—	058138	—
	37		0.1040	1.7/16	6“	12	—	058137	—
	36		0.1065	1.7/16	6“	12	—	058136	—
7/64			0.1094	1.1/2	6“	12	058007	—	—
	35		0.1100	1.1/2	6“	12	—	058135	—
	34		0.1110	1.1/2	6“	12	—	058134	—

[1] Not Split Point

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
	33		0.1130	1.1/2	6“	12	—	058133	—
	32		0.1160	1.5/8	6“	12	—	058132	—
	31		0.1200	1.5/8	6“	12	—	058131	—
1/8			0.1250	1.5/8	6“	12	058008	—	—
	30		0.1285	1.5/8	6“	12	—	058130	—
	29		0.1360	1.3/4	6“	12	—	058129	—
	28		0.1405	1.3/4	6“	12	—	058128	—
9/64			0.1406	1.3/4	6“	12	058009	—	—
	27		0.1440	1.7/8	6“	12	—	058127	—
	26		0.1470	1.7/8	6“	12	—	058126	—
	25		0.1495	1.7/8	6“	12	—	058125	—
	24		0.1520	2“	6“	12	—	058124	—
	23		0.1540	2“	6“	12	—	058123	—
5/32			0.1563	2“	6“	12	058010	—	—
	22		0.1570	2“	6“	12	—	058122	—
	21		0.1590	2.1/8	6“	12	—	058121	—
	20		0.1610	2.1/8	6“	12	—	058120	—
	19		0.1660	2.1/8	6“	12	—	058119	—
	18		0.1695	2.1/8	6“	12	—	058118	—
11/64			0.1719	2.1/8	6“	12	058011	—	—
	17		0.1730	2.3/16	6“	12	—	058117	—
	16		0.1770	2.3/16	6“	12	—	058116	—
	15		0.1800	2.3/16	6“	12	—	058115	—
	14		0.1820	2.3/16	6“	12	—	058114	—
	13		0.1850	2.5/16	6“	12	—	058113	—
3/16			0.1875	2.5/16	6“	12	058012	—	—
	12		0.1890	2.5/16	6“	12	—	058112	—
	11		0.1910	2.5/16	6“	12	—	058111	—
	10		0.1935	2.7/16	6“	12	—	058110	—
	9		0.1960	2.7/16	6“	12	—	058109	—
	8		0.1990	2.7/16	6“	12	—	058108	—
	7		0.2010	2.7/16	6“	12	—	058107	—
13/64			0.2031	2.7/16	6“	12	058013	—	—
	6		0.2040	2.1/2	6“	12	—	058106	—
	5		0.2055	2.1/2	6“	12	—	058105	—
	4		0.2090	2.1/2	6“	12	—	058104	—
	3		0.2130	2.1/2	6“	12	—	058103	—
7/32			0.2188	2.1/2	6“	12	058014	—	—
	2		0.2210	2.5/8	6“	12	—	058102	—
	1		0.2280	2.5/8	6“	12	—	058101	—
		A	0.2340	2.5/8	6“	12	—	—	058201
15/64			0.2344	2.5/8	6“	12	058015	—	—
		B	0.2380	2.3/4	6“	12	—	—	058202
		C	0.2420	2.3/4	6“	12	—	—	058203
		D	0.2460	2.3/4	6“	12	—	—	058204
		E	0.2500	2.3/4	6“	12	—	—	058205
1/4			0.2500	2.3/4	6“	12	058016	—	—
		F	0.2570	2.7/8	6“	12	—	—	058206
		G	0.2610	2.7/8	6“	6	—	—	058207
17/64			0.2656	2.7/8	6“	6	058017	—	—
		H	0.2660	2.7/8	6“	6	—	—	058208
		I	0.2720	2.7/8	6“	6	—	—	058209
		J	0.2770	2.7/8	6“	6	—	—	058210
		K	0.2810	2.15/16	6“	6	—	—	058211
9/32			0.2813	2.15/16	6“	6	058018	—	—
		L	0.2900	2.15/16	6“	6	—	—	058212
		M	0.2950	3.1/16	6“	6	—	—	058213
19/64			0.2969	3.1/16	6“	6	058019	—	—
		N	0.3020	3.1/16	6“	6	—	—	058214
5/16			0.3125	3.3/16	6“	6	058020	—	—
		O	0.3160	3.3/16	6“	6	—	—	058215
		P	0.3230	3.5/16	6“	6	—	—	058216
21/64			0.3281	3.5/16	6“	6	058021	—	—
		Q	0.3320	3.7/16	6“	6	—	—	058217
		R	0.3390	3.7/16	6“	6	—	—	058218
11/32			0.3437	3.7/16	6“	6	058022	—	—

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-6	501-6	502-6
		S	0.3480	3.1/2	6“	6	—	—	058219
		T	0.3580	3.1/2	6“	6	—	—	058220
23/64			0.3594	3.1/2	6“	6	058023	—	—
		U	0.3680	3.5/8	6“	6	—	—	058221
3/8			0.3750	3.5/8	6“	6	058024	—	—
		V	0.3770	3.5/8	6“	6	—	—	058222
		W	0.3860	3.3/4	6“	6	—	—	058223
25/64			0.3906	3.3/4	6“	6	058025	—	—
		X	0.3970	3.3/4	6“	6	—	—	058224
		Y	0.4040	3.7/8	6“	6	—	—	058225
13/32			0.4063	3.7/8	6“	6	058026	—	—
		Z	0.4130	3.7/8	6“	6	—	—	058226
27/64			0.4219	3.15/16	6“	6	058027	—	—
7/16			0.4375	4.1/16	6“	6	058028	—	—
29/64			0.4531	4.3/16	6“	6	058029	—	—
15/32			0.4687	4.5/16	6“	6	058030	—	—
31/64			0.4844	4.3/8	6“	6	058031	—	—
1/2			0.5000	4.1/2	6“	6	058032	—	—

AIRCRAFT EXTENSION DRILL

Aircraft Extension (NAS 907 Type B)

500-12 - *Fractional Sizes*

501-12 - *Wire Gauge Sizes*

502-12 - *Letter Sizes*

Low thrust design self centering 135° Split Point for easier penetration.
Steam Oxide for increased wear resistance & lubricity.
12“ Over All Length



500-12	501-12	502-12
NAS 907	NAS 907	NAS 907
4XD	4XD	4XD
HSS	HSS	HSS
135°	135°	135°
3/64 - 1/2	N50 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-12	501-12	502-12
3/64			0.0469	3/4	12“	12	059003 [1)]	—	—
1/16			0.0625	7/8	12“	12	059004	—	—
	50		0.0700	1“	12“	12	—	059150	—
	49		0.0730	1“	12“	12	—	059149	—
	48		0.0760	1“	12“	12	—	059148	—
5/64			0.0781	1“	12“	12	059005	—	—
	47		0.0785	1“	12“	12	—	059147	—
	46		0.0810	1.1/8	12“	12	—	059146	—
	45		0.0820	1.1/8	12“	12	—	059145	—
	44		0.0860	1.1/8	12“	12	—	059144	—
	43		0.0890	1.1/4	12“	12	—	059143	—
	42		0.0935	1.1/4	12“	12	—	059142	—
3/32			0.0938	1.1/4	12“	12	059006	—	—
	41		0.0960	1.3/8	12“	12	—	059141	—
	40		0.0980	1.3/8	12“	12	—	059140	—
	37		0.1040	1.7/16	12“	12	—	059137	—
	36		0.1065	1.7/16	12“	12	—	059136	—
7/64			0.1094	1.1/2	12“	12	059007	—	—
	31		0.1200	1.5/8	12“	12	—	059131	—
1/8			0.1250	1.5/8	12“	12	059008	—	—
	30		0.1285	1.5/8	12“	12	—	059130	—
	29		0.1360	1.3/4	12“	12	—	059129	—
9/64			0.1406	1.3/4	12“	12	059009	—	—
	27		0.1440	1.7/8	12“	12	—	059127	—
	26		0.1470	1.7/8	12“	12	—	059126	—
	25		0.1495	1.7/8	12“	12	—	059125	—
	23		0.1540	2“	12“	12	—	059123	—
5/32			0.1563	2“	12“	12	059010	—	—
	22		0.1570	2“	12“	12	—	059122	—
	21		0.1590	2.1/8	12“	12	—	059121	—
	20		0.1610	2.1/8	12“	12	—	059120	—
	19		0.1660	2.1/8	12“	12	—	059119	—

[1)] Not Split Point

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	500-12	501-12	502-12
	18		0.1695	2.1/8	12“	12	—	059118	—
11/64			0.1719	2.1/8	12“	12	059011	—	—
	17		0.1730	2.3/16	12“	12	—	059117	—
	16		0.1770	2.3/16	12“	12	—	059116	—
	13		0.1850	2.5/16	12“	12	—	059113	—
3/16			0.1875	2.5/16	12“	6	059012	—	—
	12		0.1890	2.5/16	12“	6	—	059112	—
	11		0.1910	2.5/16	12“	6	—	059111	—
	10		0.1935	2.7/16	12“	6	—	059110	—
	9		0.1960	2.7/16	12“	6	—	059109	—
	7		0.2010	2.7/16	12“	6	—	059107	—
13/64			0.2031	2.7/16	12“	6	059013	—	—
	5		0.2055	2.1/2	12“	6	—	059105	—
	4		0.2090	2.1/2	12“	6	—	059104	—
	3		0.2130	2.1/2	12“	6	—	059103	—
7/32			0.2188	2.1/2	12“	6	059014	—	—
	1		0.2280	2.5/8	12“	6	—	059101	—
		A	0.2340	2.5/8	12“	6	—	—	059201
15/64			0.2344	2.5/8	12“	6	059015	—	—
		B	0.2380	2.3/4	12“	6	—	—	059202
		C	0.2420	2.3/4	12“	6	—	—	059203
		D	0.2460	2.3/4	12“	6	—	—	059204
		E	0.2500	2.3/4	12“	6	—	—	059205
1/4			0.2500	2.3/4	12“	6	059016	—	—
		F	0.2570	2.7/8	12“	6	—	—	059206
		G	0.2610	2.7/8	12“	6	—	—	059207
17/64			0.2656	2.7/8	12“	6	059017	—	—
		H	0.2660	2.7/8	12“	6	—	—	059208
		I	0.2720	2.7/8	12“	6	—	—	059209
		J	0.2770	2.7/8	12“	6	—	—	059210
		K	0.2810	2.15/16	12“	6	—	—	059211
9/32			0.2813	2.15/16	12“	6	059018	—	—
		L	0.2900	2.15/16	12“	6	—	—	059212
		M	0.2950	3.1/16	12“	6	—	—	059213
19/64			0.2969	3.1/16	12“	6	059019	—	—
		N	0.3020	3.1/16	12“	6	—	—	059214
5/16			0.3125	3.3/16	12“	6	059020	—	—
		O	0.3160	3.3/16	12“	6	—	—	059215
		P	0.3230	3.5/16	12“	6	—	—	059216
21/64			0.3281	3.5/16	12“	6	059021	—	—
		Q	0.3320	3.7/16	12“	6	—	—	059217
		R	0.3390	3.7/16	12“	6	—	—	059218
11/32			0.3437	3.7/16	12“	6	059022	—	—
		S	0.3480	3.1/2	12“	3	—	—	059219
		T	0.3580	3.1/2	12“	3	—	—	059220
23/64			0.3594	3.1/2	12“	3	059023	—	—
		U	0.3680	3.5/8	12“	3	—	—	059221
3/8			0.3750	3.5/8	12“	3	059024	—	—
		V	0.3770	3.5/8	12“	3	—	—	059222
		W	0.3860	3.3/4	12“	3	—	—	059223
25/64			0.3906	3.3/4	12“	3	059025	—	—
		X	0.3970	3.3/4	12“	3	—	—	059224
		Y	0.4040	3.7/8	12“	3	—	—	059225
13/32			0.4063	3.7/8	12“	3	059026	—	—
		Z	0.4130	3.7/8	12“	3	—	—	059226
27/64			0.4219	3.15/16	12“	3	059027	—	—
7/16			0.4375	4.1/16	12“	3	059028	—	—
29/64			0.4531	4.3/16	12“	3	059029	—	—
15/32			0.4687	4.5/16	12“	3	059030	—	—
31/64			0.4844	4.3/8	12“	3	059031	—	—
1/2			0.5000	4.1/2	12“	3	059032	—	—

AIRCRAFT EXTENSION DRILL

Heavy Duty Cobalt Aircraft Extension (NAS 907 Type J)

CO500-6 - *Fractional Sizes, 6” Over All Length*

CO501-6 - *Wire Gauge Sizes, 6” Over All Length*

CO500-12 - *Fractional Sizes, 12” Over All Length*

CO501-12 - *Wire Gauge Sizes, 12” Over All Length*

Low thrust design self centering 135° Split Point for easier penetration. Low thrust design. Cobalt base material with Bronze Oxide for wear resistance and lubricity. For enhanced tool life in ferrous materials.





d_1 Ø Inch	d_1	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	CO500-6	CO501-6	CO500-12	CO501-12
1/16		0.0625	7/8	12“	12	—	—	052604	—
1/16		0.0625	7/8	6“	12	053604	—	—	—
	52	0.0635	7/8	6“	12	—	053752	—	—
	51	0.0670	1“	6“	12	—	053751	—	—
	50	0.0700	1“	6“	12	—	053750	—	—
	49	0.0730	1“	6“	12	—	053749	—	—
	48	0.0760	1“	6“	12	—	053748	—	—
5/64		0.0781	1“	12“	12	—	—	052605	—
5/64		0.0781	1“	6“	12	053605	—	—	—
	47	0.0785	1“	6“	12	—	053747	—	—
	46	0.0810	1.1/8	6“	12	—	053746	—	—
	45	0.0820	1.1/8	6“	12	—	053745	—	—
	44	0.0860	1.1/8	6“	12	—	053744	—	—
	43	0.0890	1.1/4	6“	12	—	053743	—	—
	42	0.0935	1.1/4	6“	12	—	053742	—	—
3/32		0.0938	1.1/4	12“	12	—	—	052606	—
3/32		0.0938	1.1/4	6“	12	053606	—	—	—
	41	0.0960	1.3/8	6“	12	—	053741	—	—
	40	0.0980	1.3/8	12“	12	—	—	—	052840
	40	0.0980	1.3/8	6“	12	—	053740	—	—
	39	0.0995	1.3/8	6“	12	—	053739	—	—
	38	0.1015	1.7/16	6“	12	—	053738	—	—
	37	0.1040	1.7/16	6“	12	—	053737	—	—
	36	0.1065	1.7/16	6“	12	—	053736	—	—
7/64		0.1094	1.1/2	12“	12	—	—	052607	—
7/64		0.1094	1.1/2	6“	12	053607	—	—	—
	35	0.1100	1.1/2	6“	12	—	053735	—	—
	34	0.1110	1.1/2	6“	12	—	053734	—	—
	32	0.1160	1.5/8	6“	12	—	053732	—	—
	31	0.1200	1.5/8	6“	12	—	053731	—	—
1/8		0.1250	1.5/8	12“	12	—	—	052608	—
1/8		0.1250	1.5/8	6“	12	053608	—	—	—
	30	0.1285	1.5/8	12“	12	—	—	—	052830

AIRCRAFT EXTENSION DRILL

d_1 Ø Inch	d_1	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	CO500-6	CO501-6	CO500-12	CO501-12
	30	0.1285	1.5/8	6“	12	—	053730	—	—
	29	0.1360	1.3/4	12“	12	—	—	—	052829
	29	0.1360	1.3/4	6“	12	—	053729	—	—
	28	0.1405	1.3/4	6“	12	—	053728	—	—
9/64		0.1406	1.3/4	12“	12	—	—	052609	—
9/64		0.1406	1.3/4	6“	12	053609	—	—	—
	27	0.1440	1.7/8	12“	12	—	—	—	052827
	27	0.1440	1.7/8	6“	12	—	053727	—	—
	26	0.1470	1.7/8	6“	12	—	053726	—	—
	25	0.1495	1.7/8	6“	12	—	053725	—	—
	24	0.1520	2“	6“	12	—	053724	—	—
	23	0.1540	2“	6“	12	—	053723	—	—
5/32		0.1563	2“	12“	12	—	—	052610	—
5/32		0.1563	2“	6“	12	053610	—	—	—
	22	0.1570	2“	6“	12	—	053722	—	—
	21	0.1590	2.1/8	12“	12	—	—	—	052821
	21	0.1590	2.1/8	6“	12	—	053721	—	—
	20	0.1610	2.1/8	12“	12	—	—	—	052820
	20	0.1610	2.1/8	6“	12	—	053720	—	—
	19	0.1660	2.1/8	12“	12	—	—	—	052819
	19	0.1660	2.1/8	6“	12	—	053719	—	—
	18	0.1695	2.1/8	6“	12	—	053718	—	—
11/64		0.1719	2.1/8	12“	12	—	—	052611	—
11/64		0.1719	2.1/8	6“	12	053611	—	—	—
	17	0.1730	2.3/16	6“	12	—	053717	—	—
	16	0.1770	2.3/16	12“	12	—	—	—	052816
	16	0.1770	2.3/16	6“	12	—	053716	—	—
	15	0.1800	2.3/16	6“	12	—	053715	—	—
	14	0.1820	2.3/16	6“	12	—	053714	—	—
	13	0.1850	2.5/16	6“	12	—	053713	—	—
3/16		0.1875	2.5/16	12“	6	—	—	052612	—
3/16		0.1875	2.5/16	6“	12	053612	—	—	—
	12	0.1890	2.5/16	6“	12	—	053712	—	—
	11	0.1910	2.5/16	12“	12	—	—	—	052811
	11	0.1910	2.5/16	6“	12	—	053711	—	—
	10	0.1935	2.7/16	12“	6	—	—	—	052810
	10	0.1935	2.7/16	6“	12	—	053710	—	—
	9	0.1960	2.7/16	6“	12	—	053709	—	—
	8	0.1990	2.7/16	6“	12	—	053708	—	—
	7	0.2010	2.7/16	6“	12	—	053707	—	—
13/64		0.2031	2.7/16	12“	6	—	—	052613	—
13/64		0.2031	2.7/16	6“	12	053613	—	—	—
	6	0.2040	2.1/2	6“	12	—	053706	—	—
	5	0.2055	2.1/2	6“	12	—	053705	—	—
	4	0.2090	2.1/2	6“	12	—	053704	—	—
	3	0.2130	2.1/2	6“	12	—	053703	—	—
7/32		0.2188	2.1/2	12“	6	—	—	052614	—
7/32		0.2188	2.1/2	6“	12	053614	—	—	—
	2	0.2210	2.5/8	12“	6	—	—	—	052802
	2	0.2210	2.5/8	6“	12	—	053702	—	—
	1	0.2280	2.5/8	6“	12	—	053701	—	—
15/64		0.2344	2.5/8	12“	6	—	—	052615	—
15/64		0.2344	2.5/8	6“	12	053615	—	—	—
1/4		0.2500	2.3/4	12“	6	—	—	052616	—
1/4		0.2500	2.3/4	6“	12	053616	—	—	—

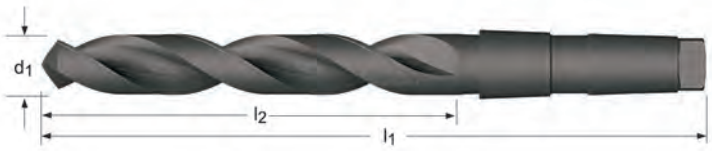
TAPER SHANK DRILL

General Purpose Taper Shank

209 Standard Taper Type

S209 Small Taper Type

Steam Oxide for increased tool life & lubricity.



209	S209
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
	
1/8 - 2“	1/2 - 2“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
1/8	0.1250	1.7/8	5.1/8	1	1	020008	—
9/64	0.1406	2.1/8	5.3/8	1	1	020009	—
5/32	0.1563	2.1/8	5.3/8	1	1	020010	—
11/64	0.1719	2.1/2	5.3/4	1	1	020011	—
3/16	0.1875	2.1/2	5.3/4	1	1	020012	—
13/64	0.2031	2.3/4	6“	1	1	020013	—
7/32	0.2188	2.3/4	6“	1	1	020014	—
15/64	0.2344	2.7/8	6.1/8	1	1	020015	—
1/4	0.2500	2.7/8	6.1/8	1	1	020016	—
17/64	0.2656	3“	6.1/4	1	1	020017	—
9/32	0.2813	3“	6.1/4	1	1	020018	—
19/64	0.2969	3.1/8	6.3/8	1	1	020019	—
5/16	0.3125	3.1/8	6.3/8	1	1	020020	—
21/64	0.3281	3.1/4	6.1/2	1	1	020021	—
11/32	0.3437	3.1/4	6.1/2	1	1	020022	—
23/64	0.3594	3.1/2	6.3/4	1	1	020023	—
3/8	0.3750	3.1/2	6.3/4	1	1	020024	—
25/64	0.3906	3.5/8	7“	1	1	020025	—
13/32	0.4063	3.5/8	7“	1	1	020026	—
27/64	0.4219	3.7/8	7.1/4	1	1	020027	—
7/16	0.4375	3.7/8	7.1/4	1	1	020028	—
29/64	0.4531	4.1/8	7.1/2	1	1	020029	—
15/32	0.4687	4.1/8	7.1/2	1	1	020030	—
31/64	0.4844	4.3/8	8.1/4	2	1	020031	—
1/2	0.5000	4.3/8	7.3/4	1	1	—	023032
1/2	0.5000	4.3/8	8.1/4	2	1	020032	—
33/64	0.5156	4.5/8	8“	1	1	—	023033
33/64	0.5156	4.5/8	8.1/2	2	1	020033	—
17/32	0.5313	4.5/8	8“	1	1	—	023034
17/32	0.5313	4.5/8	8.1/2	2	1	020034	—
35/64	0.5469	4.7/8	8.1/4	1	1	—	023035
35/64	0.5469	4.7/8	8.3/4	2	1	020035	—
9/16	0.5625	4.7/8	8.1/4	1	1	—	023036

TAPER SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
9/16	0.5625	4.7/8	8.3/4	2	1	020036	—
37/64	0.5781	4.7/8	8.3/4	2	1	020037	—
19/32	0.5937	4.7/8	8.3/4	2	1	020038	—
39/64	0.6094	4.7/8	8.3/4	2	1	020039	—
5/8	0.6250	4.7/8	8.3/4	2	1	020040	—
41/64	0.6406	5.1/8	9“	2	1	020041	—
21/32	0.6563	5.1/8	9“	2	1	020042	—
43/64	0.6719	5.3/8	9.1/4	2	1	020043	—
11/16	0.6875	5.3/8	9.1/4	2	1	020044	—
45/64	0.7031	5.5/8	9.1/2	2	1	020045	—
23/32	0.7188	5.5/8	9.1/2	2	1	020046	—
47/64	0.7344	5.7/8	9.3/4	2	1	020047	—
3/4	0.7500	5.7/8	9.3/4	2	1	020048	—
49/64	0.7656	6“	9.7/8	2	1	020049	—
25/32	0.7813	6“	9.7/8	2	1	020050	—
51/64	0.7969	6.1/8	10“	2	1	—	023051
51/64	0.7969	6.1/8	10.3/4	3	1	020051	—
13/16	0.8125	6.1/8	10“	2	1	—	023052
13/16	0.8125	6.1/8	10.3/4	3	1	020052	—
53/64	0.8281	6.1/8	10“	2	1	—	023053
53/64	0.8281	6.1/8	10.3/4	3	1	020053	—
27/32	0.8438	6.1/8	10“	2	1	—	023054
27/32	0.8438	6.1/8	10.3/4	3	1	020054	—
55/64	0.8594	6.1/8	10.3/4	3	1	020055	—
7/8	0.8750	6.1/8	10“	2	1	—	023056
7/8	0.8750	6.1/8	10.3/4	3	1	020056	—
57/64	0.8906	6.1/8	10.3/4	3	1	020057	—
29/32	0.9063	6.1/8	10“	2	1	—	023058
29/32	0.9063	6.1/8	10.3/4	3	1	020058	—
59/64	0.9219	6.1/8	10.3/4	3	1	020059	—
15/16	0.9375	6.1/8	10.3/4	3	1	020060	—
61/64	0.9531	6.3/8	11“	3	1	020061	—
31/32	0.9688	6.3/8	11“	3	1	020062	—
63/64	0.9844	6.3/8	11“	3	1	020063	—
1“	1.0000	6.3/8	11“	3	1	020100	—
1.1/64	1.0156	6.1/2	11.1/8	3	1	020101	—
1.1/32	1.0312	6.1/2	11.1/8	3	1	020102	—
1.3/64	1.0469	6.5/8	11.1/4	3	1	020103	—
1.1/16	1.0625	6.5/8	11.1/4	3	1	020104	—
1.5/64	1.0781	6.7/8	12.1/2	4	1	020105	—
1.3/32	1.0937	6.7/8	11.1/2	3	1	—	023106
1.3/32	1.0937	6.7/8	12.1/2	4	1	020106	—
1.7/64	1.1094	7.1/8	11.3/4	3	1	—	023107
1.7/64	1.1094	7.1/8	12.3/4	4	1	020107	—
1.1/8	1.1250	7.1/8	11.3/4	3	1	—	023108
1.1/8	1.1250	7.1/8	12.3/4	4	1	020108	—
1.9/64	1.1406	7.1/4	11.7/8	3	1	—	023109
1.9/64	1.1406	7.1/4	12.7/8	4	1	020109	—
1.5/32	1.1563	7.1/4	11.7/8	3	1	—	023110
1.5/32	1.1563	7.1/4	12.7/8	4	1	020110	—
1.11/64	1.1719	7.3/8	12“	3	1	—	023111
1.11/64	1.1719	7.3/8	13“	4	1	020111	—
1.3/16	1.1875	7.3/8	12“	3	1	—	023112
1.3/16	1.1875	7.3/8	13“	4	1	020112	—
1.13/64	1.2031	7.1/2	12.1/8	3	1	—	023113
1.7/32	1.2187	7.1/2	12.1/8	3	1	—	023114
1.7/32	1.2187	7.1/2	13.1/8	4	1	020114	—
1.15/64	1.2344	7.7/8	13.1/2	4	1	020115	—
1.1/4	1.2500	7.7/8	12.1/2	3	1	—	023116
1.1/4	1.2500	7.7/8	13.1/2	4	1	020116	—
1.17/64	1.2656	8.1/2	14.1/8	4	1	020117	—
1.9/32	1.2813	8.1/2	14.1/8	4	1	020118	—
1.19/64	1.2969	8.5/8	14.1/4	4	1	020119	—
1.5/16	1.3125	8.5/8	14.1/4	4	1	020120	—
1.21/64	1.3281	8.3/4	14.3/8	4	1	020121	—
1.11/32	1.3437	8.3/4	14.3/8	4	1	020122	—

TAPER SHANK DRILL

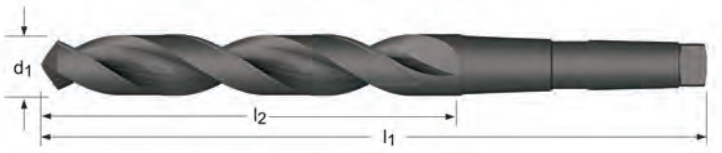
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209	S209
1.3/8	1.3750	8.7/8	14.1/2	4	1	020124	—
1.13/32	1.4063	9“	14.5/8	4	1	020126	—
1.27/64	1.4219	9.1/8	14.3/4	4	1	020127	—
1.7/16	1.4375	9.1/8	14.3/4	4	1	020128	—
1.15/32	1.4687	9.1/4	14.7/8	4	1	020130	—
1.31/64	1.4844	9.3/8	15“	4	1	020131	—
1.1/2	1.5000	9.3/8	15“	4	1	020132	—
1.33/64	1.5156	9.3/8	15“	4	1	—	023133
1.17/32	1.5313	9.3/8	15“	4	1	—	023134
1.17/32	1.5313	9.3/8	16.3/8	5	1	020134	—
1.35/64	1.5469	9.5/8	15.1/4	4	1	—	023135
1.9/16	1.5625	9.5/8	15.1/4	4	1	—	023136
1.9/16	1.5625	9.5/8	16.5/8	5	1	020136	—
1.19/32	1.5937	9.7/8	15.1/2	4	1	—	023138
1.39/64	1.6094	10“	15.5/8	4	1	—	023139
1.5/8	1.6250	10“	15.5/8	4	1	—	023140
1.5/8	1.6250	10“	17“	5	1	020140	—
1.21/32	1.6563	10.1/8	15.3/4	4	1	—	023142
1.11/16	1.6875	10.1/8	15.3/4	4	1	—	023144
1.11/16	1.6875	10.1/8	17.1/8	5	1	020144	—
1.47/64	1.7344	10.3/8	16.1/4	4	1	—	023147
1.3/4	1.7500	10.1/8	17.1/8	5	1	020148	—
1.3/4	1.7500	10.3/8	16.1/4	4	1	—	023148
1.25/32	1.7813	10.3/8	16.1/4	4	1	—	023150
1.13/16	1.8125	10.1/8	17.1/8	5	1	020152	—
1.13/16	1.8125	10.3/8	16.1/4	4	1	—	023152
1.7/8	1.8750	10.1/2	16.1/2	4	1	—	023156
1.7/8	1.8750	10.3/8	17.3/8	5	1	020156	—
1.15/16	1.9375	10.3/8	17.3/8	5	1	020160	—
1.15/16	1.9375	10.5/8	16.5/8	4	1	—	023160
1.31/32	1.9687	10.5/8	16.5/8	4	1	—	023162
2“	2.0000	10.3/8	17.3/8	5	1	020200	—
2“	2.0000	10.5/8	16.5/8	4	1	—	023200

General Purpose Taper Shank, Metric

5ATS Steam Oxide for increased wear resistance & lubricity.

A350 Long series. Steam Oxide for increased wear resistance & lubricity.

A530 TiN Coating increases wear resistance and improves tool life. Thinned Point design above 14mm diameter to reduce thrust and improve chip formation.



5ATS	A350	A530
DIN 345	DIN 341	DIN 345
4XD	6XD	4XD
HSS	HSS	HSS
118°	118°	118°
		
5.00 - 50.00	5.00 - 50.00	8.50 - 40.00

d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
5.00	0.1969	74	155	1	1	—	0034071	—
5.00	0.1969	52	133	1	1	026050	—	—
5.50	0.2165	80	161	1	1	—	0034088	—
5.50	0.2165	57	138	1	1	026055	—	—
6.00	0.2362	80	161	1	1	—	0034118	—
6.00	0.2362	57	138	1	1	026060	—	—
6.50	0.2559	63	144	1	1	026065	—	—
6.70	0.2638	86	167	1	1	—	0034125	—
6.80	0.2677	93	174	1	1	—	0034149	—
6.80	0.2677	69	150	1	1	026068	—	—
7.00	0.2756	93	174	1	1	—	0034156	—
7.00	0.2756	69	150	1	1	026070	—	—
7.50	0.2953	93	174	1	1	—	0034163	—
7.50	0.2953	69	150	1	1	026075	—	—
8.00	0.3150	100	181	1	1	—	0034187	—
8.00	0.3150	75	156	1	1	026080	—	—
8.40	0.3307	100	181	1	1	—	0034200	—
8.50	0.3346	100	181	1	1	—	0034217	—
8.50	0.3346	75	156	1	1	026085	—	0041277
8.75	0.3445	107	188	1	1	—	0034224	—
9.00	0.3543	107	188	1	1	—	0034248	—
9.00	0.3543	81	162	1	1	026090	—	0041284
9.50	0.3740	107	188	1	1	—	0034279	—
9.50	0.3740	81	162	1	1	026095	—	—
9.80	0.3858	116	197	1	1	—	0034293	—
10.00	0.3937	116	197	1	1	—	0033241	—
10.00	0.3937	87	168	1	1	026100	—	0040713
10.20	0.4016	116	197	1	1	—	0033265	—
10.20	0.4016	87	168	1	1	026102	—	0040720
10.50	0.4134	116	197	1	1	—	0033289	—
10.50	0.4134	87	168	1	1	026105	—	0040737
10.70	0.4213	125	206	1	1	—	0033296	—
11.00	0.4331	125	206	1	1	—	0033319	—

TAPER SHANK DRILL

d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
11.00	0.4331	94	175	1	1	026110	—	0040744
11.50	0.4528	125	206	1	1	—	0033333	—
11.50	0.4528	94	175	1	1	026115	—	0040751
11.75	0.4626	125	206	1	1	—	0033340	—
11.75	0.4626	94	175	1	1	—	—	0040768
11.80	0.4646	125	206	1	1	—	0033357	—
12.00	0.4724	134	215	1	1	—	0033364	—
12.00	0.4724	101	182	1	1	026120	—	0040775
12.20	0.4803	101	182	1	1	026122	—	—
12.50	0.4921	134	215	1	1	—	0033395	—
12.50	0.4921	101	182	1	1	026125	—	0040799
12.80	0.5039	101	182	1	1	026128	—	—
13.00	0.5118	134	215	1	1	—	0033401	—
13.00	0.5118	101	182	1	1	026130	—	0040812
13.50	0.5315	142	223	1	1	—	0033418	—
13.50	0.5315	108	189	1	1	026135	—	0040829
13.80	0.5433	108	189	1	1	026138	—	—
14.00	0.5512	142	223	1	1	—	0033432	—
14.00	0.5512	108	189	1	1	026140	—	0040836
14.25	0.5610	147	245	2	1	—	0033449	—
14.25	0.5610	114	212	2	1	026142	—	—
14.50	0.5709	147	245	2	1	—	0033456	—
14.50	0.5709	114	212	2	1	026145	—	0040850
14.75	0.5807	147	245	2	1	—	0033463	—
14.75	0.5807	114	212	2	1	026147	—	—
15.00	0.5906	147	245	2	1	—	0033470	—
15.00	0.5906	114	212	2	1	026150	—	0040874
15.25	0.6004	120	218	2	1	—	—	0040881
15.25	0.6004	153	251	2	1	—	0033487	—
15.50	0.6102	153	251	2	1	—	0033494	—
15.50	0.6102	120	218	2	1	026155	—	0040898
15.75	0.6201	153	251	2	1	—	0033500	—
15.75	0.6201	120	218	2	1	026157	—	—
16.00	0.6299	153	251	2	1	—	0033517	—
16.00	0.6299	120	218	2	1	026160	—	0040911
16.25	0.6398	159	257	2	1	—	0033524	—
16.50	0.6496	159	257	2	1	—	0033531	—
16.50	0.6496	125	223	2	1	026165	—	0040935
16.75	0.6594	159	257	2	1	—	0033548	—
17.00	0.6693	159	257	2	1	—	0033555	—
17.00	0.6693	125	223	2	1	026170	—	0040942
17.25	0.6791	165	263	2	1	—	0033562	—
17.50	0.6890	165	263	2	1	—	0033579	—
17.50	0.6890	130	228	2	1	026175	—	0040966
18.00	0.7087	165	263	2	1	—	0033593	—
18.00	0.7087	130	228	2	1	026180	—	0040980
18.50	0.7283	171	269	2	1	—	0033616	—
18.50	0.7283	135	233	2	1	026185	—	0040997
19.00	0.7480	171	269	2	1	—	0033623	—
19.00	0.7480	135	233	2	1	026190	—	0041017
19.50	0.7677	177	275	2	1	—	0033647	—
19.50	0.7677	140	238	2	1	026195	—	0041024
19.75	0.7776	177	275	2	1	—	0033654	—
20.00	0.7874	177	275	2	1	—	0033661	—
20.00	0.7874	140	238	2	1	026200	—	0041048
20.25	0.7972	184	282	2	1	—	0033678	—
20.50	0.8071	184	282	2	1	—	0033685	—
20.50	0.8071	145	243	2	1	026205	—	0041055
21.00	0.8268	184	282	2	1	—	0033692	—
21.00	0.8268	145	243	2	1	026210	—	0041062
21.50	0.8465	191	289	2	1	—	0033708	—
21.50	0.8465	150	248	2	1	026215	—	0041079
22.00	0.8661	191	289	2	1	—	0033715	—
22.00	0.8661	150	248	2	1	026220	—	0041086
22.50	0.8858	198	296	2	1	—	0033722	—
22.50	0.8858	155	253	2	1	026225	—	0041093

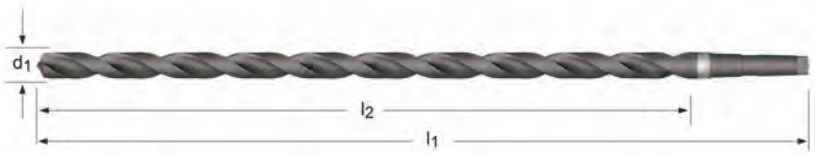
TAPER SHANK DRILL

d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	5ATS	A350	A530
23.00	0.9055	198	296	2	1	—	0033739	—
23.00	0.9055	155	253	2	1	026230	—	0041109
23.50	0.9252	198	319	3	1	—	0033746	—
23.50	0.9252	155	276	3	1	026235	—	0041116
24.00	0.9449	206	327	3	1	—	0033753	—
24.00	0.9449	160	281	3	1	026240	—	0041123
24.50	0.9646	206	327	3	1	—	0033760	—
24.50	0.9646	160	281	3	1	026245	—	0041130
25.00	0.9843	206	327	3	1	—	0033777	—
25.00	0.9843	160	281	3	1	026250	—	0041147
25.50	1.0039	165	286	3	1	—	—	0041154
25.50	1.0039	214	335	3	1	—	0033784	—
26.00	1.0236	214	335	3	1	—	0033791	—
26.00	1.0236	165	286	3	1	026260	—	0041161
26.50	1.0433	214	335	3	1	—	0033807	—
26.50	1.0433	165	286	3	1	026265	—	0041178
27.00	1.0630	222	343	3	1	—	0033814	—
27.00	1.0630	170	291	3	1	026270	—	0041185
27.50	1.0827	170	291	3	1	—	—	0041192
27.50	1.0827	222	343	3	1	—	0033821	—
28.00	1.1024	222	343	3	1	—	0033838	—
28.00	1.1024	170	291	3	1	026280	—	0041208
28.50	1.1220	175	296	3	1	—	—	0041215
29.00	1.1417	230	351	3	1	—	0033845	—
29.00	1.1417	175	296	3	1	026290	—	0041222
29.50	1.1614	175	296	3	1	—	—	0041239
30.00	1.1811	230	351	3	1	—	0033852	—
30.00	1.1811	175	296	3	1	026300	—	0041246
30.50	1.2008	239	360	3	1	—	0033869	—
31.00	1.2205	239	360	3	1	—	0033876	—
31.00	1.2205	180	301	3	1	026310	—	0041253
31.50	1.2402	239	360	3	1	—	0033883	—
32.00	1.2598	248	397	4	1	—	0033890	—
32.00	1.2598	185	334	4	1	026320	—	0041260
33.00	1.2992	185	334	4	1	—	—	0148433
33.00	1.2992	248	397	4	1	—	0033906	—
34.00	1.3386	257	406	4	1	—	0033913	—
34.00	1.3386	190	339	4	1	026340	—	—
35.00	1.3780	257	406	4	1	—	0033920	—
35.00	1.3780	190	339	4	1	026350	—	0148457
36.00	1.4173	267	416	4	1	—	0033937	—
36.00	1.4173	195	344	4	1	026360	—	—
37.00	1.4567	267	416	4	1	—	0033944	—
37.00	1.4567	195	344	4	1	026370	—	—
38.00	1.4961	277	426	4	1	—	0033951	—
38.00	1.4961	200	349	4	1	026380	—	—
39.00	1.5354	277	426	4	1	—	0033968	—
40.00	1.5748	277	426	4	1	—	0033975	—
40.00	1.5748	200	349	4	1	026400	—	0148471
41.00	1.6142	287	436	4	1	—	0033982	—
42.00	1.6535	287	436	4	1	—	0033999	—
42.00	1.6535	205	354	4	1	026420	—	—
43.00	1.6929	298	447	4	1	—	0034002	—
44.00	1.7323	298	447	4	1	—	0034019	—
44.00	1.7323	210	359	4	1	026440	—	—
45.00	1.7717	298	447	4	1	—	0034026	—
46.00	1.8110	310	459	4	1	—	0034033	—
47.00	1.8504	310	459	4	1	—	0034040	—
48.00	1.8898	321	470	4	1	—	0034057	—
50.00	1.9685	321	470	4	1	—	0034101	—
50.00	1.9685	220	369	4	1	026500	—	—

DORMER

General Purpose Taper Shank - Extra Length

A345 Steam Oxide for increase wear resistance & lubricity.



A345

DIN 1870/1

10XD

HSS

118°



8.00 - 50.00

d_1 $\emptyset h_8$ Inch	d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A345
	8.00	0.3150	165	265	1	1	0418383
	8.50	0.3346	165	265	1	1	0418390
	9.00	0.3543	175	275	1	1	0418406
	9.50	0.3740	175	275	1	1	0420201
3/8	9.52	0.3750	185	285	1	1	0418307
	10.00	0.3937	185	285	1	1	0418062
13/32	10.32	0.4063	185	285	1	1	0418116
	10.50	0.4134	185	285	1	1	0420171
	11.00	0.4331	195	300	1	1	0418079
7/16	11.11	0.4375	195	300	1	1	0418369
	11.50	0.4528	195	300	1	1	0419564
29/64	11.51	0.4531	205	310	1	1	0418284
	12.00	0.4724	205	310	1	1	0418093
	12.50	0.4921	205	310	1	1	0419571
1/2	12.70	0.5000	205	310	1	1	0418055
	13.00	0.5118	205	310	1	1	0418109
17/32	13.49	0.5313	220	325	1	1	0418161
	13.50	0.5315	220	325	1	1	0419588
	14.00	0.5512	220	325	1	1	0418123
9/16	14.29	0.5625	220	340	2	1	0418413
37/64	14.68	0.5781	220	340	2	1	0418321
	15.00	0.5906	220	340	2	1	0418130
39/64	15.48	0.6094	230	355	2	1	0418338
	15.50	0.6102	230	355	2	1	0419601
5/8	15.88	0.6250	230	355	2	1	0418352
	16.00	0.6299	230	355	2	1	0418147
41/64	16.27	0.6406	230	355	2	1	0418345
	16.50	0.6496	230	355	2	1	0419618
21/32	16.67	0.6563	230	355	2	1	0418215
	17.00	0.6693	230	355	2	1	0418154
11/16	17.46	0.6875	245	370	2	1	0418086
	17.50	0.6890	245	370	2	1	0419625

TAPER SHANK DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A345
	18.00	0.7087	245	370	2	1	0418178
	18.50	0.7283	245	370	2	1	0419632
	19.00	0.7480	245	370	2	1	0418185
3/4	19.05	0.7500	260	385	2	1	0418291
	19.50	0.7677	260	385	2	1	0419649
	20.00	0.7874	260	385	2	1	0418192
	20.50	0.8071	260	385	2	1	0419656
	21.00	0.8268	260	385	2	1	0418208
	21.50	0.8465	270	405	2	1	0419663
	22.00	0.8661	270	405	2	1	0418222
7/8	22.22	0.8750	270	405	2	1	0418376
	22.50	0.8858	270	405	3	1	0419670
	23.00	0.9055	270	405	3	1	0419687
	23.50	0.9252	270	425	3	1	0419694
	24.00	0.9449	290	440	3	1	0418239
	24.50	0.9646	290	440	3	1	0419700
	25.00	0.9843	290	440	3	1	0418246
1“	25.40	1.0000	290	440	3	1	0418031 [1]
	25.50	1.0039	290	440	3	1	0419717 [1]
	26.00	1.0236	290	440	3	1	0418253 [1]
	26.50	1.0433	290	440	3	1	0419724 [1]
	27.00	1.0630	305	460	3	1	0418260 [1]
	28.00	1.1024	305	460	3	1	0418277 [1]
	29.00	1.1417	305	460	3	1	0419731 [1]
	30.00	1.1811	305	460	3	1	0418314 [1]
1.1/4	31.75	1.2500	320	480	3	1	0418048 [1]
	31.00	1.2205	320	480	3	1	0419748 [1]
	32.00	1.2598	320	505	4	1	0419755 [1]
	33.00	1.2992	320	505	4	1	0422564 [1]
	34.00	1.3386	340	530	4	1	0419762 [1]
	35.00	1.3780	340	530	4	1	0419779 [1]
	36.00	1.4173	340	530	4	1	0419786 [1]
	37.00	1.4567	340	530	4	1	0419793 [1]
	38.00	1.4961	360	555	4	1	0419809 [1]
1.1/2	38.10	1.5000	360	555	4	1	0419540 [1]
	39.00	1.5354	360	555	4	1	0419816 [1]
	40.00	1.5748	360	555	4	1	0419823 [1]
	41.00	1.6142	360	555	4	1	0419830 [1]
	42.00	1.6535	360	555	4	1	0419847 [1]
1.3/4	44.45	1.7500	385	585	4	1	0419557 [1]
	45.00	1.7717	385	585	4	1	0419854 [1]
	48.00	1.8898	405	605	4	1	0419861 [1]
	50.00	1.9685	405	605	4	1	0419878 [1]

[1] < 10xD

TAPER SHANK DRILL

General Purpose Parabolic Flute Taper Shank - Extra Length, Metric

A951
A952

Parabolic Flute design for efficient chip removal. Allows greater drilling depths in one pass. Bright Finish in flutes improves chip flow for soft or non-ferrous materials.

✱ Lands are steam oxide for increased wear resistance & lubricity.



A951	A952
DIN 1870/1	DIN 1870/2
15XD	20XD
HSS	HSS
130°	130°
	
10.00 - 30.00	8.00 - 40.00

d_1 $\varnothing h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A951	A952
8.00	0.3150	210	330	1	1	—	0423639
8.50	0.3346	210	330	1	1	—	0423646
9.00	0.3543	220	345	1	1	—	0423653
10.00	0.3937	185	285	1	1	0418420	—
10.00	0.3937	235	360	1	1	—	0419885
10.50	0.4134	235	360	1	1	—	0419892
11.00	0.4331	195	300	1	1	0418437	—
11.00	0.4331	250	375	1	1	—	0419908
11.50	0.4528	250	375	1	1	—	0419915
12.00	0.4724	205	310	1	1	0418444	—
12.00	0.4724	260	395	1	1	—	0419922
12.50	0.4921	205	310	1	1	0418451	—
12.50	0.4921	260	395	1	1	—	0419939
13.00	0.5118	205	310	1	1	0418468	—
13.00	0.5118	260	395	1	1	—	0420188
13.50	0.5315	220	325	1	1	0418475	—
13.50	0.5315	275	410	1	1	—	0419946
14.00	0.5512	220	325	1	1	0418482	—
14.00	0.5512	275	410	1	1	—	0419953
14.50	0.5709	220	340	2	1	0418499 [1]	—
14.50	0.5709	275	425	2	1	—	0419960 [2]
15.00	0.5906	220	340	2	1	0418505 [1]	—
15.00	0.5906	275	425	2	1	—	0419977 [2]
15.50	0.6102	230	355	2	1	0418512 [1]	—
15.50	0.6102	295	445	2	1	—	0419984 [2]
16.00	0.6299	230	355	2	1	0418529 [1]	—
16.00	0.6299	295	445	2	1	—	0420195 [2]
16.50	0.6496	230	355	2	1	0418536 [1]	—
16.50	0.6496	295	445	2	1	—	0419991 [2]
17.00	0.6693	230	355	2	1	0418543 [1]	—
17.00	0.6693	295	445	2	1	—	0420003 [2]

[1] < 15xD
[2] < 20xD

TAPER SHANK DRILL

d_1 $\emptyset h_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	MTS	Pack Qty	A951	A952
17.50	0.6890	245	370	2	1	0418550 [1]	—
17.50	0.6890	310	465	2	1	—	0420010 [2]
18.00	0.7087	245	370	2	1	0418567 [1]	—
18.00	0.7087	310	465	2	1	—	0420027 [2]
18.50	0.7283	245	370	2	1	0418574 [1]	—
18.50	0.7283	310	465	2	1	—	0420034 [2]
19.00	0.7480	245	370	2	1	0418581 [1]	—
19.00	0.7480	310	465	2	1	—	0420041 [2]
19.50	0.7677	260	385	2	1	0418598 [1]	—
19.50	0.7677	325	490	2	1	—	0420058 [2]
20.00	0.7874	260	385	2	1	0418604 [1]	—
20.00	0.7874	325	490	2	1	—	0420065 [2]
21.00	0.8268	260	385	2	1	0418611 [1]	—
21.00	0.8268	325	490	2	1	—	0420072 [2]
22.00	0.8661	270	405	2	1	0418628 [1]	—
22.00	0.8661	345	515	2	1	—	0420089 [2]
23.00	0.9055	270	405	2	1	0418635 [1]	—
23.00	0.9055	345	515	2	1	—	0420096 [2]
24.00	0.9449	290	440	3	1	0418642 [1]	—
24.00	0.9449	365	555	3	1	—	0420102 [2]
25.00	0.9843	290	440	3	1	0418659 [1]	—
25.00	0.9843	365	555	3	1	—	0420119 [2]
26.00	1.0236	290	440	3	1	0418666 [1]	—
26.00	1.0236	365	555	3	1	—	0420126 [2]
27.00	1.0630	305	460	3	1	0418673 [1]	—
27.00	1.0630	385	580	3	1	—	0420133 [2]
28.00	1.1024	305	460	3	1	0418680 [1]	—
28.00	1.1024	385	580	3	1	—	0420140 [2]
29.00	1.1417	305	460	3	1	0418697 [1]	—
29.00	1.1417	385	580	3	1	—	0420157 [2]
30.00	1.1811	305	460	3	1	0418703 [1]	—
30.00	1.1811	385	580	3	1	—	0420164 [2]
31.00	1.2205	410	610	3	1	—	0423585 [2]
32.00	1.2598	410	635	4	1	—	0423592 [2]
33.00	1.2992	410	635	4	1	—	0423608 [2]
34.00	1.3386	430	665	4	1	—	0423660 [2]
35.00	1.3780	430	665	4	1	—	0423677 [2]
38.00	1.4961	460	695	4	1	—	0423615 [2]
40.00	1.5748	460	695	4	1	—	0423622 [2]

[1] < 15xD
[2] < 20xD

COBALT TAPER SHANK DRILL

Cobalt Heavy Duty Taper Shank

209CO Notched Point reduces thrust. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.



209CO

ANSI

4XD

HSS-E

135°



1/4 - 1.1/2

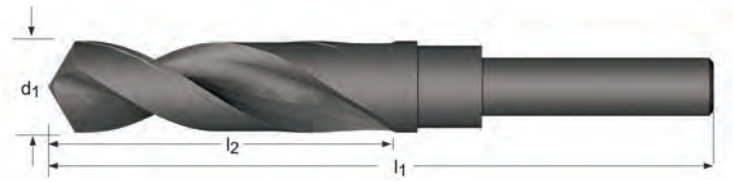
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209CO
1/4	0.2500	2.7/8	6.1/8	1	1	021316
9/32	0.2813	3“	6.1/4	1	1	021318
5/16	0.3125	3.1/8	6.3/8	1	1	021320
11/32	0.3437	3.1/4	6.1/2	1	1	021322
3/8	0.3750	3.1/2	7.3/8	2	1	021324
13/32	0.4063	3.5/8	7.1/2	2	1	021326
27/64	0.4219	3.7/8	7.3/4	2	1	021327
7/16	0.4375	3.7/8	7.3/4	2	1	021328
29/64	0.4531	4.1/8	8“	2	1	021329
15/32	0.4687	4.1/8	8“	2	1	021330
31/64	0.4844	4.3/8	8.1/4	2	1	021331
1/2	0.5000	4.3/8	8.1/4	2	1	021332
33/64	0.5156	4.5/8	8.1/2	2	1	021333
17/32	0.5313	4.5/8	8.1/2	2	1	021334
35/64	0.5469	4.7/8	8.3/4	2	1	021335
9/16	0.5625	4.7/8	8.3/4	2	1	021336
37/64	0.5781	4.7/8	8.3/4	2	1	021337
19/32	0.5937	4.7/8	8.3/4	2	1	021338
39/64	0.6094	4.7/8	8.3/4	2	1	021339
5/8	0.6250	4.7/8	8.3/4	2	1	021340
41/64	0.6406	5.1/8	9“	2	1	021341
21/32	0.6563	5.1/8	9.3/4	3	1	021342
43/64	0.6719	5.3/8	10“	3	1	021343
11/16	0.6875	5.3/8	10“	3	1	021344
45/64	0.7031	5.5/8	10.1/4	3	1	021345
23/32	0.7188	5.5/8	10.1/4	3	1	021348
47/64	0.7344	5.7/8	10.1/2	3	1	021347
3/4	0.7500	5.7/8	10.1/2	3	1	021350
49/64	0.7656	6“	10.5/8	3	1	021349
25/32	0.7813	6“	10.5/8	3	1	021352
51/64	0.7969	6.1/8	10.3/4	3	1	021351
13/16	0.8125	6.1/8	10.3/4	3	1	021354
53/64	0.8281	6.1/8	10.3/4	3	1	021353

COBALT TAPER SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	209CO
27/32	0.8438	6.1/8	10.3/4	3	1	021355
55/64	0.8594	6.1/8	10.3/4	3	1	021357
7/8	0.8750	6.1/8	10.3/4	3	1	021356
57/64	0.8906	6.1/8	10.3/4	3	1	021358
29/32	0.9062	6.1/8	10.3/4	3	1	021359
59/64	0.9219	6.1/8	10.3/4	3	1	021362
15/16	0.9375	6.1/8	10.3/4	3	1	021360
61/64	0.9531	6.3/8	11“	3	1	021363
31/32	0.9688	6.3/8	11“	3	1	021364
63/64	0.9844	6.3/8	11“	3	1	021365
1“	1.0000	6.3/8	11“	3	1	021400
1.1/64	1.0156	6.1/2	12.1/8	4	1	021401
1.1/32	1.0312	6.1/2	12.1/8	4	1	021402
1.1/16	1.0625	6.5/8	12.1/4	4	1	021404
1.3/32	1.0937	6.7/8	12.1/2	4	1	021406
1.7/64	1.1094	7.1/8	12.3/4	4	1	021407
1.1/8	1.1250	7.1/8	12.3/4	4	1	021408
1.11/64	1.1719	7.3/8	13“	4	1	021411
1.3/16	1.1875	7.3/8	13“	4	1	021412
1.7/32	1.2188	7.1/2	13.1/8	4	1	021414
1.1/4	1.2500	7.7/8	13.1/2	4	1	021416
1.9/32	1.2813	8.1/2	14.1/8	4	1	021418
1.11/32	1.3437	8.3/4	14.3/8	4	1	021422
1.3/8	1.3750	8.7/8	14.1/2	4	1	021424
1.7/16	1.4375	9.1/8	14.3/4	4	1	021428
1.1/2	1.5000	9.3/8	15“	4	1	021432

General Purpose Reduced Shank - 1/2”Shank

A170 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.



A170





13.00 - 1.1/2

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	A170
	13.00	0.5118			83	156	1	0030165
33/64	13.10	0.5157	3.1/8	6“			1	0121870
17/32	13.49	0.5313	3.1/8	6“			1	0030295
	13.50	0.5315			83	156	1	0030172
35/64	13.89	0.5469	3.1/8	6“			1	0121887
	14.00	0.5512			83	156	1	0030196
9/16	14.29	0.5625	3.1/8	6“			1	0030523
	14.50	0.5709			83	156	1	0030202
37/64	14.68	0.5781	3.1/8	6“			1	0121894
	15.00	0.5906			83	156	1	0030219
19/32	15.08	0.5937	3.1/8	6“			1	0030349
39/64	15.48	0.6094	3.1/8	6“			1	0121900
	15.50	0.6102			83	156	1	0030226
5/8	15.88	0.6250	3.1/8	6“			1	0030509
	16.00	0.6299			84	157	1	0030240
41/64	16.27	0.6406	3.1/8	6“			1	0030479
	16.50	0.6496			84	157	1	0030257
21/32	16.67	0.6563	3.1/8	6“			1	0030370
	17.00	0.6693			84	157	1	0030264
43/64	17.07	0.6719	3.1/8	6“			1	0121917
11/16	17.46	0.6875	3.1/8	6“			1	0030141
	17.50	0.6890			84	157	1	0030271
45/64	17.86	0.7031	3.1/8	6“			1	0030288
	18.00	0.7087			84	157	1	0030301
23/32	18.26	0.7188	3.1/8	6“			1	0030400
	18.50	0.7283			84	157	1	0030318
47/64	18.65	0.7344	3.1/8	6“			1	0121924
	19.00	0.7480			84	157	1	0030325
3/4	19.05	0.7500	3.1/8	6“			1	0030462
49/64	19.45	0.7656	3“	6“			1	0121931
	19.50	0.7677			81	158	1	0030332
25/32	19.84	0.7812	3“	6“			1	0030431
	20.00	0.7874			81	158	1	0030356

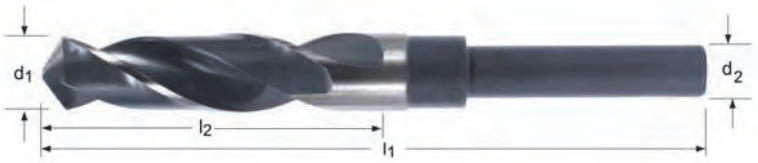
REDUCED SHANK DRILL

d_1 $Øh_8$ Inch	d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 Inch	l_1 Inch	l_2 mm	l_1 mm	Pack Qty	A170
51/64	20.24	0.7969	3“	6“			1	0030486
13/16	20.64	0.8125	3“	6“			1	0030189
	21.00	0.8268			82	158	1	0030363
53/64	21.03	0.8281	3“	6“			1	0121948
27/32	21.43	0.8437	3“	6“			1	0030448
55/64	21.83	0.8594	3“	6“			1	0121955
	22.00	0.8661			82	158	1	0030387
7/8	22.22	0.8750	3“	6“			1	0030516
57/64	22.62	0.8906	3“	6“			1	0030493
	23.00	0.9055			82	158	1	0030394
29/32	23.02	0.9062	3“	6“			1	0121863
59/64	23.42	0.9220	3“	6“			1	0121962
15/16	23.81	0.9375	3“	6“			1	0030233
	24.00	0.9449			83	159	1	0030417
61/64	24.21	0.9531	3“	6“			1	0121979
31/32	24.61	0.9688	3“	6“			1	0030455
	25.00	0.9843			83	159	1	0030424
63/64	25.00	0.9844	3“	6“			1	0121986
1“	25.40	1.0000	3“	6“			1	0030134
1.1/32	26.19	1.0312	3“	6“			1	0172728
1.1/16	26.99	1.0625	3“	6“			1	0172735
1.7/64	28.18	1.1094	3“	6“			1	0238288
1.1/8	28.58	1.1250	3“	6“			1	0172759
1.9/64	28.97	1.1406	3“	6“			1	0238301
1.5/32	29.37	1.1563	3“	6“			1	0172766
1.3/16	30.16	1.1875	3“	6“			1	0172773
1.7/32	30.96	1.2188	3“	6“			1	0172780
1.1/4	31.75	1.2500	3“	6“			1	0172797
1.5/16	33.34	1.3125	3“	6“			1	0172803
1.3/8	34.93	1.3750	3“	6“			1	0172810
1.7/16	36.51	1.4375	3“	6“			1	0172827
1.1/2	38.10	1.5000	3“	6“			1	0172834

REDUCED SHANK DRILL

General Purpose Reduced Shank - 1/2”Shank

R56 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.



R56

ANSI

4XD

HSS

118°



33/64 - 1.1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56
33/64	0.5156	3“	6“	1/2	1	091433
17/32	0.5313	3“	6“	1/2	1	091434
35/64	0.5469	3“	6“	1/2	1	091435
9/16	0.5625	3“	6“	1/2	1	091436
37/64	0.5781	3“	6“	1/2	1	091437
19/32	0.5937	3“	6“	1/2	1	091438
39/64	0.6094	3“	6“	1/2	1	091439
5/8	0.6250	3“	6“	1/2	1	091440
41/64	0.6406	3“	6“	1/2	1	091441
21/32	0.6563	3“	6“	1/2	1	091442
43/64	0.6719	3“	6“	1/2	1	091443
11/16	0.6875	3“	6“	1/2	1	091444
45/64	0.7031	3“	6“	1/2	1	091445
23/32	0.7188	3“	6“	1/2	1	091446
47/64	0.7344	3“	6“	1/2	1	091447
3/4	0.7500	3“	6“	1/2	1	091448
49/64	0.7656	3“	6“	1/2	1	091449
25/32	0.7813	3“	6“	1/2	1	091450
51/64	0.7969	3“	6“	1/2	1	091451
13/16	0.8125	3“	6“	1/2	1	091452
53/64	0.8281	3“	6“	1/2	1	091453
27/32	0.8438	3“	6“	1/2	1	091454
55/64	0.8594	3“	6“	1/2	1	091455
7/8	0.8750	3“	6“	1/2	1	091456
57/64	0.8906	3“	6“	1/2	1	091457
29/32	0.9063	3“	6“	1/2	1	091458
59/64	0.9219	3“	6“	1/2	1	091459
15/16	0.9375	3“	6“	1/2	1	091460
61/64	0.9531	3“	6“	1/2	1	091461
31/32	0.9688	3“	6“	1/2	1	091462
63/64	0.9844	3“	6“	1/2	1	091463
1“	1.0000	3“	6“	1/2	1	091464
1.1/64	1.0156	3“	6“	1/2	1	091465

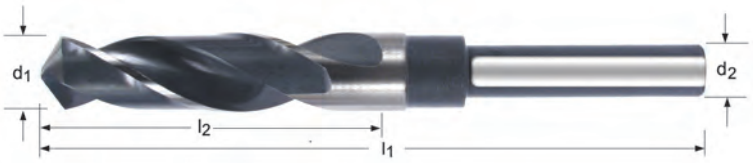
REDUCED SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56
1.1/32	1.0312	3“	6“	1/2	1	091486
1.3/64	1.0469	3“	6“	1/2	1	091467
1.1/16	1.0625	3“	6“	1/2	1	091468
1.5/64	1.0781	3“	6“	1/2	1	091469
1.3/32	1.0937	3“	6“	1/2	1	091470
1.7/64	1.1094	3“	6“	1/2	1	091471
1.1/8	1.1250	3“	6“	1/2	1	091472
1.9/64	1.1406	3“	6“	1/2	1	091473
1.5/32	1.1563	3“	6“	1/2	1	091487
1.11/64	1.1719	3“	6“	1/2	1	091474
1.3/16	1.1875	3“	6“	1/2	1	091476
1.13/64	1.2031	3“	6“	1/2	1	091475
1.7/32	1.2187	3“	6“	1/2	1	091488
1.15/64	1.2344	3“	6“	1/2	1	091477
1.1/4	1.2500	3“	6“	1/2	1	091480
1.9/32	1.2813	3“	6“	1/2	1	091479
1.5/16	1.3125	3“	6“	1/2	1	091482
1.11/32	1.3437	3“	6“	1/2	1	091497
1.3/8	1.3750	3“	6“	1/2	1	091483
1.13/32	1.4063	3“	6“	1/2	1	091492
1.7/16	1.4375	3“	6“	1/2	1	091484
1.15/32	1.4687	3“	6“	1/2	1	091495
1.1/2	1.5000	3“	6“	1/2	1	091485

REDUCED SHANK DRILL

General Purpose Reduced Shank - 1/2”Shank with 3-Flats

R57 Silver & Deming Drills with 3-Flat Shank. Steam Oxide for increased wear resistance & lubricity.



R57

ANSI

4XD

HSS

118°



33/64 - 1.1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R57
33/64	0.5156	3“	6“	1/2	1	091533
17/32	0.5313	3“	6“	1/2	1	091534
35/64	0.5469	3“	6“	1/2	1	091535
9/16	0.5625	3“	6“	1/2	1	091536
37/64	0.5781	3“	6“	1/2	1	091537
19/32	0.5937	3“	6“	1/2	1	091538
39/64	0.6094	3“	6“	1/2	1	091539
5/8	0.6250	3“	6“	1/2	1	091540
41/64	0.6406	3“	6“	1/2	1	091541
21/32	0.6563	3“	6“	1/2	1	091542
43/64	0.6719	3“	6“	1/2	1	091543
11/16	0.6875	3“	6“	1/2	1	091544
45/64	0.7031	3“	6“	1/2	1	091545
23/32	0.7188	3“	6“	1/2	1	091546
47/64	0.7344	3“	6“	1/2	1	091547
3/4	0.7500	3“	6“	1/2	1	091548
49/64	0.7656	3“	6“	1/2	1	091549
25/32	0.7813	3“	6“	1/2	1	091550
51/64	0.7969	3“	6“	1/2	1	091551
13/16	0.8125	3“	6“	1/2	1	091552
53/64	0.8281	3“	6“	1/2	1	091553
27/32	0.8438	3“	6“	1/2	1	091554
55/64	0.8594	3“	6“	1/2	1	091555
7/8	0.8750	3“	6“	1/2	1	091556
57/64	0.8906	3“	6“	1/2	1	091557
29/32	0.9063	3“	6“	1/2	1	091558
59/64	0.9219	3“	6“	1/2	1	091559
15/16	0.9375	3“	6“	1/2	1	091560
61/64	0.9531	3“	6“	1/2	1	091561
31/32	0.9688	3“	6“	1/2	1	091562
63/64	0.9844	3“	6“	1/2	1	091563
1“	1.0000	3“	6“	1/2	1	091564
1.1/64	1.0156	3“	6“	1/2	1	091565

REDUCED SHANK DRILL

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R57
1.1/32	1.0312	3“	6“	1/2	1	091586
1.3/64	1.0469	3“	6“	1/2	1	091567
1.1/16	1.0625	3“	6“	1/2	1	091568
1.5/64	1.0781	3“	6“	1/2	1	091569
1.3/32	1.0937	3“	6“	1/2	1	091570
1.7/64	1.1094	3“	6“	1/2	1	091571
1.1/8	1.1250	3“	6“	1/2	1	091572
1.9/64	1.1406	3“	6“	1/2	1	091573
1.5/32	1.1563	3“	6“	1/2	1	091587
1.11/64	1.1719	3“	6“	1/2	1	091575
1.3/16	1.1875	3“	6“	1/2	1	091576
1.13/64	1.2031	3“	6“	1/2	1	091577
1.7/32	1.2187	3“	6“	1/2	1	091588
1.15/64	1.2344	3“	6“	1/2	1	091579
1.1/4	1.2500	3“	6“	1/2	1	091580
1.9/32	1.2813	3“	6“	1/2	1	091589
1.5/16	1.3125	3“	6“	1/2	1	091582
1.11/32	1.3437	3“	6“	1/2	1	091592
1.3/8	1.3750	3“	6“	1/2	1	091583
1.13/32	1.4063	3“	6“	1/2	1	091595
1.7/16	1.4375	3“	6“	1/2	1	091584
1.15/32	1.4687	3“	6“	1/2	1	091598
1.1/2	1.5000	3“	6“	1/2	1	091585

REDUCED SHANK DRILL

General Purpose Reduced Shank - 3/4”Shank

R58 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity



R58

ANSI

1.5XD

HSS

118°



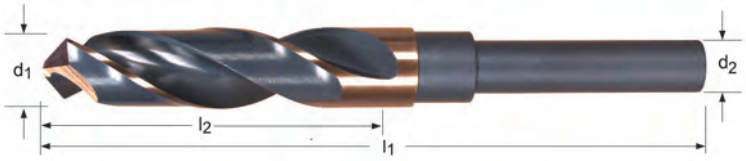
1“ - 2“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R58
1“	1.0000	3“	6“	3/4	1	091264
1.1/32	1.0312	3“	6“	3/4	1	091266
1.1/16	1.0625	3“	6“	3/4	1	091268
1.3/32	1.0937	3“	6“	3/4	1	091270
1.1/8	1.1250	3“	6“	3/4	1	091272
1.5/32	1.1563	3“	6“	3/4	1	091274
1.3/16	1.1875	3“	6“	3/4	1	091276
1.7/32	1.2187	3“	6“	3/4	1	091278
1.1/4	1.2500	3“	6“	3/4	1	091280
1.9/32	1.2813	3“	6“	3/4	1	091282
1.5/16	1.3125	3“	6“	3/4	1	091284
1.11/32	1.3437	3“	6“	3/4	1	091286
1.3/8	1.3750	3“	6“	3/4	1	091288
1.13/32	1.4063	3“	6“	3/4	1	091290
1.7/16	1.4375	3“	6“	3/4	1	091292
1.15/32	1.4687	3“	6“	3/4	1	091294
1.1/2	1.5000	3“	6“	3/4	1	091296
1.9/16	1.5625	3“	6“	3/4	1	091298
1.5/8	1.6250	3“	6“	3/4	1	091300
1.11/16	1.6875	3“	6“	3/4	1	091302
1.3/4	1.7500	3“	6“	3/4	1	091304
1.13/16	1.8125	3“	6“	3/4	1	091306
1.7/8	1.8750	3“	6“	3/4	1	091308
1.15/16	1.9375	3“	6“	3/4	1	091310
2“	2.0000	3“	6“	3/4	1	091312

REDUCED SHANK DRILL

Cobalt, Heavy Duty, Reduced Shank - 1/2”Shank

R56CO Silver & Deming Drills. Self centering Split Point reduces thrust. Cobalt base material with Bronze/Steam Oxide for wear resistance and lubricity. Suitable for ferrous materials.



R56CO

ANSI

4XD

HSS-E

118°



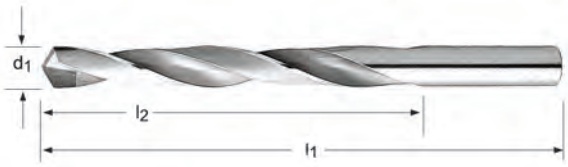
33/64 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	R56CO
33/64	0.5156	3“	6“	1/2	1	092333
17/32	0.5313	3“	6“	1/2	1	092334
35/64	0.5469	3“	6“	1/2	1	092335
9/16	0.5625	3“	6“	1/2	1	092336
37/64	0.5781	3“	6“	1/2	1	092337
19/32	0.5937	3“	6“	1/2	1	092338
39/64	0.6094	3“	6“	1/2	1	092339
5/8	0.6250	3“	6“	1/2	1	092340
41/64	0.6406	3“	6“	1/2	1	092341
21/32	0.6563	3“	6“	1/2	1	092342
43/64	0.6719	3“	6“	1/2	1	092343
11/16	0.6875	3“	6“	1/2	1	092344
45/64	0.7031	3“	6“	1/2	1	092345
23/32	0.7188	3“	6“	1/2	1	092346
47/64	0.7344	3“	6“	1/2	1	092347
3/4	0.7500	3“	6“	1/2	1	092348
49/64	0.7656	3“	6“	1/2	1	092349
25/32	0.7813	3“	6“	1/2	1	092350
51/64	0.7969	3“	6“	1/2	1	092351
13/16	0.8125	3“	6“	1/2	1	092352
53/64	0.8281	3“	6“	1/2	1	092353
27/32	0.8438	3“	6“	1/2	1	092354
55/64	0.8594	3“	6“	1/2	1	092355
7/8	0.8750	3“	6“	1/2	1	092356
57/64	0.8906	3“	6“	1/2	1	092357
29/32	0.9063	3“	6“	1/2	1	092358
59/64	0.9219	3“	6“	1/2	1	092359
15/16	0.9375	3“	6“	1/2	1	092360
61/64	0.9531	3“	6“	1/2	1	092361
31/32	0.9688	3“	6“	1/2	1	092362
63/64	0.9844	3“	6“	1/2	1	092363
1“	1.0000	3“	6“	1/2	1	092364

SPECIAL PURPOSE DRILL

Jobber Length Carbide Tipped

D444 Heavy-Duty Brazed Carbide Tipped for abrasive materials or non-ferrous materials.



D444

4XD

HSS HM

118°



N32 - 1/2

d_1 Ø "/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D444
32	0.1160	1.5/8	2.3/4	1	034632
1/8	0.1250	1.5/8	2.3/4	1	034408
30	0.1285	1.5/8	2.3/4	1	034630
29	0.1360	1.3/4	2.7/8	1	034629
9/64	0.1406	1.3/4	2.7/8	1	034409
25	0.1495	1.7/8	3“	1	034625
5/32	0.1563	2“	3.1/8	1	034410
21	0.1590	2.1/8	3.1/4	1	034621
20	0.1610	2.1/8	3.1/4	1	034620
19	0.1660	2.1/8	3.1/4	1	034619
18	0.1695	2.1/8	3.1/4	1	034618
11/64	0.1719	2.1/8	3.1/4	1	034411
17	0.1730	2.3/16	3.3/8	1	034617
15	0.1800	2.3/16	3.3/8	1	034615
14	0.1820	2.3/16	3.3/8	1	034614
13	0.1850	2.5/16	3.1/2	1	034613
3/16	0.1875	2.5/16	3.1/2	1	034412
11	0.1910	2.5/16	3.1/2	1	034611
10	0.1935	2.7/16	3.5/8	1	034610
9	0.1960	2.7/16	3.5/8	1	034609
7	0.2010	2.7/16	3.5/8	1	034607
13/64	0.2031	2.7/16	3.5/8	1	034413
3	0.2130	2.1/2	3.3/4	1	034603
7/32	0.2188	2.1/2	3.3/4	1	034414
1	0.2280	2.5/8	3.7/8	1	034601
15/64	0.2344	2.5/8	3.7/8	1	034415
B	0.2380	2.3/4	4“	1	034502
C	0.2420	2.3/4	4“	1	034503
E	0.2500	2.3/4	4“	1	034505
1/4	0.2500	2.3/4	4“	1	034416
F	0.2570	2.7/8	4.1/8	1	034506
G	0.2610	2.7/8	4.1/8	1	034507
17/64	0.2656	2.7/8	4.1/8	1	034417

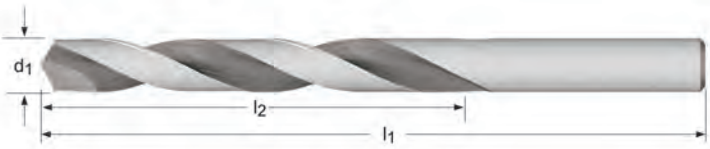
SPECIAL PURPOSE DRILL

d_1 Ø “/Nr./letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D444
H	0.2660	2.7/8	4.1/8	1	034508
I	0.2720	2.7/8	4.1/8	1	034509
J	0.2770	2.7/8	4.1/8	1	034510
K	0.2810	2.15/16	4.1/4	1	034511
9/32	0.2813	2.15/16	4.1/4	1	034418
L	0.2900	2.15/16	4.1/4	1	034512
19/64	0.2969	3.1/16	4.3/8	1	034419
N	0.3020	3.1/16	4.3/8	1	034514
5/16	0.3125	3.3/16	4.1/2	1	034420
O	0.3160	3.3/16	4.1/2	1	034515
P	0.3230	3.5/16	4.5/8	1	034516
21/64	0.3281	3.5/16	4.5/8	1	034421
Q	0.3320	3.7/16	4.3/4	1	034517
R	0.3390	3.7/16	4.3/4	1	034518
11/32	0.3437	3.7/16	4.3/4	1	034422
S	0.3480	3.1/2	4.7/8	1	034519
T	0.3580	3.1/2	4.7/8	1	034520
23/64	0.3594	3.1/2	4.7/8	1	034423
U	0.3680	3.5/8	5“	1	034521
3/8	0.3750	3.5/8	5“	1	034424
25/64	0.3906	3.3/4	5.1/8	1	034425
13/32	0.4063	3.7/8	5.1/4	1	034426
Z	0.4130	3.7/8	5.1/4	1	034526
27/64	0.4219	3.15/16	5.3/8	1	034427
7/16	0.4375	4.1/16	5.1/2	1	034428
29/64	0.4531	4.3/16	5.5/8	1	034429
15/32	0.4687	4.5/16	5.3/4	1	034430
31/64	0.4844	4.3/8	5.7/8	1	034431
1/2	0.5000	4.1/2	6“	1	034432

DORMER

Jobber Length Carbide Tipped

A160 Heavy-Duty Brazed Carbide Tipped for abrasive materials or non-ferrous materials.



A160

DIN 338

4XD

HSS HM

118°



4.00 - 16.00

d_1 $Øh_8$ mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	A160
4.00	0.1575	43	75	1	0029725
4.50	0.1772	47	80	1	0029732
5.00	0.1969	52	86	1	0029749
5.50	0.2165	57	93	1	0029756
6.00	0.2362	57	93	1	0029763
6.50	0.2559	63	101	1	0029770
6.80	0.2677	69	109	1	0029787
7.00	0.2756	69	109	1	0029794
7.50	0.2953	69	109	1	0029800
8.00	0.3150	75	117	1	0029817
8.50	0.3346	75	117	1	0029824
9.00	0.3543	81	125	1	0029831
9.50	0.3740	81	125	1	0029848
10.00	0.3937	87	133	1	0029626
10.20	0.4016	87	133	1	0029633
10.50	0.4134	87	133	1	0029640
11.00	0.4331	94	142	1	0029657
11.50	0.4528	94	142	1	0029664
12.00	0.4724	101	151	1	0029671
13.00	0.5118	101	151	1	0029688
14.00	0.5512	108	160	1	0029695
15.00	0.5906	114	169	1	0029701
16.00	0.6299	120	178	1	0029718

SOLID CARBIDE DRILL

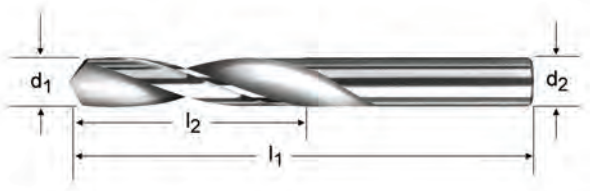
General Purpose Solid Carbide Jobber Length

D33F - *Fractional Sizes*

D33W - *Wire Gauge Sizes*

D33L - *Letter Sizes*

4-Facet Self Centering Point. Low thrust design. For abrasive or non-ferrous materials.



D33F	D33W	D33L
		
3XD	3XD	3XD
HM	HM	HM
		
		
1/32 - 1/2	N68 - N1	A - Z

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
	68		0.0310	5/16	1.1/4	1	—	003500	—
1/32			0.0313	5/16	1.1/4	1	003501	—	—
	67		0.0320	5/16	1.1/4	1	—	003502	—
	66		0.0330	5/16	1.1/4	1	—	003503	—
	65		0.0350	5/8	1.3/8	1	—	003504	—
	64		0.0360	5/8	1.3/8	1	—	003505	—
	63		0.0370	5/8	1.3/8	1	—	003506	—
	62		0.0380	5/8	1.3/8	1	—	003507	—
	61		0.0390	5/8	1.3/8	1	—	003508	—
	60		0.0400	3/4	1.1/2	1	—	003509	—
	59		0.0410	3/4	1.1/2	1	—	003510	—
	58		0.0420	3/4	1.1/2	1	—	003511	—
	57		0.0430	3/4	1.1/2	1	—	003512	—
	56		0.0465	3/4	1.1/2	1	—	003513	—
3/64			0.0469	3/4	1.1/2	1	003514	—	—
	55		0.0520	3/4	1.1/2	1	—	003515	—
	54		0.0550	3/4	1.1/2	1	—	003516	—
	53		0.0595	3/4	1.1/2	1	—	003517	—
1/16			0.0625	3/4	1.1/2	1	003518	—	—
	52		0.0635	3/4	1.1/2	1	—	003519	—
	51		0.0670	3/4	1.1/2	1	—	003520	—
	50		0.0700	7/8	1.3/4	1	—	003521	—
	49		0.0730	7/8	1.3/4	1	—	003522	—
	48		0.0760	7/8	1.3/4	1	—	003523	—
5/64			0.0781	7/8	1.3/4	1	003524	—	—
	47		0.0785	7/8	1.3/4	1	—	003525	—
	46		0.0810	7/8	1.3/4	1	—	003526	—
	45		0.0820	7/8	1.3/4	1	—	003527	—
	44		0.0860	1“	2“	1	—	003528	—
	43		0.0890	1“	2“	1	—	003529	—
	42		0.0935	1“	2“	1	—	003530	—
3/32			0.0938	1“	2“	1	003531	—	—
	41		0.0960	1“	2“	1	—	003532	—

SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
	40		0.0980	1“	2“	1	—	003533	—
	39		0.0995	1.1/4	2.1/4	1	—	003534	—
	38		0.1015	1.1/4	2.1/4	1	—	003535	—
	37		0.1040	1.1/4	2.1/4	1	—	003536	—
	36		0.1065	1.1/4	2.1/4	1	—	003537	—
7/64			0.1094	1.1/4	2.1/4	1	003538	—	—
	35		0.1100	1.1/4	2.1/4	1	—	003539	—
	34		0.1110	1.1/4	2.1/4	1	—	003540	—
	33		0.1130	1.1/4	2.1/4	1	—	003541	—
	32		0.1160	1.1/4	2.1/4	1	—	003542	—
	31		0.1200	1.1/4	2.1/4	1	—	003543	—
1/8			0.1250	1.1/4	2.1/4	1	003544	—	—
	30		0.1285	1.1/4	2.1/4	1	—	003545	—
	29		0.1360	1.3/8	2.1/2	1	—	003546	—
	28		0.1405	1.3/8	2.1/2	1	—	003547	—
9/64			0.1406	1.3/8	2.1/2	1	003548	—	—
	27		0.1440	1.3/8	2.1/2	1	—	003549	—
	26		0.1470	1.3/8	2.1/2	1	—	003550	—
	25		0.1495	1.3/8	2.1/2	1	—	003551	—
	24		0.1520	1.3/8	2.1/2	1	—	003552	—
	23		0.1540	1.3/8	2.1/2	1	—	003553	—
5/32			0.1563	1.3/8	2.1/2	1	003554	—	—
	22		0.1570	1.3/8	2.1/2	1	—	003555	—
	21		0.1590	1.3/8	2.1/2	1	—	003556	—
	20		0.1610	1.3/8	2.1/2	1	—	003557	—
	19		0.1660	1.5/8	2.3/4	1	—	003558	—
	18		0.1695	1.5/8	2.3/4	1	—	003559	—
11/64			0.1719	1.5/8	2.3/4	1	003560	—	—
	17		0.1730	1.5/8	2.3/4	1	—	003561	—
	16		0.1770	1.5/8	2.3/4	1	—	003562	—
	15		0.1800	1.5/8	2.3/4	1	—	003563	—
	14		0.1820	1.5/8	2.3/4	1	—	003564	—
	13		0.1850	1.5/8	2.3/4	1	—	003565	—
3/16			0.1875	1.5/8	2.3/4	1	003566	—	—
	12		0.1890	1.5/8	2.3/4	1	—	003567	—
	11		0.1910	1.5/8	2.3/4	1	—	003568	—
	10		0.1935	1.5/8	2.3/4	1	—	003569	—
	9		0.1960	1.3/4	3“	1	—	003570	—
	8		0.1990	1.3/4	3“	1	—	003571	—
	7		0.2010	1.3/4	3“	1	—	003572	—
13/64			0.2031	1.3/4	3“	1	003573	—	—
	6		0.2040	1.3/4	3“	1	—	003574	—
	5		0.2055	1.3/4	3“	1	—	003575	—
	4		0.2090	1.3/4	3“	1	—	003576	—
	3		0.2130	1.3/4	3“	1	—	003577	—
7/32			0.2188	1.3/4	3“	1	003578	—	—
	2		0.2210	1.3/4	3“	1	—	003579	—
	1		0.2280	1.3/4	3“	1	—	003580	—
		A	0.2340	2“	3.1/4	1	—	—	003581
15/64			0.2344	2“	3.1/4	1	003582	—	—
		B	0.2380	2“	3.1/4	1	—	—	003583
		C	0.2420	2“	3.1/4	1	—	—	003584
		D	0.2460	2“	3.1/4	1	—	—	003585
1/4			0.2500	2“	3.1/4	1	003586	—	—
		F	0.2570	2“	3.1/4	1	—	—	003587
		G	0.2610	2.1/8	3.1/2	1	—	—	003588
17/64			0.2656	2.1/8	3.1/2	1	003589	—	—
		H	0.2660	2.1/8	3.1/2	1	—	—	003590
		I	0.2720	2.1/8	3.1/2	1	—	—	003591
		J	0.2770	2.1/8	3.1/2	1	—	—	003592
		K	0.2810	2.1/8	3.1/2	1	—	—	003593
9/32			0.2813	2.1/8	3.1/2	1	003594	—	—
		L	0.2900	2.1/8	3.1/2	1	—	—	003595
		M	0.2950	2.3/8	3.3/4	1	—	—	003596
19/64			0.2969	2.3/8	3.3/4	1	003597	—	—
		N	0.3020	2.3/8	3.3/4	1	—	—	003598

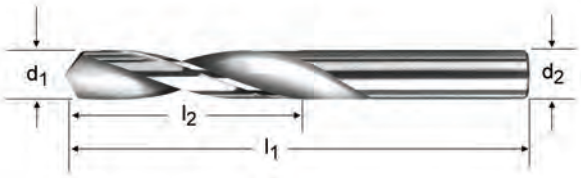
SOLID CARBIDE DRILL

d_1 Ø Inch	d_1 Ø Nr.	d_1 Ø letter	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	D33F	D33W	D33L
5/16			0.3125	2.3/8	3.3/4	1	003599	—	—
		O	0.3160	2.3/8	3.3/4	1	—	—	003600
		P	0.3230	2.3/8	3.3/4	1	—	—	003601
21/64			0.3281	2.1/2	4“	1	003602	—	—
		Q	0.3320	2.1/2	4“	1	—	—	003603
		R	0.3390	2.1/2	4“	1	—	—	003604
11/32			0.3437	2.1/2	4“	1	003605	—	—
		S	0.3480	2.1/2	4“	1	—	—	003606
		T	0.3580	2.1/2	4“	1	—	—	003607
23/64			0.3594	2.3/4	4.1/4	1	003608	—	—
		U	0.3680	2.3/4	4.1/4	1	—	—	003609
3/8			0.3750	2.3/4	4.1/4	1	003610	—	—
		V	0.3770	2.3/4	4.1/4	1	—	—	003611
		W	0.3860	2.7/8	4.1/2	1	—	—	003612
25/64			0.3906	2.7/8	4.1/2	1	003613	—	—
		X	0.3970	2.7/8	4.1/2	1	—	—	003614
		Y	0.4040	2.7/8	4.1/2	1	—	—	003615
13/32			0.4063	2.7/8	4.1/2	1	003616	—	—
		Z	0.4130	2.7/8	4.1/2	1	—	—	003617
27/64			0.4219	2.7/8	4.1/2	1	003618	—	—
7/16			0.4375	2.7/8	4.1/2	1	003619	—	—
29/64			0.4531	3“	4.3/4	1	003620	—	—
15/32			0.4687	3“	4.3/4	1	003621	—	—
31/64			0.4844	3“	4.3/4	1	003622	—	—
1/2			0.5000	3“	4.3/4	1	003623	—	—

SOLID CARBIDE DRILL

General Purpose Solid Carbide Jobber Length, Metric

D33M Self Centering Point. Low thrust design. For abrasive or non-ferrous materials.



D33M

3XD

HM

118°



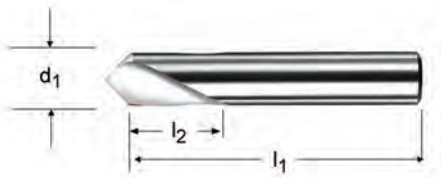
0.80 - 12.00

d_1 Ø mm	d_1 decimal Inch	l_2 mm	l_1 mm	Pack Qty	D33M
0.80	0.0315	12	31	1	003470
0.90	0.0354	16	35	1	003471
1.00	0.0394	16	38	1	003472
1.50	0.0591	19	38	1	003473
2.00	0.0787	22	44	1	003474
2.05	0.0807	22	44	1	003475
2.50	0.0984	25	50	1	003476
3.00	0.1181	32	57	1	003477
3.30	0.1299	32	57	1	003624
3.50	0.1378	35	63	1	003478
4.00	0.1575	35	63	1	003626
4.50	0.1772	41	70	1	003479
5.00	0.1969	44	75	1	003630
5.50	0.2165	44	75	1	003480
6.00	0.2362	50	82	1	003481
6.50	0.2559	50	82	1	003482
7.00	0.2756	54	89	1	003483
7.50	0.2953	60	95	1	003484
8.00	0.3150	60	95	1	003485
8.50	0.3346	63	100	1	003486
9.00	0.3543	70	100	1	003487
9.50	0.3740	70	108	1	003488
10.00	0.3937	73	114	1	003631
10.50	0.4134	73	114	1	003489
10.75	0.4232	73	114	1	003490
11.00	0.4331	73	114	1	003491
11.50	0.4528	76	120	1	003492
12.00	0.4724	76	120	1	003493

SOLID CARBIDE DRILL

General Purpose Solid Carbide Standard Length - Spotting Drill

DS-90 Provides spot location or chamfer for follow-up drilling operations.



	DS-90	DS-120	DS-142
	1XD	1XD	1XD
	HM	HM	HM
	90°	120°	142°
	1/8 - 1/2	1/8 - 1/2	1/8 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	DS-90	DS-120	DS-142
1/8	0.1250	3/8	2“	1	003332	7378063	7378069
3/16	0.1875	3/4	3“	1	003334	7378064	7378970
1/4	0.2500	3/4	3“	1	003336	7378068	7378974
5/16	0.3125	1“	2.1/2	1	003338	7378066	7378972
3/8	0.3750	1“	3“	1	003340	7378065	7378971
1/2	0.5000	1“	4“	1	003342	7378067	7378973

SPECIAL PURPOSE DRILL

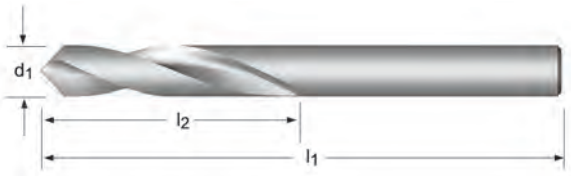
Spotting Drill - Short Length

SPS-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPSG-90 TiN Coating for increased wear resistance and improved tool life.

SPS-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPSG-120 TiN Coating for increased wear resistance and improved tool life.



SPS-90	SPSG-90	SPS-120	SPSG-120
			
1XD	1XD	1XD	1XD
HSS	HSS	HSS	HSS
			
90°	90°	120°	120°
			
1/4 - 1“	1/4 - 1“	1/4 - 1“	1/4 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPS-90	SPSG-90	SPS-120	SPSG-120
1/4	0.2500	3/4	2.1/2	1	087900	087906	087950	087956
3/8	0.3750	1.1/8	3.1/8	1	087901	087907	087951	087957
1/2	0.5000	1.3/8	3.3/4	1	087902	087908	087952	087958
5/8	0.6250	1.5/8	4.3/8	1	087903	087909	087953	087959
3/4	0.7500	1.7/8	5“	1	087904	087910	087954	087960
1“	1.0000	2.1/4	6“	1	087905	087911	087955	087961

SPECIAL PURPOSE DRILL

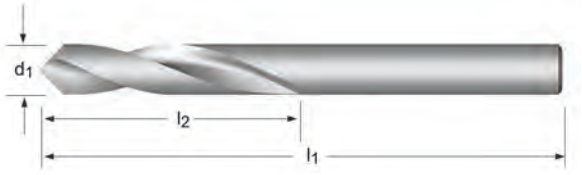
Spotting Drill - Regular Length

SPR-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPRG-90 TiN Coating for increased wear resistance and improved tool life.

SPR-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPRG-120 TiN Coating for increased wear resistance and improved tool life.



	SPR-90	SPRG-90	SPR-120	SPRG-120
	PRECISION	PRECISION	PRECISION	PRECISION
	1XD	1XD	1XD	1XD
	HSS	HSS	HSS	HSS
	90°	90°	120°	120°
				
	1/4 - 1“	1/4 - 1“	1/4 - 1“	1/4 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPR-90	SPRG-90	SPR-120	SPRG-120
1/4	0.2500	3/4	4“	1	087912	087918	087962	087968
3/8	0.3750	1.1/8	5“	1	087913	087919	087963	087969
1/2	0.5000	1.3/8	6“	1	087914	087920	087964	087970
5/8	0.6250	1.5/8	7“	1	087915	087921	087965	—
3/4	0.7500	1.7/8	8“	1	087916	087922	087966	—
1“	1.0000	2.1/4	8“	1	087917	087923	087967	—

SPECIAL PURPOSE DRILL

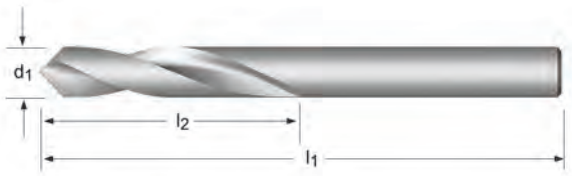
Spotting Drill - Long Length

SPL-90 Bright Finish improves chip flow in soft or non-ferrous materials

SPLG-90 TiN Coating for increased wear resistance and improved tool life.

SPL-120 Bright Finish improves chip flow in soft or non-ferrous materials

SPLG-120 TiN Coating for increased wear resistance and improved tool life.



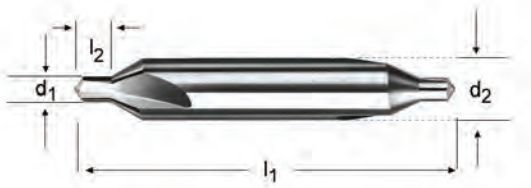
	SPL-90	SPLG-90	SPL-120	SPLG-120
	PRECISION	PRECISION	PRECISION	PRECISION
	1XD	1XD	1XD	1XD
	HSS	HSS	HSS	HSS
	90°	90°	120°	120°
				
	1/4 - 1“	1/4 - 1“	1/4 - 5/8	1/4 - 1/2

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	Pack Qty	SPL-90	SPLG-90	SPL-120	SPLG-120
1/4	0.2500	3/4	6“	1	087924	087930	087974	087980
3/8	0.3750	1.1/8	7“	1	087925	087931	087975	087981
1/2	0.5000	1.3/8	8“	1	087926	087932	087976	087982
5/8	0.6250	1.5/8	9“	1	087927	—	087977	—
3/4	0.7500	1.7/8	10“	1	087928	087934	—	—
1“	1.0000	2.1/4	10“	1	087929	087935	—	—

SOLID CARBIDE DRILL

General Purpose Combined Drill and Countersink (Center Drill)

DC 60° C'sink. Better abrasion resistance / Longer tool life. Bright Finish improves chip flow in soft or non-ferrous materials



DC











N0 - N6

Nr.	d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	DC
0	1/32	1/32	1.1/2	1/8	1	003251
1	3/64	3/64	1.1/2	1/8	1	003252
2	5/64	5/64	2“	3/16	1	003253
3	7/64	7/64	2“	1/4	1	003254
4	1/8	1/8	2.1/8	5/16	1	003255
5	3/16	3/16	2.3/4	7/16	1	003256
6	7/32	7/32	3“	1/2	1	003257

SPECIAL PURPOSE DRILL

General Purpose Combined Drill and Countersink (Center Drill)

76HA 60° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials



76HA

ANSI

1XD

HSS



N000 - N8

Nr.	d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	76HA
000	0.0200	0.0300	1.1/4	1/8	12	097630
00	0.0250	0.0300	1.1/8	1/8	12	097620
0	1/32	0.0380	1.1/8	1/8	12	097610
1	3/64	3/64	1.1/4	1/8	12	097601
2	5/64	5/64	1.7/8	3/16	12	097602
3	7/64	7/64	2"	1/4	12	097603
4	1/8	1/8	2.1/8	5/16	12	097604
5	3/16	3/16	2.3/4	7/16	6	097605
6	7/32	7/32	3"	1/2	6	097606
7	1/4	1/4	3.1/4	5/8	3	097607
8	5/16	5/16	3.1/2	3/4	1	097608

General Purpose Combined Drill and Countersink (Center Drill)

A225 60° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A217 82° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A217SET 5 pc. set consists of N1, N2, N3, N4 & N5

A218 90° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

A218SET 5 pc. set consists of N1, N2, N3, N4 & N5



A225	A217	A218
BS 328	ANSI	ANSI
1XD	1XD	1XD
HSS	HSS	HSS
60°	82°	90°
		
3/64 - 5/16	N1 - N8	N1 - N8

Nr.	d_1 Ø Inch	d_1 decimal Inch	l_2 max/min Inch	l_1 Inch	d_2 Ø Inch	Pack Qty	A225	A217	A218
BS1	3/64	0.0469	5/64 - 1/16	1.1/2	1/8	1	0172988	—	—
BS2	1/16	0.0625	3/32 - 5/64	1.3/4	3/16	1	0172995	—	—
BS3	3/32	0.0938	5/32 - 1/8	2"	1/4	1	0173008	—	—
BS4	1/8	0.1250	3/16 - 5/32	2.1/4	5/16	1	0173015	—	—
BS5	3/16	0.1875	9/32 - 1/4	2.1/2	7/16	1	0173022	—	—
BS5A	7/32	0.2188	5/16 - 9/32	2.3/4	1/2	1	0173039	—	—
BS6	1/4	0.2500	3/8 - 5/16	3"	5/8	1	0173046	—	—
BS7	5/16	0.3125	15/32 - 13/32	3.1/2	3/4	1	0173053	—	—
1		0.0469	.055-.067	1.1/4	1/8	1	—	0239216	—
1		0.0469	.055-.067	1.1/4	1/8	1	—	—	0239292
2		0.0781	.094-.106	1.7/8	3/16	1	—	0239223	—
2		0.0781	.094-.106	1.7/8	3/16	1	—	—	0239308
3		0.1094	.130-.154	2"	1/4	1	—	0239230	—
3		0.1094	.130-.154	2"	1/4	1	—	—	0239315
4		0.1250	.150-.173	2.1/8	5/16	1	—	0239247	—
4		0.1250	.150-.173	2.1/8	5/16	1	—	—	0239322
5		0.1875	.232-.256	2.3/4	7/16	1	—	0239254	—
5		0.1875	.232-.256	2.3/4	7/16	1	—	—	0239339
6		0.2188	.272-.295	3"	1/2	1	—	0239261	—
6		0.2188	.272-.295	3"	1/2	1	—	—	0239346
7		0.2500	.315-.339	3.1/4	5/8	1	—	0239278	—
7		0.2500	.315-.339	3.1/4	5/8	1	—	—	0239353
8		0.3125	.394-.417	3.1/2	3/4	1	—	0239285	—
8		0.3125	.394-.417	3.1/2	3/4	1	—	—	0239360

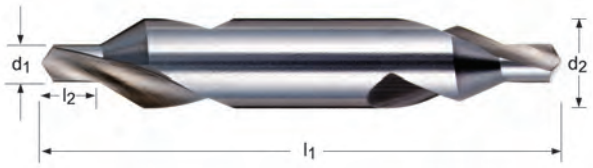
Set	Style	Pieces per set	Contents of set	Pack Qty	A217 set	A218 set
A217SET	A217	5	N1, N2, N3, N4, N5	1	0423912	—
A218SET	A218	5	N1, N2, N3, N4, N5	1	—	0423929

Cobalt Combined Drill and Countersink (Center Drill)

A221 60° C'sink. Cobalt base material for wear resistance. Bright Finish improves chip flow in soft or non-ferrous materials

A221SET

5 peice set includes N1, N2, N3, N4 & N5





Nr.	Set	d_1 Ø Inch	Style	d_1 decimal Inch	Pieces per Set	l_2 Inch	Contents of set	l_1 Inch	d_2 Ø Inch	Pack Qty	A221	A221SET
00		0.025		0.0250		1/32		1.1/8	1/8	1	0241851 [1)]	—
0		1/32		0.0313		1/32		1.1/8	1/8	1	0241844 [1)]	—
1		3/64		0.0469		3/64		1.1/4	1/8	1	0241868	—
2		5/64		0.0781		5/64		1.7/8	3/16	1	0241875	—
3		7/64		0.1094		7/64		2"	1/4	1	0241882	—
4		1/8		0.1250		1/8		2.1/8	5/16	1	0241899	—
5		3/16		0.1875		3/16		2.3/4	7/16	1	0241905	—
6		7/32		0.2188		7/32		3"	1/2	1	0241912	—
7		1/4		0.2500		1/4		3.1/4	5/8	1	0241929	—
8		5/16		0.3125		5/16		3.1/2	3/4	1	0241936	—
	A221SET		A221		5		N1, N2, N3, N4, N5			1	—	0423936

[1)] single ended only

SPECIAL PURPOSE DRILL

Threaded Hex Shank Drills

TS41 - *Stub, Wire Gauge Sizes*

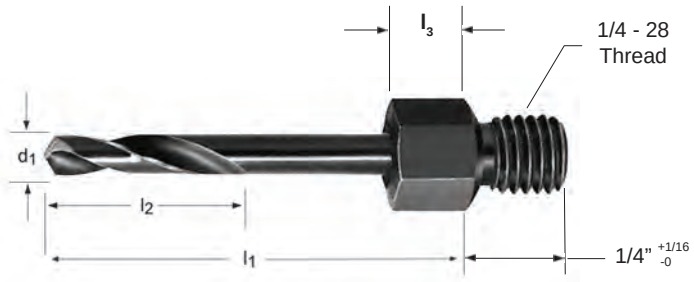
TS10 - *Short, Fractional Sizes*

TS18 - *Short, Wire Gauge Sizes*

TS51 - *Long. Fractional Sizes*

TS52 - *Long, Wire Gauge Sizes*

NAS-965 Type B Steam Oxide for increased wear resistance & lubricity. Shank design for drilling in confined spaces. Low thrust design self centering Split Point for easier penetration.
1/4-28 thread



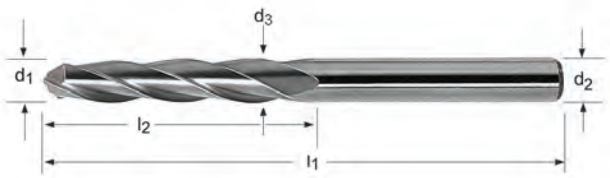
TS41	TS10 TS18	TS51 TS52
HSS	HSS	HSS
135°	135°	135°
		
N40 - N10	1/8 - 1/4 N40 - N10	1/8 - 1/4 N40 - N10

d_1 Ø Nr.	d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	l_3 lgth of hex flat	Pack Qty	TS41	TS10 TS18	TS51 TS52
40		0.0980	5/16	1/2	1/8	1	045840	—	—
40		0.0980	7/8	2.1/8	1/4	1	—	—	017940
40		0.0980	9/16	1“	1/4	1	—	045640	—
	1/8	0.1250	7/8	2.1/8	1/4	1	—	—	017958
	1/8	0.1250	9/16	1“	1/4	1	—	045708	—
30		0.1285	1.1/8	2.1/8	1/4	1	—	—	017930
30		0.1285	5/16	9/16	1/8	1	045830	—	—
30		0.1285	9/16	1.1/4	1/4	1	—	045630	—
	5/32	0.1563	1.1/8	2.1/8	1/4	1	—	—	017960
	5/32	0.1563	9/16	1.1/4	1/4	1	—	045710	—
21		0.1590	9/16	1.1/4	1/4	1	—	045621	—
21		0.1590	1.1/8	2.1/8	1/4	1	—	—	017921
20		0.1610	1.1/8	2.1/8	1/4	1	—	—	017920
20		0.1610	5/16	9/16	1/8	1	045820	—	—
20		0.1610	9/16	1.1/4	1/4	1	—	045620	—
	3/16	0.1875	1.1/8	2.1/8	1/4	1	—	—	017962
	3/16	0.1875	9/16	1.1/4	1/4	1	—	045712	—
11		0.1910	1.1/8	2.1/8	1/4	1	—	—	017911
11		0.1910	5/16	9/16	1/8	1	045811	—	—
11		0.1910	9/16	1.1/4	1/4	1	—	045611	—
10		0.1935	1.1/8	2.1/8	1/4	1	—	—	017910
10		0.1935	5/16	9/16	1/8	1	045810	—	—
10		0.1935	9/16	1.1/4	1/4	1	—	045610	—
	7/32	0.2188	1.1/8	2.1/8	5/16	1	—	—	017964
	7/32	0.2188	9/16	1.1/4	5/16	1	—	045714	—
	1/4	0.2500	1.1/8	2.1/8	5/16	1	—	—	017966
	1/4	0.2500	9/16	1.1/4	5/16	1	—	045716	—

SPECIAL PURPOSE DRILL

3-Flute Tapered Aircraft Router

ATR41 For cutting, trimming and routing without pre-drilling. 1/4“ Taper per foot. Bright Finish improves chip flow in soft or non-ferrous materials



ATR41











N1 - N4

Router Nr.	d_1 Ø Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	d_3 Ø Inch	# of Flutes	Pack Qty	ATR41
1	0.0810	0.0980	13/16	2“	0.0980	3	12	041701
2	0.1100	0.1280	7/8	2.1/4	0.1280	3	12	041702
3	0.1650	0.1875	1.1/16	2.1/2	0.1875	3	12	041703
4	0.2240	0.2500	1.1/4	2.3/4	0.2500	3	12	041704

JOBBER DRILL SETS

General Purpose Jobber Length Sets

C15R10P Bright Finish improves chip flow in
C29R10P soft or non-ferrous materials



C15R10 Steam Oxide reduces wear and chip
C29R10 welding in harder ferrous materials.



C15R10P C29R10P	C15R10 C29R10
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
	
Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	R10P Sets	R10 Sets
C15R10	R10	15	1/16 - 1/2 x 32nds	1	—	099978
C29R10	R10	29	1/16 - 1/2 x 64ths	1	—	099977
C15R10P	R10P	15	1/16-1/2 x 32nds	1	090163	—
C29R10P	R10P	29	1/16 - 1/2 x 64ths	1	090162	—

JOBBER DRILL SETS

General Purpose Jobber Length Sets

A097 Self centering Split Point, low thrust design. TiN Coated Tip increases surface hardness and improves tool life.



C20R18P
C60R18P Bright Finish improves chip flow in soft or non-ferrous materials



C20R18
C60R18 Steam Oxide for increased wear resistance & lubricity.



A097	C20R18 C60R18	C20R18P C60R18P
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS	HSS	HSS
118°	118°	118°
		
Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A097	R18 sets	R18P sets
12	A012	60	Nr.1 - Nr.60	1	0574324	—	—
14	A012	26	A - Z	1	0574331	—	—
18	A012	29	1/16 - 1/2 x 1/64	1	0574317	—	—
20	A012	15	1/16 - 1/2 x 1/32	1	0574348	—	—
30	A012	115	1/16 - 1/2 x 1/64, Nr.1 - Nr.60, A-Z	1	0574362	—	—
60	A012	13	1/16 - 1/4 x 1/64	1	0574355	—	—
C20R18	R18	20	N61 - N80	1	—	099981	—
C60R18	R18	60	N1 - N60	1	—	099976	—
C20R18P	R18P	20	N61 - N80	1	—	—	090161
C60R18P	R18P	60	N1 - N60	1	—	—	090101

JOBBER DRILL SETS

General Purpose Jobber Length and Combination Sets

C26R15P

Bright Finish improves chip flow in soft or non-ferrous materials



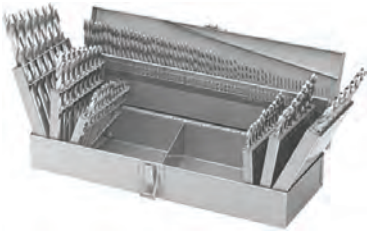
C26R15

Steam Oxide for increased wear resistance & lubricity.



C114COMBP
C115COMBP

Bright Finish improves chip flow in soft or non-ferrous materials



	C26R15P	C26R15	C115COMBP	C114COMBP
	ANSI	ANSI	ANSI	ANSI
	4XD	4XD	4XD	4XD
	HSS	HSS	HSS	HSS
	118°	118°	118°	118°
				
	Set	Set	Set	Set

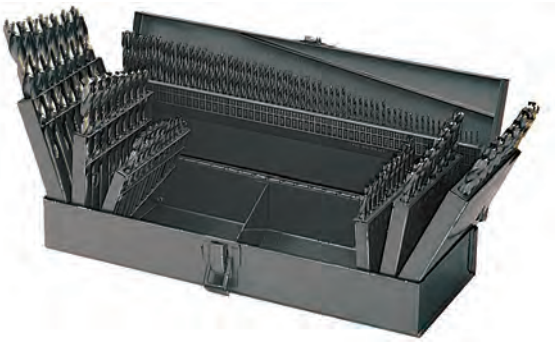
Set	Style	Pieces per Set	Sizes	Pack Qty	C26R15P	C26R15	C115COMBP	C114COMBP
C114COMBP	R10P, R18P, R10PM	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x 5 mm	1	—	—	—	090114
C115COMBP	R10P, R18P, R15P	115	1/16-1/2 x 64ths, N1-6N0, A-Z	1	—	—	090123	—
C26R15	R15	26	A - Z	1	—	099983	—	—
C26R15P	R15P	26	A - Z	1	090126	—	—	—

JOBBER DRILL SETS

General Purpose Jobber Length Combination Sets

C114COMB
C115COMB

Steam Oxide for increased wear resistance & lubricity.



C114COMB	C115COMB
ANSI	ANSI
4XD	4XD
HSS	HSS
118°	118°
	
Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C114COMB	C115COMB
C114COMB	R10, R18, 2AB	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x .5 mm	1	099990	—
C115COMB	R10, R18, R15	115	1/16-1/2 x 64ths, N1-N60, A-Z	1	—	099982

JOBBER DRILL SETS

General Purpose Jobber Length Metric Sets

A191
A190 Steam Oxide for increased wear resistance & lubricity.



C252A Bright Finish improves chip flow in soft or non-ferrous materials



C252AB
C502AB Steam Oxide for increased wear resistance & lubricity.



A191	A190	C252A	C252AB C502AB
DIN 338	DIN 338	DIN 338	DIN 338
4XD	4XD	4XD	4XD
HSS	HSS	HSS	HSS
118°	118°	118°	118°
			
Set	Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A191	A190	C252A	C252AB C502AB
12	A100	60	No.1 - No.60	1	—	0179437	—	—
18	A100	29	1/16 inch - 1/2 inch x 1/64 inch	1	—	0179451	—	—
20	A100	15	1/16 inch - 1/2 inch x 1/32 inch	1	—	0179468	—	—
201	A100	19	1.0 mm - 10.0 mm x 0.5 mm	1	—	0030547	—	—
202	A100	51	1.0 mm - 6.0 mm x 0.1 mm	1	—	0030554	—	—
203	A100	41	6.0 mm - 10.0 mm x 0.1 mm	1	—	0030561	—	—
204	A100	25	1.0 mm - 13.0 mm x 0.5 mm	1	—	0030578	—	—
206	A100	29	1.0 mm - 13.0 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	—	0030585	—	—
209	A100	91	1.0 mm - 10.0 mm x 0.1 mm	1	—	0179482	—	—
3	A100	21	1/16 inch - 3/8 inch x 1/64 inch	1	—	0179413	—	—
31M	A100	20	0.3 mm - 1.0 mm x 0.05 mm + 0.38 mm, 0.52 mm, 0.58 mm, 0.78 mm, 0.82 mm	1	0149133	—	—	—
413	A100	13	1.5 mm - 6.5 mm x 0.5 mm + 3.3 mm, 4.2 mm	1	0030608	—	—	—
419	A100	19	1.0 mm - 10.0 mm x 0.5 mm	1	0030615	—	—	—
61-80	A100	20	No.61 - No. 80	1	0179499	—	—	—
C252A	2A	25	1.0mm - 13mm x .5mm	1	—	—	099987	—
C252AB	2AB	25	1.0mm - 13mm x .5mm	1	—	—	—	099988
C502AB	2AB	50	1.0mm - 5.9mm x .1mm	1	—	—	—	099985

General Purpose Jobber Length Metric Sets

A094 Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases wear resistance and improves tool life.



A094

DIN 338

4XD

HSS

118°



Set

Set	Sizes	Pieces per Set	Sizes	Pack Qty	A094
413	A002	13	1.5 mm - 6.5 mm x 0.5 mm + 3.3 mm, 4.2 mm	1	46610302
419	A002	19	1.0 mm - 10.0 mm x 0.5 mm	1	46610303

General Purpose Jobber Length Metric Sets

A095 Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases wear resistance and improves tool life.



A095

DIN 338

4XD

HSS

118°



Set

Set	Style	Pieces per Set	C	Pack Qty	A095
18	A002	29	1/16 inch - 1/2 inch x 1/64 inch	1	0385395
20	A002	15	1/16 inch - 1/2 inch x 1/32 inch	1	46610305
200	A002	24	1.0 mm - 10.5 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	46610306
201	A002	19	1.0 mm - 10.0 mm x 0.5 mm	1	0385418
202	A002	51	1.0 mm - 6.0 mm x 0.1 mm	1	0385425
203	A002	41	6.0 mm - 10.0 mm x 0.1 mm	1	0385432
204	A002	25	1.0 mm - 13.0 mm x 0.5 mm	1	0385449
206	A002	29	1.0 mm - 13.0 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	0392331
209	A002	91	1.0 mm - 10.0 mm x 0.1 mm	1	0385562

JOBBER DRILL SETS

General Purpose Jobber Length Left Hand Sets

C15L10
C29L10

Bright Finish improves chip flow in soft or non-ferrous materials



	C15L10	C29L10
	ANSI	ANSI
	4XD	4XD
	HSS	HSS
	118°	118°
		
	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C15L10	C29L10
C15L10	L10	15	1/16-1/2 x 32nds, Left Hand	1	099955	—
C29L10	L10	29	1/16 - 1/2 x 64ths, Left Hand	1	—	099935

High Helix Jobber Length Set

A287 Low thrust design self centering Split Point for easier penetration. Steam Oxide surface treatment for increased wear resistance & lubricity. Fast spiral helix for improved chip flow when drilling stainless steel.



A287

ANSI

4XD

HSS

135°



Set

Set	Style	Pieces per Set	C	Pack Qty	A287
18	A108	29	1/16 - 1/2 x 1/64	1	0308523

JOBBER DRILL SETS

Heavy Duty Jobber Length Set

C29HX10 Low thrust design self centering Split Point for easier penetration. Stronger and more Rigid. Unique surface treatment for improved wear resistance.



C29HX10

ANSI

4XD

HSS

135°



Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29HX10
C29HX10	HX10	29	1/16 -1/2 x 64ths	1	091010

JOBBER DRILL SETS

Heavy Duty Cobalt Jobber Length Sets (NAS 907 Type J)

C13R10CO
C15R10CO
C21R10CO
C29R10CO
C60R18CO
C26R15CO

Low thrust design self centering 135° Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.



C13R10CO C15R10CO C21R10CO C29R10CO	C26R15CO	C60R18CO
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
		
Set	Set	Set

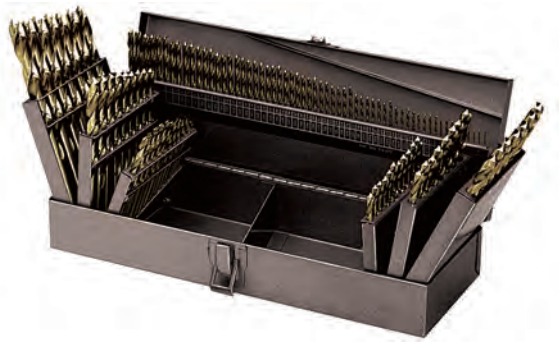
Set	Style	Pieces per Set	Sizes	Pack Qty	C29R10CO	C26R15CO	C60R18CO
C13R10CO	R10CO	13	1/16-1/4x 64ths	1	099944	—	—
C15R10CO	R10CO	15	1/16-1/2 x 32nds	1	090291	—	—
C21R10CO	R10CO	21	1/16-3/8 x 64ths	1	099701	—	—
C26R15CO	R15CO	26	A - Z	1	—	090292	—
C29R10CO	R10CO	29	1/16 - 1/2 x 64ths	1	090290	—	—
C60R18CO	R18CO	60	N1 - N60	1	—	—	090600

JOBBER DRILL SETS

Heavy Duty Cobalt Jobber Length Combination Sets (NAS 907 Type J)

C115COMBC
C114COMBC

Low thrust design self centering 135° Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.



	C115COMBC	C114COMBC
	ANSI	ANSI
	4XD	4XD
	HSS-E	HSS-E
	135°	135°
		
	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C115COMBC	C114COMBC
C114COMBC	R10CO, R18CO, 2ACO	114	1/16-1/2 x 64ths, N1-N60, 1-13mm x .5 mm	1	—	099705
C115COMBC	R10CO, R18CO, R15CO	115	1/16-1/2 x 64ths, N1-N60, A-Z	1	099706	—

SCREW MACHINE DRILL SETS

General Purpose Screw Machine Drill Sets

C29R40
C60R41
C26R42

Bright Finish improves chip flow in soft or non-ferrous materials



C29R40	C60R41	C26R42
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS	HSS	HSS
118°	118°	118°
		
Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R40	C60R41	C26R42
C26R42	R42	26	A - Z	1	—	—	090173
C29R40	R40	29	1/16-1/2 x 64ths	1	090170	—	—
C60R41	R41	60	N1 - N60	1	—	090174	—

General Purpose Screw Machine Drill Set

A088 Low thrust design self centering Split Point for easier penetration. TiN Coated Tip increases wear resistance and improves tool life.



A088

DIN ANSI

2.5XD

HSS

135°



Set

Set	Style	Pieces per Set	Sizes	Pack Qty	A088
200S	A022	24	1.0 mm - 10.5 mm x 0.5 mm + 3.3 mm, 4.2 mm, 6.8 mm, 10.2 mm	1	0616185

Heavy Duty Screw Machine Drill Set

C29R40C
C60R41C

Low thrust design self centering Split Point for easier penetration. Steam Oxide for increased wear resistance & lubricity.



	C29R40C	C60R41C
	ANSI	ANSI
	2.5XD	2.5XD
	HSS	HSS
	135°	135°
		
	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R40C	C60R41C
C29R40C	R40C	29	1/16 - 1/2 x 64ths	1	099903	—
C60R41C	R41C	60	N1 - N60	1	—	099930

SCREW MACHINE DRILL SETS

Cobalt Heavy Duty Screw Machine Drill Sets

C29M40CO
C60M41CO
C26M42CO

Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze Oxide for wear resistance and lubricity. Suitable for ferrous materials.



C29M40CO	C60M41CO	C26M42CO
ANSI	ANSI	ANSI
2.5XD	2.5XD	2.5XD
HSS-E	HSS-E	HSS-E
135°	135°	135°
		
Set	Set	Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29M40CO	C60M41CO	C26M42CO
C26M42CO	M42CO	26	A - Z	1	—	—	099961
C29M40CO	M40CO	29	1/16 - 1/2 x 64ths	1	099962	—	—
C60M41CO	M41CO	60	N1 - N60	1	—	099960	—

TAPER LENGTH DRILL SETS

General Purpose Taper Length Drill Sets

C29R51 Bright Finish improves chip flow in soft or non-ferrous materials. Longer Flute and Overall length for depth and reach.



C29R51

ANSI

6XD

HSS

118°



Set

Set	Style	Pieces per Set	Sizes	Pack Qty	C29R51
C29R51	R51	29	1/16 - 1/2 x 64ths	1	090154

REDUCED SHANK DRILL SETS

Reduced Shank Drill Sets

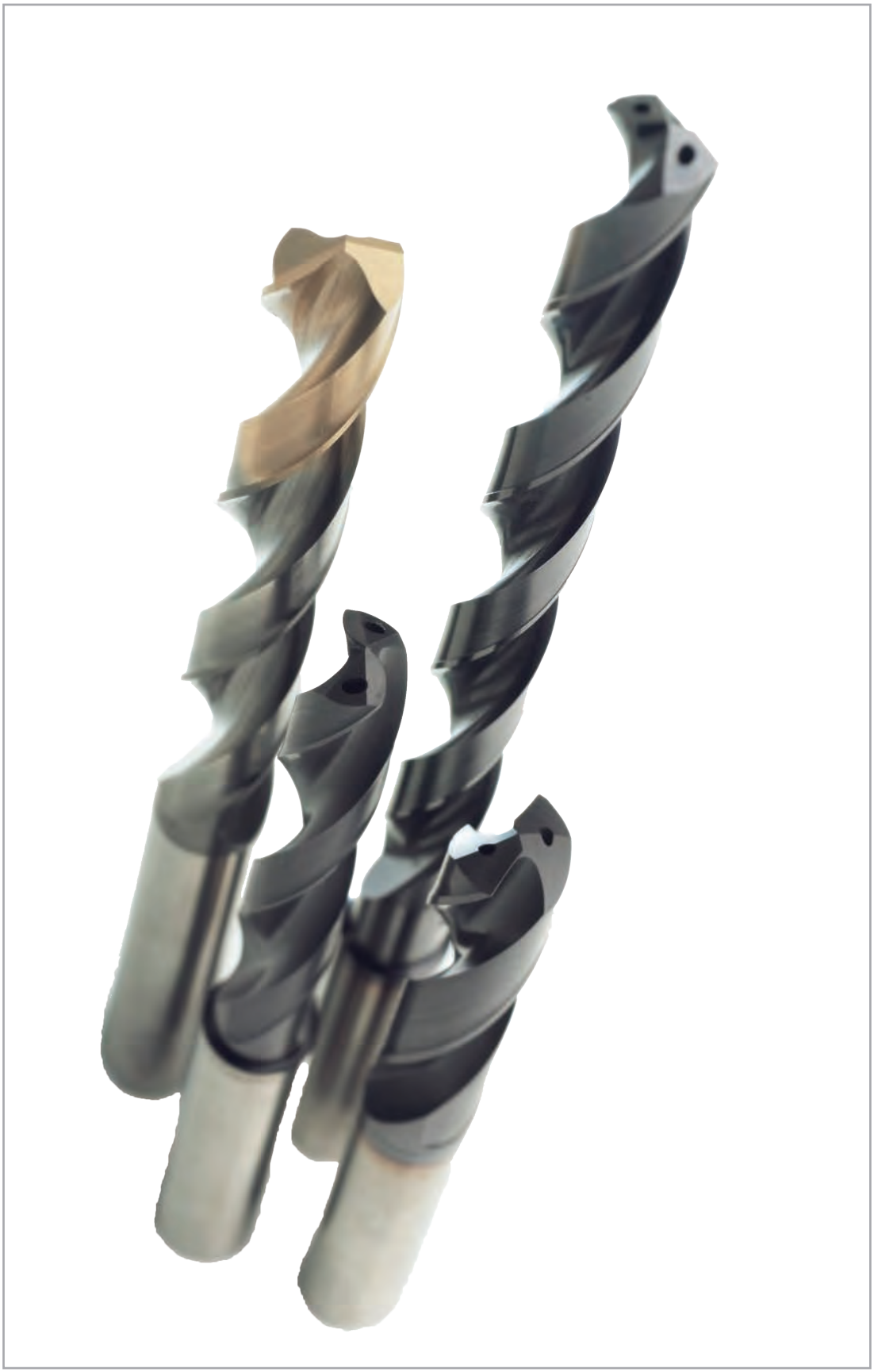
C8R56
C33R56 Silver & Deming Drills. Steam Oxide for increased wear resistance & lubricity.

C8R57 Silver & Deming Drills with **Tri-Flat** Shank. Steam Oxide for increased wear resistance & lubricity.

C8R56CO Heavy Duty Cobalt Silver & Deming Drills. Self centering 118° Split Point reduces thrust. Cobalt base material with Bronze/ Steam Oxide for wear resistance and lubricity. Suitable for ferrous materials.

C8R56 C33R56	C8R57	C8R56CO
ANSI	ANSI	ANSI
4XD	4XD	4XD
HSS	HSS	HSS-E
118°	118°	118°
		
Set	Set	Set

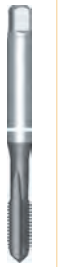
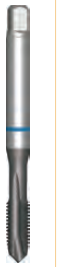
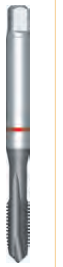
Set	Style	Pieces per Set	Sizes	Pack Qty	C8R56 C33R56	C8R57	C8R56CO
C33R56	R56	33	1/2“ Reduced Shank, 1/2 - 1“x 64ths, S&D	1	090231	—	—
C8R56	R56	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	090556	—	—
C8R56CO	R56CO	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	—	—	090328
C8R57	R57	8	1/2“ Reduced Shank, 9/16 - 1“ x 16ths, S&D	1	—	090558	—



Visual Index - Taps

DORMER

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Thread Form:	UNC	UNC	UNF	UNF	M	M	MF	MF	UNC	UNF	UNC	UNF	UNC	UNF	M	
Standard:	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	
Class of Fit:	2BX	2BX	2BX	2BX	6HX	6HX	6HX	6HX	2B	2B	2B 3B	2B 3B	2B	2B	6H	
Hole Type:																
Depth of Cut:	2XD	2.5XD	2XD	2.5XD	2XD	2.5XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	
Tool Material:	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	
Chamfer:	C 2-3	E 1.5-2	C 2-3	E 1.5-2	C 2-3	E 1.5-2	C 2-3	E 1.5-2	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	
Flute Geometry:																
Direction of Cut:																
Finish/Coating:	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	
Coolant Through:																
																
Style:	E814	E815	E914	E915	E630	E631	E770	E771	E809	E909	E813	E913	E811	E911	E625	
Range:	1/4 - 1"	1/4 - 1"	No.10 - 7/8	1/4 - 1"	M5 - M24	M6 - M24	M8 - M14	M10 - M14	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"	no.10 - 1"	M4 - M24	
Page #	236	236	236	236	237	237	237	237	238	238	239	239	241	241	242	

AMG																ISO
1.1									■ 108	■ 108					■ 108	P 1
1.2									■ 95	■ 95	● 72	● 72			■ 95	P 1
1.3									■ 75	■ 75	● 59	● 59			■ 75	P 2
1.4									● 69	● 69	● 52	● 52	■ 98	■ 98	● 69	P 3
1.5									● 43	● 42	● 33	● 33	■ 66	■ 66	● 43	P 4
1.6													● 36	● 36		H 1
1.7																H 3
1.8																H 4
2.1											■ 46	■ 46				M 1
2.2											■ 33	■ 33				M 3
2.3											■ 20	■ 20				M 2
2.4																S 2
3.1	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98	■ 98								K 1
3.2	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82	■ 82								K 2
3.3	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115	■ 115								K 3
3.4	● 82	● 82	● 82	● 82	● 82	● 82	● 82	● 82								K 4
4.1																S 1
4.2													● 33	● 33		S 2
4.3																S 3
5.1																S 1
5.2													● 33	● 33		S 2
5.3																S 3
6.1									■ 39	■ 39					■ 39	N 3
6.2	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98	● 98					● 98	N 3
6.3									■ 66	■ 66					■ 66	N 3
6.4	● 16	● 16	● 16	● 16	● 16	● 16	● 16	● 16								N 4
7.1																N 1
7.2																N 1
7.3																N 1
7.4	● 66	● 66	● 66	● 66	● 66	● 66	● 66	● 66								N 2
8.1																O
8.2	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49	■ 49								O
8.3																O
9.1																H
10.1																O

SHARK LINE

Visual Index - Taps

DORMER

	MF	M	MF	M	MF	UNC	UNF	UNC	UNF	UNC	UNF	M	MF	M	MF	M	MF	
	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	
	6H	6H	6H	6H	6H	2B	2B	2B 3B	2B 3B	2B	2B	6H	6H	6H	6H	6H	6H	
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	2XD	2XD	2.5XD	2.5XD	2.5XD	2.5XD	
	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	HSS-E PM	
	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	
						λ40°	λ40°	λ40°	λ40°	λ45°	λ45°	λ40°	λ40°	λ40°	λ40°	λ45°	λ45°	
	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	TiAlN Top	TiAlN Top	Super B	Super B	TiAlN Top	TiAlN Top	
																		
	E765	E629	E769	E627	E767	E808	E908	E812	E912	E810	E910	E624	E764	E628	E768	E626	E766	
	M8 - M18	M4 - M24	M8 - M18	M3 - M24	M8 - M14	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	M4 - M24	M8 - M18	M4 - M24	M8 - M18	M3 - M24	M8 - M14	
🕮	242	243	243	244	244	245	245	246	246	248	248	249	248	250	250	251	251	

AMG																		ISO
1.1	■ 108					■ 108	■ 108					■ 108	■ 108					P 1
1.2	■ 95	● 72	● 72			■ 95	■ 95	● 72	● 72			■ 95	■ 95	● 72	● 72			P 1
1.3	■ 75	● 59	● 59			■ 75	■ 75	● 59	● 59			■ 75	■ 75	● 59	● 59			P 2
1.4	● 69	● 52	● 52	■ 98	■ 98	● 69	● 69	● 52	● 52	■ 98	■ 98	● 69	● 69	● 52	● 52	■ 98	■ 98	P 3
1.5	● 43	● 33	● 33	■ 66	■ 66	● 43	● 43	● 33	● 33	■ 66	■ 66	● 43	● 43	● 33	● 33	■ 66	■ 66	P 4
1.6				● 36	● 36					● 36	● 36					● 36	● 36	H 1
1.7																		H 3
1.8																		H 4
2.1		■ 46	■ 46					■ 46	■ 46					■ 46	■ 46			M 1
2.2		■ 33	■ 33					■ 33	■ 33					■ 33	■ 33			M 3
2.3		■ 20	■ 20					■ 20	■ 20					■ 20	■ 20			M 2
2.4																		S 2
3.1																		K 1
3.2																		K 2
3.3																		K 3
3.4																		K 4
4.1																		S 1
4.2				● 33	● 33					● 33	● 33					● 33	● 33	S 2
4.3																		S 3
5.1																		S 1
5.2				● 33	● 33					● 33	● 33					● 33	● 33	S 2
5.3																		S 3
6.1	■ 39					■ 39	■ 39					■ 39	■ 39					N 3
6.2	● 98					● 98	● 98					● 98	● 98					N 3
6.3	■ 66					■ 66	■ 66					■ 66	■ 66					N 3
6.4																		N 4
7.1																		N 1
7.2																		N 1
7.3																		N 1
7.4																		N 2
8.1																		O
8.2																		O
8.3																		O
9.1																		H
10.1																		O

DORMER

Visual Index - Taps

	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	M	MF	M
	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	ANSI	DIN 2184-1	DIN 2184-1	DIN 2184-1	DIN 2184-1	ISO 529	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI
	2B	2B	2B	2B	3B	3B	3B	3B	2B	2B	2B	2B	2B	2B	6H	6H	6H
	3XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	3XD	3XD	3XD
	HSS PM	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM	HSS PM
	P	P	P	P	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3	B 3.5-5	C 2-3	B 3.5-5	B 3.5-5	P	P	P
	TiCN	TiCN	TiCN	TiCN			ST	ST			ST	ST	ST	ST	TiCN	TiCN	TiCN
	1672AP (UNC)	1672AP (UNF)	1674 (UNC)	1674 (UNF)	E025	E035	E026	E036	EP20	EP30	EP21	EP31	E021	E031	1673AP (M)	1673AP (MF)	1675 (M)
	No.4 - 1"	No.10 - 3/4	1/4 - 1"	1/4 - 1"	No.6 - 1"	No.6 - 1"	No.2 - 1"	No.10 - 1"	No.4 - 1"	No.8 - 1"	No.4 - 1"	No.8 - 1"	No.2 - 1"	No.8 - 1"	M4 - M24	M8 - M24	M12 - M20
📖	253	252	252	252	253	253	253	253	255	255	255	255	256	256	257	257	257
1.1	110	110	120	120	82	82	82	82	82	82	82	82	82	82	110	110	120
1.2	90	90	100	100	72	72	72	72	72	72	72	72	72	72	90	90	100
1.3	55	55	65	65	59	59	59	59	59	59	59	59	59	59	55	55	65
1.4	55	55	65	65	52	52	52	52	52	52	52	52	52	52	55	55	65
1.5	45	45	50	50	33	33	33	33	33	33	33	33	33	33	45	45	50
1.6					16	16	16	16	16	16	16	16	16	16			
1.7																	
1.8																	
2.1	50	50	60	60			26	26			23	23	23	23	50	50	60
2.2	40	40	40	40			23	23			20	20	20	20	40	40	40
2.3	40	40	45	45			16	16			13	13	13	13	40	40	45
2.4																	
3.1					49	49	49	49	49	49	49	49	49	49			
3.2					26	26	26	26	26	26	26	26	26	26			
3.3					49	49	49	49	49	49	49	49	49	49			
3.4					26	26	26	26	26	26	26	26	26	26			
4.1	35	35	40	40	33	33			33	33					35	35	40
4.2	25	25	30	30	16	16			16	16					25	25	30
4.3																	
5.1	35	35	40	40	39	39			39	39					35	35	40
5.2	20	20	25	25	16	16			16	16					20	20	25
5.3																	
6.1	45	45	50	50	39	39			39	39					45	45	50
6.2	120	120	125	125	98	98			98	98					120	120	125
6.3	100	100	110	110	66	66			66	66					100	100	110
6.4																	
7.1	85	85	95	95	52	52			52	52					85	85	95
7.2	100	100	120	120	115	115			115	115					100	100	120
7.3	85	85	95	95	66	66			66	66					85	85	95
7.4	30	30	40	40	49	49			49	49					30	30	40
8.1					98	98			98	98							
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

DORMER

	M	M	MF	M	M	MF	MF	M	M	MF	M	UNC	UNF	M	M	M	UNC
	ANSI	ANSI	ANSI	DIN 371<10 376>12	DIN 371<10 376>12	DIN 374	DIN 374	ISO 529	ISO 529	ISO 529	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI	DIN 371	DIN 376	ANSI
	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	2B	2B	6H	6HX	6HX	2B
	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2XD	2XD	2.5XD
	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM	HSS PM	HSS-E PM	HSS-E PM	HSS
	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	B 3.5-5	P	P	P	C 2-3	C 2-3	
		ST	ST		ST		ST		ST	ST	TiN	TiAlN Top	TiAlN Top	TiAlN Top	ST	ST	ST
	E005	E006	E016	EP006H	EP016H	EP10	EP11	E000	E001	E011	E000TIN	1629AP (UNC)	1629AP (UNF)	1659AP (M)	E201	E252	1985 (UNC)
	M4 - M20	M4 - M20	M8 - M14	M2 - M30	M2 - M30	M4 - M30	M4 - M30	M1.6 - M24	M1.6 - M24	M4 - M24	M3 - M20	No.4 - 1"	No.10 - 5/8	M3 - M12	M3 - M10	M8 - M24	No.4 - 1"
📖	258	258	258	259	259	260	260	261	261	261	261	263	263	264	265	265	266
1.1	82	82	82	82	82	82	82	82	82	82	131						75
1.2	72	72	72	72	72	72	72	72	72	72	131						69
1.3	59	59	59	59	59	59	59	59	59	59	105						49
1.4	52	52	52	52	52	52	52	52	52	52	89						49
1.5	33	33	33	33	33	33	33	33	33	33	43	45	45	45			30
1.6	16	16	16	16	16	16	16	16	16	16	36	25	25	25			16
1.7																	
1.8																	
2.1		26	26		23		23		23	23	26						36
2.2		23	23		20		20		20	20	23						20
2.3		16	16		13		13		13	13	16						
2.4												30	30	30			
3.1	49	49	49	49	49	49	49	49	49	49	72	90	90	90	49	49	
3.2	26	26	26	26	26	26	26	26	26	26	59	70	70	70	26	26	
3.3	49	49	49	49	49	49	49	49	49	49	82	65	65	65	49	49	
3.4	26	26	26	26	26	26	26	26	26	26	59	35	35	35	26	26	
4.1	33			33		33		33			49						20
4.2	16			16		16		16			23						16
4.3												10	10	10			7
5.1	39			39		39		39			59						30
5.2	16			16		16		16			26						16
5.3												15	15	15			10
6.1	39			39		39		39			59						
6.2	98			98		98		98			148				66	66	
6.3	66			66		66		66			115						
6.4												25	25	25	16	16	
7.1	52			52		52		52									
7.2	115			115		115		115									
7.3	66			66		66		66			98						
7.4	49			49		49		49			72				49	49	
8.1	98			98		98		98									
8.2											148				33	33	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	M	MF
	ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI	ANSI	DIN 2184-1	DIN 2184-1	DIN 2184-1	DIN 2184-1	ISO 529	ISO 529	DIN ANSI	DIN ANSI
	2B	2B	2B	2B	2B	3B	3B	3B	3B	2B	2B	2B	2B	2B	2B	6H	6H
	2.5XD	3XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	3XD	3XD
	HSS	HSS PM	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM
		Semi-B	Semi-B	Semi-B	Semi-B	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	Semi-B	Semi-B
		λ50°	λ50°	λ50°	λ50°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ50°	λ50°
	ST	TiCN	TiCN	TiCN	TiCN			ST	ST			ST	ST	ST	ST	TiCN	TiCN
	1985 (UNF)	1676AP (UNC)	1676AP (UNF)	1678 (UNC)	1678 (UNF)	E027	E037	E028	E038	EX20	EX30	EX21	EX31	E023	E033	1677AP (M)	1677AP (MF)
	No.4 - 7/8	No.4 - 1"	No.10 - 7/8	1/4 - 1"	1/4 - 7/8	No.6 - 1"	No.10 - 1"	No.4 - 1"	No.10 - 1"	No.4 - 1"	No.8 - 1"	No.4 - 1"	No.8 - 1"	No.2 - 1"	No.8 - 1"	M4 - M24	M8 - M24
📖	266	267	267	267	267	268	268	268	268	269	269	269	269	270	270	271	271
1.1	75	100	100	110	110	82	82	82	82	82	82	82	82	82	82	100	100
1.2	69	80	80	90	90	72	72	72	72	72	72	72	72	72	72	80	80
1.3	49	50	50	55	55	59	59	59	59	59	59	59	59	59	59	50	50
1.4	49	50	50	55	55	52	52	52	52	52	52	52	52	52	52	50	50
1.5	30	40	40	45	45	33	33	33	33	33	33	33	33	33	33	40	40
1.6	16						16		16						16		
1.7																	
1.8																	
2.1	36	45	45	50	50			23	23			23	23	23	23	45	45
2.2	20	30	30	35	35			20	20			20	20	20	20	30	30
2.3		35	35	40	40			13	13			13	13	13	13	35	35
2.4																	
3.1																	
3.2																	
3.3																	
3.4																	
4.1	20	30	30	35	35	33	33			33	33					30	30
4.2	16	20	20	25	25	16	16			16	16					20	20
4.3	7																
5.1	30	30	30	35	35	39	39			39	39					30	30
5.2	16	15	15	20	20	16	16			16	16					15	15
5.3	10																
6.1		40	40	45	45	39										40	40
6.2		100	100	120	120	98										100	100
6.3		90	90	100	100	66										90	90
6.4																	
7.1		80	80	90	90	52	52			52	52					80	80
7.2		95	95	115	115	115	115			115	115					95	95
7.3		80	80	90	90	66	66			66	66					80	80
7.4		30	30	35	35	49	49			49	49					30	30
8.1						98	98										
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

DORMER

	M	M	M	MF	M	M	MF	MF	M	M	MF	UNC	UNF	M	UNC	UNF	M
	DIN ANSI	ANSI	ANSI	ANSI	DIN 371<10 376>12	DIN 371<10 376>12	DIN 374	DIN 374	ISO 529	ISO 529	ISO 529	DIN ANSI	DIN ANSI	DIN ANSI	ANSI	ANSI	ANSI
	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	2B	2B	6H	2B 3B	2B 3B	6H
	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	1.5XD	1.5XD	1.5XD			
	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM
	Semi-B	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	C 2-3	Semi-B	Semi-B	Semi-B	E 1.5-2	E 1.5-2	E 1.5-2
	λ50°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ45°	λ17°	λ17°	λ17°			
	TiCN		ST	ST		ST		ST		ST	ST	TiAlN Top	TiAlN Top	TiAlN Top	TiN	TiN	TiN
	1679 (M)(MF)	E007	E008	E018	EX006H	EX016H	EX10	EX11	E002	E003	E013	1630AP (UNC)	1630AP (UNF)	1660AP (M)	1641 (UNC)	1641 (UNF)	1671 (M)
	M6 - M24	M4 - M16	M4 - M20	M8 - M14	M2 - M64	M2 - M64	M4 - M30	M4 - M30	M2 - M24	M2 - M24	M4 - M22	No.4 - 1"	No.10 - 7/8	M3 - M12	No.4 - 1/2	No.10 - 3/8	M3 - M10
🕮	271	272	272	272	273	273	274	274	275	275	275	276	276	277	278	278	279
1.1	110	82	82	82	82	82	82	82	82	82	82				150	150	150
1.2	90	72	72	72	72	72	72	72	72	72	72				125	125	125
1.3	55	59	59	59	59	59	59	59	59	59	59				90	90	90
1.4	55	52	52	52	52	52	52	52	52	52	52				90	90	90
1.5	45	33	33	33	33	33	33	33	33	33	33	45	45	45			
1.6												25	25	25			
1.7																	
1.8																	
2.1	50		23	23		23		23		23	23				70	70	70
2.2	35		20	20		20		20		20	20				60	60	60
2.3	40		13	13		13		13		13	13				50	50	50
2.4												30	30	30			
3.1												90	90	90			
3.2												70	70	70			
3.3												65	65	65			
3.4												35	35	35			
4.1	35	33			33		33		33						60	60	60
4.2	25	16			16		16		16								
4.3												10	10	10			
5.1	35	39			39		39		39						45	45	45
5.2	20	16			16		16		16								
5.3												15	15	15			
6.1	45														55	55	55
6.2	120														180	180	180
6.3	100														130	130	130
6.4												25	25	25			
7.1	89	52			52		52		52						180	180	180
7.2	115	115			115		115		115						200	200	200
7.3	90	66			66		66		66						230	230	230
7.4	35	49			49		49		49								
8.1																	
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNF	UNC	UNF	M	MF	M	G	G	G	G	G	G	UNC	UNF	UNS	UNC
	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN ANSI	DIN 5156	DIN 5156	DORMER ISO	DIN 5156	DIN 5156	DORMER ISO	ANSI	ANSI	ANSI	ANSI
	2B	2B	2B	2B	6H	6H	6H	Normal	Normal	Normal	Normal	Normal	Normal	2B 3B	2B 3B	3B	2B 3B
	3XD	3XD	3XD	3XD	3XD	3XD	3XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS PM	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS	HSS	HSS	HSS
	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	Semi-B	B 3.5-5	B 3.5-5	B 3.5-5	C 2-3	C 2-3	C 2-3				
											λ45°	λ45°	λ45°				
	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top	TiN Top		ST	ST		ST	ST				
																	
	1681AP (UNC)	1681AP (UNF)	1691AP (UNC)	1691AP (UNF)	1687AP (M)	1687AP (MF)	1697AP (M)	EP40	EP41	E041	EX40	EX41	E043	1500 (UNC)	1500 (UNF)	1500 (UNS)	1528 (UNC)
	No.4 - 1"	No.10 - 7/8	1/4 - 1"	5/16 - 1/2	M4 - M20	M10 - M16	M6 - M20	1/8 - 1"	1/8 - 1"	1/8 - 3/4	1/8 - 1.1/2	1/8 - 1.1/2	1/8 - 3/4	1/4 - 1.1/2	1/4 - 1.1/2	11/16 - 1"	No.1 - No.12
🕮	280	280	281	281	282	282	282	283	283	284	285	285	286	287	287	287	287
1.1	150	150	165	165	150	150	165	82	82	82	82	82	82	60	60	60	60
1.2	125	125	135	135	125	125	135	72	72	72	72	72	72	45	45	45	45
1.3	90	90	100	100	90	90	100	59	59	59	59	59	59	30	30	30	30
1.4	90	90	100	100	90	90	100	52	52	52	52	52	52	30	30	30	30
1.5								33	33	33	33	33	33	20	20	20	20
1.6								16	16	16			16	10	10	10	10
1.7																	
1.8																	
2.1	70	70	80	80	70	70	80		23	23		23	23	25	25	25	25
2.2	60	60	70	70	60	60	70		20	20		20	20	15	15	15	15
2.3	50	50	60	60	50	50	60		13	13		13	13	15	15	15	15
2.4																	
3.1								49	49	49				50	50	50	50
3.2								26	26	26				30	30	30	30
3.3								49	49	49				30	30	30	30
3.4								26	26	26				15	15	15	15
4.1	60	60	70	70	60	60	70	33			33			20	20	20	20
4.2								16			16			15	15	15	15
4.3																	
5.1	45	45	55	55	45	45	55	39			39			20	20	20	20
5.2								16			16			10	10	10	10
5.3																	
6.1	55	55	70	70	55	55	70	39						25	25	25	25
6.2	180	180	200	200	180	180	200	98						80	80	80	80
6.3	130	130	160	160	130	130	160	66						60	60	60	60
6.4														10	10	10	10
7.1	180	180	200	200	180	180	200	52			52			50	50	50	50
7.2	200	200	240	240	200	200	240	115			115			100	100	100	100
7.3	230	230	260	260	230	230	260	66			66			75	75	75	75
7.4								49			49			20	20	20	20
8.1								98			98			25	25	25	25
8.2														15	15	15	15
8.3																	
9.1																	
10.1																	

Visual Index - Taps

DORMER

	UNF	UNC	UNF	UNC	UNF	M	MF	UNC	UNF	UNS	UNC	UNF	UNC	UNF	UNC	UNF	M
	ANSI	ANSI	ANSI	ANSI	ANSI	ISO 529	ISO 529	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	2B 3B	3B	3B	3B	3B	6H	6H	3B	3B	3B	2B 3B	2B 3B	3B	2B 3B	3B	3B	6H
	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
		ST	ST	TiN	TiN												
	1528 (UNF)	1500A (UNC)	1500A (UNF)	TN1500 (UNC)	TN1500 (UNF)	E500	E513	1500L (UNC)	1500L (UNF)	1500L (UNS)	E061	E071	1508 (UNC)	1508 (UNF)	1595 (UNC)	1595 (UNF)	1700 (M)
	No.0 - No.12	1/4 - 1"	1/4 - 7/8	1/4 - 7/8	1/4 - 3/4	M1 - M56	M3 - M50	1/4 - 1"	1/4 - 1"	1"	No.6 - 1.1/2	No.6 - 1.1/2	1/4 - 1/2	1/4 - 1/2	1/4 - 5/16	1/4 - 1/4	M1.6 - M36
📖	287	290	290	297	297	292	294	296	296	296	297	297	298	298	298	298	299
1.1	60	60	60	59	59	23	23	60	60	60	72	72	60	60	66	66	49
1.2	45	45	45	46	46	20	20	45	45	45	66	66	45	45	59	59	36
1.3	30	30	30	30	30	16	16	30	30	30	52	52	30	30	39	39	26
1.4	30	30	30	30	30	13	13	30	30	30	39	39	30	30	39	39	26
1.5	20	20	20	20	20	10	10	20	20	20	23	23	20	20	26	26	16
1.6	10	10	10	10	10			10	10	10	13	13	10	10	16	16	7
1.7																	
1.8																	
2.1	25	25	25	26	26			25	25	25			25	25	30	30	20
2.2	15	15	15	26	26			15	15	15			15	15	20	20	13
2.3	15	15	15	16	16			15	15	15			15	15	20	20	13
2.4																	
3.1	50	50	50	49	49	39	39	50	50	50	39	39	50	50	46	46	39
3.2	30	30	30	30	30	23	23	30	30	30	23	23	30	30	26	26	26
3.3	30	30	30	30	30	33	33	30	30	30	33	33	30	30	26	26	26
3.4	15	15	15	16	16	16	16	15	15	15	16	16	15	15	16	16	13
4.1	20	20	20	20	20			20	20	20			20	20	20	20	16
4.2	15	15	15	16	16			15	15	15			15	15	16	16	13
4.3															7	7	
5.1	20	20	20	20	20			20	20	20			20	20	26	26	16
5.2	10	10	10	10	10			10	10	10			10	10	10	10	7
5.3																	
6.1	25	25	25	26	26	13	13	25	25	25	39	39	25	25	30	30	20
6.2	80	80	80	79	79	33	33	80	80	80	98	98	80	80	89	89	66
6.3	60	60	60	59	59	23	23	60	60	60	66	66	60	60	69	69	49
6.4	10	10	10	10	10	7	7	10	10	10			10	10	10	10	7
7.1	50	50	50	49	49			50	50	50			50	50	49	49	39
7.2	100	100	100	98	98	39	39	100	100	100			100	100	98	98	79
7.3	75	75	75	75	75	23	23	75	75	75	66	66	75	75	66	66	59
7.4	20	20	20	20	20	16	16	20	20	20	49	49	20	20	20	20	16
8.1	25	25	25	30	30			25	25	25			25	25	98	98	26
8.2	15	15	15	16	16	16	16	15	15	15	39	39	15	15	26	26	13
8.3						10	10				23	23					
9.1																	
10.1																	

Visual Index - Taps

	M	UNC	UNS	UNC	UNF	UNC	UNF	M	M	M	UNC	UNF	UNC	UNF	UNC	UNF	UNC
	ISO 529	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ISO 529	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	6H		2B	3B	3B	2B	2B	6H	6H	6H	2B 3B	2B 3B	2B	2B	3B	3B	2B 3B
	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
		P															
	N	N	N/ST	N/ST	N	N	TiN	TiN	TiN	ST
	E501	1500OV (UNC)	1505 (UNS)	1599 (UNC)	1599 (UNF)	1600 (UNC)	1600 (UNF)	1599 (M)	1599SB (M)	E504	1534 (UNC)	1534 (UNF)	TN1534 (UNC)	TN1534 (UNF)	1585 (UNC)	1585 (UNF)	1585A (UNC)
	M3 - M24	1/4 - 5/8	1.1/8 - 2"	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4	M6 - M14	M6 - M12	M3 - M24	No.5 - No.12	No.5 - No.12	No.4 - No.12	No.10	1/4 - 3/4	1/4 - 3/4	1/4 - 3/4
📖	300	301	302	303	303	303	303	304	304	305	306	306	306	306	307	307	307
1.1	23	49	49							46	66	66	79	79	66	66	66
1.2	20	36	36							39	66	66	75	75	66	66	66
1.3	16	26	26							33	39	39	49	49	39	39	39
1.4	13	26	26							26	39	39	49	49	39	39	39
1.5	10	16	16							20	26	26	30	30	26	26	26
1.6		7	7								16	16	20	20	16	16	16
1.7																	
1.8																	
2.1		20	20								30	30	39	39	30	30	30
2.2		13	13								20	20	26	26	20	20	20
2.3		13	13								20	20	26	26	20	20	20
2.4																	
3.1	39	39	39	49	49	49	49	49	49	59	46	46	49	49	46	46	46
3.2	23	26	26	36	36	36	36	36	36	39	26	26	30	30	26	26	26
3.3	33	26	26	36	36	36	36	36	36	72	26	26	30	30	26	26	26
3.4	16	13	13	20	20	20	20	20	20	39	16	16	20	20	16	16	16
4.1		16	16								20	20			20	20	20
4.2		13	13								16	16			16	16	16
4.3											7	7			7	7	7
5.1		16	16								26	26	30	30	26	26	26
5.2		7	7								10	10	13	13	10	10	10
5.3																	
6.1	13	20	20								30	30	39	39	30	30	30
6.2	33	66	66							66	89	89	115	115	89	89	89
6.3	23	49	49							46	69	69	89	89	69	69	69
6.4	7	7	7	13	13	13	13	13	13	13	10	10	13	13	10	10	10
7.1		39	39								49	49	66	66	49	49	49
7.2	39	79	79							79	98	98	125	125	98	98	98
7.3	23	59	59							46	66	66	79	79	66	66	66
7.4	16	16	16							33	20	20	26	26	20	20	20
8.1		26	26								98	98	121	121	98	98	98
8.2	16	13	13	13	13	13	13	13	13	33	26	26	30	30	26	26	26
8.3	10									20							
9.1																	
10.1																	

Visual Index - Taps

DORMER

	UNF	UNC	UNF	UNC	UNF	M	M	UNC	UNF	UNS	UNC	UNF	M	UNC	UNF	UNC	UNF
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	2B 3B	2B 3B	3B	3B	3B	6H	6H	2B 3B	2B 3B	3B	2B 3B	2B 3B	6H	3B	2B 3B	2B 3B	2B 3B
	2.5XD	2.5XD	2.5XD	2.5XD	1.25XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD
	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
				P	P									P	P		
	ST	TIN	TIN				TIN										
																		
	1585A (UNF)	TN1585 (UNC)	TN1585 (UNF)	1634 (UNC)	1634 (UNF)	1785M	TN1785	1534NR (UNC)	1534NR (UNF)	1534NR (UNS)	1585NR (UNC)	1585NR (UNF)	1785NR	1534NE (UNC)	1534NE (UNF)	1593 (UNC)	1593 (UNF)
	1/4 - 3/4	1/4 - 1/2	1/4 - 1/2	No.4 - No.8	No.10	M2 - M18	M4 - M12	No.1 - No.12	No.0 - No.12	No.4	1/4 - 3/4	1/4 - 3/4	M1.6 - M20	No.4 - 1/2	No.10 - 1/2	No.6 - No.10	No.10
📖	307	307	307	309	309	310	310	311	311	311	313	313	314	315	315	316	316
1.1	66	79	79	66	66	66	79	66	66	66	66	66	66	66	66	66	66
1.2	66	75	75	66	66	66	75	66	66	66	59	59	59	66	66	66	66
1.3	39	49	49	39	39	39	49	39	39	39	46	46	46	39	39	39	39
1.4	39	49	49	39	39	39	49	39	39	39	33	33	33	39	39	39	39
1.5	26	30	30	26	26	26	30	26	26	26	16	16	16	26	26	26	26
1.6	16	20	20	16	16	16	20	16	16	16	10	10	10	16	16	16	16
1.7																	
1.8																	
2.1	30	39	39	30	30	30	39	30	30	30	20	20	20	30	30	30	30
2.2	20	26	26	20	20	20	26	20	20	20	13	13	13	20	20	20	20
2.3	20	26	26	20	20	20	26	20	20	20	10	10	10	20	20	20	20
2.4																	
3.1	46	49	49	46	46	46	49	46	46	46			46	46	46	46	46
3.2	26	30	30	26	26	26	30	26	26	26			26	26	26	26	26
3.3	26	30	30	26	26	26	30	26	26	26			26	26	26	26	26
3.4	16	20	20	16	16	16	20	16	16	16			16	16	16	16	16
4.1	20			20	20	20		20	20	20				20	20	20	20
4.2	16			16	16	16		16	16	16				16	16	16	16
4.3	7			7	7	7		7	7	7	10	10	10	7	7	7	7
5.1	26	30	30	26	26	26	30	26	26	26	33	33	33	26	26	26	26
5.2	10	13	13	10	10	10	13	10	10	10	13	13	13	10	10	10	10
5.3																	
6.1	30	39	39	30	30	30	39	30	30	30	33	33	33	30	30	30	30
6.2	89	115	115	89	89	89	115	89	89	89				89	89	89	89
6.3	69	89	89	69	69	69	89	69	69	69	49	49	49	69	69	69	69
6.4	10	13	13	10	10	10	13	10	10	10				10	10	10	10
7.1	49	66	66	49	49	49	66	49	49	49	33	33	33	49	49	49	49
7.2	98	125	125	98	98	98	125	98	98	98	82	82	82	98	98	98	98
7.3	66	79	79	66	66	66	79	66	66	66	43	43	43	66	66	66	66
7.4	20	26	26	20	20	20	26	20	20	20	33	33	33	20	20	20	20
8.1	98	121	121	98	98	98	121	98	98	98	66	66	66	98	98	98	98
8.2	26	30	30	26	26	26	30	26	26	26				26	26	26	26
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	UNC	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	M	UNC	UNF	M
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI
	2B	3B	3B	3B	3B	3B	3B	2B 3B	2B 3B	3B	3B	3B	3B	6H	2B 3B	2B 3B	6H
	2XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	2.5XD	1.25XD	2.5XD	2.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
		λ30°	λ30°	λ30°	λ30°	λ52°	λ52°	λ52°	λ52°	λ40°	λ40°	λ40°	λ40°	λ52°			
										ST	ST	ST	ST				
	1585OV (UNC)	1582 (UNC)	1582 (UNF)	1586 (UNC)	1586 (UNF)	1587 (UNC)	1587 (UNF)	1588 (UNC)	1588 (UNF)	1590 (UNC)	1590 (UNF)	1591 (UNC)	1591 (UNF)	1788 (M)	1580 (UNC)	1580 (UNF)	1580 (M)
	1/4 - 5/8	No.4 - No.10	No.10 - No.10	1/4 - 1/2	1/4 - 1/2	No.3 - No.12	No.4 - No.10	1/4 - 1/2	1/4 - 1/2	No.6 - No.10	No.6 - No.10	1/4 - 1/2	1/4 - 1/2	M3 - M12	No.2 - 3/8	No.10 - 3/8	M3 - M12
🕮	316	317	317	317	317	318	318	318	318	319	319	319	319	320	321	321	322
1.1	66	66	66	66	66					69	69	69	69		98	98	98
1.2	66	49	49	49	49					59	59	59	59		79	79	79
1.3	39	36	36	36	36					39	39	39	39		49	49	49
1.4	39	36	36	36	36					39	39	39	39		49	49	49
1.5	26									30	30	30	30		30	30	30
1.6	16																
1.7																	
1.8																	
2.1	30	26	26	26	26					30	30	30	30		39	39	39
2.2	20	20	20	20	20					26	26	26	26		30	30	30
2.3	20	20	20	20	20					20	20	20	20				
2.4																	
3.1	46																
3.2	26																
3.3	26																
3.4	16																
4.1	20	20	20	20	20					20	20	20	20		30	30	30
4.2	16	16	16	16	16					16	16	16	16		26	26	26
4.3	7	7	7	7	7					7	7	7	7				
5.1	26	20	20	20	20										30	30	30
5.2	10	16	16	16	16												
5.3										10	10	10	10				
6.1	30					30	30	30	30					30	39	39	39
6.2	89					79	79	79	79					79	121	121	121
6.3	69					79	79	79	79					79	98	98	98
6.4	10																
7.1	49					49	49	49	49					49	79	79	79
7.2	98					66	66	66	66					66	161	161	161
7.3	66					66	66	66	66					66	98	98	98
7.4	20																
8.1	98																
8.2	26																
8.3																	
9.1																	
10.1																	

Visual Index - Taps

DORMER

	UNC	UNF	M	UNC	UNF	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPT	NPTF
	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI	ANSI B94.9	ANSI B94.9	ANSI B94.9	ANSI B94.9	ANSI	ANSI	ANSI	ANSI	ANSI B94.9	ANSI
	2B 3B	2B 3B	6H	2B	2B	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	3XD	3XD	3XD	2.5XD	2.5XD	2XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	2XD	2XD	1.5XD	2XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
				E 1.5-2	E 1.5-2			C 2-3	C 2-3	C 2-3							C 2-3	
															λ30°			
							TiN		TiN		N		ST					
																		
	3300 (UNC)	3300 (UNF)	3300 (M)	3306E (UNC)	3306E (UNF)	1541 (NPT)	TN1541	E710	E721	6541	1544 (NPT)	1545 (NPT)	1545A (NPT)	1548 (NPT)	1568 (NPT)	E711	1543 (NPTF)
	No.1 - 1/2	No.0 - 3/8	M3 - M10	No.4 - 5/16	No.10 - 5/16	1/16 - 2"	1/8 - 3/4	1/16 - 2"	1/8 - 1"	1/8 - 2"	1/16 - 1.1/4	1/8 - 1"	1/16 - 3/4	1/16 - 1"	1/8 - 1.1/2"	1/8 - 1.1/2	1/16 - 1":
📖	323	323	324	325	325	326	326	327	327	328	329	330	330	331	332	333	334
1.1	98	98	98	98	98	13	16	13	13		13	13	13	13	13	13	13
1.2	79	79	79	79	79	13	16	13	13		13	13	13	13	13	13	13
1.3	49	49	49	49	49	20	23	20	20		20	20	20	20	20	20	20
1.4	49	49	49	49	49	16	20	16	16		16	16	16	16	16	16	16
1.5	30	30	30	30	30	10	13	10	10		10	10	10	10	10	10	10
1.6																	
1.7																	
1.8																	
2.1	39	39	39	39	39												
2.2	30	30	30	30	30												
2.3																	
2.4																	
3.1						20	23	20	20		20	20	20	20	20	20	20
3.2						13	16	13	13		13	13	13	13	13	13	13
3.3						20	23	20	20		20	20	20	20	20	20	20
3.4						13	16	13	13		13	13	13	13	13	13	13
4.1	30	30	30	30	30												
4.2	26	26	26	26	26												
4.3																	
5.1	30	30	30	30	30												
5.2																	
5.3																	
6.1	39	39	39	39	39												
6.2	121	121	121	121	121	36	39	36	36		36	36	36	36	36	36	36
6.3	98	98	98	98	98												
6.4																	
7.1	79	79	79	79	79												
7.2	161	161	161	161	161												
7.3	98	98	98	98	98	36	39	36	36		36	36	36	36	36	36	36
7.4						23	26	23	23		23	23	23	23	23	23	23
8.1						13	16	13	13		13	13	13	13	13	13	13
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - Taps

	NPTF	NPTF	NPTF	NPTF	NPSM	NPSF	Rc	G	UNC	UNF	UNC	UNF	EGM	EGM	UNC	UNC	UNC
	ANSI	ANSI	ANSI	ANSI B94.9	ANSI	ANSI	ISO 2284	ISO 2284	ANSI	ANSI	ANSI	ANSI	DORMER ISO	DORMER ISO	ANSI	ANSI	ANSI
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	3B	3B	2B 3B	2B 3B	6H	6H	3B	3B	2B
	1.5XD	2XD	2XD	1.5XD	2XD	2XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD	2XD	3.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
				C 2-3			C 2-3						C 2-3	C 2-3	T	P	
		λ30°												λ40°			λ15°
	TiN																
	TN1543	1549 (NPTF)	1567 (NPTF)	E712	1542 (NPS)	1592 (NPSF)	E550	E547	1572 (UNC)	1572 (UNF)	1578 (UNC)	1578 (UNF)	E620	E621	U1511	1519 (UNC)	1994 (UNC)
	1/8 - 3/4	1/16 - 3/4	1/8 - 1"	1/16 - 1.1/4	1/8 - 1"	1/8 - 3/4	1/8 - 2"	1/8 - 2"	No.4 - 1/2	No.10 - 1/4	No.4 - 1/4	No.10 - 1/4	M3 - M16	M3 - M16	1/4 - 1/2	1/4 - 3/4	No.4 - 1/2
📖	334	335	336	337	338	338	339	340	341	341	341	341	342	342	343	344	345
1.1	16	13	13	13	13	13	72	23	49	49	66	66	23		39	49	82
1.2	16	13	13	13	13	13	66	20	30	30	59	59	20	59	33	36	72
1.3	23	20	20	20	20	20	52	16	26	26	46	46	16	46	26	26	59
1.4	20	16	16	16	16	16	39	13	26	26	33	33	13	33	20	26	49
1.5	13	10	10	10	10	10	23	10			16	16	10	16	16	16	
1.6							13				10	10				7	
1.7																	
1.8																	
2.1							23		16	16	20	20		20		20	
2.2							16		7	7	13	13		13		13	
2.3							23				10	10		10		13	
2.4																	
3.1	23	20	20	20	20	20	39	39					39		46	39	
3.2	16	13	13	13	13	13	23	23					23		26	26	26
3.3	23	20	20	20	20	20	33	33					33		39	26	
3.4	16	13	13	13	13	13	16	16					16			13	
4.1																16	
4.2																13	
4.3											10	10					
5.1											33	33				16	
5.2											13	13		13		7	
5.3																	
6.1							39	13	26	26	33	33	13			20	
6.2	39	36	36	36	36	36	98	33	66	66			33		52	66	98
6.3							66	23	49	49	49	49	23		39	49	66
6.4							13	7					7			7	
7.1									39	39	33	33		33		39	59
7.2							115	39	79	79	82	82	39	82	66	79	115
7.3	39	36	36	36	36	36	66	23	59	59	43	43	23	43	39	59	
7.4	26	23	23	23	23	23	49	16	16	16	33	33	16	33		16	
8.1	16	13	13	13	13	13					66	66				26	98
8.2							39	16					16		26	13	
8.3							23	10					10				
9.1																	
10.1																	

Visual Index - Taps

	UNF	UNC	UNF	M	NPT
	ANSI	DORMER DIN	DORMER DIN	DORMER ISO	ANSI
	2B	2B	Medium	6H	Normal
	1.5XD	1.5XD	1.5XD	1.5XD	1.5XD
	HSS	HSS	HSS	HSS	HSS
		C 2-3	C 2-3	C 2-3	
	λ15°	λ30°	λ30°	λ30°	λ27°
		ST	ST	ST	
					
	1994 (UNF)	**E651**	**E654**	**E650**	**E653**
	No.10 - 1/2	No.6 - 5/8	No.8 - 5/8	M3 - M16	1/8 - 1"
🕮	**345**	**346**	**346**	**347**	**348**
1.1	82	82	82	82	82
1.2	72	72	72	72	72
1.3	59	59	59	59	59
1.4	49	49	49	49	49
1.5					
1.6					
1.7					
1.8					
2.1					
2.2					
2.3					
2.4					
3.1					
3.2	26	26	26	26	26
3.3					
3.4					
4.1					
4.2					
4.3					
5.1					
5.2					
5.3					
6.1					
6.2	98	98	98	98	98
6.3	66	66	66	66	66
6.4					
7.1	59	59	59	59	59
7.2	115	115	115	115	115
7.3					
7.4					
8.1	98	98	98	98	98
8.2					
8.3					
9.1					
10.1					

List Number Index - Taps



Pgs. 220 - 351

1215 349
1500 287
1500A 290
1500L 296
1500OV 301
1505 302
1508 298
1519 344
1528 287
1534 306
1534NE 315
1534NR 311
1541 326
1542 338
1543 334
1544 329
1545 330
1548 331
1549 335
1567 336
1568 332
1572 341
1578 341
1580 321
1582 317
1585 307
1586 317
1587 318
1588 318
1590 319
1591 319
1592 338
1593 316
1595 298
1599 303
1600 303
1634 309
1641 278
1671 279
1674 252
1675 257
1678 267
1679 271
1985 266
1994 345
3300 323
3850 350
6541 328
1545A 330
1580M 322
1585A 307
1585NR 313
1585OV 316
1599M 304
1599SB 304
1629AP 263
1630AP 276
1659AP 264
1660AP 277
1672AP 252
1673AP 257
1676AP 267
1677AP 271
1681AP 280
1687AP 282
1691AP 281
1697AP 282
1700M 299
1785M 310
1785NR 314
1788M 320
229CSET 351
3300M 324
3306E 325
E000 261
E000TIN 261
E001 261
E002 275
E003 275
E005 258
E006 258
E007 272
E008 272
E011 261
E013 275
E016 258
E018 272
E021 256
E023 270
E025 253
E026 253
E027 268
E028 268
E031 256
E033 270
E035 253
E036 253
E037 268
E038 268
E041 284
E043 286
E061 297
E071 297
E201 265
E252 265
E500 292
E501 300
E504 305
E513 294
E547 340
E550 339
E620 342
E621 342
E624 249
E625 242
E626 251
E627 244
E628 250
E629 243
E630 237
E631 237
E650 347
E651 346
E653 348
E654 346
E710 327
E711 333
E712 337
E721 327
E764 249
E765 242
E766 251
E767 244
E768 250
E769 243
E770 237
E771 237
E808 245
E809 238
E810 248
E811 241
E812 246
E813 239
E814 236
E815 236
E908 245
E909 238
E910 248
E911 241
E912 246
E913 239
E914 236
E915 236
EP006H 259
EP016H 259
EP10 260
EP11 260
EP20 255
EP21 255
EP30 255
EP31 255
EP40 283
EP41 283
EX006H 273
EX016H 273
EX10 274
EX11 274
EX20 269
EX21 269
EX30 269
EX31 269
EX40 285
EX41 285
TN1500 291
TN1534 306
TN1541 326
TN1543 334
TN1585 307
TN1785 310
U1511 343

STRAIGHT FLUTE TAPS

DIN ANSI Machine Tap, White Shark for Cast Iron

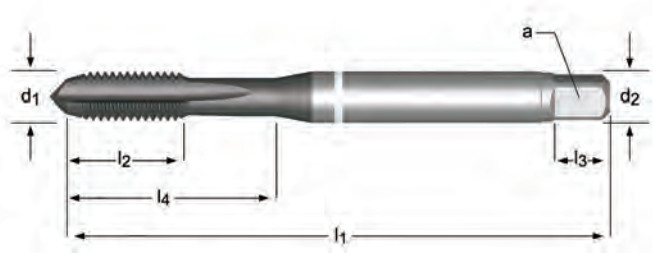
E814
E914

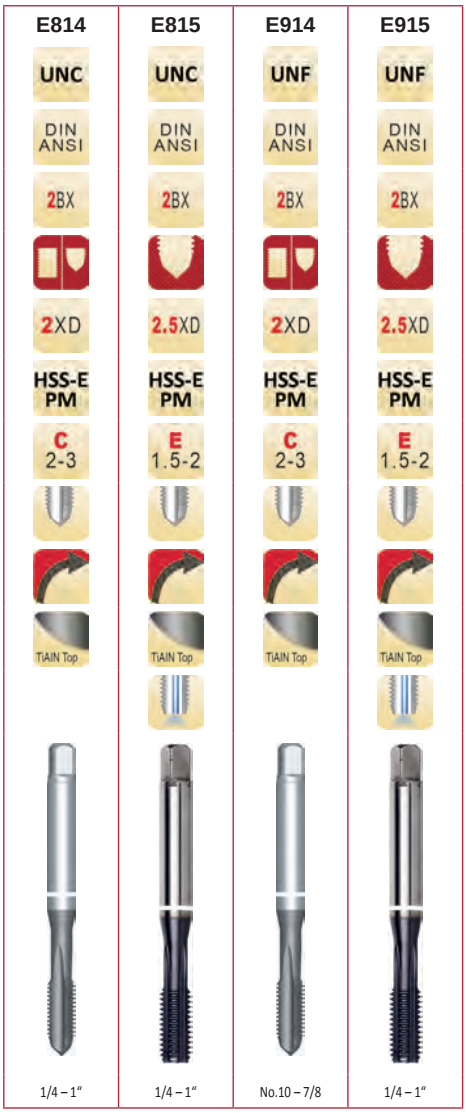
Designed for semi-bottoming or through hole tapping in Cast Iron applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

E815
E915

Coolant through design allows for higher tapping speeds and better tool life. This design eliminates the problems associated with inadequate coolant supply in some applications. Full Bottoming.

■ 3.1 3.2 3.3 8.2
● 3.4 6.2 6.4 7.4





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E814	E815	E914	E915
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	4	4.10	N21	H4	—	—	7350222	—
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	4	5.10	N7	H5	7350203	7350231	—	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	4	5.50	N3	H5	—	—	7350223	—
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	4	5.50	N3	H4	—	—	—	7350240
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	4	6.60	F	H5	7350204	—	—	—
5/16		18	3.543	0.787	1.339	0.318	0.236	0.380	4	6.60	F	H5	—	7350232	—	—
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	4	6.90	I	H5	—	—	7350224	—
	5/16	24	3.543	0.787	1.339	0.318	0.236	0.380	4	6.90	I	H5	—	—	—	7350241
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	4	8.00	5/16	H5	7350205	7350233	—	—
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	4	8.50	Q	H5	—	—	7350225	7350242
7/16		14	3.937	0.787	–	0.323	0.240	0.410	4	9.40	U	H5	7350206	7350234	—	—
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	4	9.90	25/64	H5	—	—	7350226	7350243
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H5	7350207	7350235	—	—
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H5	—	—	7350227	7350244
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350208	7350236	—	—
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H5	—	—	7350228	7350245
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350209	7350237	—	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H6	—	—	7350229	—
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5	—	—	—	7350246
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350220	7350238	—	—
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6	—	—	7350230	7350247
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350221	7350239	—	—
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6	—	—	—	7350248

DIN ANSI Machine Tap, White Shark for Cast Iron

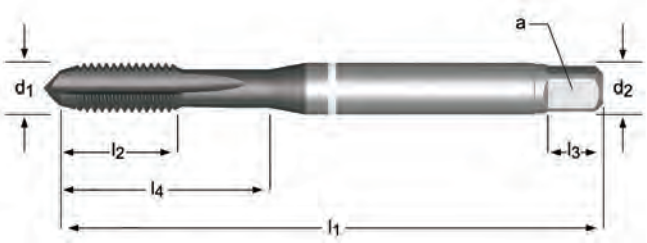
E630
E770

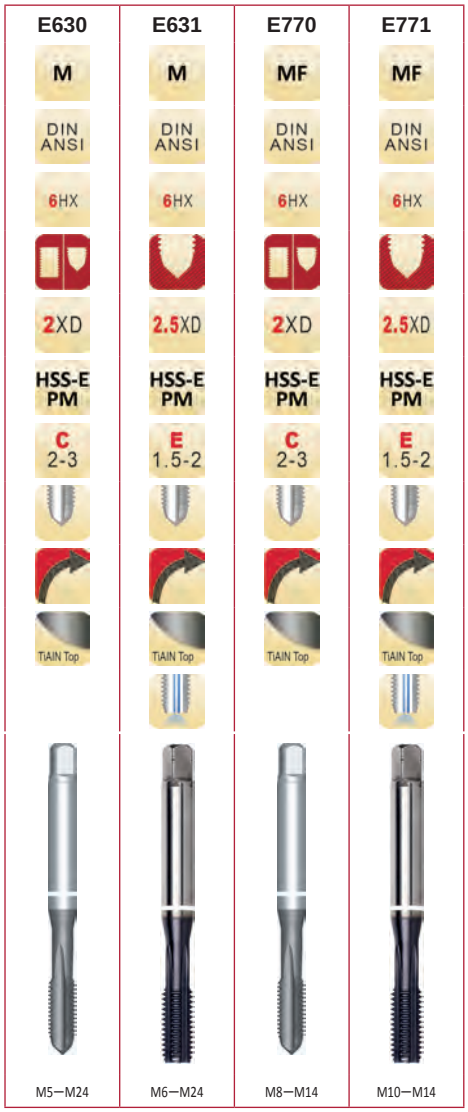
Designed for semi-bottoming or through hole tapping in Cast Iron applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

E631
E771

Coolant through design allows for higher tapping speeds and better tool life. This design eliminates the problems associated with inadequate coolant supply in some applications. Full Bottoming.

■ 3.1 3.2 3.3 8.2
● 3.4 6.2 6.4 7.4





Pack Qty = 1 pc

M	MF	P	l_1	l_2	l_4	d_2 Ø	◹ a	l_3	No. of			Limits	E630	E631	E770	E771
		mm	mm	mm	mm	Inch	Inch	mm	flutes	↔	↔					
5		0.80	70	13	25	0.194	0.150	6	4	4.20	N19	D4	7350249	—	—	—
6		1.00	80	15	25	0.255	0.189	8	4	5.00	N9	D5	—	7350265	—	—
6		1.00	80	15	30	0.255	0.189	8	4	5.00	N9	D5	7350250	—	—	—
	8	1.00	90	18	35	0.318	0.236	10	4	7.00	J	D5	—	—	7350259	—
8		1.25	90	18	35	0.318	0.236	10	4	6.80	H	D5	7350251	—	—	—
8		1.25	90	20	34	0.318	0.236	10	4	6.80	H	D5	—	7350266	—	—
	10	1.00	90	20	35	0.381	0.284	11	4	9.00	T	D6	—	—	7350260	—
	10	1.25	100	20	39	0.381	0.284	11	4	8.80	11/32	D6	—	—	7350261	7350274
10		1.50	100	20	39	0.381	0.284	11	4	8.50	Q	D6	7350252	7350267	—	—
	12	1.25	100	21	–	0.367	0.273	11	4	10.80	27/64	D6	—	—	7350262	7350275
	12	1.50	100	21	–	0.367	0.273	11	4	10.50	Z	D6	—	—	7350263	7350276
12		1.75	110	23	–	0.367	0.273	11	4	10.30	Y	D6	7350253	7350268	—	—
	14	1.50	100	21	–	0.429	0.320	13	4	12.50	31/64	D7	—	—	7350264	7350277
14		2.00	110	23	–	0.429	0.320	13	4	12.00	15/32	D7	7350254	7350269	—	—
16		2.00	110	23	–	0.480	0.358	14	4	14.00	35/64	D7	7350255	7350270	—	—
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350256	7350271	—	—
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350257	7350272	—	—
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350258	7350273	—	—

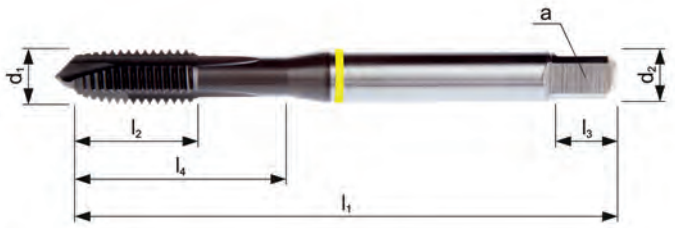
SPIRAL POINT PLUG TAPS

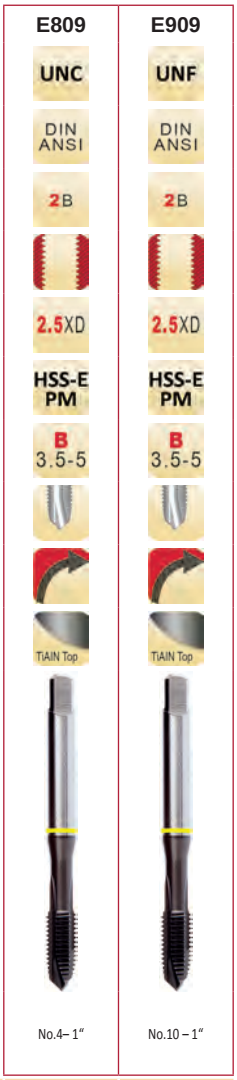
DIN ANSI Machine Tap, Yellow Shark for Low Alloy Steels

E809
E909

Designed for through hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E809	E909
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350469	
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350470	
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350471	
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350472	
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350482
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350473	
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H4		7350483
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350474	
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4		7350484
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350475	
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H4		7350485
7/16		14	3.937	0.787	–	0.323	0.240	0.410	3	9.40	U	H5	7350476	
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	3	9.90	25/64	H5		7350486
1/2		13	4.331	0.906	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350477	
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	3	11.50	29/64	H5		7350487
5/8		11	4.331	0.906	–	0.480	0.358	0.560	3	13.50	17/32	H5	7350478	
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	3	14.50	37/64	H5		7350488
3/4		10	4.921	1.181	–	0.590	0.439	0.690	3	16.50	21(32	H5	7350479	
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	3	17.50	11/16	H5		7350489
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350480	
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350490
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350481	
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6		7350491

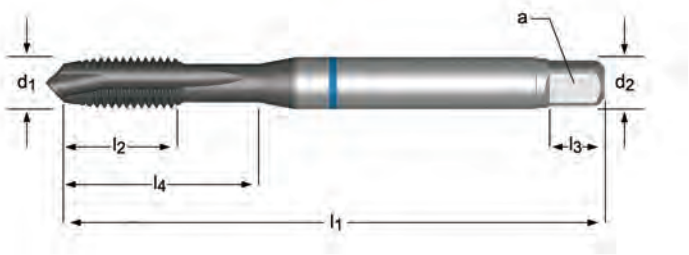
SPIRAL POINT PLUG TAPS

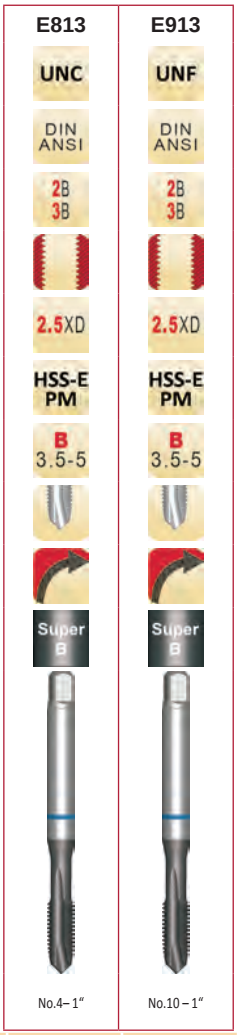
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E813
E913

Designed for superior performance through hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment to offer improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ 2.1 2.2 2.3
- ● 1.2 1.3 1.4 1.5





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E813	E913
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350278	
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H3	7350279	
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350280	
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350281	
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350299
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350282	
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H3	7350283	
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H5		7350300
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H3		7350301
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350284	
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H3	7350285	
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4		7350302
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H3		7350303
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H3	7350287	
3/8		16	3.937	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H5	7350286	
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H4		7350304
	3/8	24	3.543	0.787	1.476	0.381	0.284	0.440	3	8.50	Q	H3		7350305
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350291	
5/8		11	4.331	0.906	–	0.480	0.358	0.560	4	13.50	17/32	H3	7350292	
7/16		14	3.937	0.787	–	0.323	0.240	0.410	4	9.40	U	H5	7350288	
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	4	9.90	25/64	H5		7350306
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H5	7350289	
1/2		13	4.331	0.906	–	0.367	0.273	0.440	4	10.80	27/64	H3	7350290	
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H5		7350307
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	4	11.50	29/64	H3		7350308

SPIRAL POINT PLUG TAPS

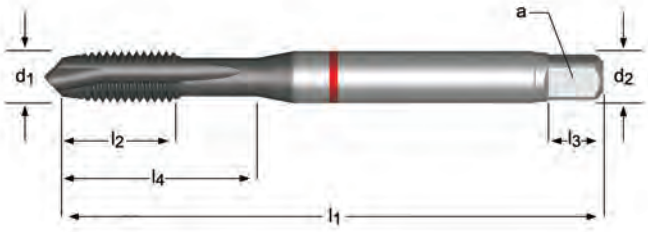
UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	◻ a Inch	l_3 Inch	No. of flutes	↔	↔	Limits	E813	E913
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H5		7350309
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	4	14.50	37/64	H3		7350310
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350293	
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H3	7350294	
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5		7350311
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H3		7350312
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350295	
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H4	7350296	
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350313
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H4		7350314
1“		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350297	
1“		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H4	7350298	
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6		7350315
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H4		7350316

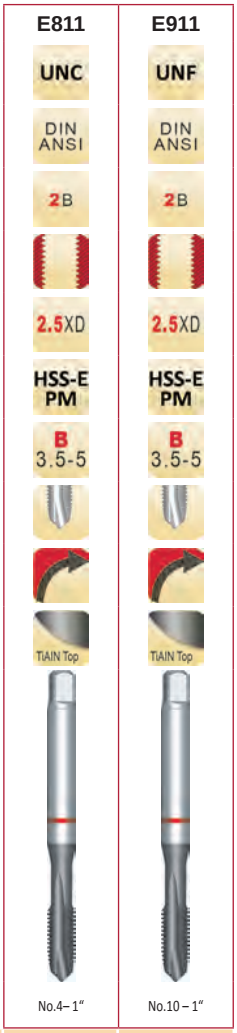
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E811
E911

Designed for high performance through hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with an additional edge treatment provides excellent performance and consistency in high production applications.

- ■ 1.4 1.5
- ● 1.6 4.2 5.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	◹ a Inch	l_3 Inch	No. of flutes			Limits	E811	E911
4		40	2.205	0.354	0.709	0.141	0.108	0.190	3	2.35	N43	H2	7350391	
6		32	2.205	0.433	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350392	
8		32	2.480	0.512	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350393	
	10	32	2.756	0.551	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350404
10		24	2.756	0.551	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350394	
	1/4	28	3.150	0.591	0.984	0.255	0.189	0.310	3	5.50	N3	H4		7350405
1/4		20	3.150	0.591	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350395	
	5/16	24	3.543	0.709	1.339	0.318	0.236	0.380	3	6.90	I	H4		7350406
5/16		18	3.543	0.709	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350396	
	3/8	24	3.543	0.787	1.476	0.318	0.284	0.440	3	8.50	Q	H4		7350407
3/8		16	3.543	0.787	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350397	
	7/16	20	3.937	0.787	–	0.323	0.240	0.410	3	9.90	25/64	H5		7350408
7/16		14	3.937	0.787	–	0.323	0.240	0.410	3	9.40	U	H5	7350398	
	1/2	20	3.937	0.827	–	0.367	0.273	0.440	3	11.50	29/64	H5		7350409
1/2		13	4.331	0.906	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350399	
	5/8	18	3.937	0.827	–	0.480	0.358	0.560	3	14.50	37/64	H5		7350410
5/8		11	4.331	0.906	–	0.480	0.358	0.560	3	13.50	17/32	H5	7350400	
	3/4	16	4.331	0.906	–	0.590	0.439	0.690	4	17.50	11/16	H5		7350411
3/4		10	4.921	1.181	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350401	
	7/8	14	4.921	0.906	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350412
7/8		9	5.512	1.339	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350402	
	1"	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6		7350413
1"		8	6.299	1.417	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350403	

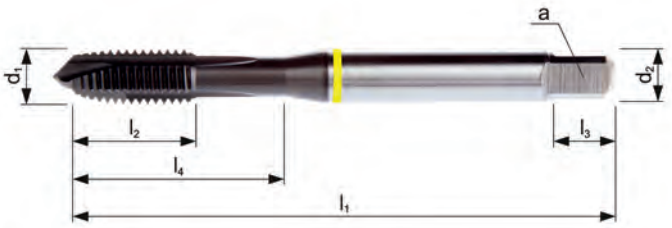
SPIRAL POINT PLUG TAPS

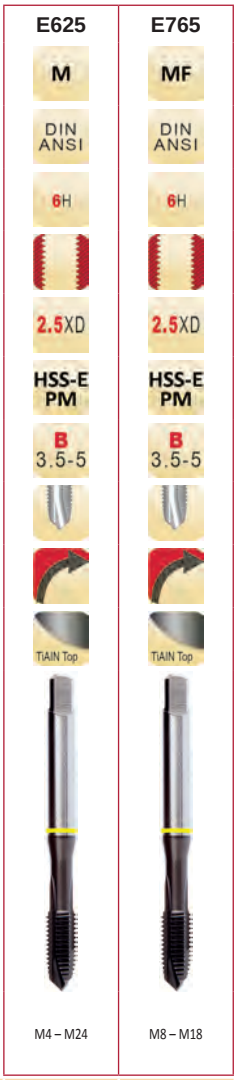
DIN ANSI Machine Tap, Yellow Shark for Low Alloy Steels

E625
E765

Designed for through hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times and longer tool life.

- ■ **1.1** **1.2** **1.3** **6.1** **6.3**
- ● **1.4** **1.5** **6.2**





Pack Qty = 1 pc

M	MF	P	l_1	l_2	l_4	d_2 Ø	⍁ a	l_3	No. of flutes			Limits	E625	E765
		mm	mm	mm	mm	Inch	Inch	mm						
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350492	
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350493	
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350494	
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5		7350503
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350495	
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6		7350504
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350496	
	12	1.50	100	21	–	0.367	0.273	11	3	10.80	27/64	D6		7350505
	12	1.50	100	21	–	0.367	0.273	11	3	10.50	Z	D6		7350506
12		1.75	110	23	–	0.367	0.273	11	3	10.30	Y	D6	7350497	
	14	1.50	100	21	–	0.429	0.320	13	3	12.50	31/64	D7		7350507
14		2.00	110	23	–	0.429	0.320	13	3	12.00	15/32	D7	7350498	
	16	1.50	100	21	–	0.480	0.358	14	3	14.50	9/16	D7		7350508
16		2.00	110	23	–	0.480	0.358	14	3	14.00	35/64	D7	7350499	
	18	1.50	110	24	–	0.542	0.404	16	3	16.50	41/64	D7		7350509
18		2.50	125	30	–	0.542	0.404	16	3	15.50	39/64	D7	7350500	
20		2.50	140	30	–	0.652	0.487	18	3	17.50	11/16	D7	7350501	
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350502	

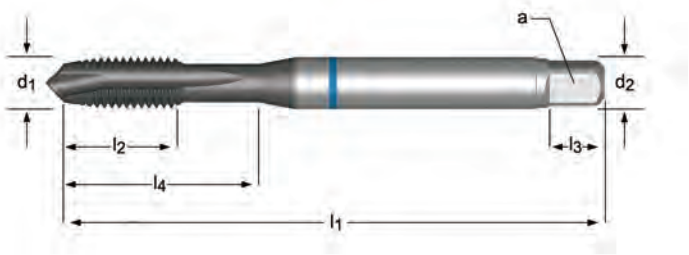
SPIRAL POINT PLUG TAPS

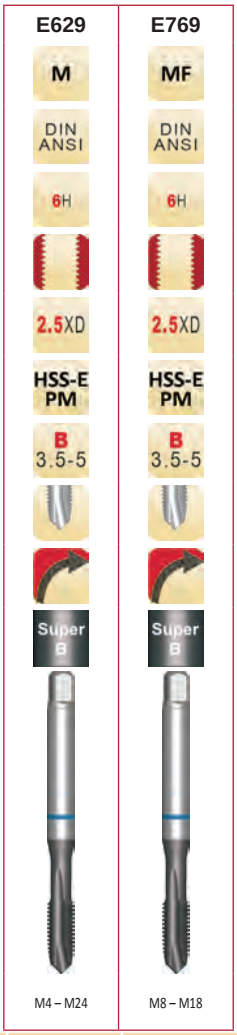
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E629
E769

Designed for superior performance through hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment to offer improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ **2.1** **2.2** **2.3**
- ● **1.2** **1.3** **1.4** **1.5**





Pack Qty = 1 pc

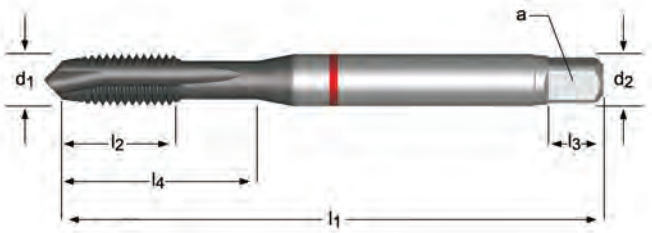
M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes			Limits	E629	E769
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350317	
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350318	
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350319	
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5		7350328
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350320	
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6		7350329
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350321	
	12	1.25	100	21	–	0.367	0.273	11	4	10.80	27/64	D6		7350330
	12	1.50	100	21	–	0.367	0.273	11	4	10.50	Z	D6		7350331
12		1.75	110	23	–	0.367	0.273	11	4	10.30	Y	D6	7350322	
	14	1.50	100	21	–	0.429	0.320	13	4	12.50	31/64	D7		7350332
14		2.00	110	23	–	0.429	0.320	13	4	12.00	15/32	D7	7350323	
	16	1.50	100	21	–	0.480	0.358	14	4	14.50	9/16	D7		7350333
16		2.00	110	23	–	0.480	0.358	14	4	14.00	35/64	D7	7350324	
	18	1.50	110	24	–	0.542	0.404	16	4	16.50	41/64	D7		7350334
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350325	
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350326	
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350327	

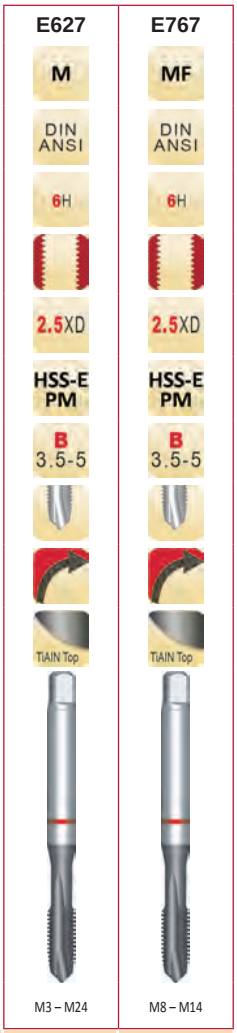
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E627
E767

Designed for high performance through hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with an additional edge treatment provides excellent performance and consistency in high production applications.

- ■ 1.4 1.5
- ● 1.6 4.2 5.2





Pack Qty = 1 pc

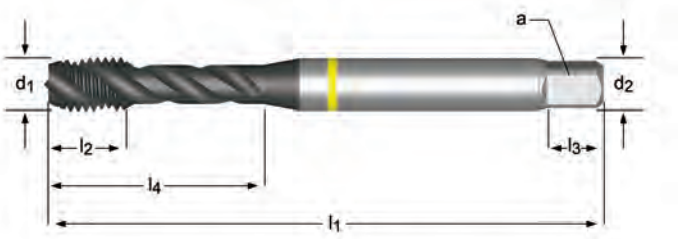
M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes	↔	↔	Limits	E627	E767
3		0.50	56	9	18	0.141	0.108	5	3	2.50	N40	D3	7350414	
4		0.70	63	12	21	0.168	0.129	6	3	3.30	N30	D4	7350415	
5		0.80	70	13	25	0.194	0.150	6	3	4.20	N19	D4	7350416	
6		1.00	80	15	30	0.255	0.189	8	3	5.00	N9	D5	7350417	
	8	1.00	90	18	35	0.318	0.236	10	3	7.00	J	D5		7350426
8		1.25	90	18	35	0.318	0.236	10	3	6.80	H	D5	7350418	
	10	1.25	100	20	39	0.381	0.284	11	3	8.80	11/32	D6		7350427
10		1.50	100	20	39	0.381	0.284	11	3	8.50	Q	D6	7350419	
	12	1.50	100	21	–	0.367	0.273	11	3	10.50	Z	D6		7350428
12		1.75	110	23	–	0.367	0.273	11	3	10.30	Y	D6	7350420	
	14	1.50	100	21	–	0.429	0.320	13	3	12.50	31/64	D7		7350429
14		2.00	110	23	–	0.429	0.320	13	3	12.00	15/32	D7	7350421	
16		2.00	110	23	–	0.480	0.358	14	3	14.00	35/64	D7	7350422	
18		2.50	125	30	–	0.542	0.404	16	4	15.50	39/64	D7	7350423	
20		2.50	140	30	–	0.652	0.487	18	4	17.50	11/16	D7	7350424	
24		3.00	160	38	–	0.760	0.567	19	4	21.00	53/64	D8	7350425	

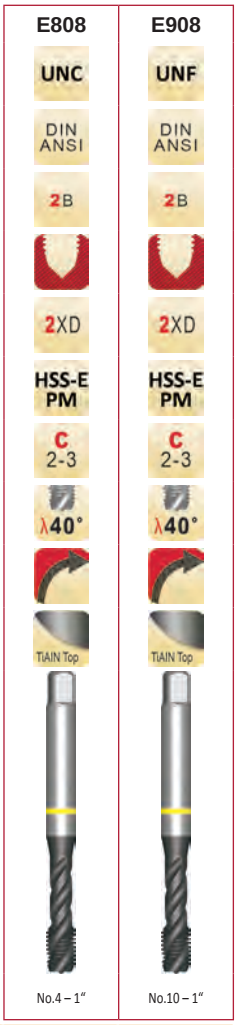
DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E808
E908

Designed for blind hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combined with a special 40° Spiral Flute geometry prevents nesting and reduces the risk of re-cutting chips on reversal allowing taps to operate at higher speeds while providing improved thread quality.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E808	E908
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350510	
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350511	
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350512	
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350513	
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350523
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350514	
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H4		7350524
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350515	
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H4		7350525
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350516	
	3/8	24	3.543	0.591	1.476	0.381	0.284	0.440	3	8.50	Q	H4		7350526
7/16		14	3.937	0.591	–	0.323	0.240	0.410	3	9.40	U	H5	7350517	
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	3	9.90	25/64	H5		7350527
1/2		13	4.331	0.709	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350518	
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	3	11.50	29/64	H5		7350528
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350519	
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5		7350529
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350520	
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5		7350530
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350521	
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350531
1″		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350522	

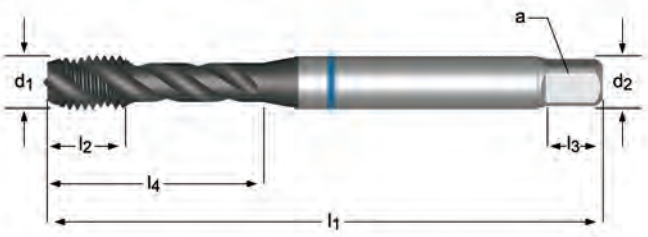
SPIRAL FLUTE TAPS

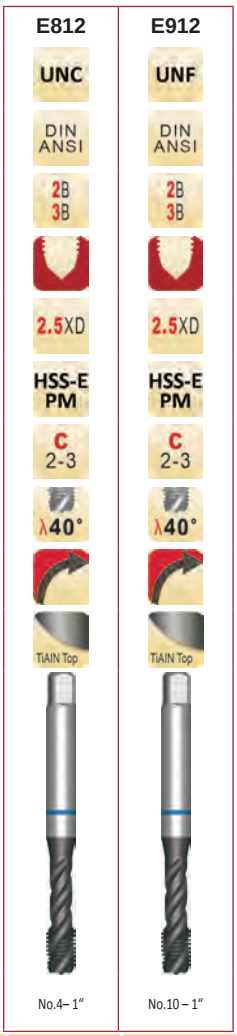
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E812
E912

Designed for superior performance blind hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment and a 40° Flute angle facilitates better chip evacuation offering improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ **2.1 2.2 2.3**
- ● **1.2 1.3 1.4 1.5**





Pack Qty = 1 pc

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E812	E912
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350335	
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.80	N36	H3	7350336	
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350337	
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350338	
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350356
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350339	
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H3	7350340	
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H5		7350357
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H3		7350358
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350341	
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H3	7350342	
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H4		7350359
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.90	I	H3		7350360
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H5	7350343	
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H3	7350344	
	3/8	24	3.543	0.591	1.476	0.318	0.284	0.440	3	8.50	Q	H4		7350361
	3/8	24	3.543	0.591	1.476	0.318	0.284	0.440	3	8.50	Q	H3		7350362
7/16		14	3.937	0.591	–	0.323	0.240	0.410	4	9.40	U	H5	7350345	
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	4	9.90	25/64	H5		7350363
1/2		13	4.331	0.709	–	0.367	0.273	0.440	4	10.70	27/64	H5	7350346	
1/2		13	4.331	0.709	–	0.367	0.273	0.440	4	10.70	27/64	H3	7350347	
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	4	11.50	29/64	H5		7350364
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	4	11.50	29/64	H3		7350365
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350348	
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H3	7350349	
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5		7350366
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H3		7350367

SPIRAL FLUTE TAPS

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	No. of flutes			Limits	E812	E912
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350350	
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H3	7350351	
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5		7350368
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H3		7350369
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350352	
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H4	7350353	
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350370
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H4		7350371
1“		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350354	
1“		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H4	7350355	
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6		7350372
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H4		7350373

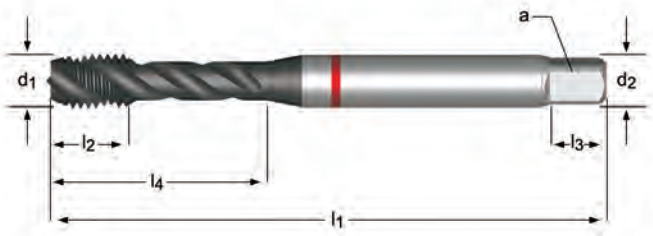
SPIRAL FLUTE TAPS

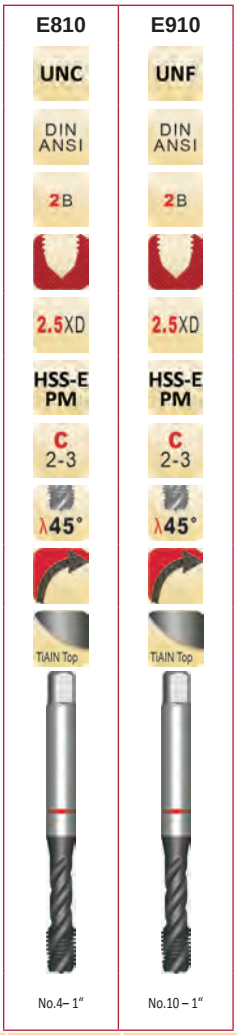
DIN ANSI Machine Tap, Red Shark for Alloy Steels

E810
E910

Designed for high performance blind hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with a special 45° Flute Geometry and an additional edge treatment provides excellent performance and consistency in high production applications. The back taper built into this design further facilitates chip evacuation and reduces torque when the tap reverses. It is recommended to use a toolholder with minimal float or soft start.

- ■ 1.4 1.5
- ● 1.6 4.2 5.2





Pack Qty = 1 pc

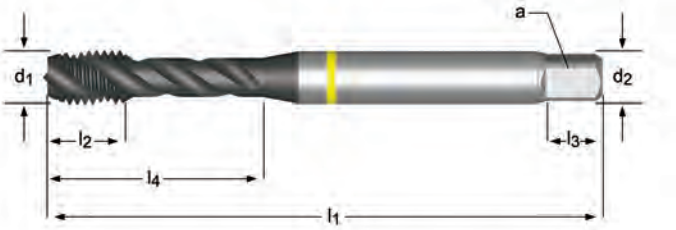
UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	No. of flutes			Limits	E810	E910
4		40	2.205	0.256	0.709	0.141	0.108	0.236	3	2.35	N43	H2	7350430	
6		32	2.205	0.256	0.787	0.141	0.108	0.190	3	2.85	N36	H2	7350431	
8		32	2.480	0.276	0.827	0.168	0.129	0.250	3	3.50	N29	H3	7350432	
10		24	2.756	0.315	1.102	0.194	0.150	0.250	3	3.90	N25	H3	7350433	
	10	32	2.756	0.315	1.102	0.194	0.150	0.250	3	4.10	N21	H3		7350443
1/4		20	3.150	0.394	0.984	0.255	0.189	0.310	3	5.10	N7	H5	7350434	
	1/4	28	3.150	0.394	0.984	0.255	0.189	0.310	3	5.50	N3	H4		7350444
5/16		18	3.543	0.472	1.339	0.318	0.236	0.380	3	6.60	F	H5	7350435	
	5/16	24	3.543	0.472	1.339	0.318	0.236	0.380	3	6.9	I	H4		7350445
3/8		16	3.937	0.591	1.535	0.381	0.284	0.440	3	8.00	5/16	H4	7350436	
	3/8	24	3.543	0.591	1.476	0.381	0.284	0.440	3	8.50	Q	H4		7350446
7/16		14	3.937	0.591	–	0.323	0.240	0.410	3	9.40	U	H5	7350437	
	7/16	20	3.937	0.591	–	0.323	0.240	0.410	3	9.90	25/64	H5		7350447
1/2		13	4.331	0.709	–	0.367	0.273	0.440	3	10.80	27/64	H5	7350438	
	1/2	20	3.937	0.709	–	0.367	0.273	0.440	3	11.50	29/64	H5		7350448
5/8		11	4.331	0.787	–	0.480	0.358	0.560	4	13.50	17/32	H5	7350439	
	5/8	18	3.937	0.591	–	0.480	0.358	0.560	4	14.50	37/64	H5		7350449
3/4		10	4.921	0.984	–	0.590	0.439	0.690	4	16.50	21/32	H5	7350440	
	3/4	16	4.331	0.984	–	0.590	0.439	0.690	4	17.50	11/16	H5		7350450
7/8		9	5.512	0.984	–	0.697	0.520	0.750	4	19.50	49/64	H6	7350441	
	7/8	14	4.921	0.984	–	0.697	0.520	0.750	4	20.40	13/16	H6		7350451
1“		8	6.299	1.181	–	0.800	0.597	0.810	4	22.25	7/8	H6	7350442	
	1“	12	5.512	1.063	–	0.800	0.597	0.810	4	23.25	59/64	H6		7350452

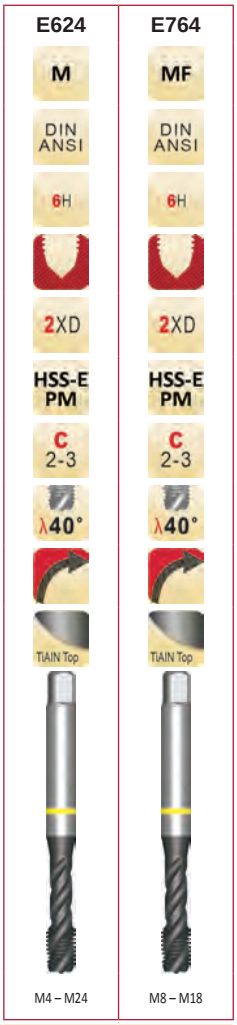
DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E624
E764

Designed for blind hole tapping in low Alloy Steel applications. Premium HSCo Powder Metal substrate with TiAlN-Top Coating combined with a special 40° Spiral Flute geometry prevents nesting and reduces the risk of re-cutting chips on reversal allowing taps to operate at higher speeds while providing improved thread quality.

- ■ 1.1 1.2 1.3 6.1 6.3
- ● 1.4 1.5 6.2





Pack Qty = 1 pc

M	MF	P	l_1	l_2	l_4	d_2 Ø	⍁ a	l_3	No. of flutes			Limits	E624	E764
		mm	mm	mm	mm	Inch	Inch	mm						
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350533	
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350534	
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350535	
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5		7350544
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350536	
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6		7350545
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350537	
	12	1.25	100	15	–	0.367	0.273	11	3	10.80	27/64	D6		7350546
	12	1.50	100	15	–	0.367	0.273	11	3	10.50	Z	D6		7350547
12		1.75	110	18	–	0.367	0.273	11	3	10.30	Y	D6	7350538	
	14	1.50	100	15	–	0.429	0.320	13	3	12.50	31/64	D7		7350548
14		2.00	110	20	–	0.429	0.320	13	3	12.00	15/32	D7	7350539	
	16	1.50	100	15	–	0.480	0.358	14	4	14.50	9/16	D7		7350549
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350540	
	18	1.50	110	17	–	0.542	0.404	16	4	16.50	41/64	D7		7350550
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350541	
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350542	
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350543	

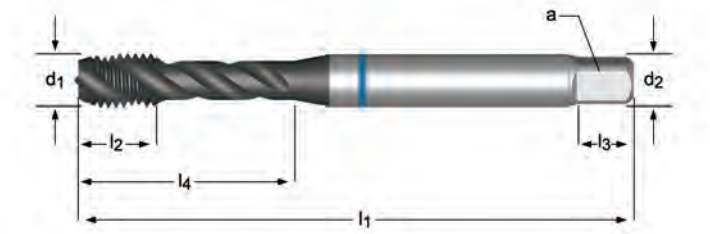
SPIRAL FLUTE TAPS

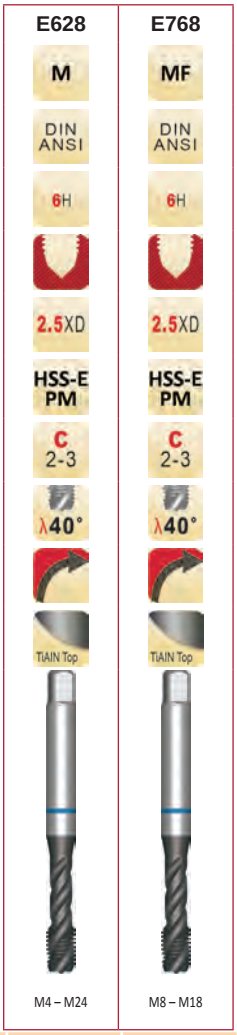
DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E628
E768

Designed for superior performance blind hole tapping in a wide range of Stainless Steel types. Premium HSCo Powder Metal substrate with Super-B (TiAlN+WC/C) Coating combined with an additional edge treatment and a 40° Flute angle facilitates better chip evacuation offering improved thread quality and longer tool life. Available in both 2B and 3B Class of Fit to cover a wide range of applications.

- ■ **2.1** **2.2** **2.3**
- ● **1.2** **1.3** **1.4** **1.5**





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	◿ a Inch	l_3 mm	No. of flutes			Limits	E628	E768
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350374	
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350375	
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350376	
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5		7350385
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350377	
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6		7350386
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350378	
	12	1.50	100	15	–	0.367	0.273	11	4	10.50	Z	D6		7350387
12		1.75	110	18	–	0.367	0.273	11	4	10.30	Y	D6	7350379	
	14	1.50	100	15	–	0.429	0.320	13	4	12.50	31/64	D7		7350388
14		2.00	110	20	–	0.429	0.320	13	4	12.00	15/32	D7	7350380	
	16	1.50	100	15	–	0.480	0.358	14	4	14.50	9/16	D7		7350389
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350381	
	18	1.50	110	17	–	0.542	0.404	16	4	16.50	41/64	D7		7350390
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350382	
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350383	
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350384	

SPIRAL FLUTE TAPS

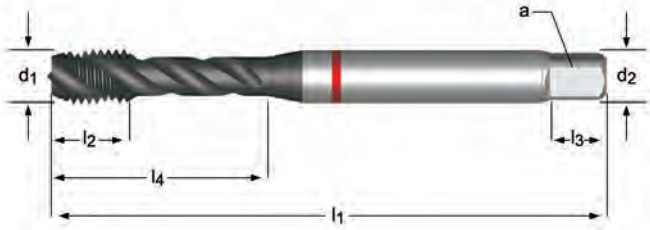
DIN ANSI Machine Tap, Red Shark for Alloy Steels

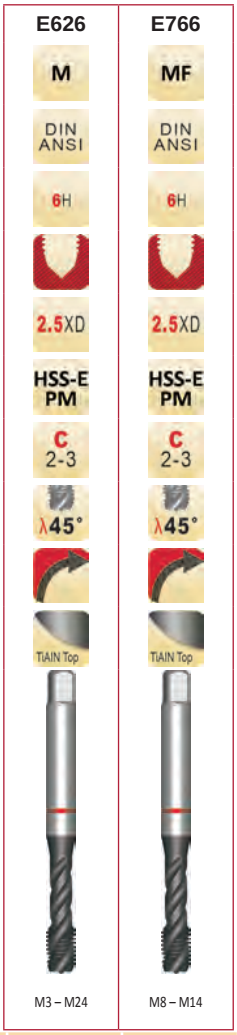
E626
E766

Designed for high performance blind hole tapping in most medium Alloy Steels. The TiAlN-Top Coating combined with a special 45° Flute Geometry and an additional edge treatment provides excellent performance and consistency in high production applications. The back taper built into this design further facilitates chip evacuation and reduces torque when the tap reverses. It is recommended to use a toolholder with minimal float or soft start.

■ **1.4** **1.5**

● **1.6** **4.2** **5.2**





Pack Qty = 1 pc

M	MF	P mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø Inch	⍁ a Inch	l_3 mm	No. of flutes			Limits	E626	E766
3		0.50	56	6	18	0.141	0.108	5	3	2.50	N40	D3	7350453	
4		0.70	63	7	21	0.168	0.129	6	3	3.30	N30	D4	7350454	
5		0.80	70	8	25	0.194	0.150	6	3	4.20	N19	D4	7350455	
6		1.00	80	10	30	0.255	0.189	8	3	5.00	N9	D5	7350456	
	8	1.00	90	13	35	0.318	0.236	10	3	7.00	J	D5		7350465
8		1.25	90	13	35	0.318	0.236	10	3	6.80	H	D5	7350457	
	10	1.25	100	15	39	0.381	0.284	11	3	8.80	11/32	D6		7350466
10		1.50	100	15	39	0.381	0.284	11	3	8.50	Q	D6	7350458	
	12	1.25	100	15	–	0.367	0.273	11	3	10.80	27/64	D6		7350467
12		1.75	110	18	–	0.367	0.273	11	3	10.30	Y	D6	7350459	
	14	1.50	100	15	–	0.429	0.320	13	3	12.50	31/64	D7		7350468
14		2.00	110	20	–	0.429	0.320	13	3	12.00	15/32	D7	7350460	
16		2.00	110	20	–	0.480	0.358	14	4	14.00	35/64	D7	7350461	
18		2.50	125	25	–	0.542	0.404	16	4	15.50	39/64	D7	7350462	
20		2.50	140	25	–	0.652	0.487	18	4	17.50	11/16	D7	7350463	
24		3.00	160	30	–	0.760	0.567	19	4	21.00	53/64	D8	7350464	

APPLIX SPIRAL POINT TAPS

UNION BUTTERFIELD

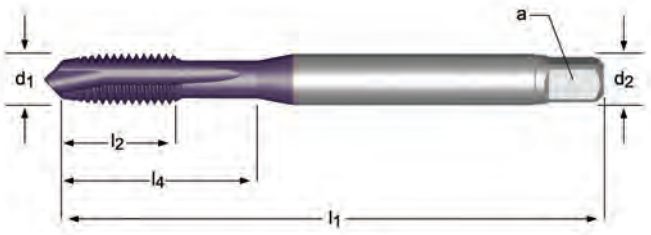
APPLIX®

MXP Multi-Application, Plug Chamfer

1672AP Designed for through hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1674 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 2.4 4.1 4.2 5.1 5.2 6.1 6.2 6.3 7.1 7.2 7.3 7.4



1672AP	1674 Coolant Through
UNC UNF	UNC UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
	
No.4 - 1“	1/4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	a Inch	# of Flutes	Limits	Pack Qty	1672AP	1674
4		40	2.205	0.433	0.709	0.141	0.110	2	H2	1	46204859 [1]	—
6		32	2.205	0.472	0.787	0.141	0.110	2	H3	1	46204864 [1]	—
8		32	2.480	0.512	0.827	0.168	0.131	3	H3	1	46204869 [1]	—
	10	32	2.756	0.512	0.984	0.194	0.152	3	H3	1	46204852 [1]	—
10		24	2.756	0.591	0.984	0.194	0.152	3	H3	1	46204851 [1]	—
	1/4	28	3.150	0.669	1.181	0.255	0.191	3	H4	1	46204850 [1]	1716512 [1]
1/4		20	3.150	0.669	1.181	0.255	0.191	3	H5	1	46204849 [1]	1716510 [1]
	5/16	24	3.543	0.669	1.378	0.318	0.238	3	H4	1	46204861 [1]	—
5/16		18	3.543	0.787	1.378	0.318	0.238	3	H5	1	46204860 [1]	1716514 [1]
	3/8	24	3.937	0.709	1.535	0.381	0.286	3	H4	1	46204858 [1]	—
3/8		16	3.937	0.866	1.535	0.381	0.286	3	H5	1	46204857 [1]	1716518 [1]
	7/16	20	3.937	0.866		0.323	0.242	3	H5	1	46204866 [2]	—
7/16		14	3.937	0.866		0.323	0.242	3	H5	1	46204865 [2]	—
	1/2	20	3.937	0.866		0.367	0.275	3	H5	1	—	—
	1/2	20	3.937	0.866		0.397	0.275	3	H5	1	46204848 [2]	—
1/2		13	4.331	0.984		0.367	0.275	3	H5	1	46204847 [2]	1716534 [2]
	5/8	18	3.937	0.866		0.480	0.360	4	H5	1	46204863 [2]	—
5/8		11	4.331	1.063		0.480	0.360	4	H5	1	46204862 [2]	1716538 [2]
	3/4	16	4.331	0.984		0.590	0.442	4	H5	1	46204856 [2]	—
3/4		10	4.921	1.181		0.590	0.442	4	H5	1	46204855 [2]	—
3/4		10	4.921	1.181		0.590	0.442	4	H5	1	—	1716542 [2]
7/8		9	5.512	1.260		0.697	0.523	4	H6	1	46204868 [2]	—
1“		8	6.299	1.417		0.800	0.600	4	H6	1	46204854 [2]	— [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

Multi-Application, Plug Chamfer

E025
E035

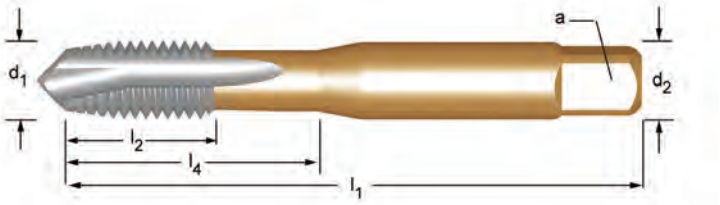
Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
E025 = UNC Sizes, E035 = UNF Sizes

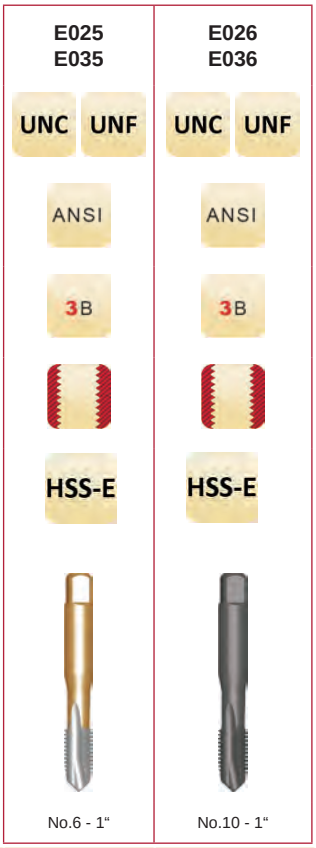
1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

E026
E036

Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E026 = UNC Sizes, E036 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





No.6 - 1“ No.10 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	# of Flutes	Limits			l_4 Inch	Pack Qty	E025 E035	E026 E036
2		56	1.3/4	0.3140	0.1410	0.1100	2	H2	N50	1.80	0.3140	1	—	0583203 [1]
4		40	1.7/8	0.6091	0.1410	0.1100	2	H2	N43	2.35	0.6091	1	—	0581254 [1]
5		40	1.15/16	0.7404	0.1410	0.1100	2	H2	N38	2.65	0.7404	1	—	0581261 [1]
	6	40	2“	0.2610	0.1410	0.1100	2	H2	N33	2.95	0.5938	1	0581957 [1]	—
6		32	2“	0.2610	0.1410	0.1100	2	H2	N36	2.85	0.5938	1	0581070 [1]	0581278 [1]
	8	36	2.1/8	0.2484	0.1680	0.1310	2	H2	N29	3.50	0.6526	1	0581964	—
8		32	2.1/8	0.2484	0.1680	0.1310	2	H2	N29	3.50	0.6526	1	0581087 [1]	0581285 [1]
	10	32	2.3/8	0.4303	0.1940	0.1520	2	H2	N21	4.10	0.8434	1	0581971 [1]	0582145 [1]
10		24	2.3/8	0.4303	0.1940	0.1520	2	H3	N25	3.90	0.8434	1	0581094 [1]	0581292 [1]
	12	28	2.3/8	0.4173	0.2200	0.1650	2	H3	N14	4.70	0.8848	1	— [1]	0582152 [1]
12		24	2.3/8	0.4173	0.2200	0.1650	2	H3	N16	4.50	0.8848	1	0581100 [1]	0581308 [1]
	1/4	28	2.1/2	0.5075	0.2550	0.1910	2	H3	N3	5.50	1.0073	1	0581995 [1]	0582169 [1]
	1/4	28	2.1/2	0.5075	0.2550	0.1910	3	H3	N3	5.50	1.0073	1	0582008 [1]	0582176 [1]
1/4		20	2.1/2	0.5075	0.2550	0.1910	2	H3	N7	5.10	1.0073	1	0581117 [1]	0581315 [1]
1/4		20	2.1/2	0.5075	0.2550	0.1910	3	H3	N7	5.10	1.0073	1	0581124 [1]	0581339 [1]
1/4		20	2.1/2	0.5075	0.2550	0.1910	3	H11	N7	5.10	1.0073	1	—	0581322 [1][3]
	5/16	24	2.23/32	0.5939	0.3180	0.2380	2	H3	I	6.90	1.1891	1	0582015 [1]	0582183 [1]
	5/16	24	2.23/32	0.5939	0.3180	0.2380	3	H3	I	6.90	1.1891	1	0582022 [1]	0582190 [1]
5/16		18	2.23/32	0.5939	0.3180	0.2380	2	H3	F	6.60	1.1891	1	0581131 [1]	0581346 [1]
5/16		18	2.23/32	0.5939	0.3180	0.2380	3	H3	F	6.60	1.1891	1	0581148 [1]	0581360 [1]
5/16		18	2.23/32	0.5939	0.3180	0.2380	3	H11	F	6.60	1.1891	1	—	0581353 [1][3]
	3/8	24	2.15/16	0.6020	0.3810	0.2860	2	H3	Q	8.50	1.2915	1	0582039 [1]	0582206 [1]
	3/8	24	2.15/16	0.6020	0.3810	0.2860	3	H3	Q	8.50	1.2915	1	0582046 [1]	—
3/8		16	2.15/16	0.6020	0.3810	0.2860	2	H3	5/16	8.00	1.2915	1	0581155 [1]	0581377 [1]
3/8		16	2.15/16	0.6020	0.3810	0.2860	3	H3	5/16	8.00	1.2915	1	0581162 [1]	0581391 [1]
3/8		16	2.15/16	0.6020	0.3810	0.2860	3	H11	5/16	8.00	1.2915	1	—	0581384 [1][3]
	7/16	20	3.5/32	0.9055	0.3230	0.2420	3	H3	25/64	9.90	—	1	0582053 [2]	0582220 [2]
7/16		14	3.5/32	0.9055	0.3230	0.2420	3	H3	U	9.40	—	1	0581179 [2]	0581407 [2]
	1/2	20	3.3/8	0.9055	0.3670	0.2750	2	H3	29/64	11.50	—	1	0582060 [2]	0582237 [2]

[1] Reinforced Shanks
[2] Reduced Shanks
[3] Oversize +.005”, not 3B

SPIRAL POINT TAPS

DORMER

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits			l_4 Inch	Pack Qty	E025 E035	E026 E036
	1/2	20	3.3/8	0.9055	0.3670	0.2750	3	H3	29/64	11.50	—	1	0582077 [2]	0582244 [2]
1/2		13	3.3/8	0.9055	0.3670	0.2750	2	H3	27/64	10.80	—	1	0581186 [2]	0581414 [2]
1/2		13	3.3/8	0.9055	0.3670	0.2750	3	H3	27/64	10.80	—	1	0581193 [2]	0581438 [2]
1/2		13	3.3/8	0.9055	0.3670	0.2750	3	H11	27/64	10.80	—	1	—	0581421 [2][3]
	9/16	18	3.19/32	0.9843	0.4290	0.3220	3	H3	33/64	12.90	—	1	0582084 [2]	0582251 [2]
9/16		12	3.19/32	0.9843	0.4290	0.3220	3	H3	31/64	12.20	—	1	0581209 [2]	0581445 [2]
	5/8	18	3.13/16	0.9843	0.4800	0.3600	3	H3	37/64	14.50	—	1	0582091 [2]	0582268 [2]
5/8		11	3.13/16	0.9843	0.4800	0.3600	3	H3	17/32	13.50	—	1	0581216 [2]	0581469 [2]
5/8		11	3.13/16	0.9843	0.4800	0.3600	3	H11	17/32	13.50	—	1	—	0581452 [2][3]
	3/4	16	4.1/4	1.1614	0.5900	0.4420	3	H3	11/16	17.50	—	1	0582107 [2]	0582275 [2]
3/4		10	4.1/4	1.1614	0.5900	0.4420	3	H4	21/32	16.50	—	1	0581223 [2]	0581476 [2]
	7/8	14	4.11/16	1.1614	0.6970	0.5230	3	H4	13/16	20.40	—	1	0582114 [2]	0582282 [2]
7/8		9	4.11/16	1.1614	0.6970	0.5230	3	H4	49/64	19.50	—	1	0581230 [2]	0581483 [2]
	1“	12	5.1/8	1.3976	0.8000	0.6000	3	H4	59/64	23.25	—	1	— [2]	0582299 [2]
	1“	14	5.1/8	1.3976	0.8000	0.6000	3	H4	59/64	23.50	—	1	0582138 [2]	0582305 [2]
1“		8	5.1/8	1.3976	0.8000	0.6000	3	H4	7/8	22.25	—	1	0581247 [2]	0581490 [2]

[1] Reinforced Shanks
[2] Reduced Shanks
[3] Oversize +.005”, not 3B

DORMER

SPIRAL POINT TAPS

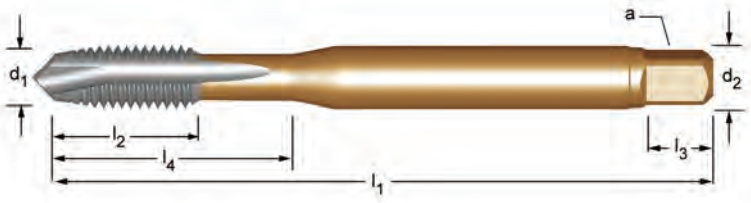
Multi-Application, Plug Chamfer

EP20/ EP30 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
EP20 = UNC Sizes, EP30 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP21/ EP31 Premium substrate with steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.
EP21 = UNC Sizes, EP31 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP20/EP30	EP21/EP31
UNC UNF	UNC UNF
DIN 2184-1	DIN 2184-1
2B	2B
HSS-E	HSS-E
	
No.4 - 1“	No.4 - 1“

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▱ a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	EP20/EP30	EP21/ EP31
4		40	2.845	56	9	3.5	2.7	6	3	2.35	18	H2	1	0138021 [1]	0138175 [1]
5		40	3.175	56	10	3.5	2.7	6	3	2.65	18	H2	1	0138038 [1]	0138182 [1]
6		32	3.505	56	11	4.0	3.0	6	3	2.85	20	H2	1	0138045 [1]	0138199 [1]
	8	36	4.166	63	12	4.5	3.4	8	3	3.5	21	H3	1	0138366 [1]	0138472 [1]
8		32	4.166	63	12	4.5	3.4	8	3	3.5	21	H3	1	0138052 [1]	0138205 [1]
	10	32	4.826	70	13	6.0	4.9	8	3	4.1	25	H3	1	0138373 [1]	0138489 [1]
10		24	4.826	70	13	6.0	4.9	8	3	3.9	25	H3	1	0138069 [1]	0138212 [1]
12		24	5.486	80	15	6.0	4.9	8	3	4.5	30	H3	1	0138076 [1]	0138229 [1]
	1/4	28	6.350	80	15	7.0	5.5	8	3	5.5	30	H4	1	0138380 [1]	0138496 [1]
1/4		20	6.350	80	15	7.0	5.5	8	3	5.1	30	H5	1	0138083 [1]	0138274 [1]
	5/16	24	7.938	90	18	8.0	6.2	9	3	6.9	35	H4	1	0138397 [1]	0138502 [1]
5/16		18	7.938	90	18	8.0	6.2	9	3	6.6	35	H5	1	0138090 [1]	0138281 [1]
	3/8	24	9.525	100	20	10.0	8.0	11	3	8.5	39	H4	1	0138403 [1]	0138519 [1]
3/8		16	9.525	100	20	10.0	8.0	11	3	8	39	H5	1	0138106 [1]	0138298 [1]
	7/16	20	11.112	100	20	8.0	6.2	9	3	9.9	-	H5	1	0138410 [2]	0138526 [2]
7/16		14	11.112	100	20	8.0	6.2	9	3	9.4	-	H5	1	0138113 [2]	0138304 [2]
	1/2	20	12.700	110	23	9.0	7.0	10	3	11.5	-	H5	1	0138427 [2]	0138533 [2]
1/2		13	12.700	110	23	9.0	7.0	10	3	10.8	-	H5	1	0138120 [2]	0138311 [2]
	5/8	18	15.875	110	25	12.0	9.0	12	3	14.5	-	H5	1	0138434 [2]	0138540 [2]
5/8		11	15.875	110	25	12.0	9.0	12	3	13.5	-	H5	1	0138137 [2]	0138328 [2]
	3/4	16	19.050	125	30	14.0	11.0	14	4	17.5	-	H5	1	0138441 [2]	0138557 [2]
3/4		10	19.050	125	30	14.0	11.0	14	4	16.5	-	H5	1	0138144 [2]	0138335 [2]
	7/8	14	22.225	140	34	18.0	14.5	17	4	20.4	-	H6	1	0138458 [2]	0138564 [2]
7/8		9	22.225	140	34	18.0	14.5	17	4	19.5	-	H6	1	0138151 [2]	0138342 [2]
	1“	12	25.400	160	38	18.0	14.5	17	4	23.25	-	H6	1	0138465 [2]	0138571 [2]
1“		8	25.400	160	38	18.0	14.5	17	4	22.25	-	H6	1	0138168 [2]	0138359 [2]

Note: DIN shank and square dimensions will necessitate metric holders

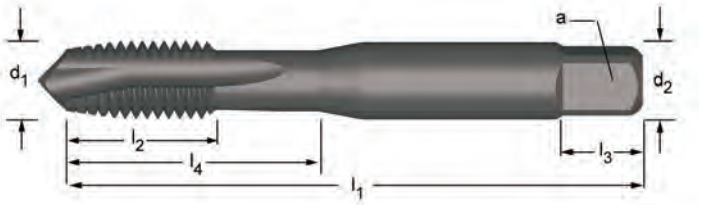
[1] Reinforced Shanks
[2] Reduced Shanks

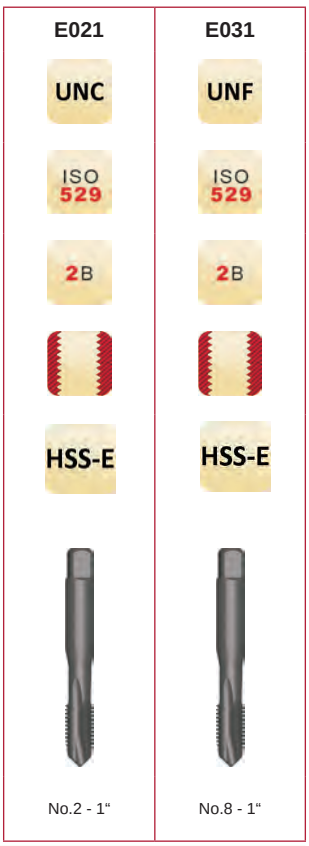
SPIRAL POINT TAPS

Multi-Application, PLUG CHAMFER

E021 Premium substrate with steam oxide surface
E031 treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E021 = UNC Sizes, E031 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	◹ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E021	E031
2		56	2.184	44.5	9.5	2.80	2.24	5	2	1.85	9.5	H2	1	0010396 [1]	—
4		40	2.845	48	14	3.15	2.50	5	3	2.35	14	H2	1	0569108 [1]	—
5		40	3.175	48	12.5	3.15	2.50	5	3	2.65	12.5	H2	1	0010419 [1]	—
6		32	3.505	50	16	3.55	2.80	5	3	2.85	16	H3	1	0569115 [1]	—
	8	36	4.166	53	9.5	4.5	3.55	6	3	3.50	17	H3	1	—	0569641 [1]
8		32	4.166	53	9.5	4.50	3.55	6	3	3.50	17	H3	1	0569122 [1]	—
	10	32	4.826	58	11	5.0	4.00	7	3	4.10	20	H3	1	—	0569658 [1]
10		24	4.826	58	11	5.00	4.00	7	3	3.90	20	H3	1	0569139 [1]	—
12		24	5.486	62	12	5.60	4.50	7	3	4.50	21	H3	1	0569146 [1]	—
	1/4	28	6.350	66	13	6.3	5.00	8	3	5.50	26	H4	1	—	0569665 [1]
1/4		20	6.350	66	13	6.30	5.00	8	3	5.10	26	H5	1	0569153 [1]	—
	5/16	24	7.938	72	16	8.0	6.30	9	3	6.90	29	H4	1	—	0569672 [1]
5/16		18	7.938	72	16	8.00	6.30	9	3	6.60	29	H5	1	0569160 [1]	—
	3/8	24	9.525	80	18	10.0	8.00	11	3	8.50	32	H4	1	—	0569689 [1]
3/8		16	9.525	80	18	10.00	8.00	11	3	8.00	32	H5	1	0569177 [1]	—
	7/16	20	11.112	85	19	8.0	6.30	9	3	9.90	-	H5	1	—	0569696 [2]
7/16		14	11.112	85	19	8.00	6.30	9	3	9.40	-	H5	1	0569184 [2]	—
	1/2	20	12.700	89	22	9.0	7.10	10	3	11.50	-	H5	1	—	0569702 [2]
1/2		13	12.700	89	22	9.00	7.10	10	3	10.80	-	H5	1	0569191 [2]	—
	9/16	18	14.288	95	24	11.2	9.00	12	3	12.90	-	H5	1	—	0569719 [2]
	5/8	18	15.875	102	24	12.5	10.00	13	3	14.50	-	H5	1	—	0569726 [2]
5/8		11	15.875	102	24	12.50	10.00	13	3	13.50	-	H5	1	0569207 [2]	—
	3/4	16	19.050	112	29	14.0	11.20	14	4	17.50	-	H5	1	—	0569733 [2]
3/4		10	19.050	112	29	14.00	11.20	14	4	16.50	-	H5	1	0569214 [2]	—
	7/8	14	22.225	118	29	16.0	12.50	16	4	20.40	-	H6	1	—	0569740 [2]
7/8		9	22.225	118	29	16.00	12.50	16	4	19.50	-	H6	1	0569221 [2]	—
	1“	12	25.400	130	35	18.0	14.00	18	4	23.25	-	H6	1	—	0569757 [2]
1“		8	25.400	130	35	18.00	14.00	18	4	22.25	-	H6	1	0569238 [2]	—

Note: ISO shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

UNION BUTTERFIELD

SPIRAL POINT TAPS

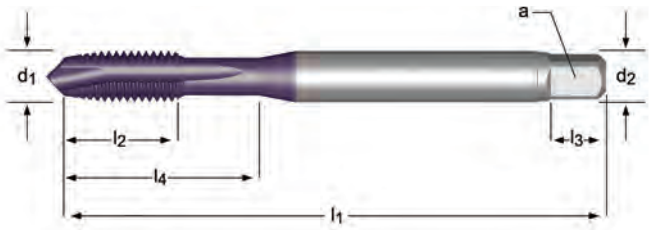
MXP Multi-Application, Plug Chamfer, Metric

APPLIX®

1673AP Designed for through hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1675 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4



1673AP	1675 Coolant Through
M MF	M MF
DIN ANSI	DIN ANSI
6H	6H
HSS PM	HSS PM
	
M4 - M24	M12 - M20

M	MF	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	⍁ a Inch	# of Flutes	Limits	Pack Qty	1673AP	1675
4		0.70	63	13	21	0.168	0.131	3	D4	1	46204884 [1]	—
5		0.80	70	15	25	0.194	0.152	3	D4	1	46204885 [1]	—
6		1.00	80	17	30	0.255	0.191	3	D5	1	46204886 [1]	—
	8	1.00	90	17	35	0.318	0.238	3	D5	1	46205008 [1]	—
8		1.25	90	20	35	0.318	0.238	3	D5	1	46204887 [1]	—
	10	1.25	100	16	39	0.381	0.286	3	D6	1	46204870 [1]	—
10		1.50	100	22	39	0.381	0.286	3	D6	1	46204871 [1]	—
	12	1.25	100	21		0.367	0.275	3	D6	1	46205009 [2]	—
	12	1.50	100	22		0.367	0.275	3	D6	1	46204872 [2]	—
12		1.75	110	24		0.367	0.275	3	D6	1	46204873 [2]	1716722 [2]
	14	1.50	100	22		0.429	0.322	4	D7	1	46204874 [2]	—
14		2.00	110	26		0.429	0.322	4	D7	1	46204875 [2]	—
	16	1.50	100	22		0.480	0.360	4	D7	1	46204876 [2]	—
16		2.00	110	27		0.480	0.360	4	D7	1	46204877 [2]	1716730 [2]
	18	1.50	110	25		0.542	0.406	4	D7	1	46204878 [2]	—
20		2.50	140	32		0.652	0.489	4	D7	1	46204881 [2]	1716738 [2]
	24	2.00	140	27		0.760	0.570	4	D8	1	46204882 [2]	—
24		3.00	160	34		0.760	0.570	4	D8	1	46204883 [2]	—

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

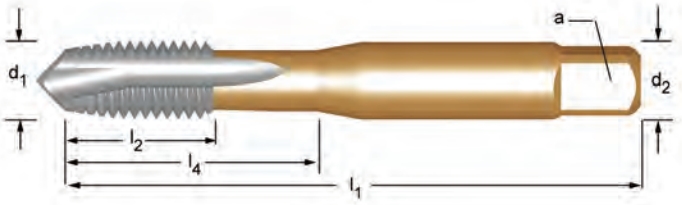
Multi-Application, Plug Chamfer

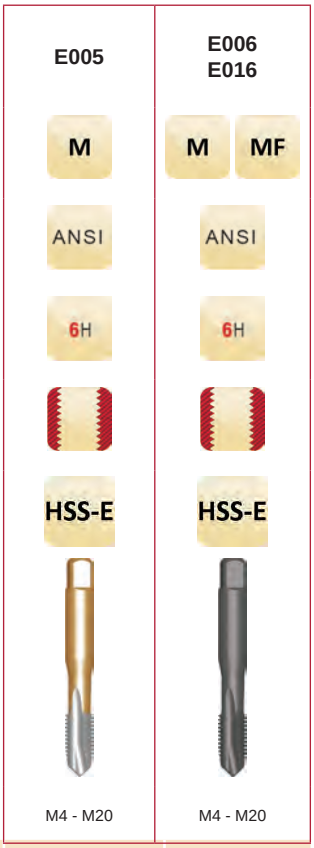
E005 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.
E005 = Metric Coarse

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

E006/ E016 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E006 = Metric Coarse, E016 = Metric Fine

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





M	MF	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	# of Flutes			l_4 Inch	Limits	Pack Qty	E005	E006 E016
4		0.70	2.1/8	0.2484	0.1680	0.1310	2	3.30	N30	0.6526	D4	1	0580301 [1]	0580462 [1]
4		0.70	2.1/8	0.2484	0.1680	0.1310	3	3.30	N30	0.6526	D4	1	0580318 [1]	0583180 [1]
5		0.80	2.3/8	0.4303	0.1940	0.1520	2	4.20	N19	0.8434	D4	1	0580325 [1]	0580479 [1]
5		0.80	2.3/8	0.4303	0.1940	0.1520	3	4.20	N19	0.8434	D4	1	0580332 [1]	0580486 [1]
6		1.00	2.1/2	0.5075	0.2550	0.1910	2	5.00	N9	1.0073	D5	1	0580349 [1]	0580493 [1]
6		1.00	2.1/2	0.5075	0.2550	0.1910	3	5.00	N9	1.0073	D5	1	0580356 [1]	0580509 [1]
	8	1.00	2.23/32	0.5939	0.3180	0.2380	3	7.00	J	1.1891	D5	1	—	0580950 [1]
8		1.25	2.23/32	0.5939	0.3180	0.2380	2	6.80	H	1.1891	D5	1	0580363 [1]	0580516 [1]
8		1.25	2.23/32	0.5939	0.3180	0.2380	3	6.80	H	1.1891	D5	1	0580370 [1]	0583197 [1]
	10	1.00	2.15/16	0.6020	0.3810	0.2860	3	9.00	T	1.2915	D6	1	—	0580967 [1]
10		1.50	2.15/16	0.6020	0.3810	0.2860	2	8.50	Q	1.2915	D6	1	0580387 [1]	0580523 [1]
10		1.50	2.15/16	0.6020	0.3810	0.2860	3	8.50	Q	1.2915	D6	1	0580394 [1]	0580530 [1]
12		1.75	3.3/8	0.9055	0.3670	0.2750	2	10.30	Y		D6	1	0580400 [2]	0580547 [2]
12		1.75	3.3/8	0.9055	0.3670	0.2750	3	10.30	Y		D6	1	0580417 [2]	0580554 [2]
	14	1.50	3.19/32	0.9843	0.4290	0.3220	3	12.50	31/64		D7	1	—	0580974 [2]
14		2.00	3.19/32	0.9843	0.4290	0.3220	3	12.00	15/32		D7	1	0580424 [2]	0580561 [2]
16		2.00	3.13/16	0.9843	0.4800	0.3600	3	14.00	35/64		D7	1	0580431 [2]	0580578 [2]
18		2.50	4.1/32	1.1614	0.5420	0.4060	3	15.50	39/64		D7	1	0580448 [2]	0580585 [2]
20		2.50	4.15/32	1.1614	0.6520	0.4890	3	17.50	11/16		D7	1	0580455 [2]	0580592 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

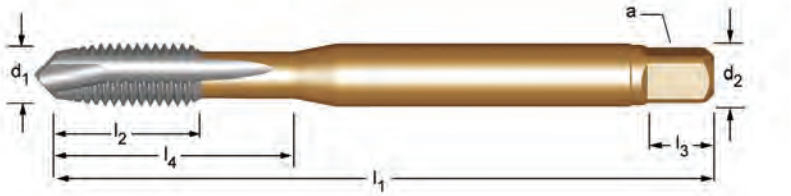
Multi-Application, Plug Chamfer

EP006H Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP016H Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP006H	EP016H
M	M
DIN 371≤10 376≥12	DIN 371≤10 376≥12
6H	6H
HSS-E	HSS-E
	
M2 - M30	M2 - M30

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	EP006H	EP016H
2	0.40	50	6	2.8	2.1	5	2	1.6	9	D3	1	0137239 [1]	0137253 [1]
2.5	0.45	50	8	2.8	2.1	5	2	2.1	12.5	D3	1	0137246 [1]	0137291 [1]
3	0.50	56	10	2.2	1.8	4	3	2.5	18	D3	1	0135716 [1]	0136126 [1]
3	0.50	56	9	3.5	2.7	6	3	2.5	18	D3	1	0135709 [1]	0136119 [1]
3.5	0.60	56	11	4.0	3.0	6	3	2.9	20	D4	1	0135723 [1]	0136133 [1]
4	0.70	63	12	2.8	2.1	5	3	3.3	21	D4	1	0135747 [1]	0136157 [1]
4	0.70	63	12	4.5	3.4	6	3	3.3	21	D4	1	0135730 [1]	0136140 [1]
4.5	0.75	70	13	6.0	4.9	8	3	3.8	25	D4	1	0135754 [1]	0136164 [1]
5	0.80	70	13	3.5	2.7	6	3	4.2	25	D4	1	0135853 [1]	0136188 [1]
5	0.80	70	13	6.0	4.9	8	3	4.2	25	D4	1	0135846 [1]	0136171 [1]
6	1.00	80	15	4.5	3.4	6	3	5	30	D5	1	0135877 [1]	0136201 [1]
6	1.00	80	15	6.0	4.9	8	3	5	30	D5	1	0135860 [1]	0136195 [1]
7	1.00	80	15	7.0	5.5	8	3	6	30	D5	1	0135884 [1]	0136218 [1]
8	1.25	90	18	6.0	4.9	8	3	6.8	35	D5	1	0135907 [1]	0136232 [1]
8	1.25	90	18	8.0	6.2	9	3	6.8	35	D5	1	0135891 [1]	0136225 [1]
10	1.50	100	20	10.0	8.0	11	3	8.5	39	D6	1	0135914 [1]	0136249 [1]
10	1.50	100	20	7.0	5.5	8	3	8.5	-	D6	1	0135921 [2]	0136256 [2]
12	1.75	110	23	9.0	7.0	10	3	10.3	-	D6	1	0135938 [2]	0136263 [2]
14	2.00	110	25	11.0	9.0	12	3	12	-	D7	1	0135945 [2]	0136317 [2]
16	2.00	110	25	12.0	9.0	12	3	14	-	D7	1	0135952 [2]	0136324 [2]
18	2.50	125	30	14.0	11.0	14	4	15.5	-	D7	1	0135969 [2]	0136331 [2]
20	2.50	140	30	16.0	12.0	15	4	17.5	-	D7	1	0135976 [2]	0136348 [2]
22	2.50	140	34	18.0	14.5	17	4	19.5	-	D8	1	0135983 [2]	0136355 [2]
24	3.00	160	38	18.0	14.5	17	4	21	-	D8	1	0135990 [2]	0136362 [2]
27	3.00	160	38	20.0	16.0	19	4	24	-	D8	1	0136003 [2]	0136379 [2]
30	3.50	180	45	22.0	18.0	21	4	26.5	-	D9	1	0136010 [2]	0136386 [2]

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

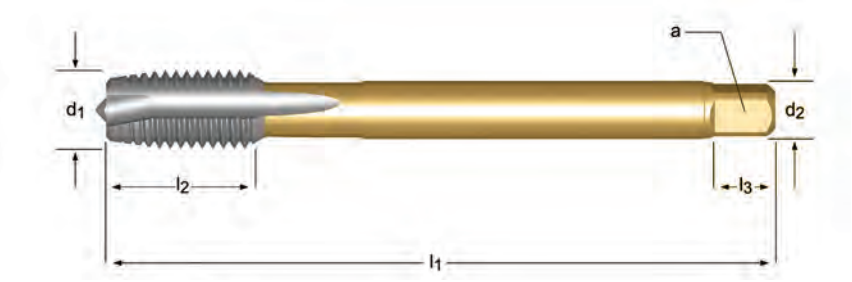
Multi-Application, Plug Chamfer

EP10 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP11 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP10	EP11
MF	MF
DIN 374	DIN 374
6H	6H
HSS-E	HSS-E
	
M4 - M30	M4 - M30

MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Limits	Pack Qty	EP10	EP11
4	0.50	63	12	2.8	2.1	5	3	3.5	D4	1	0137345	0137642
5	0.50	70	13	3.5	2.7	6	3	4.5	D4	1	0137352	0137659
6	0.75	80	15	4.5	3.4	6	3	5.3	D5	1	0137369	0137666
8	0.75	80	15	6.0	4.9	8	3	7.3	D5	1	0137376	0137673
8	1.00	90	18	6.0	4.9	8	3	7	D5	1	0137383	0137680
10	0.75	90	18	7.0	5.5	8	3	9.3	D6	1	0137390	0137697
10	1.00	90	18	7.0	5.5	8	3	9	D6	1	0137406	0137703
10	1.25	100	20	7.0	5.5	8	3	8.8	D6	1	0137413	0137710
12	1.00	100	21	9.0	7.0	10	3	11	D6	1	0137420	0137727
12	1.25	100	21	9.0	7.0	10	3	10.8	D6	1	0137437	0137819
12	1.50	100	21	9.0	7.0	10	3	10.5	D6	1	0137444	0137826
14	1.00	100	21	11.0	9.0	12	3	13	D7	1	0137451	0137833
14	1.25	100	21	11.0	9.0	12	3	13	D7	1	0137468	0137840
14	1.50	100	21	11.0	9.0	12	3	12.5	D7	1	0137475	0137857
16	1.00	100	21	12.0	9.0	12	3	15	D7	1	0137482	0137864
16	1.50	100	21	12.0	9.0	12	3	14.5	D7	1	0137499	0137871
18	1.00	110	24	14.0	11.0	14	4	17	D7	1	0137505	0137888
18	1.50	110	24	14.0	11.0	14	4	16.5	D7	1	0137512	0137895
20	1.00	125	24	16.0	12.0	15	4	19	D7	1	0137529	0137901
20	1.50	125	24	16.0	12.0	15	4	18.5	D7	1	0137536	0137918
22	1.50	125	25	18.0	14.5	17	4	20.5	D8	1	0137543	0137925
24	1.50	140	28	18.0	14.5	17	4	22.5	D8	1	0137550	0137932
24	2.00	140	28	18.0	14.5	17	4	22	D8	1	0137567	0137949
25	1.50	140	28	18.0	14.5	17	4	23.5	D8	1	0137574	0137956
26	1.50	140	28	18.0	14.5	17	4	24.5	D8	1	0137581	0137963
27	1.50	140	28	20.0	16.0	19	4	25.5	D8	1	0137598	0137970
27	2.00	140	28	20.0	16.0	19	4	25	D8	1	0137604	0137987
28	1.50	140	28	20.0	16.0	19	4	26.5	D9	1	0137611	0137994
30	1.50	150	28	22.0	18.0	21	4	28.5	D9	1	0137628	0138007
30	2.00	150	28	22.0	18.0	21	4	28	D9	1	0137635	0138014

Note: DIN shank and square dimensions will necessitate metric holders

SPIRAL POINT TAPS

Multi-Application, Plug Chamfer

E000 Premium substrate for through hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

E000 = Metric Coarse, E000TIN = TiN Coated

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

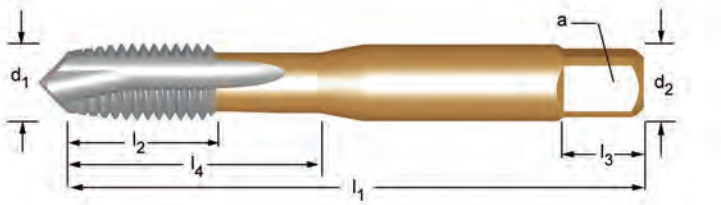
E000TIN E000 with a TiN coat

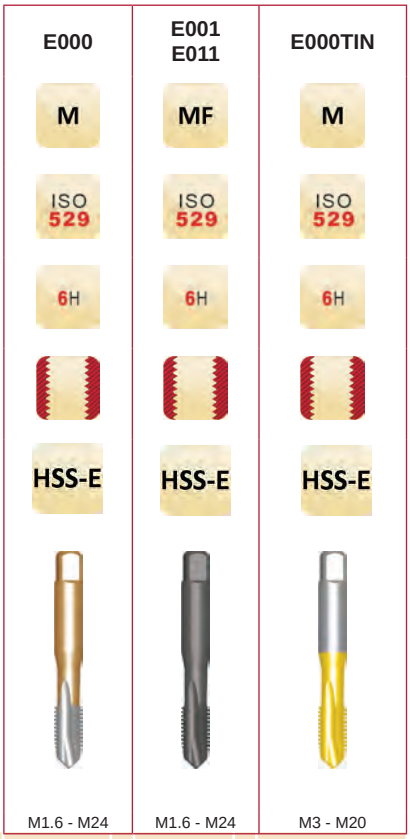
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
5.1 5.2 6.1 6.2 6.3 7.3 7.4 8.2

E001
E011 Premium substrate with steam oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E001 = Metric Coarse, E011 = Metric Fine

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4





M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	◹ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E000		E001 E011		E000TIN	
1.6		0.35	41	7	2.50	2.00	4	2	1.25	7	D3	1	0168769	1)	0168790	1)	—	
2		0.40	41	8	2.50	2.00	4	2	1.6	8	D3	1	0168776	1)	0168806	1)	—	
2.5		0.45	44.5	9.5	2.80	2.24	5	2	2.05	9.5	D3	1	0168783	1)	0168813	1)	—	
3		0.50	48	15	3.15	2.50	5	3	2.5	15	D3	1	0567586	1)	0567722	1)	46196635	1)
3.5		0.60	50	16	3.55	2.80	5	3	2.9	16	D4	1	0567593	1)	0567739	1)	—	
	4	0.50	53	17	4.0	3.15	6	3	3.5	17	D4	1	—		0568385	1)	—	
4		0.70	53	17	4.00	3.15	6	3	3.3	17	D4	1	0567609	1)	0567746	1)	46196636	1)
	5	0.50	58	11	5.0	4.00	7	3	4.5	22	D4	1	—		0568392	1)	—	
5		0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	0567616	1)	0567753	1)	46196637	1)
	6	0.50	66	13	6.3	5.00	8	3	5.5	26	D5	1	—		0568408	1)	—	
	6	0.75	66	13	6.3	5.00	8	3	5.3	26	D5	1	—		0568415	1)	—	
6		1.00	66	13	6.30	5.00	8	3	5.0	26	D5	1	0567623	1)	0567760	1)	46196638	1)
	8	0.75	72	16	8.0	6.30	9	3	7.3	29	D5	1	—		0568422	1)	—	
	8	1.00	72	16	8.0	6.30	9	3	7.0	29	D5	1	—		0568439	1)	—	
8		1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0567630	1)	0567777	1)	46196639	1)
	10	1.00	80	18	10.0	8.00	11	3	9.0	34	D6	1	—		0568446	1)	—	
	10	1.25	80	18	10.0	8.00	11	3	8.8	34	D6	1	—		0568453	1)	—	
10		1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0567647	1)	0567784	1)	46196690	1)
	12	1.00	89	22	9.0	7.10	10	3	11.0	-	D6	1	—		0568460	2)	—	
	12	1.25	89	22	9.0	7.10	10	3	10.8	-	D6	1	—		0568477	2)	—	
	12	1.50	89	22	9.0	7.10	10	3	10.5	-	D6	1	—		0568484	2)	—	
12		1.75	89	22	9.00	7.10	10	3	10.3	-	D6	1	0567654	2)	0567791	2)	46196691	2)
	14	1.00	95	24	11.2	9.00	12	3	13.0	-	D7	1	—		0568491	2)	—	
	14	1.25	95	24	11.2	9.00	12	3	12.8	-	D7	1	—		0568507	2)	—	
	14	1.50	95	24	11.2	9.00	12	3	12.5	-	D7	1	—		0568514	2)	—	
14		2.00	95	24	11.20	9.00	12	3	12.0	-	D7	1	0567661	2)	0567807	2)	—	
	16	1.00	102	24	12.5	10.00	13	3	15.0	-	D7	1	—		0568521	2)	—	
	16	1.50	102	24	12.5	10.00	13	3	14.5	-	D7	1	—		0568538	2)	—	
16		2.00	102	24	12.50	10.00	13	3	14.0	-	D7	1	0567678	2)	0567814	2)	46196692	2)

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

DORMER

M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	⊠ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E000		E001 E011		E000TIN	
	18	1.00	112	29	14.0	11.20	14	4	17.0	-	D7	1	—		0568545	2)	—	
	18	1.50	112	29	14.0	11.20	14	4	16.5	-	D7	1	—		0568552	2)	—	
18		2.50	112	29	14.00	11.20	14	4	15.5	-	D7	1	0567685	2)	0567821	2)	—	
	20	1.00	112	29	14.0	11.20	14	4	19.0	-	D7	1	—		0568569	2)	—	
	20	1.50	112	29	14.0	11.20	14	4	18.5	-	D7	1	—		0568576	2)	—	
	20	2.00	112	29	14.0	11.20	14	4	18.0	-	D7	1	—		0568583	2)	—	
20		2.50	112	29	14.00	11.20	14	4	17.5	-	D7	1	0567692	2)	—		46196693	2)
	22	1.50	118	29	16.0	12.50	16	4	20.5	-	D8	1	—		0568590	2)	—	
22		2.50	118	29	16.00	12.50	16	4	19.5	-	D8	1	0567708	2)	0567845	2)	—	
	24	1.50	130	35	18.0	14.00	18	4	22.5	-	D8	1	—		0568606	2)	—	
	24	2.00	130	35	18.0	14.00	18	4	22.0	-	D8	1	—		0568613	2)	—	
24		3.00	130	35	18.00	14.00	18	4	21.0	-	D8	1	0567715	2)	0567852	2)	—	

[1] Reinforced Shanks
[2] Reduced Shanks

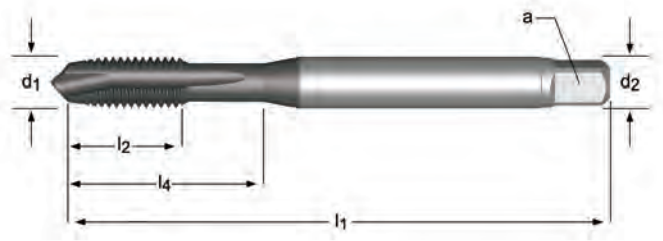
SPIRAL POINT TAPS

HMD Hard Materials / Cast Iron, Plug Chamfer

APPLIX®

1629AP Designed for through hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 1.6 2.4 3.1 3.2 3.3 3.4 4.3 5.3 6.4



1629AP

UNF UNC

DIN ANSI

2B

HSS PM



No.4 - 1"

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits	Pack Qty	1629AP
4		40	2.205	0.472	0.709	0.141	0.110	2	H2	1	46204796 [1]
6		32	2.205	0.472	0.787	0.141	0.110	3	H3	1	46204801 [1]
8		32	2.480	0.512	0.827	0.168	0.131	3	H3	1	46204805 [1]
	10	32	2.756	0.512	0.984	0.194	0.152	3	H3	1	46204759 [1]
10		24	2.756	0.591	0.984	0.194	0.152	3	H3	1	46204758 [1]
	1/4	28	3.150	0.669	1.181	0.255	0.191	3	H4	1	46204757 [1]
1/4		20	3.150	0.669	1.181	0.255	0.191	3	H5	1	46204756 [1]
	5/16	24	3.543	0.669	1.378	0.318	0.238	3	H4	1	46204798 [1]
5/16		18	3.543	0.787	1.378	0.318	0.238	3	H5	1	46204797 [1]
	3/8	24	3.937	0.709	1.535	0.381	0.286	3	H4	1	46204795 [1]
3/8		16	3.937	0.866	1.535	0.381	0.286	3	H5	1	46204794 [1]
	1/2	20	3.937	0.866		0.367	0.275	3	H5	1	46204755 [1]
1/2		13	4.331	0.984		0.367	0.275	3	H5	1	46204754 [2]
	5/8	18	3.937	0.866		0.480	0.360	3	H5	1	46204800 [2]
5/8		11	4.331	1.063		0.480	0.360	3	H5	1	46204799 [2]
3/4		10	4.921	1.181		0.590	0.442	3	H5	1	46204792 [2]
7/8		9	5.512	1.260		0.697	0.523	3	H6	1	46204804 [2]
1"		8	6.299	1.417		0.800	0.600	3	H6	1	46204791 [2]

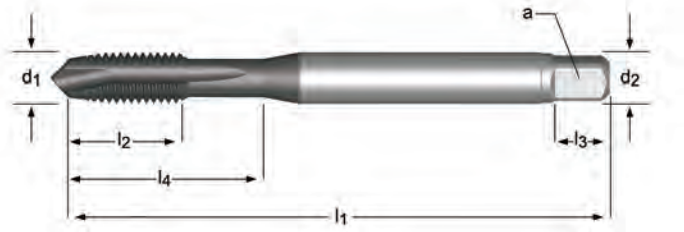
[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

HMD Hard Materials / Cast Iron, Plug Chamfer

1659AP Designed for through hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 **1.6** **2.4** **3.1** **3.2** **3.3** **3.4** **4.3** **5.3** **6.4**



1659AP(MF)

M **MF**

DIN ANSI

6H

HSS PM



M3 - M12

M	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	a Inch	# of Flutes	Limits	Pack Qty	1659AP
3	0.50	56	11	18	0.141	0.110	3	D3	1	46204832
4	0.70	63	13	21	0.168	0.131	3	D4	1	46204833 [1]
5	0.80	70	15	25	0.194	0.152	3	D4	1	46204834 [1]
6	1.00	80	17	30	0.255	0.191	3	D5	1	46204835 [1]
8	1.25	90	20	35	0.318	0.238	3	D5	1	46204837 [1]
10	1.50	100	22	39	0.381	0.286	3	D6	1	46204829 [1]
12	1.75	110	24		0.367	0.275	3	D6	1	46204831 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

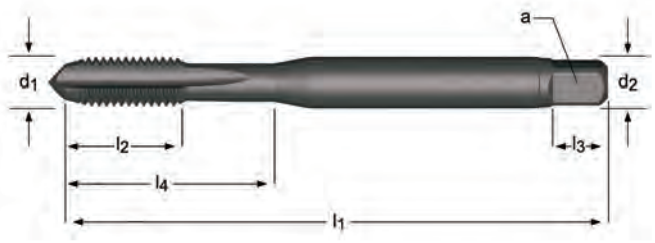
STRAIGHT FLUTE TAPS

For Cast Iron, Plug Chamfer

E201
E252

Designed for through or blind hole tapping with a specific geometry for cast iron and those materials producing broken, powdery chips. Also ideal for non-metallics, cast brass, and other brass materials. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials.

3.1 **3.2** **3.3** **3.4** **6.2** **6.4** **7.4** **8.2**



E201	E252
M	M
DIN 371	DIN 376
6HX	6HX
HSS PM	HSS PM
	
M3 - M10	M8 - M24

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	E201	E252
3	0.50	56	9	3.5	2.7	6	3	2.5	18	D3	1	0165607 [1]	—
4	0.70	63	12	4.5	3.4	6	4	3.3	21	D4	1	0085196 [1]	—
5	0.80	70	13	6.0	4.9	8	4	4.2	25	D4	1	0085202 [1]	—
6	1.00	80	15	6.0	4.9	8	4	5.0	30	D5	1	0085219 [1]	—
8	1.25	90	18	6.0	4.9	8	4	6.8		D5	1	—	0087343 [1]
8	1.25	90	18	8.0	6.2	9	4	6.8	35	D5	1	0085226 [1]	—
10	1.50	100	20	10.0	8.0	11	4	8.5	39	D6	1	0085189 [1]	—
10	1.50	100	20	7.0	5.5	8	4	8.5		D6	1	—	0087268 [2]
12	1.75	110	23	9.0	7.0	10	4	10.3		D6	1	—	0087275 [2]
14	2.00	110	25	11.0	9.0	12	4	12.0		D7	1	—	0087282 [2]
16	2.00	110	25	12.0	9.0	12	4	14.0		D7	1	—	0087299 [2]
18	2.50	125	30	14.0	11.0	14	4	15.5		D7	1	—	0087305 [2]
20	2.50	140	30	16.0	12.0	15	4	17.5		D7	1	—	0087312 [2]
22	2.50	140	34	18.0	14.5	17	4	19.5		D8	1	—	0087329 [2]
24	3.00	160	38	18.0	14.5	17	4	21.0		D8	1	—	0087336 [2]

Note: DIN shank and square dimensions will necessitate metric holders

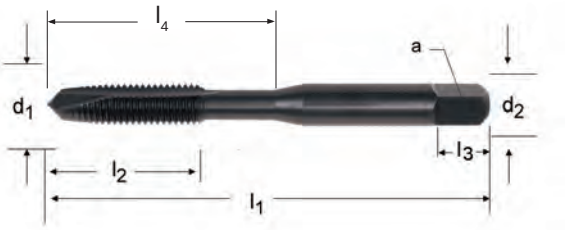
[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL POINT TAPS

DDX, High Hook, Plug Chamfer

1985 Type DDX taps feature a special O.D. and P.D. relief and increased back taper. Intended for use in through hole applications where a free cutting action is desirable. Designed to produce a class 2B fit. Sizes No.4 - 3/8" are 'necked' to allow for use in deep hole applications. Steam oxide reduces wear and prevents chip welding when through hole tapping in abrasive or harder ferrous materials.

1.1 **1.2** **1.3** **1.4** **1.5** **1.6** **2.1** **2.2** **4.1** **4.2** **4.3** **5.1** **5.2** **5.3**



1985

UNC UNF

ANSI

2B

HSS



No.4 - 1"

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	☐ a Inch	l_3 Inch	# of Flutes	1_4 Inch	Pack Qty	1985
	4	48	1.7/8	9/16	0.1410	0.1100	3/16	2	0.69	1	1013038 [1]
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	0.69	1	1013037 [1]
	5	44	1.15/16	5/8	0.1410	0.1100	3/16	2	0.75	1	1013040 [1]
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	0.75	1	1013039 [1]
	6	40	2"	11/16	0.1410	0.1100	3/16	2	0.78	1	1013042 [1]
6		32	2"	11/16	0.1410	0.1100	3/16	2	0.78	1	1013041 [1]
	8	36	2.1/8	3/4	0.1680	0.1310	1/4	2	0.81	1	1013044 [1]
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	0.81	1	1013043 [1]
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	0.94	1	1013046 [1]
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	0.94	1	1013045 [1]
	1/4	28	2.1/2	1"	0.2550	0.1910	5/16	2	1.19	1	1013050 [1]
1/4		20	2.1/2	1"	0.2550	0.1910	5/16	2	1.19	1	1013049 [1]
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	1.31	1	1013052 [1]
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	1.31	1	1013051 [1]
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	1.44	1	1013054 [1]
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	1.44	1	1013053 [1]
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	–	1	1013056 [2]
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	–	1	1013055 [2]
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	–	1	1013058 [2]
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	–	1	1013057 [2]
	9/16	18	3.19/32	1.21/32	0.4290	0.3220	1/2	3	–	1	1013060 [2]
9/16		12	3.19/32	1.21/32	0.4290	0.3220	1/2	3	–	1	1013059 [2]
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	3	–	1	1013062 [2]
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	3	–	1	1013061 [2]
	3/4	16	4.1/4	2"	0.5900	0.4420	11/16	3	–	1	1013066 [2]
3/4		10	4.1/4	2"	0.5900	0.4420	11/16	3	–	1	1013065 [2]
	7/8	14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	–	1	1013068 [2]
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	–	1	1013067 [2]
1"		8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	–	1	1013069 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

UNION BUTTERFIELD

APPLIX SPIRAL FLUTE TAP (48°-52°)

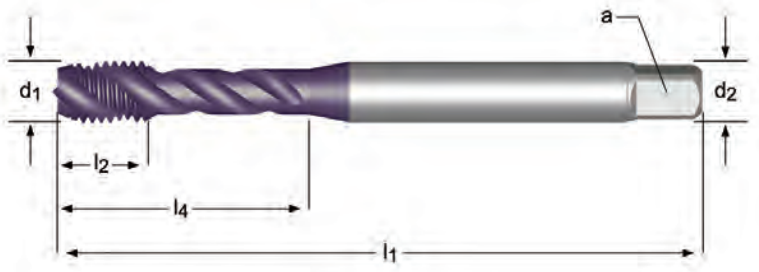
MXL Multi-Application, Semi-Bottoming

APPLIX®

1676AP Designed for blind hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1678 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4



1676AP(UNF)	1678(UNF)
UNC UNF	UNC UNF
DIN ANSI	DIN ANSI
2B	2B
HSS PM	HSS PM
	
No.4 - 1“	1/4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	d_2 Ø Inch	a Inch	# of Flutes	Limits	Pack Qty	1676AP	1678
4		40	2.205	0.236	0.709	0.141	0.110	3	H2	1	46204902 [1]	—
6		32	2.205	0.236	0.787	0.141	0.110	3	H2	1	46204907 [1]	—
8		32	2.480	0.236	0.827	0.168	0.131	3	H3	1	46204912 [1]	—
	10	32	2.756	0.354	0.984	0.194	0.152	3	H3	1	46204895 [1]	—
10		24	2.756	0.354	0.984	0.194	0.152	3	H3	1	46204894 [1]	—
	1/4	28	3.150	0.433	1.181	0.255	0.191	3	H4	1	46204893 [1]	1717512 [1]
1/4		20	3.150	0.433	1.181	0.255	0.191	3	H5	1	46204892 [1]	1717510 [1]
	5/16	24	3.543	0.472	1.378	0.318	0.238	3	H4	1	46204904 [1]	—
5/16		18	3.543	0.472	1.378	0.318	0.238	3	H5	1	46204903 [1]	1717514 [1]
	3/8	24	3.937	0.551	1.535	0.381	0.286	3	H4	1	46204901 [1]	—
3/8		16	3.937	0.551	1.535	0.381	0.286	3	H5	1	46204900 [1]	1717518 [1]
	7/16	20	3.937	0.591		0.323	0.242	3	H5	1	46204909 [2]	1717532 [2]
7/16		14	3.937	0.591		0.323	0.242	3	H5	1	46204908 [2]	1717530 [2]
	1/2	20	3.937	0.630		0.367	0.275	3	H5	1	46204891 [2]	—
1/2		13	4.331	0.630		0.367	0.275	3	H5	1	46204890 [2]	1717534 [2]
	5/8	18	3.937	0.745		0.480	0.360	3	H5	1	46204906 [2]	—
5/8		11	4.331	0.745		0.480	0.360	3	H5	1	46204905 [2]	1717538 [2]
	3/4	16	4.331	0.820		0.590	0.442	3	H5	1	46204899 [2]	—
3/4		10	4.921	0.820		0.590	0.442	3	H5	1	46204898 [2]	1717542 [2]
	7/8	14	4.921	0.910		0.697	0.523	4	H6	1	46204910 [2]	—
7/8		9	5.512	0.910		0.697	0.523	4	H6	1	46204911 [2]	46204932 [2]
1“		8	6.299	1.025		0.800	0.600	4	H6	1	46204897 [2]	1717546 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

DORMER

Multi-Application, Semi-Bottoming

E027
E037

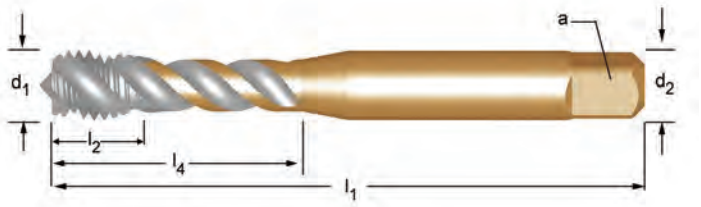
Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.
E027 = UNC Sizes, E037 = UNF Sizes

1.1 **1.2** **1.3** **1.4** **1.5** **4.1** **4.2** **5.1** **5.2** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3** **7.4** **8.1**

E028
E038

Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E028 = UNC Sizes, E038 = UNF Sizes

1.1 **1.2** **1.3** **1.4** **1.5** **1.6** **2.1** **2.2** **2.3**



E027/E037	E028/E038
UNC UNF	UNC UNF
ANSI	ANSI
3B	3B
HSS-E	HSS-E
	
No.6- 1“	No.4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	# of Flutes	Limits			l_4 Inch	Pack Qty	E027 E037	E028 E038	
4		40	1.7/8	0.6091	0.1410	0.1100	3	H2	N43	2.35	0.6091	1	—	0581643	1)
5		40	1.15/16	0.7404	0.1410	0.1100	3	H2	N38	2.65	0.7404	1	—	0581650	1)
6		32	2“	0.2610	0.1410	0.1100	3	H2	N36	2.85	0.5938	1	0581506	0581667	1)
8		32	2.1/8	0.2484	0.1680	0.1310	3	H2	N29	3.50	0.6526	1	0581513	0581674	1)
	10	32	2.3/8	0.2650	0.1940	0.1520	3	H2	N21	4.10	0.8434	1	0582312	0582435	1)
10		24	2.3/8	0.2650	0.1940	0.1520	3	H3	N25	3.90	0.8434	1	0581520	0581681	1)
12		24	2.3/8	0.2520	0.2200	0.1650	3	H3	N16	4.50	0.8848	1	0581537	0581698	1)
	1/4	28	2.1/2	0.3937	0.2550	0.1910	3	H3	N3	5.50	1.0993	1	0582329	0582442	1)
1/4		20	2.1/2	0.3937	0.2550	0.1910	3	H3	N7	5.10	1.0993	1	0581544	0581704	1)
	5/16	24	2.23/32	0.4567	0.3180	0.2380	3	H3	I	6.90	1.3094	1	0582336	0582459	1)
5/16		18	2.23/32	0.4567	0.3180	0.2380	3	H3	F	6.60	1.3094	1	0581551	0581711	1)
	3/8	24	2.15/16	0.5315	0.3810	0.2860	3	H3	Q	8.50	1.4415	1	0582343	0582466	1)
3/8		16	2.15/16	0.5315	0.3810	0.2860	3	H3	5/16	8.00	1.4415	1	0581568	0581728	1)
3/8		16	2.15/16	0.5315	0.3810	0.2860	3	H5	5/16	8.00	1.4415	1	—	0581735	1)3)
	7/16	20	3.5/32	0.6299	0.3230	0.2420	3	H3	25/64	9.90	-	1	0582350	0582473	2)
7/16		14	3.5/32	0.6299	0.3230	0.2420	3	H3	U	9.40	-	1	0581575	0581742	2)
	1/2	20	3.3/8	0.6890	0.3670	0.2750	3	H3	29/64	11.50	-	1	0582367	0582480	2)
1/2		13	3.3/8	0.6890	0.3670	0.2750	3	H3	27/64	10.80	-	1	0581582	0581759	2)
	9/16	18	3.19/32	0.7087	0.4290	0.3220	3	H3	33/64	12.90	-	1	0582374	0582497	2)
9/16		12	3.19/32	0.7087	0.4290	0.3220	3	H3	31/64	12.20	-	1	0581599	0581766	2)
	5/8	18	3.13/16	0.7087	0.4800	0.3600	3	H3	37/64	14.50	-	1	0582381	0582503	2)
5/8		11	3.13/16	0.7087	0.4800	0.3600	3	H3	17/32	13.50	-	1	0581605	0581773	2)
	3/4	16	4.1/4	0.8858	0.5900	0.4420	3	H3	11/16	17.50	-	1	0582398	0582510	2)
3/4		10	4.1/4	0.8858	0.5900	0.4420	3	H4	21/32	16.50	-	1	0581612	0581780	2)
	7/8	14	4.11/16	0.9843	0.6970	0.5230	3	H4	13/16	20.40	-	1	0582404	0582527	2)
7/8		9	4.11/16	0.9843	0.6970	0.5230	3	H4	49/64	19.50	-	1	0581629	0581797	2)
	1“	14	5.1/8	1.1811	0.8000	0.6000	3	H4	59/64	23.50	-	1	0582428	0582541	2)
1“		8	5.1/8	1.1811	0.8000	0.6000	3	H4	7/8	22.25	-	1	0581636	0581803	2)

[1] Reinforced Shanks
[2] Reduced Shanks
[3] Class of fit: 2B

SPIRAL FLUTE TAPS (45°)

Multi-Application, Semi-Bottoming

EX20
EX30

Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

EX20 = UNC Sizes, EX30 = UNF Sizes

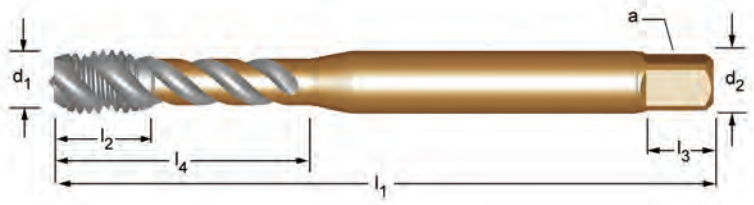
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX21
EX31

Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

EX21 = UNC Sizes, EX31 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



EX20/EX30	EX21/EX31
UNC UNF	UNC UNF
DIN 2184-1	DIN 2184-1
2B	2B
HSS-E	HSS-E
	
No.4 - 1“	No.4 - 1“

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Limits	l_4 mm	Pack Qty	EX20 EX30		EX21 EX31	
4		40	2.845	56	6	3.5	2.7	6	3	2.35	H2	18	1	0150269	1)	0150412	1)
5		40	3.175	56	6	3.5	2.7	6	3	2.65	H2	18	1	0150276	1)	0150429	1)
6		32	3.505	56	7	4.0	3.0	6	3	2.85	H2	20	1	0150283	1)	0150436	1)
	8	36	4.166	63	7	4.5	3.4	8	3	3.5	H3	21	1	0168325	1)	0168431	1)
8		32	4.166	63	7	4.5	3.4	8	3	3.5	H3	21	1	0150290	1)	0150443	1)
	10	32	4.826	70	8	6.0	4.9	8	3	4.1	H3	25	1	0168332	1)	0168448	1)
10		24	4.826	70	8	6.0	4.9	8	3	3.9	H3	25	1	0150306	1)	0150450	1)
12		24	5.486	80	10	6.0	4.9	8	3	4.5	H3	30	1	0150313	1)	0150467	1)
	1/4	28	6.350	80	10	7.0	5.5	8	3	5.5	H4	30	1	0168349	1)	0168455	1)
1/4		20	6.350	80	10	7.0	5.5	8	3	5.1	H5	30	1	0150320	1)	0150474	1)
	5/16	24	7.938	90	12	8.0	6.2	9	3	6.9	H4	35	1	0168356	1)	0168462	1)
5/16		18	7.938	90	12	8.0	6.2	9	3	6.6	H5	35	1	0150337	1)	0150627	1)
	3/8	24	9.525	100	15	10.0	8.0	11	3	8.5	H4	39	1	0168363	1)	0168479	1)
3/8		16	9.525	100	15	10.0	8.0	11	3	8	H5	39	1	0150344	1)	0151945	1)
	7/16	20	11.112	100	15	8.0	6.2	9	3	9.9	H5	-	1	0168370	2)	0168486	2)
7/16		14	11.112	100	15	8.0	6.2	9	3	9.4	H5	-	1	0150351	2)	0159507	2)
	1/2	20	12.700	110	18	9.0	7.0	10	3	11.5	H5	-	1	0168387	2)	0168493	2)
1/2		13	12.700	110	18	9.0	7.0	10	3	10.8	H5	-	1	0150368	2)	0159514	2)
	5/8	18	15.875	110	20	12.0	9.0	12	4	14.5	H5	-	1	0168394	2)	0168509	2)
5/8		11	15.875	110	20	12.0	9.0	12	4	13.5	H5	-	1	0150375	2)	0159552	2)
	3/4	16	19.050	125	25	14.0	11.0	14	4	17.5	H5	-	1	0168400	2)	0168516	2)
3/4		10	19.050	125	25	14.0	11.0	14	4	16.5	H5	-	1	0150382	2)	0159576	2)
	7/8	14	22.225	140	25	18.0	14.5	17	4	20.4	H6	-	1	0168417	2)	0168523	2)
7/8		9	22.225	140	25	18.0	14.5	17	4	19.5	H6	-	1	0150399	2)	0159590	2)
	1“	12	25.400	160	30	18.0	14.5	17	4	23.25	H6	-	1	0168424	2)	0168530	2)
1“		8	25.400	160	30	18.0	14.5	17	4	22.25	H6	-	1	0150405	2)	0168318	2)

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

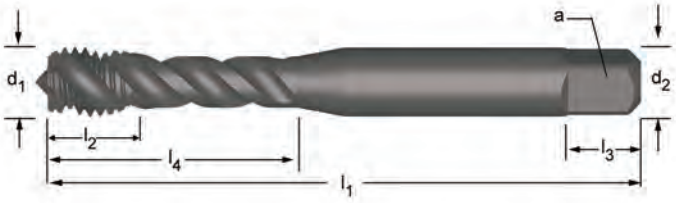
SPIRAL FLUTE TAPS (45°)

DORMER

Multi-Application, Semi-Bottoming

E023 Premium substrate with Steam Oxide surface treatment
E033 reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E023 = UNC Sizes, E033 = UNF Sizes

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3**



E023/E033

UNC UNF

ISO 529

2B

HSS-E



No.2 - 1"

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	E023 E033	
2		56	2.184	44.5	9.5	2.80	2.24	5	2	1.85	9.5	H2	1	0010440	1)
4		40	2.845	48	6	3.15	2.50	5	3	2.35	14	H2	1	0569382	1)
5		40	3.175	48	6	3.15	2.50	5	3	2.65	12.5	H2	1	0010471	1)
6		32	3.505	50	6	3.55	2.80	5	3	2.85	16	H2	1	0569399	1)
	8	36	4.166	53	7	4.5	3.55	6	3	3.50	17	H3	1	0570081	1)
8		32	4.166	53	7	4.50	3.55	6	3	3.50	17	H3	1	0569405	1)
	10	32	4.826	58	8	5.0	4.00	7	3	4.10	20	H3	1	0570098	1)
10		24	4.826	58	8	5.00	4.00	7	3	3.90	20	HH3	1	0569412	1)
12		24	5.486	62	12	5.60	4.50	7	3	4.50	21	H3	1	0569429	1)
	1/4	28	6.350	66	10	6.3	5.00	8	3	5.50	28	H4	1	0570104	1)
1/4		20	6.350	66	10	6.30	5.00	8	3	5.10	28	H5	1	0569436	1)
	5/16	24	7.938	72	12	8.0	6.30	9	3	6.90	31	H4	1	0570111	1)
5/16		18	7.938	72	12	8.00	6.30	9	3	6.60	31	H5	1	0569443	1)
	3/8	24	9.525	80	15	10.0	8.00	11	3	8.50	34	H4	1	0570128	1)
3/8		16	9.525	80	15	10.00	8.00	11	3	8.00	34	H5	1	0569450	1)
	7/16	20	11.112	85	19	8.0	6.30	9	3	9.90	-	H5	1	0570135	2)
7/16		14	11.112	85	19	8.00	6.30	9	3	9.40	-	H5	1	0569467	2)
	1/2	20	12.700	89	22	9.0	7.10	10	3	11.50	-	H5	1	0570142	2)
1/2		13	12.700	89	19	9.00	7.10	10	3	10.80	-	H5	1	0569474	2)
	9/16	18	14.288	95	24	11.2	9.00	12	3	12.90	-	H5	1	0570159	2)
	5/8	18	15.875	102	24	12.5	10.00	13	4	14.50	-	H5	1	0570166	2)
5/8		11	15.875	102	24	12.50	10.00	13	4	13.50	-	H5	1	0569481	2)
	3/4	16	19.050	112	29	14.0	11.20	14	4	17.50	-	H5	1	0570173	2)
3/4		10	19.050	112	29	14.00	11.20	14	4	16.50	-	H5	1	0569498	2)
	7/8	14	22.225	118	29	16.0	12.50	16	4	20.40	-	H6	1	0570180	2)
7/8		9	22.225	118	29	16.00	12.50	16	4	19.50	-	H6	1	0569504	2)
	1"	12	25.400	130	35	18.0	14.00	18	4	23.25	-	H6	1	0570197	2)
1"		8	25.400	130	35	18.00	14.00	18	4	22.25	-	H6	1	0569511	2)

Note: ISO shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAP (48°-52°)

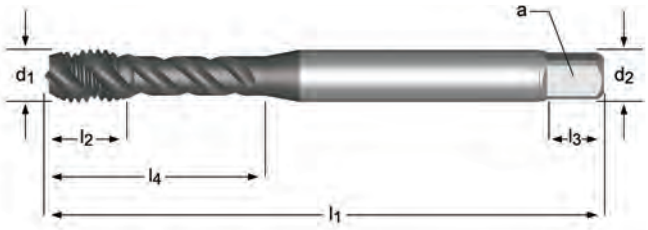
MXL Multi-Application, Semi-Bottoming

APPLIX

1677AP Designed for blind hole tapping in a variety of materials with a hardness up to 36 Rc. The premium substrate and TiCN coating combine to offer superior abrasion resistance, higher operating speeds, improved thread quality, reduced cycle times, and longer tool life.

1679 Coolant thru design allows higher tapping speeds and eliminates the problems associated with inadequate coolant in horizontal or deep hole applications.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3 4.1 4.2 5.1 5.2 6.1 6.2 6.3
7.1 7.2 7.3 7.4



	1677AP(M)	1679(M)
	M MF	M MF
	DIN ANSI	DIN ANSI
	6H	6H
	HSS PM	HSS PM
		
	M4 - M24	M6 - M24

M	MF	TPI	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	a Inch	# of Flutes	Pack Qty	1677AP	1679(M)
4		0.70	63	6	21	D4	0.168	0.131	3	1	46204927 [1]	—
5		0.80	70	9	25	D4	0.194	0.152	3	1	46204928 [1]	—
6		1.00	80	11	30	D5	0.255	0.191	3	1	46204929 [1]	1717704 [1]
	8	1.00	90	12	35	D5	0.318	0.238	3	1	46205010 [1]	—
8		1.25	90	12	35	D5	0.318	0.238	3	1	46204930 [1]	1717706 [1]
	10	1.25	100	14	39	D6	0.381	0.286	3	1	46204913 [1]	1717708
10		1.50	100	14	39	D6	0.381	0.286	3	1	46204914 [1]	1717710 [1]
	12	1.50	100	16		D6	0.367	0.275	3	1	46204915 [2]	—
12		1.75	110	16		D6	0.367	0.275	3	1	46204916 [2]	1717722 [2]
	14	1.50	100	18		D7	0.429	0.322	3	1	46204917 [2]	—
14		2.00	110	18		D7	0.429	0.322	3	1	46204918 [2]	1717726 [2]
16		2.00	110	19		D7	0.480	0.360	3	1	46204920 [2]	1717730 [2]
	18	1.50	110	21		D7	0.542	0.406	3	1	46204921 [2]	—
18		2.50	125	21		D7	0.542	0.406	3	1	46204922 [2]	1717734 [2]
	20	1.50	125	21		D7	0.652	0.489	3	1	46204923 [2]	—
20		2.50	140	21		D7	0.652	0.489	3	1	46204924 [2]	1717738 [2]
24		3.00	160	26		D8	0.760	0.570	4	1	46204926 [2]	1717742 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

DORMER

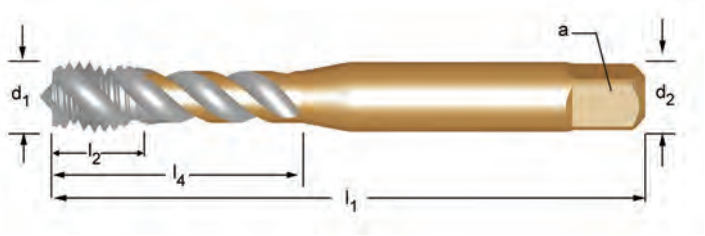
Multi-Application, Semi-Bottoming

E007 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.
E007 = Metric Coarse, E017 = Metric Fine

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

E008
E018 Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.
E008 = Metric Coarse, E018 = Metric Fine

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



E007	E008/E018
M	M MF
ANSI	ANSI
6H	6H
HSS-E	HSS-E
M4 - M20	M4 - M20

M	MF	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	◿ a Inch	# of flutes	Limits			l_4 Inch	Pack Qty	E007		E008 E018	
4		0.70	2.1/8	0.2484	0.1680	0.1310	3	D4	3.30	N30	0.6526	1	0580608	1)	0580707	1)
5		0.80	2.3/8	0.2650	0.1940	0.1520	3	D4	4.20	N19	0.8434	1	0580615	1)	0580714	1)
6		1.00	2.1/2	0.3937	0.2550	0.1910	3	D5	5.00	N9	1.0993	1	0580622	1)	0580721	1)
	8	1.00	2.23/32	0.4567	0.3180	0.2380	3	D5	7.00	J	1.3094	1	—		0581032	1)
8		1.25	2.23/32	0.4567	0.3180	0.2380	3	D5	6.80	H	1.3094	1	0580639	1)	0580738	1)
	10	1.00	2.15/16	0.5315	0.3810	0.2860	3	D6	9.00	T	1.4415	1	—		0581049	1)
10		1.50	2.15/16	0.5315	0.3810	0.2860	3	D6	8.50	Q	1.4415	1	0580646	1)	0580745	1)
12		1.75	3.3/8	0.6890	0.3670	0.2750	3	D6	10.30	Y		1	0580653	2)	0580752	2)
	14	1.50	3.19/32	0.7087	0.4290	0.3220	3	D7	12.50	31/64		1	—		0581056	2)
14		2.00	3.19/32	0.7087	0.4290	0.3220	3	D7	12.00	15/32		1	—	2)	0580769	2)
16		2.00	3.13/16	0.7087	0.4800	0.3600	3	D7	14.00	35/64		1	0580677	2)	0580776	2)
20		2.50	4.15/32	0.8858	0.6520	0.4890	3	D7	17.50	11/16		1	—	2)	0580790	2)

[1] Reinforced Shanks
[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

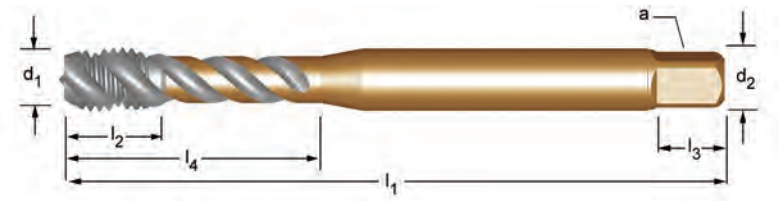
Multi-Application, Semi-Bottoming

EX006H Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX016H Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



	EX006H	EX016H
	M	M
	DIN 371≤10 376≥12	DIN 371≤10 376≥12
	6H	6H
	HSS-E	HSS-E
		
	M2 - M64	M2 - M64

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	EX006H	EX016H
2	0.40	45	4	2.8	2.1	5	3	1.6	9	D3	1	0137307 [1]	0137321 [1]
2.5	0.45	50	4	2.8	2.1	5	3	2.05	12.5	D3	1	0137314 [1]	0137338 [1]
3	0.50	56	6	3.5	2.7	6	3	2.5	18	D3	1	0136591 [1]	0136942 [1]
3.5	0.60	56	7	4.0	3.0	6	3	2.9	20	D4	1	0136607 [1]	0136966 [1]
4	0.70	63	7	4.5	3.4	6	3	3.3	21	D4	1	0136614 [1]	0136973 [1]
5	0.80	70	8	6.0	4.9	8	3	4.2	25	D4	1	0136621 [1]	0136980 [1]
6	1.00	80	10	4.5	3.4	6	3	5	31	D5	1	0136645 [1]	0137000 [1]
6	1.00	80	10	6.0	4.9	8	3	5	31	D5	1	0136638 [1]	0136997 [1]
7	1.00	80	10	7.0	5.5	8	3	6	31	D5	1	0136652 [1]	0137017 [1]
8	1.25	90	12	8.0	6.2	9	3	6.8	35	D5	1	0136669 [1]	0137024 [1]
8	1.25	90	13	6.0	4.9	8	3	6.8	35	D5	1	0136676 [1]	0137031 [1]
10	1.50	100	15	10.0	8.0	11	3	8.5	39	D6	1	0136683 [1]	0137048 [1]
10	1.50	100	15	7.0	5.5	8	3	8.5	39	D6	1	0136690 [1]	0137055 [1]
12	1.75	110	16	9.0	7.0	10	3	10.3	-	D6	1	0136706 [2]	0137062 [2]
14	2.00	110	20	11.0	9.0	12	3	12	-	D7	1	0136713 [2]	0137079 [2]
16	2.00	110	20	12.0	9.0	12	4	14	-	D7	1	0136720 [2]	0137086 [2]
18	2.50	125	25	14.0	11.0	14	4	15.5	-	D7	1	0136737 [2]	0137093 [2]
20	2.50	140	25	16.0	12.0	15	4	17.5	-	D7	1	0136744 [2]	0137109 [2]
22	2.50	140	25	18.0	14.5	17	4	19.5	-	D8	1	0136829 [2]	0137116 [2]
24	3.00	160	30	18.0	14.5	17	4	21	-	D8	1	0136836 [2]	0137123 [2]
27	3.00	160	30	20.0	16.0	19	4	24	-	D8	1	0136843 [2]	0137130 [2]
30	3.50	180	36	22.0	18.0	21	4	26.5	-	D9	1	0136850 [2]	0137147 [2]
33	3.50	180	36	25.0	20.0	23	4	29.5	-	D9	1	0136867 [2]	0137154 [2]
36	4.00	200	40	28.0	22.0	25	4	32	-	D9	1	0136874 [2]	0137161 [2]
39	4.00	200	40	32.0	24.0	27	4	35	-	D9	1	0136881 [2]	0137178 [2]
42	4.50	200	45	32.0	24.0	27	4	37.5	-	D10	1	0136898 [2]	0137185 [2]
48	5.00	250	50	36.0	29.0	32	4	43	-	D11	1	0136904 [2]	0137192 [2]
52	5.00	250	50	40.0	32.0	35	5	47	-	D11	1	0136911 [2]	0137208 [2]
56	5.50	250	55	40.0	32.0	35	5	50.5	-	D11	1	0136928 [2]	0137215 [2]
64	6.00	315	60	50.0	39.0	42	6	58	-	D12	1	0136935 [2]	0137222 [2]

Note: DIN shank and square dimensions will necessitate metric holders

[1] Reinforced Shanks

[2] Reduced Shanks

SPIRAL FLUTE TAPS (45°)

DORMER

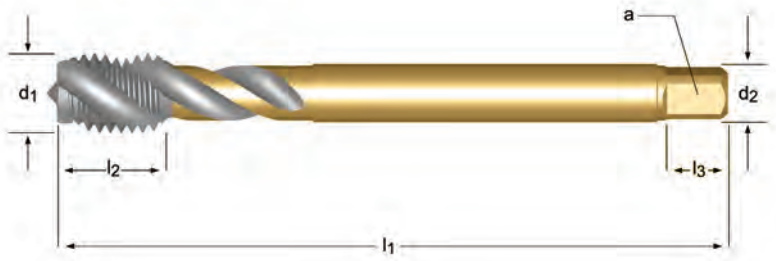
Multi-Application, Semi-Bottoming

EX10 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX11 Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



	EX10	EX11
	MF	MF
	DIN 374	DIN 374
	6H	6H
	HSS-E	HSS-E
		
	M4 - M30	M4 - M30

MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Limits	Pack Qty	EX10	EX11
4	0.50	63	7	2.8	2.1	5	3	3.5	D4	1	0149669	0149966
5	0.50	70	8	3.5	2.7	6	3	4.5	D4	1	0149676	0149973
6	0.75	80	10	4.5	3.4	6	3	5.3	D5	1	0149683	0149980
8	0.75	80	13	6.0	4.9	8	3	7.3	D5	1	0149690	0149997
8	1.00	90	13	6.0	4.9	8	3	7	D5	1	0149706	0150009
10	0.75	90	13	7.0	5.5	8	3	9.3	D6	1	0149713	0150016
10	1.00	90	13	7.0	5.5	8	3	9	D6	1	0149720	0150023
10	1.25	100	15	7.0	5.5	8	3	8.8	D6	1	0149737	0150030
12	1.00	100	15	9.0	7.0	10	3	11	D6	1	0149744	0150047
12	1.25	100	15	9.0	7.0	10	3	10.8	D6	1	0149751	0150054
12	1.50	100	15	9.0	7.0	10	3	10.5	D6	1	0149768	0150061
14	1.00	100	15	11.0	9.0	12	3	13	D7	1	0149775	0150078
14	1.25	100	15	11.0	9.0	12	3	12.8	D7	1	0149782	0150085
14	1.50	100	15	11.0	9.0	12	3	12.5	D7	1	0149799	0150092
16	1.00	100	15	12.0	9.0	12	4	15	D7	1	0149805	0150108
16	1.50	100	15	12.0	9.0	12	4	14.5	D7	1	0149812	0150115
18	1.00	110	17	14.0	11.0	14	4	17	D7	1	0149829	0150122
18	1.50	110	17	14.0	11.0	14	4	16.5	D7	1	0149836	0150139
20	1.00	125	17	16.0	12.0	15	4	19	D7	1	0149843	0150146
20	1.50	125	17	16.0	12.0	15	4	18.5	D7	1	0149850	0150153
22	1.50	125	17	18.0	14.5	17	4	20.5	D8	1	0149867	0150160
24	1.50	140	20	18.0	14.5	17	4	22.5	D8	1	0149874	0150177
24	2.00	140	20	18.0	14.5	17	4	22	D8	1	0149881	0150184
25	1.50	140	20	18.0	14.5	17	4	23.5	D8	1	0149898	0150191
26	1.50	140	20	18.0	14.5	17	4	24.5	D8	1	0149904	0150207
27	1.50	140	20	20.0	16.0	19	4	25.5	D8	1	0149911	0150214
27	2.00	140	20	20.0	16.0	19	4	25	D8	1	0149928	0150221
28	1.50	140	20	20.0	16.0	19	4	26.5	D9	1	0149935	0150238
30	1.50	150	20	22.0	18.0	21	4	28.5	D9	1	0149942	0150245
30	2.00	150	20	22.0	18.0	21	4	28	D9	1	0149959	0150252

Note: DIN shank and square dimensions will necessitate metric holders

SPIRAL FLUTE TAPS (45°)

Multi-Application, Semi-Bottoming

E002 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

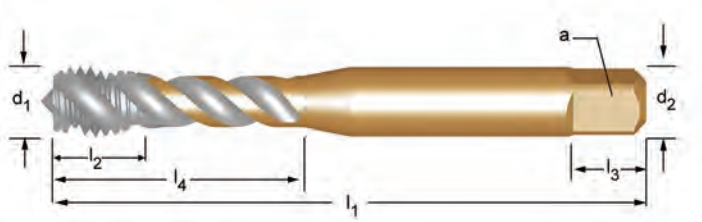
E002 = Metric Coarse

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

E003 **E013** Premium substrate with Steam Oxide surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E003 = Metric Coarse, E013 = Metric Fine

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



E002	E003 / E013
M	M MF
ISO 529	ISO 529
6H	6H
HSS-E	HSS-E
M2 - M24	M2 - M24

Note: ISO shank and square dimensions will necessitate metric holders

M	MF	P mm	l_1 mm	l_2 mm	d_2 Ø mm	▱ a mm	l_3 mm	# of Flutes	Limits	↔	l_4 mm	Pack Qty	E002	E003 E013
2		0.40	41	8	2.50	2.00	4	2	D3	1.6	8	1	0168820 [1]	0168844 [1]
2.5		0.45	44.5	9.5	2.80	2.24	5	2	D3	2.05	9.5	1	0168837 [1]	0168851 [1]
3		0.50	48	6	3.15	2.50	5	3	D3	2.5	12.5	1	0567869 [1]	0568002 [1]
	4	0.50	53	7	4.0	3.15	6	3	D4	3.5	19	1	—	0568798 [1]
4		0.70	53	7	4.00	3.15	6	3	D4	3.3	19	1	0567883 [1]	0568026 [1]
	5	0.50	58	8	5.0	4.0	7	3	D4	4.5	22	1	—	0568804 [1]
5		0.80	58	8	5.00	4.00	7	3	D4	4.2	22	1	0567890 [1]	0568033 [1]
	6	0.50	66	10	6.3	5.0	8	3	D5	5.5	27	1	—	0568811 [1]
	6	0.75	66	10	6.3	5.0	8	3	D5	5.3	27	1	—	0568828 [1]
6		1.00	66	10	6.30	5.00	8	3	D5	5.0	27	1	0567906 [1]	0568040 [1]
	8	0.75	72	12	8.0	6.3	9	3	D5	7.3	31	1	—	0568835 [1]
	8	1.00	72	12	8.0	6.3	9	3	D5	7.0	31	1	—	0568842 [1]
8		1.25	72	12	8.00	6.30	9	3	D5	6.8	31	1	0567913 [1]	0568057 [1]
	10	1.00	80	15	10.0	8.0	11	3	D6	9.0	35	1	—	0568859 [1]
	10	1.25	80	15	10.0	8.0	11	3	D6	8.8	35	1	—	0568866 [1]
10		1.50	80	15	10.00	8.00	11	3	D6	8.5	35	1	0567920 [1]	0568064 [1]
	12	1.00	89	16	9.0	7.1	10	3	D6	11.0	-	1	—	0568873 [2]
	12	1.25	89	16	9.0	7.1	10	3	D6	10.8	-	1	—	0568880 [2]
	12	1.50	89	16	9.0	7.1	10	3	D6	10.5	-	1	—	0568897 [2]
12		1.75	89	16	9.00	7.10	10	3	D6	10.3	-	1	0567937 [2]	0568071 [2]
	14	1.50	95	18	11.2	9.0	12	3	D7	12.5	-	1	—	0568903 [2]
14		2.00	95	18	11.20	9.00	12	3	D7	12.0	-	1	0567944 [2]	0568088 [2]
	16	1.00	102	18	12.5	10.0	13	4	D7	15.0	-	1	—	0568910 [2]
	16	1.50	102	18	12.5	10.0	13	4	D7	14.5	-	1	—	0568927 [2]
16		2.00	102	18	12.50	10.00	13	4	D7	14.0	-	1	0567951 [2]	0568095 [2]
	18	1.50	112	29	14.0	11.2	14	4	D7	16.5	-	1	—	0568934 [2]
18		2.50	112	29	14.00	11.20	14	4	D7	15.5	-	1	0567968 [2]	0568101 [2]
	20	1.50	112	29	14.0	11.2	14	4	D7	18.5	-	1	—	0568941 [2]
20		2.50	112	29	14.00	11.20	14	4	D7	17.5	-	1	0567975 [2]	0568118 [2]
	22	1.50	118	29	16.0	12.5	16	4	D8	20.5	-	1	—	0568958 [2]
22		2.50	118	29	16.00	12.50	16	4	D8	19.5	-	1	0567982 [2]	0568125 [2]
24		3.00	130	35	18.00	14.00	18	4	D8	21.0	-	1	0567999 [2]	0568132 [2]

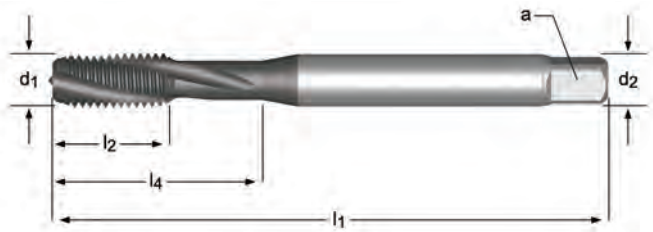
[1] Reinforced Shanks, [2] Reduced Shanks

SPIRAL FLUTE TAP (16°-19°)

HMD Hard Materials / Cast Iron, Semi-Bottoming

1630AP Designed for blind hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 **1.6** **2.4** **3.1** **3.2** **3.3** **3.4** **4.3** **5.3** **6.4**



1630AP

UNC UNF

DIN ANSI

2B

HSS PM



No.4 - 1“

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	a Inch	# of Flutes	Pack Qty	1630AP
4		40	2.205	0.236	0.709	H2	0.141	0.110	2	1	46204818 [1]
6		32	2.205	0.236	0.787	H2	0.141	0.110	2	1	46204823 [1]
8		32	2.480	0.236	0.827	H3	0.168	0.131	2	1	46204828 [1]
	10	32	2.756	0.354	0.984	H3	0.194	0.152	3	1	46204811 [1]
10		24	2.756	0.354	0.984	H3	0.194	0.152	3	1	46204810 [1]
	1/4	28	3.150	0.433	1.181	H4	0.255	0.191	3	1	46204809 [1]
1/4		20	3.150	0.433	1.181	H5	0.255	0.191	3	1	46204808 [1]
	5/16	24	3.543	0.472	1.378	H4	0.318	0.238	3	1	46204820 [1]
5/16		18	3.543	0.472	1.378	H5	0.318	0.238	3	1	46204819 [1]
	3/8	24	3.937	0.551	1.535	H4	0.381	0.286	3	1	46204817 [1]
3/8		16	3.937	0.551	1.535	H5	0.381	0.286	3	1	46204816 [1]
	7/16	20	3.937	0.591	–	H5	0.323	0.242	3	1	46204825 [2]
7/16		14	3.937	0.591	–	H5	0.323	0.242	3	1	46204824 [2]
	1/2	20	3.937	0.630	–	H5	0.367	0.275	3	1	46204807 [2]
1/2		13	4.331	0.630	–	H5	0.367	0.275	3	1	46204806 [2]
	5/8	18	3.937	0.745	–	H5	0.480	0.360	4	1	46204822 [2]
5/8		11	4.331	0.745	–	H5	0.480	0.360	4	1	46204821 [2]
	3/4	16	4.331	0.820	–	H5	0.590	0.442	4	1	46204815 [2]
3/4		10	4.921	0.820	–	H5	0.590	0.442	4	1	46204814 [2]
	7/8	14	4.921	0.910	–	H6	0.697	0.523	4	1	46204826 [2]
7/8		9	5.512	0.910	–	H6	0.697	0.523	4	1	46204827 [2]
1“		8	6.299	1.025	–	H6	0.800	0.600	4	1	46204813 [2]

[1] Reinforced Shanks
[2] Reduced Shanks

UNION BUTTERFIELD

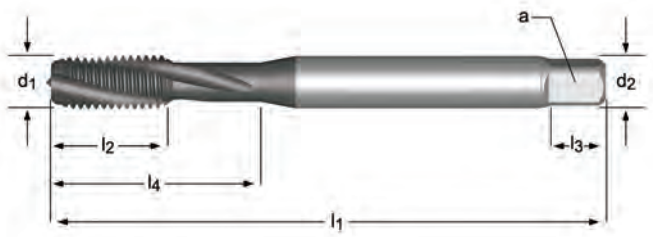
SPIRAL FLUTE TAP (16°-19°)

APPLIX

HMD Hard Materials / Cast Iron, Semi-Bottoming

1660AP Designed for blind hole tapping materials with a hardness of >38 Rc. Premium substrate provides superior abrasion resistance and edge strength. TiAlN-Top coating lowers the coefficient of friction, improves thread quality, affords higher operating speeds, and longer tool life.

1.5 **1.6** **2.4** **3.1** **3.2** **3.3** **3.4** **4.3** **5.3** **6.4**



1660AP(M)

M

DIN ANSI

6H

HSS PM



M3 - M12

M	P mm	l_1 mm	l_2 mm	l_4 Inch (Neck Length)	d_2 Ø Inch	a Inch	# of Flutes	Limits	Pack Qty	1660AP(M)	
3	0.50	56	8	18	0.141	0.110	3	D3	1	46204841	
4	0.70	63	6	21	0.168	0.131	3	D4	1	46204842	1)
5	0.80	70	9	25	0.194	0.152	3	D4	1	46204843	1)
6	1.00	80	11	30	0.255	0.191	3	D5	1	46204844	1)
8	1.25	90	12	35	0.318	0.238	3	D5	1	46204846	1)
10	1.50	100	14	39	0.381	0.286	3	D6	1	46204838	1)
12	1.75	110	16		0.367	0.275	3	D6	1	46204840	2)

1) Reinforced Shanks
2) Reduced Shanks

THREAD FORMING TAPS

Multi-Application / Lube Grooves, Full-Bottoming

1641 Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. TiN coated for enhanced performance. The hard, smooth coating provides a greater lubricity, increases tool life, and improves thread flank finish.

The entry taper is full bottoming style (1-2 thread chamfer) for blind hole tapping.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**



1641(UNC)	1641(UNF)
UNC	UNF
ANSI	ANSI
2B 3B	2B 3B
HSS PM	HSS PM
	
No.4 - 1/2	No.10 - 3/8

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	l_3 Inch	d_2 Ø Inch	⍁ a Inch	Limits	Pack Qty	1641(UNC)	1641(UNF)
4		40	1.7/8	5/16	1/4	3/16	0.141	0.110	H3	1	1712221	—
4		40	1.7/8	5/16	1/4	3/16	0.141	0.110	H5	1	1712223	—
6		32	2“	3/8	5/16	3/16	0.141	0.110	H3	1	1712233	—
6		32	2“	3/8	5/16	3/16	0.141	0.110	H5	1	1712235	—
8		32	2.1/8	3/8	3/8	1/4	0.141	0.110	H3	1	1712239	—
8		32	2.1/8	3/8	3/8	1/4	0.141	0.110	H5	1	1712241	—
	10	32	2.3/8	1/2	3/8	1/4	0.194	0.152	H4	1	—	1712258
	10	32	2.3/8	1/2	3/8	1/4	0.194	0.152	H6	1	—	1712260
10		24	2.3/8	1/2	3/8	1/4	0.194	0.152	H6	1	1712254	—
	1/4	28	2.1/2	5/8	3/8	5/16	0.255	0.191	H4	1	—	1712270
	1/4	28	2.1/2	5/8	3/8	5/16	0.255	0.191	H6	1	—	1712272
1/4		20	2.1/2	5/8	3/8	5/16	0.255	0.191	H4	1	1712264	—
1/4		20	2.1/2	5/8	3/8	5/16	0.255	0.191	H6	1	1712266	—
	5/16	24	2.23/32	11/16	7/16	3/8	0.318	0.238	H7	1	—	1712285
5/16		18	2.23/32	11/16	7/16	3/8	0.318	0.238	H5	1	1712277	—
5/16		18	2.23/32	11/16	7/16	3/8	0.318	0.238	H7	1	1712279	—
	3/8	24	2.15/16	3/4	1/2	7/16	0.381	0.286	H7	1	—	1712297
3/8		16	2.15/16	3/4	1/2	7/16	0.381	0.286	H5	1	1712289	—
3/8		16	2.15/16	3/4	1/2	7/16	0.381	0.286	H7	1	1712291	—
1/2		13	3.3/8	15/16	23/32	7/16	0.367	0.275	H5	1	1712301	—
1/2		13	3.3/8	15/16	23/32	7/16	0.367	0.275	H8	1	1712304	—

Multi-Application / Lube Grooves, Full-Bottoming

1671 Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. TiN coated for enhanced performance. The hard, smooth coating provides a greater lubricity, increases tool life, and improves thread flank finish.

The entry taper is full bottoming style for blind hole tapping.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**



1671(M)

M

ANSI

6H

HSS PM



M3 - M10

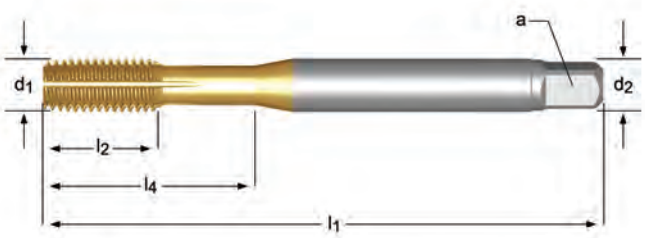
M	P mm	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	l_3 Inch	d_2 Ø Inch	◹ a Inch	Limits	Pack Qty	1671(M)
3	0.50	1.15/16	5/16	3/16	3/16	0.141	0.110	D5	1	1713051
4	0.70	2.1/8	3/8	3/8	1/4	0.168	0.131	D6	1	1713052
5	0.80	2.3/8	1/2	3/8	1/4	0.194	0.152	D7	1	1713053
6	1.00	2.1/2	5/8	3/8	5/16	0.255	0.191	D8	1	1713054
8	1.00	2.23/32	11/16	7/16	3/8	0.318	0.238	D9	1	1713055
8	1.25	2.23/32	11/16	7/16	3/8	0.318	0.238	D9	1	1713056
10	1.50	2.15/16	3/4	1/2	7/16	0.381	0.286	D10	1	1713057

THREAD FORMING TAPS

MXR Multi-Application / Lube Grooves, Semi-Bottoming

1681AP Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**



	1681AP(UNC)	1681AP(UNF)
	UNC	UNF
	DIN ANSI	DIN ANSI
	2B	2B
	HSS PM	HSS PM
		
	No.4 - 1"	No.10 - 7/8

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	▨ a Inch	Pack Qty	1681AP (UNC)	1681AP (UNF)
4		40	2.205	0.433	0.709	H5	0.141	0.110	1	46204945 [1]	—
6		32	2.205	0.472	0.787	H5	0.141	0.110	1	46204950 [1]	—
8		32	2.480	0.512	0.827	H5	0.168	0.131	1	46204955 [1]	—
	10	32	2.756	0.512	0.984	H6	0.194	0.152	1	—	46204938 [1]
10		24	2.756	0.591	0.984	H6	0.194	0.152	1	46204937 [1]	—
12		24	3.150	0.630	1.142	H6	0.220	0.165	1	46371643 [1]	—
	1/4	28	3.150	0.669	1.181	H6	0.255	0.191	1	—	46204936 [1]
1/4		20	3.150	0.669	1.181	H6	0.255	0.191	1	46204935 [1]	—
	5/16	24	3.543	0.669	1.378	H7	0.318	0.238	1	—	46204947 [1]
5/16		18	3.546	0.787	1.378	H7	0.318	0.238	1	46204946 [1]	—
	3/8	24	3.937	0.709	1.535	H7	0.381	0.286	1	—	46204944 [1]
3/8		16	3.937	0.866	1.535	H7	0.381	0.286	1	46204943 [1]	—
	7/16	20	3.937	0.866	–	H8	0.323	0.242	1	—	46204952 [2]
7/16		14	3.937	0.866	–	H8	0.323	0.242	1	46204951 [2]	—
	1/2	20	3.937	0.866	–	H8	0.397	0.275	1	—	46204934 [2]
1/2		13	4.331	0.984	–	H8	0.367	0.275	1	46204933 [2]	—
5/8		11	4.331	1.063	–	H8	0.480	0.360	1	46204948 [2]	—
	3/4	16	4.331	0.984	–	H8	0.590	0.442	1	—	46204942 [2]
3/4		10	4.921	1.181	–	H8	0.590	0.442	1	46204941 [2]	—
	7/8	14	4.921	1.024	–	H9	0.697	0.523	1	—	46204953 [2]
7/8		9	5.512	1.260	–	H9	0.697	0.523	1	46204954 [2]	—
1"		8	6.299	1.417	–	H9	0.800	0.600	1	46204940 [2]	—

[1] Reinforced Shanks
[2] Reduced Shanks

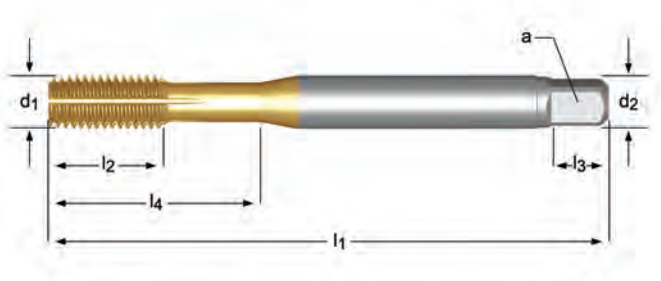
THREAD FORMING TAPS

MXR Multi-Application / Lube Grooves, Semi-Bottoming

APPLIX

1691AP Coolant thru premium PM substrate allows higher tapping speeds in soft ferrous or non-ferrous materials. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**



	1691AP(UNC)	1691AP(UNF)
	UNC	UNF
	DIN ANSI	DIN ANSI
	2B	2B
	HSS PM	HSS PM
		
	1/4 - 1"	5/16 - 1/2

UNC	UNF	TPI	l_1 Inch	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	▨ a Inch	Pack Qty	1691AP (UNC)	1691AP (UNF)
1/4		20	3.150	0.669	1.181	H6	0.255	0.191	1	46204976 [1)]	—
	5/16	24	3.543	0.669	1.378	H7	0.318	0.238	1	—	46204985 [1)]
5/16		18	3.546	0.787	1.378	H7	0.318	0.238	1	46204984 [1)]	—
	3/8	24	3.937	0.709	1.535	H7	0.381	0.286	1	—	46204983 [1)]
3/8		16	3.937	0.866	1.535	H7	0.381	0.286	1	46204982 [1)]	—
	7/16	20	3.937	0.866	–	H8	0.323	0.242	1	—	46204989 [2)]
	1/2	20	3.937	0.866	–	H8	0.397	0.275	1	—	46204975 [2)]
1/2		13	4.331	0.984	–	H8	0.367	0.275	1	46204974 [2)]	—
5/8		11	4.331	1.063	–	H8	0.480	0.360	1	46204986 [2)]	—
3/4		10	4.921	1.181	–	H8	0.590	0.442	1	46204980 [2)]	—
1"		8	6.299	1.417	–	H9	0.800	0.600	1	46204979 [2)]	—

[1)] Reinforced Shanks
[2)] Reduced Shanks

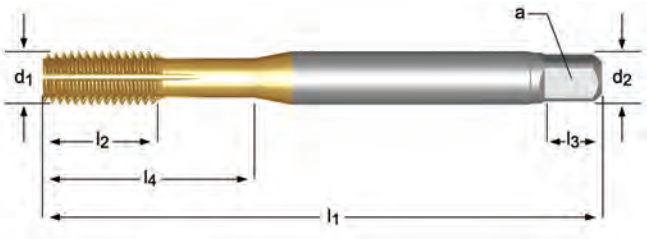
THREAD FORMING TAPS

MXR Multi-Application / Lube Grooves, Semi-Bottoming

1687AP Premium PM substrate provides superior abrasion resistance and edge strength. Multiple Lube Groove design assures lubrication in the forming zone and eliminates the build up of hydraulic pressure in blind holes. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow. Features a semi-bottoming lead for improved performance and longer tool life. Can be used for through or blind holes.

1697AP Coolant thru premium PM substrate allows higher tapping speeds in soft ferrous or non-ferrous materials. The TiN-Top coating process reduces friction, prevents chip welding and improves chip flow.

1.1 **1.2** **1.3** **1.4** **1.5** **2.1** **2.2** **2.3** **4.1** **5.1** **6.1** **6.2** **6.3** **7.1** **7.2** **7.3**



	1687AP	1697AP
	M MF	M
	DIN ANSI	DIN ANSI
	6H	6H
	HSS PM	HSS PM
		
	M4 - M20	M6 - M20

M	MF	P mm	l_1 mm	l_2 mm	l_2 Inch	l_4 Inch (Neck Length)	Limits	d_2 Ø Inch	a Inch	Pack Qty	1687AP	1697AP
4		0.70	63	13		21	D6	0.168	0.131	1	46204970 [1]	—
5		0.80	70	15		25	D7	0.194	0.152	1	46204971 [1]	—
6		1.00	80	17		30	D8	0.255	0.191	1	46204972 [1]	46205004 [1]
8		1.25	90	20		25	D9	0.318	0.238	1	46204973 [1]	—
8		1.25	90	20		35	D9	0.318	0.238	1	—	46205005 [1]
	10	1.25	100	16		39	D10	0.381	0.286	1	46204956 [1]	—
10		1.50	100	22		39	D10	0.381	0.286	1	46204957 [1]	46204991 [1]
	12	1.50	100	22			D11	0.367	0.275	1	46204958 [2]	—
12		1.75	110	24			D11	0.367	0.275	1	46204959 [2]	46204993 [2]
	14	1.50	100	22			D10	0.429	0.322	1	46204960 [2]	—
14		2.00	110	26			D11	0.429	0.322	1	46204961 [2]	— [2]
	16	1.50	100	22			D10	0.480	0.360	1	46204962 [2]	—
16		2.00	110	27			D11	0.480	0.360	1	46204963 [2]	46204997 [2]
	20	1.50	125		25		D11	0.652	0.489	1	—	46205000 [2]
20		2.50	140	32			D12	0.652	0.489	1	46204967 [2]	— [2]

[1] Reinforced Shanks
[2] Reduced Shanks

PIPE TAPS, STRAIGHT FLUTE

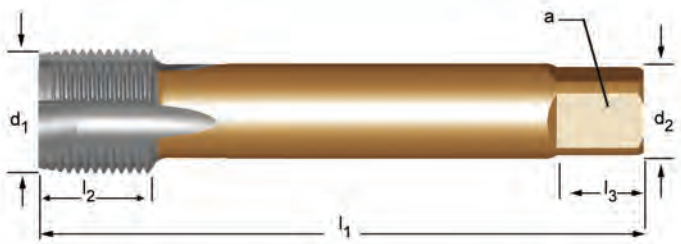
Parallel Thread, G (BSP), Plug Style

EP40 Bronze oxide body and shank reduces rust and corrosion. Bright flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

EP41 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4



EP40	EP41
G	G
DIN 5156	DIN 5156
Normal	Normal
	
HSS-E	HSS-E
	
1/8 - 1“	1/8 - 1“

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of flutes	↔	Pack Qty	EP40	EP41
1/8	28	9.728	90	18	7.0	5.5	8	3	8.8	1	0138588	0138663
1/4	19	13.157	100	21	11.0	9.0	12	3	11.8	1	0138595	0138670
3/8	19	16.662	100	21	12.0	9.0	12	4	15.25	1	0138601	0138687
1/2	14	20.955	125	24	16.0	12.0	15	4	19	1	0138618	0138694
5/8	14	22.911	125	24	18.0	14.5	17	4	21	1	0138625	0138700
3/4	14	26.441	140	28	20.0	16.0	19	4	24.5	1	0138632	0147054
7/8	14	30.201	150	28	22.0	18.0	21	4	28.25	1	0138649	0149645
1“	11	33.249	160	30	25.0	20.0	23	4	30.75	1	0138656	0149652

Note: DIN shank and square dimensions will necessitate metric holders

Parallel Thread, G(BSP), Plug Style

E041 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 **1.2** **1.3** **1.4** **1.5** **1.6** **2.1** **2.2** **2.3** **3.1** **3.2** **3.3** **3.4**



E041

G

DORMER ISO

Normal

HSS-E



1/8 - 3/4

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	Pack Qty	E041
1/8	28	9.728	90	15	8.0	6.3	9	3	8.80	1	0569818
1/4	19	13.157	100	19	10.0	8.0	11	3	11.80	1	0569825
3/8	19	16.662	100	21	12.5	10.0	13	3	15.25	1	0569832
1/2	14	20.955	125	26	16.0	12.5	16	4	19.00	1	0569849
3/4	14	26.441	140	28	20.0	16.0	20	4	24.50	1	0569856

Note: ISO shank and square dimensions will necessitate metric holders

PIPE TAPS, SPIRAL FLUTE

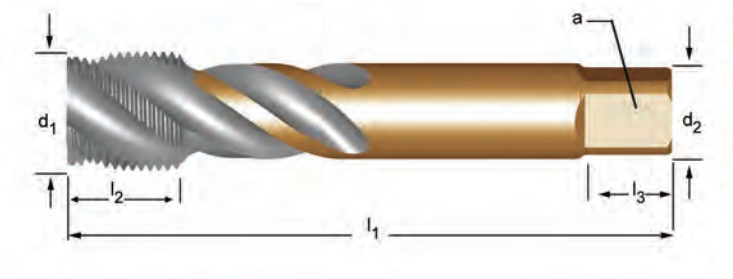
Parallel Thread, G(BSP), Semi- Bottoming

EX40 Bronze oxide body and shank reduces rust and corrosion. Bright flutes improve chip flow in soft or non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4 8.1

EX41 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



EX40	EX41
G	G
DIN 5156	DIN 5156
Normal	Normal
HSS-E	HSS-E
	
1/8 - 1.1/2	1/8 - 1.1/2

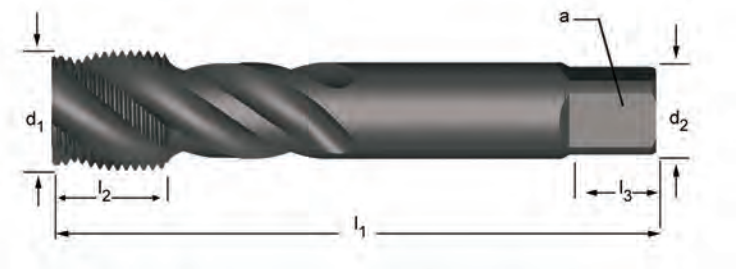
G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of flutes	↔	Pack Qty	EX40	EX41
1/8	28	9.728	90	13	7.0	5.5	8	3	8.8	1	0168547	0168653
1/4	19	13.157	100	15	11.0	9.0	12	3	11.8	1	0168554	0168660
3/8	19	16.662	100	15	12.0	9.0	12	4	15.25	1	0168561	0168677
1/2	14	20.955	125	18	16.0	12.0	15	4	19	1	0168578	0168684
5/8	14	22.911	125	18	18.0	14.5	17	4	21	1	0168585	0168691
3/4	14	26.441	140	20	20.0	16.0	19	4	24.5	1	0168592	0168707
7/8	14	30.201	150	20	22.0	18.0	21	4	28.25	1	0168608	0168714
1“	11	33.249	160	22	25.0	20.0	23	4	30.75	1	0168615	0168721
1.1/8	11	37.897	170	22	28.0	22.0	25	4	35	1	0168622	0168738
1.1/4	11	41.910	170	22	32.0	24.0	27	4	39.5	1	0168639	0168745
1.1/2	11	47.803	190	23	36.0	29.0	32	4	45	1	0168646	0168752

Note: DIN shank and square dimensions will necessitate metric holders

Parallel Thread, G(BSP), Semi-Bottoming

E043 Steam oxide surface treatment reduces wear and chip welding in abrasive or harder ferrous materials.

1.1 **1.2** **1.3** **1.4** **1.5** **1.6** **2.1** **2.2** **2.3**



E043

G

DORMER ISO

Normal

HSS-E



1/8 - 3/4

G(BSP)	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	⍁ a mm	l_3 mm	# of flutes		Pack Qty	E043
1/8	28	9.728	90	15	8.0	6.3	9	3	8.80	1	0569917
1/4	19	13.157	100	19	10.0	8.0	11	3	11.80	1	0569924
3/8	19	16.662	100	21	12.5	10.0	13	4	15.25	1	0569931
1/2	14	20.955	125	26	16.0	12.5	16	4	19.00	1	0569948
3/4	14	26.441	140	28	20.0	16.0	20	4	24.50	1	0569955

Note: ISO shank and square dimensions will necessitate metric holders

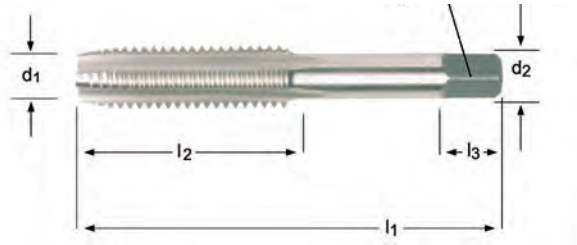
HAND TAPS

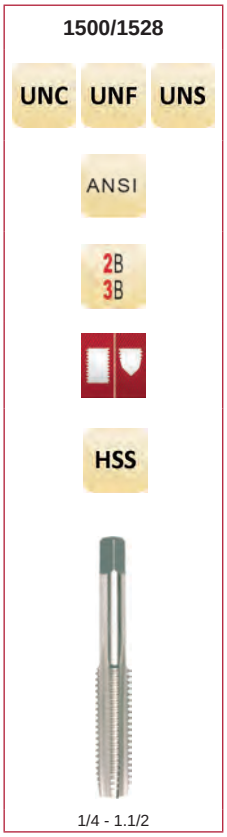
General Purpose

1500
1500S
1528
1528S

The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.
Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

1500 - Fractional sizes
1528 - Machine screw sizes
1500S / 1528S - Sets include 1 of each tap (Taper, Plug, and Bottoming)





- *Sizes 0 thru 3/8 have male centers on thread end*
- *Sizes larger than 3/8 all have female centers / flat ends*

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
0		**80**		**1.5/8**	**5/16**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010593**	**1010594**	**1010596**	**1010999**
0		80		1.5/8	5/16	0.1410	0.1100	3/16	2	H2	1	—	1010595	1010597	—
1	**64**			**1.11/16**	**3/8**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010598**	**1010599**	**1010601**	**1011000**
1		**72**		**1.11/16**	**3/8**	**0.1410**	**0.1100**	**3/16**	**2**	**H1**	**1**	**1010603**	**1010604**	**1010606**	**1011001**
2	56			1.3/4	7/16	0.1410	0.1100	3/16	2	H2	1	-—	1010615	1010617	—
2	**56**			**1.3/4**	**7/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H1**	**1**	**1010608**	**1010610**	**1010612**	**—**
2	56			1.3/4	7/16	0.1410	0.1100	3/16	3	H2	1	1010609	1010611	1010613	1011003
2		**64**		**1.3/4**	**7/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	—-	—-	—-	**1011073**
3	48			1.13/16	1/2	0.1410	0.1100	3/16	2	H2	1	—-	1010631	—	—
3	**48**			**1.13/16**	**1/2**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010625**	**1010627**	**1010629**	**1011005**
3		**56**		**1.13/16**	**1/2**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010634**	**1010636**	**1010637**	**1011074**
4	40			1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	—	1010650	1010652	—
4	40			1.7/8	9/16	0.1410	0.1100	3/16	3	H1	1	1010643	1010645	1010647	—
4	**40**			**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010644**	**1010646**	**1010648**	**1011008**
4		**48**		**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010653**	**1010655**	**1010656**	**1011075**
4			**36**	**1.7/8**	**9/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	—	—	—	**1011006**
5	**40**			**1.15/16**	**5/8**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010660**	**1010662**	**1010664**	**1011010**
5		**44**		**1.15/16**	**5/8**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010669**	**1010671**	**1010672**	**1011076**
6	32			2“	11/16	0.1410	0.1100	3/16	2	H2	1	—	1010685	1010688	—
6	32			2“	11/16	0.1410	0.1100	3/16	2	H3	1	—	1010686	1010689	—
6	32			2“	11/16	0.1410	0.1100	3/16	3	H1	1	1010675	1010678	1010681	—
6	32			2“	11/16	0.1410	0.1100	3/16	3	H2	1	1010676	1010679	1010682	1011012
6	**32**			**2“**	**11/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H3**	**1**	**1010677**	**1010680**	**1010683**	**1011013**
6		**40**		**2“**	**11/16**	**0.1410**	**0.1100**	**3/16**	**3**	**H2**	**1**	**1010690**	**1010692**	**1010693**	**1011014**

HAND TAPS

UNION BUTTERFIELD

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	◹ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
8	32			2.1/8	3/4	0.1680	0.1310	1/4	2	H2	1	—	1010706	1010709	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	2	H3	1	—	1010707	1010710	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	3	H2	1	—	1010712	1010715	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	3	H3	1	—	1010713	1010716	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	4	H1	1	—	1010699	—	—
8	32			2.1/8	3/4	0.1680	0.1310	1/4	4	H2	1	1010697	1010700	1010703	1011016
8	**32**			**2.1/8**	**3/4**	**0.1680**	**0.1310**	**1/4**	**4**	**H3**	**1**	**1010698**	**1010701**	**1010704**	**1011017**
8		**36**		**2.1/8**	**3/4**	**0.1680**	**0.1310**	**1/4**	**4**	**H2**	**1**	**1010717**	**1010719**	**1010720**	**1011018**
10	24			2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	1010733	1010736	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	1010734	1010737	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	3	H2	1	—	1010739	—	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	—	1010740	1010743	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	4	H1	1	—	1010726	—	—
10	24			2.3/8	7/8	0.1940	0.1520	1/4	4	H2	1	1010724	1010727	1010730	1011020
10	**24**			**2.3/8**	**7/8**	**0.1940**	**0.1520**	**1/4**	**4**	**H3**	**1**	**1010725**	**1010728**	**1010731**	**1011021**
10		32		2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	1010754	1010757	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	1010755	1010758	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	3	H2	1	—	1010760	1010763	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	—	1010761	1010764	—
10		32		2.3/8	7/8	0.1940	0.1520	1/4	4	H2	1	1010745	1010748	1010751	1011023
10		**32**		**2.3/8**	**7/8**	**0.1940**	**0.1520**	**1/4**	**4**	**H3**	**1**	**1010746**	**1010749**	**1010752**	**1011024**
12	**24**			**2.3/8**	**15/16**	**0.2200**	**0.1650**	**9/32**	**4**	**H3**	**1**	**1010765**	**1010767**	**1010768**	**1011025**
12		**28**		**2.3/8**	**15/16**	**0.2200**	**0.1650**	**9/32**	**4**	**H3**	**1**	**1010769**	**1010771**	**1010772**	**1011026**
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H1	1	1010001	1010004	1010008	—
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H2	1	1010002	1010005	1010009	—
1/4	**20**			**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**4**	**H3**	**1**	**1010003**	**1010006**	**1010010**	**1011029**
1/4	20			2.1/2	1“	0.2550	0.1910	5/16	4	H5	1		1010007	1010011	—
1/4		28		2.1/2	1“	0.2550	0.1910	5/16	4	H2	1	—	1010016	1010020	—
1/4		**28**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**4**	**H3**	**1**	**1010014**	**1010017**	**1010021**	**1011032**
1/4		28		2.1/2	1“	0.2550	0.1910	5/16	4	H4	1	—	1010018	1010022	—
5/16	18			2.23/32	1.1/8	0.3180	0.2380	3/8	4	H2	1	1010024	1010027	1010031	—
5/16	**18**			**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**4**	**H3**	**1**	**1010025**	**1010028**	**1010032**	**1011035**
5/16		**24**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**4**	**H3**	**1**	**1010036**	**1010039**	**1010043**	**1011038**
3/8	16			2.15/16	1.1/4	0.3810	0.2860	7/16	4	H2	1	1010046	1010049	1010053	—
3/8	**16**			**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**4**	**H3**	**1**	**1010047**	**1010050**	**1010054**	**1011041**
3/8	16			2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	1010051	1010055	—
3/8		**24**		**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**4**	**H3**	**1**	**1010058**	**1010061**	**1010065**	**1011044**
7/16	**14**			**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**4**	**H3**	**1**	**1010067**	**1010070**	**1010074**	**1011045**
7/16		**20**		**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**4**	**H3**	**1**	**1010076**	**1010079**	**1010083**	**1011046**
1/2	13			3.3/8	1.21/32	0.3670	0.2750	7/16	4	H2	1	—	1010087	1010091	—
1/2	**13**			**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**4**	**H3**	**1**	**1010085**	**1010088**	**1010092**	**1011047**
1/2	13			3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	1010089	1010093	—
1/2		**20**		**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**4**	**H3**	**1**	**1010094**	**1010097**	**1010101**	**1011048**
9/16	**12**			**3.19/32**	**1.21/32**	**0.4290**	**0.3220**	**1/2**	**4**	**H3**	**1**	**1010103**	**1010106**	**1010108**	**1011049**
9/16		**18**		**3.19/32**	**1.21/32**	**0.4290**	**0.3220**	**1/2**	**4**	**H3**	**1**	**1010110**	**1010113**	**1010116**	**1011050**
5/8	**11**			**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**4**	**H3**	**1**	**1010118**	**1010121**	**1010123**	**1011051**
5/8		**18**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**4**	**H3**	**1**	**1010125**	**1010128**	**1010131**	**1011052**
11/16			**11**	**4.1/32**	**1.13/16**	**0.5420**	**0.4060**	**5/8**	**4**	**H3**	**1**	**—**	**—**	**—**	**1011053**
11/16			**16**	**4.1/32**	**1.13/16**	**0.5420**	**0.4060**	**5/8**	**4**	**H3**	**1**	**—**	**—**	**—**	**1011054**
3/4	**10**			**4.1/4**	**2“**	**0.5900**	**0.4420**	**11/16**	**4**	**H3**	**1**	**1010139**	**1010142**	**1010144**	**1011055**
3/4		**16**		**4.1/4**	**2“**	**0.5900**	**0.4420**	**11/16**	**4**	**H3**	**1**	**1010146**	**1010149**	**1010152**	**1011056**
7/8	**9**			**4.11/16**	**2.7/32**	**0.6970**	**0.5230**	**3/4**	**4**	**H4**	**1**	**1010154**	**1010157**	**1010159**	**1011057**
7/8		**14**		**4.11/16**	**2.7/32**	**0.6970**	**0.5230**	**3/4**	**4**	**H4**	**1**	**1010160**	**1010163**	**1010166**	**1011058**

UNION BUTTERFIELD

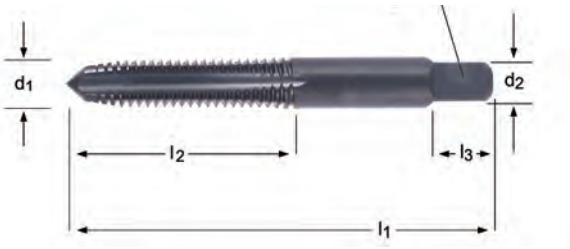
HAND TAPS

Nominal d_1	TPI UNC	TPI UNF	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
1“	8			5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010167	1010170	1010172	1011059
1“		12		5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010173	1010174	1010175	1011060
1“			14	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	1	1010176	1010178	1010181	1011061
1.1/8	7			5.7/16	2.9/16	0.8960	0.6720	7/8	4	H4	1	1010182	1010183	1010184	1011062
1.1/8		12		5.7/16	2.9/16	0.8960	0.6720	7/8	4	H4	1	1010185	1010186	1010187	1011063
1.1/4	7			5.3/4	2.9/16	1.0210	0.7660	1“	4	H4	1	1010188	1010189	1010190	1011064
1.1/4		12		5.3/4	2.9/16	1.0210	0.7660	1“	6	H4	1	1010191	1010192	1010193	1011065
1.3/8	6			6.1/16	3“	1.1000	0.8310	1.1/16	4	H4	1	1010194	1010195	1010196	1011066
1.3/8		12		6.1/16	3“	1.1000	0.8310	1.1/16	6	H4	1	1010197	1010198	1010199	1011067
1.1/2	6			6.3/8	3“	1.2300	0.9250	1.1/8	4	H4	1	1010200	1010201	1010202	1011068
1.1/2		12		6.3/8	3“	1.2300	0.9250	1.1/8	6	H4	1	1010203	1010204	1010205	1011069

UNION BUTTERFIELD

General Purpose

1500A Similar in design to the standard 1500 series, but steam oxide treated to reduce wear and chip welding in harder ferrous materials. Not recommended for non-ferrous applications. For through or blind hole tapping.



1500A

UNC UNF

ANSI

3B

HSS



1/4 - 1“

1) Male centers on thread end
2) Female centers / flat ends

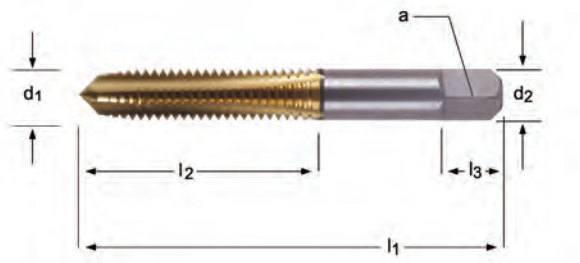
UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500A	
1/4		20	2.1/2	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1050006	1)
	1/4	28	2.1/2	1.000	0.2550	0.1910	5/16	4	H3	Bottoming	1	1050021	1)
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1050039	1)
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1050028	1)
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1050061	1)
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1050050	1)
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1050079	2)
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1050070	2)
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1050097	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1050088	2)
	9/16	18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1050113	2)
9/16		12	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1050106	2)
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1050128	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1050121	2)
	3/4	16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1050149	2)
3/4		10	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1050142	2)
	7/8	14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1050163	2)
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1050157	2)
1“		8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1050170	2)

HAND TAPS

General Purpose

TN1500

Similar in design to the 1500 series but TiN coated for enhanced performance. The hard, smooth finish provides greater lubricity, increases tool life, improves thread flank finish, and allows higher tapping speeds. For through or blind hole tapping.



TN1500

UNC UNF

ANSI

3B

HSS



1/4 - 7/8

[1] *Male centers on thread end*
[2] *Female centers / flat ends*

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	TN1500	
	1/4	28	2.1/2	1.0000	0.2550	0.1910	5/16	4	H3	Plug	1	1060017	1)
1/4		20	2.1/2	1.0000	0.2550	0.1910	5/16	4	H3	Plug	1	1060006	1)
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1060039	1)
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1060028	1)
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1060061	1)
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1060050	1)
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1060079	2)
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1060070	2)
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1060097	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1060088	2)
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Bottoming	1	1060092	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1060121	2)
	5/8	18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Bottoming	1	1060131	2)
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Bottoming	1	1060123	2)
	3/4	16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Bottoming	1	1060152	2)
3/4		10	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Bottoming	1	1060144	2)
7/8		9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1060157	2)

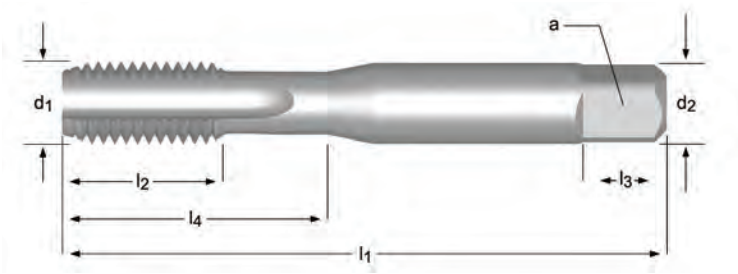
DORMER

General Purpose

E500 The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

Sets include 1 of each tap (Taper, Plug, and Bottoming)



E500

M

ISO 529

6H

HSS



M1 - M56

Note: ISO shank and square dimensions will necessitate metric holders

Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Pack Qty	Taper	Plug	Bottoming	Sets
1	0.25	38	4.5	2.50	2.00	4	2	0.75	4.5	1	0160152	0160169	0122464	—
1.2	0.25	38	4.5	2.50	2.00	4	2	0.95	4.5	1	0160176	0160183	0122471	—
1.4	0.30	40	6	2.50	2.00	4	2	0.95	6	1	0160190	0160206	0122488	—
1.6	0.35	41	8	2.50	2.00	4	2	1.25	8	1	0155035	0139950	0093900	0155028
1.7	0.35	41	8	2.50	2.00	4	2	1.35	8	1	0155004	0093924	0093931	0154991
1.8	0.35	41	8	2.50	2.00	4	2	1.45	8	1	0154960	0093948	0093955	—
2	0.40	41	8	2.50	2.00	4	3	1.6	8	1	0094259	0094266	0094273	0154939
2	0.45	41	8	2.50	2.00	4	3	1.55	8	1	0160244	0160251	0160268	—
2.2	0.45	44.5	9.5	2.80	2.24	5	3	1.75	9.5	1	0154915	0094167	0094174	—
2.3	0.45	44.5	9.5	2.80	2.24	5	3	1.85	9.5	1	0154885	0094198	0094204	—
2.5	0.45	44.5	9.5	2.80	2.24	5	3	2.05	9.5	1	0154854	0094228	0094235	0154847
2.6	0.45	44.5	9.5	2.80	2.24	5	3	2.15	9.5	1	0156735	0156742	0122440	—
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	1	0154823	0094440	0094457	0094464
3	0.60	48	12.5	3.15	2.50	5	3	2.4	12.5	1	0159927	0159934	0159941	—
3.5	0.60	50	14	3.55	2.80	5	3	2.9	14	1	0094402	0094419	0094426	0154809
4	0.70	53	14	4.00	3.15	6	3	3.3	14	1	0154786	0094648	0094655	0094662
4	0.75	53	14	4.00	3.15	6	3	3.25	14	1	0160213	0160220	0160237	-—
4.5	0.75	53	9.5	4.50	3.55	6	3	3.8	18	1	0154762	0094617	0094624	0154755
5	0.80	58	11	5.00	4.00	7	3	4.2	22	1	0154731	0094761	0094778	0154724
5	0.90	58	11	5.00	4.00	7	3	4.1	22	1	0159958	0159965	0159972	—
5.5	0.90	62	12	5.60	4.50	7	3	4.6	21	1	0159996	0160008	0160015	—
6	1.00	66	13	6.30	5.00	8	3	5	26	1	0094808	0094815	0094822	0154700
7	1.00	66	13	7.10	5.60	8	3	6	26	1	0154687	0139967	0094846	0094853
8	1.25	72	16	8.00	6.30	9	3	6.8	29	1	0154663	0094877	0094884	0094891
9	1.25	72	16	9.00	7.10	10	3	7.8	29	1	0154649	0152119	0094914	0154632
10	1.50	80	18	10.00	8.00	11	3	8.5	34	1	0153246	0093979	0093986	0154618
11	1.50	85	19	8.00	6.30	9	3	9.5		1	0154595	0094006	0094013	0154588
12	1.75	89	22	9.00	7.10	10	3	10.3		1	0154564	0094037	0094044	0094051
14	2.00	95	24	11.20	9.00	12	4	12		1	0152980	0094075	0094082	0154540
16	2.00	102	24	12.50	10.00	13	4	14		1	0154526	0094105	0094112	0154519
18	2.50	112	29	14.00	11.20	14	4	15.5		1	0154496	0094136	0094143	0154489
20	2.50	112	29	14.00	11.20	14	4	17.5		1	0154465	0150719	0094297	0154458

HAND TAPS

Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Pack Qty	Taper	Plug	Bottoming	Sets
22	2.50	118	29	16.00	12.50	16	4	19.5		1	0154434	0094310	0094327	0154427
24	3.00	130	35	18.00	14.00	18	4	21		1	0154403	0094341	0094358	0154397
27	3.00	135	35	20.00	16.00	20	4	24		1	0154366	0094365	0094372	—
30	3.50	138	41	20.00	16.00	20	4	26.5		1	0154359	0094488	0094495	—
33	3.50	151	41	22.40	18.00	22	4	29.5		1	0154342	0152225	0094525	—
36	4.00	162	47	25.00	20.00	24	4	32		1	0154335	0094549	0094556	—
39	4.00	170	47	28.00	22.40	26	4	35		1	0154328	0152232	0094587	—
42	4.50	170	53	28.00	22.40	26	6	37.5		1	0154311	0152249	0094686	—
45	4.50	187	54	31.50	25.00	28	6	40.5		1	0154304	0152256	0094709	—
48	5.00	187	60	31.50	25.00	28	6	43		1	0154298	0152263	0094730	—
52	5.00	200	60	35.50	28.00	31	6	47		1	—	—	0094792	—
56	5.50	200	60	35.50	28.00	31	6	50.5		1	—	—	0122457	—

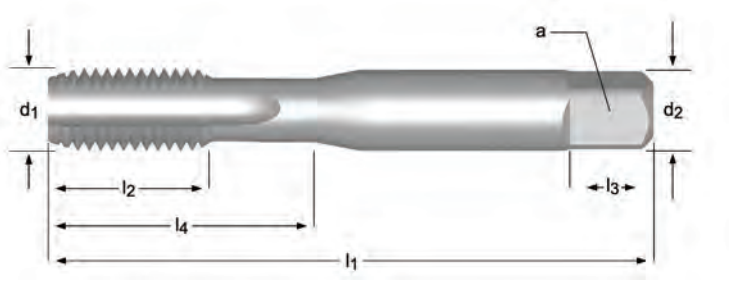
Note: ISO shank and square dimensions will necessitate metric holders

General Purpose

E513 The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

3 pc.(No.6) sets include 1 of each tap (Taper, Plug and Bottoming)
2 pc.(No.7) sets include 1 of each tap (Plug and Bottoming)



Note: ISO shank and square dimensions will necessitate metric holders

E513

MF

ISO 529

6H

HSS



M3 - M50

Nominal d_1	Pitch MF	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	# of Flutes	l_3 mm		l_4 mm	Pack Qty	Taper	Plug	Bottoming	2 Pc Sets	3 Pc Sets
3	0.35	48	12.5	3.15	2.50	3	5	2.65	12.5	1	0160039	0160046	0096567	—	—
3.5	0.35	48	12.5	3.15	2.50	3	5	3.2	12.5	1	—	—	0343111	—	—
4	0.50	53	14	4.00	3.15	3	6	3.5	14	1	0156766	0152454	0096680	0155561	—
5	0.50	58	11	5.00	4.00	3	7	4.5	22	1	0156728	0096727	0096734	0096741	—
5	0.75	58	11	5.00	4.00	3	7	4.3	22	1	0157046	0156773	0123027	—	—
6	0.50	66	13	6.30	5.00	3	8	5.5	26	1	0156780	0156797	0123034	—	—
6	0.75	66	13	6.30	5.00	3	8	5.3	26	1	0156803	0152461	0096765	0096772	—
7	0.75	66	13	7.10	5.60	3	8	6.3	26	1	0160053	0096789	0096796	—	—
8	0.50	72	16	8.00	6.30	3	9	7.5	29	1	0160060	0160077	0123058	—	—
8	0.75	72	16	8.00	6.30	3	9	7.3	29	1	0157053	0152478	0096802	0096819	—
8	1.00	72	16	8.00	6.30	3	9	7	29	1	0157060	0152485	0096826	0155554	—
9	0.75	72	16	9.00	7.10	3	10	8.3	29	1	—	—	0343128	—	—
9	1.00	72	16	9.00	7.10	3	10	8	29	1	0159644	0155752	0096833	—	—
10	0.50	80	18	10.00	8.00	3	11	9.5	34	1	—	—	0343135	—	—
10	0.75	80	18	10.00	8.00	3	11	9.3	34	1	0160084	0160091	0123065	—	—
10	1.00	80	18	10.00	8.00	3	11	9	34	1	0157077	0152492	0096086	0155547	0157084
10	1.25	80	18	10.00	8.00	3	11	8.8	34	1	0157091	0152508	0096079	0155530	0157107
11	0.75	85	19	8.00	6.30	3	9	10.3		1	0160107	0160114	0123072	—	—
11	1.00	85	19	8.00	6.30	3	9	10		1	0159651	0096093	0096109	—	—
11	1.25	85	19	8.00	6.30	3	9	9.8		1	—	—	0343142	—	—
12	0.75	89	22	9.00	7.10	3	10	11.3		1	—	—	0343166	—	—
12	1.00	89	22	9.00	7.10	3	10	11		1	0157114	0152515	0096154	0155523	—
12	1.25	89	22	9.00	7.10	3	10	10.8		1	0157121	0152522	0096116	0096123	0157138
12	1.50	89	22	9.00	7.10	3	10	10.5		1	0157145	0096130	0096147	0155516	0157152
13	1.50	89	22	9.00	7.10	3	10	11.5		1	—	—	0343173	—	—
14	1.00	95	24	11.20	9.00	4	12	13		1	0156810	0152539	0096185	0155509	—
14	1.25	95	24	11.20	9.00	4	12	12.8		1	0156827	0152546	0096161	—	0156834
14	1.50	95	24	11.20	9.00	4	12	12.5		1	0156841	0152553	0096178	0155486	0156858
15	1.50	95	24	11.20	9.00	4	12	13.5		1	—	0096192	0096208	—	—
16	1.00	102	24	12.50	10.00	4	13	15		1	0156865	0152560	0096246	0096253	—
16	1.25	102	24	12.50	10.00	4	13	14.8		1	—	—	0343203	—	—
16	1.50	102	24	12.50	10.00	4	13	14.5		1	0156872	0152577	0096222	0096239	0156889

HAND TAPS

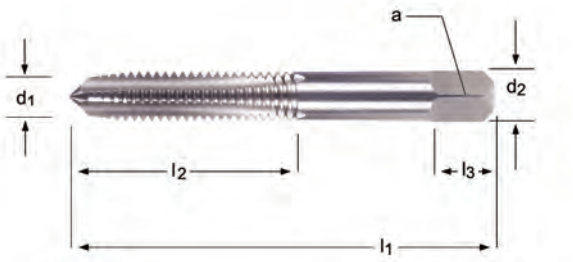
Nominal d_1	Pitch MF	l_1 mm	l_2 mm	d_2 Ø mm	a mm	# of Flutes	l_3 mm		l_4 mm	Pack Qty	Taper	Plug	Bottoming	2 Pc Sets	3 Pc Sets
18	1.00	112	29	14.00	11.20	4	14	17		1	0156896	0096277	0096284	0096291	—
18	1.50	112	29	14.00	11.20	4	14	16.5		1	0156902	0152584	0096260	0155479	0156919
18	2.00	112	29	14.00	11.20	4	14	16		1	0156926	0096307	0096314	0096321	—
20	1.00	112	29	14.00	11.20	4	14	19		1	0156933	0096345	0096352	0096369	—
20	1.50	112	29	14.00	11.20	4	14	18.5		1	0156940	0152591	0096338	0155462	0156957
20	2.00	112	29	14.00	11.20	4	14	18		1	0156964	0096376	0096383	0155455	—
22	1.00	118	29	16.00	12.50	4	16	21		1	—	0096406	0096413	0155448	—
22	1.50	118	29	16.00	12.50	4	16	20.5		1	0156971	0152607	0096390	0155431	—
22	2.00	118	29	16.00	12.50	4	16	20		1	0156988	0096420	0096437	0096444	—
24	1.00	130	35	18.00	14.00	4	18	23		1	—	0096475	0096482	—	—
24	1.50	130	35	18.00	14.00	4	18	22.5		1	0156995	0152614	0096451	0096468	—
24	2.00	130	35	18.00	14.00	4	18	22		1	0157008	0096499	0096505	0155745	—
25	1.50	130	35	18.00	14.00	4	18	23.5		1	0157015	0152621	0096512	0150740	0157022
26	1.50	130	35	18.00	14.00	4	18	24.5		1	—	0096529	0096536	—	—
27	1.50	135	35	20.00	16.00	4	20	25.5		1	—	0155738	0123010	—	—
27	2.00	135	35	20.00	16.00	4	20	25		1	—	—	0123041	—	—
28	1.50	138	35	20.00	16.00	4	20	26.5		1	—	0096543	0096550	—	—
30	1.50	138	41	20.00	16.00	4	20	28.5		1	—	0096574	0096581	—	—
30	2.00	138	41	20.00	16.00	4	20	28		1	—	0155721	0123003	—	—
32	1.50	151	41	22.40	18.00	4	22	30.5		1	0157039	0155578	0096598	—	—
33	2.00	151	41	22.40	18.00	4	22	31		1	—	0096604	0096611	—	—
35	1.50	162	47	25.00	20.00	4	24	33.5		1	—	0096628	0096635	—	—
36	1.50	162	47	25.00	20.00	4	24	34.5		1	—	—	0343302	—	—
36	2.00	162	47	25.00	20.00	4	24	34		1	—	0152638	0096642	—	—
36	3.00	162	47	25.00	20.00	4	24	33		1	—	0096659	0096666	—	—
39	3.00	170	47	28.00	22.40	4	26	36		1	—	0152645	0096673	—	—
40	1.50	170	53	28.00	22.40	6	26	38.5		1	—	0155691	0096697	—	—
42	1.50	170	53	28.00	22.40	6	26	40.5		1	—	0155684	0096703	—	—
42	3.00	170	53	28.00	22.40	6	26	39		1	—	—	0343319	—	—
45	1.50	187	54	31.50	25.00	6	28	43.5		1	—	0155677	0096710	—	—
48	1.50	187	60	31.50	25.00	6	28	46.5		1	—	—	0343333	—	—
48	2.00	187	60	31.50	25.00	6	28	46		1	—	—	0343340	—	—
48	3.00	187	60	31.50	25.00	6	28	45		1	—	—	0343357	—	—
50	1.50	187	60	31.50	25.00	6	28	48.5		1	—	0155660	0096758	—	—

Note: ISO shank and square dimensions will necessitate metric holders

UNION BUTTERFIELD

General Purpose, Left Hand

1500L Left Hand. Similar in design to the standard 1500 series but finished with left hand threads, which when viewed axially, wind in a counter-clockwise and receding direction. Available in plug chamfer. For through or blind hole applications.



1500L

UNC UNF UNS

ANSI

3B

HSS



1/4 - 1"

UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500L
	1/4		28	2.1/2	1“	0.2550	0.1910	5/16	4	H3	Plug	1	1011775
1/4			20	2.1/2	1“	0.2550	0.1910	5/16	4	H3	Plug	1	1011772
	5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1011781
5/16			18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1011778
	3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1011787
3/8			16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1011784
	7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1011793
7/16			14	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	Plug	1	1011790
	1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1011799
1/2			13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	Plug	1	1011796
	9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1011805
9/16			12	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	Plug	1	1011802
	5/8		18	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1011811
5/8			11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	Plug	1	1011808
	3/4		16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1011823
3/4			10	4.1/4	2“	0.5900	0.4420	11/16	4	H3	Plug	1	1011820
	7/8		14	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1011829
7/8			9	4.11/16	2.7/32	0.6970	0.5230	3/4	4	H4	Plug	1	1011826
		1“	14	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011838
	1“		12	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011835
1“			8	5.1/8	2.1/2	0.8000	0.6000	13/16	4	H4	Plug	1	1011832

HAND TAPS

General Purpose

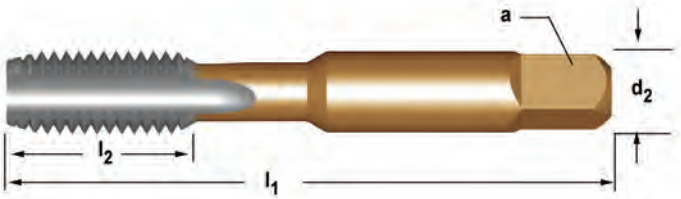
E061
E071

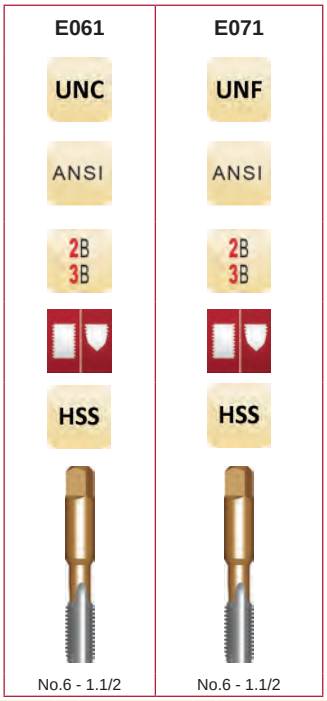
The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

Premium substrate with bronze oxide body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

E061 = UNC Sizes, E071 = UNF Sizes





Nominal d_1	TP UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	a Inch	# of Flutes	Limits	↔	↔	l_4 Inch	Pack Qty	Taper	Plug	Bottoming	Sets
6	32		2“	0.5800	0.1410	0.1100	3	H3	36	2.85	0.5800	1	0348291	0348307	0348314	0348321
6		40	2“	0.5800	0.1410	0.1100	3	H2	33	2.90	0.5800	1	0349427	0349434	0349441	0349458
8	32		2.1/8	0.6500	0.1680	0.1310	4	H3	29	3.50	0.6500	1	0348284	0348338	0348345	0348352
8		36	2.1/8	0.6500	0.1680	0.1310	4	H2	29	3.50	0.6500	1	0349465	0349472	0349489	0349496
10	24		2.3/8	0.7600	0.1940	0.1520	4	H3	25	3.90	0.7600	1	0348369	0348376	0348383	0348390
10		32	2.3/8	0.7600	0.1940	0.1520	4	H3	21	4.10	0.7600	1	0349502	0349519	0349526	0349533
12	24		2.3/8	0.8100	0.2200	0.1650	4	H3	16	4.50	0.8100	1	0348406	0348413	0348420	0348437
12		28	2.3/8	0.8100	0.2200	0.1650	4	H3	15	4.70	0.8100	1	0349540	0349557	0349564	0349571
1/4	20		2.1/2	0.6500	0.2550	0.1910	4	H3	7	5.10	1.0630	1	0348444	0348451	0348468	0348475
1/4		28	2.1/2	0.6500	0.2550	0.1910	4	H3	3	5.50	1.0630	1	0349588	0349595	0349601	0349618
5/16	18		2.23/32	0.7700	0.3180	0.2380	4	H3	F	6.60	1.2598	1	0348482	0348499	0348505	0348512
5/16		24	2.23/32	0.7700	0.3180	0.2380	4	H3	I	6.90	1.2598	1	0349625	0349632	0349649	0349656
3/8	16		2.15/16	0.8100	0.3810	0.2860	4	H3	5/16	8.00	1.3780	1	0348529	0348536	0348543	0348550
3/8		24	2.15/16	0.8100	0.3810	0.2860	4	H3	Q	8.50	1.3780	1	0349663	0349670	0349687	0349694
7/16	14		3.5/32	0.9055	0.3230	0.2420	4	H3	U	9.40		1	0348567	0348574	0348581	0348598
7/16		20	3.5/32	0.9055	0.3230	0.2420	4	H3	25/64	9.90		1	0349700	0349717	0349724	0349731
1/2	13		3.3/8	0.9055	0.3670	0.2750	4	H3	27/64	10.80		1	0348604	0348611	0348628	0348635
1/2		20	3.3/8	0.9055	0.3670	0.2750	4	H3	29/64	11.50		1	0349748	0349755	0349762	0349779
9/16	12		3.19/32	0.9843	0.4290	0.3220	4	H3	27/64	12.20		1	0351833	0348642	0348659	0348666
9/16		18	3.19/32	0.9843	0.4290	0.3220	4	H3	33/64	12.90		1	0349786	0349793	0349809	0349816
5/8	11		3.13/16	0.9843	0.4800	0.3600	4	H3	17/32	13.50		1	0348673	0348680	0348697	0348703
5/8		18	3.13/16	0.9843	0.4800	0.3600	4	H3	37/64	14.50		1	0349823	0349830	0349847	0349854
3/4	10		4.1/4	1.1811	0.5900	0.4420	4	H3	21/32	16.50		1	0348710	0348727	0348734	0348741
3/4		16	4.1/4	1.1811	0.5900	0.4420	4	H3	11/16	17.50		1	0349861	0349878	0349885	0351932
7/8	9		4.11/16	1.1811	0.6970	0.5230	4	H4	49/64	19.50		1	0348758	0348765	0348772	0348789
7/8		14	4.11/16	1.1811	0.6970	0.5230	4	H4	13/16	20.40		1	0349892	0349908	0349915	0349922
1“	8		5.1/8	1.4173	0.8000	0.6000	4	H4	7/8	22.25		1	0348796 [1]	0348802 [1]	0348819 [1]	0348826 [1]
1“		12	5.1/8	1.4173	0.8000	0.6000	4	H4	59/64	23.25		1	0349939 [1]	0349946 [1]	0349953 [1]	0349960 [1]
1“		14	5.1/8	1.4173	0.8000	0.6000	4	H4	59/64	23.25		1	0349977 [1]	0349984 [1]	0349991 [1]	0350003 [1]
1.1/8	7		5.7/16	1.3976	0.8950	0.6710	4	H4	63/64	25.00		1	0388112 [1]	0388129 [1]	0388136 [1]	0259719 [1]
1.1/8		12	5.7/16	1.3976	0.8950	0.6710	4	H4	1.3/64	26.50		1	0388235 [1]	0388242 [1]	0388259 [1]	—
1.1/4	7		5.3/4	1.6338	1.0210	0.7650	4	H4	1.7/64	28.00		1	0388143 [1]	0388150 [1]	0388167 [1]	0259702 [1]
1.1/4		12	5.3/4	1.6338	1.0210	0.7650	6	H4	1.5/32	29.50		1	0388266 [1]	0388273 [1]	0388280 [1]	—
1.3/8	6		6.1/16	1.8700	1.1090	0.8300	4	H4	1.7/32	30.75		1	0388174 [1]	0388181 [1]	0388198 [1]	—
1.3/8		12	6.1/16	1.8700	1.1090	0.8300	6	H4	1.9/32	32.75		1	0388297 [1]	0388303 [1]	0388310 [1]	—
1.1/2	6		6.3/8	1.8700	1.2330	0.9520	4	H4	1.11/32	34.00		1	0388204 [1]	0388211 [1]	0388228 [1]	0259696 [1]
1.1/2		12	6.3/8	1.8700	1.2330	0.9250	6	H4	1.27/64	36.00		1	0388327 [1]	0388334 [1]	0388341 [1]	—

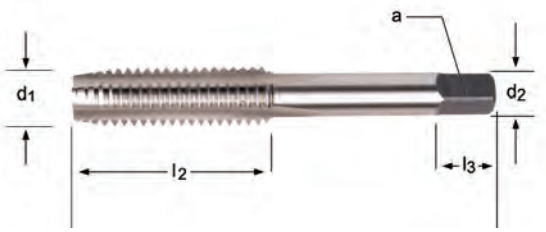
[1] Bright Finish

HAND TAPS

General Purpose, Optional Flutes

1508 *- Optional 3 Flute*
1595 *- Optional 2 Flute*

Fewer flutes than standard, providing more space for chip evacuation and particularly when tapping holes greater than 1.5 tap diameters in depth. For through or blind hole applications.



1508 (UNC)	1508 (UNF)	1595
UNC	UNF	UNF UNC
ANSI	ANSI	ANSI
3B	2B 3B	3B
HSS	HSS	HSS
1/4 - 1/2	1/4 - 5/16	1/4 - 5/16

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1508(UNC)	1508(UNF)	1595
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Plug	1	—	1010223	—
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Plug	1	—	—	1010208
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Plug	1	1010216	—	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Plug	1	—	—	1010206
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Bottoming	1	—	—	—
	1/4	28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Bottoming	1	—	—	1010209
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	3	H3	Bottoming	1	1010219	—	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H3	Bottoming	1	—	—	1010207
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Plug	1	—	1010236	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Plug	1	1010230	—	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H3	Plug	1	—	—	1010210
	5/16	24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Bottoming	1	—	1010237	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	Bottoming	1	1010233	—	—
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H3	Bottoming	1	—	—	1010211
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Plug	1	—	1010246	—
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Plug	1	1010240	—	—
	3/8	24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Bottoming	1	—	1010247	—
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	Bottoming	1	1010243	—	—
	7/16	20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	Plug	1	—	1010250	—
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	Plug	1	1010248	—	—
	1/2	20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Plug	1	—	1010254	—
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Plug	1	1010252	—	—
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	Bottoming	1	1010253	—	—

UNION BUTTERFIELD

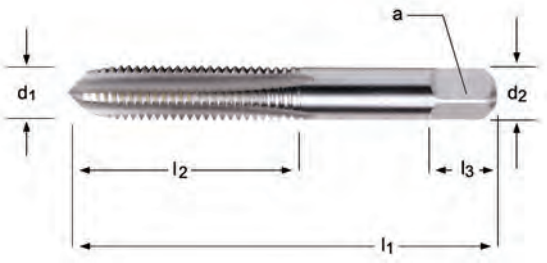
HAND TAPS

General Purpose

1700(M) The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

Taper - 7-10 pitch chamfer length
Plug - 3-5 pitch chamfer length
Bottoming - 1-2 pitch chamfer length

1700S Sets include 1 of each tap (Taper, Plug, and Bottoming).



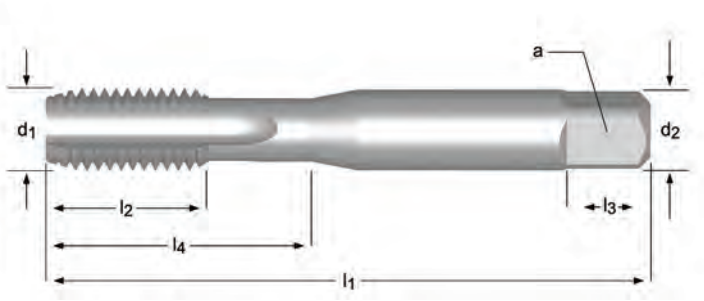
1700(M)	1700S
M	M
ANSI	ANSI
6H	6H
HSS	HSS
	
M1.6 - M36	M2 - M20

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	l_3 Inch	a Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming	Sets
M1.6	0.35	1.5/8	5/16	0.1410	3/16	0.1100	2	D3	1	1012408	1012409	1012410	—
M1.8	0.35	1.11/16	3/8	0.1410	3/16	0.1100	2	D3	1	1012411	1012412	—	—
M2	0.40	1.3/4	7/16	0.1410	3/16	0.1100	3	D3	1	1012414	1012415	1012416	1012558
M2.3	0.40	1.3/4	7/16	0.1410	3/16	0.1100	3	D3	1	—	1012421	1012422	—
M2.5	0.45	1.13/16	1/2	0.1410	3/16	0.1100	3	D3	1	1012423	1012424	1012425	1012560
M2.6	0.45	1.13/16	1/2	0.1410	3/16	0.1100	3	D3	1	1012426	1012427	—	—
M3	0.50	1.15/16	5/8	0.1410	3/16	0.1100	3	D3	1	1012432	1012433	1012434	1012561
M3.5	0.60	2“	11/16	0.1410	3/16	0.1100	3	D4	1	1012435	1012436	1012437	1012562
M4	0.70	2.1/8	3/4	0.1680	1/4	0.1310	4	D4	1	1012441	1012442	1012443	1012563
M4.5	0.75	2.3/8	7/8	0.1940	1/4	0.1520	4	D4	1	1012444	1012445	—	-—
M5	0.80	2.3/8	7/8	0.1940	1/4	0.1520	4	D4	1	1012453	1012454	1012455	1012564
M6	1.00	2.1/2	1“	0.2550	5/16	0.1910	4	D5	1	1012459	1012460	1012461	1012565
M7	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012465	1012466	1012467	1012576
M8	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012468	1012469	1012470	1012577
M8	1.25	2.23/32	1.1/8	0.3180	3/8	0.2380	4	D5	1	1012471	1012472	1012473	1012566
M9	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D5	1	—	1012478	1012479	-—
M10	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D5	1	1012480	1012481	1012482	1012578
M10	1.50	2.15/16	1.1/4	0.3810	7/16	0.2860	4	D6	1	1012483	1012484	1012485	1012567
M11	1.50	3.5/32	1.7/16	0.3230	13/32	0.2420	4	D6	1	—	1012493	1012494	-—
M12	1.25	3.3/8	1.21/32	0.3670	7/16	0.2750	4	D5	1	1012498	1012499	1012500	1012579
M12	1.75	3.3/8	1.21/32	0.3670	7/16	0.2750	4	D6	1	1012495	1012496	1012497	1012568
M14	1.50	3.19/32	1.21/32	0.4290	1/2	0.3220	4	D6	1	1012501	1012502	1012503	—
M14	2.00	3.19/32	1.21/32	0.4290	1/2	0.3220	4	D7	1	1012504	1012505	1012506	1012580
M16	1.50	3.13/16	1.13/16	0.4800	9/16	0.3600	4	D6	1	1012513	1012514	1012515	-—
M16	2.00	3.13/16	1.13/16	0.4800	9/16	0.3600	4	D7	1	1012516	1012517	1012518	1012581
M18	1.50	4.1/32	1.13/16	0.5420	5/8	0.4060	4	D6	1	1012522	1012523	1012524	—
M18	2.50	4.1/32	1.13/16	0.5420	5/8	0.4060	4	D7	1	1012525	1012526	1012527	1012582
M20	1.50	4.15/32	2“	0.6520	11/16	0.4890	4	D6	1	1012534	1012535	1012536	—
M20	2.50	4.15/32	2“	0.6520	11/16	0.4890	4	D7	1	1012537	1012538	1012539	1012583
M22	1.50	4.11/16	2.7/32	0.6970	3/4	0.5230	4	D6	1	1012540	1012541	1012542	—
M22	2.50	4.11/16	2.7/32	0.6970	3/4	0.5230	4	D7	1	1012543	1012544	1012545	—
M24	2.00	4.29/32	2.7/32	0.7600	3/4	0.5700	4	D7	1	1012546	1012547	1012548	—
M24	3.00	4.29/32	2.7/32	0.7600	3/4	0.5700	4	D8	1	1012555	1012556	1012557	—
M30	3.50	5.7/16	2.9/16	1.0210	1“	0.7660	4	D9	1	1012570	1012571	1012572	—
M36	4.00	6.1/16	3“	1.2330	1.1/8	0.9250	4	D9	1	—	1012574	1012575	—

General Purpose, Left Hand

E501

Left Hand. Similar in design to the standard E500 series but finished with left hand threads, which when viewed axially, wind in a counter-clockwise and receding direction. Available in taper, plug, and bottoming chamfer. For through or blind hole applications.





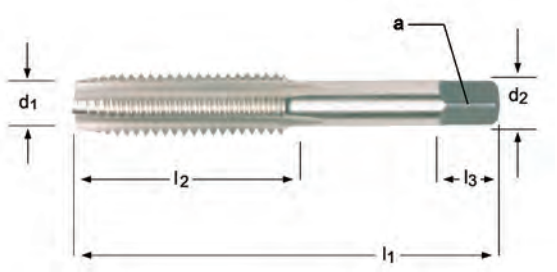
Nominal d_1	Pitch M	l_1 mm	l_2 mm	d_2 Ø mm	⊿ a mm	l_3 mm	# of Flutes	↔	l_4 mm	Limits	Pack Qty	Taper	Plug	Bottoming
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	D3	1	0159828	0095058	0095065
4	0.70	53	14	4.00	3.15	6	3	3.3	14	D4	1	0159835	0095072	0095089
5	0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	—	0095096	0095102
6	1.00	66	13	6.30	5.00	8	3	5	26	D5	1	0159859	0095119	0095126
8	1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0159866	0095133	0095140
10	1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0159873	0094938	0094945
12	1.75	89	22	9.00	7.10	10	3	10.3		D6	1	0159880	0094952	0094969
14	2.00	95	24	11.20	9.00	12	4	12		D7	1	0159897	0094976	0094983
16	2.00	102	24	12.50	10.00	13	4	14		D7	1	0159903	0094990	0095003
18	2.50	112	29	14.00	11.20	14	4	15.5		D7	1	—	—	0095010
20	2.50	112	29	14.00	11.20	14	4	17.5		D7	1	0159910	0095027	0095034
22	2.50	118	29	16.00	12.50	16	4	19.5		D7	1	—	—	0122495
24	3.00	130	35	18.00	14.00	18	4	21		D8	1	—	0152447	0095041

Note: ISO shank and square dimensions will necessitate metric holders

General Purpose, Oversize

1500OV(UNC)

0.005” oversize. Similar in design to the standard 1500 series, but with a pitch diameter which is 0.0050” to 0.0055” larger than the basic pitch diameter. Used primarily where a part will be plated or treated after tapping. Available as a standard with a plug chamfer. Oversize P.D. limits are equivalent to H11.
For through or blind hole applications.



1500OV(UNC)

UNC

ANSI

HSS



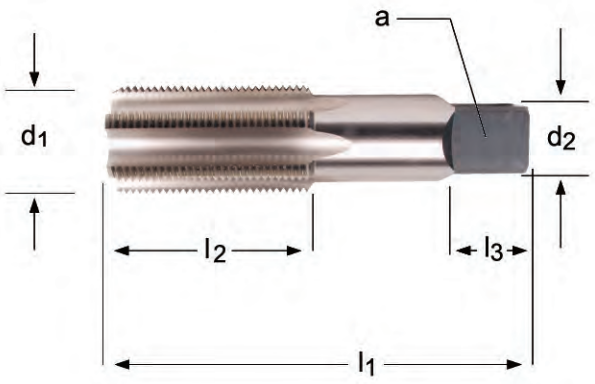
1/4 - 5/8

UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1500OV(UNC)
1/4	20	2.1/2	1.000	0.2550	0.1910	5/16	4	H11	Plug	1	1011748
5/16	18	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H11	Plug	1	1011749
3/8	16	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H11	Plug	1	1011750
1/2	13	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H11	Plug	1	1011752
5/8	11	3.13/16	1.13/16	0.4800	0.3600	9/16	4	H11	Plug	1	1011753

UNION BUTTERFIELD

General Purpose, 8-Pitch

1505 Proven performers for manufacturers of oil field equipment, large valves, electric utilities, power generation machinery, and general construction. For through or blind hole applications.



1505(UNS)

UNS

ANSI

2B

HSS



1.1/8 - 2“

Nominal d_1	TPI UNS	l_1 Inch	l_2 Inch	d_2 Ø Inch /	◹ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Taper	Plug	Bottoming
1.1/8	8	5.7/16	2.9/16	0.8960	0.6720	7/8	4	H5	1	1013310	1013311	1013312
1.1/4	8	5.3/4	2.9/16	1.0210	0.7660	1“	4	H5	1	1013313	1013314	1013315
1.3/8	8	6.1/16	3“	1.1080	0.8310	1.1/16	4	H5	1	1013316	1013317	1013318
1.1/2	8	6.3/8	3“	1.2330	0.9250	1.1/8	6	H5	1	1013319	1013320	1013321
1.5/8	8	6.11/16	3.3/16	1.3050	0.9780	1.1/8	6	H6	1	1013322	1013323	1013324
1.3/4	8	7“	3.3/16	1.4300	1.0720	1.1/4	6	H6	1	1013325	1013326	1013327
1.7/8	8	7.5/16	3.9/16	1.5190	1.1390	1.1/4	6	H6	1	1013328	1013329	1013330
2“	8	7.5/8	3.9/16	1.6440	1.2330	1.3/8	6	H6	1	1013331	1013332	1013333

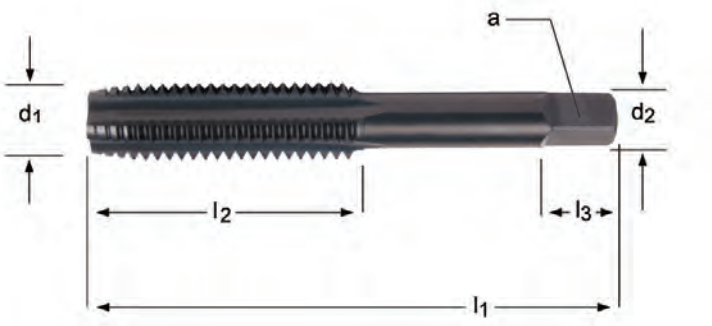
HAND TAPS

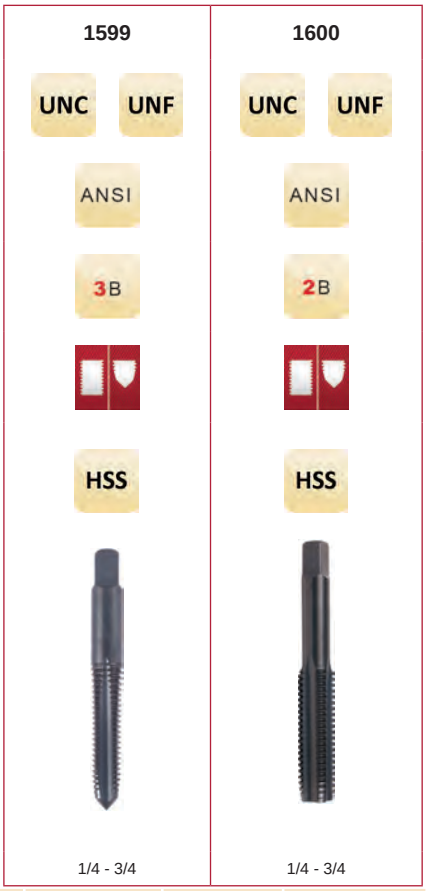
For Cast Iron

1599
1600

Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken, powdery chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.

1599 - H3
1600 - H5



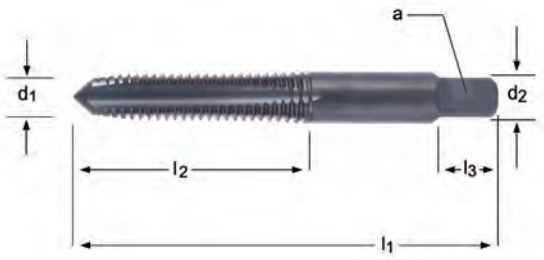


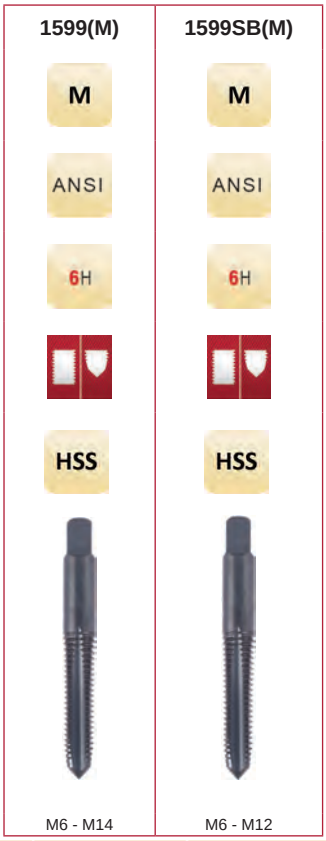
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☐ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1599 Plug	1599 Bottoming	1600 Plug	1600 Bottoming
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	4	H3	1	1010256	1010257	—	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	4	H5	1	—	—	1011256	1011257
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	4	H5	1	—	—	1011258	1011259
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	1	1010260	1010261	—	—
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	4	H5	1	—	—	—	1011261
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H3	1	—	1010263	—	—
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	4	H5	1	—	—	1011262	1011263
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010264	1010265	—	—
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	—	1011264	1011265
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010266	1010267	—	—
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	4	H5	1	—	—	1011266	1011267
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	4	H5	1	—	—	1011268	1011269
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H3	1	—	1010271	—	—
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	4	H5	1	—	—	1011270	1011271
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010272	1010273	—	—
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	—	—	1011273
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010274	1010275	—	—
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H5	1	—	—	1011274	1011275
9/16	12		3.19/32	1.21/32	0.4290	0.3220	1/2	4	H5	1	—	—	1011276	1011277
9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	—	1010279	—	—
9/16		18	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H5	1	—	—	—	1011279
5/8	11		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	1	1010280	1010281	—	—
5/8	11		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H5	1	—	—	1011280	1011281
3/4	10		4.1/4	2“	0.5900	0.4420	11/16	4	H3	1	—	1010285	—	—
3/4	10		4.1/4	2“	0.5900	0.4420	11/16	4	H5	1	—	—	—	1011285
3/4		16	4.1/4	2“	0.5900	0.4420	11/16	4	H3	1	1010286	1010287	—	—
3/4		16	4.1/4	2“	0.5900	0.4420	11/16	4	H5	1	—	—	—	1011287

For Cast Iron

1599(M)
1599SB(M)

Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. Nitride and steam oxide coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.

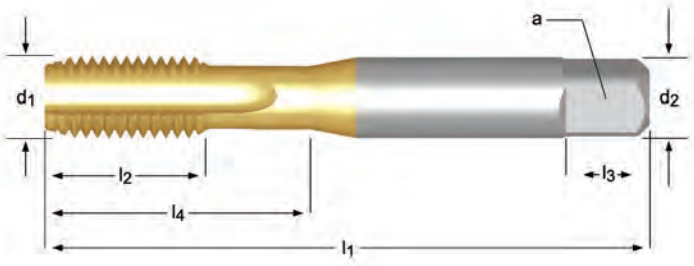




Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1599M Plug	1599M Bottoming	1599SB Semi-Bottoming
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	4	D5	1	1012256	1012266	1012276
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	4	D5	1	1012258	1012268	1012278
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	4	D6	1	1012260	1012270	1012280
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	4	D6	1	1012262	1012272	1012282
M14	1.25	3.19/32	1.21/32	0.4290	0.3220	1/2	4	D4	1	1010288	—	—

For Cast Iron, Semi-Bottoming

E504 Designed for through or blind hole tapping with a specific cutting geometry for gray cast irons and those materials producing broken chips. Also ideal for non-metallics, cast brass, and other brass materials producing broken powdery chips. TiN coating increases the surface hardness and improves tool life.



E504

M

ISO 529

6H

HSS



M3 - M24

M	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Limits	Pack Qty	E504
3	0.50	48	12.5	3.15	2.50	5	3	2.5	12.5	D3	1	0122563
4	0.70	53	14	4.00	3.15	6	3	3.3	14	D4	1	0122556
5	0.80	58	11	5.00	4.00	7	3	4.2	22	D4	1	0122501
6	1.00	66	13	6.30	5.00	8	3	5	26	D5	1	0122518
8	1.25	72	16	8.00	6.30	9	3	6.8	29	D5	1	0122525
10	1.50	80	18	10.00	8.00	11	3	8.5	34	D6	1	0122532

Note: ISO shank and square dimensions will necessitate metric holders

SPIRAL POINT TAPS

UNION BUTTERFIELD

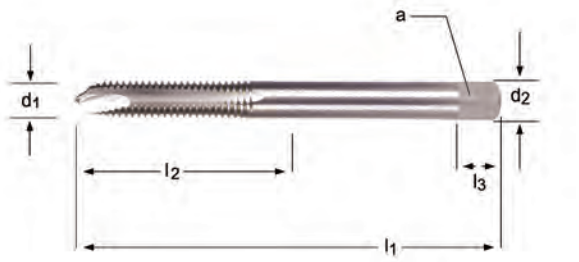
Relieved Style, Machine Screw Sizes

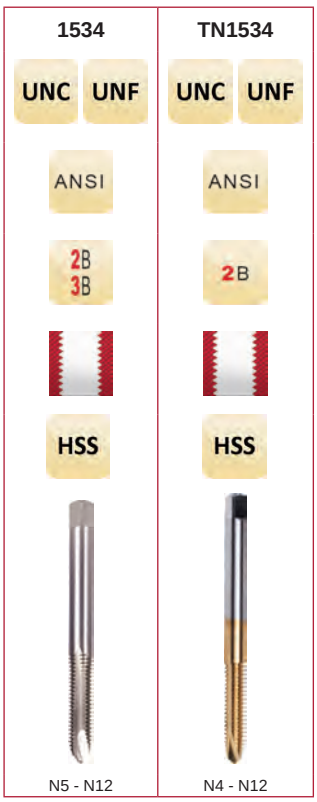
1534
TN1534

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1534 style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright finish - improves chip flow in soft or non-ferrous materials.
TiN Coating - increases surface hardness and improves tool life.





UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534	TN1534
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	—	1060805
	5	44	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1012358	—
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1012356	—
5		40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012357	—
	6	40	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1012366	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H1	Plug	1	1012359	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1012360	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H3	Plug	1	1012361	1062361
	6	40	2“	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012367	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1012363	—
6		32	2“	11/16	0.1410	0.1100	3/16	2	H3	Bottoming	1	1012364	—
	8	36	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1012375	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H1	Plug	1	1012368	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1012369	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Plug	1	1012370	1062370
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Bottoming	1	1012372	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Bottoming	1	1012373	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1012381	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1012382	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1012383	1062383
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1012377	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1012378	1062378
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1012385	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1012386	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1012379	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1012380	—
	12	28	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1012388	—
12		24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1012389	1062389
12		24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Bottoming	1	1012699	—

UNION BUTTERFIELD

SPIRAL POINT TAPS

Relieved Style, Fractional Sizes

1585

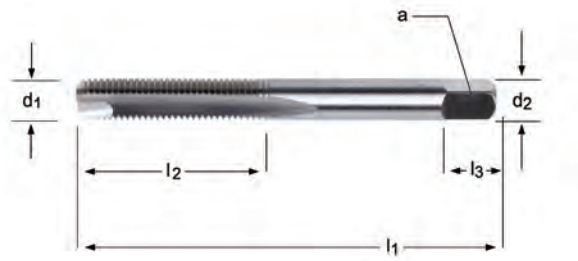
1585A

TN1585

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1585 style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright Finish - improves chip flow in soft or non-ferrous materials.
Steam Oxide - reduces wear and prevents chip welding in harder ferrous materials.
TiN Coating - increases surface hardness and improves tool life.



1585	1585A	TN1585
UNC UNF	UNC UNF	UNC UNF
ANSI	ANSI	ANSI
3B	2B 3B	3B
HSS	HSS	HSS
		
1/4 - 3/4	1/4 - 3/4	1/4 - 1/2

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1585	1585A	TN1585
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H1	Plug	1	1010290	—	—
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H2	Plug	1	1010291	—	—
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Plug	1	1010292	1050292	1060292
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	3	H3	Plug	1	1010295	—	1060295
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	3	H5	Plug	1	1010296	—	1060296
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H5	Plug	1	1010293	—	1060293
1/4		20	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Bottoming	1	1010294	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H2	Plug	1	1010298	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	3	H2	Plug	1	1010302	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Plug	1	1010299	1050299	1060299
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H4	Plug	1	1010300	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	3	H4	Plug	1	1010303	—	—
	1/4	28	2.1/2	1“	0.2550	5/16	0.1910	2	H3	Bottoming	1	1010301	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H1	Plug	1	1010304	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H2	Plug	1	1010305	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Plug	1	1010306	1050306	1060306
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H3	Plug	1	1010309	—	1060309
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H5	Plug	1	1010310	—	1060310
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H5	Plug	1	1010307	—	—
5/16		18	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Bottoming	1	1010308	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H2	Plug	1	1010316	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Plug	1	1010313	1050313	1060313
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	3	H4	Plug	1	1010317	—	—
	5/16	24	2.23/32	1.1/8	0.3180	3/8	0.2380	2	H3	Bottoming	1	1010315	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H1	Plug	1	1010318	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H3	Plug	1	1010320	1050320	1060320
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H2	Plug	1	1010319	—	—
3/8		16	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H5	Plug	1	1010321	—	1060321
	3/8	24	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H3	Plug	1	1010324	1050324	1060324
	3/8	24	2.15/16	1.1/4	0.3810	7/16	0.2860	3	H4	Plug	1	1010325	—	—

SPIRAL POINT TAPS

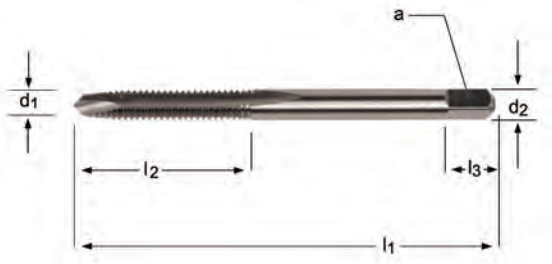
UNION BUTTERFIELD

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	⊠ a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1585	1585A	TN1585
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H2	Plug	1	1010327	—	—
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H3	Plug	1	1010328	1050328	1060328
7/16		14	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H5	Plug	1	1010329	—	—
	7/16	20	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H2	Plug	1	1010331	—	—
	7/16	20	3.5/32	1.7/16	0.3230	13/32	0.2420	3	H3	Plug	1	1010332	1050332	1060332
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H1	Plug	1	1010334	—	—
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H2	Plug	1	1010335	—	—
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H3	Plug	1	1010336	1050336	1060336
1/2		13	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H5	Plug	1	1010337	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H1	Plug	1	1010338	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H2	Plug	1	1010339	—	—
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H3	Plug	1	1010340	1050340	1060340
	1/2	20	3.3/8	1.21/32	0.3670	7/16	0.2750	3	H5	Plug	1	1010341	—	—
5/8		11	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H3	Plug	1	1010342	1050342	—
5/8		11	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H5	Plug	1	1010343	—	—
	5/8	18	3.13/16	1.13/16	0.4800	9/16	0.3600	3	H3	Plug	1	1012774	—	—
3/4		10	4.1/2	2“	0.5900	11/16	0.4420	3	H3	Plug	1	—	1050344	—
3/4		10	4.1/4	2“	0.5900	11/16	0.4420	3	H3	Plug	1	1010344	—	—
3/4		10	4.1/4	2“	0.5900	11/16	0.4420	3	H5	Plug	1	1010345	—	—
	3/4	16	4.1/2	2“	0.5900	11/16	0.4420	3	H3	Plug	1	—	1052775	—
	3/4	16	4.1/4	2“	0.5900	11/16	0.4420	3	H3	Plug	1	1012775	—	—

SPIRAL POINT TAPS

Relieved Style, Machine Screw Sizes

1634 Premium Cobalt substrate. Designed for tough jobs in high temperature alloys, stainless steel, cast iron, abrasive non-ferrous materials and other similar materials. Due to their premium steel content and special design, this range will effectively increase productivity through longer tool life. Ideally suited for through hole tapping.



1634(UNF)

UNC UNF

ANSI

3B

HSS-E



N4 - N10

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1634
4		40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1011102
6		32	2“	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1011104
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1011105
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1011106

SPIRAL POINT TAPS

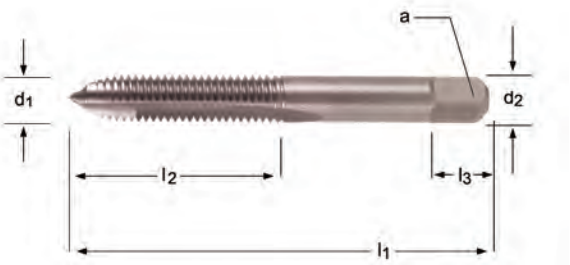
Relieved Style, Metric

1785M
TN1785

Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials. The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.

The 1785M style features eccentrically relieved threads with full pitch diameter relief. These taps are extremely free cutting, resulting in longer tool life. The use of rigid tapping equipment is highly recommended with this style of tap.

Bright Finish - improves chip flow in soft or non-ferrous materials.
TiN Coating - increases surface hardness and improves tool life.



1785M	TN1785
M	M
ANSI	ANSI
6H	6H
HSS	HSS
	
M2 - M18	M4 - M12

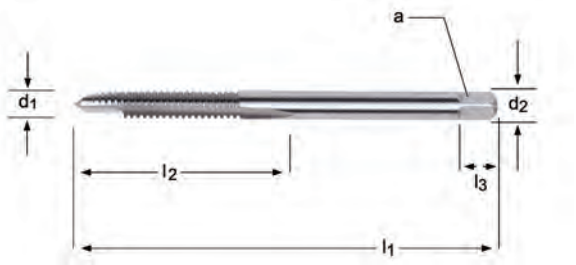
M	P mm	l_1 Inch	l_2 Inch	d_2 Ø Inch	l_3 Inch	a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1785M	TN1785
M2	0.40	1.3/4	7/16	0.1410	3/16	0.1100	2	D3	Plug	1	1012659	—
M2.5	0.45	1.13/16	1/2	0.1410	3/16	0.1100	2	D3	Plug	1	1012662	—
M3	0.50	1.15/16	5/8	0.1410	3/16	0.1100	2	D3	Plug	1	1012664	—
M3.5	0.60	2“	11/16	0.1410	3/16	0.1100	2	D4	Plug	1	1012666	—
M4	0.70	2.1/8	3/4	0.1310	1/4	0.1680	2	D4	Plug	1	—	1062668
M4	0.70	2.1/8	3/4	0.1680	1/4	0.1310	2	D4	Plug	1	1012668	—
M4.5	0.75	2.3/8	7/8	0.1940	1/4	0.1520	2	D4	Plug	1	1012669	—
M5	0.80	2.3/8	7/8	0.1520	1/4	0.1940	2	D4	Plug	1	—	1062672
M5	0.80	2.3/8	7/8	0.1940	1/4	0.1520	2	D4	Plug	1	1012672	—
M6	1.00	2.1/2	1“	0.1910	5/16	0.2550	2	D5	Plug	1	—	1062674
M6	1.00	2.1/2	1“	0.2550	5/16	0.1910	2	D5	Plug	1	1012674	—
M7	1.00	2.23/32	1.1/8	0.3180	3/8	0.2380	2	D5	Plug	1	1012676	—
M8	1.25	2.23/32	1.1/8	0.2380	3/8	0.3180	2	D5	Plug	1	—	1062678
M8	1.25	2.23/32	1.1/8	0.3180	3/8	0.2380	2	D5	Plug	1	1012678	—
M9	1.25	2.15/16	1.1/4	0.3810	7/16	0.2860	3	D5	Plug	1	1012680	—
M10	1.50	2.15/16	1.1/4	0.2860	7/16	0.3810	3	D6	Plug	1	—	1062682
M10	1.50	2.15/16	1.1/4	0.3810	7/16	0.2860	3	D6	Plug	1	1012682	—
M11	1.50	3.5/32	1.7/16	0.3230	13/32	0.2420	3	D6	Plug	1	1012685	—
M12	1.75	3.3/8	1.21/32	0.2750	7/16	0.3670	3	D6	Plug	1	—	1062686
M12	1.75	3.3/8	1.21/32	0.3670	7/16	0.2750	3	D6	Plug	1	1012686	—
M14	2.00	3.19/32	1.21/32	0.4290	1/2	0.3220	3	D7	Plug	1	1012689	—
M16	2.00	3.13/16	1.13/16	0.4800	9/16	0.3600	3	D7	Plug	1	1012693	—
M18	2.50	4.1/32	1.13/16	0.5420	5/8	0.4060	3	D7	Plug	1	1012696	—

UNION BUTTERFIELD

SPIRAL POINT TAPS

Non-Relieved Style, Machine Screw Sizes

1534NR Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the 1534/1585 series. For through hole applications.
Sizes in bold font indicate the most commonly used flute and 'H' limit for that size.



1534NR

UNC UNF UNS

ANSI

2B 3B



HSS



No.0 - No.12

UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534NR
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010775
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010776
	0		80	1.5/8	5/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010778
	1		72	1.11/16	3/8	0.1410	0.1100	3/16	2	H1	Plug	1	1010783
	1		72	1.11/16	3/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010784
1			64	1.11/16	3/8	0.1410	0.1100	3/16	2	H1	Plug	1	1010779
1			64	1.11/16	3/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010780
	2		64	1.3/4	7/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010791
	2		64	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010792
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010787
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010788
2			56	1.3/4	7/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010790
	3		56	1.13/16	1/2	0.1410	0.1100	3/16	2	H1	Plug	1	1010799
	3		56	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Plug	1	1010800
3			48	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Plug	1	1010796
3			48	1.13/16	1/2	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010798
		4	36	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010803
	4		48	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010809
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010804
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010805
	4		48	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010811
4			40	1.7/8	9/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010807
	5		44	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010817
5			40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Plug	1	1010813
5			40	1.15/16	5/8	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010815
	6		40	2"	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010825
6			32	2"	11/16	0.1410	0.1100	3/16	2	H1	Plug	1	1010818
6			32	2"	11/16	0.1410	0.1100	3/16	2	H2	Plug	1	1010819
6			32	2"	11/16	0.1410	0.1100	3/16	2	H3	Plug	1	1010820
	6		40	2"	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010827
6			32	2"	11/16	0.1410	0.1100	3/16	2	H2	Bottoming	1	1010822
6			32	2"	11/16	0.1410	0.1100	3/16	2	H3	Bottoming	1	1010823

SPIRAL POINT TAPS

UNION BUTTERFIELD

UNC	UNF	UNS	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1534NR
	8		36	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1010835
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H1	Plug	1	1010828
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Plug	1	1010829
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Plug	1	1010830
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H2	Bottoming	1	1010832
8			32	2.1/8	3/4	0.1680	0.1310	1/4	2	H3	Bottoming	1	1010833
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1010843
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1010844
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1010845
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1010847
	10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1010848
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H1	Plug	1	1010837
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Plug	1	1010838
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Plug	1	1010839
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H2	Bottoming	1	1010841
10			24	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	Bottoming	1	1010842
	12		28	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1010853
12			24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Plug	1	1011071
12			24	2.3/8	15/16	0.2200	0.1650	9/32	2	H3	Bottoming	1	1011072

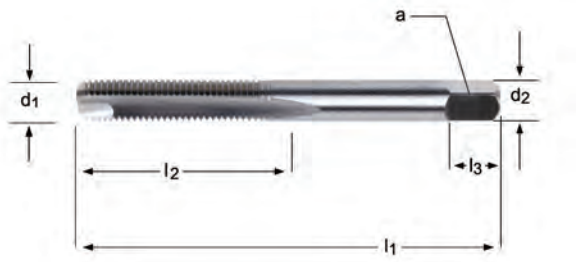
UNION BUTTERFIELD

SPIRAL POINT TAPS

Non-Relieved Style, Fractional Sizes

1585NR

Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the regular 1534/1585 series. For through hole applications.
Sizes in bold font indicate the most commonly used flute and 'H' limit for that size.



1585NR

UNC UNF

ANSI

2B 3B



HSS



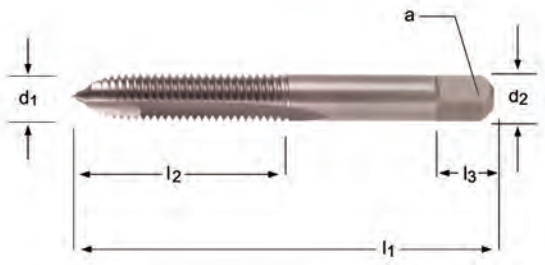
1/4 - 3/4

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H1	1	1012813	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H2	1	1012814	—
1/4	**20**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**2**	**H3**	**1**	**1012815**	**1012817**
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H5	1	1012816	—
1/4	**20**		**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**3**	**H3**	**1**	**1012818**	**—**
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H1	1	1012820	—
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H2	1	1012821	—
1/4		**28**	**2.1/2**	**1“**	**0.2550**	**0.1910**	**5/16**	**2**	**H3**	**1**	**1012822**	**1012824**
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	2	H2	1	1012828	—
5/16	**18**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**2**	**H3**	**1**	**1012829**	**47197820**
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	2	H5	1	1012830	—
5/16	**18**		**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**3**	**H3**	**1**	**1012832**	**1012831**
5/16		**24**	**2.23/32**	**1.1/8**	**0.3180**	**0.2380**	**3/8**	**2**	**H3**	**1**	**1012836**	**—**
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H2	1	1012842	—
3/8	**16**		**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**3**	**H3**	**1**	**1012843**	**—**
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H5	1	1012844	—
3/8		**24**	**2.15/16**	**1.1/4**	**0.3810**	**0.2860**	**7/16**	**3**	**H3**	**1**	**1012847**	**—**
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H2	1	1012849	—
7/16	**14**		**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**3**	**H3**	**1**	**1012850**	**—**
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H5	1	1012851	—
7/16		**20**	**3.5/32**	**1.7/16**	**0.3230**	**0.2420**	**13/32**	**3**	**H3**	**1**	**1012853**	**—**
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H2	1	1012856	—
1/2	**13**		**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**3**	**H3**	**1**	**1012857**	**—**
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H5	1	1012858	—
1/2		**20**	**3.3/8**	**1.21/32**	**0.3670**	**0.2750**	**7/16**	**3**	**H3**	**1**	**1012861**	**—**
5/8	**11**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H3**	**1**	**1012863**	**—**
5/8	**11**		**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H5**	**1**	**1012864**	**—**
5/8		**18**	**3.13/16**	**1.13/16**	**0.4800**	**0.3600**	**9/16**	**3**	**H3**	**1**	**1012867**	**—**
3/4	**10**		**4.1/2**	**2“**	**0.5900**	**0.4420**	**11/16**	**3**	**H3**	**1**	**1012865**	**—**
3/4	10		4.1/2	2“	0.5900	0.4420	11/16	3	H5	1	1012866	—
3/4		**16**	**4.1/2**	**2“**	**0.5900**	**0.4420**	**11/16**	**3**	**H3**	**1**	**1012868**	**—**

SPIRAL POINT TAPS

Non-Relieved, Metric Sizes

1785NR Feature concentric threads with no pitch diameter relief. These taps are particularly recommended for applications requiring close gauging fits and in older equipment that is not sufficiently rigid to accommodate the free cutting action of the regular 1785 series. For through hole applications.



1785NR

M

ANSI

6H



HSS



M1.6 - M20

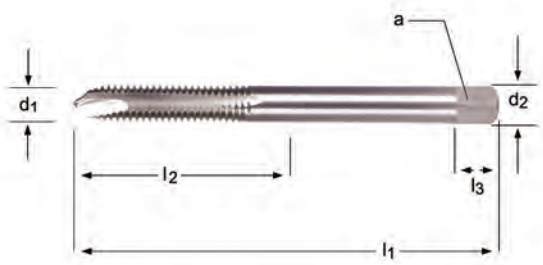
M	P mm	l_1 Inch	l_2 Inch	l_3 Inch	d_2 Ø Inch	▨ a Inch	# of Flutes	Limits	Chamfer	Pack Qty	1785NR
1.6	0.35	1.5/8	5/16	0.1410	0.1100	3/16	2	D3	Plug	1	1012890
2	0.40	1.3/4	7/16	0.1410	0.1100	3/16	2	D3	Plug	1	1012891
2.5	0.45	1.13/16	1/2	0.1410	0.1100	3/16	2	D3	Plug	1	1012893
3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	2	D3	Plug	1	1012896
3.5	0.60	2“	11/16	0.1410	0.1100	3/16	2	D4	Plug	1	1012897
4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	2	D4	Plug	1	1012898
4.5	0.75	2.3/8	7/8	0.1940	0.1520	1/4	2	D4	Plug	1	1012899
5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	2	D4	Plug	1	1012900
6	1.00	2.1/2	1“	0.2550	0.1910	5/16	2	D5	Plug	1	1012901
7	1.00	2.23/32	1.1/8	0.3180	0.2380	3/8	2	D5	Plug	1	1012902
8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	2	D5	Plug	1	1012903
10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	3	D6	Plug	1	1012904
12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	3	D6	Plug	1	1012905
14	2.00	3.19/32	1.21/32	0.4290	0.3220	1/2	3	D7	Plug	1	1012906
16	2.00	3.13/16	1.13/16	0.4800	0.3600	9/16	3	D7	Plug	1	1012907
20	2.50	4.15/32	2“	0.6520	0.4890	11/16	3	D7	Plug	1	1012909

UNION BUTTERFIELD

SPIRAL POINT TAPS

Extension / Non-Relieved Style

1534NE Similar in design and thread geometries to the standard 1534NR series, but with a longer shank length. Bright finish improves chip flow in soft or non-ferrous materials. For through hole applications.



1534NE(UNC)

UNC UNF

ANSI

3B

HSS



No.4 - 1/2

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Chamfer	1534NE
4		40	4“	9/16	0.1410	0.1100	3/16	2	H2	1	Plug	1020002
6		32	4“	11/16	0.1410	0.1100	3/16	2	H3	1	Plug	1020004
6		32	6“	11/16	0.1410	0.1100	3/16	2	H3	1	Plug	1020006
8		32	4“	3/4	0.1680	0.1310	1/4	2	H3	1	Plug	1020008
8		32	6“	3/4	0.1680	0.1310	1/4	2	H3	1	Plug	1020010
	10	32	4“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020016
	10	32	6“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020018
10		24	4“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020012
10		24	6“	7/8	0.1940	0.1520	1/4	2	H3	1	Plug	1020014
	1/4	28	4“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020024
	1/4	28	6“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020026
1/4		20	4“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020020
1/4		20	6“	1“	0.2550	0.1910	5/16	2	H3	1	Plug	1020022
	5/16	24	4“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020032
	5/16	24	6“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020034
5/16		18	4“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020028
5/16		18	6“	1.1/8	0.3180	0.2380	3/8	2	H3	1	Plug	1020030
	3/8	24	4“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020040
	3/8	24	6“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020042
3/8		16	4“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020036
3/8		16	6“	1.1/4	0.3810	0.2860	7/16	3	H3	1	Plug	1020038
	7/16	20	6“	1.7/16	0.3230	0.2420	13/32	3	H3	1	Plug	1020046
7/16		14	6“	1.7/16	0.3230	0.2420	13/32	3	H3	1	Plug	1020044
	1/2	20	6“	1.21/32	0.3670	0.2750	7/16	3	H3	1	Plug	1020050
1/2		13	6“	1.21/32	0.3670	0.2750	7/16	3	H3	1	Plug	1020048

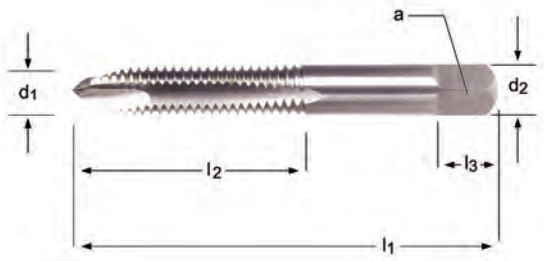
SPIRAL POINT TAPS

Oversize / Relieved Style

1593
1585OV

Similar in design to the standard 1534/1585 series but with a pitch diameter larger than the basic pitch diameter. Used primarily where a part will be plated or treated after tapping. For through hole applications.

1593: 0.003” - 0.0035” Oversize
1585OV: 0.005” Oversize



1593	1585OV
UNC UNF	UNC
ANSI	ANSI
2B 3B	2B
HSS	HSS
N6 - N10	1/4 - 5/8

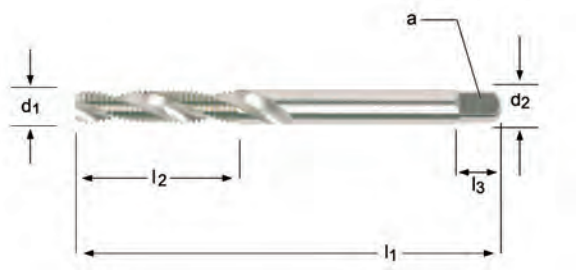
UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1593	1585OV
6		32	2“	11/16	0.1410	0.1100	3/16	2	H7	Plug	1	1010877	—
8		32	2.1/8	3/4	0.1680	0.1310	1/4	2	H7	Plug	1	1010879	—
	10	32	2.3/8	7/8	0.1940	0.1520	1/4	2	H7	Plug	1	1010883	—
10		24	2.3/8	7/8	0.1940	0.1520	1/4	2	H7	Plug	1	1010881	—
1/4		20	2.1/2	1“	0.2550	0.1910	5/16	2	H11	Plug	1	—	1011754
5/16		18	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H11	Plug	1	—	1011755
3/8		16	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H11	Plug	1	—	1011756
7/16		14	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H11	Plug	1	—	1011757
1/2		13	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H11	Plug	1	—	1011758
5/8		11	3.13/16	1.13/16	0.4800	0.3600	9/16	3	H11	Plug	1	—	1011759

SPIRAL FLUTE TAPS

Regular Spiral 30°

1582 *- Machine Screw Sizes*
1586 *- Fractional Sizes*

Generally used where chip disposal is a problem. The spiral flute design effictively draws chips out of the hole. Recommended for use when tapping blind or through holes in a variety of materials. Excellent choice for non-ferrous applications.



1582 / 1586

UNC UNF

ANSI

3B

HSS



No.4 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⊿ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
4	40		1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	1010905	1010906
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010909	1010910
8	32		2.1/8	3/4	0.1680	0.1310	1/4	2	H3	1	1010913	1010914
10	24		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	1010915	1010916
10		32	2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	1010917	1010918
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	2	H3	1	1010346	1010347
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010348	1010349
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	2	H3	1	1010350	1010351
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010352	1010353
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010354	1010355
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010356	1010357
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010358	1010359
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010360	1010361
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010362	1010363
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010366	1010367
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010368	1010369

SPIRAL FLUTE TAPS

High Spiral Helicut 52°

1587 *- Machine Screw Sizes*
1588 *- Fractional Sizes*

Similar to the regular spiral flute design of 1582/1586 except that the faster spiral improves the chip drawing action and permits the bridging of larger gaps inside a hole. For blind or through hole applications. Excellent choice for non-ferous applications.



1587 / 1588

UNC UNF

ANSI

2B 3B

HSS



N4 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	☒ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
4	40		1.7/8	9/16	0.1410	0.1100	3/16	2	H2	1	1010887	1010888
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010891	1010892
8	32		2.1/8	3/4	0.1680	0.1310	1/4	3	H3	1	1010895	1010896
10	24		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010897	1010898
10		32	2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010899	1010900
1/4	20		2.1/2	1.000	0.2550	0.1910	5/16	3	H3	1	1010398	1010399
1/4		28	2.1/2	1.000	0.2550	0.1910	5/16	3	H3	1	1010400	1010401
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010402	1010403
5/16		24	2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010404	1010405
3/8	16		2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010406	1010407
3/8		24	2.15/16	1.1/4	0.3810	0.2860	7/16	3	H3	1	1010408	1010409
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010410	1010411
7/16		20	3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010412	1010413
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010414	1010415
1/2		20	3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010416	1010417

SPIRAL FLUTE TAPS

Heavy Duty Spiral 40°

1590 *- Machine Screw Sizes*
1591 *- Fractional Sizes*

A slower helix angle, larger core diameter, three flutes and wider throat dimensions than the regular 1587/1588 series. Designed for tough blind or through hole tapping. Chip ejection is more efficient and problems such as chipping and breakage are largely eliminated. A steam oxide finish makes this tap ideal for use in ferrous materials and higher strength alloys.

1590 / 1591

UNC UNF

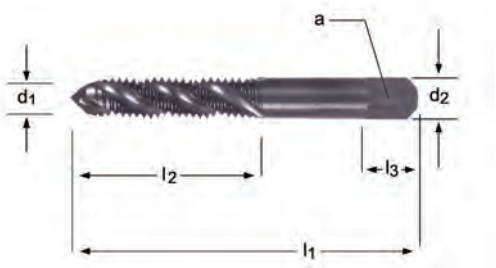
ANSI

3B

HSS



N6 - 1/2

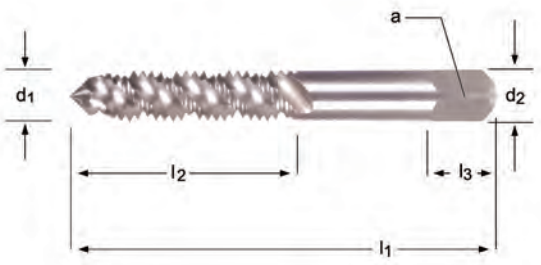


Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	Plug	Bottoming
6	32		2“	11/16	0.1410	0.1100	3/16	2	H3	1	1010937	1010938
6		40	2“	11/16	0.1410	0.1100	3/16	2	H3	1	—	1010940
10	24		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010945	1010946
10		32	2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010947	1010948
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010953	1010954
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010955	1010956
5/16	18		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010957	1010958
3/8	16		2.5/16	1.1.4	0.3810	0.2860	7/16	3	H3	1	1010961	1010962
7/16	14		3.5/32	1.7/16	0.3230	0.2420	13/32	3	H3	1	1010965	1010966
1/2	13		3.3/8	1.21/32	0.3670	0.2750	7/16	3	H3	1	1010969	1010970

SPIRAL FLUTE TAPS

High Spiral Helicut 52°, Metric

1788(M) Similar to the regular spiral flute design of 1582/1586 except that the faster spiral improves the chip drawing action and permits the bridging of larger gaps inside a hole. For blind or through hole applications. Excellent choice for non-ferrous applications.



1788(M)

M

ANSI

6H

HSS

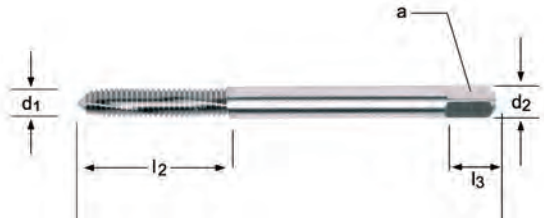


M3 - M12

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	No. of Flutes	Limits	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	2	D3	1	1012920	1012940
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	3	D4	1	1012923	1012943
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	3	D4	1	1012925	1012945
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	3	D5	1	1012926	1012946
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	3	D5	1	1012928	1012948
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	3	D6	1	1012930	1012950
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	3	D6	1	1012932	1012952

Rol-Rite / Spiral Lobe

1580 The Rol-Rite style has a spiral lobe pattern and no oil or lubrication grooves. It is designed for general purpose applications and is particularly suited for through holes in thin sections and for interrupted holes. For through or blind hole applications.



1580

UNC UNF

ANSI

2B 3B

HSS



N2 - 3/8

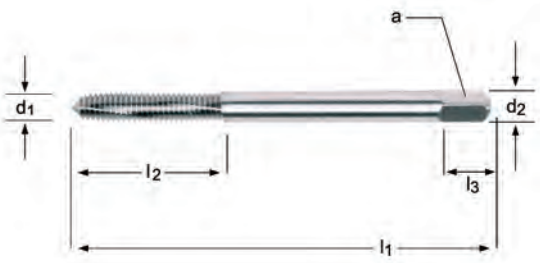
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	◹ a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H2	1	—	1310004
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H3	1	—	1310005
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H3	1	1310012	1310014
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H5	1	—	1310015
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H3	1	—	1310022
6	32		2“	11/16	0.1410	0.1100	3/16	H3	1	1310028	1310031
6	32		2“	11/16	0.1410	0.1100	3/16	H5	1	1310029	—
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H3	1	1310038	1310041
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H5	1	1310039	1310042
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310048	1310051
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H4	1	—	1310057
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310055	1310058
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310068	1310071
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H6	1	1310069	—
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310074	1310076
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310078	1310080
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H7	1	—	1310081
5/16		24	2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310082	—
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	1310086	1310088
3/8		24	2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	—	1310092

THREAD FORMING TAPS

UNION BUTTERFIELD

Rol-Rite, Spiral Lobe

1580(M) The Rol-Rite style has a spiral lobe pattern and no oil or lubrication grooves. It is designed for general purpose applications and is particularly suited for through holes in thin sections and for interrupted holes.



1580(M)

M

ANSI

6H

HSS



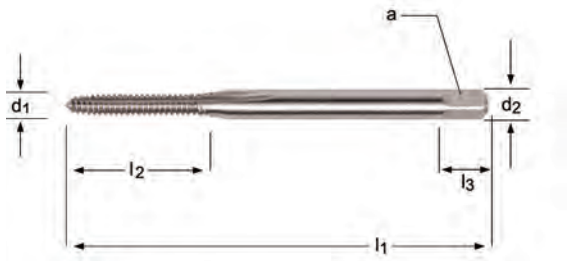
M3 - M12

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	D5	1	1310400	1310401
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	D6	1	1310402	1310403
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	D7	1	1310404	1310405
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	D8	1	1310406	1310407
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	D9	1	1310408	1310409
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	D10	1	1310410	1310411
M12	1.75	3.3/8	1.21/32	0.3670	0.2750	7/16	D11	1	1310412	1310413

THREAD FORMING TAPS

Rol-Form / Lube Grooves

3300 The Rol-Form style has 2-4 grooves (depending on size) extending the full length of thread to assure lubrication in the forming zone and to eliminate build up of the hydraulic pressure in blind holes. They are particularly suited to blind holes in thin walled die castings.



3300

UNC UNF

ANSI

2B 3B

HSS



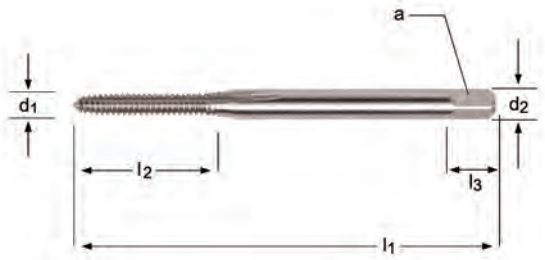
N0 - 1/2

Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	Limits	Pack Qty	Plug	Bottoming
0		80	1.5/8	5/16	0.1410	0.1100	3/16	H2	1	—	1310110
1	64		1.11/16	3/8	0.1410	0.1100	3/16	H2	1	—	1310111
1		72	1.11/16	3/8	0.1410	0.1100	3/16	H2	1	—	1310112
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H2	1	—	1310113
2	56		1.3/4	7/16	0.1410	0.1100	3/16	H3	1	—	1310114
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H3	1	1310121	1310123
4	40		1.7/8	9/16	0.1410	0.1100	3/16	H5	1	1310122	—
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H3	1	—	1310131
5	40		1.15/16	5/8	0.1410	0.1100	3/16	H5	1	—	1310132
6	32		2“	11/16	0.1410	0.1100	3/16	H3	1	1310137	1310140
6	32		2“	11/16	0.1410	0.1100	3/16	H5	1	1310138	1310141
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H3	1	1310147	1310150
8	32		2.1/8	3/4	0.1680	0.1310	1/4	H5	1	1310148	1310151
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310157	1310160
10	24		2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310158	1310161
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H4	1	1310163	1310166
10		32	2.3/8	7/8	0.1940	0.1520	1/4	H6	1	1310164	1310167
12	24		2.3/8	15/16	0.2200	0.1650	9/32	H4	1	1310169	—
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310177	1310180
1/4	20		2.1/2	1“	0.2550	0.1910	5/16	H6	1	1310178	1310181
1/4		28	2.1/2	1“	0.2550	0.1910	5/16	H4	1	1310183	1310185
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H5	1	1310187	1310189
5/16	18		2.23/32	1.1/8	0.3180	0.2380	7/16	H7	1	1310188	1310190
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H5	1	1310195	1310197
3/8	16		2.15/16	1.1/4	0.3810	0.2860	1/2	H7	1	1310196	1310198
3/8		24	2.15/16	1.1/4	0.3810	0.2860	1/2	H7	1	1310200	1310202
1/2	13		3.3/8	1.21/32	0.3670	0.2750	23/32	H5	1	1310211	—

Rol-Form, Lube Grooves

3300(M)

The Rol-Form style has 1-2 lube grooves (depending on size) extending the full length of thread to assure lubrication in the forming zone and to eliminate build up of the hydraulic pressure in blind holes. They are particularly suited to blind holes in thin walled die castings.



3300(M)

M

ANSI

6H

HSS



M3 - M10

Nominal d_1	Pitch M	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▨ a Inch	l_3 Inch	Limits	Grooves	Pack Qty	Plug	Bottoming
M3	0.50	1.15/16	5/8	0.1410	0.1100	3/16	D5	1	1	1310500	1310501
M4	0.70	2.1/8	3/4	0.1680	0.1310	1/4	D6	1	1	1310502	1310503
M5	0.80	2.3/8	7/8	0.1940	0.1520	1/4	D7	1	1	1310504	1310505
M6	1.00	2.1/2	1“	0.2550	0.1910	5/16	D8	2	1	1310506	1310507
M8	1.25	2.23/32	1.1/8	0.3180	0.2380	3/8	D9	2	1	1310508	1310509
M10	1.50	2.15/16	1.1/4	0.3810	0.2860	7/16	D10	2	1	1310510	1310511

THREAD FORMING TAPS

Extension Rol-Form / Lube Grooves

3306E Similar in design and thread geometries to the standard 3300 series but with longer shank lengths than standard.



3306E(UNF)

UNC UNF

ANSI

2B

HSS



N4 - 5/16

UNC	UNF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	Limits	Chamfer	Pack Qty	3306E
4		40	4“	9/16	0.1410	0.1100	3/16	H3	Bottoming	1	1321002
4		40	4“	9/16	0.1410	0.1100	3/16	H5	Bottoming	1	1321004
6		32	4“	11/16	0.1410	0.1100	3/16	H3	Bottoming	1	1321006
8		32	4“	3/4	0.1680	0.1310	1/4	H3	Bottoming	1	1321014
	10	32	4“	7/8	0.1940	0.1520	1/4	H4	Bottoming	1	1321030
10		24	4“	7/8	0.1940	0.1520	1/4	H4	Bottoming	1	1321022
1/4		20	4“	1“	0.2550	0.1910	5/16	H4	Bottoming	1	1321038
5/16		18	4“	1.1/8	0.3180	0.2380	3/8	H5	Bottoming	1	1321062

PIPE TAPS

General Purpose, Medium Hook, NPT

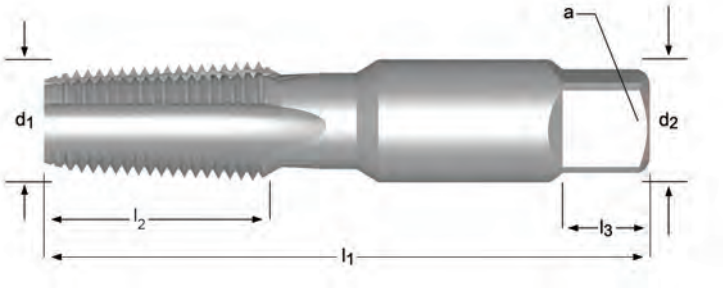
1541

TN1541

Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials. The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.

TiN coating increases surface hardness and improves tool life.

Made to Metal Cutting Tool Institute Standards, table 311



	1541(NPT)	TN1541
	NPT	NPT
	ANSI	ANSI
	Normal	Normal
	HSS	HSS
		
	1/16 - 2"	1/8 - 3/4

Nominal d_1	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch /	a Inch	l_3 Inch	# of Flutes	Pack Qty	1541	TN1541
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010518	—
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010528	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010519	1060519
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010520	1060520
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010521	1060521
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010522	1060522
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010523	1060523
1"	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010524	—
1.1/4	11.5	4"	1.3/4	1.3130	0.9840	15/16	5	1	1010525	—
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1"	7	1	1010526	—
2"	11.5	4.1/2	1.3/4	1.8750	1.4060	1.1/8	7	1	1010527	—

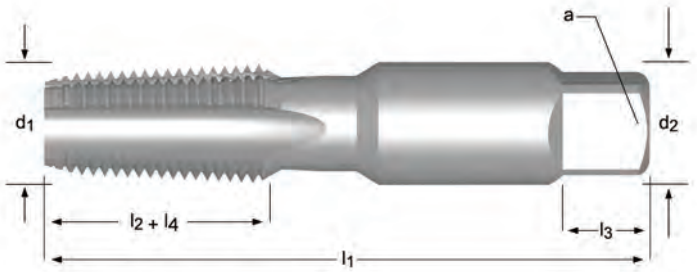
PIPE TAPS

General Purpose, Medium Hook, NPT

E710
E721

Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials. The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.

TiN coating increases surface hardness and improves tool life.



E710	E721
NPT	NPT
ANSI B94.9	ANSI B94.9
Normal	Normal
HSS	HSS
	
1/16 - 2"	1/8 - 1"

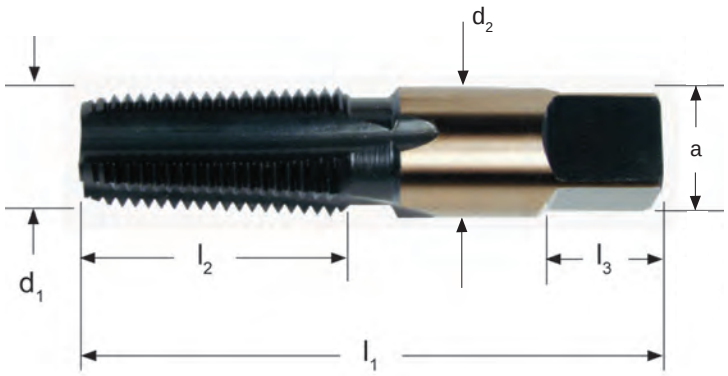
Nominal d_1	TPI	l_1 mm	l_2 mm	d_2 Ø mm	◿ a mm	l_3 mm	↔	# of Flutes	l_4 mm	Pack Qty	E710	E721
1/16	27	65	17	7.9	5.9	8	6.3	4	11.7	1	0159491	—
1/8	27	70	19	11.1	8.3	10	8.5	4	11.9	1	0099889	0161463
1/8	27	70	19	11.1	8.3	10	8.5	4	11.9	Set of 2	0210314 [1)]	—
1/4	18	75	27	14.3	10.7	11	11	4	17.6	1	0099872	0161470
1/4	18	75	27	14.3	10.7	11	11	4	17.6	Set of 2	0210321 [1)]	—
3/8	18	80	27	17.8	13.5	13	14.5	4	19.5	1	0099919	0161487
3/8	18	80	27	17.8	13.5	13	14.5	4	19.5	Set of 2	0210338 [1)]	—
1/2	14	100	35	17.5	13.1	16	18	4	22.7	1	0099865	0161494
1/2	14	100	35	17.5	13.1	16	18	4	22.7	Set of 2	0210345 [1)]	—
3/4	14	105	35	23.0	17.2	17	23	5	24.4	1	0099902	0161500
3/4	14	105	35	23.0	17.2	17	23	5	24.4	Set of 2	0210352 [1)]	—
1"	11.5	115	43	28.6	21.4	21	29	5	29.4	1	0099834	0161517
1.1/4	11.5	125	43	33.3	25.0	24	38	5	27.7	1	0099858	—
1.1/2	11.5	135	43	38.1	28.6	25	44	7	28.9	1	0099841	—
2"	11.5	145	43	47.6	35.7	29	56	7	26.6	1	0099896	—

[1)] Sets (No.7) include: *1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)*

UNION BUTTERFIELD

General Purpose / Work-Rite, NPT

6541 Straight Flute. Medium hook for multi-material tapping. Generally used for pipe fittings and couplings in most ferrous and non-ferrous materials.
The nominal size of a pipe tap is that of the pipe fitting to be tapped and not the actual size of the tap. NPT threads require the use of a 'sealant' such as teflon tape or pipe compound to ensure a tight joint.



6541

NPT

ANSI B94.9

Normal



1/8 - 2"

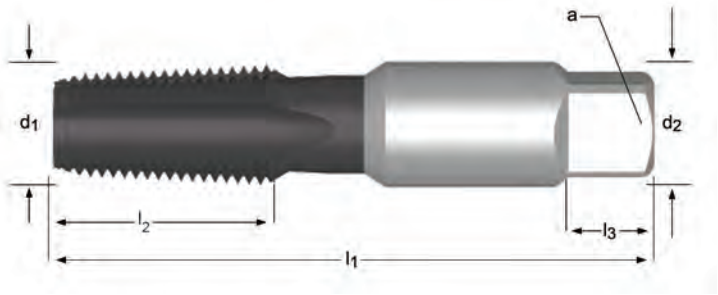
NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Pack Qty	6541
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	8110601
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	8110602
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	8110603
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	8110604
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	8110605
1"	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	8110606
1.1/4	11.5	4"	1.3/4	1.3130	0.9840	15/16	5	1	8110607
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1	7	1	8110608
2"	11.5	4.1/2	1.3/4	1.8750	1.4060	1.1/8	7	1	8110609

PIPE TAPS

Low Rake for Cast Iron, NPT

1544

Straight Flute. Low rake heavy-duty for cast iron and heat treated alloy steels. Nitride surface treatment reduces wear and chip welding. Manufactured with a cutting geometry specifically for gray cast irons producing broken chips. The design makes these taps also appropriate for non-metallics, cast brass and other brass materials producing broken, powdery chips.



1544

NPT

ANSI B94.9

Normal

HSS



1/16 - 1.1/4

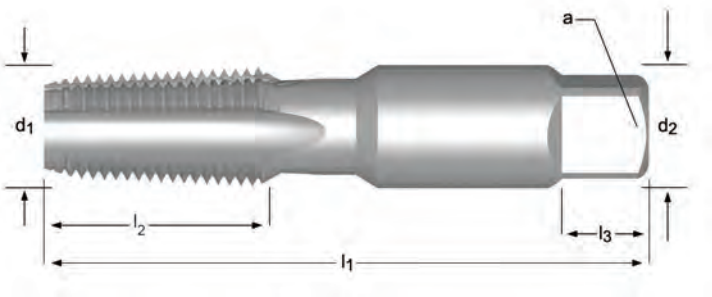
NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	1544
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1011760
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1011761
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1011762
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1011763
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1011764
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1011765
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1011766
1.1/4	11.5	4“	1.3/4	1.3130	0.9840	15/16	5	1	1011767

UNION BUTTERFIELD

High Hook, NPT

1545 Designed with a high hook and deep flutes to handle the tough curly chips of free cutting materials such as low carbon and leaded steels, boiler plate, aluminum and die castings.

1545A Identical to the 1545 series but with steam oxide surface treatment to prevent galling and chipping.



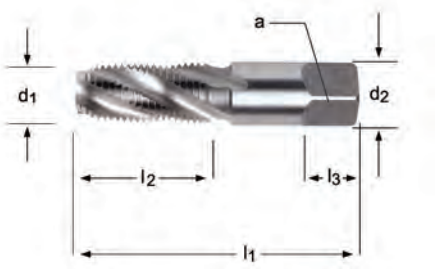
1545	1545A
NPT	NPT
ANSI	ANSI
Normal	Normal
HSS	HSS
	
1/18 - 1"	1/16 - 3/4

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	# of Flutes	Pack Qty	1545	1545A
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	—	1052869
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1012879	—
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1012870	1052870
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1012871	1052871
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1012872	1052872
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1012873	1052873
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1012874	1052874
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1012875	—

PIPE TAPS

Spiral Flute, 30°, NPT

1548 Designed with a medium hook. Most effective when used in applications that produce, long, stringy chips. The spiral flute design effectively draws the chips from the hole being tapped.



1548

NPT

ANSI

Normal

HSS



1/16 - 1“

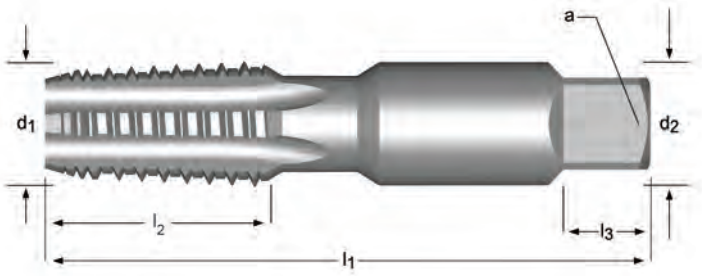
NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▨ a Inch	l_3 Inch	# of Flutes	Pack Qty	1548
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010920
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010924
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010922
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010926
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010928
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010930
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010932
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010934

UNION BUTTERFIELD

Interrupted Thread, NPT

1568

Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips. Ideal for use in soft, ductile materials or those producing long, continuous chips.



1568

NPT

ANSI

Normal

HSS

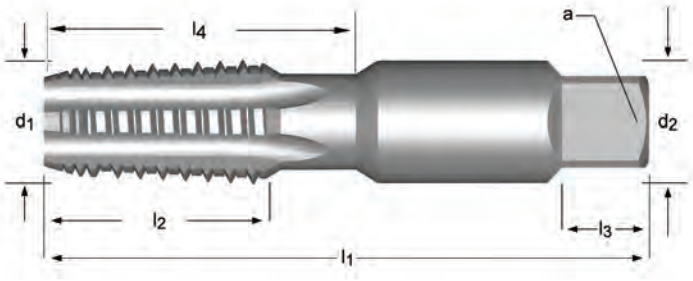


1/8 - 1.1/2

NPT	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Pack Qty	1568
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	5	1	1010560
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	5	1	1010551
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	5	1	1010552
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	5	1	1010553
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	5	1	1010554
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010555
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010556
1.1/4	11.5	4“	1.3/4	1.3130	0.9840	15/16	5	1	1010557
1.1/2	11.5	4.1/4	1.3/4	1.5000	1.1250	1“	7	1	1010558

Interrupted Thread, NPT

E711 Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips. Ideal for use in soft, ductile materials or those producing long, continuous chips.



E711

NPT

ANSI B94.9

Normal

HSS



1/8 - 1.1/2

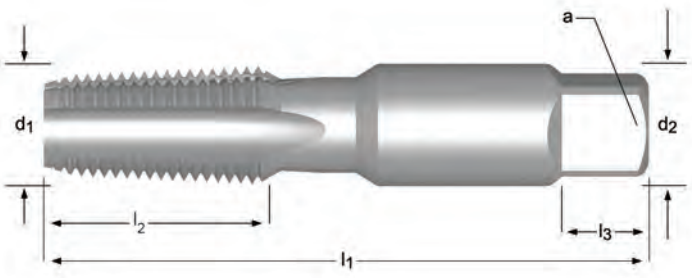
NPT	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		Pack Qty	E711
1/8	27	10.29	70	19	309	11.1	8.3	10	5	8.5	1	0099957
1/4	18	13.72	75	27	44.6	14.3	10.7	11	5	11.0	1	0099940
3/8	18	17.15	80	27	46.5	17.8	13.5	13	5	14.5	1	0099971
1/2	14	21.33	100	35	57.7	17.5	13.1	16	5	18.0	1	0099933
3/4	14	26.67	105	35	59.4	23.0	17.2	17	5	23.0	1	0099964
1“	11.5	33.40	115	43	72.4	28.6	21.4	21	5	29.0	1	0099926
1.1/2	11.5	48.26	135	43	71.9	38.1	28.6	25	7	44.0	1	0124079

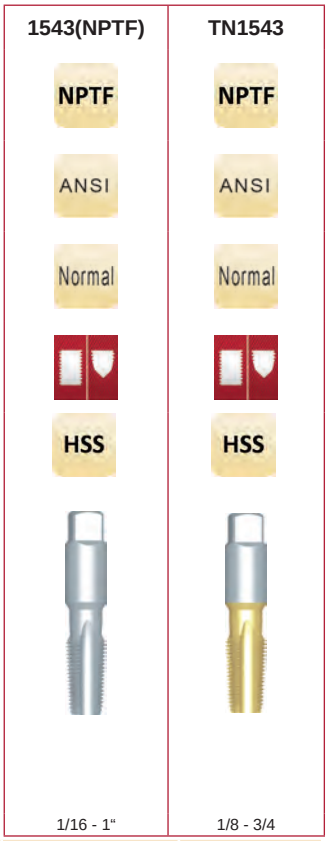
PIPE TAPS

Dryseal, NPTF, Medium Hook

1543 Similar in design to the 1541 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.

TN1543 TiN coated option increases surface hardness and improves tool life.



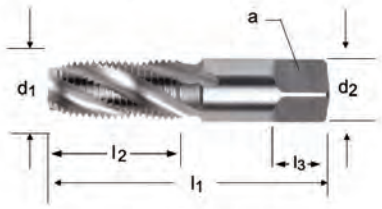


NPTF	TPI	l_1 Inch	l_1 mm	l_2 Inch	l_2 mm	d_2 Ø Inch	▱ a Inch	l_3 Inch	# of Flutes	Pack Qty	1543(NPTF)	TN1543
1/16	27	2.1/8		11/16		0.3130	0.2340	3/8	4	1	1010529	—
1/8	27		2.1/8		3/4	0.4380	0.3280	3/8	4	1	—	1060530
1/8	27	2.1/8		3/4		0.3130	0.2340	3/8	4	1	1010539	—
1/8	27	2.1/8		3/4		0.4380	0.3280	3/8	4	1	1010530	—
1/4	18		2.7/16		1.1/16	0.5630	0.4210	7/16	4	1	—	1060531
1/4	18	2.7/16		1.1/16		0.5630	0.4210	7/16	4	1	1010531	—
3/8	18		2.9/16		1.1/16	0.7000	0.5310	1/2	4	1	—	1060532
3/8	18	2.9/16		1.1/16		0.7000	0.5310	1/2	4	1	1010532	—
1/2	14		3.1/8		1.3/8	0.6880	0.5150	5/8	4	1	—	1060533
1/2	14	3.1/8		1.3/8		0.6880	0.5150	5/8	4	1	1010533	—
3/4	14		3.1/4		1.3/8	0.9060	0.6790	11/16	5	1	—	1060534
3/4	14	3.1/4		1.3/8		0.9060	0.6790	11/16	5	1	1010534	—
1“	11.5	3.3/4		1.3/4		1.1250	0.8430	13/16	5	1	1010535	—

PIPE TAPS

Spiral Flute, Dryseal, NPTF

1549 Spiral Flute 30º. Medium hook for evacuation of long, stringy chips. Similar in design to the 1548 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



1549

NPTF

ANSI

Normal



HSS



1/16 - 3/4

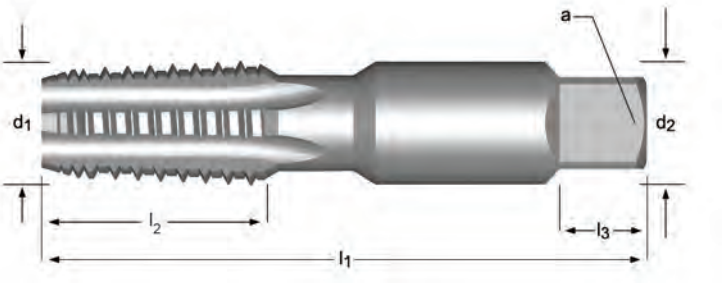
NPTF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Pack Qty	1549
1/16	27	2.1/8	11/16	0.3130	0.2340	3/8	4	1	1010921
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010925
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010923
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010927
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010929
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010931
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010933

UNION BUTTERFIELD

Interrupted Thread, Dryseal, NPTF

1567 Interrupted thread design for chip evacuation. Removal of every other thread allows more coolant deeper into the hole. Helps to eliminate torn threads and re-cutting of chips.

Similar in design to the 1568 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



1567

NPTF

ANSI

Normal

HSS

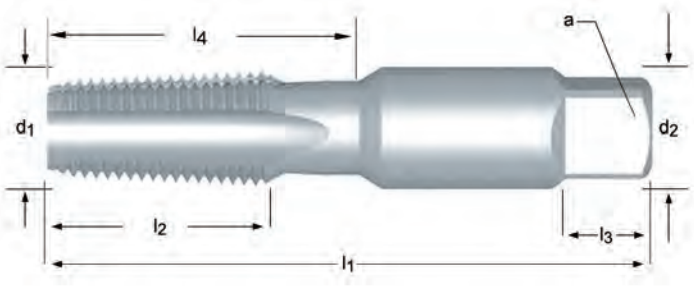


1/8 - 1“

NPTF	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	⍁ a Inch	l_3 Inch	# of Flutes	Pack Qty	1567
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	5	1	1010570
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	5	1	1010561
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	5	1	1010562
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	5	1	1010563
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	5	1	1010564
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010565
1“	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010566

General Purpose, Medium Hook, Dryseal, NPTF

E712 Medium hook for multi-material tapping. Similar in design to the E710 series but manufactured to Dryseal American National Standard Taper Pipe Thread (NPTF) specifications. Used where a leak proof pressure tight joint is required without the use of a sealing compound.



E712

NPTF

ANSI B94.9

Normal

HSS



1/16 - 1.1/4

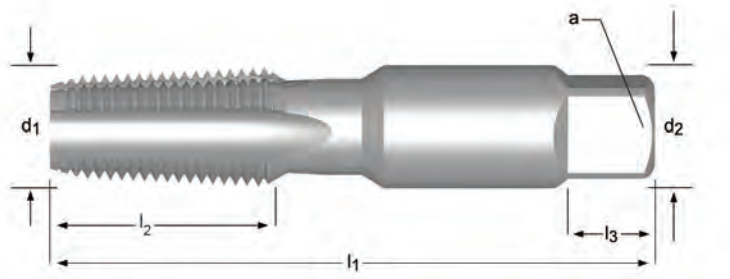
NPTF	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes		Pack Qty	E712
1/16	27	7.94	65	17	11.7	8.1	6.0	8	4	6.20	1	0100004
1/8	27	10.29	70	19	11.9	11.1	8.3	10	4	8.40	1	0100035
1/4	18	13.72	75	27	17.6	14.3	10.7	11	4	10.90	1	0100028
3/8	18	17.15	80	27	19.5	17.8	13.5	13	4	14.25	1	0100059
1/2	14	21.34	100	35	22.7	17.5	13.1	16	4	17.75	1	0100011
3/4	14	26.67	105	35	24.4	23.0	17.2	17	5	23.00	1	0100042
1“	11.5	33.40	115	43	29.4	28.6	21.4	21	5	29.00	1	0099988
1.1/4	11.5	42.16	125	43	27.7	33.4	24.9	23	5	37.75	1	0099995

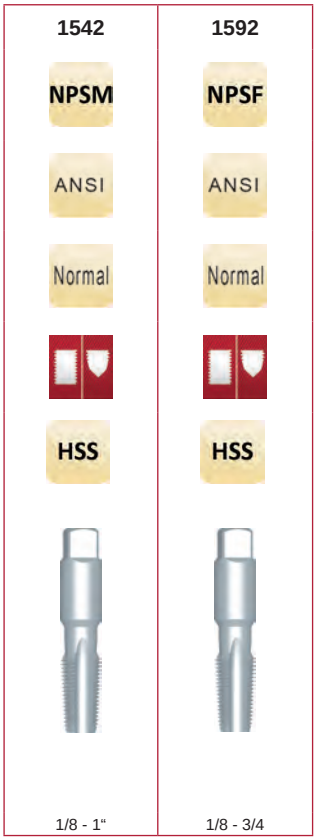
UNION BUTTERFIELD

Straight Pipe Taps, NPS & NPSF

1542 NPSM (Mechanical) - Suitable for tapping holes for low pressure work, and then assemble with either taper threaded or straight threaded pipe or fitting and secure a tight joint with lubricant or sealer.

1592 NPSF (Dryseal) - Similar in design to the 1542 series but manufactured to Dryseal American National Standard Pipe Thread NPSF specifications. Intended for low pressure work where a sealer is not used such as fuel and oil lines. When assembling with a dryseal taper-threaded part there will not be any clearance between the crest and roof of the threads.

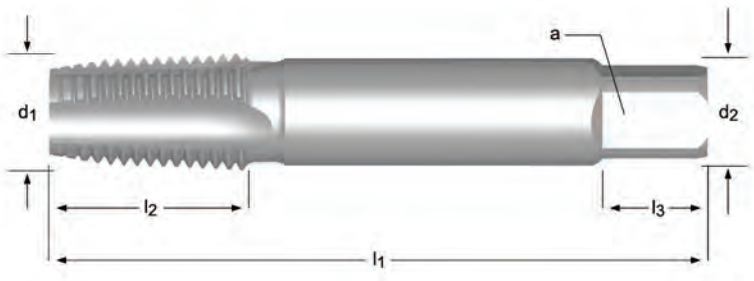




Nominal d_1	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch /	⍁ a Inch	l_3 Inch	# of Flutes	Pack Qty	1542	1592
1/8	27	2.1/8	3/4	0.3130	0.2340	3/8	4	1	1010587	1010592
1/8	27	2.1/8	3/4	0.4380	0.3280	3/8	4	1	1010581	1010588
1/4	18	2.7/16	1.1/16	0.5630	0.4210	7/16	4	1	1010582	1010589
3/8	18	2.9/16	1.1/16	0.7000	0.5310	1/2	4	1	1010583	1010590
1/2	14	3.1/8	1.3/8	0.6880	0.5150	5/8	4	1	1010584	1010591
3/4	14	3.1/4	1.3/8	0.9060	0.6790	11/16	5	1	1010585	1011070
1"	11.5	3.3/4	1.3/4	1.1250	0.8430	13/16	5	1	1010586	—

Taper Pipe Taps, British Standard

E550 Similar to the E710 but manufactured to British Standard Taper Pipe Thread specification (BSPT).





E550

Rc

ISO 2284

Normal

HSS

1/8 - 2“

Rc	TPI	d_1 nom mm	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	Pack Qty	E550	
1/8	28	9.728	59	15	8.0	6.3	9	3	8.4	1	0099490	
1/8	28	9.728	59	15	8.0	6.3	9	3	8.4	Set of 2	0159408	1)
1/4	19	13.157	67	19	10.0	8.0	11	3	11.2	1	0099483	
1/4	19	13.157	67	19	10.0	8.0	11	3	11.2	Set of 2	0159422	1)
3/8	19	16.662	75	21	12.5	10.0	13	3	14.75	1	0099520	
3/8	19	16.662	75	21	12.5	10.0	13	3	14.75	Set of 2	0159446	1)
1/2	14	20.955	87	26	16.0	12.5	16	5	18.25	1	0099476	
1/2	14	20.955	87	26	16.0	12.5	16	5	18.25	Set of 2	0159460	1)
3/4	14	26.441	96	28	20.0	16.0	20	5	23.75	1	0099513	
3/4	14	26.441	96	28	20.0	16.0	20	5	23.75	Set of 2	0159484	1)
1“	11	33.249	109	33	25.0	20.0	24	5	30	1	0099445	
1.1/4	11	41.910	119	36	31.5	25.0	28	5	38.5	1	0099469	
1.1/2	11	47.803	125	37	35.5	28.0	31	7	44.5	1	0099452	
2“	11	59.614	140	41	40.0	31.5	34	7	56	1	0099506	

Note: ISO shank and square dimensions will necessitate metric holders

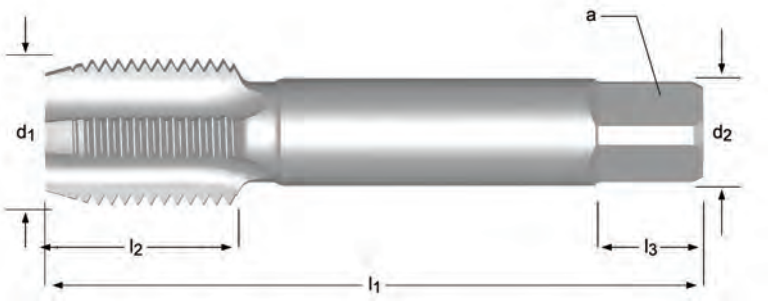
[1] Sets (No.7) include: *1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)*

DORMER

Straight Pipe Taps, British Standard

E547 Similar to the NPS pipe taps, but manufactured to British Standard Parallel Pipe Thread specifications (BSPP).





Nominal d_1	TPI	l_1 mm	l_2 mm	d_2 Ø mm	▨ a mm	l_3 mm	# of Flutes	↔	Pack Qty	Taper	Plug	Bottoming
1/8	28	59	15	8.0	8.0	9	4	8.8	1	0157169	0157176	0099285
1/4	19	67	19	10.0	8.0	11	4	11.8	1	0157190	0157206	0099278
3/8	19	75	21	12.5	10.0	13	4	15.25	1	0157220	0157237	0099315
1/2	14	87	26	16.0	12.5	16	4	19	1	0157251	0157268	0099261
5/8	14	91	26	18.0	14.0	18	4	21	1	0157282	0099322	0099339
3/4	14	96	28	20.0	16.0	20	4	24.5	1	0157299	0150757	0099308
7/8	14	102	29	22.4	18.0	22	4	28.25	1	0157305	0099353	0099360
1“	11	109	33	25.0	20.0	24	4	30.75	1	0157312	0157329	0099254
1.1/4	11	119	36	31.5	25.0	28	6	39.5	1	0157336	0099216	0099223
1.1/2	11	125	37	35.5	28.0	31	6	45	1	0157343	0099193	0099209
2“	11	140	41	40.0	31.5	34	6	57	1	0157367	0157374	0099292

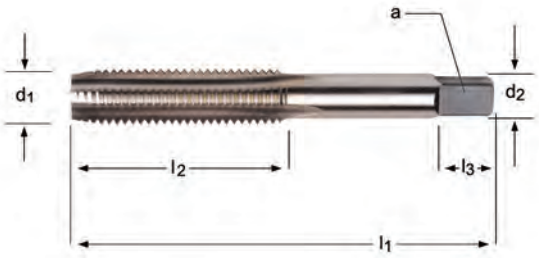
Note: ISO shank and square dimensions will necessitate metric holders

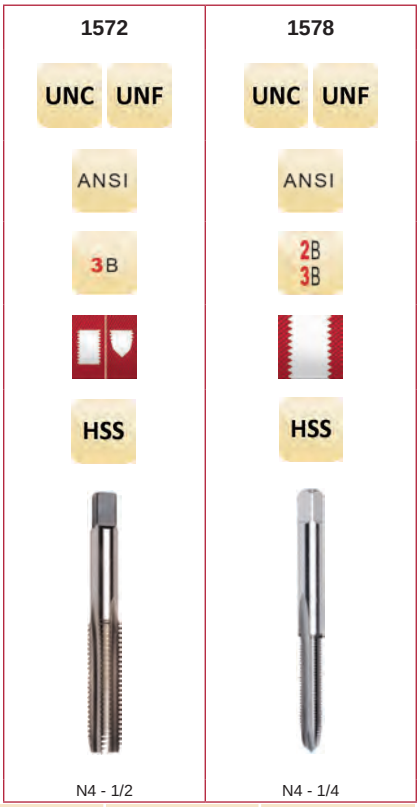
SPECIAL PURPOSE TAPS

Screw Thread Insert, STI

1572 - *Straight flute, hand tap*
1578 - *Spiral point, machine tap*

Designed for use in aluminum, magnesium, and other non-ferrous materials where taps of this type are most commonly used. Taps suitable for other materials can be furnished on request. STI taps are dimensionally oversize and utilize a larger tap drill size so that the thread they produce will accept a helical coil wire screw thread insert of the same nominal size and pitch. For a particular size and pitch the lower H-Limit number is suggested for class 2B and 3B threads, while the higher H-Limit is suggested for class 2B.





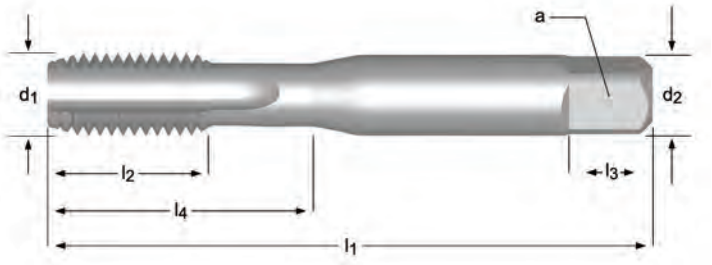
Nominal d_1	TPI UNC	TPI UNF	l_1 Inch	l_2 Inch	d_2 Ø Inch /	▱ a Inch	l_3 Inch	# of Flutes	Limits	Pack Qty	1572 - Plug	1572 Bottoming	1578 - Plug
4	40		2“	11/16	0.1410	0.1100	3/16	2	H2	1	—	—	1010491
4	40		2“	11/16	0.1410	0.1100	3/16	3	H2	1	1010419	1010421	—
6	32		2.3/8	7/8	0.1940	0.1520	1/4	2	H2	1	—	—	1010494
6	32		2.3/8	7/8	0.1940	0.1520	1/4	2	H3	1	—	—	1010495
6	32		2.3/8	7/8	0.1940	0.1520	1/4	3	H3	1	1010427	1010429	—
8	32		2.3/8	15/16	0.2200	0.1650	9/32	2	H2	1	—	—	1010498
8	32		2.3/8	15/16	0.2200	0.1650	9/32	2	H3	1	—	—	1010499
8	32		2.3/8	15/16	0.2200	0.1650	9/32	3	H3	1	1010435	1010437	—
10	24		2.1/2	1“	0.2550	0.1910	5/16	3	H2	1	1010438	1010440	—
10		32	2.1/2	1“	0.2550	0.1910	9/32	2	H2	1	—	—	1010502
10		32	2.1/2	1“	0.2550	0.1910	5/16	3	H2	1	1010442	1010444	—
10		32	2.1/2	1“	0.2550	0.1910	5/16	3	H3	1	1010443	1010445	—
1/4	20		2.23/32	1.1/8	0.3180	0.2380	5/16	2	H2	1	—	—	1010506
1/4	20		2.23/32	1.1/8	0.3180	0.2380	5/16	2	H3	1	—	—	1010507
1/4	20		2.23/32	1.1/8	0.3180	0.2380	3/8	3	H3	1	1010451	1010453	—
1/4		28	2.23/32	1.1/8	0.3180	0.2380	5/16	2	H2	1	—	—	1010508
1/4		28	2.23/32	1.1/8	0.3180	0.2380	5/16	2	H3	1	—	—	1010509
1/4		28	2.23/32	1.1/8	0.3180	0.2380	3/8	2	H2	1	—	1010456	—
5/16	18		2.15/16	1.1/4	0.3810	0.2860	7/16	4	H3	1	1010458	—	—
3/8	16		3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	1010466	1010468	—
7/16	14		3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	1010474	—	—
7/16		20	3.3/8	1.21/32	0.3670	0.2750	7/16	4	H3	1	—	—	—
1/2	13		3.13/16	1.13/16	0.4800	0.3600	9/16	4	H3	1	1010482	—	—
1/2		20	3.19/32	1.21/32	0.4290	0.3220	1/2	4	H3	1	—	—	—

Screw Thread Insert, STI, Semi-Bottoming

E620 - Straight flute

E621 - Spiral flute

Designed for use in aluminum, magnesium, and other non-ferrous materials where taps of this type are most commonly used. Taps suitable for other materials can be furnished on request. STI taps are dimensionally oversize and utilize a larger tap drill size so that the thread they produce will accept a helical coil wire screw thread insert of the same nominal size and pitch.



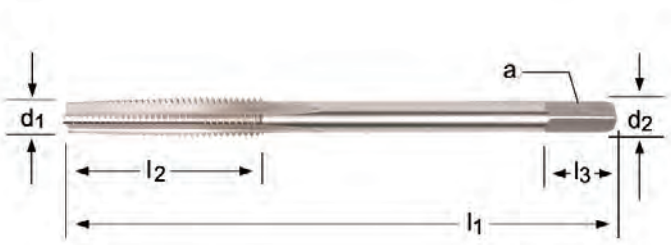
	E620	E621
	EGM	EGM
	DORMER ISO	DORMER ISO
	6H	6H
	HSS	HSS
		
	M3 - M16	M3 - M16

Nominal d_1	P mm	l_1 mm	l_2 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes		l_4 mm	Pack Qty	E620	E621
3	0.50	53	14	4.00	3.15	6	3	3.2	14	1	0384824	0384916
4	0.70	58	11	5.00	4.00	7	3	4.2	20	1	0384831	0384923
5	0.80	66	13	6.30	5.00	8	3	5.2	26	1	0384848	0384930
6	1.00	72	16	8.00	6.30	9	3	6.3	29	1	0384855	—
6	1.00	72	16	8.00	6.30	9	3	6.3	31	1	—	0384947
8	1.25	80	18	10.00	8.00	11	3	8.4	32	1	0384862	—
8	1.25	80	18	10.00	8.00	11	3	8.4	34	1	—	0384954
10	1.50	89	22	9.00	7.10	10	3	10.5		1	0384879	0384961
12	1.75	95	24	11.20	9.00	12	4	12.5		1	0384886	—
12	1.75	95	24	11.20	9.00	12	3	12.5		1	—	0384978
14	2.00	112	29	14.00	11.20	14	4	14.5		1	0384893	—
14	2.00	112	29	14.00	11.20	14	3	14.5		1	—	0384985
16	2.00	112	29	14.00	11.20	14	4	16.5		1	0384909	—
16	2.00	112	29	14.00	11.20	14	3	16.5		1	-—	0384992

SPECIAL PURPOSE TAPS

Nut Style

U1511 For small production runs in conventional tapping machines. They have a relatively long shank smaller than the minor diameter to permit accumulation of several nuts after tapping. Available in taper style, 7-10 thread chamfer.



U1511

UNC

ANSI

3B

HSS



1/4 - 1/2

UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	▱ a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	U1511
1/4	20	5“	1.5/8	0.1850	0.1390	9/16	4	H3	Taper	1	1010375
5/16	18	5.1/2	1.13/16	0.2400	0.1800	5/8	4	H3	Taper	1	1010376
3/8	16	6“	2“	0.2940	0.2200	11/16	4	H3	Taper	1	1010377
1/2	13	7“	2.1/2	0.4000	0.3000	7/8	4	H3	Taper	1	1010378

UNION BUTTERFIELD

Pulley Style

1519 These taps have the same major diameters and pitch diameters as standard fractional size taps, but with extended shanks for reaching locations inaccessible to regular hand taps. Although originally designed for tapping pulley holes, the long shank permits tapping other long reach applications.



1519

UNC

ANSI

3B

HSS



1/4 - 3/4

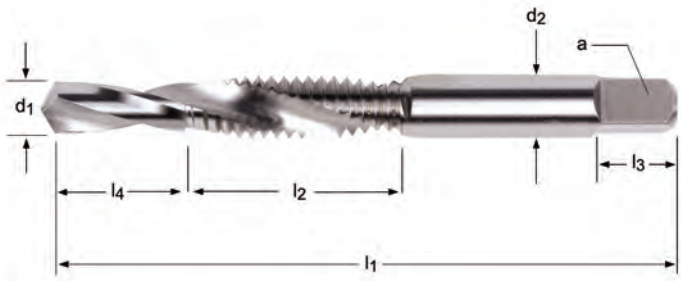
UNC	TPI	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	# of Flutes	Limits	Chamfer	Pack Qty	1519
1/4	20	6“	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1010379
1/4	20	8“	1.000	0.2550	0.1910	5/16	4	H3	Plug	1	1010380
5/16	18	6“	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1010381
5/16	18	8“	1.1/8	0.3180	0.2380	3/8	4	H3	Plug	1	1010382
3/8	16	6“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010383
3/8	16	8“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010384
3/8	16	10“	1.1/4	0.3810	0.2860	7/16	4	H3	Plug	1	1010385
1/2	13	6“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010388
1/2	13	8“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010389
1/2	13	10“	1.21/32	0.5070	0.3800	9/16	4	H3	Plug	1	1010390
5/8	11	6“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010392
5/8	11	8“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010393
5/8	11	10“	1.13/16	0.6330	0.4750	11/16	4	H3	Plug	1	1010394
3/4	10	10“	2.000	0.7590	0.5690	3/4	4	H3	Plug	1	1010396

SPECIAL PURPOSE TAPS

Combination Drill & Tap

1994 Spiral Flute 15º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Bright finish improves chip flow in soft or non-ferrous materials.



1994(UNF)

UNC UNF

ANSI

2B

HSS



No.4 - 1/2

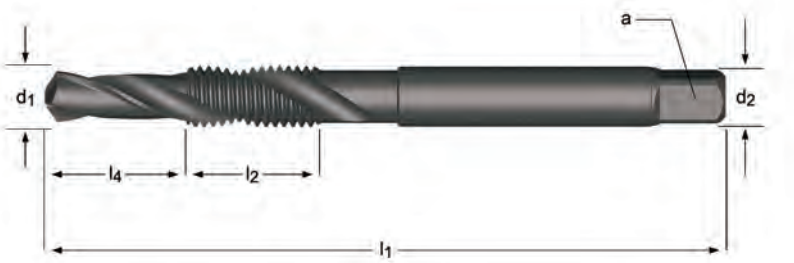
UNC	UNF	TPI	d_1 Ø Inch	l_1 Inch	l_2 Inch	d_2 Ø Inch	a Inch	l_3 Inch	l_4 Inch	# of Flutes	Pack Qty	1994
4		40	0.0890	1.7/8	3/8	0.1410	0.1100	3/16	1/4	2	1	1110010
5		40	0.1015	1.15/16	13/32	0.1410	0.1100	3/16	9/32	2	1	1110020
6		32	0.1110	2“	7/16	0.1410	0.1100	3/16	5/16	2	1	1110030
8		32	0.1360	2.1/8	1/2	0.1680	0.1310	1/4	3/8	2	1	1110040
10		24	0.1540	2.3/8	5/8	0.1940	0.1520	1/4	13/32	2	1	1110050
	10	32	0.1610	2.3/8	5/8	0.1940	0.1520	1/4	13/32	2	1	1110054
12		24	0.1800	2.3/8	21/32	0.2200	0.1650	9/32	15/32	2	1	1110060
	12	28	0.1850	2.3/8	21/32	0.2200	0.1650	9/32	15/32	2	1	1110064
1/4		20	0.2055	2.1/2	25/32	0.2550	0.1910	5/16	17/32	2	1	1110080
	1/4	28	0.2188	2.1/2	25/32	0.2550	0.1910	5/16	17/32	2	1	1110084
5/16		18	0.2660	2.27/32	15/16	0.3180	0.2380	3/8	11/16	2	1	1110090
	5/16	24	0.2770	2.27/32	15/16	0.3180	0.2380	3/8	11/16	2	1	1110094
3/8		16	0.3230	3.3/8	1.1/16	0.3810	0.2860	7/16	13/16	2	1	1110100
	3/8	24	0.3390	3.3/8	1.1/16	0.3810	0.2860	7/16	13/16	2	1	1110104
7/16		14	0.3770	3.3/4	1.1/4	0.3230	0.2420	13/32	1“	2	1	1110110
	7/16	20	0.3937	3.3/4	1.1/4	0.3230	0.2420	13/32	1“	2	1	1110114
1/2		13	0.4331	4.1/16	1.3/8	0.3670	0.2750	7/16	1.1/8	2	1	1110120
	1/2	20	0.4531	4.1/16	1.3/8	0.3670	0.2750	7/16	1.1/8	2	1	1110124

Combination Drill & Tap

E651
E654

Spiral Flute 30º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Steam oxide finish reduces wear and chip welding in harder ferrous materials.



E651 / E654

UNC UNF

DORMER DIN

2B

HSS



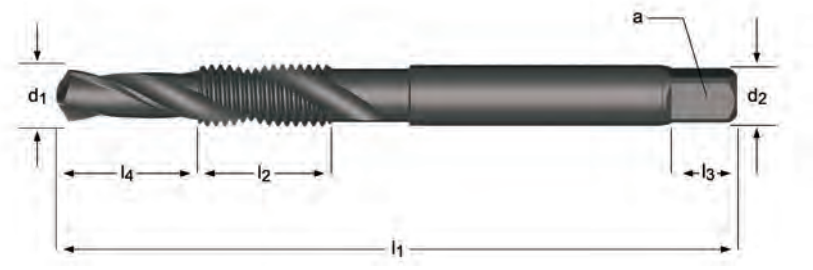
No.6 - 5/8

UNC	UNF	TPI	d_1 nom mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	⧄ a mm	# of Flutes	Pack Qty	E651 / E654
6		32	2.85	56.9	12	6.0	3.50	2.90	2	1	0388907
8		32	3.50	64.0	12	8.0	4.50	3.55	2	1	0273272
	8	36	3.50	64.0	13	8.0	4.50	3.55	2	1	0339053
10		24	3.90	72.0	15	10.0	5.00	4.00	2	1	0273197
	10	32	4.10	72.0	16	10.0	5.00	4.00	2	1	0338971
12		24	4.50	77.0	15	11.0	5.60	4.50	2	1	0273210
	12	28	4.70	77.0	17	11.0	5.60	4.50	2	1	0338995
1/4		20	5.10	83.0	17	13.0	6.30	5.00	2	1	0273227
	1/4	28	5.50	83.0	19	13.0	6.30	5.00	2	1	0339008
5/16		18	6.60	94.0	21	16.0	8.00	6.30	2	1	0273241
	5/16	24	6.90	94.0	22	16.0	8.00	6.30	2	1	0339022
3/8		16	8.00	104.0	23	19.0	10.00	8.00	2	1	0273234
	3/8	24	8.50	104.0	24	19.0	10.00	8.00	2	2	0339015
7/16		14	9.40	107.0	25	22.0	8.00	6.30	2	1	0273265
	7/16	20	9.90	107.0	25	22.0	8.00	6.30	2	1	0339046
1/2		13	10.80	114.0	29	25.0	9.00	7.10	2	1	0273203
	1/2	20	11.50	114.0	29	25.0	9.00	7.10	2	1	0338988
9/16		12	12.20	124.0	29	28.0	11.20	9.00	2	1	0273289
	9/16	18	12.90	124.0	30	28.0	11.20	9.00	2	1	0339060
5/8		11	13.50	134.0	31	32.5	12.50	10.00	2	1	0273258
	5/8	18	14.50	134.0	32	32.0	12.50	10.00	2	1	0339039

Combination Drill & Tap

E650 Spiral Flute 30º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity. Designed to provide 65% thread engagement and a 2B class of fit.

Steam oxide finish reduces wear and chip welding in harder ferrous materials.



E650

M

DORMER ISO

6H

HSS



M3 - M16

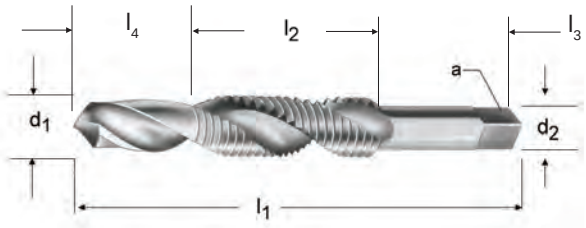
M	P mm	d_1 Ø mm	l_1 mm	l_2 mm	l_4 mm	d_2 Ø mm	a mm	l_3 mm	# of Flutes	Pack Qty	E650
3	0.50	2.5	56	10	6	3.15	2.5	5.0	2	1	0167861
4	0.70	3.3	65	12	8	4.0	3.15	6.0	2	1	0127551
5	0.80	4.2	69	15	10	5.0	4.00	7.0	2	1	0127568
6	1.00	5.0	84	18	12	6.3	5.00	8.0	2	1	0127575
8	1.25	6.8	96	21	16	8.0	6.30	9.0	2	1	0127582
10	1.50	8.5	108	22	20	10.0	8.00	11.0	2	1	0127513
12	1.75	10.2	113	29	24	9.0	7.10	10.0	2	1	0127520
14	2.00	12.0	123	30	28	11.2	9.00	12.0	2	1	0127537
16	2.00	14.0	134	32	32	12.5	10.00	13.0	2	1	0127544

DORMER

Combination Drill & Tap, NPT Pipe Threads

E653 Spiral Flute 27º. Drills and taps in a single pass, reducing cycle time. Commonly used in multi-spindle operations with reversing capacity.

Bright finish improves chip flow in soft or non-ferrous materials.



E653

NPT

ANSI

Normal

HSS



1/8 - 1“

NPT	TPI	d_1 nom Inch	l_1 Inch	l_2 Inch	l_3 Inch	l_4 Inch	d_2 Ø Inch	▨ a Inch	# of Flutes	Pack Qty	E653
1/8	27	0.3346	2.7/8	3/4	3/8	3/4	0.4370	0.3280	2	1	0297285
1/4	18	0.4331	3.5/16	1.1/16	7/16	7/8	0.5620	0.4210	2	1	0297278
3/8	18	0.5709	3.1/2	1.1/16	1/2	15/16	0.7000	0.5310	2	1	0297308
1/2	14	0.7087	4.3/8	1.3/8	5/8	1.1/4	0.6870	0.5150	2	1	0297261
3/4	14	0.9055	4.9/16	1.3/8	11/16	1.5/16	0.9060	0.6790	2	1	0297292
1“	11.5	1.1417	5.3/8	1.3/4	13/16	1.5/8	1.1250	0.8430	2	1	0297247

Tap Wrench, T-Handle

1215 T-Handle tap wrenches have a sliding handle and chuck. Designed for hand tapping in tight places and can also be used with any tool that can be turned by hand.





1215

T0-T2

Tap Wrench #	Hand Reamer Capacity Inch	Hand Reamer Capacity mm	Hand Tap Capacity Inch	Hand Tap Capacity mm	Pack Qty	1215
T0	1/8 - 3/16	M3 - M5	1/16 - 5/32	M1 - M4	1	1810372
T1	3/16 - 5/16	M4 - M7	3/16 - 7/16	M4 - M10	1	1810373
T2	1/4 - 15/32	M6 - M14	1/4 - 9/16	M6 - M14	1	1810374

Tap Wrench, Straight Handle

3850 Straight handle tap wrenches are ideal for hand tapping. The straight handle design provides greater leverage, particularly suited for use with larger diameters. Simple to operate. Hardened steel jaws are opened and closed by simply twisting one hand which is knurled for side gripping.



3850



No.8 - No.14

Number	Hand Reamer Capacity Inch	Hand Reamer Capacity mm	Hand Tap Capacity Inch	Hand Tap Capacity mm	l_1 Length	Pack Qty	3850
8	1/8 - 5/16	M3 - M8	1/16 - 5/16	M1 - M8	7“	1	1810017
9	3/16 - 3/8	M5 - M9	3/16 - 1/2	M4 - M12	10.1/2“	1	1810018
10	1/4 - 9/16	M6 - M14	1/4 - 3/4	M3 - M8	15“	1	1810019
11	3/8 - 3/4	M9 - M19	3/8 - 1“	M10 - M25	20“	1	1810020
12	3/8 - 7/8	M9 - M22	3/8 - 1.1/8	M10 - M27	25.5/8“	1	1810021
14	5/8 - 1.1/2	M16 - M39	7/8 - 1.7/8	M22 - M42	40.1/2“	1	1810022

Tap & Drill Combination Sets

229CSET 18 piece tap (styles 1500 and 1528) with corresponding drills (styles R10P & R18P). Metal index.

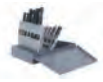


229CSET

UNC

ANSI

HSS



Set

Set	Style	Pieces per Set	UNC Tap Sizes	Tap Drill Sizes	Pack Qty	229CSET
229C	1500,1528 Taps; R10P,R15P,R18P Drills	18	6-32,8-32,10-24,10-32,1/4-20,5/16-18,3/8-16,7/16-14,1/2-13	#36,#29,#25,#21,#7,F,5/16,U,27/64	1	4111502

LIST NUMBER INDEX - DIES

DORMER

Thread Form:	UNC	UNF
Standard:	ANSI	ANSI
Tolerance:		
Chamfer:		
Tool Material:	CS	CS
Direction of Cut:		
Finish/Coating:		
		
Style:	2010(UNC)	2010(UNF)
Range:	No.4 - 1.1/2	No.10 - 1.1/2

Application Material Groups (AMG)			Hardness HRC	Page #	356	356
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	1.1	26	26
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	1.2	23	23
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	1.3	20	20
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	1.4	16	16
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	1.5		
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	1.6		
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	1.7		
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	1.8		
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	2.1	13	13
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	2.2	7	7
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	2.3		
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	2.4		
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	3.1	26	26
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	3.2	23	23
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	3.3	20	20
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	3.4	16	16
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	4.1		
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	4.2		
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	4.3	7	7
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	5.1	30	30
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	5.2	7	7
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	5.3	7	7
6.Copper	6.1 Copper	Commercially Pure	<100 HB	6.1	30	30
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	6.2	26	26
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	6.3	23	23
	6.4 High Strength Bronze	Ampco 18-25	<49	6.4		
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	7.1	33	33
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	7.2	49	49
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	7.3	49	49
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	7.4	33	33
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	8.1	49	49
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	8.2	33	33
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	8.3	16	16
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	9.1		
10.Graphite	10.1 Standard graphite		---	10.1		

LIST NUMBER INDEX - DIES

	UNS	NPT	UNC	UNF	UNC	UNF	M	G
	ANSI	ANSI	ANSI	ANSI	BS 1127: 1950	BS 1127: 1950	ANSI	BS 1127: 1950
					1.75XP	1.75XP		1.75XP
	CS	CS	HSS	HSS	HSS	HSS	HSS	HSS
								
	2010(UNS)	**2010(NPT)**	**2510(UNC)**	**2510(UNF)**	**F320**	**F330**	**2710M**	**F370**
	1“	1/8 - 1/2	No.5 - 7/8	No.5 - 7/8	No.4 - 1.1/4	No.4 - 1.1/2	M2 - M20	1/8 - 1.1/2
	364	**365**	**365**	**365**	**365**	**366**	**367**	**368**
1.1	26	26	26	26	26	26	26	26
1.2	23	23	23	23	23	23	23	23
1.3	20	20	20	20	20	20	20	20
1.4	16	16	16	16	16	16	16	16
1.5								
1.6								
1.7								
1.8								
2.1	13	13	13	13	13	13	13	13
2.2	7	7	7	7	7	7	7	7
2.3								
2.4								
3.1	26	26	26	26	26	26	26	26
3.2	23	23	23	23	23	23	23	23
3.3	20	20	20	20	20	20	20	20
3.4	16	16	16	16	16	16	16	16
4.1								
4.2								
4.3	7	7	7	7	7	7	7	7
5.1	30	30	30	30	30	30	30	30
5.2	7	7	7	7	7	7	7	7
5.3	7	7	7	7	7	7	7	7
6.1	30	30	30	30	30	30	30	30
6.2	26	26	26	26	26	26	26	26
6.3	23	23	23	23	23	23	23	23
6.4								
7.1	33	33	33	33	33	33	33	33
7.2	49	49	49	49	49	49	49	49
7.3	49	49	49	49	49	49	49	49
7.4	33	33	33	33	33	33	33	33
8.1	49	49	49	49	49	49	49	49
8.2	33	33	33	33	33	33	33	33
8.3	16	16	16	16	16	16	16	16
9.1								
10.1								

LIST NUMBER INDEX - DIES

DORMER

	M	UNC	UNF	UNS	NPT	M	M	MF
	ISO 2568	ANSI	ANSI	ANSI	ANSI	ANSI	BS 1127: 1950	BS 1127: 1950
	6g						6g	6g
	1.75XP						1.75XP	1.75XP
	HSS	CS	CS	CS	CS	CS	HSS	HSS
								
								
								
	F201	2025(UNC)	2025(UNF)	2025(UNS)	2025(NPT)	2325M	F302	F312
	M3 - M20	1/4 - 1.1/2	1/4 - 1.1/2	11/16 - 1“	1/8 - 1“	M6 - M20	M3 - M36	M8 - M24
	356	**356**	**358**	**358**	**360**	**360**	**362**	**363**
1.1	26	26	26	26	26	26	26	26
1.2	23	23	23	23	23	23	23	23
1.3	20	20	20	20	20	20	20	20
1.4	16	16	16	16	16	16	16	16
1.5								
1.6								
1.7								
1.8								
2.1	13	13	13	13	13	13	13	13
2.2	7	7	7	7	7	7	7	7
2.3								
2.4								
3.1	26	26	26	26	26	26	26	26
3.2	23	23	23	23	23	23	23	23
3.3	20	20	20	20	20	20	20	20
3.4	16	16	16	16	16	16	16	16
4.1								
4.2								
4.3	7	7	7	7	7	7	7	7
5.1	30	30	30	30	30	30	30	30
5.2	7	7	7	7	7	7	7	7
5.3	7	7	7	7	7	7	7	7
6.1	30	30	30	30	30	30	30	30
6.2	26	26	26	26	26	26	26	26
6.3	23	23	23	23	23	23	23	23
6.4								
7.1	33	33	33	33	33	33	33	33
7.2	49	49	49	49	49	49	49	49
7.3	49	49	49	49	49	49	49	49
7.4	33	33	33	33	33	33	33	33
8.1	49	49	49	49	49	49	49	49
8.2	33	33	33	33	33	33	33	33
8.3	16	16	16	16	16	16	16	16
9.1								
10.1								

List Number Index - Dies



Pgs. 352-370

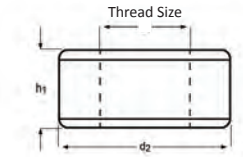
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2010..... 356
2025..... 365
2325M..... 366
2510..... 358
2710M..... 362
8007..... 369
F201 364
F302 367
F312 368
F320 360
F330 360
F370 363
L110..... 370

UNION BUTTERFIELD

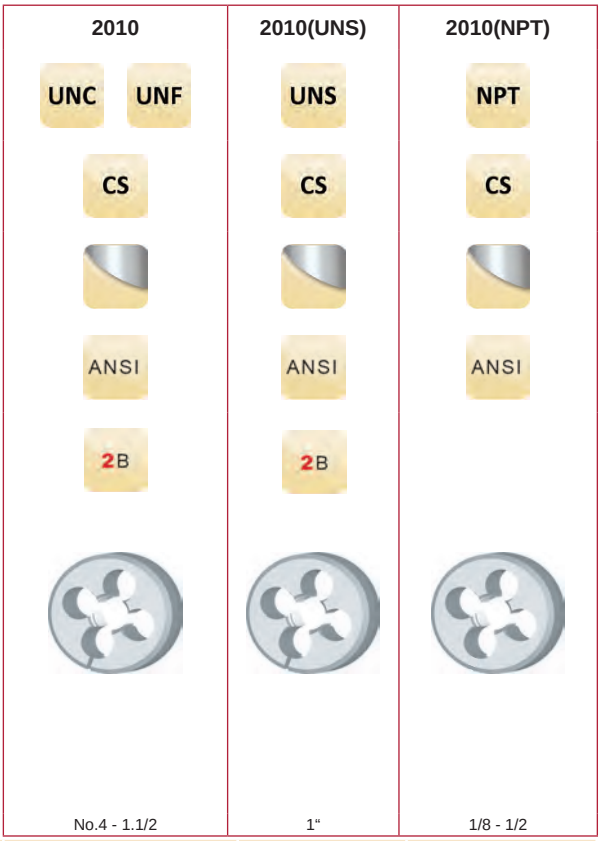
Round Adjustable, Split Type

2010 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die NPT type dies are not split*







UNC	UNF	UNS	NPT	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2010 (UNC)(UNF)	2010 (UNS)	2010 (NPT)
4				40	13/16	1/4	1	1410016	—	—
5				40	13/16	1/4	1	1410022	—	—
6				32	1“	3/8	1	1410027	—	—
6				32	13/16	1/4	1	1410026	—	—
8				32	1“	3/8	1	1410033	—	—
8				32	13/16	1/4	1	1410032	—	—
	10			32	1“	3/8	1	1410042	—	—
	10			32	13/16	1/4	1	1410041	—	—
10				24	1“	3/8	1	1410039	—	—
10				24	13/16	1/4	1	1410038	—	—
	12			28	13/16	1/4	1	1410047	—	—
12				24	13/16	1/4	1	1410044	—	—
	1/4			28	1“	3/8	1	1410069	—	—
	1/4			28	1.1/2	1/2	1	1410071	—	—
	1/4 (UNEF)			32	1“	3/8	1	1410077	—	—
1/4				20	1“	3/8	1	1410064	—	—
1/4				20	1.1/2	1/2	1	1410066	—	—
1/4				20	13/16	1/4	1	1410063	—	—
	5/16			24	1“	3/8	1	1410085	—	—
	5/16			24	1.1/2	1/2	1	1410087	—	—
	5/16			32	1“	3/8	1	1410090	—	—
5/16				18	1“	3/8	1	1410080	—	—
5/16				18	1.1/2	1/2	1	1410082	—	—
5/16				18	13/16	1/4	1	1410079	—	—
5/16				18	2“	5/8	1	1410083	—	—
	3/8			24	1“	3/8	1	1410097	—	—
	3/8			24	1.1/2	1/2	1	1410099	—	—
3/8				16	1“	3/8	1	1410093	—	—
3/8				16	1.1/2	1/2	1	1410095	—	—
3/8				16	2“	5/8	1	1410096	—	—
			1/8	27	1“	3/8	1	—	—	1410203
			1/8	27	1.1/2	1/2	1	—	—	1410204
	7/16			20	1“	3/8	1	1410105	—	—

DIES

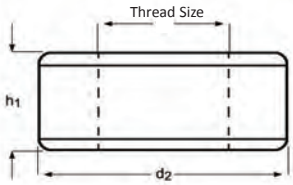
UNC	UNF	UNS	NPT	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2010 (UNC)(UNF)	2010 (UNS)	2010 (NPT)
	7/16			20	1.1/2	1/2	1	1410107	—	—
7/16				14	1“	3/8	1	1410101	—	—
7/16				14	1.1/2	1/2	1	1410103	—	—
	1/2			20	1.1/2	1/2	1	1410114	—	—
1/2				13	1.1/2	1/2	1	1410110	—	—
1/2				13	2“	5/8	1	1410111	—	—
			1/4	18	1.1/2	1/2	1	—	—	1410205
			1/4	18	2“	5/8	1	—	—	1410206
	9/16			18	1.1/2	1/2	1	1410120	—	—
9/16				12	1.1/2	1/2	1	1410117	—	—
	5/8			18	1.1/2	1/2	1	1410126	—	—
	5/8			18	2“	5/8	1	1410127	—	—
5/8				11	1.1/2	1/2	1	1410123	—	—
5/8				11	2“	5/8	1	1410124	—	—
			3/8	18	1.1/2	1/2	1	—	—	1410207
			3/8	18	2“	5/8	1	—	—	1410208
	3/4			16	2“	5/8	1	1410133	—	—
3/4				10	2“	5/8	1	1410131	—	—
			1/2	14	2“	5/8	1	—	—	1410209
	7/8			14	2“	5/8	1	1410137	—	—
7/8				9	2“	5/8	1	1410135	—	—
		1“		14	3“	1“	1	—	1410144	—
	1“			12	3“	1“	1	1410142	—	—
1“				8	3“	1“	1	1410140	—	—
1.1/8				7	3“	1“	1	1410145	—	—
	1.1/4			12	3“	1“	1	1410148	—	—
1.1/4				7	3“	1“	1	1410147	—	—
1.3/8				6	3“	1“	1	1410149	—	—
	1.1/2			12	3“	1“	1	1410152	—	—
1/1/2				6	3“	1“	1	1410151	—	—

UNION BUTTERFIELD

Round Adjustable, Split Type

2510 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





2510(UNC)	2510(UNF)
UNC	UNF
HSS	HSS
ANSI	ANSI
2B	2B
	
N5 - 7/8	N5 - 7/8

UNC	UNF	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2510(UNC)	2510(UNF)
	5	44	13/16	1/4	1	—	1410154
5		40	13/16	1/4	1	1410153	—
	6	40	13/16	1/4	1	—	1410157
	8	36	13/16	1/4	1	—	1410161
8		32	1“	3/8	1	1410160	—
8		32	13/16	1/4	1	1410159	—
	10	32	1“	3/8	1	—	1410165
	10	32	13/16	1/4	1	—	1410166
10		24	1“	3/8	1	1410164	—
10		24	13/16	1/4	1	1410163	—
	12	28	13/16	1/4	1	—	1410169
12		24	13/16	1/4	1	1410167	—
	1/4	28	1“	3/8	1	—	1410175
	1/4	28	1.1/2	1/2	1	—	1410176
	1/4	28	13/16	1/4	1	—	1410174
1/4		20	1“	3/8	1	1410172	—
1/4		20	1.1/2	1/2	1	1410173	—
	5/16	24	1“	3/8	1	—	1410181
	5/16	24	1.1/2	1/2	1	—	1410182
	5/16	24	13/16	1/4	1	—	1410180
5/16		18	1“	3/8	1	1410178	—
5/16		18	1.1/2	1/2	1	1410179	—
	3/8	24	1“	3/8	1	—	1410185
	3/8	24	1.1/2	1/2	1	—	1410186
3/8		16	1“	3/8	1	1410183	—
3/8		16	1.1/2	1/2	1	1410184	—
	7/16	20	1“	3/8	1	—	1410189
	7/16	20	1.1/2	1/2	1	—	1410190
7/16		14	1“	3/8	1	1410187	—
7/16		14	1.1/2	1/2	1	1410188	—
	1/2	20	1.1/2	1/2	1	—	1410192
1/2		13	1.1/2	1/2	1	1410191	—
	9/16	18	1.1/2	1/2	1	—	1410194

DIES

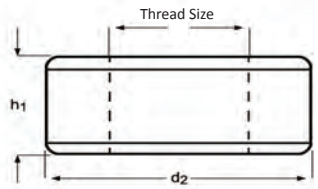
UNC	UNF	TPI	d_2 Ø Inch	h_1 Inch	Pack Qty	2510(UNC)	2510(UNF)
9/16		12	1.1/2	1/2	1	1410193	—
	5/8	18	1.1/2	1/2	1	—	1410197
5/8		11	1.1/2	1/2	1	1410195	—
	3/4	16	2“	5/8	1	—	1410200
3/4		10	2“	5/8	1	1410199	—
	7/8	14	2“	5/8	1	—	1410202
7/8		9	2“	5/8	1	1410201	—

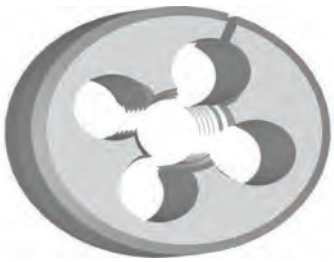
Round Adjustable, Split Type

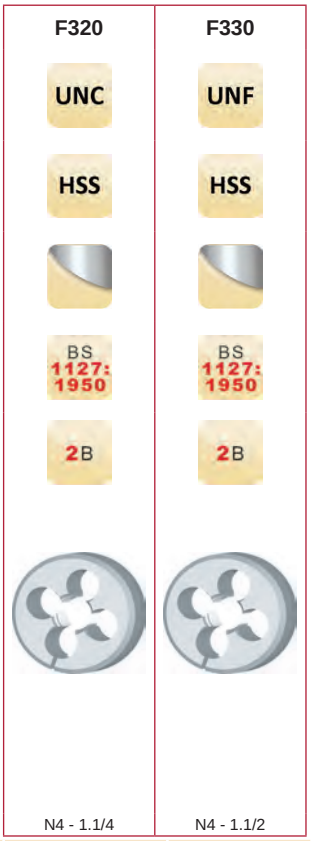
F320
F330

Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*







UNC	UNF	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F320	F330
	4	48	2.85	13/16	1/4	1	—	0207307
4		40	2.85	13/16	1/4	1	0206614	—
	5	44	3.18	13/16	1/4	1	—	0207314
5		40	3.18	13/16	1/4	1	0206621	—
	6	40	3.51	13/16	1/4	1	—	0207338
6		32	3.51	13/16	1/4	1	0206645	—
	8	36	4.17	13/16	1/4	1	—	0207352
8		32	4.17	1“	3/8	1	0206676	—
8		32	4.17	13/16	1/4	1	0206669	—
	10	32	4.83	13/16	1/4	1	—	0207376
	10	32	4.83	1“	3/8	1	—	0207383
10		24	4.83	1“	3/8	1	0206690	—
10		24	4.83	13/16	1/4	1	0206683	—
	12	28	5.49	13/16	1/4	1	—	0207390
12		24	5.49	13/16	1/4	1	0206706	—
	1/4	28	6.35	1“	3/8	1	—	0207420
	1/4	28	6.35	1.1/2	1/2	1	—	0207444
	1/4	28	6.35	13/16	1/4	1	—	0207413
1/4		20	6.35	1“	3/8	1	0206737	—
1/4		20	6.35	1.1/2	1/2	1	0206751	—
1/4		20	6.35	1.5/16	7/16	1	0206744	—
1/4		20	6.35	13/16	1/4	1	0206720	—
	5/16	24	7.94	1“	3/8	1	—	0207451
	5/16	24	7.94	1.1/2	1/2	1	—	0207475
	5/16	24	7.94	1.5/16	7/16	1	—	0207468
5/16		18	7.94	1“	3/8	1	0206768	—
5/16		18	7.94	1.1/2	1/2	1	0206782	—
	3/8	24	9.53	1“	3/8	1	—	0207482
	3/8	24	9.53	1.1/2	1/2	1	—	0207505
	3/8	24	9.53	1.5/16	7/16	1	—	0207499
3/8		16	9.53	1“	3/8	1	0206799	—
3/8		16	9.53	1.1/2	1/2	1	0206812	—
3/8		16	9.53	1.5/16	7/16	1	0206805	—

DIES

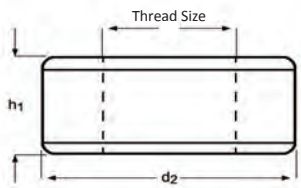
UNC	UNF	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F320	F330
	7/16	20	11.11	1“	3/8	1	—	0207512
	7/16	20	11.11	1.1/2	1/2	1	—	0207536
	7/16	20	11.11	1.5/16	7/16	1	—	0207529
7/16		14	11.11	1.1/2	1/2	1	0206850	—
7/16		14	11.11	1.5/16	7/16	1	0206843	—
	1/2	20	12.70	1.1/2	1/2	1	—	0207550
	1/2	20	12.70	1.5/16	7/16	1	—	0207543
1/2		13	12.70	1.1/2	1/2	1	0206874	—
1/2		13	12.70	1.5/16	7/16	1	0206867	—
1/2		13	12.70	2“	5/8	1	0206881	—
	9/16	18	14.29	1.1/2	1/2	1	—	0207581
	9/16	18	14.29	1.5/16	7/16	1	—	0207574
9/16		12	14.29	1.1/2	1/2	1	0206904	—
	5/8	18	15.88	1.1/2	1/2	1	—	0207604
	5/8	18	15.88	2“	5/8	1	—	0207611
5/8		11	15.88	1.1/2	1/2	1	0206928	—
5/8		11	15.88	2“	5/8	1	0206935	—
	3/4	16	19.05	1.1/2	1/2	1	—	0207635
	3/4	16	19.05	2“	5/8	1	—	0207642
3/4		10	19.05	1.1/2	1/2	1	0206959	—
3/4		10	19.05	2“	5/8	1	0206966	—
	7/8	14	22.23	2“	5/8	1	—	0207659
7/8		9	22.23	2“	5/8	1	0206973	—
	1“	12	25.40	2“	5/8	1	—	0207666
1“		8	25.40	2“	5/8	1	0206980	—
	1.1/8	12	28.58	3“	7/8	1	—	0207673
1.1/8		7	28.58	3“	7/8	1	0206997	—
	1.1/4	12	31.75	3“	7/8	1	—	0207680
1.1/4		7	31.75	3“	7/8	1	0207000	—
	1.1/2	12	38.10	3“	7/8	1	—	0207703

Round Adjustable, Split Type

2710M

Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





2710M

M

HSS



ANSI

6H



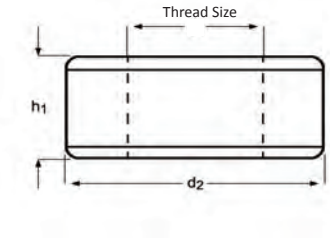
M2 - M20

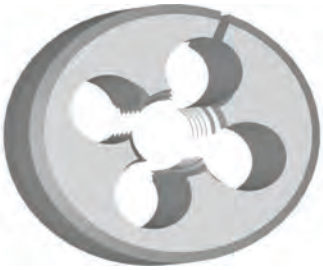
M	P mm	d_2 Ø Inch	h_1 Inch	Pack Qty	2710M
2	0.40	13/16	1/4	1	1410573
2.5	0.45	13/16	1/4	1	1410575
3	0.50	13/16	1/4	1	1410577
4	0.70	13/16	1/4	1	1410579
4.5	0.75	13/16	1/4	1	1410580
5	0.80	13/16	1/4	1	1410581
6	1.00	1“	3/8	1	1410582
8	1.25	1“	3/8	1	1410584
9	1.25	1“	3/8	1	1410585
10.0	1.50	1“	3/8	1	1410586
12	1.75	1“	3/8	1	1410630
12	1.75	1.1/2	1/2	1	1410588
14	2.00	1.1/2	1/2	1	1410589
16	2.00	1.1/2	1/2	1	1410590
18	2.50	2“	5/8	1	1410591
20	2.50	2“	5/8	1	1410592

Round Adjustable, Split Type

F370 Round adjustable dies can be closed down by approximately 0.006” on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die.*





F370

G

HSS

BS 1127: 1950



1/8 - 1.1/2

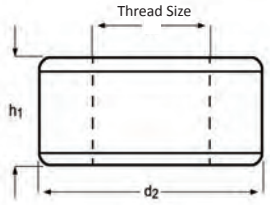
G(BSP)	TPI	d_1 nom mm	d_2 Ø Inch	h_1 Inch	Pack Qty	F370
1/8	28	9.73	1“	3/8	1	0209325
1/4	19	13.16	1.5/16	7/16	1	0209332
3/8	19	16.66	1.1/2	1/2	1	0209349
1/2	14	20.96	2“	5/8	1	0209356
5/8	14	22.91	2“	5/8	1	0209363
3/4	14	26.44	2“	5/8	1	0209370
7/8	14	30.20	2.1/4	11/16	1	0209387
1“	11	33.25	2.1/4	11/16	1	0209394
1.1/4	11	41.91	3“	7/8	1	0209400
1.1/2	11	47.80	4“	1“	1	0209417

Gun Nosed Dies (Left Hand)

F201

Left hand gun nosed dies have a chamfer length similar to semi-bottoming taps to lead the threads. This design direct chips away from the cutting area. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





F201

M

HSS



ISO 2568

6H



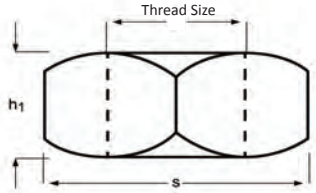
M3 - M20

M	P mm	d_2 Ø mm	h_1 mm	Pack Qty	F201
3	0.50	20	5	1	0164747
4	0.70	20	5	1	0105030
5	0.80	20	7	1	0105047
6	1.00	20	7	1	0105054
8	1.25	25	9	1	0105061
10	1.50	30	11	1	0104996
12	1.75	38	14	1	0105009
14	2.00	38	14	1	0105016
16	2.00	45	18	1	0105023
18	2.50	45	18	1	0164754
20	2.50	45	18	1	0164761

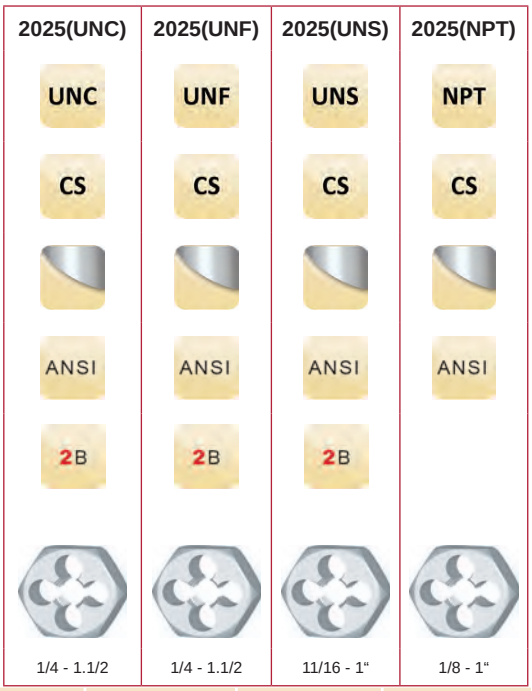
Hexagon Rethreading Bolt Dies (Dienuts)

2025 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





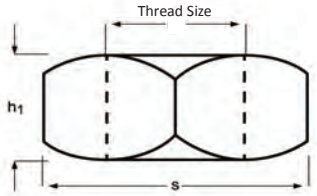


UNC	UNF	UNS	NPT	TPI	S Inch	h_1 Inch	Pack Qty	2025(UNC)	2025(UNF)	2025(UNS)	2025(NPT)
			1/8	27	1.1/16	3/8	1	—	—	—	1410270
	1/4			28	19/32	1/2	1	—	1410240	—	—
1/4				20	19/32	1/2	1	1410239	—	—	—
			1/4	18	1.1/4	5/8	1	—	—	—	1410271
	5/16			24	11/16	5/16	1	—	1410242	—	—
5/16				18	11/16	5/16	1	1410241	—	—	—
	3/8			24	25/32	3/8	1	—	1410244	—	—
3/8				16	25/32	3/8	1	1410243	—	—	—
			3/8	18	1.7/16	5/8	1	—	—	—	1410272
	7/16			20	7/8	7/16	1	—	1410246	—	—
7/16				14	7/8	7/16	1	1410245	—	—	—
	1/2			20	1.1/16	1/2	1	—	1410248	—	—
1/2				13	1.1/16	1/2	1	1410247	—	—	—
			1/2	14	1.5/8	3/4	1	—	—	—	1410273
	9/16			18	1.1/16	1/2	1	—	1410250	—	—
9/16				12	1.1/16	1/2	1	1410249	—	—	—
	5/8			18	1.1/4	5/8	1	—	1410252	—	—
5/8				11	1.1/4	5/8	1	1410251	—	—	—
		11/16		11	1.7/16	3/4	1	—	—	1410253	—
		11/16		16	1.7/16	3/4	1	—	—	1410254	—
	3/4			16	1.7/16	3/4	1	—	1410256	—	—
3/4				10	1.7/16	3/4	1	1410255	—	—	—
			3/4	14	2"	13/16	1	—	—	—	1410274
	7/8			14	1.5/8	7/8	1	—	1410258	—	—
7/8				9	1.5/8	7/8	1	1410257	—	—	—
		1"		14	1.13/16	1"	1	—	—	1410261	—
	1"			12	1.13/16	1"	1	—	1410260	—	—
1"				8	1.13/16	1"	1	1410259	—	—	—
			1"	11.5	2.3/8	1"	1	—	—	—	1410275
	1.1/8			12	2"	1"	1	—	1410263	—	—
1.1/8				7	2"	1"	1	1410262	—	—	—
	1.1/4			12	2.3/16	1"	1	—	1410265	—	—
1.1/4				7	2.3/16	1"	1	1410264	—	—	—
	1.3/8			12	2.3/8	1"	1	—	1410267	—	—
1.3/8				6	2.3/8	1"	1	1410266	—	—	—
	1.1/2			12	2.9/16	1"	1	—	1410269	—	—
1.1/2				6	2.9/16	1"	1	1410268	—	—	—

Hexagon Rethreading Bolt Dies (Dienuts)

2325M Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die.*





2325M

M

CS



ANSI

6H



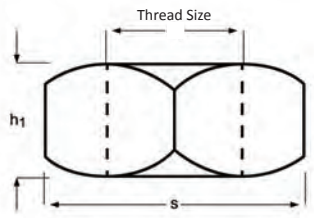
M6 - M20

M	P mm	S Inch	h_1 Inch	Pack Qty	2325M
6	1.00	1	3/8	1	1410609
8	1.25	1	3/8	1	1410611
9	1.25	1	3/8	1	1410612
10	1.50	1	3/8	1	1410613
12	1.75	1	3/8	1	1410615
14	2.00	1.7/16	1/2	1	1410616
16	2.00	1.7/16	1/2	1	1410618
18	1.50	1.7/16	1/2	1	1410620
18	2.50	1.7/16	1/2	1	1410619
20	2.50	1.13/16	3/4	1	1410621

Hexagon Rethreading Bolt Dies (Dienuts)

F302 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on te size of the die.*





F302

M

HSS

BS 1127: 1950

6H



M3 - M36

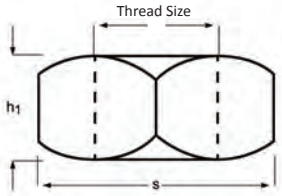
M	P mm	S decimal Inch	h_1 Inch	Pack Qty	F302
3	0.50	0.7100	1/4	1	0105627
4	0.70	0.7100	1/4	1	0105672
5	0.80	0.7100	1/4	1	0105719
6	1.00	0.7100	1/4	1	0105733
7	1.00	0.8200	5/16	1	0105740
8	1.25	0.8200	5/16	1	0105757
10	1.50	0.9200	3/8	1	0105528
11	1.50	1.0100	7/16	1	0105535
12	1.75	1.1000	1/2	1	0105542
14	2.00	1.3000	5/8	1	0105559
16	2.00	1.3000	5/8	1	0105566
18	2.50	1.4800	11/16	1	0105573
20	2.50	1.4800	11/16	1	0105580
22	2.50	1.6700	13/16	1	0105597
24	3.00	2.0500	15/16	1	0105603
27	3.00	2.2200	1.1/16	1	0105610
30	3.50	2.2200	1.1/16	1	0105634
33	3.50	2.5800	1.1/8	1	0105641
36	4.00	2.7600	1.1/4	1	0105658

DORMER

Hexagon Rethreading Bolt Dies (Dienuts)

F312 Rethreading bolt dies (dienuts) are used for reclaiming or cleaning up threads by hand. They are not normally used for cutting threads from solid. Bright finish improves chip flow in soft or non-ferrous materials.

Note: *Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die*





F312

MF

HSS

BS 1127: 1950

6H



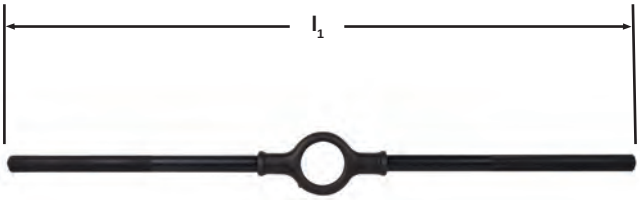
M8 - M24

MF	P mm	S decimal Inch	h_1 Inch	Pack Qty	F312
8	0.75	0.8200	5/16	1	0206331
8	1.00	0.8200	5/16	1	0206348
10	1.00	0.9200	3/8	1	0206379
10	1.25	0.9200	3/8	1	0206386
12	1.00	1.0100	7/16	1	0206393
12	1.25	1.0100	7/16	1	0206409
12	1.50	1.0100	7/16	1	0206416
14	1.50	1.3000	5/8	1	0206430
16	1.50	1.3000	5/8	1	0206454
18	1.50	1.4800	11/16	1	0206461
20	1.50	1.4800	11/16	1	0206485
22	1.50	1.6700	13/16	1	0206508
24	1.50	2.0500	15/16	1	0206522
24	2.00	2.0500	15/16	1	0206539

Die Stocks, Straight Handle

1301
8007

Designed for use with round adjustable split dies. The die is held in place by two opposed cone point screws in the stock which locate in two indents in the die. When this is effected, the split in the die lines up opposite a third pointed set screw which can be run in to spread the die slightly for minute adjustment.



1301	8007
	
D2 - D14	200

Die Stock #	l_1 Inch	Die O.D.	Pack Qty	1301	8007
D2	6.3/8	13/16	1	1810042	—
D3	9“	1“	1	1810043	—
D6	14“	1.1/2	1	1810096	—
200	14.3/4	2“	1	—	1810053
D14	40.3/4	3“	1	1810034	—

Die Stocks, Straight Handle

L110 Designed for use with Dormer gun nosed dies.
The die is held in place by two opposed cone point screws in the stock which locate in two indents in the die. When this is effected, the split in the die lines up opposite a third pointed set screw which can be run in to spread the die slightly for minute adjustment.



L110



16.00 - 4“

Nr.	Die Size Ø x H	Pack Qty	L110
1“	16 x 5	1	0111604
2a	20 x 5	1	0111611
2b	20 x 7	1	0111628
3	25 x 9	1	0111635
4“	30 x 11	1	0111642
5	38 x 14	1	0111666
5f	38 x 10	1	0111659
6	45 x 18	1	0111680
6f	45 x 14	1	0111673
7	55 x 22	1	0111703
7f	55 x 16	1	0111697
8	65 x 25	1	0111727
8f	65 x 18	1	0111710
9	75 x 30	1	0111741
9f	75 x 20	1	0111734
10	90 x 36	1	0111765
10f	90 x 22	1	0111758
	13/16 x 1/4	1	0218013
	1 x 3/8	1	0218020
	1.5/16 x 7/16	1	0218037
	1.1/2 x 1/2	1	0218044
	2 x 5/8	1	0218051
	2.1/4 x 11/16	1	0218068
	3 x 7/8	1	0218075
	4 x 1	1	0218082



Visual Index - End Mills

# of Flutes	Type of Cut	Depth/ Width of Cut	Alpha Code	Feed Per Tooth (Ft) Dia Inches										
				1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4
>4		↕ 1,5 ↔ 0,05	A				0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
			B				0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.004
			C				0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.007
3-4		↕ 1,5 ↔ 0,1	A	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.005
			B	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.007
			C	0.001	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
3-4		↕ 1 ↔ 0,5	A	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002
			B	0.003	0.000	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.004
			C	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005
2-3		↕ 0,5 ↔ 1	A	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003
			B	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004
			C	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005
3-4		↕ 0,5 ↔ 1 ↕ 1 ↔ 0,5												
			B				0.001	0.002	0.003	0.003	0.003	0.004	0.004	0.004
2 & 4		↕ 0,1 - 0,5mm ↔ 0,1 - 0,5mm	A											
			BC	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003		
				0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.004		
4		↕ 0,01 - 0,1 ↔ ≤ 1	A											
			BC				0.002	0.002	0.002	0.003		0.003		
							0.002	0.002	0.003	0.003		0.004		

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # of flutes to find your Ft Range.

For HSS Feed Rate Chart see page 561

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - End Mills

Tool Material:	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM
Application:																
Type:	W	W	W	W	W	N	N	N	N							
Number of Flutes:	Z 2	Z 2	Z 2	Z 3	Z 3	Z 6-8	Z 4	Z 4	Z 4	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2
Cut Length:																
Helix:	λ 42°	λ 30°	λ 37°	λ 45°	λ 45°	λ 45°	λ °	λ °	λ °	λ 30°	λ 30°	λ 30°	λ 30°	λ 30°	λ 30°	λ 30°
Shank:																
Finish/Coating:	TiCN	TiCN	TiCN	TiCN	TiCN	AlTiN	AlTiN	AlTiN	AlTiN			TiAlN				TiAlN
Tolerance:										Normal	Normal	Normal	Normal	Normal	Normal	Normal
Direction:																
																	
Style:	S400HA	S401HA	S402HA	S403HA	S404HA	S405HA	S406HA	S406HB	S407HA	E4302	E3302	E3302V	E3302M	E5302	E6302	E6302V
Range:	1/16 - 3/4	5/32 - 3/4	1/4 - 1"	1/8 - 1"	1/2 - 1"	1/4 - 3/4	1/8 - 1"	3/8 - 1"	1/8 - 1"	1/8 - 1/2	1/16 - 5/8	1/16 - 5/8	2.00 - 25.00	1/8 - 1/2	1/8 - 1/2	1/8 - 1/2
Page #	378	379	380	381	382	383	384	385	386	386	388	388	389	390	391	391
370							✓	✓	✓	289B	289B	400B	289B	269B	249B	361B
1.2							✓	✓	✓	223B	223B	298B	223B	212B	200B	269B
1.3						✓	✓	✓	✓	223B	223B	298B	223B	212B	200B	269B
1.4						✓	✓	✓	✓	180B	180B	259B	180B	171B	161B	239B
1.5						✓	✓	✓	✓	161B	161B	230B	161B	152B	144B	200B
1.6						✓			✓	148B	148B	200B	148B	140B	131B	180B
1.7						✓										
1.8						✓										
2.1							✓	✓		200A	200A	325A	200A	190A	180A	298A
2.2							✓	✓		141A	141A	223A	141A	125A	108A	180A
2.3							✓	✓		108A	108A	174A	108A	103A	98A	171A
2.4							✓	✓		89A	89A	131A	89A	78A	66A	131A
3.1									✓	374B	374B	551B	374B	336A	298B	499B
3.2									✓	318B	318B	525B	318B	284B	249B	400B
3.3									✓	318B	318B	525B	318B	284B	249B	400B
3.4						✓			✓	249B	249B	374B	249B	225B	200B	341B
4.1							✓	✓				230B				200B
4.2							✓	✓				200B				180B
4.3							✓	✓				190B				174B
5.1							✓	✓				230B				200B
5.2							✓	✓				161A				141A
5.3							✓	✓				98A				85A
6.1	✓	✓	✓	✓	✓					649C	649C		649C	617C	584C	
6.2	✓	✓	✓	✓	✓					499C	499C		499C	474C	449C	
6.3	✓	✓	✓	✓	✓					499C	499C		499C	474C	449C	
6.4	✓	✓	✓	✓	✓					125B	125B		125B	117B	108B	
7.1	✓	✓	✓	✓	✓					1499C	1499C		1499C	1424C	1348C	
7.2	✓	✓	✓	✓	✓					1499C	1499C		1499C	1424C	1348C	
7.3	✓	✓	✓	✓	✓					649C	649C		649C	617C	584C	
7.4	✓	✓	✓	✓	✓					400B	400B		400B	380B	361B	
8.1	✓	✓	✓	✓	✓											
8.2	✓	✓	✓	✓	✓											
8.3	✓	✓	✓	✓	✓											
9.1																
10.1																

✓ See technical section for running parameters on these products

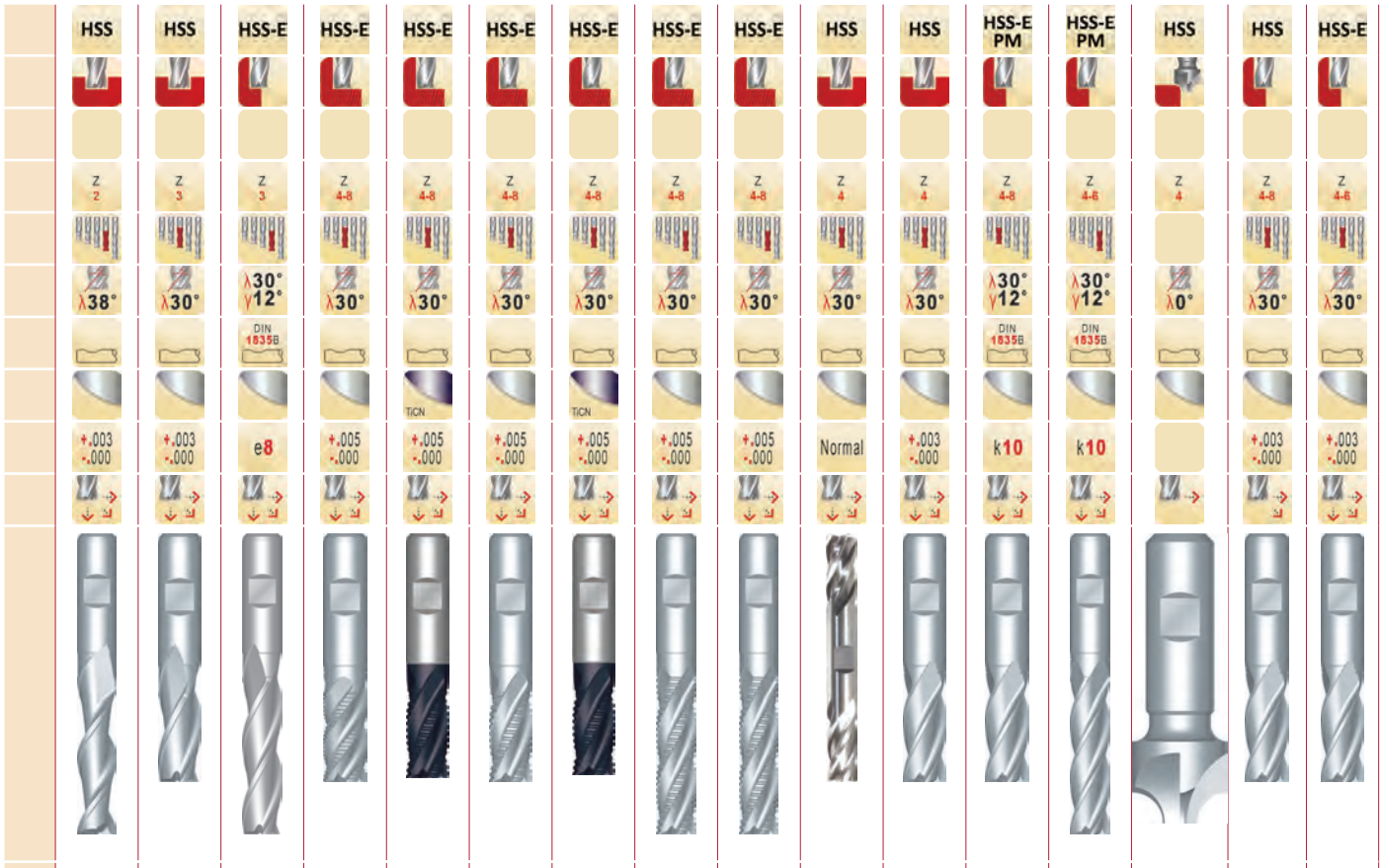
Visual Index - End Mills

	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM	HM
	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 3	Z 3	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4
	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°
		AlTiN		AlTiN			AlTiN		AlTiN			AlTiN		AlTiN		AlTiN	
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	EB3302	**EB3302V**	**EB3302M**	**EB3302MV**	**EB5302**	**EB6302**	**EB6302V**	**E3303**	**E3303V**	**E4304**	**E3304**	**E3304V**	**E3304M**	**E3304MV**	**E5304**	**E5304V**	**E6304**
	1/16 - 1/2	1/16 - 1/2	2.00 - 20.00	2.00 - 12.00	1/8 - 5/8	1/8 - 1/2	1/8 - 1/2	1/16 - 1/2	1/16 - 1/2	1/8 - 1/2	1/16 - 1"	1/16 - 1"	2.00 - 25.00	2.00 - 20.00	1/8 - 3/4	1/8 - 3/4	1/8 - 1"
	392	**392**	**393**	**393**	**394**	**395**	**395**	**396**	**396**	**397**	**398**	**398**	**399**	**399**	**400**	**400**	**401**
379	289B	400B	289B	400B	269B	249B	361B	289B	400B	361B	361B	499B	361B	499B	343B	474B	325B
1.2	223B	298B	223B	298B	212B	200B	269B	223B	298B	325B	325B	449B	325B	449B	312B	425B	298B
1.3	223B	298B	223B	298B	212B	200B	269B	223B	298B	325B	325B	449B	325B	449B	312B	425B	298B
1.4	180B	259B	180B	259B	170B	161B	239B	180B	259B	298B	298B	423B	298B	423B	287B	406B	276B
1.5	161B	230B	161B	230B	152B	144B	200B	161B	230B	249B	249B	400B	249B	400B	238B	380B	226B
1.6	148B	200B	148B	200B	140B	131B	180B	148B	200B	230B	230B	328B	230B	328B	205B	313B	180B
1.7																	
1.8																	
2.1	200A	325A	200A	325A	190A	180A	298A	200A	325A	239A	239A	351A	239A	351A	220A	338A	200A
2.2	141A	223A	141A	223A	125A	108A	180A	141A	223A	171A	171A	276A	171A	276A	156A	251A	141A
2.3	108A	174A	108A	174A	103A	98A	171A	108A	174A	131A	131A	200A	131A	200A	123A	182A	115A
2.4	89A	131A	89A	131A	78A	82A	89A			105A	105A	164A	105A	164A	97A	140A	89A
3.1	374B	551B	374B	551B	336A	298B	499B	374B	551B	449B	449B	699B	449B	699B	405B	650B	361B
3.2	318B	525B	318B	525B	284B	249B	400B	318B	525B	377B	377B	649B	377B	649B	338B	578B	298B
3.3	318B	525B	318B	525B	284B	249B	400B	318B	525B	377B	377B	649B	377B	649B	338B	578B	298B
3.4	249B	374B	249B	374B	225B	200B	341B	249B	374B	279B	279B	430B	279B	430B	254B	415B	230B
4.1		230B		230B			200B		230B			259B		259B		245B	
4.2		200B		200B			180B		200B			230B		230B		220B	
4.3		190B		190B			174B		190B			200B		200B		190B	
5.1		230B		230B		148B	200B		230B			266B		266B		251B	
5.2		161A		161A			141A		161A			200A		200A		190A	
5.3		98A		98A			85A		98A			131A		131A		123A	
6.1	649C		649C		617C	584C		649C		679C	679C		679C		646C		613C
6.2	499C		499C		474C	449C		499C		574C	574C		574C		546C		518C
6.3	499C		499C		474C	449C		499C		574C	574C		574C		546C		518C
6.4	125B		125B		117B	108B		125B		144B	144B		144B		138B		131B
7.1	1499C		1499C		1424C	1348C		1499C		1601C	1601C		1601C		1525C		1450C
7.2	1499C		1499C		1424C	1348C		1499C		1601C	1601C		1601C		1525C		1450C
7.3	649C		649C		617C	584C		649C		708C	708C		708C		674C		640C
7.4	400B		400B		380B	361B		400B		479B	479B		479B		455B		430B
8.1																	
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - End Mills

	HM	HM	HM	HM	HM	HM	HM	HM	HM	HSS-E PM	HSS	HSS	HSS	HSS-E	HSS-E PM	HSS	HSS
										P9					P9		
										N					N		
	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 4	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2	Z 2
	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30°	λ30° γ12°	λ30°	λ30°	λ30°	λ30°	λ30° γ12°	λ30°	λ38°
										DIN 1835B					DIN 1835B		
	AlTiN		AlTiN		AlTiN		AlTiN		AlTiN								
	Normal	Normal	Normal	Normal	Normal			Normal	Normal	e8	+.003 -.000	+.003 -.000	+.0001 -.0015	+.003 -.000	e8	+.003 -.000	+.003 -.000
																	
	E6304V	EB3304	EB3304V	EB3304M	EB3304MV	EB5304	EB5304V	EB6304	EB6304V	C110	923	920	920K	963	C123	905	980
	1/8 - 1"	1/16 - 3/4	1/16 - 3/4	2.00 - 12.00	2.00 - 12.00	1/4 - 5/8	1/4 - 5/8	1/8 - 5/8	1/8 - 5/8	1.00 - 50.00	1/8 - 3/4	1/8 - 1.1/2	1/8 - 1"	1/8 - 1"	1/16 - 40.00	1/8 - 3/4	1/4 - 1"
	401	402	402	403	403	404	404	405	405	406	408	409	410	411	412	414	415
1.1	449B	361B	499B	361B	499B	343B	450B	325B	400B	197A	98A	98A	98A	164A	180A	112S	164A
1.2	400B	325B	449B	325B	449B	312B	412B	298B	374B	164A	89A	89A	89A	131A	148A	89S	131A
1.3	400B	325B	449B	325B	449B	312B	412B	298B	374B	131B	75B	75B	75B	115B	131B	79T	115B
1.4	390B	298B	423B	298B	423B	287B	387B	276B	351B	115B				98B	115B		
1.5	361B	249B	400B	249B	400B	238B	363B	226B	325B								
1.6	298B	230B	328B	230B	328B	205B	288B	180B	249B								
1.7																	
1.8																	
2.1	325A	239A	351A	239A	351A	220A	288A	200A	226A	98F				75F	82F		75F
2.2	226A	171A	276A	171A	276A	156A	233A	141A	190A								62F
2.3	164A	131A	200A	131A	200A	123A	176A	115A	151A								
2.4	115A	98A	148A	98A	148A		135A		121A								
3.1	600B	449B	699B	449B	699B	405B	500B	361B	499B	115A	82A	82A	82A	92A	98A	89S	
3.2	508B	377B	649B	377B	649B	338B	540N	298B	430B	98A	66A	66A	66A	75A	82A	72S	
3.3	508B	377B	649B	377B	649B	338B	540B	298B	430B	164B	82B	82B	82B	131B	148B	89T	
3.4	400B	279B	430B	279B	430B	255B	384B	230B	338B	98B				82B	98B		
4.1	230B		259B		259B		230B		200B	115D	59D	59D	59D	92D	98D	62V	92D
4.2	210B		230B		230B		210B		190B	82D	49D	49D	49D	75D	82D	49V	
4.3	180B		200B		200B		180B										
5.1	236B		266B		266B		238B		210B	197D	98D	98D	98D	157D	164D	108V	157D
5.2	180A		200A		200A		176A			49C	20C	20C	20C	43C	49C	20U	
5.3	115A		131A		131A												
6.1		679C		679C		646C		613C	699C	279C	180C	180C	180C	410C	262C	200U	410C
6.2		574C		574C		602C		518C	571C	279C	197C	197C	197C	410C	262C	223U	
6.3		574C		574C		546C		518C	571C	279C	197C	197C	197C	410C	262C	223U	
6.4		144B		144B		137B		131B	180B								
7.1		1601C		1601C		1526C		1450C	1650C	722E	197E	197E	197E	984E	656E	243X	984E
7.2		1601C		1601C		1526C		1450C	1650C	722E	180E	180E	180E	984E	656E	194X	984E
7.3		708C		708C		674C		640C	708C	279E	115E	115E	115E	295E	262E	144X	295E
7.4		479B		479B		455B		430B	410B								
8.1										295C	197C	197C	197C	410C	262C	200U	410C
8.2																	
8.3																	
9.1																	
10.1																	

Visual Index - End Mills



	981	930	C346	9002	TC9002	9003	TC9003	9009	9008	948	945	C247	C273	883	940	960
	1/4 - 3/4	1/8 - 1"	3.00 - 20.00	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 1"	1/4 - 3/4	1/8 - 3/4	1/8 - 1"	2.00 - 50.00	2.00 - 40.00	1/16 - 1/2	1/8 - 1"	1/8 - 1"
	416	417	418	419	419	420	420	421	422	423	424	425	427	429	430	431
1.1	148A		148A	164G	197G	164G	197G	148G	148G	115S	164S	180S	164S	66P	115S	164S
1.2	118A	131A	115A	131G	184G	131G	184G	118G	118G	92S	131S	148S	164S	66P	92S	131S
1.3	102B	115B	98B	115H	161H	115H	161H	102H	102H	79T	115T	131T	115T	52P	79T	115T
1.4		98B	82B	98H	138H	98H	138H	89H	89H	69T	98T	115T	98T	46P	69T	98T
1.5		66C												33P		
1.6														26P		
1.7																
1.8																
2.1	66F		66F	75L	105L	75L	105L	66L	66L	52Y	75Y	82Y	33Y	43P	52Y	75Y
2.2	56F	62F												30P		
2.3														20R		
2.4														16R		
3.1			82A	92G	128G	92G	128G	82G	82G	92S	92S	98S	82S	59R	92S	92S
3.2		75A	66A	75G	105G	75G	105G	66G	66G	75S	75S	82S	66S	49R	75S	75S
3.3		131B	115B	131H	184H	131H	184H	118H	118H	92T	131T	148T	131T	52R	92T	131T
3.4		82B	66B	82H	128H	82H	128H	72H	72H	56T	82T	82T	82T	33R	56T	82T
4.1	82D	92D	82D	92J	128J	92J	128J	82J	82J	62V	92V	98V	82V	52N	62V	92V
4.2		75D	66D	75J	105J	75J	105J	66J	66J	52V	75V	82V	66V	36O	52V	75V
4.3		33D												20O		
5.1	141D		148D	157J	220J	157J	220J	141J	141J	108V	157V	164V	148V	66P	108V	157V
5.2		43C	33C	43I	59I	43I	59I	36I	36I	20U	43U	49U	33U	13O	20U	43U
5.3		20D												7M		
6.1	367C		230C	410I	574I	410I	574I	367I	367I	203U	410U	262U	230U	131P	203U	410U
6.2		410C	230C	410I	574I	410I	574I	367I	367I	223U	410U	262U	230U	148P	223U	410U
6.3		410C	230C	410I	574I	410I	574I	367I	367I	223U	410U	262U	230U	148P	223U	410U
6.4		49C												16M		
7.1	886E		590E								984X	656X	590X	180R		984X
7.2	886E		590E	984K	1378K	984K	1378K	886K	886K	197X	984X	656X	590X	134R	197X	984X
7.3	266E	295E		295K	413K	295K	413K	266K	266K	148X	295X	262X	230X	85R	148X	295X
7.4		197A												56R		
8.1	367C		230C	410I	574I	410I	574I	367I	367I	203U	410U	262U	230U		203U	410U
8.2		410C														
8.3																
9.1																
10.1														56R		

List Number Index - End Mills



Pgs. 371-431

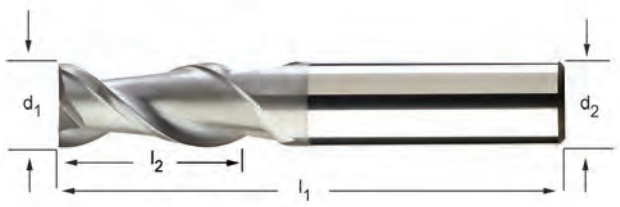
883..... 429
905..... 414
920..... 409
923..... 408
930..... 417
940..... 430
945..... 424
948..... 423
960..... 431
963..... 411
980..... 415
981..... 416
9002..... 419
9003..... 420
9008..... 422
9009..... 421
920K 410
C110 406
C123..... 412
C247..... 425
C273..... 427
C346..... 418
E3302 388
E3302M 389
E3302V..... 388
E3303 396
E3303V..... 396
E3304 398
E3304M 399
E3304MV..... 399
E3304V..... 398
E4302 386
E4304 397
E5302 390
E5304 400
E5304V..... 400
E6302 391
E6302V..... 391
E6304 401
E6304V..... 401
EB3302..... 392
EB3302M..... 393
EB3302MV .. 393
EB3302V 392
EB3304..... 402
EB3304M..... 403
EB3304MV .. 403
EB3304V 402
EB5302..... 394
EB5304..... 404
EB5304V 404
EB6302..... 395
EB6302V 395
EB6304..... 405
EB6304V 405
S400HA 378
S401HA 379
S402HA 380
S403HA 381
S404HA 382
S405HA 383
S406HA 384
S406HB 385
S407HA 386
TC9002..... 419
TC9003..... 420

Solid Carbide 2-Flute End Mill

Regular Length, Center Cutting, Square End, 42° Helix

S400HA

TiCN coating increases surface hardness, and abrasion resistance while resisting edge buildup. The unique combination of a higher rake angle and deeper flutes provides excellent chip evacuation at higher metal removal rates in Aluminum and Non-Ferrous applications.



S400HA











1/16 - 3/4

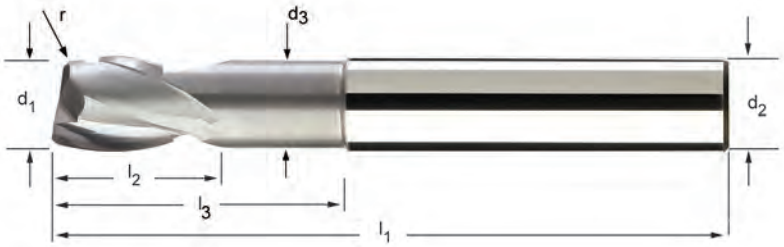
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S400HA
1/16	0.0625	1/8	1/8	1.1/2	2	1	46612209
3/32	0.0938	1/8	1/4	1.1/2	2	1	46612260
1/8	0.1250	1/4	5/16	1.3/4	2	1	46612261
3/16	0.1875	1/4	7/16	2“	2	1	46612262
1/4	0.2500	3/8	3/4	2.1/2	2	1	46612263
5/16	0.3125	3/8	13/16	2.1/2	2	1	46612264
3/8	0.3750	3/8	1“	2.1/2	2	1	46612265
1/2	0.5000	1/2	1“	3“	2	1	46612266
1/2	0.5000	1/2	2“	4“	2	1	46612267
5/8	0.6250	5/8	1.1/4	3.1/2	2	1	46612268
3/4	0.7500	3/4	1.1/2	4“	2	1	46612269
3/4	0.7500	3/4	3“	5.1/2	2	1	46612270

DORMER Solid Carbide 2-Flute End Mill

Regular Length, Center Cutting, Corner Radius, 30° Helix, Necked

S401HA TiCN coating increases surface hardness, and abrasion resistance while resisting edge buildup. Provides excellent chip evacuation in Aluminum and Non-Ferrous applications. Excellent cutting qualities in Copper and free machining Stainless Steel applications.



S401HA

HM

W

Z 2



5/32 - 3/4

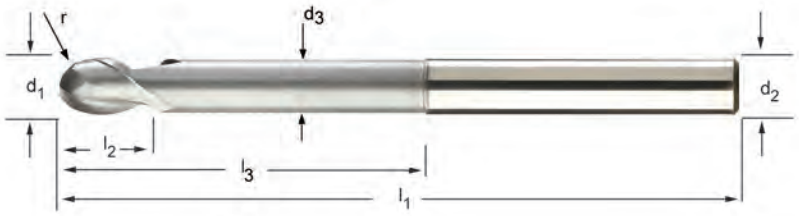
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0010	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	l_3 Inch	d_3 decimal Inch	Pack Qty	S401HA
5/32	0.1563	0.012	1/4	3/16	2“	2	3/8	0.140	1	46612271
1/4	0.2500	0.020	1/4	5/16	2.3/8	2	3/4	0.226	1	46612272
5/16	0.3125	0.024	5/16	3/8	2.3/4	2	1.1/8	0.282	1	46612273
3/8	0.3750	0.031	3/8	1/2	3.1/8	2	1.1/2	0.336	1	46612274
1/2	0.5000	0.040	1/2	9/16	3.1/2	2	1.1/2	0.460	1	46612275
5/8	0.6250	0.051	5/8	3/4	4“	2	1.3/4	0.566	1	46612276
3/4	0.7500	0.063	3/4	1“	4“	2	1.3/4	0.670	1	46612277

Solid Carbide 2-Flute End Mill

Long Reach Ball Nose, 37° Helix, Necked

S402HA TiCN coating increases surface hardness, and abrasion resistance while resisting edge buildup. Provides excellent chip evacuation in Aluminum and Non-Ferrous applications. Suitable for step-milling applications.



S402HA











1/4 - 1“

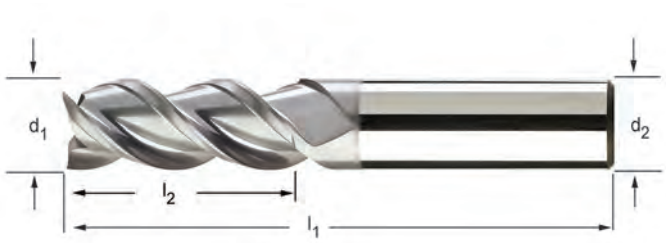
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0010	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	l_3 Inch	d_3 decimal Inch	Pack Qty	S402HA
1/4	0.2500	1/8	1/4	3/8	4“	2	2.1/4	0.220	1	46612278
3/8	0.3750	3/16	3/8	1/2	4“	2	2.1/4	0.345	1	46612279
1/2	0.5000	1/4	1/2	5/8	5“	2	2.1/4	0.470	1	46612280
1/2	0.5000	1/4	1/2	5/8	6“	2	3.1/4	0.470	1	46612284
1/2	0.5000	1/4	1/2	5/8	6“	2	4“	0.470	1	46612285
5/8	0.6250	5/16	5/8	3/4	5“	2	2.1/4	0.585	1	46612281
5/8	0.6250	5/16	5/8	3/4	6“	2	3.1/4	0.585	1	46612286
5/8	0.6250	5/16	5/8	3/4	7“	2	4.1/4	0.585	1	46612287
3/4	0.7500	3/8	3/4	1“	5“	2	2.1/4	0.710	1	46612282
3/4	0.7500	3/8	3/4	1“	6“	2	3.1/4	0.710	1	46612288
3/4	0.7500	3/8	3/4	1“	7“	2	4.1/4	0.710	1	46612289
1“	1.0000	1/2	1“	1.1/8	5“	2	2.1/4	0.960	1	46612283
1“	1.0000	1/2	1“	1.1/8	6“	2	3.1/4	0.960	1	46612290
1“	1.0000	1/2	1“	1.1/8	7“	2	4.1/4	0.960	1	46612291

DORMER Solid Carbide 3-Flute End Mill

Regular Length, Center Cutting, Square End, 45° Helix

S403HA TiCN coating increases surface hardness, and abrasion resistance while resisting edge buildup. The unique combination a 3-Flute design and 45° high helix allows for harmonic balance at high speed for high velocity milling in Aluminum and Non-Ferrous applications.



Cutting Diameter Tolerance = + 0 / - 0.0005”
Shank Diameter Tolerance = + 0 / - 0.0003”

S403HA

HM

W

Z 3



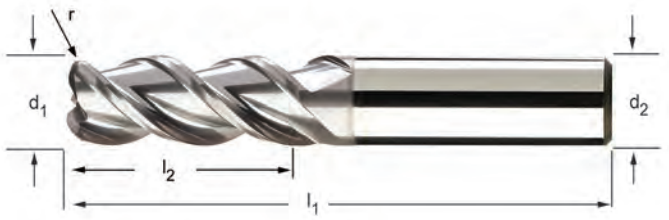
1/8 - 1“

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S403HA
1/8	0.1250	1/8	3/8	1.1/2	3	1	46612292
3/16	0.1875	3/16	9/16	2“	3	1	46612293
1/4	0.2500	1/4	5/8	2.1/2	3	1	46612294
5/16	0.3125	5/16	5/8	2.1/2	3	1	46612295
3/8	0.3750	3/8	1“	2.1/2	3	1	46612296
7/16	0.4375	7/16	1.1/4	2.3/4	3	1	46612297
1/2	0.5000	1/2	1.1/4	3“	3	1	46612298
5/8	0.6250	5/8	1.5/8	3.1/2	3	1	46612299
3/4	0.7500	3/4	1.5/8	4“	3	1	46612300
1“	1.0000	1“	2“	5“	3	1	46612301

Solid Carbide 3-Flute End Mill

Regular Length, Center Cutting, Square End, 45° Helix

S404HA TiCN coating increases surface hardness, and abrasion resistance while resisting edge buildup. The unique combination a 3-Flute design with corner radii and 45° helix allows for harmonic balance at high speed for high velocity milling in Aluminum and Non-Ferrous applications.



Cutting Diameter Tolerance = + 0 / - 0.0005”
Shank Diameter Tolerance = + 0 / - 0.0003”

S404HA

HM

W

Z 3

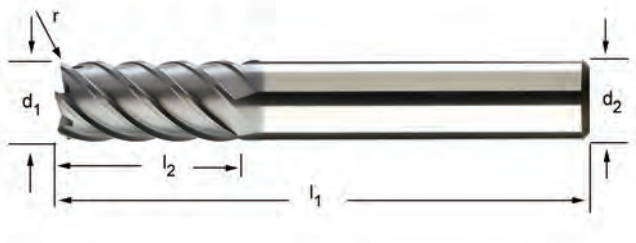
1/2 - 1“

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0010	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S404HA
1/2	0.5000	0.060	1/2	1.1/4	3“	3	1	46612302
1/2	0.5000	0.120	1/2	1.1/4	3“	3	1	46612306
5/8	0.6250	0.060	5/8	1.5/8	3.1/2	3	1	46612303
5/8	0.6250	0.120	5/8	1.5/8	3.1/2	3	1	46612307
3/4	0.7500	0.060	3/4	1.5/8	4“	3	1	46612304
3/4	0.7500	0.120	3/4	1.5/8	4“	3	1	46612308
1“	1.0000	0.060	1“	2“	5“	3	1	46612305
1“	1.0000	0.120	1“	2“	5“	3	1	46612309

DORMER Solid Carbide Multi-Flute End Mill

Long Length, Center Cutting, Corner Radius, 45° Helix

S405HA AlTiN coating increases surface hardness, and improves tool life allowing higher metal removal rates. This 6-8 Flute Finisher with corner radius design and 45° high helix for high speed cutting and finish milling of high hardened materials while providing superior workpiece finishes.



Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

S405HA

HM

N

Z 6-8



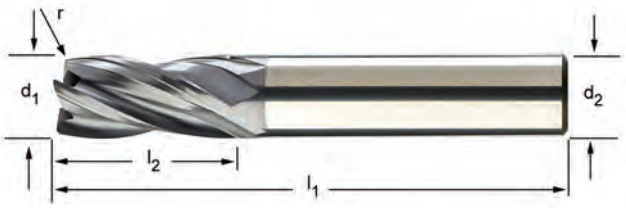
1/4 - 3/4

d_1 Ø Inch	d_1 decimal Inch	r Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S405HA
1/4	0.2500	0.020	1/4	1/2	2.1/4	6	1	46660543
5/16	0.3125	0.020	5/16	3/4	2.1/2	6	1	46660544
3/8	0.3750	0.020	3/8	7/8	2.7/8	6	1	46660545
3/8	0.3750	0.030	3/8	7/8	2.7/8	6	1	46660546
1/2	0.5000	0.020	1/2	1“	3.1/4	6	1	46660547
1/2	0.5000	0.030	1/2	1“	3.1/4	6	1	46660548
5/8	0.6250	0.030	5/8	1.1/4	3.5/8	6	1	46660549
5/8	0.6250	0.060	5/8	1.1/4	3.5/8	6	1	46660550
3/4	0.7500	0.030	3/4	1.1/2	4.1/8	8	1	46660551
3/4	0.7500	0.060	3/4	1.1/2	4.1/8	8	1	46660552
3/4	0.7500	0.090	3/4	1.1/2	4.1/8	8	1	46660553

Solid Carbide 4-Flute End Mill

Regular Length, Center Cutting, Corner Radius, Unequal Helix

S406HA AlTiN coating increases surface hardness, and improves tool life allowing higher metal removal rates. These unequal helix Inox cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for most materials under 40 HRC



S406HA











1/8 - 1“

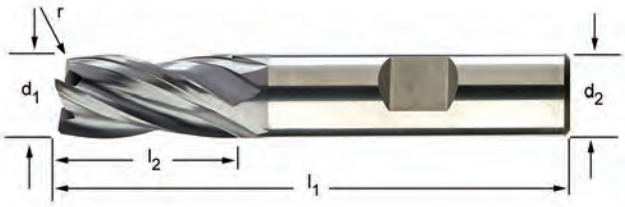
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0012	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S406HA
1/8	0.1250	0.015	1/8	3/8	1.1/2	4	1	46612328
3/16	0.1875	0.015	3/16	7/16	2“	4	1	46612329
1/4	0.2500	0.020	1/4	1/2	2.1/2	4	1	46612330
5/16	0.3125	0.020	5/16	13/16	2.1/2	4	1	46612331
3/8	0.3750	0.020	3/8	7/8	2.1/2	4	1	46612332
7/16	0.4375	0.020	7/16	1“	2.3/4	4	1	46612333
1/2	0.5000	0.030	1/2	1“	3“	4	1	46612334
9/16	0.5625	0.030	9/16	1.1/8	3.1/2	4	1	46612335
5/8	0.6250	0.040	5/8	1.1/4	3.1/2	4	1	46612336
3/4	0.7500	0.040	3/4	1.1/2	4“	4	1	46612337
1“	1.0000	0.040	1“	1.1/2	4“	4	1	46612338

Solid Carbide 4-Flute End Mill

Regular Length, Center Cutting, Corner Radius, Unequal Helix

S406HB AlTiN coating increases surface hardness, and improves tool life allowing higher metal removal rates. These unequal helix Inox cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for most materials under 40 HRC. Weldon flat on shank.



S406HB

HM

N

Z 4



3/8 - 1“

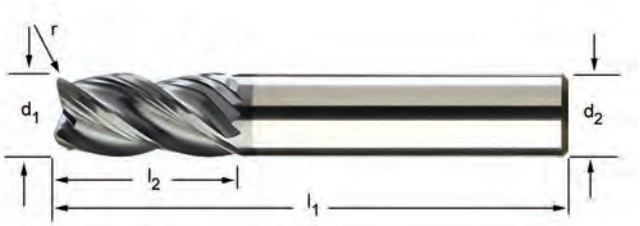
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0012	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S406HB
3/8	0.3750	0.020	3/8	7/8	2.1/2	4	1	46612339
7/16	0.4375	0.020	7/16	1“	2.3/4	4	1	46612340
1/2	0.5000	0.030	1/2	1“	3“	4	1	46612341
9/16	0.5625	0.030	9/16	1.1/8	3.1/2	4	1	46612342
5/8	0.6250	0.040	5/8	1.1/4	3.1/2	4	1	46612343
3/4	0.7500	0.040	3/4	1.1/2	4“	4	1	46612344
1“	1.0000	0.040	1“	1.1/2	4“	4	1	46612345

Solid Carbide 4-Flute End Mill

Regular Length, Center Cutting, Corner Radius, Unequal Helix

S407HA AlTiN coating increases surface hardness, and improves tool life allowing higher metal removal rates. These unequal helix Steel cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for most materials under 40 HRC



S407HA



1/8 - 1“

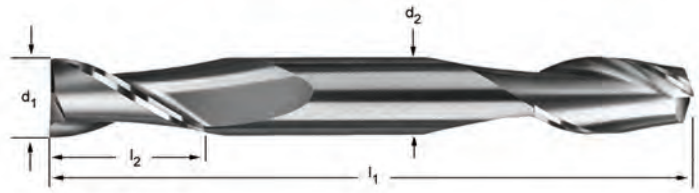
Cutting Diameter Tolerance = + 0 / - 0.0012”
Shank Diameter Tolerance = + 0 / - 0.0003”

d_1 Ø Inch	d_1 decimal Inch	r ± 0.0012	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	S407HA
1/8	0.1250	0.010	1/8	3/8	1.1/2	4	1	46612317
3/16	0.1875	0.010	3/16	7/16	2“	4	1	46612318
1/4	0.2500	0.015	1/4	1/2	2.1/2	4	1	46612319
5/16	0.3125	0.015	5/16	13/16	2.1/2	4	1	46612320
3/8	0.3750	0.015	3/8	7/8	2.1/2	4	1	46612321
7/16	0.4375	0.015	7/16	1“	2.3/4	4	1	46612322
1/2	0.5000	0.025	1/2	1“	3“	4	1	46612323
9/16	0.5625	0.025	9/16	1.1/8	3.1/2	4	1	46612324
5/8	0.6250	0.035	5/8	1.1/4	3.1/2	4	1	46612325
3/4	0.7500	0.035	3/4	1.1/2	4“	4	1	46612326
1“	1.0000	0.035	1“	1.1/2	4“	4	1	46612327

Solid Carbide 2 Flute End Mill

Regular Length, Square End, Double End, 30° Helix

E4302 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials



E4302











1/8 - 1/2

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E4302
1/8	0.1250	3/8	3/8	3“	2	1	002200
5/32	0.1562	3/8	7/16	3“	2	1	002201
3/16	0.1875	3/8	1/2	3“	2	1	002202
1/4	0.2500	3/8	5/8	3“	2	1	002204
5/16	0.3125	3/8	3/4	3.1/2	2	1	002206
3/8	0.3750	3/8	3/4	3.1/2	2	1	002208
1/2	0.5000	1/2	1“	4“	2	1	002210

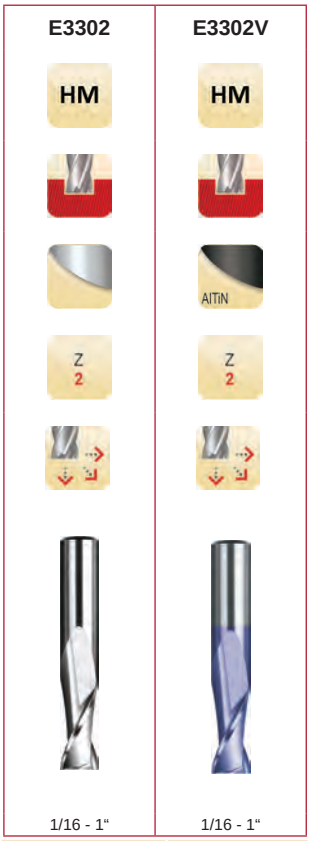
Solid Carbide 2 Flute End Mill

Regular Length, Square End, 30° Helix

E3302 Bright finish improves chip flow in soft and non-ferrous materials.

E3302V ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E3302	E3302V
1/16	0.0625	1/8	1/4	1.1/2	2	1	001000	002850
5/64	0.0781	1/8	1/4	1.1/2	2	1	001001	002851
3/32	0.0938	1/8	3/8	1.1/2	2	1	001002	002852
1/8	0.1250	1/8	1/2	1.1/2	2	1	001004	002854
9/64	0.1406	3/16	9/16	2“	2	1	001005	—
5/32	0.1562	3/16	9/16	2“	2	1	001006	002856
11/64	0.1719	3/16	9/16	2“	2	1	001007	—
3/16	0.1875	3/16	5/8	2“	2	1	001008	002858
7/32	0.2188	1/4	5/8	2.1/2	2	1	001010	002860
1/4	0.2500	1/4	3/4	2.1/2	2	1	001012	002862
5/16	0.3125	5/16	7/8	2.1/2	2	1	001016	002863
3/8	0.3750	3/8	7/8	2.1/2	2	1	001017	002864
7/16	0.4375	7/16	1“	2.1/2	2	1	001018	002865
1/2	0.5000	1/2	1“	3“	2	1	001019	002866
9/16	0.5625	9/16	1.1/4	3.1/2	2	1	001020	002867
5/8	0.6250	5/8	1.1/4	3.1/2	2	1	001021	002868
3/4	0.7500	3/4	1.1/2	4“	2	1	001023	—
1“	1.0000	1“	1.1/2	4“	2	1	001025	—

Solid Carbide 2 Flute End Mill

Regular Length, Square End, 30° Helix

E3302M Bright finish improves chip flow in soft and non-ferrous materials.



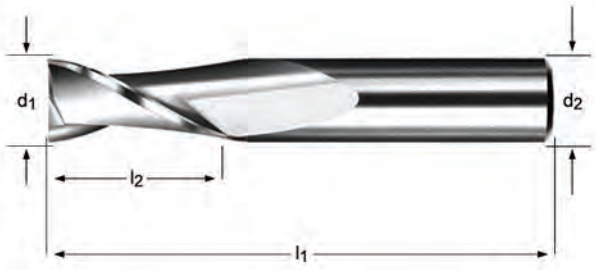


d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	E3302M
2.00	0.0787	3.0	6.0	38.0	2	1	001028
2.50	0.0984	3.0	7.0	38.0	2	1	001029
3.00	0.1181	3.0	12.0	38.0	2	1	001030
4.00	0.1575	4.0	14.0	50.0	2	1	001032
4.50	0.1772	5.0	14.0	50.0	2	1	001033
5.00	0.1969	5.0	16.0	50.0	2	1	001034
6.00	0.2362	6.0	19.0	63.0	2	1	001035
7.00	0.2756	8.0	19.0	63.0	2	1	001036
8.00	0.3150	8.0	20.0	63.0	2	1	001037
9.00	0.3543	10.0	22.0	70.0	2	1	001038
10.00	0.3937	10.0	22.0	70.0	2	1	001039
11.00	0.4331	11.0	25.0	70.0	2	1	001040
12.00	0.4724	12.0	25.0	75.0	2	1	001041
14.00	0.5512	14.0	30.0	88.0	2	1	001043
16.00	0.6299	16.0	32.0	88.0	2	1	001044
20.00	0.7874	20.0	38.0	100.0	2	1	001046
25.00	0.9843	25.0	38.0	100.0	2	1	001047

Solid Carbide 2 Flute End Mill

Long Length, Square End, 30° Helix

E5302 Bright finish improves chip flow in soft and non-ferrous materials.





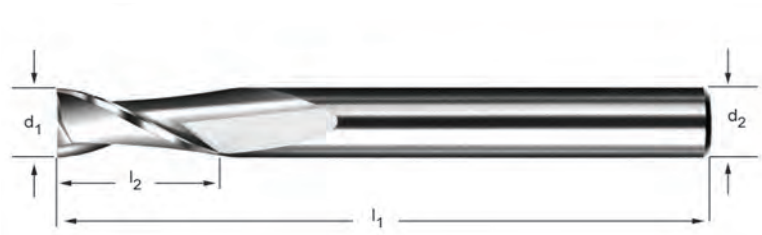
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E5302
1/8	0.1250	1/8	3/4	2“	2	1	000000
3/16	0.1875	3/16	3/4	2.1/2	2	1	000001
1/4	0.2500	1/4	1.1/8	3“	2	1	000002
3/8	0.3750	3/8	1.1/8	3“	2	1	000004
1/2	0.5000	1/2	2“	4“	2	1	000006

Solid Carbide 2 Flute End Mill

Extra Long Length, Square End, 30° Helix

E6302 Bright finish improves chip flow in soft and non-ferrous materials.

E6302V ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.























E6302	E6302V
1/8 - 1/2	1/8 - 1/2

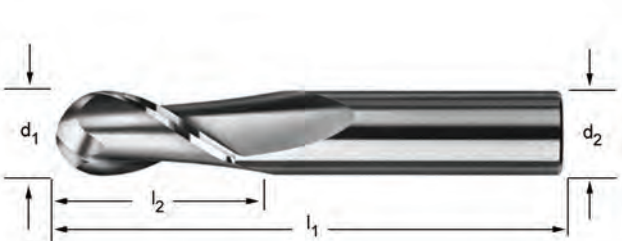
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E6302	E6302V
1/8	0.1250	1/8	1“	3“	2	1	004800	003130
3/16	0.1875	3/16	1.1/8	3“	2	1	004801	003131
1/4	0.2500	1/4	1.1/2	4“	2	1	004802	003132
5/16	0.3125	5/16	1.5/8	4“	2	1	004803	—
3/8	0.3750	3/8	1.3/4	4“	2	1	004804	003134
1/2	0.5000	1/2	3“	6“	2	1	004806	003136

Solid Carbide 2 Flute End Mill

Regular Length, Ball Nose, 30° Helix

EB3302 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB3302V Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



EB3302	EB3302V
HM	HM
	
	
AlTiN	
Z 2	Z 2
	
	
1/16 - 1/2	1/16 - 1/2

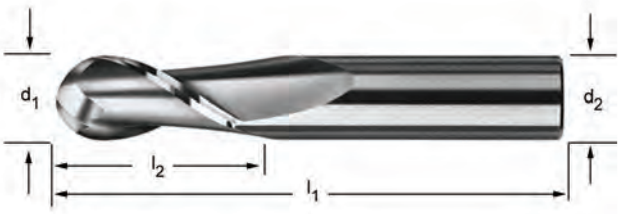
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB3302	EB3302V
1/16	0.0625	1/8	1/4	1.1/2	2	1	001200	002630
3/32	0.0938	1/8	3/8	1.1/2	2	1	001202	—
1/8	0.1250	1/8	1/2	1.1/2	2	1	001204	002634
5/32	0.1562	3/16	9/16	2“	2	1	001206	—
3/16	0.1875	3/16	5/8	2“	2	1	001208	002638
7/32	0.2188	1/4	5/8	2.1/2	2	1	001210	002640
1/4	0.2500	1/4	3/4	2.1/2	2	1	001212	002642
5/16	0.3125	5/16	7/8	2.1/2	2	1	001216	002643
3/8	0.3750	3/8	7/8	2.1/2	2	1	001217	002644
1/2	0.5000	1/2	1“	3“	2	1	001219	002646

Solid Carbide 2 Flute End Mill

Regular Length, Ball Nose, 30° Helix

EB3302M Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB3302MV Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.





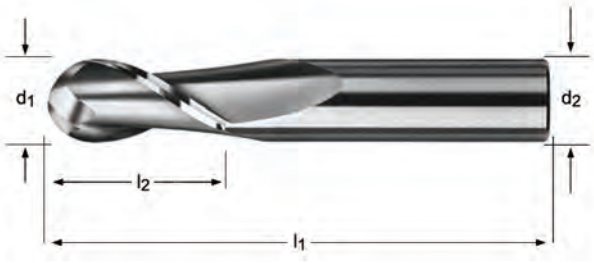


d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	EB3302M	EB3302MV
2.00	0.0787	3.0	6.0	38.0	2	1	001228	—
2.50	0.0984	3.0	6.0	38.0	2	1	001229	—
3.00	0.1181	3.0	12.0	38.0	2	1	001230	004402
4.00	0.1575	4.0	14.0	50.0	2	1	001232	004404
5.00	0.1969	5.0	16.0	50.0	2	1	001234	004406
6.00	0.2362	6.0	19.0	63.0	2	1	001235	004407
7.00	0.2756	8.0	19.0	63.0	2	1	001236	004408
8.00	0.3150	8.0	19.0	63.0	2	1	001237	004409
9.00	0.3543	10.0	22.0	70.0	2	1	001238	004410
10.00	0.3937	10.0	22.0	70.0	2	1	001239	004411
12.00	0.4724	12.0	25.0	75.0	2	1	001241	004413
16.00	0.6299	16.0	32.0	88.0	2	1	001243	—
20.00	0.7874	20.0	38.0	100.0	2	1	001245	—

Solid Carbide 2 Flute End Mill

Long Length, Ball Nose, 30° Helix

EB5302 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.





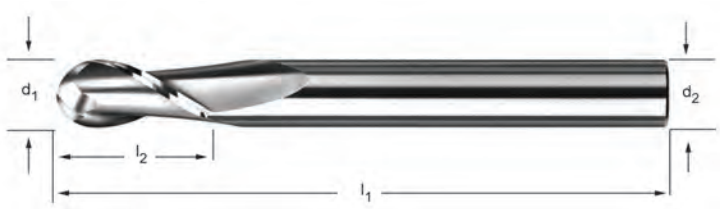
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB5302
1/8	0.1250	1/8	3/4	2“	2	1	000040
3/16	0.1875	3/16	3/4	2.1/2	2	1	000041
1/4	0.2500	1/4	1.1/8	3“	2	1	000042
5/16	0.3125	5/16	1.1/8	3“	2	1	000043
3/8	0.3750	3/8	1.1/8	3“	2	1	000044
1/2	0.5000	1/2	2“	4“	2	1	000046
5/8	0.6250	5/8	2.1/4	5“	2	1	000047

Solid Carbide 2 Flute End Mill

Extra Long Length, Ball Nose, 30° Helix

EB6302 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB6302V Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



	EB6302	EB6302V
	HM	HM
		AlTiN
	Z 2	Z 2
	1/8 - 1/2	1/8 - 1/2

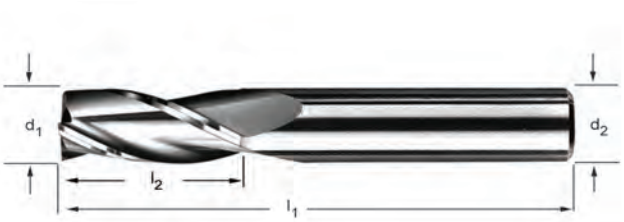
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB6302	EB6302V
1/8	0.1250	1/8	1“	3“	2	1	005400	003700
3/16	0.1875	3/16	1.1/8	3“	2	1	005401	003701
1/4	0.2500	1/4	1.1/2	4“	2	1	005402	003702
5/16	0.3125	5/16	1.5/8	4“	2	1	005403	003703
3/8	0.3750	3/8	1.3/4	4“	2	1	005404	003704
1/2	0.5000	1/2	3“	6“	2	1	005406	003706

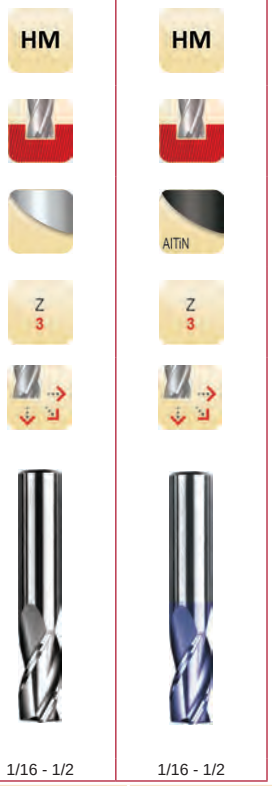
Solid Carbide 3 Flute End Mill

Regular Length, Square End, 30° Helix

E3303 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.

E3303V 3-flute design for less chatter. ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



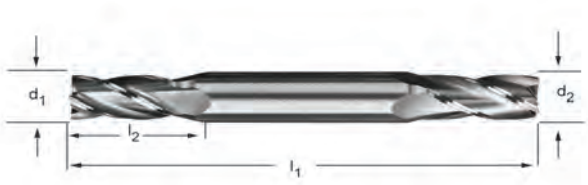


d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E3303	E3303V
1/16	0.0625	1/8	1/4	1.1/2	3	1	001050	002920
3/32	0.0938	1/8	3/8	1.1/2	3	1	001052	002921
1/8	0.1250	1/8	1/2	1.1/2	3	1	001054	002922
5/32	0.1562	3/16	9/16	2“	3	1	001056	002923
3/16	0.1875	3/16	5/8	2“	3	1	001058	002924
1/4	0.2500	1/4	3/4	2.1/2	3	1	001062	002926
5/16	0.3125	5/16	7/8	2.1/2	3	1	001066	002927
3/8	0.3750	3/8	7/8	2.1/2	3	1	001067	002928
1/2	0.5000	1/2	1“	3“	3	1	001069	002930

Solid Carbide 4 Flute End Mill

Square End, Double End , 30° Helix

E4304 **Regular Length**. Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E4304
1/8	0.1250	3/8	3/8	3“	4	1	002250
5/32	0.1562	3/8	7/16	3“	4	1	002251
3/16	0.1875	3/8	1/2	3“	4	1	002252
1/4	0.2500	3/8	5/8	3“	4	1	002254
5/16	0.3125	3/8	3/4	3.1/2	4	1	002256
3/8	0.3750	3/8	3/4	3.1/2	4	1	002258
1/2	0.5000	1/2	1“	4“	4	1	002260

Solid Carbide 4 Flute End Mill

Regular Length, Square End , 30° Helix

E3304 Bright finish improves chip flow in soft or non-ferrous materials.

E3304V ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



E3304	E3304V
HM	HM
	
	
Z 4	Z 4
	
	
1/16 - 1“	1/16 - 1“

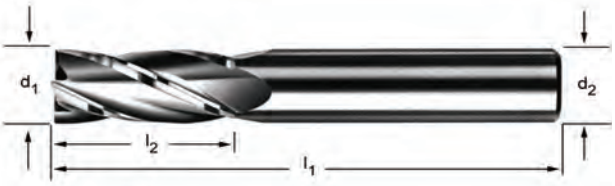
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E3304	E3304V
1/16	0.0625	1/8	1/4	1.1/2	4	1	001100	002690
5/64	0.0781	1/8	1/4	1.1/2	4	1	001101	002691
3/32	0.0938	1/8	3/8	1.1/2	4	1	001102	002692
7/64	0.1094	1/8	3/8	1.1/2	4	1	001103	002693
1/8	0.1250	1/8	1/2	1.1/2	4	1	001104	002694
9/64	0.1406	3/16	9/16	2“	4	1	001105	002695
5/32	0.1562	3/16	9/16	2“	4	1	001106	002696
11/64	0.1719	3/16	9/16	2“	4	1	001107	002697
3/16	0.1875	3/16	5/8	2“	4	1	001108	002698
13/64	0.2031	1/4	5/8	2.1/2	4	1	001109	002699
7/32	0.2188	1/4	5/8	2.1/2	4	1	001110	002700
1/4	0.2500	1/4	3/4	2.1/2	4	1	001112	002702
5/16	0.3125	5/16	7/8	2.1/2	4	1	001116	002703
3/8	0.3750	3/8	7/8	2.1/2	4	1	001117	002704
7/16	0.4375	7/16	1“	2.1/2	4	1	001118	002705
1/2	0.5000	1/2	1“	3“	4	1	001119	002706
9/16	0.5625	9/16	1.1/4	3.1/2	4	1	001120	002707
5/8	0.6250	5/8	1.1/4	3.1/2	4	1	001121	002708
11/16	0.6875	3/4	1.1/2	4“	4	1	001122	002709
3/4	0.7500	3/4	1.1/2	4“	4	1	001123	002710
7/8	0.8750	7/8	1.1/2	4“	4	1	001124	002711
1“	1.0000	1“	1.1/2	4“	4	1	001125	002712

Solid Carbide 4 Flute End Mill

Regular Length, Square End , 30° Helix

E3304M Bright finish improves chip flow in soft or non-ferrous materials.

E3304MV AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



E3304M	E3304MV
HM	HM
	AlTiN
Z 4	Z 4
2.00 - 25.00	2.00 - 20.00

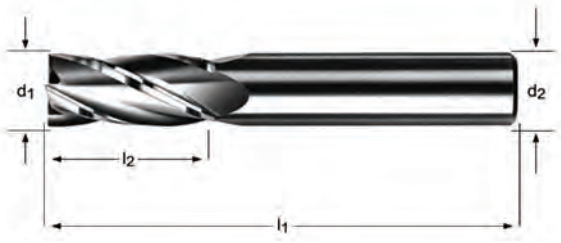
d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	E3304M	E3304MV
2.00	0.0787	3.0	6.0	38.0	4	1	001128	004325
2.50	0.0984	3.0	7.0	38.0	4	1	001129	004326
3.00	0.1181	3.0	12.0	38.0	4	1	001130	004327
3.50	0.1378	4.0	12.0	50.0	4	1	001131	004328
4.00	0.1575	4.0	14.0	50.0	4	1	001132	004329
4.50	0.1772	5.0	14.0	50.0	4	1	001133	004330
5.00	0.1969	5.0	16.0	50.0	4	1	001134	004331
6.00	0.2362	6.0	19.0	63.0	4	1	001135	004332
7.00	0.2756	8.0	19.0	63.0	4	1	001136	004333
8.00	0.3150	8.0	19.0	63.0	4	1	001137	004334
9.00	0.3543	10.0	22.0	70.0	4	1	001138	004335
10.00	0.3937	10.0	22.0	70.0	4	1	001139	004336
11.00	0.4331	11.0	25.0	70.0	4	1	001140	004337
12.00	0.4724	12.0	25.0	75.0	4	1	001141	004338
14.00	0.5512	14.0	30.0	88.0	4	1	001143	004339
16.00	0.6299	16.0	32.0	88.0	4	1	001144	004340
18.00	0.7087	18.0	36.0	100.0	4	1	001145	004341
20.00	0.7874	20.0	38.0	100.0	4	1	001146	004342
25.00	0.9843	25.0	38.0	100.0	4	1	001147	—

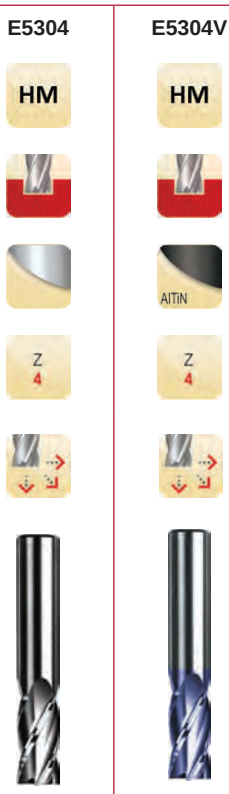
Solid Carbide 4 Flute End Mill

Long Length, Square End , 30° Helix

E5304 Bright finish improves chip flow in soft or non-ferrous materials.

E5304V AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E5304	E5304V
1/8	0.1250	1/8	3/4	2“	4	1	000020	000030
3/16	0.1875	3/16	3/4	2.1/2	4	1	000021	000031
1/4	0.2500	1/4	1.1/8	3“	4	1	000022	000032
5/16	0.3125	5/16	1.1/8	3“	4	1	000023	000033
3/8	0.3750	3/8	1.1/8	3“	4	1	000024	000034
7/16	0.4375	7/16	2“	4“	4	1	000025	000035
1/2	0.5000	1/2	2“	4“	4	1	000026	000036
5/8	0.6250	5/8	2.1/4	5“	4	1	000027	000037
3/4	0.7500	3/4	2.1/4	5“	4	1	000028	000038

Solid Carbide 4 Flute End Mill

Extra Long Length, Square End , 30° Helix

E6304 Bright finish improves chip flow in soft or non-ferrous materials.

E6304V AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



E6304	E6304V
HM	HM
	AlTiN
Z 4	Z 4
1/8 - 1“	1/8 - 1“

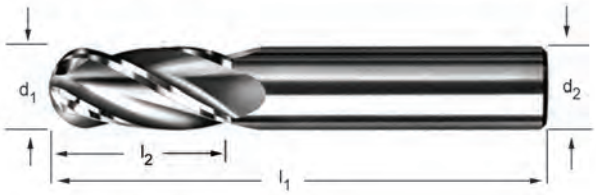
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	E6304	E6304V
1/8	0.1250	1/8	1“	3“	4	1	004900	003165
3/16	0.1875	3/16	1.1/8	3“	4	1	004901	003166
1/4	0.2500	1/4	1.1/2	4“	4	1	004902	003167
5/16	0.3125	5/16	1.5/8	4“	4	1	004903	003168
3/8	0.3750	3/8	1.3/4	4“	4	1	004904	003169
7/16	0.4375	7/16	3“	6“	4	1	004905	003170
1/2	0.5000	1/2	3“	6“	4	1	004906	003171
5/8	0.6250	5/8	3“	6“	4	1	004907	003172
3/4	0.7500	3/4	3“	6“	4	1	004908	003173
1“	1.0000	1“	3“	6“	4	1	004909	003174

Solid Carbide 4 Flute End Mill

Regular Length, Ball Nose , 30° Helix

EB3304 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB3304V Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



EB3304	EB3304V
HM	HM
	
	
Z 4	Z 4
	
	
1/16 - 3/4	1/16 - 3/4

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB3304	EB3304V
1/16	0.0625	1/8	1/4	1.1/2	4	1	001300	003070
3/32	0.0938	1/8	3/8	1.1/2	4	1	001302	003072
1/8	0.1250	1/8	1/2	1.1/2	4	1	001304	003074
5/32	0.1562	3/16	9/16	2“	4	1	001306	003076
3/16	0.1875	3/16	5/8	2“	4	1	001308	003078
1/4	0.2500	1/4	3/4	2.1/2	4	1	001312	003082
5/16	0.3125	5/16	7/8	2.1/2	4	1	001316	003083
3/8	0.3750	3/8	7/8	2.1/2	4	1	001317	003084
7/16	0.4375	7/16	1“	2.1/2	4	1	001318	003085
1/2	0.5000	1/2	1“	3“	4	1	001319	003086
5/8	0.6250	5/8	1.1/4	3.1/2	4	1	001321	003088
3/4	0.7500	3/4	1.1/2	4“	4	1	001323	003090

Solid Carbide 4 Flute End Mill

Regular Length, Ball Nose, 30° Helix

EB3304M Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB3304MV Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



	EB3304M	EB3304MV
	HM	HM
		AlTiN
	Z 4	Z 4
	2.00 - 12.00	2.00 - 12.00

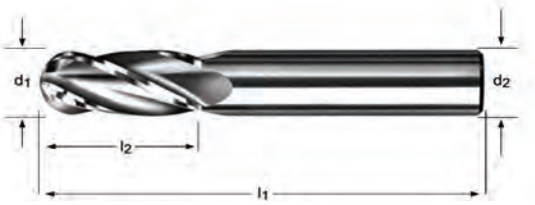
d_1 Ø mm	d_1 decimal Inch	d_2 Ø mm	l_2 mm	l_1 mm	# of Flutes	Pack Qty	EB3304M	EB3304MV
2.00	0.0787	3.0	6.0	38.0	4	1	001344	004750
3.00	0.1181	3.0	12.0	38.0	4	1	001342	004752
4.00	0.1575	4.0	14.0	50.0	4	1	001340	004754
4.50	0.1772	5.0	14.0	50.0	4	1	001339	—
5.00	0.1969	5.0	16.0	50.0	4	1	001338	004756
6.00	0.2362	6.0	19.0	63.0	4	1	001337	004757
8.00	0.3150	8.0	19.0	63.0	4	1	001335	004759
10.00	0.3937	10.0	22.0	70.0	4	1	001333	004761
11.00	0.4331	11.0	25.0	70.0	4	1	—	—
12.00	0.4724	12.0	25.0	75.0	4	1	001331	004763

Solid Carbide 4 Flute End Mill

Long Length, Ball Nose, 30° Helix

EB5304 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB5304V Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.





d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB5304	EB5304V
1/4	0.2500	1/4	1.1/8	3“	4	1	000062	000072
3/8	0.3750	3/8	1.1/8	3“	4	1	000064	000074
1/2	0.5000	1/2	2“	4“	4	1	000066	000076
5/8	0.6250	5/8	2.1/4	5“	4	1	000067	000077

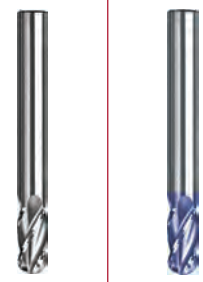
Solid Carbide 4 Flute End Mill

Extra Long Length, Ball Nose, 30° Helix

EB6304 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

EB6304V Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



EB6304	EB6304V
HM	HM
	AlTiN
Z 4	Z 4
	
1/8 - 5/8	1/8 - 5/8

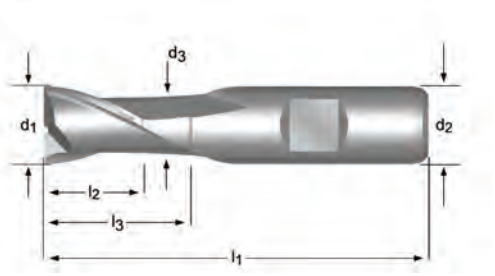
d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	EB6304	EB6304V
1/8	0.1250	1/8	1“	3“	4	1	005700	003745
3/16	0.1875	3/16	1.1/8	3“	4	1	005701	003746
1/4	0.2500	1/4	1.1/2	4“	4	1	005702	003747
5/16	0.3125	5/16	1.5/8	4“	4	1	005703	003748
3/8	0.3750	3/8	1.3/4	4“	4	1	005704	003749
1/2	0.5000	1/2	3“	6“	4	1	005706	003751
5/8	0.6250	5/8	3“	6“	4	1	005707	003752

HSS-PM 2 Flute End Mill

DORMER

Stub Length, Square End, Weldon Shank, 30° Helix

C110 Powdered Metal. P9 slotting tolerance.



C110











1.00 - 50.00

d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C110	
	1.00	6	2.5	47	2	-	-	1	0353165	
	1.50	6	3	47	2	-	-	1	0353172	
1/16	1.59	6	3	47	2	-	-	1	0639795	
	1.80	6	4	48	2	-	-	1	0353189	
	2.00	6	4	48	2	-	-	1	0353301	
3/32	2.38	6	5	49	2	-	-	1	0639801	
	2.50	6	5	49	2	-	-	1	0353318	
	2.80	6	5	49	2	-	-	1	0353325	
	3.00	6	5	49	2	-	-	1	0353370	
1/8	3.18	6	6	50	2	-	-	1	0639818	
	3.50	6	6	50	2	-	-	1	0353387	
	3.80	6	7	51	2	-	-	1	0353394	
	4.00	6	7	51	2	-	-	1	0353424	
	4.50	6	7	51	2	-	-	1	0353431	
3/16	4.76	6	8	52	2	-	-	1	0639825	
	4.80	6	8	52	2	-	-	1	0353448	1)2)
	5.00	6	8	52	2	-	-	1	0353455	
	5.50	6	8	52	2	-	-	1	0353462	
	5.75	6	8	52	2	-	-	1	0353479	1)2)
	6.00	6	8	52	2	-	-	1	0353486	
1/4	6.35	10	10	60	2	-	-	1	0639832	
	6.50	10	10	60	2	-	-	1	0353493	
	6.75	10	10	60	2	-	-	1	0629031	
	7.00	10	10	60	2	-	-	1	0353509	
	7.50	10	10	60	2	-	-	1	0353516	
	7.75	10	11	61	2	-	-	1	0573495	1)2)
5/16	7.94	10	11	61	2	-	-	1	0639849	
	8.00	10	11	61	2	-	-	1	0353523	
	8.50	10	11	61	2	-	-	1	0353530	
	9.00	10	11	61	2	-	-	1	0353547	

[1] Diameter tolerance h10
[2] Slot not in P9 tolerance
[3] Available in HSCo only

HSS-PM 2 Flute End Mill

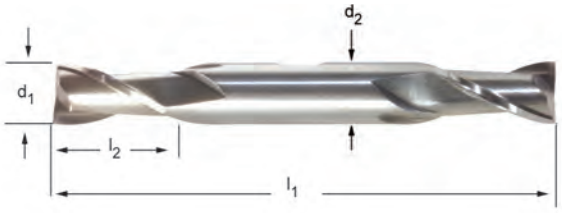
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C110	
	9.50	10	11	61	2	-	-	1	0353554	
3/8	9.52	10	13	63	2	22.5	9.5	1	0639856	
	9.70	10	13	63	2	22.5	9.5	1	0573501	1)2)
	10.00	10	13	63	2	22.5	9.5	1	0353196	
13/32	10.32	12	13	70	2	-	-	1	0639863	
	10.50	12	13	70	2	-	-	1	0353202	
	11.00	12	13	70	2	-	-	1	0353219	
7/16	11.11	12	13	70	2	-	-	1	0639870	
	11.50	12	13	70	2	-	-	1	0573433	
	11.70	12	16	73	2	27.5	11.5	1	0573440	1)2)
	12.00	12	16	73	2	27.5	11.5	1	0353226	
	12.50	12	16	73	2	27.5	11.5	1	0573457	
1/2	12.70	12	16	73	2	27.5	11.5	1	0639887	
	13.00	12	16	73	2	27.5	11.5	1	0353233	
17/32	13.49	12	16	73	2	27.5	11.5	1	0639894	
	13.70	12	16	73	2	27.5	11.5	1	0573464	1)2)
	14.00	12	16	73	2	27.5	11.5	1	0353240	
9/16	14.29	12	16	73	2	27.5	11.5	1	0639900	
	15.00	12	16	73	2	27.5	11.5	1	0353257	
	15.70	16	19	79	2	30.5	15.5	1	0573471	1)2)
5/8	15.88	16	19	79	2	30.5	15.5	1	0639917	
	16.00	16	19	79	2	30.5	15.5	1	0353264	
	17.00	16	19	79	2	30.5	15.5	1	0353271	
11/16	17.46	16	19	79	2	30.5	15.5	1	0639924	
	17.70	16	19	79	2	30.5	15.5	1	0628942	
	18.00	16	19	79	2	30.5	15.5	1	0353288	
	19.00	16	19	79	2	30.5	15.5	1	0353295	
3/4	19.05	20	22	88	2	37.5	18.5	1	0639931	
	19.70	20	22	88	2	37.5	19.5	1	0628959	
	20.00	20	22	88	2	37.5	19.5	1	0353332	
	21.70	20	22	88	2	37.5	19.5	1	0628966	
	22.00	20	22	88	2	37.5	19.5	1	0353349	
7/8	22.22	20	22	88	2	37.5	19.5	1	0639948	
	24.00	25	26	102	2	45.5	23.5	1	0573488	
	24.70	25	26	102	2	45.5	24.5	1	0628973	
	25.00	25	26	102	2	45.5	24.5	1	0353356	
1“	25.40	25	26	102	2	45.5	24.5	1	0621929	
	26.00	25	26	102	2	45.5	24.5	1	0628980	
	28.00	25	26	102	2	45.5	24.5	1	0353363	
1.1/8	28.58	25	26	102	2	45.5	24.5	1	0639962	
	30.00	25	26	102	2	45.5	24.5	1	0353400	
1.1/4	31.75	32	32	112	2	51.5	31.5	1	0639979	
	32.00	32	32	112	2	51.5	31.5	1	0353417	
	35.00	32	32	112	2	51.5	31.5	1	0639986	1)3)
	36.00	32	32	112	2	51.5	31.5	1	0628997	1)3)
	40.00	40	38	130	2	59.5	39.0	1	0629000	1)3)
	45.00	40	38	130	2	59.5	38.0	1	0629017	1)3)
	50.00	50	45	147	2	66.5	48.0	1	0629024	1)3)

[1] Diameter tolerance h10
[2] Slot not in P9 tolerance
[3] Available in HSCo only

HSS 2 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

923 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.





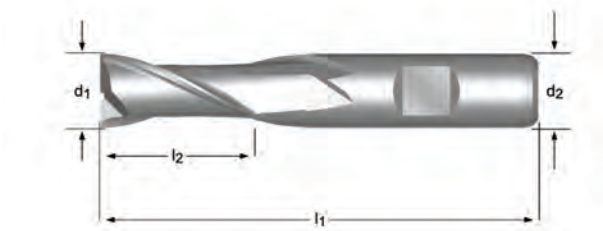
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	923
1/8	0.1250	3/8	3.1/16	3/8	2	1	5110364
5/32	0.1562	7/16	3.1/8	3/8	2	1	5110365
3/16	0.1875	7/16	3.1/4	3/8	2	1	5110366
1/4	0.2500	1/2	3.3/8	3/8	2	1	5110368
9/32	0.2812	9/16	3.3/8	3/8	2	1	5110369
5/16	0.3125	9/16	3.1/2	3/8	2	1	5110370
3/8	0.3750	9/16	3.1/2	3/8	2	1	5110372
13/32	0.4062	13/16	4.1/8	1/2	2	1	5110373
7/16	0.4375	13/16	4.1/8	1/2	2	1	5110374
1/2	0.5000	13/16	4.1/8	1/2	2	1	5110376
5/8	0.6250	1.1/8	5“	5/8	2	1	5110378
3/4	0.7500	1.5/16	5.5/8	3/4	2	1	5110380

UNION BUTTERFIELD

HSS 2 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

920 Bright finish improves chip flow in soft or non-ferrous materials.



920











1/8 - 1/2

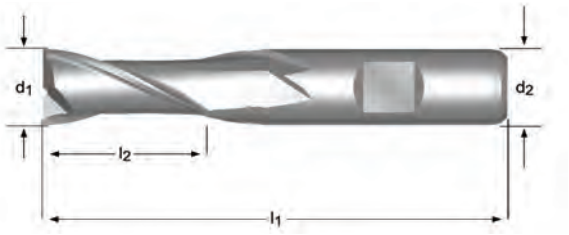
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	920
1/8	0.1250	3/8	2.5/16	3/8	2	1	5110302
3/16	0.1875	7/16	2.3/8	3/8	2	1	5110303
1/4	0.2500	1/2	2.7/16	3/8	2	1	5110304
5/16	0.3125	9/16	2.1/2	3/8	2	1	5110305
3/8	0.3750	9/16	2.1/2	3/8	2	1	5110306
7/16	0.4375	13/16	2.11/16	3/8	2	1	5110307
1/2	0.5000	13/16	2.11/16	3/8	2	1	5110308
1/2	0.5000	1“	3.1/4	1/2	2	1	5110309
9/16	0.5625	1.1/8	3.3/8	1/2	2	1	5110310
5/8	0.6250	1.1/8	3.3/8	1/2	2	1	5110311
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	5110314
11/16	0.6875	1.5/16	3.5/8	1/2	2	1	5110312
11/16	0.6875	1.5/16	3.3/4	5/8	2	1	5110315
3/4	0.7500	1.5/16	3.5/8	1/2	2	1	5110313
3/4	0.7500	1.5/16	3.3/4	5/8	2	1	5110316
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	5110708
13/16	0.8125	1.1/2	4“	5/8	2	1	5110317
7/8	0.8750	1.1/2	4“	5/8	2	1	5110318
7/8	0.8750	1.1/2	4.1/8	3/4	2	1	5110709
7/8	0.8750	1.1/2	4.1/8	7/8	2	1	5110321
15/16	0.9375	1.1/2	4“	5/8	2	1	5110319
1“	1.0000	1.1/2	4“	5/8	2	1	5110320
1“	1.0000	1.1/2	4.1/8	3/4	2	1	5110710
1“	1.0000	1.1/2	4.1/8	7/8	2	1	5110323
1“	1.0000	1.5/8	4.1/2	1“	2	1	5110326
1.1/8	1.1250	1.5/8	4.1/4	3/4	2	1	5111714
1.1/8	1.1250	1.5/8	4.1/2	1“	2	1	5110327
1.1/4	1.2500	1.5/8	4.1/2	1“	2	1	5110328
1.1/4	1.2500	1.5/8	4.1/2	1.1/4	2	1	5110331
1.1/2	1.5000	1.5/8	4.1/4	3/4	2	1	5111717
1.1/2	1.5000	1.5/8	4.1/2	1“	2	1	5110330
1.1/2	1.5000	1.5/8	4.1/2	1.1/4	2	1	5110332

HSS 2 Flute End Mill

Regular Length, Square End, Keyway, Weldon Shank, 30° Helix

920K

Keyway cutter, close tolerance (+0.0000”/-0.0015”). Bright finish improves chip flow in soft or non-ferrous materials.





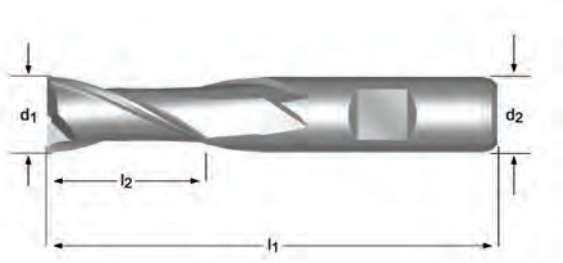
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	920K
1/8	0.1250	3/8	2.5/16	3/8	2	1	5110715
3/16	0.1875	7/16	2.3/8	3/8	2	1	5110716
1/4	0.2500	1/2	2.7/16	3/8	2	1	5110717
5/16	0.3125	9/16	2.1/2	3/8	2	1	5110718
3/8	0.3750	9/16	2.1/2	3/8	2	1	5110719
1/2	0.5000	1“	3.1/4	1/2	2	1	5110720
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	5110721
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	5110722
7/8	0.8750	1.1/2	4.1/8	7/8	2	1	5110723
1“	1.0000	1.5/8	4.1/2	1“	2	1	5110724

UNION BUTTERFIELD

Cobalt 2 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

963 Bright finish improves chip flow in soft or non-ferrous materials.



963











1/8 - 1“

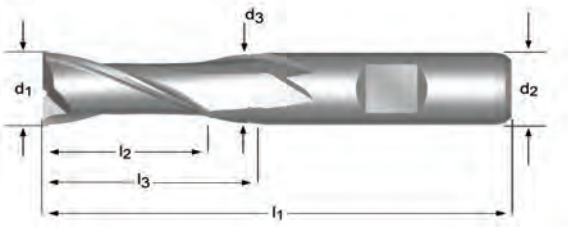
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	963
1/8	0.1250	3/8	2.5/16	3/8	2	1	5110633
3/16	0.1875	7/16	2.3/8	3/8	2	1	5110634
1/4	0.2500	1/2	2.7/16	3/8	2	1	5110635
5/16	0.3125	9/16	2.1/2	3/8	2	1	5110636
3/8	0.3750	9/16	2.1/2	3/8	2	1	5110637
1/2	0.5000	1“	3.1/4	1/2	2	1	5110638
5/8	0.6250	1.5/16	3.3/4	5/8	2	1	5110639
3/4	0.7500	1.5/16	3.7/8	3/4	2	1	5110640
1“	1.0000	1.5/8	4.1/2	1“	2	1	5110641

HSS-PM 2 Flute End Mill

DORMER

Regular Length, Square End, Weldon Shank, 30° Helix

C123 Powdered Metal. P9 slotting tolerance.



C123











1/16 - 40.00

d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C123	
1/16	1.59	6	7	51	2	—	—	1	0640012	1)
	2.00	6	7	51	2	—	—	1	0353646	
	2.50	6	8	52	2	—	—	1	0353653	
	3.00	6	8	52	2	—	—	1	0353714	
1/8	3.18	6	10	54	2	—	—	1	0640029	1)
	3.50	6	10	54	2	—	—	1	0353721	
5/32	3.97	6	11	55	2	—	—	1	0640036	1)
	4.00	6	11	55	2	—	—	1	0353769	
	4.50	6	11	55	2	—	—	1	0353776	
3/16	4.76	6	13	57	2	—	—	1	0640043	1)
	5.00	6	13	57	2	—	—	1	0353790	
	5.50	6	13	57	2	—	—	1	0353806	
	6.00	6	13	57	2	—	—	1	0353813	
1/4	6.35	10	16	66	2	—	—	1	0640050	1)
	6.50	10	16	66	2	—	—	1	0353820	
	7.00	10	16	66	2	—	—	1	0353837	
	7.50	10	16	66	2	—	—	1	0353844	
5/16	7.94	10	19	69	2	—	—	1	0640067	1)
	8.00	10	19	69	2	—	—	1	0353851	
	8.50	10	19	69	2	—	—	1	0353868	
	9.00	10	19	69	2	—	—	1	0353875	
	9.50	10	19	69	2	—	—	1	0353882	
3/8	9.52	10	22	72	2	31.5	9.5	1	0640074	1)
	10.00	10	22	72	2	31.5	9.5	1	0353561	
	11.00	12	22	79	2	—	—	1	0353578	
	12.00	12	26	83	2	37.5	11.5	1	0353585	
1/2	12.70	12	26	83	2	37.5	11.5	1	0640081	1)
	13.00	12	26	83	2	37.5	11.5	1	0353592	
	14.00	12	26	83	2	37.5	11.5	1	0353608	
9/16	14.29	12	26	83	2	37.5	11.5	1	0640098	1)

[1] Diameter tolerance -.0005 inches / -.0013 inches
[2] Diameter tolerance -.0005 inches / -.0015 inches
[3] Available in HSCo only

HSS-PM 2 Flute End Mill

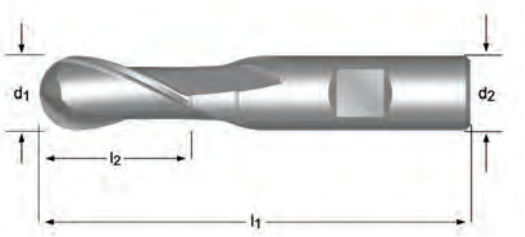
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C123	
	15.00	12	26	83	2	37.5	11.5	1	0353615	
5/8	15.88	16	32	92	2	43.5	15.5	1	0640104	1)
	16.00	16	32	92	2	43.5	15.5	1	0353622	
	18.00	16	32	92	2	43.5	15.5	1	0353639	
3/4	19.05	20	38	104	2	53.5	18.5	1	0640111	2)
	20.00	20	38	104	2	53.5	19.5	1	0353660	
	22.00	20	38	104	2	53.5	19.5	1	0353677	
	25.00	25	45	121	2	64.5	24.5	1	0353691	
1“	25.40	25	45	121	2	64.5	24.5	1	0640128	
	30.00	25	45	121	2	64.5	24.5	1	0353738	
	32.00	32	53	133	2	72.5	31.5	1	0353745	
	36.00	32	53	133	2	72.5	31.5	1	0353752	3)
	40.00	40	63	155	2	84.5	39.0	1	0353783	3)

[1] Diameter tolerance -.0005 inches / -.0013 inches
[2] Diameter tolerance -.0005 inches / -.0015 inches
[3] Available in HSCo only

HSS 2 Flute End Mill

Regular Length, Ball Nose, Weldon Shank, 30° Helix

905 Ball nose for cutting internal radius. Bright finish improves chip flow in soft or non-ferrous materials.





1/8 - 3/4

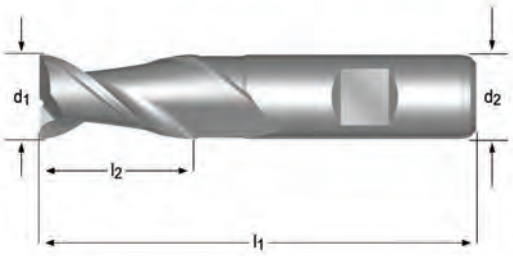
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 mm	d_2 Ø Inch	# of Flutes	Pack Qty	905
1/8	0.1250	3/8	2.5/16	3/8	2	1	5110390
3/16	0.1875	1/2	2.3/8	3/8	2	1	5110391
1/4	0.2500	5/8	2.7/16	3/8	2	1	5110392
5/16	0.3125	3/4	2.1/2	3/8	2	1	5110393
3/8	0.3750	3/4	2.1/2	3/8	2	1	5110394
7/16	0.4375	1“	3.1/4	1/2	2	1	5110395
1/2	0.5000	1“	3.1/4	1/2	2	1	5110396
9/16	0.5625	1.1/8	3.3/8	1/2	2	1	5110700
5/8	0.6250	1.1/8	3.3/8	1/2	2	1	5110701
3/4	0.7500	1.5/16	3.5/8	1/2	2	1	5110702

UNION BUTTERFIELD

HSS 2 Flute End Mill

Regular Length, Square End, Weldon Shank, 37° Helix

980 High Helix design for aluminum and other non-ferrous materials.



980

HSS

Z 2



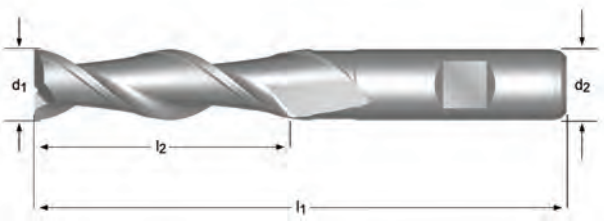
1/4 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	980
1/4	0.2500	5/8	2.7/16	3/8	2	1	5110602
5/16	0.3125	3/4	2.1/2	3/8	2	1	5110603
3/8	0.3750	3/4	2.1/2	3/8	2	1	5110604
1/2	0.5000	1.1/4	3.1/4	1/2	2	1	5110606
3/4	0.7500	1.5/8	3.7/8	3/4	2	1	5110608
1“	1.0000	2“	4.1/2	1“	2	1	5110609

HSS 2 Flute End Mill

Long Length, Square End, Weldon Shank, 37° Helix

981 High Helix design for aluminum and other non-ferrous materials.





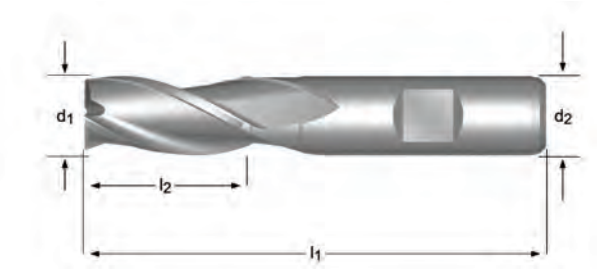
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	981
1/4	0.2500	1.1/4	3.1/16	3/8	2	1	5110613
5/16	0.3125	1.3/8	3.1/8	3/8	2	1	5110614
3/8	0.3750	1.1/2	3.1/4	3/8	2	1	5110615
1/2	0.5000	2“	4“	1/2	2	1	5110617
3/4	0.7500	3“	5.1/4	3/4	2	1	5110619

UNION BUTTERFIELD

HSS 3 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

930 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.





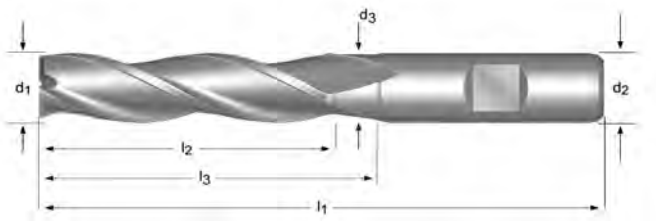
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	930
1/8	0.1250	3/8	2.5/16	3/8	3	1	5110221
3/16	0.1875	1/2	2.3/8	3/8	3	1	5110222
1/4	0.2500	5/8	2.7/16	3/8	3	1	5110223
5/16	0.3125	3/4	2.1/2	3/8	3	1	5110224
3/8	0.3750	3/4	2.1/2	3/8	3	1	5110225
7/16	0.4375	1“	2.11/16	3/8	3	1	5110226
1/2	0.5000	1.1/4	3.1/4	1/2	3	1	5110228
9/16	0.5625	1.3/8	3.3/8	1/2	3	1	5110229
5/8	0.6250	1.5/8	3.3/4	5/8	3	1	5110232
3/4	0.7500	1.5/8	3.3/4	5/8	3	1	5110233
3/4	0.7500	1.5/8	3.7/8	3/4	3	1	5110696
1“	1.0000	1.7/8	4“	5/8	3	1	5110235
1“	1.0000	2“	4.1/2	1“	3	1	5110237

Cobalt 3 Flute End Mill

DORMER

Long Length, Square End, Weldon Shank, 30° Helix

C346 P9 slotting tolerance. 3 flute design provides less chatter.



C346

HSS-E

P9

Z 3



3.00 - 20.00

d_1 Ø mm	d_2 Øh$_6$ mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C346
3.00	6	12	56	3	-	-	1	0122297
4.00	6	19	63	3	-	-	1	0122303
5.00	6	24	68	3	-	-	1	0122310
6.00	6	24	68	3	-	-	1	0122327
7.00	10	30	80	3	-	-	1	0126325
8.00	10	38	88	3	-	-	1	0126332
9.00	10	38	88	3	-	-	1	0126349
10.00	10	45	95	3	-	-	1	0126233
11.00	12	45	102	3	-	-	1	0126240
12.00	12	53	110	3	-	-	1	0126257
13.00	12	53	110	3	64.5	11.5	1	0126264
14.00	12	53	110	3	64.5	11.5	1	0126271
15.00	12	53	110	3	64.5	11.5	1	0126288
16.00	16	63	123	3	74.5	15.5	1	0126295
18.00	16	63	123	3	74.5	15.5	1	0126301
20.00	20	75	141	3	90.5	19.5	1	0126318

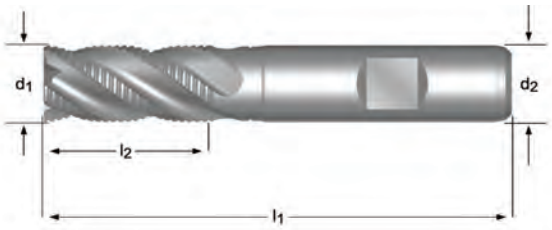
UNION BUTTERFIELD

Cobalt 4 Flute End Mill

Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

9002 Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.

TC9002 TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.



	9002	TC9002
	HSS-E	HSS-E
		TiCN
	Z 4-8	Z 4-8
	1/4 - 1“	1/4 - 1“

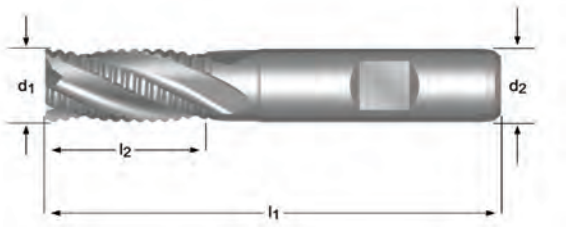
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	9002	TC9002
1/4	0.2500	5/8	2.7/16	3/8	4	1	5210014	5270014
5/16	0.3125	3/4	2.1/2	3/8	4	1	5210015	5270015
3/8	0.3750	3/4	2.1/2	3/8	4	1	5210016	5270016
7/16	0.4375	1.1/4	3.1/4	1/2	4	1	5210017	5270017
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	5210018	5270018
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	5210019	—
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	5210020	5270020
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	5210021	5270021
7/8	0.8750	1.7/8	4.1/8	3/4	5	1	5210022	—
1“	1.0000	2“	4.1/2	1“	5	1	5210023	5270023

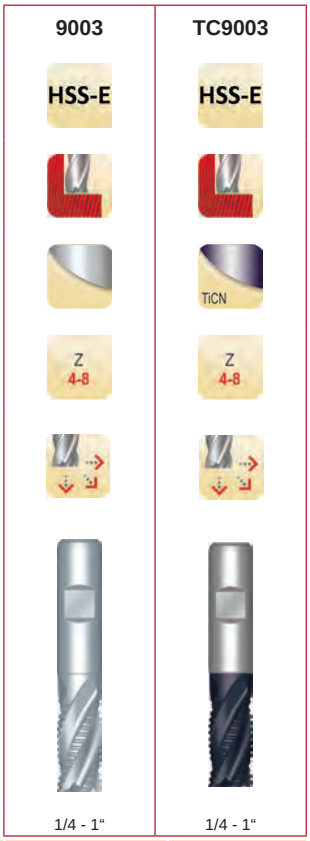
Cobalt Multi-Flute End Mill

Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

9003 Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.

TC9003 TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.





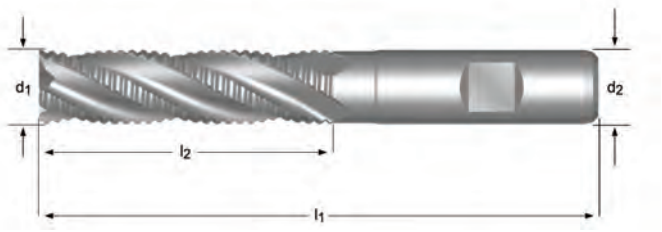
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	9003	TC9003
1/4	0.2500	5/8	2.7/16	3/8	4	1	5210028	5270028
5/16	0.3125	3/4	2.1/2	3/8	4	1	5210029	5270029
3/8	0.3750	3/4	2.1/2	3/8	4	1	5210030	5270030
7/16	0.4375	1.1/4	3.1/4	1/2	4	1	5210031	5270031
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	5210032	5270032
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	5210033	—
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	5210034	5270034
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	5210035	5270035
7/8	0.8750	1.7/8	4.1/8	3/4	5	1	5210036	5270036
1“	1.0000	2“	4.1/2	1“	5	1	5210037	5270037

UNION BUTTERFIELD

Cobalt 4 Flute End Mill

Long Length, Square End, Roughing, Weldon Shank, 30° Helix

9009 Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.



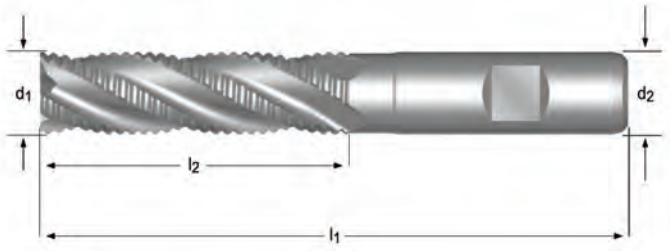


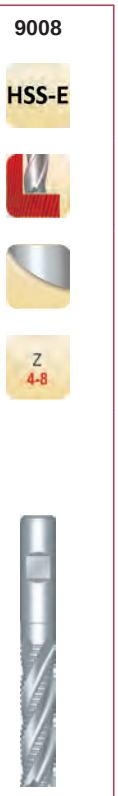
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	9009
1/4	0.2500	1.1/4	3.1/8	3/8	4	1	5210089
3/8	0.3750	1.1/2	3.1/4	3/8	4	1	5210090
1/2	0.5000	2“	4“	1/2	4	1	5210091
5/8	0.6250	2.1/2	4.5/8	5/8	4	1	5210092
3/4	0.7500	3“	5.1/4	3/4	4	1	5210093
7/8	0.8750	3.1/2	5.3/4	3/4	6	1	5210094
1“	1.0000	4“	6.1/2	1“	5	1	5210095

Cobalt 4 Flute End Mill

Long Length, Square End, Roughing, Weldon Shank, 30° Helix

9008 Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.



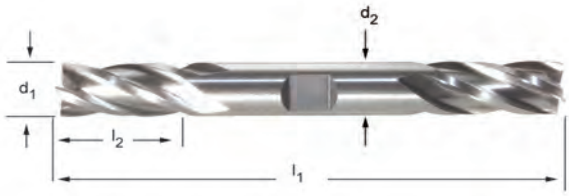


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	9008
1/4	0.2500	1.1/4	3.1/8	3/8	4	1	5210078
3/8	0.3750	1.1/2	3.1/4	3/8	4	1	5210079
1/2	0.5000	2“	4“	1/2	4	1	5210080
3/4	0.7500	3“	5.1/4	3/4	4	1	5210082

HSS 4 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

948 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.



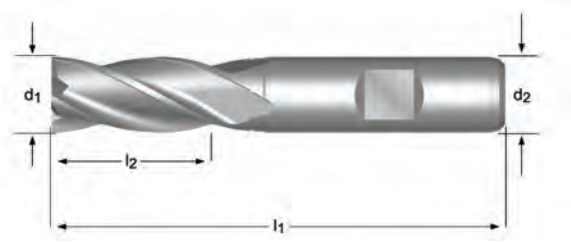


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	948
1/8	0.1250	3/8	3.1/16	3/8	4	1	5110162
3/16	0.1875	1/2	3.1/4	3/8	4	1	5110163
1/4	0.2500	5/8	3.3/8	3/8	4	1	5110164
5/16	0.3125	3/4	3.1/2	3/8	4	1	5110165
3/8	0.3750	3/4	3.1/2	3/8	4	1	5110166
1/2	0.5000	1“	4.1/8	1/2	4	1	5110167
5/8	0.6250	1.3/8	5“	5/8	4	1	5110168
3/4	0.7500	1.5/8	5.5/8	3/4	4	1	5110169

HSS 4 Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

945 Bright finish improves chip flow in soft or non-ferrous materials.



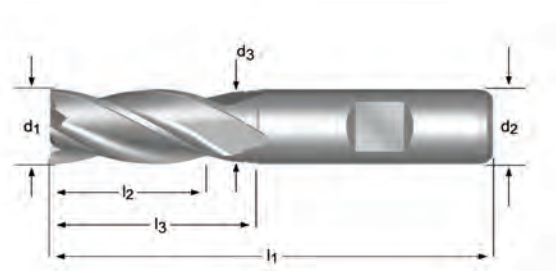


d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	945
1/8	0.1250	3/8	2.5/16	3/8	4	1	5110071
3/16	0.1875	1/2	2.3/8	3/8	4	1	5110072
1/4	0.2500	5/8	2.7/16	3/8	4	1	5110073
5/16	0.3125	3/4	2.1/2	3/8	4	1	5110074
3/8	0.3750	3/4	2.1/2	3/8	4	1	5110075
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	5110076
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	5110077
11/16	0.6875	1.5/8	3.3/4	5/8	4	1	5110078
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	5110079
7/8	0.8750	1.7/8	4.1/8	7/8	4	1	5110080
1“	1.0000	2“	4.1/2	1“	4	1	5110081

HSS-PM Multi-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

C247 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.





d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C247	
	2.00	6	7	51	4	—	—	1	0354667	
	2.50	6	8	52	4	—	—	1	0354674	
	3.00	6	8	52	4	—	—	1	0354728	
1/8	3.18	6	10	54	4	—	—	1	0640142	1)
	3.50	6	10	54	4	—	—	1	0354735	
	4.00	6	11	55	4	—	—	1	0354766	
	4.50	6	11	55	4	—	—	1	0354773	
3/16	4.76	6	13	57	4	—	—	1	0640159	1)
	5.00	6	13	57	4	—	—	1	0354780	
	5.50	6	13	57	4	—	—	1	0354797	
	6.00	6	13	57	4	—	—	1	0354803	
1/4	6.35	10	16	66	4	—	—	1	0640166	1)
	6.50	10	16	66	4	—	—	1	0354810	
	7.00	10	16	66	4	—	—	1	0354827	
	7.50	10	16	66	4	—	—	1	0354834	
5/16	7.94	10	19	69	4	—	—	1	0640173	1)
	8.00	10	19	69	4	—	—	1	0354841	
	8.50	10	19	69	4	—	—	1	0354858	
	9.00	10	19	69	4	—	—	1	0354865	
	9.50	10	19	69	4	—	—	1	0354872	
3/8	9.52	10	22	72	4	31.5	9.5	1	0640180	1)
	10.00	10	22	72	4	31.5	9.5	1	0354582	
	11.00	12	22	79	4	—	—	1	0354599	
	12.00	12	26	83	4	37.5	11.5	1	0354605	
1/2	12.70	12	26	83	4	37.5	11.5	1	0640197	1)
	13.00	12	26	83	4	37.5	11.5	1	0354612	
	14.00	12	26	83	4	37.5	11.5	1	0354629	
9/16	14.29	12	26	83	4	37.5	11.5	1	0640203	1)
	15.00	12	26	83	4	37.5	11.5	1	0354636	
5/8	15.88	16	32	92	4	43.5	15.5	1	0640210	1)

[1] Diameter tolerance +.0025 inches / -.0005 inches
[2] Not center Cutting
[3] Available in HSCo only

HSS-PM 4 Flute End Mill

DORMER

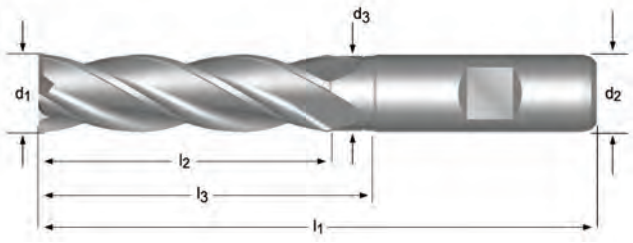
d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C247	
	16.00	16	32	92	4	43.5	15.5	1	0354643	
	17.00	16	32	92	4	43.5	15.5	1	0609316	
	18.00	16	32	92	4	43.5	15.5	1	0354650	
	19.00	16	32	92	4	43.5	15.5	1	0609323	
3/4	19.05	20	38	104	4	53.5	18.5	1	0640227	1)
	20.00	20	38	104	4	53.5	19.5	1	0354681	
	21.00	20	38	104	4	53.5	19.5	1	0609330	
	22.00	20	38	104	5	53.5	19.5	1	0354698	
7/8	22.22	20	38	104	5	53.5	19.5	1	0640234	1)
	23.00	20	38	104	5	53.5	19.5	1	0609347	
	24.00	25	45	121	5	64.5	23.5	1	0609354	
	25.00	25	45	121	5	64.5	24.5	1	0354704	
1“	25.40	25	45	121	5	64.5	24.5	1	0640241	1)
	26.00	25	45	121	6	64.5	24.5	1	0609361	
	28.00	25	45	121	6	64.5	24.5	1	0354711	
	30.00	25	45	121	6	64.5	24.5	1	0354742	
	32.00	32	53	133	6	72.5	31.5	1	0354759	
	36.00	32	53	133	6	72.5	31.5	1	0609378	2)3)
	40.00	40	63	155	6	84.5	39.0	1	0609385	2)3)
	50.00	50	75	177	8	96.5	48.0	1	0640258	2)3)

1) Diameter tolerance +.0025 inches / -.0005 inches
2) Not center Cutting
3) Available in HSCo only

HSS-PM Multi-Flute End Mill

Long Length, Square End, Weldon Shank

C273 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.





d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C273	
	2.00	6	10	54	4	—	—	1	0354964	
	2.50	6	12	56	4	—	—	1	0354971	
	3.00	6	12	56	4	—	—	1	0355022	
1/8	3.18	6	15	59	4	—	—	1	0640265	1)
	3.50	6	15	59	4	—	—	1	0355039	
	4.00	6	19	63	4	—	—	1	0355060	
	4.50	6	19	63	4	—	—	1	0355077	
3/16	4.76	6	24	68	4	—	—	1	0640272	1)
	5.00	6	24	68	4	—	—	1	0355084	
	5.50	6	24	68	4	—	—	1	0355091	
	6.00	6	24	68	4	—	—	1	0355107	
1/4	6.35	10	30	80	4	—	—	1	0640289	1)
	7.00	10	30	80	4	—	—	1	0355114	
	8.00	10	38	88	4	—	—	1	0355121	
	9.00	10	38	88	4	—	—	1	0355138	
3/8	9.52	10	45	95	4	54.5	9.5	1	0640296	1)
	10.00	10	45	95	4	54.5	9.5	1	0354889	
	11.00	12	45	102	4	—	—	1	0354896	
	12.00	12	53	110	4	64.5	11.5	1	0354902	
1/2	12.70	12	53	110	4	64.5	11.5	1	0640302	1)
	13.00	12	53	110	4	64.5	11.5	1	0354919	
	14.00	12	53	110	4	64.5	11.5	1	0354926	
	15.00	12	53	110	4	64.5	11.5	1	0354933	
5/8	15.88	16	63	123	4	74.5	15.5	1	0640319	1)
	16.00	16	63	123	4	74.5	15.5	1	0354940	
	18.00	16	63	123	4	74.5	15.5	1	0354957	
3/4	19.05	20	75	141	4	90.5	18.5	1	0640326	1)
	20.00	20	75	141	4	90.5	19.5	1	0354988	
	22.00	20	75	141	5	90.5	19.5	1	0354995	
	25.00	25	90	166	5	109.5	24.5	1	0355008	

[1] Diameter tolerance +.0025 inches / -.0005 inches
[2] Available in HSCo only
[3] Not Center Cutting

HSS-PM 4 Flute End Mill

DORMER

d_1 Ø Inch	d_1 Ø mm	d_2 Øh_6 mm	l_2 mm	l_1 mm	# of Flutes	l_3 mm	d_3 Ø mm	Pack Qty	C273	
1“	25.40	25	90	166	5	109.5	24.5	1	0640340	1)
	28.00	25	90	166	6	109.5	24.5	1	0355015	
	30.00	25	90	166	6	109.5	24.5	1	0355046	
	32.00	32	106	186	6	125.5	31.5	1	0355053	
	40.00	40	125	217	6	146.5	39.0	1	0609309	2)3)

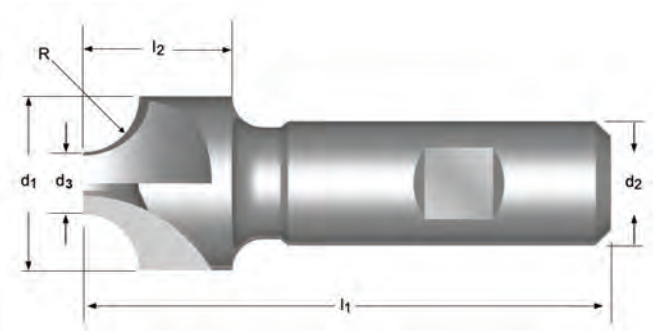
1) Diameter tolerance +.0025 inches / -.0005 inches
2) Available in HSCo only
3) Not Center Cutting

UNION BUTTERFIELD

HSS 4 Flute End Mill

Regular Length, Inverse Radius, Corner Rounding, Weldon Shank

883 Corner rounding for cutting external radius on part. Bright finish improves chip flow in soft or non-ferrous materials.



883

HSS

Z 4



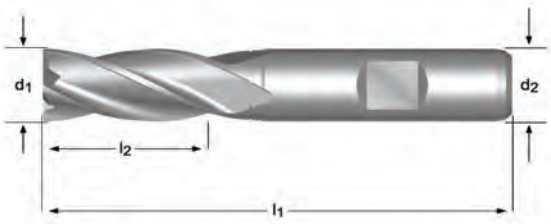
1/16 - 1/2

r Inch	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	883
1/16	7/16	3/8	1/4	13/16	2.1/2	4	1	5110686
3/32	1/2	3/8	1/4	13/16	2.1/2	4	1	5110687
1/8	5/8	1/2	1/4	1.1/16	3“	4	1	5110688
5/32	3/4	1/2	5/16	1“	3“	4	1	5110689
3/16	7/8	3/4	3/8	7/8	3.1/8	4	1	5110690
1/4	1“	3/4	3/8	1“	3.1/4	4	1	5110691
5/16	1.1/8	7/8	3/8	1.5/16	3.1/2	4	1	5110692
3/8	1.1/4	7/8	3/8	1.1/2	3.3/4	4	1	5110693
7/16	1.3/8	1“	3/8	1.9/16	4“	4	1	5110694
1/2	1.1/2	1“	3/8	1.5/8	4.1/8	4	1	5110695

HSS Multi Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

940 Multi-flute finishing. Bright finish improves chip flow in soft or non-ferrous materials.





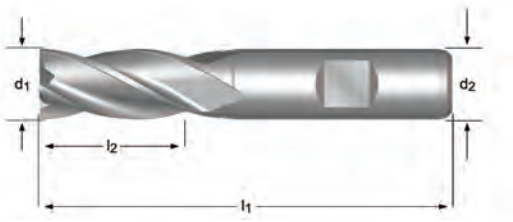
d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	940
1/8	0.1250	3/8	2.5/16	3/8	4	1	5110001
3/16	0.1875	1/2	2.3/8	3/8	4	1	5110002
1/4	0.2500	5/8	2.7/16	3/8	4	1	5110003
5/16	0.3125	3/4	2.1/2	3/8	4	1	5110004
3/8	0.3750	3/4	2.1/2	3/8	4	1	5110005
7/16	0.4375	1“	2.11/16	3/8	4	1	5110006
1/2	0.5000	1“	2.11/16	3/8	4	1	5110007
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	5110008
9/16	0.5625	1.3/8	3.3/8	1/2	4	1	5110009
5/8	0.6250	1.3/8	3.3/8	1/2	4	1	5110010
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	5110013
11/16	0.6875	1.5/8	3.5/8	1/2	4	1	5110011
11/16	0.6875	1.5/8	3.3/4	5/8	4	1	5110014
3/4	0.7500	1.5/8	3.5/8	1/2	4	1	5110012
3/4	0.7500	1.5/8	3.3/4	5/8	4	1	5110015
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	5110711
13/16	0.8125	1.7/8	4“	5/8	6	1	5110016
7/8	0.8750	1.7/8	4“	5/8	6	1	5110017
7/8	0.8750	1.7/8	4.1/8	3/4	4	1	5110712
7/8	0.8750	1.7/8	4.1/8	7/8	4	1	5110020
1“	1.0000	1.7/8	4“	5/8	6	1	5110019
1“	1.0000	1.7/8	4.1/8	3/4	4	1	5110713
1“	1.0000	1.7/8	4.1/8	7/8	4	1	5110022
1“	1.0000	2“	4.1/2	1“	4	1	5110025

UNION BUTTERFIELD

Cobalt 4-Flute End Mill

Regular Length, Square End, Weldon Shank, 30° Helix

960 Multi-flute finishing for high strength heat resistant materials, stainless and alloy steel, super alloys, and titanium alloys.



960

HSS-E

Z 4-6



1/8 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pack Qty	960
1/8	0.1250	3/8	2.5/16	3/8	4	1	5110660
3/16	0.1875	1/2	2.3/8	3/8	4	1	5110661
1/4	0.2500	5/8	2.7/16	3/8	4	1	5110662
5/16	0.3125	3/4	2.1/2	3/8	4	1	5110663
3/8	0.3750	3/4	2.1/2	3/8	4	1	5110664
1/2	0.5000	1.1/4	3.1/4	1/2	4	1	5110665
5/8	0.6250	1.5/8	3.3/4	5/8	4	1	5110666
3/4	0.7500	1.5/8	3.7/8	3/4	4	1	5110667
1“	1.0000	2“	4.1/2	1“	4	1	5110669

Visual Index - Reamers

Feed Rate Chart - Reamers

Alpha Code	Reamers - Feed in Inches per Revolution Ø Diameter												
	1/16	5/64	1/8	3/16	5/16	25/64	1/2	5/8	25/32	1"	1-13/16	1-1/2	2"
A	0.002	0.002	0.003	0.004	0.006	0.007	0.007	0.009	0.010	0.011	0.013	0.015	0.017
B	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.011	0.012	0.014	0.016	0.020	0.022
C	0.003	0.003	0.005	0.007	0.009	0.010	0.011	0.013	0.015	0.017	0.019	0.024	0.027
D	0.031	0.004	0.006	0.008	0.011	0.013	0.014	0.016	0.019	0.021	0.024	0.029	0.033
E	0.004	0.006	0.007	0.010	0.014	0.015	0.017	0.020	0.021	0.025	0.030	0.036	0.043
F	0.006	0.007	0.010	0.014	0.017	0.020	0.022	0.025	0.028	0.031	0.037	0.047	0.059

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6Al4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6Al4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Reamers

Tool Material:	HM	HM	HM	HM	HM	HSS-E	HSS	HSS	HSS	HSS-E	HSS-E	HSS	HSS	HSS
Finish/Coating:										ST		ST Bronze		
Standard:	DIN 8050	DIN 8093	DIN 8051	DIN 8094	DIN 8093	DIN 212	ANSI	ANSI	ANSI	BS 328	DIN 212	ANSI	ANSI	ANSI
Direction of Cut:														
Shank:					DIN 6535HA									
Flute Style:	A	B	A	B	B	B				B	E			
Tolerance:	H7	H7	H7	H7	Ø.95-5.5 0,+0.004 Ø5.51-12 0,+0.005	Ø.95-5.5 0,+0.004 Ø5.51-12 0,+0.005	USCTI	USCTI	USCTI	H7	H7		USCTI	USCTI
Taper Gradient:													1:48	
														
Style:	B441	B400	B442	B411	B481	B170	4533	4531	4535	B901	B157	B122	4588	4536
Range:	10.00 - 20.00	1.00 - 20.00	10.00 - 20.00	5.00 - 30.00	0.98 - 12.05	0.98 - 12.00	N60 - 1.1/2	3/8 - 1.3/4"	1/16 - 1"	1.50 - 1/2	2.00 - 20.00	3/8 - 1.1/16	7/0 - 10	1/4 - 1"
Page #	436	437	438	439	440	442	445	449	450	451	452	453	454	455
1.1	59B	59B	59B	59B	59B	82C	82C	82C	82C	59C	82C	59C	59C	82C
1.2	59B	59B	59B	59B	59B	66C	66C	66C	66C	46C	66C	46C	46C	66C
1.3	46B	46B	46B	46B	46B	52C	52C	52C	52C	36C	52C	36C	36C	52C
1.4	46B	46B	46B	46B	46B	49B	49B	49B	49B	33B	49B	33B	33B	49B
1.5	33C	33C	33C	33C	33C	30B	30B	30B	30B	16B	30B	16B	16B	30B
1.6	33C	33C	33C	33C	33C	16A	16A	16A	16A	13A	16A	13A	13A	16A
1.7														
1.8														
2.1						36C	36C	36C	36C	26C	36C	26C	26C	36C
2.2						20B	20B	20B	20B		20B	16B	16B	20B
2.3						26B	26B	26B	26B		26B	20B	20B	26B
2.4							20B	20B	20B					20B
3.1	56D	56D	56D	56D	56D	52E	52E	52E	52E	46E		46E	46E	52E
3.2	56D	56D	56D	56D	56D	49D	49D	49D	49D	36D		36D	36D	49D
3.3	56D	56D	56D	56D	56D	43C	43C	43C	43C	33C		33C	33C	43C
3.4	46D	46D	46D	46D	46D	36C	36C	36C	36C	30C		30C	30C	36C
4.1	46C	46C	46C	46C	46C	49C	49C	49C	49C	36C	49C	36C	36C	49C
4.2	46C	46C	46C	46C	46C	30B	30B	30B	30B	16B	30B	16B	16B	30B
4.3	33B	33B	33B	33B	33B	16B	16B	16B	16B	13B	16B	13B	13B	16B
5.1	33C	33C	33C	33C	33C	26D	26D	26D	26D	16D	26D	16D	16D	26D
5.2	33B	33B	33B	33B	33B	16C	16C	16C	16C	10C	16C			16C
5.3	33B	33B	33B	33B	33B	10C	10C	10C	10C	7C	10C			10C
6.1	125E	125E	125E	125E	125E	82D	82D	82D	82D	59D	82D	59D	59D	82D
6.2	125E	125E	125E	125E	125E	92E	92E	92E	92E	66E	92E	66E	66E	92E
6.3	125E	125E	125E	125E	125E	82D	82D	82D	82D	59D		59D	59D	82D
6.4	125D	125D	125D	125D	125D	46D	46D	46D	46D	36D		36D	36D	46D
7.1	197D	197D	197D	197D	197D					75F	92F	75F	75F	
7.2	197D	197D	197D	197D	197D					59F	82F	59F	59F	
7.3	82D	82D	82D	82D	82D						66E	49E	49E	
7.4	82D	82D	82D	82D	82D						52D	46D	46D	
8.1	82C	82C	82C	82C	82C						98B			
8.2	43C	43C	43C	43C	43C					69B		69B	69B	
8.3														
9.1											10A			
10.1														

Visual Index - Reamers

	4537	4532	B101	B121	4579	T400	4500	B334	B335	4587	4591	4600	B100	B301
	HSS	HSS	HSS-E	HSS	HSS	HSS	HSS	HSS		HSS	HSS	HSS	HSS	HSS
	ANSI	ANSI	BS 328	DIN 311	ANSI	ANSI	ANSI	DORMER		ANSI	ANSI	ANSI	DIN 206	BS 328
			B										B	A
	USCTI	USCTI	H7	k11	USCTI	USCTI	USCTI			USCTI	USCTI	USCTI	H7	
										1:48	1:48			1:48
														
	5/16 - 1"	3/8 - 1.3/4	3.00 - 2"	10.00 - 30.00	7/16 - 1.1/16	1/2 - 1.5/8	1/8 - 1"	N000 N16	Blades Nuts	N0 - N10	N0 - N10	1/8 - 1"	1.50 - 50.00	1/16 - 1/2

	455	456	457	459	460	461	462	463	464	465	466	467	468	470
1.1	82C	82C	59C	59C	59C	75E	82C	59C		59C	59C	59C	59C	59C
1.2	66C	66C	46C	46C	46C	46F	66C	46C		46C	46C	46C	46C	46C
1.3	52C	52C	36C	36C	36C	49F	52C	36C		36C	36C	36C	36C	36C
1.4	49B	49B	33B	33B	33B	49D	49B	33B		33B	33B	33B	33B	33B
1.5	30B	30B	16B	16B	16B	36D	30B	16B		16B	16B	16B	16B	16B
1.6	16A	16A	13A	13A	13A		16A	13A		13A	13A	13A	13A	13A
1.7														
1.8														
2.1	36C	36C	26C		26C	66F	36C	26F		26C	26C	26C	26F	26C
2.2	20B	20B			16B	39D	20B			16B	16B	16B		16B
2.3	26B	26B			20B	39D	26B			20B	20B	20B		20B
2.4		20B					20B					20B		
3.1	52E	52E	46E	46E	46E	108E	52E	46E		46E	46E	46E	46E	46E
3.2	49D	49D	36D	36D	36D	59H	49D	36D		36D	36D	36D	36D	36D
3.3	43C	43C	33C	33C	33C	59F	43C	33C		33C	33C	33C	33C	33C
3.4	36C	36C	30C	30C	30C		36C	30C		30C	30C	30C	30C	30C
4.1	49C	49C	36C	36C	36C	69F	49C	36C		36C	36C	36C	36C	36C
4.2	30B	30B	16B		16B	36D	30B	16B		16B	16B	16B	16B	16B
4.3	16B	16B	13B		13B		16B	13B		13B	13B	13B	13B	13B
5.1	26D	26D	16D		16D	49D	26D	16D		16D	16D	16D	16D	16D
5.2	16C	16C	10C				16C	10C					10C	
5.3	10C	10C	7C				10C	7C					7C	
6.1	82D	82D	59D		59D		82D	59D		59D	59D	59D	59D	59D
6.2	92E	92E	66E		66E		92E	66E		66E	66E	66E	66E	66E
6.3	82D	82D	59D		59D		82D	59D		59D	59D	59D	59D	59D
6.4	46D	46D	36D		36D		46D	36D		36D	36D	36D	36D	36D
7.1			75F		75F			75F		75F	75F	75F	75F	75F
7.2			59F		59F			59F		59F	59F	59F	59F	59F
7.3					49E					49E	49E	49E		49E
7.4					46D					46D	46D	46D		46D
8.1														
8.2			69B	69B	69B			69B		69B	69B	69B	69B	69B
8.3														
9.1														
10.1														

List Number Index - Reamers



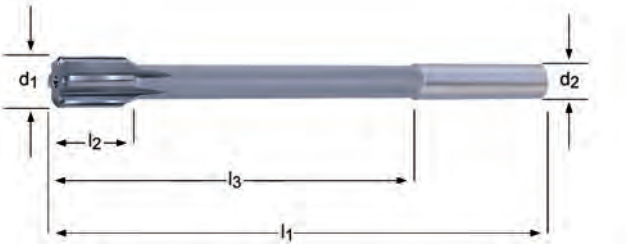
Pgs. 432 - 470

4500.....462
4531.....449
4532.....456
4533.....445
4535.....450
4536.....455
4537.....455
4579.....460
4587.....465
4588.....454
4591.....466
4600.....467
B100.....468
B101.....457
B121.....459
B122.....453
B157.....452
B170.....442
B301.....470
B334.....463
B335.....464
B400.....437
B411.....439
B441.....436
B442.....438
B481.....440
B901.....451
T400.....461

Machine Reamer, Straight Shank, Brazed Carbide Tipped

B441 Extremely unequal flute spacing. Straight flute. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



B441

HM

DIN 8050



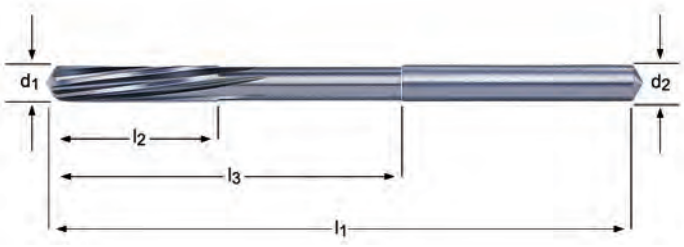
10.00 - 20.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B441
10.0	133	19	87	6	10	1	0421086
11.0	142	19	96	6	10	1	0421093
12.0	151	19	105	6	10	1	0421109
13.0	151	19	105	6	10	1	0426302
14.0	160	19	110	6	12.5	1	0421116
15.0	162	19	112	6	12.5	1	0421123
16.0	170	22	120	6	12.5	1	0421130
17.0	175	22	123	6	14	1	0421147
18.0	182	22	130	6	14	1	0421154
19.0	189	22	131	6	16	1	0421161
20.0	195	22	137	6	16	1	0421178

Machine Reamer, Straight Shank

B400 Extremely unequal flute spacing with left hand slow spiral, right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 4.3 5.1 5.2
5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2



B400

HM

DIN 8093



1.00 - 20.00

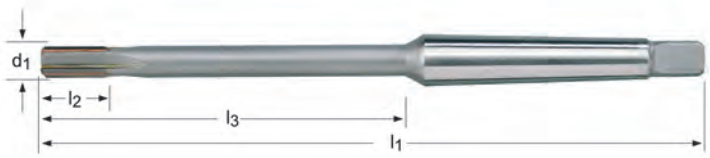
d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B400
1.0	34	6	15	3	1.0	1	0052983 [1]
1.2	38	8	16.5	3	1.2	1	0052990 [1]
1.4	40	8	18	3	1.4	1	0053003 [1]
1.5	40	8	18	3	1.5	1	0053010 [1]
1.6	49	11	26	3	1.6	1	0053027 [1]
1.8	49	11	25	4	1.8	1	0053034 [1]
2.0	49	11	24	4	2.0	1	0053041 [1]
2.2	57	15	30	4	2.2	1	0053058 [1]
2.5	57	15	28	4	2.5	1	0053065 [1]
2.8	61	15	32	4	2.8	1	0053072 [1]
3.0	61	15	30	6	3.0	1	0144152 [1]
3.2	70	18	33	6	3.2	1	0144169 [1]
3.5	70	18	33	6	3.5	1	0144176 [1]
4.0	75	19	44	6	4.0	1	0144183 [1]
4.5	80	21	46	6	4.5	1	0144190 [1]
5.0	86	23	53	6	5.0	1	0144206 [1]
5.5	93	26	56	6	5.6	1	0144213 [1]
6.0	93	26	56	6	5.6	1	0144220 [1]
6.5	101	28	63	6	6.3	1	0144237 [2]
7.0	109	31	69	6	7.1	1	0144244 [2]
8.0	117	33	75	6	8.0	1	0144251 [2]
9.0	125	36	81	6	9.0	1	0144268 [2]
10.0	133	38	87	6	10.0	1	0144275 [2]
12.0	151	44	105	6	10.0	1	0144282 [2]
14.0	160	47	110	8	12.5	1	0144299 [2]
16.0	170	52	120	8	12.5	1	0144305 [2]
18.0	182	56	130	6	14.0	1	0144312 [3]
20.0	195	60	137	6	16.0	1	0144329 [3]

[1] Solid Carbide
[2] Carbide Head
[3] Carbide Tipped

Machine Reamer, Taper Shank, Brazed Carbide Tipped

B442 Extremely unequal flute spacing with straight flute. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



B442

HM

DIN 8051



10.00 - 20.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B442
10.0	168	19	102.5	6	1	1	0421185
12.0	182	19	116.5	6	1	1	0421192
14.0	189	19	123.5	6	1	1	0421208
15.0	204	19	124	6	2	1	0421215
16.0	210	22	130	6	2	1	0421222
17.0	214	22	134	6	2	1	0421239
18.0	219	22	139	6	2	1	0421246
19.0	223	22	143	6	2	1	0426319
20.0	228	22	148	6	2	1	0421253

Machine Reamer, Taper Shank

B411 Extremely unequal spacing with left hand spiral, and right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

B411

HM

DIN 8094



5.00 - 30.00

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B411
5.0	133	23	67.5	6	1	1	0053195 [1]
6.0	138	26	72.5	6	1	1	0053201 [1]
7.0	150	31	84.5	6	1	1	0053218 [1]
8.0	156	33	90.5	6	1	1	0053225 [1]
9.0	162	36	96.5	6	1	1	0053232 [1]
10.0	168	38	102.5	6	1	1	0053126 [1]
12.0	182	44	116.5	6	1	1	0053140 [1]
14.0	189	47	123.5	8	1	1	0053164 [1]
15.0	204	50	124	8	2	1	0053171 [1]
16.0	210	52	130	8	2	1	0053188 [1]
17.0	214	54	134	6	2	1	0144336 [2]
18.0	219	56	139	6	2	1	0144343 [2]
19.0	223	58	143	6	2	1	0144350 [2]
20.0	228	60	148	6	2	1	0144367 [2]
22.0	237	64	157	6	2	1	0144374 [2]
24.0	268	68	169	8	3	1	0144381 [2]
25.0	268	68	169	8	3	1	0144398 [2]
26.0	273	70	174	8	3	1	0144404 [2]
30.0	281	73	182	8	3	1	0144411 [2]

[1] Carbide Head
[2] Carbide Tipped

APPLICATION CARBIDE REAMER

DORMER

High Precision, Straight Shank

B481

High Precision NC Centesimal Reamers are offered in 0.01mm increments. Extremely unequal flute spacing with left hand slow spiral, right hand cut. For machining reaming of abrasive, hard ferrous, and non-ferrous materials. Ideal for hydraulic and heat shrink tool holding systems.

B481

HM

DIN 8093



0.98 - 12.05

1.1	1.2	1.3	1.4	1.5	1.6	3.1	3.2	3.3	3.4	4.1	4.2	4.3	5.1	5.2
5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2				



d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_6$ mm	Pack Qty	B481
0.98	49.5	6	21.5	3	4	1	0421567
0.99	49.5	6	21.5	3	4	1	0421574
1.00	49.5	6	21.5	3	4	1	0421581
1.01	49.5	6	21.5	3	4	1	0421598
1.02	49.5	6	21.5	3	4	1	0421604
1.03	49.5	9	21.5	3	4	1	0421611
1.48	49	9	21	3	4	1	0421628
1.49	49	9	21	3	4	1	0421635
1.50	49	9	21	3	4	1	0421642
1.51	49	9	21	3	4	1	0421659
1.52	49	9	21	3	4	1	0421666
1.53	49	9	21	3	4	1	0421673
1.98	49	12	21	4	4	1	0421680
1.99	49	12	21	4	4	1	0421697
2.00	49	12	21	4	4	1	0421857
2.01	49	12	21	4	4	1	0421864
2.02	49	12	21	4	4	1	0421871
2.03	49	12	21	4	4	1	0421888
2.48	59	16	31	4	4	1	0421895
2.49	59	16	31	4	4	1	0421901
2.50	59	16	31	4	4	1	0421918
2.51	59	16	31	4	4	1	0421925
2.52	59	16	31	4	4	1	0421932
2.53	59	16	31	4	4	1	0421949
2.97	62.5	17	35	6	4	1	0421956
2.98	62.5	17	35	6	4	1	0421963
2.99	62.5	17	35	6	4	1	0421970
3.00	62.5	17	35	6	4	1	0421987
3.01	62.5	17	35	6	4	1	0421994
3.02	62.5	17	35	6	4	1	0422007
3.03	62.5	17	35	6	4	1	0422014
3.97	75	19	47	6	4	1	0422021
3.98	75	19	47	6	4	1	0422038

APPLICATION CARBIDE REAMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh_6 mm	Pack Qty	B481
3.99	75	19	47	6	4	1	0422045
4.00	75	19	47	6	4	1	0422052
4.01	75	19	47	6	4	1	0422069
4.02	75	19	47	6	4	1	0422076
4.03	75	19	47	6	4	1	0422083
4.97	86	23	50	6	6	1	0422090
4.98	86	23	50	6	6	1	0422106
4.99	86	23	50	6	6	1	0422113
5.00	86	23	50	6	6	1	0422120
5.01	86	23	50	6	6	1	0422137
5.02	86	23	50	6	6	1	0422144
5.03	86	23	50	6	6	1	0422151
5.97	93	26	57	6	6	1	0422168
5.98	93	26	57	6	6	1	0422175
5.99	93	26	57	6	6	1	0422182
6.00	93	26	57	6	6	1	0422199
6.01	93	26	57	6	6	1	0422205
6.02	93	26	57	6	6	1	0422212
6.03	93	26	57	6	6	1	0422229
7.97	117	33	81	6	8	1	0422236
7.98	117	33	81	6	8	1	0422243
7.99	117	33	81	6	8	1	0422250
8.00	117	33	81	6	8	1	0422267
8.01	117	33	81	6	8	1	0422274
8.02	117	33	81	6	8	1	0422281
8.03	117	33	81	6	8	1	0422298
8.04	117	33	81	6	8	1	0422304
9.97	133	38	93	6	10	1	0422311
9.98	133	38	93	6	10	1	0422328
9.99	133	38	93	6	10	1	0422335
10.00	133	38	93	6	10	1	0421703
10.01	133	38	93	6	10	1	0421710
10.02	133	38	93	6	10	1	0421727
10.03	133	38	93	6	10	1	0421734
10.04	133	38	93	6	10	1	0421741
10.05	133	38	93	6	10	1	0421758
11.97	151	44	106	6	12	1	0421765
11.98	151	44	106	6	12	1	0421772
11.99	151	44	106	6	12	1	0421789
12.00	151	44	106	6	12	1	0421796
12.01	151	44	106	6	12	1	0421802
12.02	151	44	106	6	12	1	0421819
12.03	151	44	106	6	12	1	0421826
12.04	151	44	106	6	12	1	0421833
12.05	151	44	106	6	12	1	0421840

APPLICATION COBALT REAMER

DORMER

High Precision, Straight Shank

B170 Centesimal Reamer by 0.01mm increments. Left hand slow spiral, right hand cut. For machine reaming of abrasive, hard ferrous, and non-ferrous materials.

1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4



B170

HSS-E

DIN 212



0.98 - 12.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B170
0.98	34	5.5	15	3	1.0	1	0127957
0.99	34	5.5	15	3	1.0	1	0127964
1.00	34	5.5	15	3	1.0	1	0127971
1.01	34	5.5	15	3	1.0	1	0127988
1.02	34	5.5	15	3	1.0	1	0127995
1.03	34	5.5	15	3	1.0	1	0128008
1.04	34	5.5	15	3	1.0	1	0128015
1.05	34	5.5	15	3	1.0	1	0128022
1.49	40	8.0	18	3	1.5	1	0128459
1.50	40	8.0	18	3	1.5	1	0128466
1.51	43	9.0	20	3	1.6	1	0050392
1.52	43	9.0	20	3	1.6	1	0128473
1.98	49	11.0	24	4	2.0	1	0128916
1.99	49	11.0	24	4	2.0	1	0128923
2.00	49	11.0	24	4	2.0	1	0130896
2.01	49	11.0	24	4	2.0	1	0130902
2.02	49	11.0	24	4	2.0	1	0130919
2.03	49	11.0	24	4	2.0	1	0130926
2.04	49	11.0	24	4	2.0	1	0130933
2.05	49	11.0	24	4	2.0	1	0130940
2.49	57	14.0	28	4	2.5	1	0131367
2.50	57	14.0	28	4	2.5	1	0131374
2.51	57	14.0	28	4	2.5	1	0131381
2.52	57	14.0	28	4	2.5	1	0131398
2.98	61	15.0	32	6	3.0	1	0131848
2.99	61	15.0	32	6	3.0	1	0131855
3.00	61	15.0	32	6	3.0	1	0131862
3.01	65	16.0	35	6	3.2	1	0050491
3.02	65	16.0	35	6	3.2	1	0131879
3.03	65	16.0	35	6	3.2	1	0131886
3.04	65	16.0	35	6	3.2	1	0131893
3.05	65	16.0	35	6	3.2	1	0131909
3.49	70	18.0	40	6	3.5	1	0132302

DORMER

APPLICATION COBALT REAMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh_9 mm	Pack Qty	B170
3.50	70	18.0	40	6	3.5	1	0132319
3.51	70	18.0	40	6	3.5	1	0132326
3.52	70	18.0	40	6	3.5	1	0132333
3.98	75	19.0	43	6	4.0	1	0132784
3.99	75	19.0	43	6	4.0	1	0132791
4.00	75	19.0	43	6	4.0	1	0132807
4.01	75	19.0	43	6	4.0	1	0132814
4.02	75	19.0	43	6	4.0	1	0132821
4.03	75	19.0	43	6	4.0	1	0132838
4.04	75	19.0	43	6	4.0	1	0132845
4.05	75	19.0	43	6	4.0	1	0132852
4.49	80	21.0	47	6	4.5	1	0133286
4.50	80	21.0	47	6	4.5	1	0133293
4.51	80	21.0	47	6	4.5	1	0133309
4.52	80	21.0	47	6	4.5	1	0133316
4.98	86	23.0	52	6	5.0	1	0133767
4.99	86	23.0	52	6	5.0	1	0133774
5.00	86	23.0	52	6	5.0	1	0133781
5.01	86	23.0	52	6	5.0	1	0133798
5.02	86	23.0	52	6	5.0	1	0133804
5.03	86	23.0	52	6	5.0	1	0133811
5.04	86	23.0	52	6	5.0	1	0133828
5.05	86	23.0	52	6	5.0	1	0133835
5.49	93	26.0	57	6	5.6	1	0134269
5.50	93	26.0	57	6	5.6	1	0134276
5.51	93	26.0	57	6	5.6	1	0134283
5.52	93	26.0	57	6	5.6	1	0134290
5.98	93	26.0	57	6	5.6	1	0134757
5.99	93	26.0	57	6	5.6	1	0134764
6.00	93	26.0	57	6	5.6	1	0134771
6.01	101	28.0	63	6	6.3	1	0134788
6.02	101	28.0	63	6	6.3	1	0134795
6.03	101	28.0	63	6	6.3	1	0134801
6.04	101	28.0	63	6	6.3	1	0134818
6.05	101	28.0	63	6	6.3	1	0134825
6.49	101	28.0	63	6	6.3	1	0135242
6.50	101	28.0	63	6	6.3	1	0135259
6.51	101	28.0	63	6	6.3	1	0135303
6.52	101	28.0	63	6	6.3	1	0135310
6.98	109	31.0	69	6	7.1	1	0135761
6.99	109	31.0	69	6	7.1	1	0135778
7.00	109	31.0	69	6	7.1	1	0135785
7.01	109	31.0	69	6	7.1	1	0135792
7.02	109	31.0	69	6	7.1	1	0135808
7.03	109	31.0	69	6	7.1	1	0135815
7.04	109	31.0	69	6	7.1	1	0135822
7.05	109	31.0	69	6	7.1	1	0135839
7.49	109	31.0	69	6	7.1	1	0136270
7.50	109	31.0	69	6	7.1	1	0136287
7.51	117	33.0	75	6	8.0	1	0136294
7.52	117	33.0	75	6	8.0	1	0136300
7.98	117	33.0	75	6	8.0	1	0136751
7.99	117	33.0	75	6	8.0	1	0136768
8.00	117	33.0	75	6	8.0	1	0136959
8.01	117	33.0	75	6	8.0	1	0136775
8.02	117	33.0	75	6	8.0	1	0136782
8.03	117	33.0	75	6	8.0	1	0136799
8.04	117	33.0	75	6	8.0	1	0136805
8.05	117	33.0	75	6	8.0	1	0136812
8.49	117	33.0	75	6	8.0	1	0137260
8.50	117	33.0	75	6	8.0	1	0137277
8.51	125	36.0	81	6	9.0	1	0050590
8.52	125	36.0	81	6	9.0	1	0137284
8.98	125	36.0	81	6	9.0	1	0137734
8.99	125	36.0	81	6	9.0	1	0137741
9.00	125	36.0	81	6	9.0	1	0137758

APPLICATION COBALT REAMER

DORMER

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B170
9.01	125	36.0	81	6	9.0	1	0137765
9.02	125	36.0	81	6	9.0	1	0137772
9.03	125	36.0	81	6	9.0	1	0137789
9.04	125	36.0	81	6	9.0	1	0137796
9.05	125	36.0	81	6	9.0	1	0137802
9.49	125	36.0	81	6	9.0	1	0138236
9.50	125	36.0	81	6	9.0	1	0138243
9.51	133	38.0	87	6	10.0	1	0138250
9.52	133	38.0	87	6	10.0	1	0138267
9.98	133	38.0	87	6	10.0	1	0138717
9.99	133	38.0	87	6	10.0	1	0138724
10.00	133	38.0	87	6	10.0	1	0128930
10.01	133	38.0	87	6	10.0	1	0128947
10.02	133	38.0	87	6	10.0	1	0128954
10.03	133	38.0	87	6	10.0	1	0128961
10.04	133	38.0	87	6	10.0	1	0128978
10.05	133	38.0	87	6	10.0	1	0128985
10.49	133	38.0	87	6	10.0	1	0129463
10.50	133	38.0	87	6	10.0	1	0135266
10.51	133	38.0	87	6	10.0	1	0129470
10.52	133	38.0	87	6	10.0	1	0129487
10.98	142	41.0	96	6	10.0	1	0129883
10.99	142	41.0	96	6	10.0	1	0129890
11.00	142	41.0	96	6	10.0	1	0129906
11.01	142	41.0	96	6	10.0	1	0129913
11.02	142	41.0	96	6	10.0	1	0129920
11.03	142	41.0	96	6	10.0	1	0129937
11.04	142	41.0	96	6	10.0	1	0129944
11.05	142	41.0	96	6	10.0	1	0129951
11.49	142	41.0	96	6	10.0	1	0130384
11.50	142	41.0	96	6	10.0	1	0130391
11.51	142	41.0	96	6	10.0	1	0130407
11.52	142	41.0	96	6	10.0	1	0130414
11.98	151	44.0	105	6	10.0	1	0130865
11.99	151	44.0	105	6	10.0	1	0130872
12.00	151	44.0	105	6	10.0	1	0130889

HSS REAMER

Chucking Reamer, Straight Shank

4533 Straight Flute, Right Hand Cut. Chucking reamers have shorter and deeper flutes than hand reamers and are specifically designed for accurate machine reaming in most materials and equipment including screw machines, turret lathes, drill presses, and machining centers. Recommended for most general purpose reaming.

Produced per ASME B94.2-1995 Standards.



4533

HSS

ANSI



N60 - 1.1/2

d_1 Ø "/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
N60	0.0400	0.0390	1/2	2.1/2	4	1	5010173
N59	0.0410	0.0390	1/2	2.1/2	4	1	5010175
N58	0.0420	0.0390	1/2	2.1/2	4	1	5010177
N57	0.0430	0.0390	1/2	2.1/2	4	1	5010179
N56	0.0465	0.0455	1/2	2.1/2	4	1	5010186
3/64	0.0469	0.0455	1/2	2.1/2	4	1	5010187
N55	0.0520	0.0510	1/2	2.1/2	4	1	5010198
N54	0.0550	0.0510	1/2	2.1/2	4	1	5010204
N53	0.0595	0.0585	1/2	2.1/2	4	1	5010213
1/16	0.0625	0.0585	1/2	2.1/2	4	1	5010219
N52	0.0635	0.0585	1/2	2.1/2	4	1	5010221
N51	0.0670	0.0660	3/4	3“	4	1	5010228
N50	0.0700	0.0660	3/4	3“	4	1	5010234
N49	0.0730	0.0660	3/4	3“	4	1	5010240
N48	0.0760	0.0720	3/4	3“	4	1	5010246
5/64	0.0781	0.0720	3/4	3“	4	1	5010251
N47	0.0785	0.0720	3/4	3“	4	1	5010252
N46	0.0810	0.0771	3/4	3“	4	1	5010257
N45	0.0820	0.0771	3/4	3“	4	1	5010259
N44	0.0860	0.0810	3/4	3“	4	1	5010267
N43	0.0890	0.0810	3/4	3“	4	1	5010273
N42	0.0935	0.0880	3/4	3“	4	1	5010282
3/32	0.0938	0.0880	3/4	3“	4	1	5010283
N41	0.0960	0.0928	7/8	3.1/2	4	1	5010288
N40	0.0980	0.0928	7/8	3.1/2	4	1	5010292
N39	0.0995	0.0928	7/8	3.1/2	4	1	5010295
N38	0.1015	0.0950	7/8	3.1/2	4	1	5010299
N37	0.1040	0.0950	7/8	3.1/2	4	1	5010304
N36	0.1065	0.1030	7/8	3.1/2	4	1	5010309
7/64	0.1094	0.1030	7/8	3.1/2	4	1	5010316
N35	0.1100	0.1030	7/8	3.1/2	4	1	5010318
N34	0.1110	0.1055	7/8	3.1/2	4	1	5010320
N33	0.1130	0.1055	7/8	3.1/2	4	1	5010324

HSS REAMER

UNION BUTTERFIELD

d_1 Ø "/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
N32	0.1160	0.1120	7/8	3.1/2	4	1	5010330
N31	0.1200	0.1120	7/8	3.1/2	4	1	5010338
	0.1230	0.1120	7/8	3.1/2	4	1	5010344
	0.1240	0.1190	7/8	3.1/2	4	1	5010346
	0.1247	0.1190	7/8	3.1/2	4	1	5010349
1/8	0.1250	0.1190	7/8	3.1/2	4	1	5010350
	0.1260	0.1190	7/8	3.1/2	4	1	5010354
N30	0.1285	0.1190	7/8	3.1/2	4	1	5010359
N29	0.1360	0.1275	1“	4“	4	1	5010374
N28	0.1405	0.1350	1“	4“	4	1	5010383
9/64	0.1410	0.1350	1“	4“	4	1	5010384
N27	0.1440	0.1350	1“	4“	4	1	5010391
N26	0.1470	0.1430	1“	4“	4	1	5010397
N25	0.1495	0.1430	1“	4“	4	1	5010402
N24	0.1520	0.1460	1“	4“	4	1	5010407
N23	0.1540	0.1460	1“	4“	4	1	5010411
5/32	0.1562	0.1510	1“	4“	6	1	5010416
N22	0.1570	0.1510	1“	4“	6	1	5010418
N21	0.1590	0.1530	1.1/8	4.1/2	6	1	5010422
N20	0.1610	0.1530	1.1/8	4.1/2	6	1	5010426
N19	0.1660	0.1595	1.1/8	4.1/2	6	1	5010436
N18	0.1695	0.1595	1.1/8	4.1/2	6	1	5010443
11/64	0.1719	0.1645	1.1/8	4.1/2	6	1	5010448
N17	0.1730	0.1645	1.1/8	4.1/2	6	1	5010451
N16	0.1770	0.1700	1.1/8	4.1/2	6	1	5010459
N15	0.1800	0.1755	1.1/8	4.1/2	6	1	5010465
N14	0.1820	0.1755	1.1/8	4.1/2	6	1	5010469
N13	0.1850	0.1800	1.1/8	4.1/2	6	1	5010475
	0.1855	0.1800	1.1/8	4.1/2	6	1	5010476
	0.1865	0.1800	1.1/8	4.1/2	6	1	5010478
	0.1870	0.1800	1.1/8	4.1/2	6	1	5010479
3/16	0.1875	0.1800	1.1/8	4.1/2	6	1	5010480
	0.1885	0.1800	1.1/8	4.1/2	6	1	5010482
N12	0.1890	0.1800	1.1/8	4.1/2	6	1	5010483
N11	0.1910	0.1860	1.1/4	5“	6	1	5010487
N10	0.1935	0.1860	1.1/4	5“	6	1	5010492
N9	0.1960	0.1895	1.1/4	5“	6	1	5010498
N8	0.1990	0.1895	1.1/4	5“	6	1	5010504
N7	0.2010	0.1945	1.1/4	5“	6	1	5010508
13/64	0.2031	0.1945	1.1/4	5“	6	1	5010513
N6	0.2040	0.1945	1.1/4	5“	6	1	5010515
N5	0.2055	0.2016	1.1/4	5“	6	1	5010518
N4	0.2090	0.2016	1.1/4	5“	6	1	5010525
N3	0.2130	0.2075	1.1/4	5“	6	1	5010533
7/32	0.2188	0.2075	1.1/4	5“	6	1	5010545
N2	0.2210	0.2173	1.1/2	6“	6	1	5010550
N1	0.2280	0.2173	1.1/2	6“	6	1	5010564
A	0.2340	0.2265	1.1/2	6“	6	1	5010576
15/64	0.2344	0.2265	1.1/2	6“	6	1	5010577
B	0.2380	0.2329	1.1/2	6“	6	1	5010585
C	0.2420	0.2329	1.1/2	6“	6	1	5010593
D	0.2460	0.2329	1.1/2	6“	6	1	5010602
	0.2480	0.2329	1.1/2	6“	6	1	5010606
	0.2490	0.2400	1.1/2	6“	6	1	5010608
	0.2495	0.2400	1.1/2	6“	6	1	5010609
1/4	0.2500	0.2400	1.1/2	6“	6	1	5010610
E	0.2500	0.2400	1.1/2	6“	6	1	5011202
	0.2510	0.2400	1.1/2	6“	6	1	5010612
F	0.2570	0.2485	1.1/2	6“	6	1	5010619
G	0.2610	0.2485	1.1/2	6“	6	1	5010622
17/64	0.2656	0.2485	1.1/2	6“	6	1	5010623
H	0.2660	0.2485	1.1/2	6“	6	1	5010624
I	0.2720	0.2485	1.1/2	6“	6	1	5010626
J	0.2770	0.2485	1.1/2	6“	6	1	5010627
K	0.2810	0.2485	1.1/2	6“	6	1	5010628
9/32	0.2812	0.2485	1.1/2	6“	6	1	5010629

UNION BUTTERFIELD

HSS REAMER

d_1 Ø “/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
L	0.2900	0.2792	1.1/2	6“	6	1	5010630
M	0.2950	0.2792	1.1/2	6“	6	1	5010631
19/64	0.2969	0.2792	1.1/2	6“	6	1	5010632
N	0.3020	0.2792	1.1/2	6“	6	1	5010633
	0.3105	0.2792	1.1/2	6“	6	1	5010636
	0.3115	0.2792	1.1/2	6“	6	1	5010638
	0.3120	0.2792	1.1/2	6“	6	1	5010639
5/16	0.3125	0.2792	1.1/2	6“	6	1	5010640
	0.3135	0.2792	1.1/2	6“	6	1	5010642
O	0.3160	0.2792	1.1/2	6“	6	1	5010645
P	0.3230	0.2792	1.1/2	6“	6	1	5010647
21/64	0.3281	0.2792	1.1/2	6“	6	1	5010648
Q	0.3320	0.2792	1.1/2	6“	6	1	5010649
R	0.3390	0.2792	1.1/2	6“	6	1	5010650
11/32	0.3438	0.2792	1.1/2	6“	6	1	5010651
S	0.3480	0.3100	1.3/4	7“	6	1	5010652
T	0.3580	0.3100	1.3/4	7“	6	1	5010653
23/64	0.3594	0.3100	1.3/4	7“	6	1	5010654
U	0.3680	0.3100	1.3/4	7“	6	1	5010655
	0.3730	0.3100	1.3/4	7“	6	1	5010658
	0.3740	0.3100	1.3/4	7“	6	1	5010659
	0.3745	0.3100	1.3/4	7“	6	1	5010660
3/8	0.3750	0.3100	1.3/4	7“	6	1	5010661
	0.3760	0.3100	1.3/4	7“	6	1	5010662
V	0.3770	0.3100	1.3/4	7“	6	1	5010663
W	0.3860	0.3100	1.3/4	7“	6	1	5010665
25/64	0.3906	0.3100	1.3/4	7“	6	1	5010666
X	0.3970	0.3100	1.3/4	7“	6	1	5010667
Y	0.4040	0.3100	1.3/4	7“	6	1	5010668
13/32	0.4062	0.3100	1.3/4	7“	6	1	5010670
Z	0.4130	0.3730	1.3/4	7“	6	1	5010671
27/64	0.4219	0.3730	1.3/4	7“	6	1	5010672
	0.4355	0.3730	1.3/4	7“	6	1	5010673
	0.4365	0.3730	1.3/4	7“	6	1	5010674
	0.4370	0.3730	1.3/4	7“	6	1	5010675
7/16	0.4375	0.3730	1.3/4	7“	6	1	5010676
	0.4385	0.3730	1.3/4	7“	6	1	5010677
29/64	0.4531	0.3730	1.3/4	7“	6	1	5010678
15/32	0.4688	0.3730	1.3/4	7“	6	1	5010679
31/64	0.4844	0.4355	2“	8“	6	1	5010680
	0.4980	0.4355	2“	8“	6	1	5010681
	0.4990	0.4355	2“	8“	6	1	5010682
	0.4995	0.4355	2“	8“	6	1	5010683
1/2	0.5000	0.4355	2“	8“	6	1	5010684
	0.5010	0.4355	2“	8“	6	1	5010685
33/64	0.5156	0.4355	2“	8“	6	1	5010690
17/32	0.5312	0.4355	2“	8“	6	1	5010691
35/64	0.5469	0.4355	2“	8“	8	1	5010692
9/16	0.5625	0.4355	2“	8“	8	1	5010693
37/64	0.5781	0.4355	2“	8“	8	1	5010694
19/32	0.5938	0.4355	2“	8“	8	1	5010695
39/64	0.6094	0.5620	2.1/4	9“	8	1	5010696
5/8	0.6250	0.5620	2.1/4	9“	8	1	5010698
41/64	0.6406	0.5620	2.1/4	9“	8	1	5010700
21/32	0.6562	0.5620	2.1/4	9“	8	1	5010701
43/64	0.6719	0.5620	2.1/4	9“	8	1	5010702
11/16	0.6875	0.5620	2.1/4	9“	8	1	5010703
45/64	0.7031	0.5620	2.1/4	9“	8	1	5010704
23/32	0.7188	0.5620	2.1/4	9“	8	1	5010705
47/64	0.7344	0.6245	2.1/2	9.1/2	8	1	5010706
3/4	0.7500	0.6245	2.1/2	9.1/2	8	1	5010708
49/64	0.7656	0.6245	2.1/2	9.1/2	8	1	5010710
25/32	0.7812	0.6245	2.1/2	9.1/2	8	1	5010711
51/64	0.7969	0.6245	2.1/2	9.1/2	8	1	5010712
13/16	0.8125	0.6245	2.1/2	9.1/2	8	1	5010713
53/64	0.8281	0.6245	2.1/2	9.1/2	8	1	5010714

HSS REAMER

d_1 Ø “/Nr./letter	d_1 decimal Inch	d_2 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4533
27/32	0.8438	0.6245	2.1/2	9.1/2	8	1	5010715
55/64	0.8594	0.7495	2.5/8	10“	8	1	5010716
7/8	0.8750	0.7495	2.5/8	10“	8	1	5010717
57/64	0.8906	0.7495	2.5/8	10“	8	1	5010718
29/32	0.9062	0.7495	2.5/8	10“	8	1	5010719
59/64	0.9219	0.7495	2.5/8	10“	8	1	5010720
15/16	0.9375	0.7495	2.5/8	10“	8	1	5010721
61/64	0.9531	0.7495	2.5/8	10“	8	1	5010722
31/32	0.9688	0.7495	2.5/8	10“	8	1	5010723
63/64	0.9844	0.8745	2.3/4	10.1/2	8	1	5010724
1“	1.0000	0.8745	2.3/4	10.1/2	8	1	5010725
1.1/16	1.0625	0.8745	2.3/4	10.1/2	8	1	5010726
1.1/8	1.1250	0.8745	2.7/8	11“	8	1	5010727
1.3/16	1.1875	0.9995	2.7/8	11“	8	1	5010728
1.1/4	1.2500	0.9995	3“	11.1/2	8	1	5010729
1.3/8	1.3750	0.9995	3.1/4	12“	8	1	5010731
1.1/2	1.5000	1.2495	3.1/2	12.1/2	8	1	5010733

HSS REAMER

Chucking Reamer, Expansion, Straight Shank

4531

Straight Flute, Right Hand Cut. Expansion Chucking Reamers are an economical general purpose high production tool. The expansion feature permits the reamer to be resharpened many times while still retaining the original size.
Recommended for abrasive materials. As the diameter wears down, the reamers can be expanded many times by tightening the end adjusting screw and regrinding to it's original size.

Produced per ASME B94.2-1995 Standards.



4531

HSS

ANSI



3/8 - 1.3/4"

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4531
3/8	0.3750	5/16	3/4	7"	6	1	5011204
7/16	0.4375	3/8	7/8	7"	6	1	5010778
1/2	0.5000	7/16	1"	8"	6	1	5010780
9/16	0.5625	7/16	1.1/8	8"	6	1	5010782
5/8	0.6250	9/16	1.1/4	9"	6	1	5010784
3/4	0.7500	5/8	1.3/8	9.1/2	6	1	5010788
7/8	0.8750	3/4	1.1/2	10"	6	1	5010792
1"	1.0000	7/8	1.1/8	10.1/2	8	1	5010796
1.1/4	1.2500	1"	1.7/8	11.1/2	8	1	5010804
1.7/16	1.4375	1.1/4	2"	12"	10	1	5010807
1.3/4	1.7500	1.1/4	2.3/8	13.1/2	10	1	5010812

HSS REAMER

UNION BUTTERFIELD

Chucking Reamer, Straight Shank

4535

Slow Right Hand Spiral Flute, Right Hand Cut. Cuts with a smoother, chatter free action than straight flute reamers. Recommended for more difficult to ream materials, better surface finish requirements, applications with an interruption, and to aid in chip evacuation in blind holes.

Designed for accurate machine reaming using all types of equipment and incorporating all other design features of the straight flute style.

Produced per ASME B94.2-1995 standards.



4535

HSS

ANSI



1/16 - 1“

d_1 Ø Inch	d_1 decimal Inch	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4535
1/16	0.0625	0.0585	1/2	2.1/2	4	1	5010054
5/64	0.0781	0.0720	3/4	3“	4	1	5010055
3/32	0.0938	0.0880	3/4	3“	4	1	5010056
7/64	0.1094	0.1030	7/8	3.1/2	4	1	5010057
1/8	0.1250	0.1190	7/8	3.1/2	4	1	5010058
5/32	0.1562	0.1510	1“	4“	6	1	5010060
11/64	0.1719	0.1645	1.1/8	4.1/2	6	1	5010061
3/16	0.1875	0.1800	1.1/8	4.1/2	6	1	5010062
13/64	0.2031	0.1945	1.1/4	5“	6	1	5010063
7/32	0.2188	0.2075	1.1/4	5“	6	1	5010064
1/4	0.2500	0.2400	1.1/2	6“	6	1	5010066
17/64	0.2656	0.2485	1.1/2	6“	6	1	5010067
9/32	0.2812	0.2485	1.1/2	6“	6	1	5010068
5/16	0.3125	0.2792	1.1/2	6“	6	1	5010070
11/32	0.3438	0.2792	1.1/2	6“	6	1	5010072
3/8	0.3750	0.3100	1.3/4	7“	6	1	5010074
25/64	0.3906	0.3100	1.3/4	7“	6	1	5010075
13/32	0.4062	0.3100	1.3/4	7“	6	1	5010076
7/16	0.4375	0.3730	1.3/4	7“	6	1	5010078
31/64	0.4844	0.4355	2“	8“	6	1	5010081
1/2	0.5000	0.4355	2“	8“	6	1	5010082
17/32	0.5312	0.4355	2“	8“	6	1	5010083
9/16	0.5625	0.4355	2“	8“	8	1	5010084
5/8	0.6250	0.5620	2.1/4	9“	8	1	5010086
11/16	0.6875	0.5620	2.1/4	9“	8	1	5010088
3/4	0.7500	0.6245	2.1/2	9.1/2	8	1	5010090
7/8	0.8750	0.7495	2.5/8	10“	8	1	5010094
1“	1.0000	0.8745	2.3/4	10.1/2	8	1	5010098

COBALT REAMER

Machine Reamer, Straight Shank

B901 Left Hand Slow Spiral, Right Hand Cut. Steam Oxide in flutes reduces wear and chip welding in soft ferrous materials.





1.50mm - 1/2

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	Pack Qty	B901
	1.50	44	21	4	1	0180808
1/16	1.59	44	21	4	1	0180815
	2.00	50	25	4	1	0180822
3/32	2.38	58	29	4	1	0180839
	2.50	58	29	4	1	0180846
	3.00	62	31	4	1	0180853
1/8	3.18	66	33	4	1	0180860
	3.50	71	35	4	1	0180877
5/32	3.97	76	38	6	1	0180891
	4.00	76	38	6	1	0180907
	4.50	81	41	6	1	0180921
3/16	4.76	87	44	6	1	0180938
	5.00	87	44	6	1	0180945
13/64	5.16	87	44	6	1	0180952
	5.50	93	47	6	1	0180969
7/32	5.56	93	47	6	1	0180976
15/64	5.95	93	47	6	1	0180983
	6.00	93	47	6	1	0180990
1/4	6.35	100	50	6	1	0181003
	7.00	107	54	6	1	0181010
9/32	7.14	107	54	6	1	0181027
5/16	7.94	115	58	6	1	0181034
	8.00	115	58	6	1	0181041
	9.00	124	62	6	1	0181065
3/8	9.52	133	66	6	1	0181072
	10.00	133	66	6	1	0181089
	11.00	142	71	6	1	0181102
7/16	11.11	142	71	6	1	0181119
	12.00	152	76	6	1	0181126
1/2	12.70	152	76	6	1	0181133

Machine Reamer, Straight Shank

B157 Left Hand Fast Sprial, Right Hand Cut. Designed for Stainless Steel, Titanium, and Nickel Alloy applications.



B157

HSS-E

DIN 212

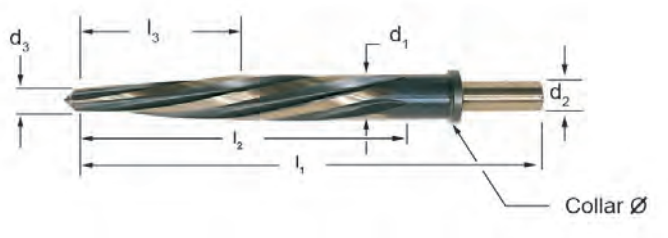


2.00 - 20.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	l_4 mm	# of Flutes	d_2 Øh$_9$ mm	Pack Qty	B157
2.0	49	11	3.5	24	3	2.0	1	0049648
3.0	61	15	4.0	32	3	3.0	1	0122198
4.0	75	19	4.0	43	3	4.0	1	0049679
5.0	86	23	4.5	52	3	5.0	1	0049693
6.0	93	26	6.0	57	3	5.6	1	0049716
7.0	109	31	7.0	69	3	7.1	1	0049730
8.0	117	33	9.0	75	3	8.0	1	0049747
9.0	125	36	9.5	81	3	9.0	1	0049754
10.0	133	38	10.0	87	3	10.0	1	0049617
11.0	142	41	10.5	96	3	10.0	1	0049624
12.0	151	44	11.0	105	3	10.0	1	0049631
13.0	151	44	11.5	105	3	10.0	1	0140352
14.0	160	47	12.0	110	3	12.5	1	0140369
15.0	162	50	12.5	112	3	12.5	1	0140376
16.0	170	52	13.0	120	3	12.5	1	0140383
17.0	175	54	13.5	123	3	14.0	1	0140390
18.0	182	56	14.0	130	3	14.0	1	0140406
19.0	189	58	14.5	131	3	16.0	1	0140413
20.0	195	60	15.0	137	3	16.0	1	0140420

Car Reamer (Alignment Reamer), Reduced Shank

B122 Left Hand Helical Flute, Right Hand Cut. 1/2” Reduced Shank with Tri-Flats. Combination Bronze and Steam Oxide in flutes reduces wear and chip welding in harder ferrous materials. Used to align or enlarge holes.



Note: Collar diameter = d_1 + 1/8“
Collar thickness = 3/16“
Shank Length = 1.1/2“

B122

HSS

ST Bronze

ANSI



3/8 - 1.1/16

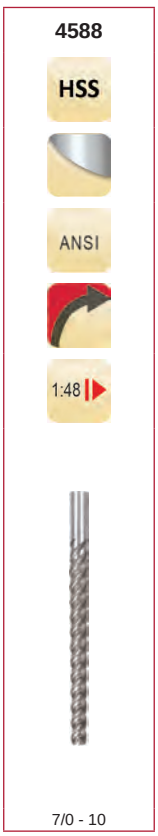
d_1 Ø Inch	d_1 decimal Inch	l_1 Inch	l_2 Inch	l_3 Inch	# of Flutes	d_2 Ø Inch	d_3 Ø Inch	Pack Qty	B122
3/8	0.3750	4.5/8	2.1/2	1.3/8	4	3/8	1/4	1	0426296
1/2	0.5000	5.7/8	3.3/4	2	5	1/2	9/32	1	0252376
9/16	0.5625	5.7/8	3.3/4	2	5	1/2	11/32	1	0252437
5/8	0.6250	6.3/8	4.1/4	2.1/4	5	1/2	11/32	1	0252413
11/16	0.6875	6.3/8	4.1/4	2.1/4	5	1/2	3/8	1	0252369
3/4	0.7500	6.7/8	4.1/2	2.1/2	5	1/2	13/32	1	0252406
13/16	0.8125	6.7/8	4.1/2	2.1/2	5	1/2	7/16	1	0252383
7/8	0.8750	6.7/8	4.1/2	2.1/2	5	1/2	15/32	1	0252420
15/16	0.9375	6.7/8	4.1/2	2.1/2	5	1/2	9/16	1	0252390
1“	1.0000	6.7/8	4.1/2	2.1/2	5	1/2	19/32	1	0252345
1.1/16	1.0625	6.7/8	4.1/2	2.1/2	5	1/2	11/16	1	0252352

HSS REAMER

Machine Reamer, Taper Pin Type, Straight Shank

4588 Left hand high spiral. Right hand cut taper pin (1/4” per foot). Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. Ideal geometry for the machine reaming of pin holes on a production basis. Helical construction prevents chips from packing in flutes and reduces breakage.





nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4588
7/0	0.0497	0.0666	5/64	13/16	1.13/16	2	1	5011157
6/0	0.0611	0.0810	3/32	15/16	1.15/16	2	1	5011158
5/0	0.0719	0.0966	7/64	1.3/16	2.3/16	2	1	5011159
4/0	0.0869	0.1142	1/8	1.5/16	2.5/16	2	1	5011160
3/0	0.1029	0.1300	9/64	1.5/16	5.5/16	2	1	5011161
2/0	0.1137	0.1462	5/32	1.9/16	2.9/16	3	1	5011162
1	0.1447	0.1798	3/16	1.11/16	2.15/16	3	1	5011164
2	0.1600	0.2010	13/64	1.15/16	3.3/16	3	1	5011165
3	0.1813	0.2294	15/64	2.5/16	3.11/16	3	1	5011166
4	0.2071	0.2600	17/64	2.9/16	4.1/16	3	1	5011167
5	0.2410	0.2994	5/16	2.13/16	4.5/16	3	1	5011168
6	0.2773	0.3540	23/64	3.11/16	5.7/16	3	1	5011169
7	0.3297	0.4220	13/32	4.7/16	6.5/16	3	1	5011170
8	0.3971	0.5050	7/16	5.3/16	7.3/16	3	1	5011171
9	0.4800	0.6066	9/16	6.1/16	8.5/16	4	1	5011172
10	0.5799	0.7216	5/8	6.13/16	9.5/16	4	1	5011173

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

HSS REAMER

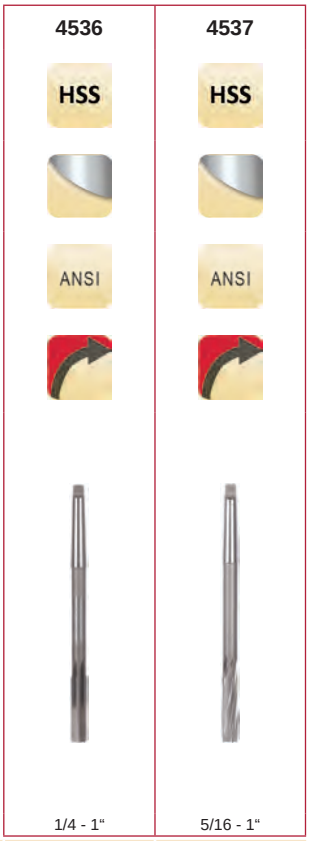
Chucking Reamer, Taper Shank

4536 Straight flute, right hand cut. Chucking reamers have shorter and deeper flutes than hand reamers and are specifically designed for accurate machine reaming in most materials and equipment.

4537 Right hand spiral flute, right hand cut. Cuts with a smoother action than a straight flute reamer. Recommended for more difficult to ream materials, better surface finish requirements, applications with an interruption, and to aid in chip removal in blind holes.

Produced per ASME B94.2-1995 standards.





d_1 Ø Inch	d_1 decimal Inch	MTS	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4536	4537
1/4	0.2500	1	1.1/2	6“	6	1	5010734	—
9/32	0.2813	1	1.1/2	6“	6	1	5010735	—
5/16	0.3125	1	1.1/2	6“	6	1	5010736	5010142
11/32	0.3437	1	1.1/2	6“	6	1	5010737	—
3/8	0.3750	1	1.3/4	7“	6	1	5010738	5010144
13/32	0.4062	1	1.3/4	7“	6	1	5010739	—
7/16	0.4375	1	1.3/4	7“	6	1	5010740	—
1/2	0.5000	1	2“	8“	6	1	5010742	5010148
9/16	0.5625	1	2“	8“	8	1	5010744	—
5/8	0.6250	2	2.1/4	9“	8	1	5010746	5010152
11/16	0.6875	2	2.1/4	9“	8	1	5010748	—
3/4	0.7500	2	2.1/2	9.1/2	8	1	5010750	5010156
13/16	0.8125	2	2.1/2	9.1/2	8	1	5010752	5010158
7/8	0.8750	2	2.5/8	10“	8	1	5010754	5010160
15/16	0.9375	3	2.5/8	10“	8	1	5010756	—
1“	1.0000	3	2.3/4	10.1/2	8	1	5010758	5010164

UNION BUTTERFIELD

Chucking Reamer, Expansion, Taper Shank

4532

Straight flute, right hand cut.
Expansion Chucking Reamers are an economical general purpose high production tool. The expansion feature permits the reamer to be resharpened many times while still retaining the original size.
Recommended for abrasive materials. As the diameter wears down, the reamers can be expanded many times by tightening the end adjusting screw and regrinding to it's original size.

Produced per ASME B94.2-1995 standards.



4532

HSS

ANSI



3/8 - 1.3/4"

d_1 Ø Inch	d_1 decimal Inch	MTS	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4532
3/8	0.3750	1	3/4	7"	6	1	5011206
1/2	0.5000	1	1"	8"	6	1	5010822
5/8	0.6250	2	1.1/4	9"	6	1	5010826
11/16	0.6875	2	1.1/4	9"	6	1	5010828
3/4	0.7500	2	1.3/8	9.1/2	6	1	5010830
7/8	0.8750	2	1.1/2	10"	6	1	5010834
1"	1.0000	3	1.5/8	10.1/2	8	1	5010838
1.1/8	1.1250	3	1.3/4	11"	8	1	5010842
1.1/4	1.2500	4	1.7/8	11.1/2	8	1	5010846
1.3/8	1.3750	4	2"	12"	8	1	5010848
1.1/2	1.5000	4	2.1/8	12.1/2	10	1	5010850
1.5/8	1.6250	4	2.1/4	13"	10	1	5010852
1.3/4	1.7500	5	2.3/8	13.1/2	10	1	5010854

COBALT REAMER

Machine Reamer, Taper Shank

B101 Left hand slow spiral, right hand. Steam oxide in flutes reduces wear chip welding harder ferrous materials.



B101











3.00mm - 2"

Note: All sizes have 1mm x 45 chamfer (lead).
Cutting diameters are produced to H7 tolerance

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	MTS	Pack Qty	B101
	3.00	112	33	4	1	1	0181560
1/8	3.18	112	33	4	1	1	0181140
	3.50	115	35	6	1	1	0181577
	4.00	117	38	6	1	1	0181584
	4.50	120	41	6	1	1	0181591
3/16	4.76	124	44	6	1	1	0181164
	5.00	124	44	6	1	1	0181607
	5.50	127	47	6	1	1	0181614
	6.00	127	47	6	1	1	0181621
1/4	6.35	130	50	6	1	1	0181188
	6.50	130	50	6	1	1	0181638
	7.00	134	54	6	1	1	0181645
5/16	7.94	138	58	6	1	1	0181201
	8.00	138	58	6	1	1	0181669
	8.50	138	58	6	1	1	0181676
	9.00	142	62	6	1	1	0181683
	9.50	142	62	6	1	1	0181690
3/8	9.52	146	66	6	1	1	0181225
	10.00	146	66	6	1	1	0181706
	10.50	146	66	6	1	1	0181713
	11.00	151	71	6	1	1	0181720
7/16	11.11	151	71	6	1	1	0181249
	12.00	156	76	6	1	1	0181744
	12.50	156	76	6	1	1	0181751
1/2	12.70	156	76	6	1	1	0181263
	13.00	156	76	6	1	1	0181768
	13.50	161	81	6	1	1	0181775
	14.00	161	81	8	1	1	0181782
9/16	14.29	181	81	8	2	1	0181287
	14.50	181	81	8	2	1	0181799
	15.00	181	81	8	2	1	0181805
	15.50	187	87	8	2	1	0181812
5/8	15.88	187	87	8	2	1	0181300

HSS REAMER

DORMER

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	MTS	Pack Qty	B101
	16.00	187	87	8	2	1	0181829
	16.50	187	87	8	2	1	0181836
	17.00	187	87	8	2	1	0181843
	18.00	193	93	8	2	1	0181850
	19.00	193	93	8	2	1	0181867
3/4	19.05	200	100	8	2	1	0181348
	20.00	200	100	8	2	1	0181874
13/16	20.64	200	100	8	2	1	0181362
	21.00	200	100	8	2	1	0181881
	22.00	207	107	8	2	1	0181898
7/8	22.22	207	107	8	2	1	0181386
	23.00	207	107	8	2	1	0181904
	24.00	242	115	8	3	1	0181911
	25.00	242	115	10	3	1	0181928
1“	25.40	242	115	10	3	1	0181423
	26.00	242	115	10	3	1	0181935
	27.00	251	124	10	3	1	0181942
	28.00	251	124	10	3	1	0181959
1.1/8	28.58	251	124	10	3	1	0181447
	29.00	251	124	10	3	1	0181966
	30.00	251	124	10	3	1	0181973
	31.00	260	133	10	3	1	0181980
1.1/4	31.75	260	133	10	3	1	0181461
	32.00	293	133	10	4	1	0181997
	34.00	302	142	10	4	1	0182017
1.3/8	34.93	302	142	10	4	1	0181485
	35.00	302	142	10	4	1	0182024
	36.00	302	142	10	4	1	0182031
	37.00	302	142	10	4	1	0182048
	38.00	312	152	10	4	1	0182055
1.1/2	38.10	312	152	10	4	1	0181508
	39.00	312	152	10	4	1	0182062
	40.00	312	152	10	4	1	0182079
	41.00	312	152	10	4	1	0182086
	42.00	312	152	10	4	1	0182093
	43.00	323	163	10	4	1	0182109
	44.00	323	163	10	4	1	0182116
1.3/4	44.45	323	163	10	4	1	0181522
	45.00	323	163	12	4	1	0182123
	46.00	323	163	12	4	1	0182130
	47.00	323	163	12	4	1	0182147
	48.00	334	174	12	4	1	0182154
	50.00	334	174	12	4	1	0182178
2“	50.80	334	174	12	4	1	0181546

HSS REAMER

Bridge Reamer, Taper Shank

B121 Left hand fast spiral, right hand cut tapered bridge reamer. Used in structural iron and steel applications for badly misaligned holes. The l_3 length has a 1:10 starting taper.



B121

HSS

ST

DIN 311



10.00 - 30.00

d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	MTS	Pack Qty	B121
10.0	171	95	30	4	1	1	0049020
11.0	176	100	33	4	1	1	0049037
12.0	199	105	39	4	2	1	0049044
13.0	199	105	39	4	2	1	0049051
14.0	209	115	42	4	2	1	0049068
15.0	219	125	45	4	2	1	0049075
16.0	229	135	48	4	2	1	0049082
17.0	251	135	51	4	3	1	0049099
18.0	261	145	58	4	3	1	0049105
19.0	261	145	58	4	3	1	0049112
20.0	271	155	62	4	3	1	0049129
21.0	271	155	62	4	3	1	0049136
22.0	281	165	66	4	3	1	0049143
23.0	281	165	66	4	3	1	0049150
24.0	296	180	72	4	3	1	0049167
25.0	296	180	72	4	3	1	0049174
26.0	296	180	72	4	3	1	0049181
30.0	311	195	78	5	3	1	0049211

UNION BUTTERFIELD

Bridge Reamer, Taper Shank

4579

Left hand slow spiral, right hand cut tapered bridge reamer. Used in structural iron and steel applications for badly misaligned holes.

Produced per ASME B94.2-1995 standards.



4579

HSS

ANSI



7/16 - 1.1/16

nom Ø	d_1 Ø (min)	d_2 Ø (max)	MTS	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4579
7/16	1/4	7/16	2	4.3/8	8.1/4	4	1	5011055
1/2	9/32	1/2	2	5.1/8	9“	4	1	5011056
9/16	11/32	9/16	2	5.1/8	9“	4	1	5011057
5/8	3/8	5/8	2	6.1/8	10“	4	1	5011058
11/16	25/64	11/16	3	7.1/8	11.3/4	4	1	5011059
3/4	7/16	3/4	3	7.3/8	12“	4	1	5011060
13/16	1/2	13/16	3	7.3/8	12“	4	1	5011061
7/8	9/16	7/8	3	7.3/8	12“	4	1	5011062
15/16	5/8	15/16	3	7.3/8	12“	4	1	5011063
1“	11/16	1“	3	7.3/8	12“	4	1	5011064
1.1/16	3/4	1.1/16	3	7.3/8	12“	4	1	5011065

HSS CORE DRILL

Taper Shank - 4-Flute

T400 Core drill with taper shank for enlarging pre-drilled or cast holes in a wide range of materials.



T400











1/2 - 1.5/8

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	MTS	Pack Qty	T400
1/2	0.5000	4.3/8	8.1/4	2	1	024532
17/32	0.5312	4.5/8	8.1/2	2	1	024534
9/16	0.5625	4.7/8	8.3/4	2	1	024536
5/8	0.6250	4.7/8	8.3/4	2	1	024540
21/32	0.6562	5.1/8	9“	2	1	024542
3/4	0.7500	5.7/8	9.3/4	2	1	024548
25/32	0.7812	6“	9.7/8	2	1	024550
7/8	0.8750	6.1/8	10.3/4	3	1	024556
1“	1.0000	6.3/8	11“	3	1	024600
1.1/32	1.0312	6.1/2	11.1/8	3	1	024602
1.1/16	1.0625	6.5/8	11.1/4	3	1	024604
1.1/8	1.1250	7.1/8	12.3/4	4	1	024608
1.5/32	1.1562	7.1/4	12.7/8	4	1	024610
1.1/4	1.2500	7.7/8	13.1/2	4	1	024616
1.5/16	1.3125	8.5/8	14.1/4	4	1	024620
1.11/32	1.3438	8.3/4	14.3/8	4	1	024622
1.3/8	1.3750	8.7/8	14.1/2	4	1	024624
1.1/2	1.5000	9.3/8	15“	4	1	024632
1.9/16	1.5625	9.5/8	16.5/8	5	1	024636
1.5/8	1.6250	10“	17“	5	1	024640

HSS REAMER

Hand Reamer, Square Drive

4500 Straight flute hand reamer with square drive, right hand cut. Widely used by hand for the final sizing of drilled holes. The square on the shank allows it to be held in either a tap wrench or a vise depending on whether it is the reamer or the part that is rotating. A long starting taper allows for ease of entry and accurate alignment. The straight flute style is recommended for most general purpose hand reaming applications.



4500

HSS

ANSI



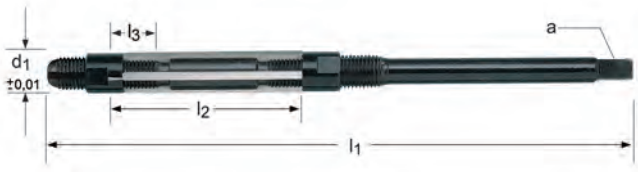
1/8 - 1“

d_1 Ø Inch	d_1 decimal Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4500
1/8	0.1250	1.1/2	3“	6	1	5010928
3/16	0.1875	1.3/4	3.1/2	6	1	5010930
1/4	0.2500	2“	4“	6	1	5010932
5/16	0.3125	2.1/4	4.1/2	6	1	5010934
3/8	0.3750	2.1/2	5“	6	1	5010936
7/16	0.4375	2.3/4	5.1/2	6	1	5010938
1/2	0.5000	3“	6“	6	1	5010940
9/16	0.5625	3.1/4	6.1/2	8	1	5010942
5/8	0.6250	3.1/2	7“	8	1	5010944
3/4	0.7500	4.3/16	8.3/8	8	1	5010948
7/8	0.8750	4.7/8	9.3/4	8	1	5010950
1“	1.0000	5.7/16	10.7/8	8	1	5010952

HSS REAMER

Adjustable Hand Reamer, Replaceable Blade Type

B334 For light duty sizing of uninterrupted holes.



B334

HSS



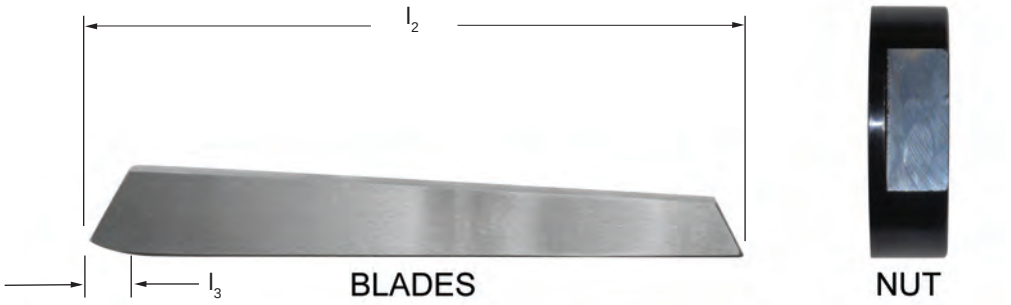
N000 - N16

Nr.	d min-max mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	▨ a mm	Pack Qty	B334
000	6.4 - 7.2	110	32	7	4	3.0	1	0052174
00	7.2 - 8.0	110	32	7	4	3.4	1	0052167
0	8.0 - 9.0	115	34	9	5	3.8	1	0052150
1	9.0 - 10.0	115	34	9	5	4.3	1	0052181
2	10.0 - 11.0	115	34	9	5	4.9	1	0052228
3	11.0 - 12.0	125	35	9	5	4.9	1	0052235
4	12.0 - 13.5	135	41	9	5	6.2	1	0052242
5	13.5 - 15.5	146	50	12	5	7.0	1	0052259
6	15.5 - 18.0	166	60	12	5	8.0	1	0052266
7	18.0 - 21.0	178	65	15	5	9.0	1	0052273
8	21.0 - 24.0	195	76	15	5	11.0	1	0052280
9	24.0 - 27.5	218	82	18	5	12.0	1	0052297
10	27.5 - 31.5	245	86	18	5	14.5	1	0052198
11	31.5 - 37.0	280	98	18	6	18.0	1	0052204
12	37.0 - 45.0	325	108	20	6	20.0	1	0052211
13	45.0 - 55.0	370	118	20	6	26.0	1	0140819
14	55.0 - 67.0	400	125	20	6	32.0	1	0140826
15	67.0 - 80.0	435	140	23	8	39.0	1	0140833
16	80.0 - 95.0	475	155	23	8	49.0	1	0140840

HSS REAMER

Adjustable Hand Reamer, Replaceable Blade Type

B335 Replace blades & nuts for use with B334



B335

HSS

DORMER



N000 BLADES - N16 NUTS

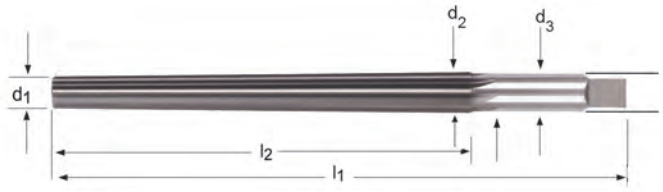
Nr.	l_2 mm	l_3 mm	Nuts Pack Qty	B335 Nuts	Blades Pack Qty	B335 Blades
000	32	7	1	0144640	4	0052327
00	32	7	1	0144633	4	0052310
0	34	9	1	0144626	5	0052303
1	34	9	1	0144657	5	0052334
2	34	9	1	0144664	5	0052372
3	35	9	1	0144671	5	0052389
4	41	9	1	0144688	5	0052396
5	50	12	1	0144695	5	0052402
6	60	12	1	0144701	5	0052419
7	65	15	1	0144718	5	0052426
8	76	15	1	0144725	5	0052433
9	82	18	1	0144732	5	0052440
10	86	18	1	0144749	5	0052341
11	98	18	1	0144756	6	0052358
12	108	20	1	0144763	6	0052365
13	118	20	1	0144770	6	0144589
14	125	20	1	0144787	6	0144596
15	140	23	1	0144794	8	0144602
16	155	23	1	0144800	8	0144619

HSS REAMER

Hand Reamer, Taper Pin Type, Square Drive

4587 Straight flute taper pin (1/4” per foot), right hand cut.
Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use.
Recommended for most materials.

Produced per ASME B94.2-1995 standards.



4587

HSS

ANSI

1:48



N0 - N10

nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4587
0	0.1287	0.1638	11/64	1.11/16	2.15/16	6	1	5011129
1	0.1447	0.1798	3/16	1.11/16	2.15/16	6	1	5011130
2	0.1600	0.2010	13/64	1.15/16	3.3/16	6	1	5011131
3	0.1813	0.2294	15/64	2.5/16	3.11/16	6	1	5011132
4	0.2071	0.2600	17/64	2.9/16	4.1/16	6	1	5011133
5	0.2410	0.2994	5/16	2.13/16	4.5/16	6	1	5011134
6	0.2773	0.3540	23/64	3.11/16	5.7/16	6	1	5011135
7	0.3297	0.4220	13/32	4.7/16	6.5/16	6	1	5011136
8	0.3971	0.5050	7/16	5.3/16	7.3/16	6	1	5011137
9	0.4800	0.6066	9/16	6.1/16	8.5/16	8	1	5011138
10	0.5799	0.7216	5/8	6.13/16	9.5/16	8	1	5011139

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

UNION BUTTERFIELD

Hand Reamer, Taper Pin, Square Drive

4591

Left hand slow spiral flute, right hand cut taper pin (1/4” per foot) hand reamer with square drive.
Designed to convert a straight hole into a tapered hole into which standard taper pins (ASA B5.20-1958) will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use.
Recommended for most materials.

Produced per ASME B94.2-1995 standards.



4591

HSS

ANSI

1:48



N0 - N10

nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4591
0	0.1287	0.1638	11/64	1.11/16	2.15/16	6	1	5011146
1	0.1447	0.1798	3/16	1.11/16	2.15/16	6	1	5011147
2	0.1600	0.2010	13/64	1.15/16	3.3/16	6	1	5011148
3	0.1813	0.2294	15/64	2.5/16	3.11/16	6	1	5011149
4	0.2071	0.2600	17/64	2.9/16	4.1/16	6	1	5011150
5	0.2410	0.2994	5/16	2.13/16	4.5/16	6	1	5011151
6	0.2773	0.3540	23/64	3.11/16	5.7/16	6	1	5011152
7	0.3297	0.4220	13/32	4.7/16	6.5/16	6	1	5011153
8	0.3971	0.5050	7/16	5.3/16	7.3/16	6	1	5011154
9	0.4800	0.6066	9/16	6.1/16	8.5/16	8	1	5011155
10	0.5799	0.7216	5/8	6.13/16	9.5/16	8	1	5011156

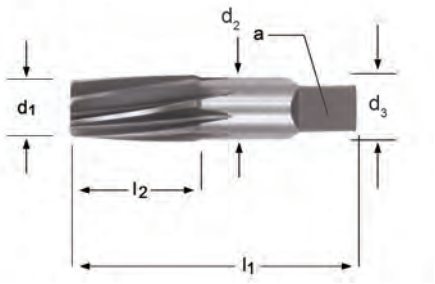
Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

HSS REAMER

Hand Reamer, Taper Pipe Type, Square Drive

4600 Left hand spiral flute, right hand cut taper (3/4” per foot) taper pipe reamer.
Intended for reaming holes to be tapped with American Standard taper pipe taps. Generally used by hand with a tap wrench.

Produced per ASME B94.2-1995 standards.



4600

HSS

ANSI



1/8 - 1“

nom Ø	d_1 Ø Inch	d_2 Ø Inch	d_3 Ø Inch	l_2 Inch	l_1 Inch	▱ a mm	# of Flutes	Pack Qty	4600
1/8	0.3160	0.3620	0.4375	3/4	2.1/8	0.3280	6	1	1810007
1/4	0.4060	0.4720	0.5625	1.1/16	2.7/16	0.4210	6	1	1810008
3/8	0.5400	0.6060	0.7000	1.1/16	2.9/16	0.5310	8	1	1810009
1/2	0.6650	0.7510	0.6875	1.3/8	3.1/8	0.5150	8	1	1810010
3/4	0.8760	0.9620	0.9063	1.3/8	3.1/4	0.6790	10	1	1810011
1“	1.1030	1.2120	1.1250	1.3/4	3.3/4	0.8430	10	1	1810012

Note: Nom Ø (column 1) is the NPT pipe thread size.
This is not the tool diameter.

Hand Reamer, Square Drive

B100 Left hand spiral flute, right hand cut.
Widely used by hand for the final sizing of drilled holes. The square on the shank allows it to be held in either a tap wrench or a vise depending on whether it is the reamer or the part that is rotating. A long starting taper allows for ease of entry and accurate alignment.



B100

HSS

ST

DIN 206



1.50 - 50.00

Produced per DIN206 Form B.
Cutting diameters are produced to H7 tolerance.
Shank diameters (same as cutting diameters) but produced to e9 tolerance.

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	▨ a mm	Pack Qty	B100
	1.50	41	20	5	3	1.12	1	0179987
1/16	1.59	41	20	5	3	1.12	1	0179598
	1.60	44	21	5	3	1.25	1	0179994
5/64	1.98	47	23	6	4	1.40	1	0179604
	2.00	50	25	6	4	1.60	1	0048610
3/32	2.38	54	27	7	4	1.80	1	0179611
	2.50	58	29	7	4	2.10	1	0048634
7/64	2.78	62	31	8	6	2.10	1	0179628
	3.00	62	31	8	6	2.40	1	0048719
1/8	3.18	66	33	8	6	2.40	1	0179635
	3.20	66	33	8	6	2.40	1	0048726
	3.50	71	35	9	6	2.70	1	0048733
9/64	3.57	71	35	9	6	2.70	1	0179642
5/32	3.97	76	38	10	6	3.00	1	0179659
	4.00	76	38	10	6	3.00	1	0048801
11/64	4.37	81	41	10	6	3.40	1	0179666
	4.50	81	41	10	6	3.40	1	0048818
3/16	4.76	87	44	11	6	3.80	1	0179673
	5.00	87	44	11	6	3.80	1	0048887
13/64	5.16	87	44	11	6	3.80	1	0179680
	5.50	93	47	12	6	4.30	1	0048894
7/32	5.56	93	47	12	6	4.30	1	0179697
15/64	5.95	93	47	12	6	4.90	1	0179703
	6.00	93	47	12	6	4.90	1	0048917
1/4	6.35	100	50	13	6	4.90	1	0179710
	6.50	100	50	13	6	4.90	1	0140314
17/64	6.75	107	54	14	6	5.50	1	0179727
	7.00	107	54	14	6	5.50	1	0048924
9/32	7.14	107	54	14	6	6.20	1	0179734
	7.50	107	54	14	6	6.20	1	0140321
19/64	7.54	115	58	15	6	6.20	1	0179741
5/16	7.94	115	58	15	6	6.20	1	0179758
	8.00	115	58	15	6	6.20	1	0048931

DORMER

HSS REAMER

d_1 Ø Inch	d_1 Ø mm	l_1 mm	l_2 mm	l_3 mm	# of Flutes	▨ a mm	Pack Qty	B100
21/64	8.33	115	58	15	6	7.00	1	0179765
	8.50	115	58	15	6	7.00	1	0140338
11/32	8.73	124	62	16	6	7.00	1	0179772
	9.00	124	62	16	6	7.00	1	0048948
23/64	9.13	124	62	16	6	8.00	1	0179789
	9.50	124	62	16	6	8.00	1	0140345
3/8	9.52	124	62	17	6	8.00	1	0179796
25/64	9.92	133	66	17	6	8.00	1	0179802
	10.00	133	66	17	6	8.00	1	0048511
13/32	10.32	133	66	17	6	8.00	1	0179819
	10.50	133	66	17	6	8.00	1	0180006
	11.00	142	71	18	6	9.00	1	0048528
7/16	11.11	142	71	18	6	9.00	1	0179826
	11.50	142	71	18	6	9.00	1	0180013
	12.00	152	76	19	6	9.00	1	0048535
	12.50	152	76	19	6	10.00	1	0180020
1/2	12.70	152	76	19	6	10.00	1	0179840
	13.00	152	76	19	6	10.00	1	0048542
17/32	13.49	163	81	20	8	11.00	1	0179857
	13.50	163	81	20	8	11.00	1	0180037
	14.00	163	81	20	8	11.00	1	0048559
9/16	14.29	163	81	20	8	11.00	1	0179864
	14.50	163	81	20	8	11.00	1	0180044
	15.00	163	81	20	8	12.00	1	0048566
19/32	15.08	163	81	22	8	12.00	1	0179871
5/8	15.88	175	87	22	8	12.00	1	0179888
	16.00	175	87	22	8	12.00	1	0048573
	17.00	175	87	22	8	13.00	1	0048580
11/16	17.46	188	93	23	8	14.50	1	0179895
	18.00	188	93	23	8	14.50	1	0048597
	19.00	188	93	23	8	14.50	1	0048603
3/4	19.05	188	93	25	8	14.50	1	0179901
	20.00	201	100	25	8	16.00	1	0048658
13/16	20.64	201	100	25	8	16.00	1	0179925
	21.00	201	100	25	8	16.00	1	0180051
	22.00	215	107	27	8	18.00	1	0048665
7/8	22.22	215	107	27	8	18.00	1	0179949
	23.00	215	107	27	8	18.00	1	0180068
	24.00	231	115	29	8	18.00	1	0048672
	25.00	231	115	29	8	20.00	1	0048689
1“	25.40	231	115	29	8	20.00	1	0179970
	26.00	231	115	29	8	20.00	1	0048696
	27.00	247	124	31	10	22.00	1	0180075
	28.00	247	124	31	10	22.00	1	0048702
	29.00	247	124	31	10	22.00	1	0180082
	30.00	247	124	31	10	24.00	1	0048740
	31.00	265	133	33	10	24.00	1	0180099
	32.00	265	133	33	10	24.00	1	0048757
	33.00	265	133	33	10	26.00	1	0180105
	34.00	284	142	36	10	26.00	1	0048764
	35.00	284	142	36	10	29.00	1	0048771
	36.00	284	142	36	10	29.00	1	0048788
	37.00	284	142	36	10	29.00	1	0180112
	38.00	305	152	38	10	29.00	1	0048795
	39.00	305	152	38	10	32.00	1	0180129
	40.00	305	152	38	10	32.00	1	0048825
	45.00	326	163	41	12	35.00	1	0048856
	50.00	347	174	44	12	39.00	1	0048900

Hand Reamer, Taper Pin Type, Square Drive

B301

Straight flute taper pin (1/4” per foot), straight shank reamer. Designed to convert a straight hole into a tapered hole into which standard taper pins will fit. The square on the shank is suitable for holding a tap wrench or vise, depending on whether the reamer or part is rotating, making them ideal for hand use. Recommended for most materials.





nom Ø	d_1 Ø mm	l_1 mm	l_2 mm	# of Flutes	◪ a mm	d_2 Ø mm	Pack Qty	B301
1/16	1.10	51	25	4	1.2	1.63	1	0182277 [1]
5/64	1.50	51	25	4	1.6	2.03	1	0182284 [1]
3/32	1.75	57	32	4	2.0	2.41	1	0182291 [1]
7/64	2.03	64	38	4	2.2	2.82	1	0182307 [1]
1/8	2.30	70	44	4	2.5	3.23	1	0182314 [1]
9/64	2.64	73	48	4	2.8	3.63	1	0182321 [1]
5/32	2.95	76	51	4	3.1	4.01	1	0182338 [1]
11/64	3.23	89	57	4	3.6	4.42	1	0182345 [1]
3/16	3.50	102	70	4	4.0	4.95	1	0182352 [1]
7/32	4.13	102	70	6	4.5	5.59	1	0182369 [1]
1/4	4.64	117	86	6	5.0	6.43	1	0182376 [2]
9/32	5.23	143	105	6	5.6	7.42	1	0182383 [2]
5/16	5.84	143	105	6	6.3	8.03	1	0182390 [2]
11/32	6.43	152	114	6	7.1	8.81	1	0182406 [2]
3/8	7.03	165	127	6	8.0	9.68	1	0182413 [2]
13/32	7.42	191	146	6	8.0	10.46	1	0182420 [2]
7/16	8.21	191	146	6	9.0	11.25	1	0182437 [2]
1/2	9.41	210	165	6	10.0	12.85	1	0182444 [2]

[1] Limit of tolerance +0.0030
[2] Limit of tolerance +0.0050

Visual Index - Countersinks & Counterbores



Visual Index - Countersinks & Counterbores

Alpha Code	Countersinks, Counterbores - Feed in Inches per Revolution Ø Diameter									
	1/4	5/16	5/64	5/8	25/32	1"	1-1/4	1-1/2	2-3/8	3"
A	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.005	0.006	0.006
B	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008
C	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
D	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010	0.011
E	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012	0.013
F	0.004	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.014
G	0.004	0.005	0.006	0.007	0.008	0.009	0.011	0.013	0.014	0.016
H	0.005	0.006	0.007	0.008	0.009	0.010	0.012	0.014	0.016	0.018

Application Material Groups (AMG)			Hardness HRC	ISO
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB	P 1
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB	P 1
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24	P 2
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24	P 3
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38	P 4
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38	H 1
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55	H 3
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63	H 4
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24	M 1
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24	M 3
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32	M 2
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32	S 2
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB	K 1
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32	K 2
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB	K 3
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32	K 4
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB	S 1
	4.2 Titanium, alloyed	6AI4V, 6A14V-2Sn, Monel, Monel K	<28	S 2
	4.3 Titanium, alloyed	6AI4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38	S 3
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB	S 1
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28	S 2
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38	S 3
6.Copper	6.1 Copper	Commercially Pure	<100 HB	N 3
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB	N 4
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB	N 3
	6.4 High Strength Bronze	Ampco 18-25	<49	N 4
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB	N 1
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB	N 1
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB	N 1
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB	N 2
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---	O
	8.2 Thermosetting plastics	Bakelit, Pertinax	---	O
	8.3 Reinforced plastic materials	CFK, GFKAFK	---	O
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54	H
10.Graphite	10.1 Standard graphite		---	O

Visual Index - Countersinks & Counterbores

Tool Material:	HM	HSS	HSS	HSS	HSS	HSS	HSS	HSS-E	HSS	HSS	HSS	HSS-E	HSS
Finish/Coating:						TiN				TiAlN		AlTiCN	TiAlN
Standard:	DIN 335C	ANSI	ANSI	ANSI	DIN 334C	DIN 334C	DIN 335C	DORMER	DIN 335C	DIN 335C	DIN 335C	DIN 335C	DIN 335C
Direction of Cut:													
Application:													
Shank:													
Countersink Angle:	90°	60°	60°	60°	60°	60°	82°	90°	90°	90°	90°	90°	100°
		↓ 90°	↓ 100°	↓ 82°									
													
Style:	G400	4603	4608	4602	G135	G335	G154	G149	G136	G560	G142	G570	G171
Range:	6.30 - 31.00	1/4 - 1.1/2	1/4 - 1"	1/2 - 1"	6.30 - 25.00	6.30 - 25.00	6.30 - 25.00	5.00 - 50.00	4.30 - 31.00	6.30 - 31.00	4.80 - 31.00	6.30 - 31.00	6.30 - 25.00
Page #	476	477	478	479	480	480	481	482	483	483	484	485	486
1.1	98F	98F	98F	98F	98F	164E	98F	98D	98F	164E	98F	148E	164E
1.2	82E	82E	82E	82E	82E	131E	82E	82D	82E	131E	82E	118E	131E
1.3	66D	66D	66D	66D	66D	98D	66D	66C	66D	98D	66D	89D	98D
1.4	49D	49D	49D	49D	49D	66D	49D	49B	49D	66D	49D	72D	66D
1.5	33B	33B	33B	33B	33B	49B	33B	33A	33B	49B		56B	49B
1.6	20A	20A	20A	20A	20A	33B	20A	20A	20A	33B		39B	33B
1.7													
1.8													
2.1	26C	26C	26C	26C	26C		26C	26B	26C		26C	56C	
2.2	20B	20B	20B	20B	20B		20B	20A	20B		20B	39B	
2.3	13A	13A	13A	13A	13A		13A		13A		13A	49A	
2.4												33A	
3.1	82F	82F	82F	82F	82F	148F	82F	82D	82F	148F		131C	148F
3.2	49D	49D	49D	49D	49D	115D	49D	49C	49D	115D		105C	115D
3.3	39C	39C	39C	39C	39C	98C	39C	39A	39C	98C		89C	98C
3.4	26C	26C	26C	26C	26C	98C	26C	26A	26C	98C		79C	98C
4.1	39C	39C	39C	39C	39C	66C	39C	39B	39C	66C	39C		66C
4.2	33A	33A	33A	33A	33A	49A	33A	33A	33A	49A	33A		49A
4.3	26A	26A	26A	26A	26A	33A	26A	26A	26A	33A			33A
5.1	39C	39C	39C	39C	39C	66C	39C	39B	39C	66C	39C		66C
5.2	20B	20B	20B	20B	20B	33B	20B	20A	20B	33B	20B	20A	33B
5.3	13A	13A	13A	13A	13A	20A	13A	13A	13A	20A		13A	20A
6.1	82D	82D	82D	82D	82D	131D	82D	82B	82D	131D	82D	131D	131D
6.2	66F	66F	66F	66F	66F	98F	66F	66C	66F	98F	66F	98F	98F
6.3	82F	82F	82F	82F	82F	131F	82F	82C	82F	131F	82F	131F	131F
6.4	33D	33D	33D	33D	33D	49D	33D	33B	33D	49D		49D	49D
7.1	98G	98G	98G	98G	98G	164G	98G	98D	98G	164G	98G	148G	164G
7.2	82F	82F	82F	82F	82F	131F	82F	82C	82F	131F	82F	118F	131F
7.3	66F	66F	66F	66F	66F	98F	66F	66C	66F	98F	66F	89F	98F
7.4	33F	33F	33F	33F	33F	49F	33F	33C	33F	49F	33F	43F	49F
8.1	98G	98G	98G	98G	98G	164G	98G	98D	98G	164G	98G		164G
8.2	66G	66G	66G	66G	66G	98G	66G	66D	66G	98G	66G		98G
8.3													
9.1													
10.1													

Visual Index - Countersinks & Counterbores

	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS	HSS
					TiN						
	DORMER	DIN 335A	DIN 334D	DIN 335D	DIN 335D	DIN 335C	ANSI	ANSI	ANSI	ANSI	ANSI
	90°	90°	60°	90°	90°	90°					
											
	G600	G132	G137	G138	G338	G236	4702	4706	4705	4703	4704
	6.30 - 25.00	8.00 - 20.00	16.00 - 80.00	25.00 - 80.00	25.00 - 63.00	Set	1/4 - 2"	1/4 - 1"	1/4 - 1"	1/4 - 2.1/2	3/32 - 2"
	487	488	489	490	490	491	492	493	493	495	496
1.1	72F		98F	98F	164F		82C	82C	82C	82C	
1.2	56E		82E	82E	131E		66C	66C	66C	66C	
1.3	49D	66E	66D	66D	98D		52C	52C	52C	52C	
1.4	39D	49D	49D	49D	66D		49B	49B	49B	49B	
1.5	26B	33D	33B	33B	49B		30B	30B	30B	30B	
1.6	20A	20B	20A	20A	33A		16A	16A	16A	16A	
1.7											
1.8											
2.1	26C		26C	26C			36C	36C	36C	36C	
2.2	20B		20B	20B			20B	20B	20B	20B	
2.3	13A	13B	13A	13A			26B	26B	26B	26B	
2.4											
3.1	82F		82F	82F	148F		52E	52E	52E	52E	
3.2	49D		49D	49D	115D		49D	49D	49D	49D	
3.3	39C		39C	39C	98C		43C	43C	43C	43C	
3.4		26D	26C	26C	98C		36C	36C	36C	36C	
4.1			39C	39C	66C		49C	49C	49C	49C	
4.2		26A	33A	33A	49A		30B	30B	30B	30B	
4.3		26A	26A	26A	33A		16B	16B	16B	16B	
5.1			39C	39C	66C		26D	26D	26D	26D	
5.2		20C	20B	20B	33B		16C	16C	16C	16C	
5.3		13B	13A	13A	20A		10C	10C	10C	10C	
6.1	82D		82D	82D	131D		82D	82D	82D	82D	
6.2	66F		66F	66F	98F		92E	92E	92E	92E	
6.3	82F		82F	82F	131F		82D	82D	82D	82D	
6.4	33D	33F	33D	33D	49D		46D	46D	46D	46D	
7.1	98G		98G	98G	164G						
7.2	82F		82F	82F	131F						
7.3	66F		66F	66F	98F						
7.4	33F		33F	33F	49F						
8.1			98G	98G	164G						
8.2			66G	66G	98G						
8.3		16G									
9.1											
10.1											

List Number Index - Countersinks/Counterbores



Pgs. 471-497

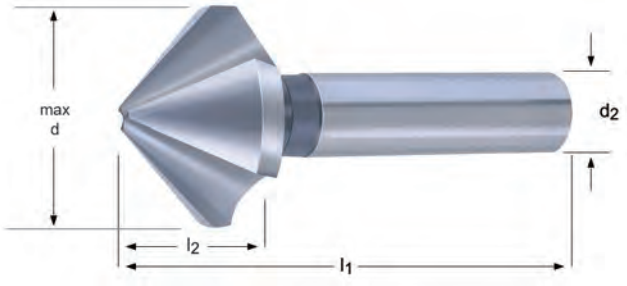
4602.....479
4603.....477
4608..... 478
4702..... 492
4703..... 495
4704..... 496
4705..... 493
4706..... 493
G132..... 488
G135..... 480
G136..... 483
G137..... 489
G138..... 490
G142..... 484
G149..... 482
G154.....481
G171..... 486
G236.....491
G335..... 480
G338..... 490
G400..... 476
G560..... 483
G570..... 485
G600.....487

MULTI-APPLICATION CARBIDE COUNTERSINK

Solid Carbide, Straight Shank, 3-Flute

G400 90º Countersink with Straight Shank. Recommended for abrasive, hard ferrous, and non-ferrous materials.

1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	3.2	3.3	3.4	4.1	4.2
4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	



G400

HM

DIN 335C



6.30 - 31.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_6$ mm	# of Flutes	Pack Qty	G400
6.3 (1/4)	1.5	5.0	45	5	3	1	0128787
8.3 (5/16)	2.0	6.0	50	6	3	1	0128794
10.4 (3/8)	2.5	7.1	50	6	3	1	0128725
12.4 (1/2)	2.8	8.0	56	8	3	1	0128732
16.5 (5/8)	3.2	10.0	60	10	3	1	0128749
20.5 (3/4)	3.5	12.5	63	10	3	1	0128756
25.0 (1“)	3.8	15.0	67	10	3	1	0128763
31.0 (1.1/4)	4.2	18.0	71	12	3	1	0128770

UNION BUTTERFIELD

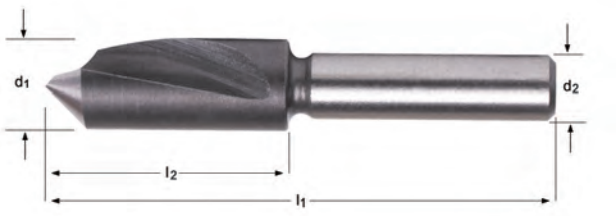
HSS COUNTERSINK

Countersink, Straight Shank, Single-Flute

4603

Available in 60º, 82º, or 90º angles. Engineered for machine use and light portable work. Single flute construction and low controlled relief assure the user of chatterless operation.

Best results obtained using high speeds and low feed. Recommended that the predrilled hole be at least 10% of the countersink diameter.



4603

HSS

ANSI



1/4 - 1.1/2

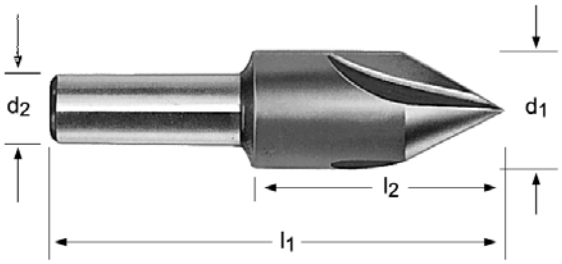
d_1 Ø Inch	angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4603
1/4	82°	3/16	11/16	1.7/16	1	1	4710797
1/4	90°	3/16	11/16	1.7/16	1	1	4710805
3/8	60°	1/4	7/8	1.3/4	1	1	4710790
3/8	82°	1/4	25/32	1.21/32	1	1	4710798
3/8	90°	1/4	3/4	1.5/8	1	1	4710806
1/2	60°	1/4	1“	2“	1	1	4710791
1/2	82°	1/4	27/32	1.27/32	1	1	4710799
1/2	90°	1/4	13/32	1.13/16	1	1	4710807
5/8	82°	3/8	1.3/32	2.3/32	1	1	4710800
5/8	90°	3/8	1“	2“	1	1	4710808
3/4	60°	3/8	1.13/32	2.21/32	1	1	4710793
3/4	82°	3/8	1.5/32	2.13/32	1	1	4710801
3/4	90°	3/8	1.1/16	2.5/16	1	1	4710809
1“	60°	1/2	1.9/16	3.1/8	1	1	4710794
1“	82°	1/2	1.1/4	2.13/16	1	1	4710802
1“	90°	1/2	1.1/4	2.13/16	1	1	4710810
1.1/4	60°	1/2	1.3/4	3.3/4	1	1	4710795
1.1/4	82°	1/2	1.1/2	3.1/2	1	1	4710803
1.1/4	90°	1/2	1.9/16	3.9/16	1	1	4710811
1.1/2	60°	1/2	2.5/16	4.1/4	1	1	4710796
1.1/2	82°	1/2	1.15/16	3.7/8	1	1	4710804
1.1/2	90°	1/2	1.13/16	3.3/4	1	1	4710812

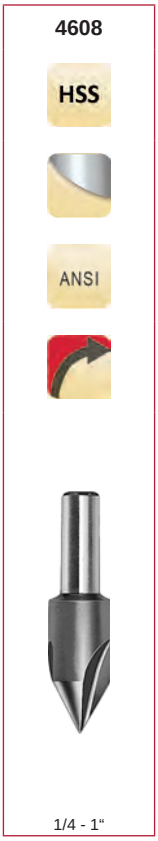
HSS COUNTERSINK

UNION BUTTERFIELD

Straight Shank, 3-Flute

4608 Center Reamer/Countersink, Available in 60º, 82º, 90º, or 100º angles. Widely used to countersink screw heads and rivet heads, and countersink holes for lathe centers. The odd number of flutes eliminates chatter in most applications while providing better accuracy than a single-flute countersink.





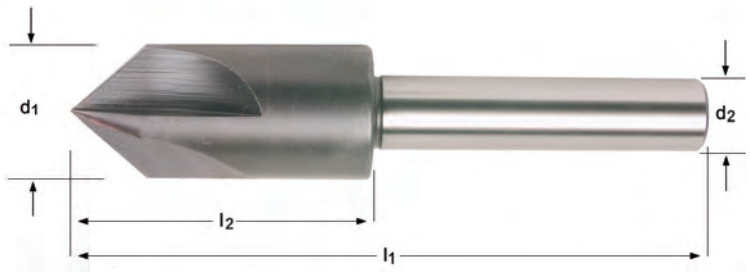
d_1 Ø Inch	Angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4608
1/4	60º	3/16	3/4	1.1/2	3	1	5011093
1/4	82º	3/16	3/4	1.1/2	3	1	5011098
1/4	90º	3/16	3/4	1.1/2	3	1	5011103
1/4	100º	3/16	3/4	1.1/2	3	1	5011108
3/8	60º	1/4	7/8	1.3/4	3	1	5011094
3/8	82º	1/4	7/8	1.3/4	3	1	5011099
3/8	90º	1/4	7/8	1.3/4	3	1	5011104
3/8	100º	1/4	7/8	1.3/4	3	1	5011109
1/2	60º	3/8	1“	2“	3	1	5011095
1/2	82º	3/8	1“	2“	3	1	5011100
1/2	90º	3/8	1“	2“	3	1	5011105
1/2	100º	3/8	1“	2“	3	1	5011110
5/8	60º	3/8	1“	2.1/4	3	1	5011096
5/8	82º	3/8	1“	2.1/4	3	1	5011101
5/8	90º	3/8	1“	2.1/4	3	1	5011106
5/8	100º	3/8	1“	2.1/4	3	1	5011111
3/4	60º	1/2	1.1/4	2.5/8	3	1	5011097
3/4	82º	1/2	1.1/4	2.5/8	3	1	5011102
3/4	90º	1/2	1.1/4	2.5/8	3	1	5011107
3/4	100º	1/2	1.1/4	2.5/8	3	1	5011112
1“	60º	1/2	1“	3“	3	1	46262132
1“	82º	1/2	1“	3“	3	1	46262133
1“	90º	1/2	1“	3“	3	1	46262134
1“	100º	1/2	1“	3“	3	1	46262135

UNION BUTTERFIELD

HSS COUNTERSINK

Countersink, Straight Shank, 4-Flute

4602 Countersink with angles of 60º for centers or 82º for flat head screws. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



4602

HSS

ANSI



1/2 - 1“

d_1 Ø Inch	angle	d_2 Ø Inch	l_2 Inch	l_1 Inch	# of Flutes	Pack Qty	4602
1/2	60°	1/2	1.5/8	3.7/8	4	1	4710588
1/2	82°	1/2	1.5/8	3.7/8	4	1	4710593
5/8	60°	1/2	1.3/4	4“	4	1	4710589
5/8	82°	1/2	1.3/4	4“	4	1	4710594
3/4	60°	1/2	1.7/8	4.1/8	4	1	4710590
3/4	82°	1/2	1.7/8	4.1/8	4	1	4710595
7/8	60°	1/2	2“	4.1/4	4	1	4710591
7/8	82°	1/2	2“	4.1/4	4	1	4710596
1“	60°	1/2	2.1/8	4.3/8	4	1	4710592
1“	82°	1/2	2.1/8	4.3/8	4	1	4710597

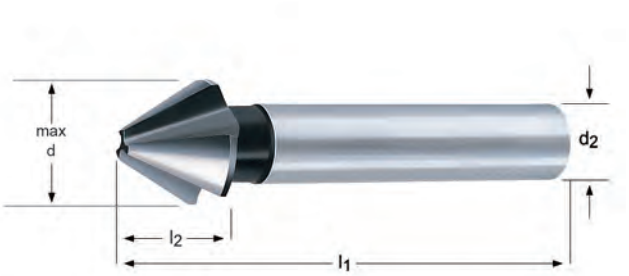
HSS COUNTERSINK

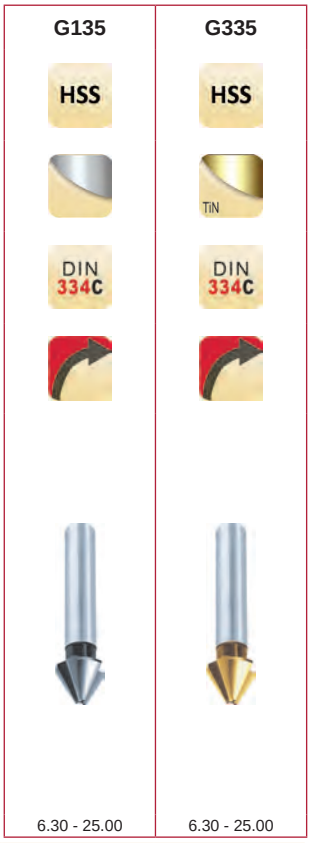
Straight Shank, 3-Flute

60º countersink with straight shank for multiple materials.

G135 Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G335 TiN coated for improved wear resistance.



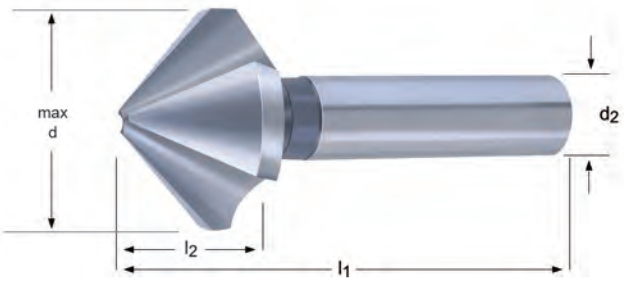


max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G135	G335
6.3 (1/4)	1.6	6.8	45	5	3	1	0108482	0149546
8.0 (5/16)	2.0	8.5	50	6	3	1	0108499	0149553
10.0 (3/8)	2.5	7.6	50	6	3	1	0144817	0149560
12.5 (1/2)	3.2	11.7	56	8	3	1	0108444	0149577
16.0 (5/8)	4.0	14.5	63	10	3	1	0108451	0149584
20.0 (3/4)	5.0	17.5	67	10	3	1	0108468	0149591
25.0 (1“)	6.3	20.5	71	10	3	1	0108475	0149607

HSS COUNTERSINK

Straight Shank, 3-Flute

G154 82º countersink for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



G154

HSS

DIN 335C



6.30 - 25.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G154
6.3 (1/4)	1.5	5.5	45	5	3	1	0149348
8.3 (5/16)	2.0	6.5	50	6	3	1	0149355
10.4 (3/8)	2.5	7.6	50	6	3	1	0149362
12.4 (1/2)	2.8	8.5	56	8	3	1	0149379
16.5 (5/8)	3.2	10.5	60	10	3	1	0149386
20.5 (3/4)	3.5	13.0	63	10	3	1	0149393
25.0 (1“)	3.8	15.5	67	10	3	1	0149409

COBALT COUNTERSINK

Straight Shank, Single Flute

G149 90º Countersink, single flute, for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



G149

HSS-E



5.00 - 50.00

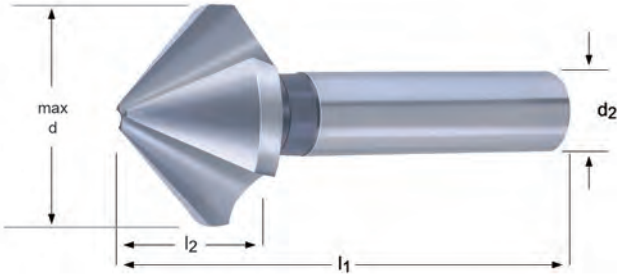
max d mm	min d mm	l_2 mm	l_1 mm	d_2 Ø mm	d_1 Ø mm	# of Flutes	Pack Qty	G149
5	2	19.0	45	6	10	1	1	0109106
10	5	23.0	48	8	14	1	1	0109038
15	10	34.0	65	10	21	1	1	0109045
20	15	43.0	84	12	28	1	1	0109052
25	20	48.0	102	15	35	1	1	0109069
30	25	61.0	115	15	44	1	1	0109076
35	30	65.0	127	15	48	1	1	0109083
40	35	66.0	136	15	53	1	1	0109090
50	40	85.0	166	20	60	1	1	0109113

HSS COUNTERSINK

Straight Shank, 3-Flute

G136 90º Countersink with straight shank for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G560 90º Countersink with straight shank for multiple materials. TiAlN coating increases surface hardness, improves chip flow, and increases tool life.



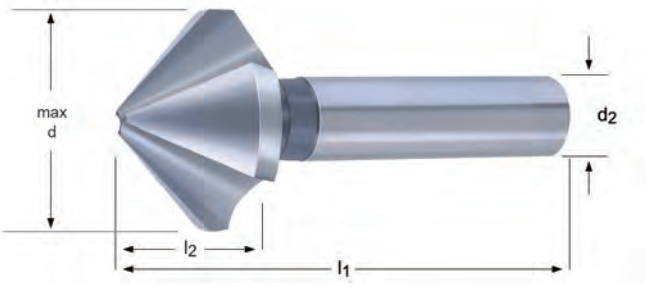
	G136	G560
	HSS	HSS
		TiAlN
	DIN 335C	DIN 335C
	4.30 - 31.00	6.30 - 31.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G136	G560
4.3	1.3	4.0	40	4	3	1	0108659	—
5.0	1.5	4.5	40	4	3	1	0108666	—
5.3	1.5	4.5	40	4	3	1	0108673	—
5.8	1.5	5.0	45	5	3	1	0108680	—
6.0	1.5	5.0	45	5	3	1	0108697	—
6.3	1.5	5.5	45	5	3	1	0108703	0109694
7.0	1.8	5.5	50	6	3	1	0108710	—
7.3	1.8	6.1	50	6	3	1	0108727	—
8.0	2.0	6.1	50	6	3	1	0108734	0127711
8.3	2.0	6.5	50	6	3	1	0108741	0127728
9.4	2.2	7.2	50	6	3	1	0108758	—
10.0	2.5	7.6	50	6	3	1	0108505	0109632
10.4	2.5	7.6	50	6	3	1	0108512	0109649
11.5	2.8	8.0	56	8	3	1	0108529	—
12.4	2.8	8.5	56	8	3	1	0108536	0109656
13.4	2.9	9.0	56	8	3	1	0108543	—
15.0	3.2	9.5	60	10	3	1	0108550	—
16.5	3.2	10.5	60	10	3	1	0108567	0109663
19.0	3.5	11.7	63	10	3	1	0108574	—
20.5	3.5	13.0	63	10	3	1	0108581	0109670
23.0	3.8	13.7	67	10	3	1	0108598	—
25.0	3.8	15.5	67	10	3	1	0108604	0109687
26.0	3.8	15.5	67	10	3	1	0108611	—
28.0	4.0	16.5	71	12	3	1	0108628	—
30.0	4.2	18.5	71	12	3	1	0108635	—
31.0	4.2	18.5	71	12	3	1	0108642	0127735

HSS COUNTERSINK

Straight Shank, 3-Flute

G142 90° Countersink with extra radial relief for soft or gummy materials. Bright finish improves chip flow in these materials.



G142

HSS

DIN 335C



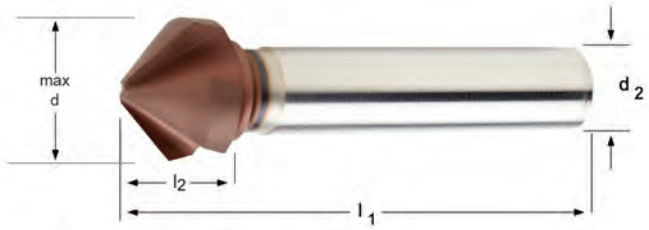
4.80 - 31.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G142
4.8	1.3	4.5	40	4	3	1	0168059
5.0	1.5	4.5	40	4	3	1	0168066
6.0	1.5	5.0	45	5	3	1	0168073
6.3	1.5	5.5	45	5	3	1	0149270
7.0	1.8	5.5	50	6	3	1	0168080
7.3	1.8	6.1	50	6	3	1	0168097
8.0	2.0	6.1	50	6	3	1	0168103
8.3	2.0	6.5	50	6	3	1	0150658
10.0	2.5	7.6	50	6	3	1	0168110
10.4	2.5	7.6	50	6	3	1	0149287
11.5	2.8	8.0	56	8	3	1	0168127
12.4	2.8	8.5	56	8	3	1	0149294
15.0	3.2	9.5	60	10	3	1	0168134
16.5	3.2	10.5	60	10	3	1	0149300
19.0	3.5	11.7	63	10	3	1	0168141
20.5	3.5	13.0	63	10	3	1	0149317
23.0	3.8	13.7	67	10	3	1	0168158
25.0	3.8	15.5	67	10	3	1	0149324
31.0	4.2	18.5	71	12	3	1	0149331

COBALT COUNTERSINK

Straight Shank, 3-Flute

G570 90º Countersink with AlTiCN coating designed primarily for Alloy Steels and Stainless Steels. Special PVD coating increases surface hardness and temperature resistance while maintaining a high level of toughness even in dry cutting conditions.



G570









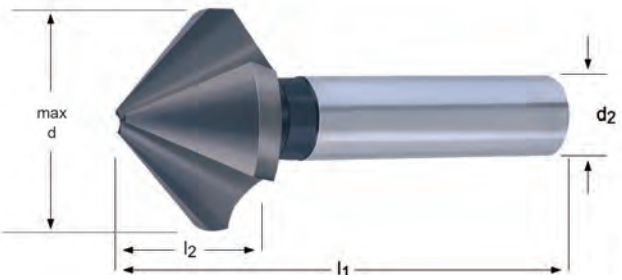


6.30 - 31.00

max d mm	min d mm	l_1 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G570
6.3	1.5	6.5	45	5	3	1	46381760
8.3	2.0	8.2	50	6	3	1	46381761
10.4	2.5	9.7	50	6	3	1	46381762
12.4	2.8	10.6	56	8	3	1	46381763
16.5	3.2	13.9	60	10	3	1	46381764
20.5	3.5	17.1	63	10	3	1	46381765
25.0	3.8	21.4	67	10	3	1	46381766
31.0	4.2	24.4	71	12	3	1	46381767

Straight Shank, 3-Flute

G171 100° Countersink with straight shank design for cast iron, soft steels & aluminum. TiAlN coating increases surface hardness and improves tool life at higher speeds.



G171











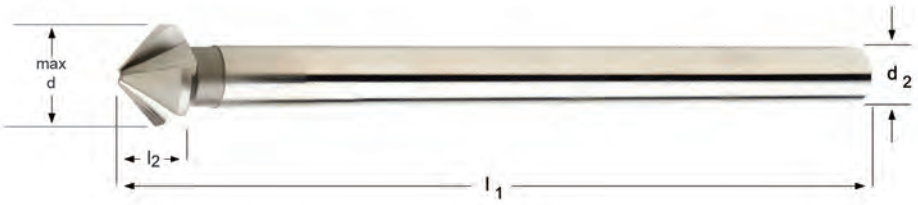
6.30 - 25.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 Øh$_9$ mm	# of Flutes	Pack Qty	G171
6.3	1.5	4.5	44.0	5.0	3	1	0372609
8.3	2.0	5.5	49.0	6.0	3	1	0372616
10.4	2.5	6.6	49.0	6.0	3	1	0372555
12.4	2.8	7.0	53.0	6.0	3	1	0372562
16.5	3.2	9.0	56.0	6.0	3	1	0372579
20.5	3.5	11.0	61.0	10.0	3	1	0372586
25.0	3.8	13.5	65.0	10.0	3	1	0372593

HSS COUNTERSINK

Straight Shank, 3-Flute

G600 90° Countersink with straight shank for long reach applications. Multi-material type excellent for soft to medium steels. Bright finish improves chip flow in softer materials.



G600



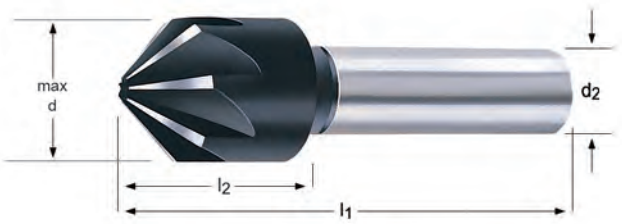


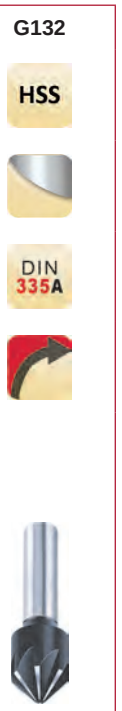
6.30 - 25.00

max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G600
6.3	1.3	6.4	154	5	3	1	46381768
8.3	1.8	8.3	155	6	3	1	46381769
10.4	2.2	9.7	157	6	3	1	46381770
12.4	2.5	10.6	158	8	3	1	46381771
15.0	2.8	12.6	159	10	3	1	46381772
16.5	2.8	13.9	161	10	3	1	46381773
20.5	3.0	17.1	164	10	3	1	46381774
25.0	3.2	21.4	168	10	3	1	46381775

Straight Shank, Multi-Flute

G132 90° Multi-flute countersink for better stability in harder materials. More flutes to share the load when cutting at slower speeds.





8.00 - 20.00

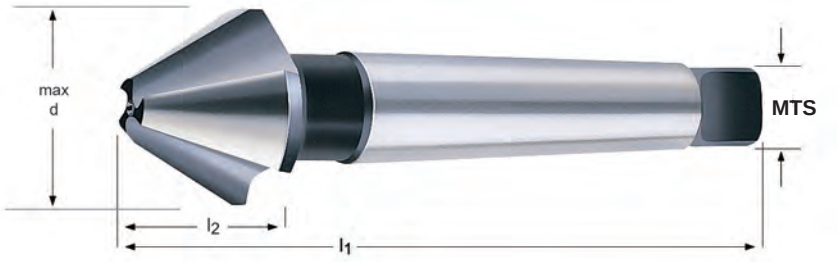
max d mm	min d mm	l_2 mm	l_1 mm	d_2 $Øh_9$ mm	# of Flutes	Pack Qty	G132
8.0	-	0.0	48	8	5	1	0108291
12.5	2.0	15.5	48	8	5	1	0108260
16.0	3.2	19.5	56	10	7	1	0108277
20.0	5.0	23.0	60	10	7	1	0108284

HSS COUNTERSINK

Taper Shank, 3-Flute

G137

60º Countersink with MorseTaper Shank for multiple materials. Bright finish improves chip flow in soft ferrous and non-ferrous materials.



G137











16.00 - 80.00

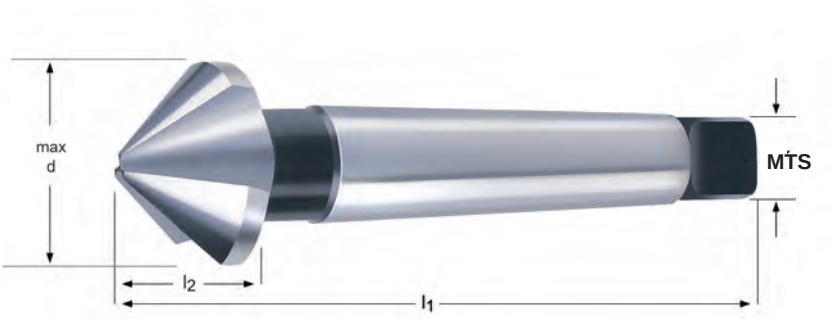
max d mm	min d mm	l_2 mm	l_1 mm	MTS	# of Flutes	Pack Qty	G137
16.0 (5/8)	4.0	14.5	90	1	3	1	0108765
20.0 (3/4)	5.0	17.5	106	2	3	1	0108772
25.0 (1“)	6.3	20.0	112	2	3	1	0108789
31.5 (1.1/4)	10.0	23.0	118	2	3	1	0108796
40.0 (1.1/2)	12.5	28.5	150	3	3	1	0108802
50.0 (2“)	16.0	36.0	160	3	3	1	0108819
63.0 (2.1/2)	20.0	43.0	190	4	3	1	0108826
80.0 (3“)	25.0	54.0	200	4	3	1	0108833

HSS COUNTERSINK

Taper Shank, 3-Flute

G138 90° Countersink with Morse Taper Shank for multiple materials. Excellent for steel, titanium & nickle alloys. Bright finish improves chip flow in soft ferrous and non-ferrous materials.

G338 90° Countersink with Morse Taper Shank for multiple materials. TiN coating increases surface hardness and improves chip flow in steel, cast iron and aluminum alloys.





max d mm	min d mm	l_2 mm	l_1 mm	MTS	# of Flutes	Pack Qty	G138	G338
25.0	3.8	15.5	106	2	3	1	0108895	0109502
30.0	4.2	18.5	112	2	3	1	0108925	—
31.0	4.2	20.0	112	2	3	1	0108932	0109519
34.0	4.5	19.5	118	2	3	1	0108949	—
37.0	4.8	21.7	118	2	3	1	0108956	0109526
40.0	10.0	20.5	140	3	3	1	0108963	0109533
50.0	14.0	24.1	150	3	3	1	0108970	0109540
63.0	16.0	28.5	180	4	3	1	0108987	0109557
80.0	22.0	36.0	190	4	3	1	0108994	—

HSS COUNTERSINK

Straight Shank, 3-Flute

G236 90° Countersink sets in 4 or 6 pcs. Sets 1&2 in bright finish improves chip flow in soft ferrous & non-ferrous materials. Set 3 in TiAlN coating increases surface hardness and improves tool life.



G236

HSS

TiAlN

DIN 335C



Set

Set	Styles in set	Pieces per Set	Diameters in set	Pack Qty	G236
1	G136	6	6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm	1	0217887
2	G136	4	6.30 mm, 10.40 mm, 16.50 mm, 20.50 mm	1	0344750
3	G560	6	6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm	1	46521338

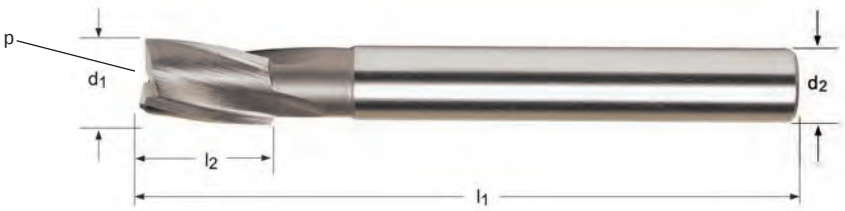
HSS COUNTERBORE

UNION BUTTERFIELD

Counterbore Body - Interchangeable Pilot Type

4702 Short Length

Used to enlarge the end of a preformed hole when a flat bottom is required. The counterbore is an end cutting tool which utilizes and interchangeable pilot to align the enlarged hole being machined with the preformed hole. The 3 and 5 flute counterbore reduces chatter and improves finish.



4702













1/4 - 2“

d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	# of Flutes	Pilot (p) Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4702
1/4	3/4	3.13/16	15/64	3	3/32	1/8	3/16	1	6210031
9/32	3/4	3.13/16	17/64	3	3/32	1/8	7/32	1	6210032
5/16	3/4	3.13/16	19/64	3	3/32	1/8	1/4	1	6210033
11/32	3/4	3.13/16	5/16	3	3/32	1/8	9/32	1	6210034
3/8	1“	4.1/16	5/16	3	5/32	3/16	5/16	1	6210035
13/32	1“	4.1/16	3/8	3	5/32	3/16	11/32	1	6210036
7/16	1“	4.1/16	3/8	3	5/32	3/16	3/8	1	6210037
15/32	1.1/4	4.5/16	7/16	3	3/16	3/16	13/32	1	6210038
1/2	1.1/4	4.5/16	7/16	3	3/16	3/16	7/16	1	6210039
9/16	1.1/4	4.5/16	1/2	3	3/16	3/16	1/2	1	6210041
19/32	1.1/4	5.1/8	1/2	3	3/16	3/16	17/32	1	6210042
5/8	1.1/4	5.1/8	1/2	3	3/16	3/16	9/16	1	6210043
11/16	1.1/4	5.1/8	1/2	3	3/16	3/16	5/8	1	6210045
3/4	1.1/2	5.3/8	1/2	3	1/4	5/16	11/16	1	6210047
25/32	1.1/2	5.3/8	5/8	3	1/4	5/16	23/32	1	6210048
13/16	1.1/2	5.3/8	5/8	3	1/4	5/16	3/4	1	6210049
27/32	1.1/2	5.3/8	3/4	3	1/4	5/16	25/32	1	6210050
7/8	1.1/2	5.3/8	3/4	3	1/4	5/16	13/16	1	6210051
1“	1.3/4	6.3/8	3/4	3	5/16	3/8	15/16	1	6210055
2“	2.1/2	8.3/8	1.1/2	5	1/2	9/16	1.15/16	1	6210065

UNION BUTTERFIELD

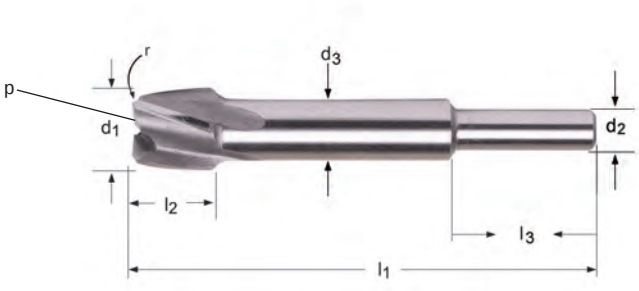
HSS COUNTERBORE

Counterbore Body, Aircraft Series - Interchangeable Pilot Type

4705 Long Series, 3-flute with corner radius

4706 Short Series (Aircraft) 4-flute with corner radius

Used for the facing of bosses, and counterboring recesses for spring pockets and screw heads. Supplied with corner radius to produce the fillets necessary for this type of work. Designed for pneumatic or electric drills.



4705	4706
HSS	HSS
ANSI	ANSI
	
1/4 - 1.7/16	1/4 - 1“

d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	l_3 Inch	d_3 Ø Inch	# of Flutes	Pilot (p) Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4705	4706
1/4	1/2	2.3/8	1/4	1.1/8	15/64	4	3/32	1/8	3/16	1	—	6210137 [1]
1/4	3/4	3.13/16	15/64	3.1/16	15/64	3	3/32	1/8	3/16	1	6210107 [1]	—
5/16	1/2	2.3/8	1/4	7/8	17/64	4	3/32	1/8	1/4	1	—	6210139 [1]
5/16	3/4	3.13/16	19/64	3.1/16	19/64	3	3/32	1/8	1/4	1	6210109 [1]	—
11/32	1/2	2.3/8	1/4	7/8	19/64	4	3/32	1/8	9/32	1	—	6210140 [1]
3/8	1/2	2.3/8	1/4	7/8	5/16	4	3/32	3/16	5/16	1	—	6210141 [2]
3/8	3/4	3.13/16	5/16	3.1/16	5/16	3	3/32	3/16	5/16	1	6210111 [1]	—
13/32	1/2	2.13/16	1/4	7/8	5/16	4	1/8	3/16	11/32	1	—	6210142 [2]
7/16	1/2	2.13/16	1/4	7/8	5/16	4	1/8	3/16	3/8	1	—	6210143 [2]
7/16	3/4	3.13/16	3/8	3.1/16	3/8	3	1/8	3/16	3/8	1	6210113 [1]	—
15/32	1/2	2.13/16	1/4	7/8	5/16	4	1/8	1/4	13/32	1	—	6210144 [2]
1/2	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	7/16	1	—	6210145 [2]
1/2	3/4	3.13/16	7/16	3.1/16	7/16	3	1/8	1/4	7/16	1	6210115 [1]	—
17/32	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	15/32	1	—	6210146 [2]
17/32	3/4	5.3/8	1/2	4.5/8	1/2	3	1/8	1/4	15/32	1	6210116 [1]	—
9/16	1/2	2.13/16	1/4	7/8	3/8	4	1/8	1/4	1/2	1	—	6210147 [2]
9/16	3/4	5.3/8	1/2	4.5/8	1/2	3	1/8	1/4	1/2	1	6210117 [1]	—
19/32	3/4	5.3/8	1/2	4.3/16	9/16	3	1/8	1/4	17/32	1	6210118 [1]	—
5/8	3/4	5.3/8	1/2	4.3/16	9/16	3	1/8	1/4	9/16	1	6210119 [1]	—
11/16	1/2	2.13/16	1/4	7/8	1/2	4	1/8	1/4	5/8	1	—	6210151 [3]
21/32	1.1/4	5.3/8	1/2	3.5/8	9/16	3	3/16	1/4	19/32	1	6210120 [1]	—
11/16	1.1/4	5.3/8	1/2	3.5/8	5/8	3	3/16	1/4	5/8	1	6210121 [1]	—
3/4	1.1/4	5.3/8	1/2	3.5/8	11/16	3	3/16	5/16	11/16	1	6210123 [1]	—

[1] 1/32 Corner Radius
[2] 3/64 Corner Radius
[3] 0.0550” Corner Radius

HSS COUNTERBORE

UNION BUTTERFIELD

d_1 Ø Inch	l_2 Inch	l_1 Inch	d_2 Ø Inch	l_3 Inch	d_3 Ø Inch	# of Flutes	Pilot Mounting Ø Inch	Pilot Ø min	Pilot Ø max	Pack Qty	4705	4706
3/4	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	11/16	1	—	6210153 [3]
25/32	1.1/4	5.3/8	1/2	3.5/8	11/16	3	3/16	5/16	23/32	1	6210124 [1]	—
13/16	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	3/4	1	6210125 [1]	—
13/16	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	3/4	1	—	6210155 [3]
7/8	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	13/16	1	6210126 [1]	—
7/8	1/2	2.13/16	1/4	7/8	1/2	4	3/16	5/16	13/16	1	—	6210157 [3]
15/16	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	5/16	7/8	1	6210127 [1]	—
1“	1.1/4	5.3/8	1/2	3.5/8	3/4	3	3/16	3/8	15/16	1	6210128 [1]	—
1“	1/2	2.13/16	1/4	7/8	1/2	4	3/16	3/8	15/16	1	—	6210161 [3]

[1] 1/32 Corner Radius
[2] 3/64 Corner Radius
[3] 0.0550” Corner Radius

UNION BUTTERFIELD

HSS COUNTERBORE

Counterbore Body, Taper Shank, Short Series - Interchangeable Pilot Type

4703 Short counterbore body, with taper shank for use with detachable pilots which align counterbore to existing drilled hole. 3 & 5 Flute designs for less chatter.

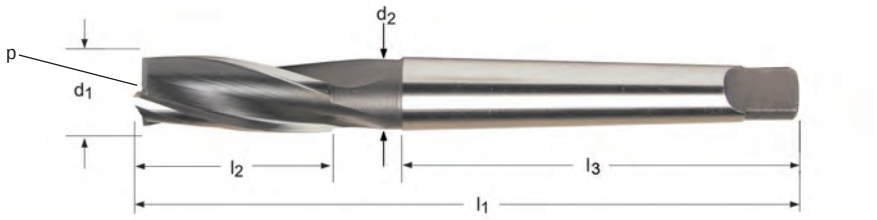
4703

HSS

ANSI



1/4 - 2.1/2



d_1 Ø Inch	l_2 Inch	l_1 Inch	MTS	d_2 Neck Dia. Inch	l_3 Shank Length Inch	# of Flutes	pilot (p) mounting Ø Inch	pilot Ø min	pilot Ø max	Pack Qty	4703
1/4	3/4	3.13/16	1	15/64	2.9/16	3	3/32	1/8	3/16	1	6210066
5/16	3/4	3.13/16	1	19/64	2.9/16	3	3/32	1/8	1/4	1	6210068
3/8	1“	4.1/16	1	11/32	2.9/16	3	5/32	3/16	5/16	1	6210070
7/16	1“	4.1/16	1	13/32	2.9/16	3	5/32	3/16	3/8	1	6210072
1/2	1.1/4	4.5/16	1	29/64	2.9/16	3	3/16	1/4	7/16	1	6210074
9/16	1.1/4	4.5/16	1	29/64	2.9/16	3	3/16	1/4	1/2	1	6210076
5/8	1.1/4	5.1/8	2	9/16	3.1/8	3	3/16	1/4	9/16	1	6210078
11/16	1.1/4	5.1/8	2	5/8	3.1/8	3	3/16	1/4	5/8	1	6210080
3/4	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	11/16	1	6210082
13/16	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	3/4	1	6210084
7/8	1.1/2	5.3/8	2	21/32	3.1/8	3	1/4	5/16	13/16	1	6210085
15/16	1.1/2	6.1/8	2	7/8	3.7/8	3	1/4	5/16	7/8	1	6210086
1“	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	15/16	1	6210087
1.1/16	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1“	1	6210088
1.1/8	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1.1/16	1	6210089
1.3/16	1.3/4	6.3/8	3	7/8	3.7/8	3	5/16	3/8	1.1/8	1	6210090
1.1/4	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.3/16	1	6210091
1.5/16	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.1/4	1	6210092
1.3/8	2“	6.5/8	3	7/8	3.7/8	5	3/8	7/16	1.5/16	1	6210093
1.1/2	2“	7.7/8	4	1.3/16	4.7/8	5	3/8	7/16	1.7/16	1	6210094
1.5/8	2.1/4	8.1/8	4	1.3/8	4.7/8	5	7/16	1/2	1.9/16	1	6210095
1.3/4	2.1/4	8.1/8	4	1.3/8	4.7/8	5	7/16	1/2	1.11/16	1	6210096
1.7/8	2.1/4	8.1/8	4	1.1/2	4.7/8	5	7/16	1/2	1.13/16	1	6210097
2“	2.1/2	8.3/8	4	1.1/2	4.7/8	5	1/2	9/16	1.5/16	1	6210098
2.1/8	2.1/2	9.7/8	5	1.3/4	6.1/8	5	1/2	9/16	2.1/16	1	6210099
2.1/4	2.1/2	9.7/8	5	1.3/4	6.1/8	5	1/2	9/16	2.3/16	1	6210100

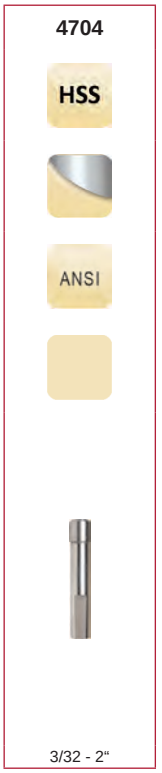
HSS COUNTERBORE

UNION BUTTERFIELD

Counterbore Pilot, Detachable

4704 Interchangeable detachable pilots for use with counterbore bodies. Pilot shank diameters must match counterbore body “pilot diameter” for proper match.





pilot Ø Inch	d_1 Ø Inch	l_2 Inch	l_1 Inch	Pack Qty	4704
1/8	3/32	1/8	1.1/4	1	3210114
5/32	3/32	3/16	1.5/16	1	3210115
3/16	3/32	3/16	1.5/16	1	3210116
7/32	3/32	1/4	1.3/8	1	3210117
1/4	3/32	1/4	1.3/8	1	3210118
1/8	1/8	1/8	1.7/16	1	3210249
5/32	1/8	3/16	1.1/2	1	3210251
3/16	1/8	3/16	1.1/2	1	3210255
7/32	1/8	1/4	1.9/16	1	3210258
1/4	1/8	1/4	1.9/16	1	3210259
9/32	1/8	5/16	1.5/8	1	3210261
5/16	1/8	5/16	1.5/8	1	3210262
3/8	1/8	3/8	1.11/16	1	3210263
7/16	1/8	7/16	1.3/4	1	3210264
1/2	1/8	1/2	1.13/16	1	3210265
3/16	5/32	3/16	1.9/16	1	3210119
7/32	5/32	1/4	1.5/8	1	3210120
1/4	5/32	1/4	1.5/8	1	3210121
9/32	5/32	5/16	1.11/16	1	3210122
5/16	5/32	5/16	1.11/16	1	3210123
3/8	5/32	3/8	1.3/4	1	3210124
3/16	3/16	1/4	1.7/8	1	3210281
7/32	3/16	1/4	1.7/8	1	3210284
1/4	3/16	1/4	1.7/8	1	3210125
9/32	3/16	5/16	1.15/16	1	3210287
5/16	3/16	5/16	1.15/16	1	3210126
11/32	3/16	3/8	2“	1	3210444
3/8	3/16	3/8	2“	1	3210127
13/32	3/16	7/16	2.1/16	1	3210445
7/16	3/16	7/16	2.1/16	1	3210128
15/32	3/16	1/2	2.1/8	1	3210446
1/2	3/16	1/2	2.1/8	1	3210129
9/16	3/16	9/16	2.3/16	1	3210130
5/8	3/16	9/16	2.3/16	1	3210131
13/16	3/16	13/16	2.7/16	1	3210296

UNION BUTTERFIELD

HSS COUNTERBORE

pilot Ø Inch	d_1 Ø Inch	l_2 Inch	l_1 Inch	Pack Qty	4704
7/8	3/16	7/8	2.1/2	1	3210297
1/4	1/4	1/4	1.11/16	1	3210300
9/32	1/4	5/16	1.3/4	1	3210302
5/16	1/4	5/16	1.3/4	1	3210132
3/8	1/4	3/8	1.13/16	1	3210133
7/16	1/4	7/16	1.7/8	1	3210134
1/2	1/4	1/2	1.15/16	1	3210135
17/32	1/4	9/16	2“	1	3210447
9/16	1/4	9/16	2“	1	3210136
5/8	1/4	5/8	2.1/16	1	3210137
11/16	1/4	11/16	2.1/8	1	3210138
3/4	1/4	3/4	2.3/16	1	3210139
13/16	1/4	7/8	2.5/16	1	3210140
1“	1/4	1“	2.7/16	1	3210314
3/8	5/16	3/8	2“	1	3210142
7/16	5/16	7/16	2.1/16	1	3210143
1/2	5/16	1/2	2.1/8	1	3210144
9/16	5/16	9/16	2.3/16	1	3210145
5/8	5/16	5/8	2.1/4	1	3210146
11/16	5/16	11/16	2.5/16	1	3210147
3/4	5/16	3/4	2.3/8	1	3210148
13/16	5/16	7/8	2.1/2	1	3210149
15/16	5/16	1“	2.5/8	1	3210151
1“	5/16	1“	2.5/8	1	3210152
7/16	3/8	7/16	2.5/16	1	3210155
1/2	3/8	1/2	2.3/8	1	3210156
9/16	3/8	9/16	2.7/16	1	3210157
5/8	3/8	5/8	2.1/2	1	3210158
11/16	3/8	11/16	2.9/16	1	3210159
3/4	3/8	3/4	2.5/8	1	3210160
13/16	3/8	7/8	2.3/4	1	3210161
7/8	3/8	7/8	2.3/4	1	3210162
15/16	3/8	1“	2.5/8	1	3210163
9/16	7/16	5/8	2.7/8	1	3210173
11/16	7/16	3/4	3“	1	3210175
3/4	7/16	3/4	3“	1	3210176
13/16	7/16	7/8	3.1/8	1	3210177
7/8	7/16	7/8	3.1/8	1	3210178
15/16	7/16	1“	3.1/4	1	3210179
1“	7/16	1“	3.1/4	1	3210180
9/16	1/2	5/8	3.1/8	1	3210195
1“	1/2	1“	3.1/2	1	3210202
1.1/2	1/2	1.1/2	4“	1	3210210

List Number Index - Miscellaneous



Pgs. 498-502

411 501
430 501
K520 502
K521 502
1800 499
1815 499
1816 499
1900 500

SCREW EXTRACTOR

1800 Screw Extractor

1815 Screw Extractor Set, 5 piece

1816 Screw Extractor Set, 6 piece





1800	1815	1816
CS	CS	CS
		
		
		
.054 - 1.27/32	Set	Set

Nr.	d_1 Ø Inch	Sizes in Set	d_2 Ø Inch	Pieces per Set	l_1 Inch	Capacity For Screws & Bolts	Capacity For Pipe Sizes	Pack Qty	1800	1815set	1816set
801	0.0540		5/32		2“	3/16 - 1/4		12	3210001	—	—
802	0.0860		3/16		2.3/8	1/4 - 5/16		12	3210002	—	—
803	1/8		1/4		2.3/4	5/16 - 7/16		12	3210003	—	—
804	11/64		5/16		3“	7/16 - 9/16		6	3210004	—	—
805	1/4		7/16		3.3/8	9/16 - 3/4	1/8 - 1/4	6	3210005	—	—
806	3/8		5/8		3.3/4	3/4 - 1“	3/8	1	3210006	—	—
807	31/64		3/4		4.1/8	1 - 1.3/8	1/2	1	3210007	—	—
808	47/64		1“		4.3/8	1.3/8 - 1.3/4	3/4	1	3210008	—	—
809	31/32		1.1/4		4.5/8	1.3/4 - 2.1/8	1	1	3210009	—	—
810	1.7/32		1.17/32		5“	2.1/8 - 2.1/2	1.1/4	1	3210010	—	—
811	1.15/32		1.27/32		5.5/8	2.1/2 - 3	1.1/2	1	3210011	—	—
812	1.27/32		2.9/32		6.1/4	3 - 3.1/2	2	1	3210012	—	—
1815		801 - 805		5		3/16 - 3/4	1/8 - 1/4	1	—	3210013	—
1816		801 - 806		6		3/16 - 1	1/8 - 3/8	1	—	—	3210014

DRILLING & TAPPING FLUID

1900

Drilling & Tapping Fluid - A heavy oil for drilling & tapping all ferrous and non-ferrous materials. Increases productivity and extends tool life. Environmentally safe.

Wax Stick - Multi-purpose wax that sticks to the tool and effectively removes heat while adding lubrication. Withstands trememdous pressure. Can be used in lieu of drilling/tapping fluids and cutting oils.

Foam - Heavy duty aerosol foam coats the tools as it foams on contact. Will not contaminate existing coolant.

Light Tapping Fluid - A light viscosity heavy duty drilling & tapping fluid for reducing torque. Ideal for use with a re-circulation system. Can be added to existing cutting oils to increase lubricity. Will not contaminate existing coolant as it will float to the surface for easy skimming.



Sizes	Style	Description	Pack Qty	1900
1/2 oz	Trial Size	Drilling & Tapping Fluid	1	1910512
4 oz	Squirt Bottle	Drilling & Tapping Fluid	24	1910501
16 oz	Squirt Bottle	Drilling & Tapping Fluid	12	1910502
1 gal	Bottle	Drilling & Tapping Fluid	6	1910503
5 gal	Dispenser	Drilling & Tapping Fluid	1	1910506
5 gal	Pail	Drilling & Tapping Fluid	1	1910504
55 gal	Drum	Drilling & Tapping Fluid	1	1910505
1 lb	Stick	Wax	24	1950501
20 oz	Aerosal Can	Foam	12	1910509
1 gal	Bottle	Light Drilling & Tapping Fluid	6	1930503
16 oz	Squirt Bottle	Light Drilling & Tapping Fluid	12	1930502
16 oz	Squirt Bottle	Light Tapping Fluid (single)	1	46437347
16 oz	Squirt Bottle	Drilling & Tapping Fluid (single)	1	46437348
20 oz	Aerosal Can	Foam (single)	1	46437349
1 lb	Stick	Wax (single)	1	46437430

SLEEVES & KEYS

411 Taper shank (internal and external) adapters. Heat treated and externally ground. Steam oxide surface finish prevents corosion.

430 Drill Drift. Dropped forged steel keys used for removing taper shank tools from adapting sleeves and machine spindles.

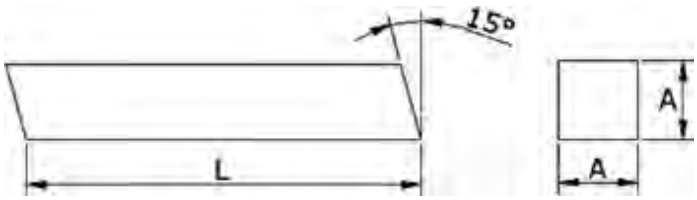




430 MTS #	411 Inside Taper	411 Outside Taper	Length	Pack Qty	411	430
					411 ST ANSI  MTS #1 - #5	430 ST ANSI  MTS #1 - #5
1			4.1/2	1	—	3210338
2			5.1/2	1	—	3210339
3			7	1	—	3210340
4			8	1	—	3210341
5			9.7/8	1	—	3210342
	1	2	3.1/2	1	3210046	—
	1	3	3.15/16	1	3210047	—
	1	4	4.13/16	1	3210048	—
	2	3	4.3/8	1	3210050	—
	2	4	4.13/16	1	3210051	—
	3	4	5.5/16	1	3210053	—
	3	5	6.1/16	1	3210054	—
	4	5	6.1/2	1	3210055	—
	5	6	8.1/2	1	3210057	—

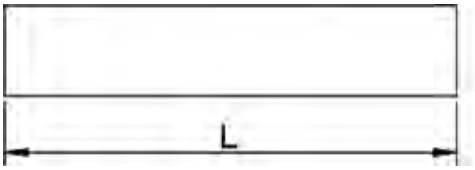
TOOL BIT BLANKS

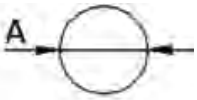
K520 Cobalt ground blank with 15º beveled ends





K521 Cobalt round blank







Sizes	Overall Length	K520
4	100	0160732
5	160	0160749
6	100	0110478
6	160	0110485
6	200	0110492
8	100	0110546
8	160	0110553
8	200	0110560
10	100	0110171
10	160	0110195
10	200	0110201
12	100	0110225
12	160	0110249
12	200	0110256
14	160	0110294
14	200	0110300
16	100	0110317
16	160	0110324
16	200	0110331
20	160	0110379
20	200	0110386
25	200	0110409
3/16	2.1/2	0254721
1/4	2.1/2	0254684
1/4	4“	0197943
5/16	2.1/2	0254790
5/16	3“	0254806
5/16	4“	0197950
3/8	3“	0254769
3/8	4“	0197967
3/8	6“	0254776
7/16	3.1/2	0340691
1/2	4“	0197974
1/2	6“	0197981
5/8	4.1/2	0197998
5/8	6“	0254820

Sizes	Overall Length	K521
4	100	0110799
6	160	0110805
8	100	0164884
8	200	0110843
10	100	0110850
10	200	0110881
12	100	0110904
12	160	0110911
12	200	0110607
14	200	0110638
15	100	0110645
16	160	0110669
18	160	0164914
1/4	4”	0110720
1/2	6”	0110782

Technical Section - Icon Descriptions

Material



Carbide



High Speed Steel



High Speed Cobalt



High Speed Powder
Metallurgy Steel



High Speed Cobalt
Powder Metallurgy Steel



High Speed Steel
and Carbide



Chromium Steel

Coating



Bright



Steam Tempered



Nitride



Nitride/ Steam Tempered



Bronze



Titanium Aluminium Nitride



Titanium Carbo-Nitride



Titanium Nitride



Bright/ Steam Tempered



Bright/ Titanium Nitride



Steam Tempered/ Bronze



Titanium Aluminium Nitride - Top



Titanium Nitride - Top



Ti-phon
(TiAlCrSiN)



Purple / Bronze
(Dual oxide surface treatment)



Alcrona Top
(AlCrN - Top)



Aluminium Titanium Carbo-Nitride



Aluminium Titanium Nitride

Technical Section - Icon Descriptions

Common Icons

Direction



Right hand rotation



Left hand rotation

Depth



Drilling icons

Point Angle



Countersink ^{0}



60º Countersink



82º Countersink



90º Countersink

Form



Normal Helix



Quick Helix



Continuously Thinned Web

Coolant



Internal Coolant

Drilling icons

Shank



Straight Shank



Morse taper shank



DIN 6535 HA
(cylindrical)



DIN 6535 HE



Reduced shank



Threaded Hex Shank



DIN 6535 HB / HE



DIN 6535 HB
(Weldon Shank)

Manufacturing Standards









































Reaming - Countersink Icons

Taper Gradient



Imperial Standard Taper



Metric Standard Taper

Tolerance



Industry standard hole tolerance



Specific Reamer Tolerance



ISO Tolerance for shafts

Application



Countersink



Counterbore

Countersink [0]









Shank

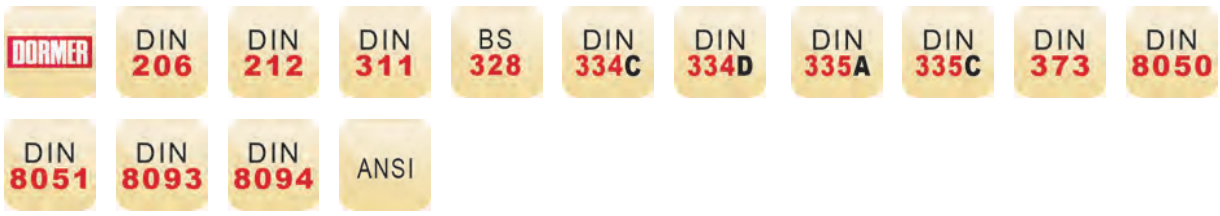


Straight



Morse taper

Manufacturing Standards



Technical Section - Icon Descriptions

Threading icons

Thread form



Metric coarse



Metric fine



Unified Coarse



Unified Fine



Unified Special



British standard pipe fastening - G series



National taper pipe



National taper pipe dryseal



National straight pipe dryseal



National straight pipe mechanical



ISO Metric Coarse to DIN8140-2



British standard pipe taper - Rc Series

Flute Geometry


Straight Flute


Spiral Point


Fluteless - thread forming



15º Helix



17º Helix



27º Helix



30º Helix



40º Helix



45º Helix



50º Helix



52º Helix


Straight Flute (hand tap)

Hole Type


Through hole


Blind hole


Through or blind hole

Threading icons

Chamfer



Plug chamfer



Semi-bottoming



Full-bottoming



Semi-bottoming



Plug



Taper

Tolerance



Common Class of fit



Multiple Classes of fit



Closer class of fit for accuracy



Common metric class of fit



Class of fit outside Std. for high strength or abrasive materials



Normal

Standards































Technical Section - Icon Descriptions

Milling icons

Type



For steels with low to high resistance



For soft and malleable materials

Application



Slotting P9 tolerance



Slotting



Finishing (side cutting)



Roughing



Ball nose



Corner radius inside



Corner rounding outside

Direction



Slotting, ramping, plunging



Slotting, ramping



Finishing (side cutting)

Cut Length



Extra short



Short



Medium



Long



Extra long

Technical Section - Icon Descriptions

Milling icons

Diameter tolerance



Industry standard shaft tolerances

Helix Angle



Unequal Helix

# of teeth or flutes



Shank



Straight Shank

Weldon Shank

Tool Materials

High Speed Steel

HSS

A medium-alloyed high speed steel that has good machinability and good performance. HSS exhibits hardness, toughness and wear resistance characteristics that make it attractive in a wide range of applications, for example in drills and taps.

Cobalt High Speed Steel

HSS-E

This high speed steel contains cobalt for increased hot hardness. The composition of HSCo is a good combination of toughness and hardness. It has good machinability and good wear resistance, which makes it usable for drills, taps, milling cutters and reamers.

Non Cobalt Powder Metallurgy Steel

HSS PM

Has a finer and more consistent grain structure than HSCo resulting in a tougher product. Tool life and wear resistance is normally higher than HSCo and this grade has superior edge strength and rigidity. Mainly used for milling cutters and taps.

Sintered Cobalt High Speed Steel

HSS-E PM

HSCo-XP is a Cobalt high speed steel which has been produced using powder metallurgy technology. High speed steel produced by this method exhibits superior toughness and grindability. Taps and milling cutters find particular advantage when manufactured from XP grade steel.

Chromium Steel

CS

Chromium steel is a tool steel in which the principal alloying element is Chromium. It is used only for the manufacture of taps and dies. This steel has lower hot hardness properties in comparison with high speed steels. Suited for hand tap applications.

	Grade	Hardness (HV10)	C %	W %	Mo %	Cr %	V %	Co %	Tool Material
HSS	M2	810-850	0.9	6.4	5.0	4.2	1.8	-	HSS
HSS-E	M35	830-870	0.93	6.4	5.0	4.2	1.8	4.8	HSCO
	M42	870-960	1.08	1.5	9.4	3.9	1.2	8.0	
HSS PM	-	830-870	0.9	6.25	5.0	4.2	1.9	-	HSS Powder Metal
HSS-E PM	ASP 2017	860-900	0.8	3.0	3.0	4.0	1.0	8.0	HSCO Powder Metal
	ASP 2030	870-910	1.28	6.4	5.0	4.2	3.1	8.5	
	ASP 2052	870-910	1.6	10.5	2.0	4.8	5.0	8.0	
CS	-	775-825	1.03	-	-	1.5	-	-	Chromium Steel

Carbide Materials

Carbide Materials (or Hard Materials)

HM

A sintered powder metallurgy steel, consisting of a metallic carbide composite with binder metal. The most central raw material is tungsten carbide (WC). Tungsten carbide contributes to the hardness of the material. Tantalum carbide (TaC), titanium carbide (TiC) and niobium carbide (NbC) complements WC and adjusts the properties to what is desired. These three materials are called cubic carbides. Cobalt (Co) acts as a binder and keeps the material together.

Carbide materials are often characterised by high compression strength, high hardness and therefore high wear resistance, but also by limited flexural strength and toughness. Carbide is used in taps, reamers, milling cutters, drills and thread milling cutters.

Properties	HSS materials	Carbide materials	K10/30F (often used for solid tools)
Hardness (HV30)	800-950	1300-1800	1600
Density (g/cm^3)	8.0-9.0	7.2-15	14.45
Compressive strength (N/mm^2)	3000-4000	3000-8000	6250
Flexural strength, (bending) (N/mm^2)	2500-4000	1000-4700	4300
Heat resistance (°C)	550	1000	900
E-module (KN/mm^2)	260-300	460-630	580
Grain size (µm)	-	0.2-10	0.8

The combination of hard particle (WC) and binder metal (Co) give the following changes in characteristics.

Characteristic	Higher WC content give	Higher Co content give
Hardness	Higher hardness	Lower hardness
Compressive strength (CS)	Higher CS	Lower CS
Bending strength (BS)	Lower BS	Higher BS

Grain size also influences the material properties. Small grain sizes means higher hardness and coarse grains give more toughness.

Technical Section - General

Surface Treatments



Steam Tempering
Steam tempering gives a strongly adhering blue oxide surface that acts to retain cutting fluid and prevent chip to tool welding, thereby counteracting the formation of a built-up edge. Steam tempering can be applied to any bright tool but is most effective on drills and taps.



Bronze Finish
The bronze finish is a thin oxide layer formed on the tool surface and it is applied principally to Cobalt and Vanadium high speed steels.



Nitriding (FeN)
Nitriding is a process that is used to increase the hardness and wear resistance of the surface of a tool. It is particularly suitable for taps that are used on abrasive materials such as cast iron, bakelite, etc. Nitriding is used on twist drills when it is desirable to increase the strength and wear resistance of the cylindrical lands.

Surface Coatings



Titanium Nitride Coating (TiN)
Titanium Nitride is a gold colored ceramic coating applied by physical vapour deposition (PVD). High hardness combined with low friction properties ensures considerably longer tool life, or alternatively, better cutting performance from tools which have not been coated. TiN coating is used mainly for drills and taps.



Titanium Carbon Nitride Coating (TiCN)
Titanium Carbon Nitride is a ceramic coating applied by PVD coating technology. TiCN is harder than TiN and has a lower coefficient of friction. Its hardness and toughness in combination with good wear resistance ensures that it finds its principal application in the field of milling to enhance the performance of milling cutters.



Titanium Aluminum Nitride Coating (TiAlN)
Titanium Aluminium Nitride is a multi layer ceramic coating applied by PVD coating technology, which exhibits high toughness and oxidation stability. These properties make it ideal for higher speeds and feeds, whilst at the same time improving tool life TiAlN is suitable for drilling and tapping. It is recommended to use TiAlN when machining dry.

Technical Section - General



Chromium Nitride Coating (CrN)
CrN is an excellent coating for aluminum alloys, copper alloys and low alloyed steel materials. CrN can also be used as an alternative on Titanium and Nickel alloys. This coating has a low tendency for built-up edges.



Alcrona Top (AlCrN Top)
Alcrona Top is an aluminum chromium nitride coating mostly used for milling cutters. The coatings hot hardness and high oxidation resistance are two unique properties. When machining applications involving heavy mechanical and thermal stresses, these properties translate into supreme wear resistance.



Hardlube (TiAlN/WC/C)
Super B is a Titanium Aluminum Nitride + Tungsten Carbide + Carbon Coating used for wet and minimal lubrication machining in drilling, milling and tapping applications. Very effective for cast iron, hardened steels and heat resistant super alloys.

Surface treatment / Coating properties

Surface Treaments	Color	Coating material	Hardness (HV)	Thick-ness (µm)	Coating structure	Frict. coeff. against steel	Max. appl. temp. (°C)
	Dark grey	Fe 304	400	Max. 5	Conversion into the surface	–	550
	Bronze	Fe 304	400	Max. 5	Conversion into the surface	–	550
	Grey	FeN	1300	20	Diffusion zone	–	550
	Gold	TiN	2300	1-4	Mono-layer	0.4	600
	Blue grey	TiCN	3000	1-4	Multi-layer gradient	0.4	500
	Black grey	TiAlN	3300	3	Nano structured	0.3-0.35	900
	Silver grey	CrN	1750	3-4	Mono-layer	0.5	700
	Blue grey	AlCrN Top	3200		Mono-layer	0.35	1100
	Black	TiAlN+ WC/C	3000	2-6	Multi-layer lamellar	0.2	800

Decimal Equivalents

Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent	Size	Decimal Equivalent
80	.0135	1/16	.0625	3.3 mm	.1299	5.4 mm	.2126	O	.3160	13.50 mm	.5315
0.35 mm	.0138	1.6 mm	.0630	3.4 mm	.1339	3	.2130	8.1 mm	.3189	35/64	.5469
79	.0145	52	.0635	29	.1360	5.5 mm	.2165	8.2 mm	.3228	14.00 mm	.5512
1/64	.0156	1.65 mm	.0650	3.5 mm	.1378	7/32	.2188	P	.3230	9/16	.5625
.4 mm	.0157	1.7 mm	.0669	28	.1405	5.6 mm	.2205	8.25 mm	.3248	14.50 mm	.5709
78	.0160	51	.0670	9/64	.1406	2	.2210	8.3 mm	.3268	37/64	.5781
.45 mm	.0177	1.75 mm	.0689	3.6 mm	.1417	5.7 mm	.2244	21/64	.3281	15.00 mm	.5906
77	.0180	50	.0700	27	.1440	5.75 mm	.2264	8.4 mm	.3307	19/32	.5938
.5 mm	.0197	1.8 mm	.0709	3.7 mm	.1457	1	.2280	Q	.3320	39/64	.6094
76	.0200	1.85 mm	.0728	26	.1470	5.8 mm	.2283	8.5 mm	.3346	15.50 mm	.6102
75	.0210	49	.0730	3.75 mm	.1476	5.9 mm	.2323	8.6 mm	.3386	5/8	.6250
.55 mm	.0217	1.9 mm	.0748	25	.1495	A	.2340	R	.3390	16.00 mm	.6299
74	.0225	48	.0760	3.8 mm	.1496	15/64	.2344	8.7 mm	.3425	41/64	.6406
.6 mm	.0236	1.95 mm	.0768	24	.1520	6 mm	.2362	11/32	.3438	16.50 mm	.6496
73	.0240	5/64	.0781	3.9 mm	.1535	B	.2380	8.75 mm	.3445	21/32	.6562
72	.0250	47	.0785	23	.1540	6.1 mm	.2402	8.8 mm	.3465	17.00 mm	.6693
.65 mm	.0256	2 mm	.0787	5/32	.1562	C	.2420	S	.3480	43/64	.6719
71	.0260	2.05 mm	.0807	22	.1570	6.2 mm	.2441	8.90 mm	.3504	11/16	.6875
.7 mm	.0276	46	.0810	4 mm	.1575	D	.2460	9.00 mm	.3543	17.50 mm	.6890
70	.0280	45	.0820	21	.1590	6.25 mm	.2461	T	.3580	45/64	.7031
69	.0292	2.1 mm	.0827	20	.1610	6.3 mm	.2480	9.10 mm	.3583	18.00 mm	.7087
.75 mm	.0295	2.15 mm	.0846	4.1 mm	.1614	E	.2500	23/64	.3594	23/32	.7188
68	.0310	44	.0860	4.2 mm	.1654	1/4	.2500	9.20 mm	.3622	18.50 mm	.7283
1/32	.0312	2.2 mm	.0866	19	.1660	6.4 mm	.2520	9.25 mm	.3642	47/64	.7344
.8 mm	.0315	2.25 mm	.0886	4.25 mm	.1673	6.5 mm	.2559	9.30 mm	.3661	19.00 mm	.7480
67	.0320	43	.0890	4.3 mm	.1693	F	.2570	U	.3680	3/4	.7500
66	.0330	2.3 mm	.0906	18	.1695	6.6 mm	.2598	9.40 mm	.3701	49/64	.7656
.85 mm	.0335	2.35 mm	.0925	11/64	.1719	G	.2610	9.50 mm	.3740	19.50 mm	.7677
65	.0350	42	.0935	17	.1730	6.7 mm	.2638	3/8	.3750	25/32	.7812
.9 mm	.0354	3/32	.0938	4.4 mm	.1732	17/64	.2656	V	.3770	20.00 mm	.7874
64	.0360	2.4 mm	.0945	16	.1770	6.75 mm	.2657	9.60 mm	.3780	51/64	.7969
63	.0370	41	.0960	4.5 mm	.1772	H	.2660	9.70 mm	.3819	20.50 mm	.8071
.95 mm	.0374	2.45 mm	.0965	15	.1800	6.8 mm	.2677	9.75 mm	.3839	13/16	.8125
62	.0380	40	.0980	4.6 mm	.1811	6.9 mm	.2717	9.80 mm	.3858	21.00 mm	.8268
61	.0390	2.5 mm	.0984	14	.1820	I	.2720	W	.3860	53/64	.8281
1 mm	.0394	39	.0995	13	.1850	7 mm	.2756	9.90 mm	.3898	27/32	.8438
60	.0400	38	.1015	4.7 mm	.1850	J	.2770	25/64	.3906	21.50 mm	.8465
59	.0410	2.60 mm	.1024	4.75 mm	.1870	7.1 mm	.2795	10.00 mm	.3937	55/64	.8594
1.05 mm	.0413	37	.1040	3/16	.1875	K	.2810	X	.3970	22.00 mm	.8661
58	.0420	2.7 mm	.1063	4.8 mm	.1890	9/32	.2812	Y	.4040	7/8	.8750
57	.0430	36	.1065	12	.1890	7.2 mm	.2835	13/32	.4062	22.50 mm	.8858
1.1 mm	.0433	2.75 mm	.1083	11	.1910	7.25 mm	.2854	Z	.4130	57/64	.8906
1.15 mm	.0453	7/64	.1094	4.9 mm	.1929	7.3 mm	.2874	10.50 mm	.4134	23.00 mm	.9055
56	.0465	35	.1100	10	.1935	L	.2900	27/64	.4219	29/32	.9062
3/64	.0469	2.8 mm	.1102	9	.1960	7.4 mm	.2913	11.00 mm	.4331	59/64	.9219
1.2 mm	.0472	34	.1110	5 mm	.1969	M	.2950	7/16	.4375	23.50 mm	.9252
1.25 mm	.0492	33	.1130	8	.1990	7.5 mm	.2953	11.50 mm	.4528	15/16	.9375
1.3 mm	.0512	2.9 mm	.1142	5.1 mm	.2008	19/64	.2969	29/64	.4531	24.00 mm	.9449
55	.0520	32	.1160	7	.2010	7.6 mm	.2992	15/32	.4688	61/64	.9531
1.35 mm	.0531	3 mm	.1181	13/64	.2031	N	.3020	12.00 mm	.4724	24.50 mm	.9646
54	.0550	31	.1200	6	.2040	7.7 mm	.3031	31/64	.4844	31/32	.9688
1.4 mm	.0551	3.1 mm	.1220	5.2 mm	.2047	7.75 mm	.3051	12.50 mm	.4921	25.00 mm	.9843
1.45 mm	.0571	1/8	.1250	5	.2055	7.8 mm	.3071	1/2	.5000	63/64	.9844
1.5 mm	.0591	3.2 mm	.1260	5.25 mm	.2067	7.9 mm	.3110	13.00 mm	.5118	1.0000	1.0000
53	.0595	3.25 mm	.1280	5.3 mm	.2087	5/16	.3125	33/64	.5156		
1.55 mm	.0610	30	.1285	4	.2090	8 mm	.3150	17/32	.5312		

Hardness Conversion Table

Rockwell Hardness			Brinell	Tensile Strength
C	B	A	Hardness	(Lbs./Sq.In.)
70	—	86.5	780	—
69	—	86.0	762	—
68	—	85.5	745	—
67	—	85.0	728	—
66	—	84.5	712	—
65	—	84.0	697	—
64	—	83.5	682	—
63	—	83.0	668	—
62	—	82.5	653	—
61	—	82.0	640	—
60	—	81.0	627	314,000
59	—	80.5	614	307,000
58	—	80.0	601	299,000
57	—	79.5	578	291,000
56	—	79.0	567	284,000
55	—	78.5	555	277,000
54	—	78.0	545	270,000
53	—	77.5	534	263,000
52	—	77.0	514	256,000
51	—	76.5	505	250,000
50	—	76.0	495	243,000
49	—	75.5	477	236,000
48	—	75.0	469	230,000
47	—	74.0	461	223,000
46	115	73.5	444	217,000
45	115	73.0	429	211,000
44	114	72.5	415	205,000
43	114	72.0	408	200,000
42	113	71.5	401	195,000
41	112	71.0	388	188,000
40	112	70.5	375	182,000
39	111	70.0	369	176,000

Rockwell Hardness			Brinell	Tensile Strength
C	B	A	Hardness	(Lbs./Sq.In.)
38	110	69.5	363	171,000
37	110	69.0	352	167,000
36	109	68.5	341	162,000
35	109	68.0	331	158,000
34	108	67.5	321	153,000
33	108	67.0	311	148,000
32	107	66.5	302	144,000
31	106	66.0	293	140,000
30	105	65.5	285	136,000
29	104	65.0	277	133,000
28	104	64.5	269	131,000
27	103	64.0	265	130,000
26	103	63.5	262	128,000
25	102	63.0	255	125,000
24	102	62.5	248	122,000
23	101	62.0	241	119,000
22	100	61.5	235	116,000
21	99	61.0	229	113,000
20	98	60.0	223	110,000
19	97	59.5	220	108,000
18	97	59.0	217	107,000
17	96	58.0	212	104,000
16	96	57.5	207	101,000
15	95	57.0	202	99,000
14	94	56.5	200	98,000
13	93	56.0	197	97,000
12	92	55.5	192	95,000
11	92	55.0	189	94,000
10	91	54.0	187	93,000
9	90	53.5	183	91,000
8	89	53.0	179	89,000
7	88	52.5	174	87,000

Lubricants

Lubricants or coolants are used on cutting tools to reduce friction or to reduce heat.

Type of Lubricant	Description	Advantages	Disadvantages
Emulsion	Emulsions or water-soluble cutting oils give lubrication properties combined with good cooling property. The oil concentrate in emulsion contains additives that give different properties like lubricators, preservatives and EP additives to improve bearing strength.	Reduces heat. Flushes away chips.	Disposal cost. Environment
Minimal lubrication	Minimal lubrication is a small amount of oil distributed with compressed air to lubricate the cutting or forming process.	Low cost. Good	Bad chip removal. Requires good set up of nozzle positioning
Oil	Cutting oils have good lubrication properties but do not provide such good cooling as water-based cutting fluids.	Good	High cost. Environment.
Dry / compressed air	Compressed air directed to the cutting process.	Clean process. Remove Chips. Low cost.	Works in a limited no. of applications.



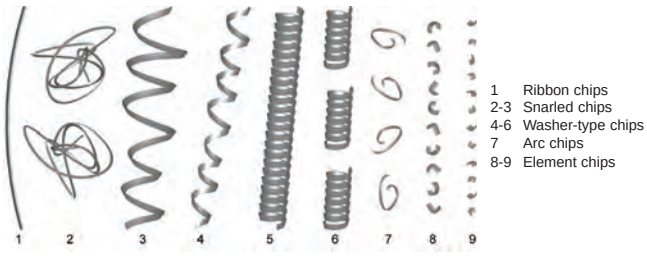


Types Of Chips

Chip formation is mostly caused by plastic deformation. This process, due to the friction generated during machining, generates heat. Heat has the positive effect of increasing the plasticity of the workpiece material, but the negative effect of increasing the wear on the tool. When workpiece material reaches its breakage point, then the chip is generated. Its form and development depend on different factors, such as:

- Chemical-physical compatibility between tool and workpiece materials
- Cutting operation
- Cutting conditions (speed, feed, material removal rate)
- Tool geometry
- Friction coefficient (with or without coating)
- Lubrication

Depending on different combinations of the above mentioned factors, the chips can turn out in many different ways (see figure below).



Chips that are shaped as small “6’s & 9’s” are desireable in most machining applications. this will allow for the best possible chip evacuation from the deepest cavities. Tool life is also increased dramatically when chips are kept small and manageable. When the heat generated from cutting is kept in the chip instead of the tool, wear is kept to minimum.

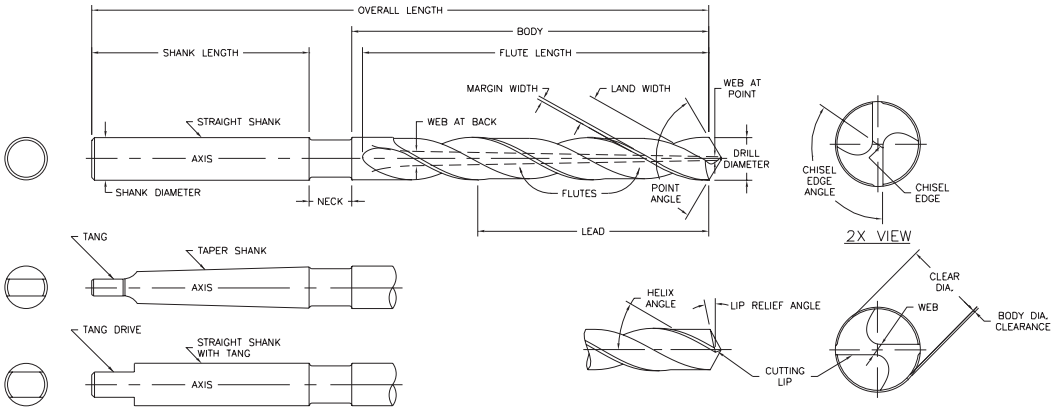
Industry Standard tolerancess For Shafts & Holes

Tolerance values are shown in Microns (μm) Formula for Microns ...1 μm = 0.001 mm / 0.000039

Toler-ance	Diameter (mm)							
	> 1 ≤ 3	> 3 ≤ 6	> 6 ≤ 10	> 10 ≤ 18	> 18 ≤ 30	> 30 ≤ 50	> 50 ≤ 80	> 80 ≤ 120
	Diameter (inch)							
	> 0.039 ≤ 0.118	> 0.118 ≤ 0.236	> 0.236 ≤ 0.394	> 0.394 ≤ 0.709	> 0.709 ≤ 1.181	> 1.181 ≤1.968	>1.968 ≤ 3.149	> 3.149 ≤ 4.724
	Tolerance values (μm)							
e8	-14 / -28	-20 / -38	-25 / -47	-32 / -59	-40 / -73	-50 / -89	-60 / -106	-72 / -126
f6	-6 / -12	-10 / -18	-13 / -22	-16 / -27	-20 / -33	-25 / -41	-30 / -49	-36 / -58
f7	-6 / -16	-10 / -22	-13 / -28	-16 / -34	-20 / -41	-25 / -50	-30 / -60	-36 / -71
h6	0 / -6	0 / -8	0 / -9	0 / -11	0 / -13	0 / -16	0 / -19	0 / -22
h7	0 / -10	0 / -12	0 / -15	0 / -18	0 / -21	0 / -25	0 / -30	0 / -35
h8	0 / -14	0 / -18	0 / -22	0 / -27	0 / -33	0 / -39	0 / -46	0 / -54
h9	0 / -25	0 / -30	0 / -36	0 / -43	0 / -52	0 / -62	0 / -74	0 / -87
h10	0 / -40	0 / -48	0 / -58	0 / -70	0 / -84	0 / -100	0 / -120	0 / -140
h11	0 / -60	0 / -75	0 / -90	0 / -110	0 / -130	0 / -160	0 / -190	0 / -220
h12	0 / -100	0 / -120	0 / -150	0 / -180	0 / -210	0 / -250	0 / -300	0 / -350
k10	+40 / 0	+48 / 0	+58 / 0	+70 / 0	+84 / 0	+100 / 0	+120 / 0	+140 / 0
k12	+100 / 0	+120 / 0	+150 / 0	+180 / 0	+210 / 0	+250 / 0	+300 / 0	+350 / 0
m7	+2 / +12	+4 / +16	+6 / +21	+7 / +25	+8 / +29	+9 / +34	+11 / +41	+13 / +48
js14	+/- 125	+/- 150	+/- 180	+/- 215	+/- 260	+/- 310	+/- 370	+/- 435
js16	+/- 300	+/- 375	+/- 450	+/- 550	+/- 650	+/- 800	+/- 950	+/- 1100
H7	+10 / 0	+12 / 0	+15 / 0	+18 / 0	+21 / 0	+25 / 0	+30 / 0	+35 / 0
H8	+14 / 0	+18 / 0	+22 / 0	+27 / 0	+ 33 / 0	+39 / 0	+46 / 0	+54 / 0
H9	+25 / 0	+30 / 0	+36 / 0	+43 / 0	+52 / 0	+62 / 0	+74 / 0	+87 / 0
H12	+100 / 0	+120 / 0	+150 / 0	+180 / 0	+210 / 0	+250 / 0	+300 / 0	+350 / 0
P9	-6 / -31	-12 / -42	-15 / -51	-18 / -61	-22 / -74	-26 / -86	-32 / -106	-37 / -124
S7	-13 / -22	-15 / -27	-17 / -32	-21 / -39	-27 / -48	-34 / -59	-42 / -72	-58 / -93

Technical Section - Drilling

Drill Nomenclature



Axis—The imaginary straight line which forms the longitudinal center line of a drill.

Backtaper—A slight decrease in diameter from front to back in the body of a drill.

Body—The portion of a drill extending from the shank or neck to the outer corners of the cutting lips.

Body Clearance Diameter—The portion of the land that has been cut away so it will not bind against the walls of the hole.

Chisel-Edge—The edge at the end of the web that connects the cutting lips.

Chisel-Edge Angle—The included angle between the chisel-edge and cutting lip, as viewed from the end of a drill.

Clearance Diameter—The diameter over the cut away portion of the drill lands.

Drill—A rotary end cutting tool having one or more cutting lips, and having one or more helical or straight flutes for the passage of chips and the admission of a cutting fluid.

Drill Diameter—The diameter over the margins of a drill measured at the point.

Flute Length—The length from the outer corners of the cutting lips to the extreme back of the flutes. Includes the sweep of the tool used to generate the flutes and therefore does not indicate the usable length of flutes.

Flutes—Helical or straight grooves cut or formed in the body of a drill to provide cutting lips, permit removal of chips, and allow cutting fluid to reach the cutting lips.

Helix Angle—The angle formed by the leading edge of the land with a plane containing the axis of a drill.

Land—The peripheral portion of the body between adjacent flutes.

Land Width—The distance between the leading edge and heel of the land; measured at a right angle to the leading edge.

Lead—The axial advance of a leading edge of the land in one turn around the circumference.

Lip Relief Angle—The axial relief angle at the outer corner of the lip; measured by projection to a plane tangent to the periphery at the outer corner of the lip.

Lips—The cutting edges of a two flute drill extending from the chisel- edge to the periphery.

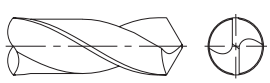
Margin—The cylindrical portion of the land, which is not cut away, to provide clearance.

Neck—The section of reduced diameter between the body and the shank of a drill.

Overall Length—The length from the extreme end of the shank to the outer corners of the cutting lip. It does not include the conical shank end often used on straight shank drills, nor the conical cutting point used on both straight and taper shank drills.

Point—The cutting end of a drill, made up of the ends of the lands and the web. In form, it resembles a cone, but departs from a true cone to furnish clearance behind the cutting lips.

Conventional—Conventional Points with 118° included point angles are the most commonly used because they provide satisfactory results in a wide variety of materials. A possible limitation is that the straight chisel edge contributes to walking at the drill point, often making it necessary to spot the hole for improved accuracy.

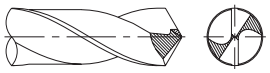


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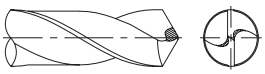
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Drill Nomenclature

Split — Split-Points (commonly called Crankshaft Points) were originally developed for use on drills designed for deep oil holes in automotive crankshafts. Since its inception, the split-point has gained widespread use and is applied to both 118° and 135° included point angles. Its main advantages are the ability to reduce thrust and eliminate walking at the drill point. This is a distinct advantage when the drill is used in a portable drill or in drilling applications where bushings cannot be used. The split-point also has two positive rake cutting edges extending to the center of the drill, which can assist as a chipbreaker to produce small chips which can readily be ejected.



Notched — Notched Points were developed for drilling tough alloys. Commonly incorporated on heavy web drills, which allow the point to withstand the higher thrust loads required in drilling these materials. As with the split-point, the Notched Point contains two additional positive rake cutting edges extending toward the center of the drill. These secondary cutting lips, which extend no further than half the original cutting lip, can assist in chip control and reduce the torque required in drilling tough materials. Notched Points can be incorporated on both 118° and 135° included point angles, making them suitable for drilling a wide variety of materials.



Point Angle—The included angle between the cutting lips projected upon a plane parallel to the drill axis and parallel to the two cutting lips.

Relative Lip Height—The difference in indicator reading between the cutting lips of a drill. Measured at a right angle to the cutting lip at a specific distance from the axis of the tool.

Shank—The part of a drill by which it is held and driven.

Tang—The flattened end of a taper shank, intended to fit into a driving slot in a socket.

Tang Drive—Two opposite parallel driving flats on the extreme end of a straight shank.

Taper Shank— Drills having conical shanks suitable for direct fitting in machine spindles, driving sleeves, or sockets. Tapered shanks generally have a tang.

Web—The central portion of the body that joins the lands. The extreme end of the web forms the chisel-edge on a two flute drill.

Web Thickness—The thickness of the web at the point, unless another specific location is indicated.

Drilling terminology/ operating formulas

Speed — The speed of a drill is determined by the rate at which the outer periphery of the tool rotates in relation to material being cut. In general, the SFM at which a drill will operate is within a range based upon the workpiece material, its condition, hardness, and depth of hole. The deeper the hole, the greater tendency there is for more heat to be generated, due to length of drill engagement, as well as chip compaction. Thus, speed reduction is often recommended to minimize the amount of heat being generated. By increasing the SFM, fewer holes will result. Therefore, it is usually advisable to start the drilling process at a slower SFM and then increase to the maximum.

Feed — Feed rates for drilling are governed by the drill diameter machinability of materials and depth of hole. Small drills, harder materials, and deeper holes require additional considerations in selecting the proper feed rates.

The following terms and formulas can be used to determine the appropriate operating parameters.

Terms			Formulas		
IPM	=	Inches Per Minute	IPR x RPM	=	IPM
IPR	=	Inches Per Revolution	$\frac{IPM}{RPM}$	=	IPR
RPM	=	Revolutions Per Minute	$\frac{SFM \times 3.82}{D}$	=	RPM
SFM	=	Surface Feet Per Minute	D x RPM x .26	=	SFM
D	=	Drill Diameter			

Note: For element and tolerance information, see specific technical sections on Solid Carbide or High Speed Steel.

Optimizing the Drilling Operation / Troubleshooting

Drill Selection

Use the shortest drill the application will permit in order to achieve maximum tool rigidity.

Holders

Tool holders and collets must provide good concentricity between the drill and the machine spindle. Use a positive back stop to prevent the tool from backing up into the holder. Never collet the tool over the flutes or over-tighten the holder. Static runout in the tool assembly must be accurately checked and maintained.

Workpiece

A secure and rigid workpiece to minimize deflection is needed, particularly on through-hole applications.

Coolants

Coolants are recommended when drilling mild steel and high temperature alloys. The purpose of the coolant media is to direct the chips away from the cutting tool and workpiece. Excessive coolant pressure and/or too much volume can negatively affect performance. When using coolant fed drills, the coolant pressure that is required should be higher than normal. Suggested pressure for coolant fed drills is minimally 150 PSI. As the diameter of the drill is reduced, the higher the pressure. This is to assist the chip in evacuating from a more confined area.

Drilling Troubleshooting Guide

Problem	Solution
Wear on Outer Corners	• Reduce cutting speed • Increase feed (IPR) • Improve direction of coolant flow • Increase coolant pressure • Add corner break
Chipping of Chisel Edge	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Check point centrality and lip height • Increase feed rate
Chipping of Cutting Lips	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Reduce speed • Reduce point clearance • Increase hone
Cracking of Lands	• Check movement of workpiece • Increase back taper • Check accuracy of drill runout • Chip packing; increase flute form opening or peck drill (HSS or HSCO only) • Slow down helix, horizontal drilling • Increase feed • When spot drilling, reduce feed • Improve direction of coolant flow • Increase coolant pressure
Oversize Hole	• Increase speed, reduce feed • Check workpiece clamping accuracy and movement • Check accuracy of drill runout • Chip packing, increase flute form opening or peck drill (HSS or HSCO only) • Check point centrality and lip height
Undersize Hole	• Improve direction of coolant flow • Reduce cutting speed, increase feed • Check drill diameter
Hole Not Round	• Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Check point centrality and lip height • Chip packing, increase flute form opening or peck drill (HSS or HSCO only)
Drill Breakage	• Chip packing, increase flute form opening or peck drill (HSS or HSCO only) • Check workpiece clamping accuracy and movement • Check accuracy of drill runout • Reduce feed rate, increase feed rate • Improve direction of coolant flow • Increase coolant pressure

Hole Size / Achievable Hole Tolerances

As geometric, substrate and coating configurations become more advanced, the ability of a drill to produce a more accurate hole size increases. In general, a standard geometry tool will achieve a hole size to H12. However as the configuration of the drill becomes more complex the achievable hole size, under favorable conditions, can be as good as H8.

To offer a better insight, listed below are the product types and their achievable hole tolerances:

HSS General Purpose drills – H12

HSS / HSCo Parabolic Flute Deep Hole Drills (PFX) – H10

HSS / HSCo High performance TiN/ TiALN coated (ADX) – H9

Solid Carbide High Performance TiN / TiALN coated (CDX) – H8

NOMINAL HOLE DIAMETER (MM)

∅ (mm)	H8	H9	H10	H12
≤ 3	0 / +0.014	0 / +0.025	0 / +0.040	0 / +0.100
> 3 ≤ 6	0 / +0.018	0 / +0.030	0 / +0.048	0 / +0.120
> 6 ≤ 10	0 / +0.022	0 / +0.036	0 / +0.058	0 / +0.150
> 10 ≤ 18	0 / +0.027	0 / +0.043	0 / +0.070	0 / +0.180
> 18 ≤ 30	0 / +0.033	0 / +0.052	0 / +0.084	0 / +0.210

NOMINAL HOLE DIAMETER (INCHES)

∅ (inch)	H8	H9	H10	H12
≤ .1181	0 / +0.0006	0 / +0.0010	0 / +0.0016	0 / +0.0040
>.1181≤.2362	0 / +0.0007	0 / +0.0012	0 / +0.0019	0 / +0.0048
>.2362 ≤.3937	0 / +0.0009	0 / +0.0015	0 / +0.0023	0 / +0.0059
>.3937≤.7087	0 / +0.0011	0 / +0.0017	0 / +0.0028	0 / +0.0071
>.7087≤1.1811	0 / +0.0013	0 / +0.0021	0 / +0.0033	0 / +0.0083

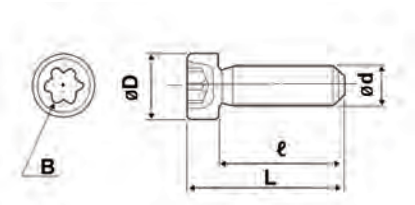
In view of the ability of some drills to produce a much tighter hole tolerance, due consideration should be given to drilled holes which are subject to secondary operations, eg. tapping, reaming. The diameter of the drill will need to be increased from what is recommended to account for the fact that the hole size produced will be smaller.

Technical Section - Drilling - Hydra

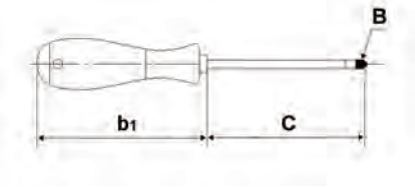
Torque Table

H860	H861	H853 3xD	H855 5xD	H858 8xD	TORQUE VALUES Nm (metric System)	TORQUE VALUES in/lbs (inch System)
H860N1	H861N1	12.0mm-15.0mm 31/64"-39/64"	12.0mm-15.0mm 31/64"-39/64"	14.0mm-15.0mm	0.75-0.99	6.6-8.8
H860N2	H861N2	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm 41/64"-23/32"	16.0mm-18.0mm	0.93-1.24	8.2-11.0
H860N3	H861N3	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm 49/64"-27/32"	19.0mm-21.0mm	1.84-2.44	16.3-21.6
H860N4	H861N3	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm 57/64"-31/32"	22.0mm-24.0mm	2.73-3.72	24.2-32.9
H860N5	H861N4	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm 1.1/64"-1.3/32"	25.0mm-27.0mm	4.14-5.52	36.6-48.8
H860N6	H861N5	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm 1.1/8"-1.3/16"	28.0mm-33.5mm	4.97-6.63	44.0-58.7
H860N7	H861N6	35.0mm-42.5mm	35.0mm-42.5mm	35.0mm-42.5mm	7.20	63.7

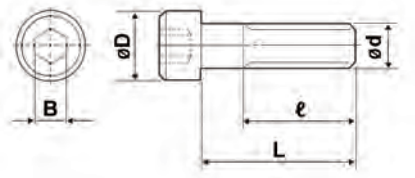
Screws and screw-drivers data



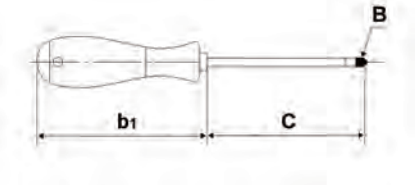
e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N1	M2.2	0.45	7.5	5.7	3.5	8IP
H860N2	M2.5	0.45	9.0	7.0	4.1	10IP
H860N3	M3.0	0.50	10.5	8.0	4.9	15IP
H860N4	M3.5	0.60	11.5	8.8	5.5	15IP
H860N5	M4.0	0.70	12.5	9.5	6.0	20IP
H860N6	M4.5	0.75	14.3	10.8	6.8	25IP



code	B	C	b1
H861N1	8IP	60	104
H861N2	10IP	80	111
H861N3	15IP	80	111
H861N4	20IP	100	118
H861N5	25IP	100	118



e-code	d	Pitch	L (mm)	l (mm)	D (mm)	B
H860N7	M5.0	0.8	15	FULL	8.5	4



e-code	B	C	b1
H861N6	4	75	111

Drilling Hints & Tips with the Hydra Drill

COOLANTS
For maximum chip evacuation and tool performance, coolant use is recommended.

Emulsion coolant concentration of 6 – 8% is re-commended for most applications, at a coolant pressure of 20 bar or higher. For high strength steel, stainless steels and tougher drilling applications, use a higher concentration of 10-12%. In these applications, particularly in stainless steels, it is recommended to use the maximum coolant pressure on the machine.

The Hydra-drill coolant holes provide improved web strength and reduce heat at the cutting edges for increased productivity and longer tool life.

HOLDERS
Always use tool holders and collets that provide good concentricity between the drill and the machine spindle. Use a positive stop to prevent the tool from backing up into the holder. Radial runout in the tool assembly must be accurately checked and maintained.

WORKPIECE
A secure and rigid workpiece will minimise deflection, and allow for better accuracy and true position of the hole.

FEEDS
It is important not to underfeed the drill which will cause it to dwell and dull. This is particularly true in work hardening materials. Feed rates should be high enough for proper chip formation.



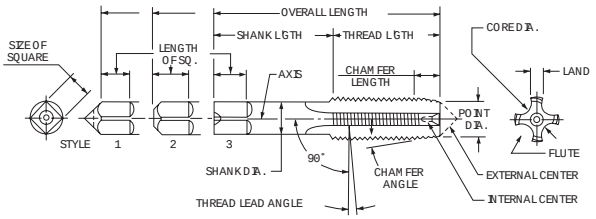
Entrance or exit on an angular surface

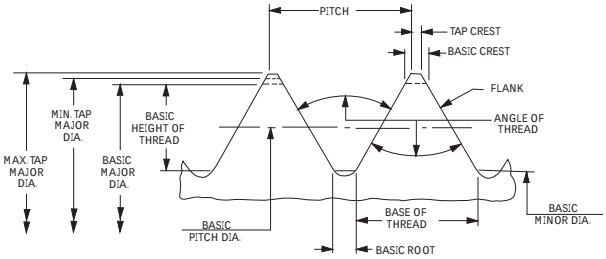
Drilling through cross holes

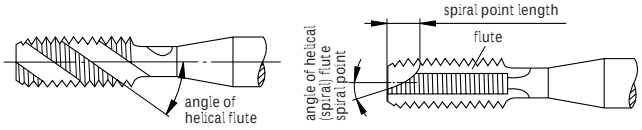
Interrupt at exit

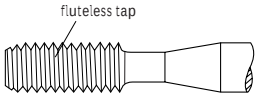
In these drilling scenarios, reducing feed rate to 1/3 (33%) is generally recommended. Drilling into an entry angle of more than 10º is NOT recommended – surface should be milled flat first.

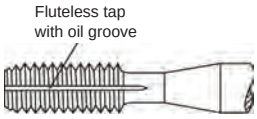
Technical Section - Threading











Allowance: The minimum clearance or maximum interference which is intended between mating parts.

Angle of Thread: The angle included between the flanks of a thread measured in an axial plane.

Back Taper: A slight taper on the threaded portion of the tap making the pitch diameter near the shank smaller than that at the chamfer.

Basic: The theoretical or nominal standard size from which all variations are made.

Chamfer: The tapered and relieved cutting teeth at the front end of the threaded section. Common types of chamfer are taper, 8 to 10 pitches long, plug, 3 to 5 pitches and bottoming, 1 to 2 pitches.

Crest: The top surface joining the two sides or flanks of a thread.

Cutting Face: The leading side of the land.

Flute: The longitudinal channels formed on a tap to create cutting edges on the thread profile.

Heel: The following side of the land.

Height of Thread: In profile, distance between crest and bottom section of thread measured normal to the axis.

Hook Face: A concave cutting face of the land. This may be varied for different materials and conditions.

Interrupted Thread: Alternate teeth are removed in the thread helix on a tap; usually restricted to those having an odd number of flutes.

Land: One of the threaded sections between the flutes of a tap.

Lead of Thread: The distance a screw thread advances axially in one turn.

Major Diameter: The largest diameter of the screw or nut on a straight screw thread.

Minor Diameter: The smallest diameter of the screw or nut on a straight screw thread.

Neck: The reduced diameter, on some taps, between the threaded portion and the shank.

Pitch: The distance from a point on one thread to a corresponding point on the next thread, measured parallel to the axis.

Pitch Diameter: On a straight screw thread, the diameter of an imaginary cylinder where the width of the thread and the width of the space between threads is equal.

Point Diameter: The diameter at the leading end of the chamfered portion.

Radial: The straight face of a land, the plane of which passes through the axis of the tap.

Rake: The angle of the cutting face of the land in relation to an axial plane intersecting the cutting face at the major diameter.

Relief: The removal of metal behind the cutting edge to provide clearance between the part being threaded and a portion of the threaded land. Also, see back taper.

CHAMFER RELIEF: The gradual decrease in land height from cutting edge to heel on the chamfered portion of the tap land to provide radial clearance for the cutting edge.

CON-ECCENTRIC RELIEF: Radial relief in the thread form starting at the back of a concentric margin.

ECCENTRIC THREAD RELIEF: Radial relief in the thread form starting at the cutting edge and continuing to the heel.

Root: The bottom surface joining the flanks of two adjacent threads.

Side or flank of thread: The surface of the thread which connects the crest with the root.

Shank: The portion of the tap by which it is held and driven.

Spiral Point: An oblique cutting edge ground into the lands to provide a shear cutting action on the first few threads.

Square: The squared end of the tap shank.

Thread: The helical formed tooth of the tap which produces the thread in a tapped hole.

Thread Lead Angle: The angle made by the helix of the thread at the pitch diameter, with a plane perpendicular to the axis.

Threads Per Inch: The number of threads in one inch of length.

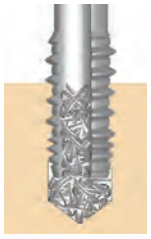
Thread:

SINGLE: A thread in which lead is equal to pitch.

DOUBLE: A thread in which lead is equal to twice the pitch.

TRIPLE: A thread in which lead is equal to triple the pitch.

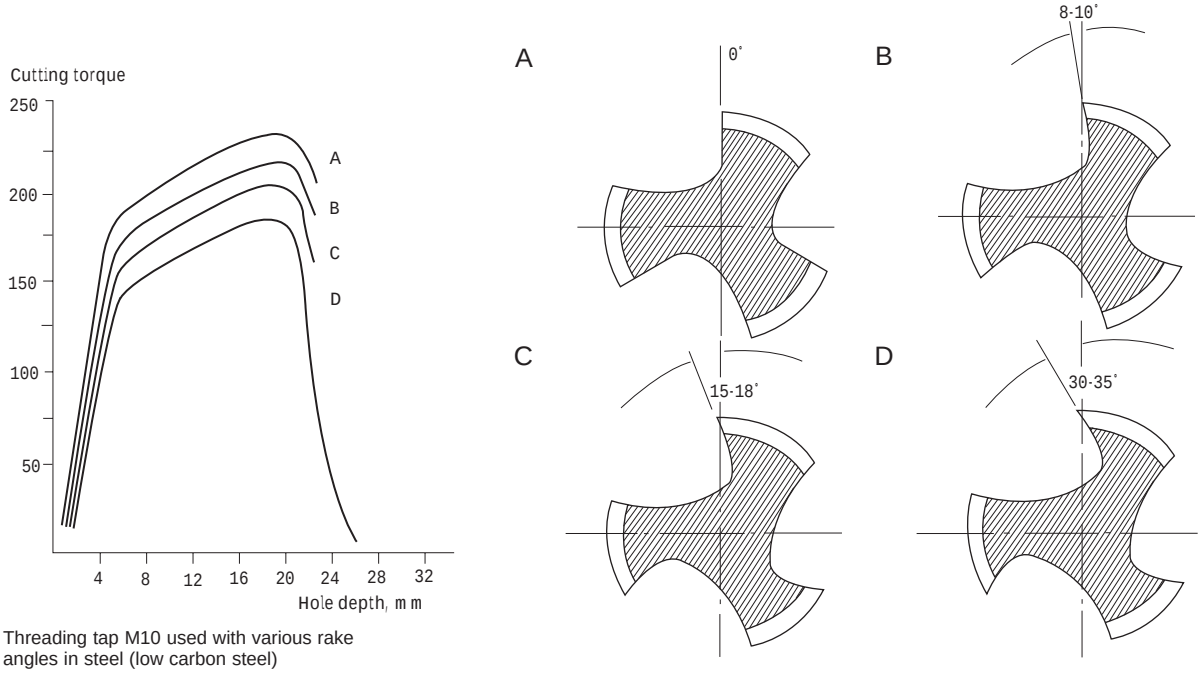
Tap Geometries & Applications

Description	Chips
Taps with straight flutes Straight flutes are the most commonly used type of tap. Suitable for use on most materials, mainly short chipping steel and cast iron, they form the basis of the program.	
Taps with interrupted thread The interrupted thread ensures less friction and therefore less resistance, which is particularly important when threading material which is resilient and difficult to machine (e.g. aluminium, bronze). It is also easier for lubricant to penetrate to the cutting edges, thus helping to minimize the torque generated	
Spiral point taps The tap has a straight fairly shallow flute and is often referred to as a gun nose or spiral point tap. The gun nose or spiral point is designed to drive the chips forward. The relatively shallow flutes ensure that the sectional strength is maximised. They also act to allow lubricant to reach the cutting edges. This type of tap is recommended for threading through holes.	
Nut taps These taps are generally used to thread nuts but can be used also on deep through holes. They have a shank diameter smaller than the nominal and a longer overall length, because their function is to accumulate nuts. They are used on special machines designed to thread huge amounts of nuts. They can work in steel and stainless steel. The first serial tap has a very long chamfer, in order to spread the cutting load on almost two thirds of the thread length.	

Description	Chips
Taps with flutes only on the chamfer lead The cutting part of the tap is formed by gun nosing in the same manner as for a spiral point tap, the function being to drive the chips forward ahead of the cutting edges. This design is extremely rigid which facilitates good machining results. However, the short length of the gun nosing limits its application to a depth of hole less than about 1.5 x Ø.	
Taps with spiral flutes Taps with spiral flutes are intended primarily for threading in blind holes. The helical flute transports the chips back away from the cutting edges and out of the hole, thus avoiding packing of chips in the flutes or at the bottom of the hole. In this way, danger of breaking the tap or damaging the thread is minimised.	
Cold forming taps Cold forming taps differ from cutting taps in that the thread is produced by plastic deformation of the component material rather than by the traditional cutting action. This means that no chips are produced by their action. The application range is materials with good formability. Tensile strength (Rm) should not exceed 1200 N/mm^2 and the elongation factor (A_5) should not be less than 10%. Cold forming taps without flutes are suitable for normal machining and are especially suitable when vertically tapping blind holes. They are also available with through coolant.	
Through coolant taps The performance of taps with through coolant holes is higher than the same taps used with external lubrication. These kinds of taps allow better evacuation of the chip, which is transported away from the cutting area itself. Wear on the cutting edge is reduced, since the cooling effect on the cutting zone is higher than the heat generation. Lubrication can be oil, emulsion or air pressurised with oil mist. Working pressure not less then 15 bar is required, but good results can be obtained with minimal lubrication.	

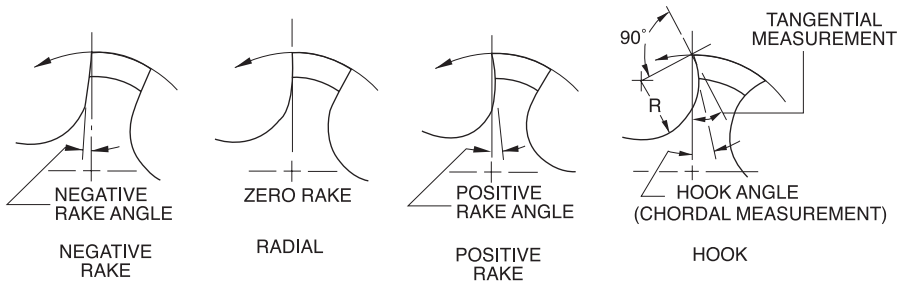
Tapping Technical Data

Rake Angles

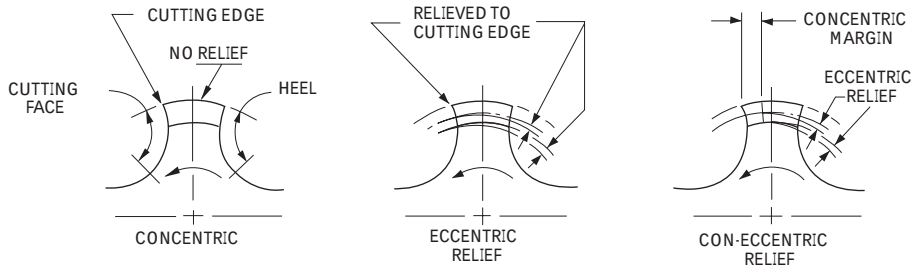


Threading tap M10 used with various rake angles in steel (low carbon steel)

The rake angle has a primary influence on cutting forces and consequently the cutting torque and surface finish of the thread. Test results made with different rake angles are shown in the above diagram, illustrating how cutting torque decreases with a larger rake angle. There is, however, a limit. A large rake angle means lower strength of the cutting edge.



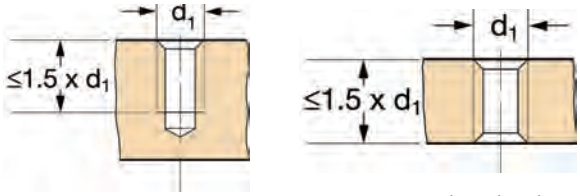
Relief Angles



Cutting Chamfers

The cutting part of a tap is the teeth of the chamfer on the leading end of the tap. The rest of the thread length is the cylindrical guiding part, which is slightly back-tapered for clearance. A decision on the best type of chamfer form has to be carefully made as both the tap life and quality of thread are greatly affected.

Generally, the form and length of chamfer depend on the type of hole to be tapped. Though holes do not normally cause difficulties whereas the tapping of blind holes can create certain problems associated with chip evacuation.

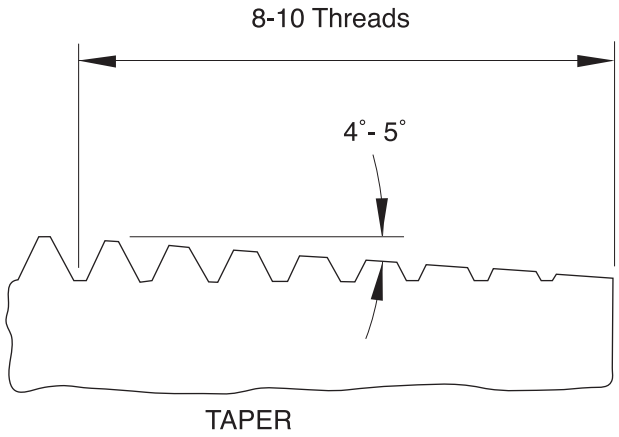


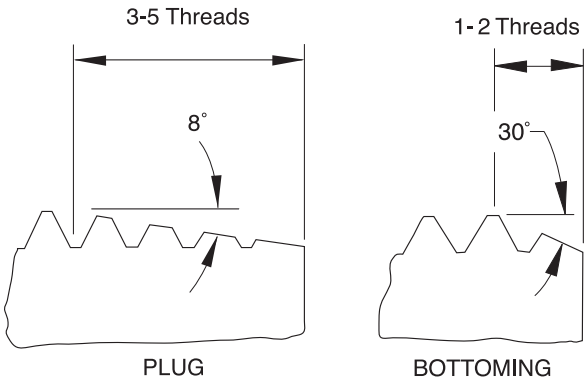
Blind Hole Through Hole

The length of the chamfer is determined by careful consideration of the following factors:

- The number of chamfer cutting teeth cannot be kept too low so as to avoid overloading, premature dulling and oversized or rough threads.
- A chamfer lead that is too long, however, increases the torque and the danger of breakage.

Commonly used chamfers are taper, plug and bottoming. Eight to ten cutting teeth per land are produced by a taper chamfer. A plug chamfer produces three to five cutting teeth per land and a bottoming chamfer one to two cutting teeth per land. The recommended radial relief behind the cutting edge of the chamfer portion is .004" to .005" relief per 1/16 of land width.





Tapping Speeds

Correct tapping speeds are very important in obtaining efficient tapping results. There are many factors which affect tapping speeds, some of which are listed below:

Material Factors:

- Thermo-conductivity of the material and wall thickness as it affects heat dispersion.
- Variations in carbon content of steel.
- Hard spots in material.
- Depth of hole to be tapped.
- Percentage of full thread to be tapped.

Tap Factors:

- Major diameters, pitch and lead.
- Style of tap.
- Width of lands.
- Amount of hook or rake.
- Length of chamfer. Bottoming taps normally require slower speeds than plug chamfered taps

Mechanical Factors:

- Type of tapping machine and holder; Speeds for small diameter taps are often governed by the limitation of the machine.
- Condition of tapping machine and spindle.
- Type of fixture.
- Vertical or horizontal tapping (faster speeds for vertical tapping).
- Method of feeding the tap.
- Cutting fluid used and method of application.

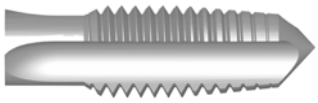
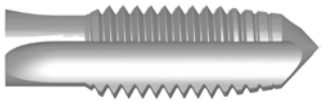
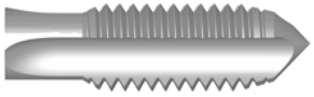
The optimum speed for tapping is the highest speed that conditions permit, consistent with economic tool life.

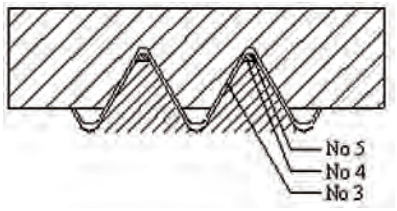
Proper tapping speeds are determined best by experiment. In the table below the speeds shown should be used as a guide only, and the suggested surface feet per minute adjusted upward or downward until the best results are obtained.

$$RPM = \frac{3.82 \times SFM}{D} \qquad SFM = .26 \times RPM \times D$$

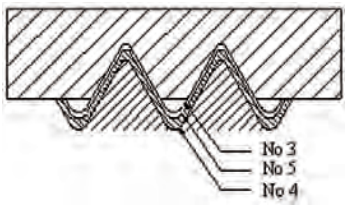
Chamfer Lengths And Serial Taps

The first group (No. 1, No. 2, No. 3) includes taps with complete thread profile and the difference is in the chamfer length. The second group (No. 4, No. 5) includes taps with incomplete thread profile. They have lower pitch and outer diameter, compared to the complete standard, and longer chamfer. After using them, a finishing tap No. 3, must be used.

No. 1 =		6-8 x P 
No. 2 =		4-6 x P 
No. 3 =		2-3 x P 
No. 4 =		6-8 x P
No. 5 =		3,5-5 x P



Ø<=M10



Ø>=M12

ISO	Set code number	Including tap number
	No. 6	No. 1 + No. 2 + No. 3
	No. 7	No. 2 + No. 3
	No. 8	No. 4 + No. 5 + No. 3
	No. 9	No. 5 + No. 3
DIN	**Set code number**	**Including tap number**
	No. 8	No.3 (form C) + No.4 (form A) + No.5 (form B)
	No. 9	No.3 (form C) + No.5 (form B)
ANSI	**Set code number**	**Including tap number**
	Hand Tap (No. 6)	Taper(No.1) + Plug(No.2) + Bottoming(No.3)

Tapping Technical Data

The Relationship Between H-Limit and Class of Fit

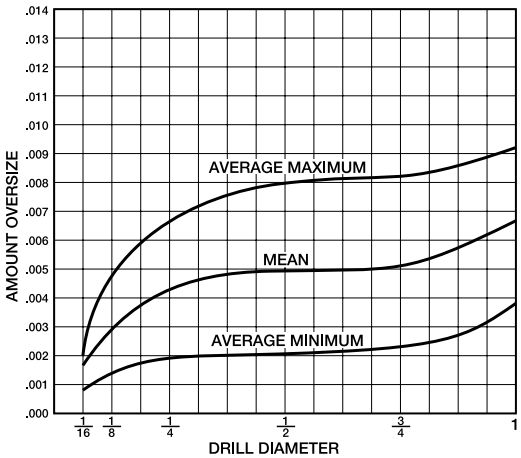
H-limits are used to properly size a tap for the threaded hole to be produced. They are selected based upon the tolerance required for the part. These tolerances are defined by the symbols class 1B, 2B, or 3B. Class 1B has the broadest tolerance and is generally applied to DIY (Do It Yourself) type nuts and bolts. Class 2B is the most common and is used for general fasteners and threaded parts. Class 3B is the tightest tolerance and used for close fit and high strength fastening applications, primarily in the automotive and aerospace industry.

Once the class of thread and part tolerance has been defined, an H-limit is selected to produce a thread that is within the minimum and maximum limits for that class of fit. These limits are the same as the Go and No Go thread plug gage dimensions. The goal is to select a tap with an H-limit that is near the middle of the part tolerance. For instance, if the total tolerance was .005", the tap should be approximately .0025" larger than the minimum limit of the part and .0025" smaller than the maximum. However, to handle the widest variety of tapping conditions, the "40% rule" is commonly used. Using this rule, the tap is placed at 40% of the part tolerance. For example, if the part tolerance is .005", multiplying .005" by 0.40 equals .002". Thus, the tap would be .002" larger than the minimum limit of the part or Go thread gage.

With the position of the tap in relationship to the part tolerance established, the selection of an H-limit number, such as H3, H4, H5, etc. is possible. H-limits are a sequence of size "steps" in .0005" increments beginning at the minimum size limit of the part, starting with H1. In other words, an H1 limit is one .0005" increment larger than the minimum limit of Go gage, an H2 is two .0005" increments (or .001) larger than the minimum limit, an H3 is three .0005" increments (or .0015") and so on. In the example above, a tap that is .002" larger than minimum limit, is four .0005" increments larger, or an H4. This would be tht tap H-limit recommendation for this tolerance.

If after selecting the proper H-limit, an oversize or undersized thread exists, or if shrinkage due to heat treating or plating will occur, larger of smaller H-limits may be required to adjust to the condition.

Probable Oversize Values For Drilled Holes



Drills will normally cut a hole larger in diameter than the drill itself. The amount depends upon the rigidity of the equipment, stiffness of the drill, accuracy of the point, the material being drilled, and many other contributing factors. However, averaging all factors, the charge below shows what might be expected with standard drills without guide bushings in steel or cast iron using good drilling practices and reasonable care in the resharpening of the drills.

Drills as received from our factory will usually drill hole sizes between the minimum and mean lines. Reconditioned drills, however, may produce hole sizes between the minimum and maximum lines depending upon drill wear, margin pick-up, and accuracy of resharpening.

Probable Oversize Diameters in Drilling

Drill Dia., Inch	Amount Oversize, Inch Average Max	Mean	Average Min.
1/16	.002	.0015	.001
1/8	.0045	.003	.001
1/4	.0065	.004	.002

Drill Dia., Inch	Amount Oversize, Inch Average Max	Mean	Average Min.
1/2	.008	.005	.002
3/4	.008	.005	.003
1	.004	.009	.007

Pitch Diameter Limits

Fractional and Machine Screw

All standard Ground Thread Taps will be marked with the letter G to designate Ground Thread. The letter G will be followed by the letter H to designate above basic (L below basic) and a numeral to designate the pitch diameter limits.

Example: G H3 indicates a Ground Thread Tap with pitch diameter limits .0010 to .0015 over basic

Pitch diameter limits for Taps to 1" diameter inclusive:

L1 = Basic to Basic minus .0005

H1 = Basic to Basic plus .0005

H2 = Basic plus .0005 to Basic plus .0010

H3 = Basic plus .0010 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

Pitch Diameter limits for Taps over 1" diameter to 1-1/2" diameter inclusive:

H4 = Basic plus .0010 to Basic plus .0020

Pitch Diameter limit numbers for taps not shown above or those over 1-1/2" diameter.

For taps with H or L limit numbers not shown above or over 1-1/2" diameter for example H12 or L10, the H or L limit number divided by 2 indicates in thousandths of an inch the amount the maximum tap pitch diameter is over basic in the H series or the amount the minimum tap pitch diameter is under basic on the L series.

Metric I.S.O

Where the tap pitch diameter is over or under basic thread pitch diameter by even multiples of .00052", the tap will be marked with the letter “D” or “DU” respectively, followed by a limit number. The limit number is determined as follows:

$$D \quad \text{Limit No.} = \frac{\text{Amt. Tap PD High Limit Is Over Basic PD}}{.00052"}$$

$$DU \quad \text{Limit No.} = \frac{\text{Amt. Tap PD Low Limit Is Under Basic PD}}{.00052"}$$

Examples:

M1.6 x .035 - for D3 limit, max. tap PD = basic plus .0015"
Tap PD tolerance = minus .0006"

M12 x 1.75-for D6 limit, max. tap PD = basic plus .0030"
Tap PD tolerance = minus .0012"

M39 x 4-for D10 limit, max. tap PD = basic plus .0050"
Tap PD tolerance = minus .0020"

M6 x 1-for DU 4 limit, min. tap PD = basic minus .0020"
Tap PD tolerance = plus .0010"

Metric taps will be marked with a capital M followed by the nominal size in millimeters and the pitch in millimeters separated by the sign “x.” For example, M1.6 x 0.35; M6 x 1; M10 x 1.5.

Specials

Special taps are to be marked with the nominal diameter and number of threads per inch and form of thread as specified by the purchaser on his order or blue print provided such specifications are reasonably correct.

Special Ground Thread taps made to the pitch diameter limits shown will also be marked with the corresponding limit number.

When taps are specified to be a certain amount oversize or undersized, it is standard practice to add or subtract this amount from the basic pitch diameter of the nominal size tap. This dimension then becomes the new minimum pitch diameter for the special tap to which Standard Tolerance for the nominal size is added.

Undersize or oversize taps will be marked with the nominal size and pitch, followed by the amount the minimum pitch diameter is over or under basic. For example, 1/2–13+.010".

Whenever possible, in the case of oversize, undersize, or other special taps, orders should specify the minimum and maximum tap pitch diameter desired.

Left hand taps will be marked “Left Hand” or “LH.”

Technical Section - Threading

The limits and tolerances of external threads for unified screws are designated by the letter ”A”, which results in class 1A, class 2A, and class 3A screws. The nut (internal thread) limits and tolerances are designated by the letter “B” resulting in class 1B, class 2B, and class 3B.

Tolerances: The tolerance of the tapped hole in the unified series is always 1.3 times the tolerance of the screw for the same class of fit. In the American National Standard, pitch diameter tolerances on both the nut and the screw were equal with the nut above basic and the screw below basic.

Class 1A and 1B: This class of fit is intended to cover the manufacture of threaded parts where quick and easy assembly is necessary or desired and an allowance is provided to permit ready assembly.

Class 2A and 2B: This class of fit is intended to cover screws, bolts and nuts, but it is also suitable for a variety of other applications. An allowance is provided to minimize galling and seizure in assembling and use. It will also accommodate limited amount of plating, coating or finish.

Class 3A and 3B: This class of fit is provided for those applications where closeness of fit, accuracy of lead and angle of thread is important. No allowance is provided and these threads are obtained consistently only by use of high quality production equipment and checked by a very efficient system of gaging and inspection.

Unified and American standard threads have substantially the same thread form. Threads of both standards are mechanically interchangeable. The main difference between the two standards are: Variation of tolerance with size, differences in amounts of pitch diameter tolerance for external and internal threads, and differences in thread designations.

Caution: Select the proper percent of thread for the material to be tapped.

Remember: As the drilled hole becomes smaller the amount of chips to be removed becomes so great that the friction generated may require as much power as does the actual cutting.

TABLE OVER TAP TOLERANCE VS TOLERANCE ON INTERNAL THREAD (NUT)

Tolerance class, Tap			Tolerance, Internal thread (Nut)					Application
ISO	DIN	ANSI BS						
ISO 1	4 H	3 B	4 H	5 H				Fit without allowance
ISO 2	6 H	2 B	4 G	5 G	6 H			Normal fit
ISO 3	6 G	1 B			6 G	7 H	8 H	Fit with large allowance
-	7 G	-				7 G	8 G	Loose fit for following treatement or coating

Thread tolerances for taps are collected in standard reference DIN 13.

Normal tolerance is ISO 2 (6H) on taps, which generates an average quality fit between screw and nut. Lower tolerance (ISO 1) generates a fine fit without a gap on the flanks between screw and nut. Higher tolerance (ISO 3) generates a rough fit, with large gap. It is used in the case of a nut which will later be coated or if a loose fit is preferred.

Between tolerances 6H (ISO2) and 6G (ISO3), as well as between 6G and 7G, the tap manufacturer produces taps with tolerance 6HX and 6GX. “X” means the tolerance is outside standard and it is used for taps working high strength material or abrasive material such as cast iron. These materials do not cause oversize problems, so higher tolerance can be used in order to increase tool life. The width of the tolerance is equal between, for example, 6H and 6HX.

Forming taps are usually produced with a 6HX or 6GX tolerance.

The tolerance icon for BSW and BSF is medium. This refers to BS 84 “medium fit”.

Pipe threads with the tolerance icon “Normal” refer to the following standards:

G threads to ISO 228-1. One class for internal thread (tap), and class A and B for external thread (die).
R, Rc and R threads to ISO 7-1.
NPT and NPSM to ANSI B1.20.1.
NPTF and NPSF to ANSI B1.20.3.
PG to DIN 40 430.

SELF-LOCKING THREAD FORM

Concept

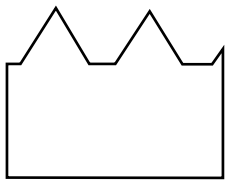
Designed to produce threads for self-locking operations and put a lock on fastener costs.

This is not to be confused as just another range of taps for a specific application. It is a thread form. Utilizing the latest generation CNC equipment this thread form can be produced on straight flute, spiral flute, spiral point, roll form and even the range of Applix high performance taps.

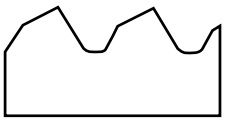
Although this is a made-to-order program, quantities of up to 48 pieces of any style would be delivered in no greater than 10 working days.

The relatively small quantities being produced and the additional thread grinding required does mean that taps featuring this thread form can be marginally more expensive than conventionally ground taps. Depending on the size, quantity, and/or the type of tool being compared, the additional cost will vary. However, before making a pure price decision we recommend a review of the added benefits of the concepts featured in this catalog and how they help in offsetting costs in other areas.

Self-Locking Threads and How They Work



Standard Thread Form



Self-Locking Thread Form

Taps ground to the adjacent self-locking thread form produce a highly efficient female thread form with a 30° inclined wedge that provides optimum locking contact with the crests of the male threads of a standard bolt or screw. The thread form produced is ideal for a wide variety of applications where vibration resistance is a must. Clamping forces are evenly distributed along the entire length of thread engagement providing a capability to resist the forces created by vibration that can loosen ordinary threaded fasteners. The end result is a standard male fastener locked firmly in place without having to resort to the use of costly adhesives, locking devices or inserts.

On the smaller diameters, <8-32 but including 8-36, because of their size, the taps are ground with a modified ramp form.



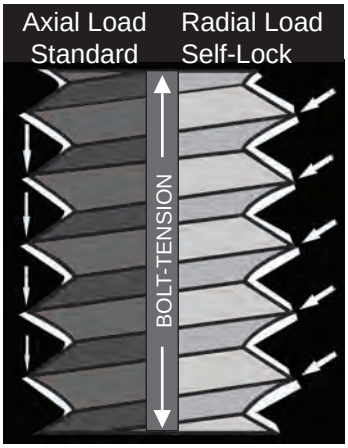
Key Features and Benefits

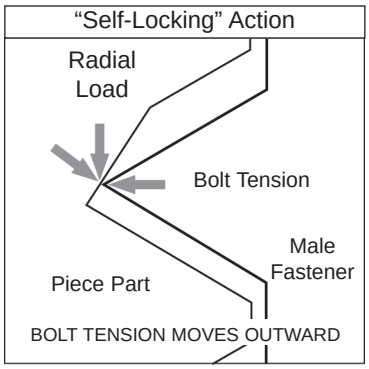
Improves Holding Power

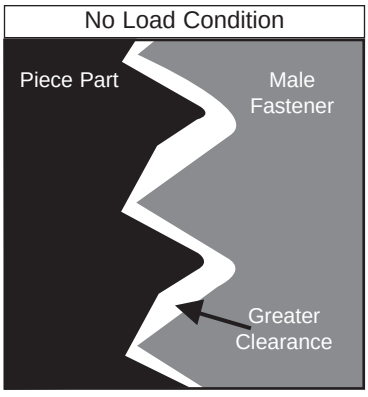
A 30° wedge lock on the female thread creates a continuous spiral contact along the entire thread length for improved holding power versus standard thread forms.

Clamp Load More Evenly Distributed

Clamp load forces are spread evenly across all threads versus conventional 60° thread forms that put the clamping force on the first few threads only with the other threads receiving limited or no contact at all.







Reduces Fastener Costs

Utilizing this thread form converts standard male fasteners into highly efficient self-locking ones and may eliminate the necessity for costly locking fasteners, chemical bonds, nylon plugs or other devices to maintain tightness.

Faster Assembly Operations

The larger tap drill size creates greater clearance with the male fastener than conventionally produced threads. In assembling fasteners produced with this thread form it is clearly noticeable that the fasteners turn more freely irrespective of whether by hand or utilizing assembly machinery. Assembly costs are lower and assembly related rejects are additionally reduced.

Holding Power that Lasts and Lasts

There is no loss of locking power in those applications requiring frequent loosening and tightening of the male fastener. This eliminates time intensive disassembly and assembly procedures. Conventional locking fasteners would be either destroyed or their locking power severely diminished.

Threading Solution for Soft Materials

The optimum load distribution provided by this thread form eliminates thread stripping that is typical with thread forms that concentrate clamping load on fewer threads. Ideal for aluminum and other lightweight, soft materials in applications where stripping is frequent.

Environmentally Friendly

Because the threads produced permit the male fastener to be locked in place by simply tightening, there is no necessity for bonding materials or chemical agents which eliminates the need for using potentially environmentally harmful products plus saving valuable time and cost.

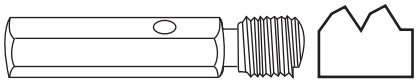
SELF-LOCKING THREAD FORM

Gaging for Self-Locking Threads

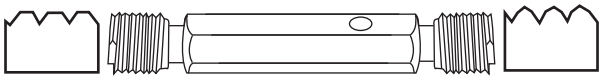
An essential element in high quality thread production is an accurate gaging capability. To facilitate the latter Precision offers a complete gaging system for self-locking threads, which consists
of the following:

LARGER DIAMETERS

Go-Pitch Diameter and Ramp Gage

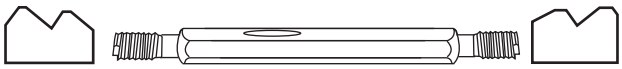


Hi-Pitch Diameter and Ramp Gage



SMALLER DIAMETERS

Go-Pitch Diameter and Ramp Gage Hi-Limit Gage

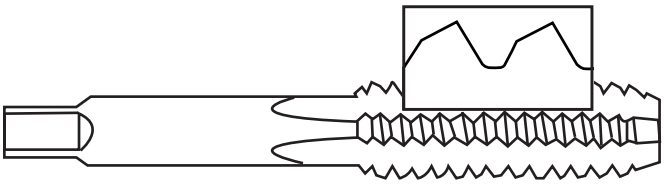


Precision certifies all new gages for self-locking threads to insure their functional accuracy. A certificate of compliance can be provided for a nominal charge. It is highly recommended that they be returned on a periodic basis for recertification.

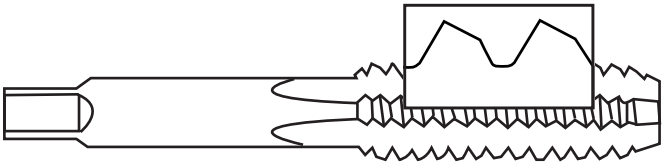
When placing your inquiry for a self-locking tap, simply advise the type of gage(s) you require and one consistent with whatever size is ordered will be quoted and supplied.

How to Order

Style ‘RW’



Style ‘LW’



Unless otherwise specified, the taps will be provided featuring a ramp angle in the direction detailed and referred to as style “RW.”

When tapping is to be effected from the opposite end of a through hole, the style “LW” must be special ordered. This style features the ramp angle in the opposite direction as detailed, and is generally used in the production of nuts.

There is no requirement to specify an H or D limit. Basically, one size fits all because contact is not made on the thread flanks but on the wedge ramp.

To place an order call or fax Customer Service at:
TEL: 1-800-877-3745 • FAX: 1-815-459-2804

Simply identify the following:
–The List No. or description of the standard tap.
–The size, number of flutes and chamfer requirements.
–The ramp style (RW or LW).

Should a gage be required, simply indicate the type when placing the order.

Technical Section - Threading

TAP DRILL SIZES FOR UNIVERSAL AND M-PROFILE SCREW THREADS

Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percent of Thread	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable % of Thread (inches)
0-80	56	.0465	83	.0015	.0480	74
—	3/64	.0469	81	.0015	.0484	71
—	1.20mm	.0472	79	.0015	.0487	69
—	1.25mm	.0492	67	.0015	.0507	57
1-64	54	.0550	89	.0015	.0565	81
—	1.45mm	.0571	78	.0015	.0586	71
—	53	.0595	67	.0015	.0610	59
1-72	1.5mm	.0591	77	.0015	.0606	68
—	53	.0595	75	.0015	.0610	67
—	1.55mm	.0610	67	.0015	.0606	68
2-56	51	.0670	82	.0017	.0687	74
—	1.75mm	.0689	73	.0017	.0706	66
—	50	.0700	69	.0017	.0717	62
—	1.80mm	.0709	65	.0017	.0726	58
2-64	50	.0700	79	.0017	.0717	70
—	1.80mm	.0709	74	.0017	.0726	66
—	49	.0730	64	.0017	.0747	56
3-48	48	.0760	85	.0019	.0779	78
—	5/64	.0781	77	.0019	.0800	70
—	47	.0785	76	.0019	.0804	69
—	2.00mm	.0787	75	.0019	.0806	68
—	46	.0810	67	.0019	.0829	60
—	45	.0820	63	.0019	.0839	56
3-56	46	.0810	78	.0019	.0829	69
—	45	.0820	73	.0019	.0839	65
—	2.10mm	.0827	70	.0019	.0846	62
—	2.15mm	.0846	62	.0019	.0865	54
4-40	44	.0860	80	.0020	.0880	74
—	2.20mm	.0866	78	.0020	.0886	72
—	43	.0890	71	.0020	.0910	65
—	2.30mm	.0906	66	.0020	.0926	60
4-48	2.35mm	.0925	72	.0020	.0926	72
—	42	.0935	68	.0020	.0955	61
—	3/32	.0938	68	.0020	.0958	60
—	2.40mm	.0945	65	.0020	.0965	57
5-40	40	.0980	83	.0023	.1003	76
—	39	.0995	79	.0023	.1018	71
—	38	.1015	72	.0023	.1038	65
—	2.60mm	.1024	70	.0023	.1047	63
5-44	38	.1015	79	.0023	.1038	72
—	2.60mm	.1024	77	.0023	.1047	69
—	37	.1040	71	.0023	.1063	63
6-32	37	.1040	84	.0023	.1063	78
—	36	.1065	78	.0023	.1088	72
—	7/64	.1094	70	.0026	.1120	64
—	35	.1100	69	.0026	.1126	63
—	34	.1100	67	.0026	.1136	60
6-40	34	.1110	83	.0026	.1136	75
—	33	.1130	77	.0026	.1156	69
—	2.90mm	.1142	73	.0026	.1168	65
—	32	.1160	68	.0026	.1186	60
8-32	3.40mm	.1339	74	.0029	.1368	67
—	29	.1360	69	.0029	.1389	62

Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percent of Thread	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable % of Thread (inches)
8-36	29	.1360	78	.0029	.1389	70
—	3.5mm	.1378	72	.0029	.1407	65
10-24	27	.1440	85	.0032	.1472	79
—	3.70mm	.1457	82	.0032	.1489	76
—	26	.1470	79	.0032	.1502	74
—	25	.1495	75	.0032	.1527	69
—	24	.1520	70	.0032	.1552	64
10-32	5/32	.1563	83	.0032	.1595	75
—	22	.1570	81	.0032	.1602	73
—	21	.1590	76	.0032	.1622	68
12-24	11/64	.1719	82	.0035	.1754	75
—	17	.1730	79	.0035	.1765	73
—	16	.1770	72	.0035	.1805	66
12-28	16	.1770	84	.0035	.1805	77
—	15	.1800	78	.0035	.1835	70
—	4.60mm	.1811	75	.0035	.1846	67
—	14	.1820	73	.0035	.1855	66
1/4-20	9	.1960	83	.0038	.1998	77
—	8	.1990	79	.0038	.2028	73
—	7	.2010	75	.0038	.2048	70
—	13/64	.2031	72	.0038	.2069	66
1/4-28	5.40mm	.2126	81	.0038	.2164	72
—	3	.2130	80	.0038	.2168	72
5/16-18	F	.2570	77	.0038	.2608	72
—	6.60mm	.2598	73	.0038	.2636	68
—	G	.2610	71	.0041	.2651	66
5/16-24	H	.2660	86	.0041	.2701	78
—	6.80mm	.2677	83	.0041	.2718	75
—	I	.2720	75	.0041	.2761	67
3/8-16	7.80mm	.3071	84	.0044	.3115	78
—	7.90mm	.3110	79	.0044	.3154	73
—	5/16	.3125	77	.0044	.3169	72
—	O	.3160	73	.0044	.3204	68
3/8-24	21/64	.3281	87	.0044	.3325	79
—	8.40mm	.3307	82	.0044	.3351	74
—	Q	.3320	79	.0044	.3364	71
—	8.50mm	.3346	75	.0044	.3390	67
7/16-14	T	.3580	86	.0046	.3626	81
—	23/64	.3594	84	.0046	.3640	79
—	9.20mm	.3622	81	.0046	.3668	76
—	9.30mm	.3661	77	.0046	.3707	72
—	U	.3680	75	.0046	.3726	70
—	9.40mm	.3701	73	.0046	.3747	68
7/16-20	W	.3860	79	.0046	.3906	72
—	25/64	.3906	72	.0046	.3952	65
1/2-13	10.50mm	.4134	87	.0047	.4181	82
—	27/64	.4219	78	.0047	.4266	73
1/2-20	29/64	.4531	72	.0047	.4578	65

TAP DRILL SIZES FOR METRIC M-PROFILE SCREW THREADS

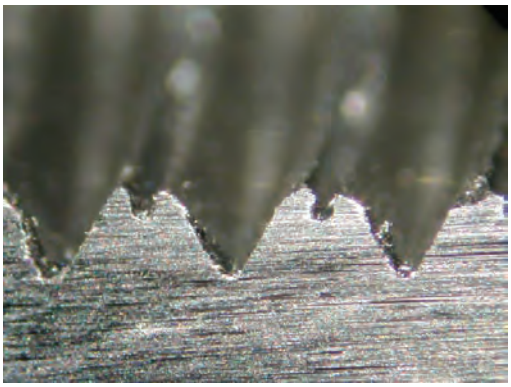
Metric of Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theoretical Percent of Thread	Probable Mean Oversize	Probable Hole Size	Probable Percent Thread
M1.6 x 0.35	1.20mm	.0472	88	.0014	.0486	80
—	1.25mm	.0492	77	.0014	.0506	69
M2 x 0.4	1/16	.0625	79	.0015	.0640	72
—	1.60mm	.0630	77	.0017	.0647	69
—	52	.0635	74	.0017	.0652	66
M2.5 x 0.45	2.05mm	.0807	77	.0019	.0826	69
—	46	.0810	76	.0019	.0829	67
—	45	.0820	71	.0019	.0839	63
M3 x 0.5	40	.0980	79	.0023	.1003	70
—	2.5mm	.0984	77	.0023	.1007	68
—	39	.0995	73	.0023	.1018	64
M3.5 x 0.6	33	.1130	81	.0026	.1156	72
—	2.9mm	.1142	77	.0026	.1168	68
—	32	.1160	71	.0026	.1186	63
M4 x 0.7	3.2mm	.1260	88	.0029	.1289	80
—	30	.1285	81	.0029	.1314	73
—	3.3mm	.1299	77	.0029	.1328	69
M4.5 x 0.75	3.7mm	.1457	82	.0032	.1489	74
—	26	.1470	79	.0032	.1502	70
—	25	.1495	72	.0032	.1527	64

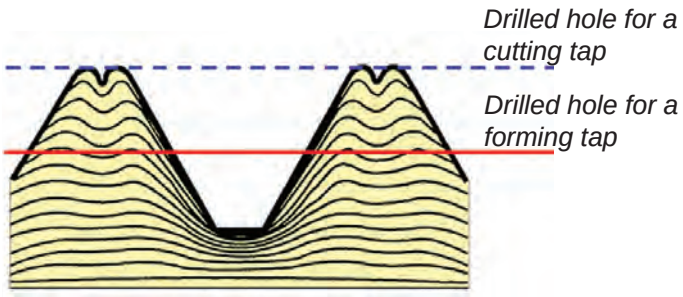
Metric of Tap	Tap Drill	Decimal Equiv. of Tap Drill	Theoretical Percent of Thread	Probable Mean Oversize	Probable Hole Size	Probable Percent Thread
M5 x 0.8	4.2mm	.1654	77	.0032	.1686	69
—	19	.1660	75	.0032	.1692	68
M6 x 1	10	.1935	84	.0038	.1973	76
—	9	.1960	79	.0038	.1998	71
—	5mm	.1969	77	.0038	.2006	70
—	8	.1990	73	.0038	.2028	65
M7 x 1	A	.2340	81	.0038	.2378	74
—	6mm	.2362	77	.0038	.2400	70
—	B	.2380	74	.0038	.2418	66
M8 x 1.25	6.7mm	.2638	80	.0041	.2679	74
—	17/64	.2656	77	.0041	.2697	71
—	H	.2660	77	.0041	.2701	70
—	6.8mm	.2677	74	.0041	.2718	68
M10 x 1.5	8.4mm	.3307	82		.0044	.3351
—	Q	.3320	80	.0044	.3364	75
—	8.5mm	.3346	77	.0044	.3390	71
M12 x 1.5	10.4mm	.4094	81		.0047	.4141
—	Z	.4130	77	.0047	.4177	71
M12 x 1.75	10.20mm	.4016	79		.0047	.4063
—	Y	.4040	76	.0047	.4087	71
—	13/32	.4062	74	.0047	.4109	69

Note: "Probable Hole Size" columns listed above apply to HSS/HSCo Drills ONLY. When using Solid Carbide Drills as Tap-Drills you must ADD the average Oversize amount per diameter to the size listed in these "Probable Hole Size" columns.

Flow Of Material When Forming A Thread

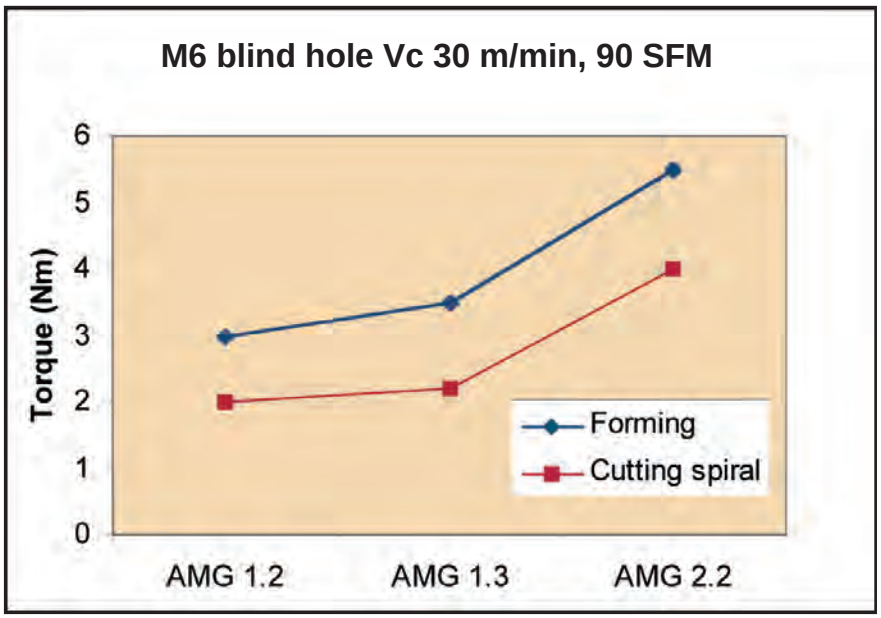
The tapping hole size depends upon the material being drilled, the cutting conditions selected and the condition of the equipment being used. If material is pushed up at the thread entry by the tap and/or the life of the tap is too short, select a slightly larger drill diameter. If on the other hand the profile of the thread formed is insufficient, then select a slightly smaller drill diameter.





Section of thread obtained by forming tap on steel C45

Cold forming taps require more power on the spindle, compared to a cutting tap of the same size, since it generates higher torque.



Torque comparison between forming and cutting taps in different material groups.

Technical Section - Threading

Note: Recommended thread percentage for various (Inch standard) tap sizes is shown in the “60% Thread “ columns below. This is also the average percentage that is desirable for metric sizes. Use the “Probable Percent of Thread” column in the “Metric Sizes” tables below.

TAP DRILL SIZES FOR FORMING TAPS

Machine Screw Sizes

Tap Size	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread		50% Thread	
	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size
0-80	0.0536	1.35mm	0.0540	1.35mm	0.0545	—	0.0549	54	0.0554	54	0.0558	1.0mm
1-64	0.0650	1.65mm	0.0655	1.65mm	0.0661	—	0.0666	—	0.0672	51	0.0677	51
1-72	0.0659	1.65mm	0.0663	—	0.0669	1.7mm	0.0673	51	0.0679	51	0.0683	—
2-56	0.0769	1.95mm	0.0774	1.95mm	0.0781	23498	0.0787	47	0.0794	2.0mm	0.0799	—
2-64	0.0780	5/64	0.0785	47	0.0791	2.0mm	0.0796	2.0mm	0.0802	—	0.0807	2.05mm
3-48	0.0884	2.25mm	0.0890	43	0.0898	43	0.0905	2.3mm	0.0913	2.3mm	0.0919	—
3-56	0.0899	43	0.0904	—	0.0911	2.3mm	0.0917	2.3mm	0.0924	2.35mm	0.0929	2.35mm
4-40	0.0993	2.5mm	0.1000	39	0.1010	39	0.1018	38	0.1028	2.6mm	0.1035	2.6mm
4-48	0.1014	38	0.1020	38	0.1028	2.6mm	0.1035	2.6mm	0.1043	37	0.1049	37
5-40	0.1123	34	0.1130	33	0.1140	33	0.1148	2.9mm	0.1158	32	0.1165	32
5-44	0.1134	33	0.1141	2.9mm	0.1150	2.9mm	0.1157	—	0.1166	32	0.1173	32
6-32	0.1221	3.1mm	0.1230	3.1mm	0.1243	—	0.1252	40916	0.1264	3.2mm	0.1274	—
6-40	0.1253	1/8	0.1260	3.2mm	0.1270	3.2mm	0.1278	3.25mm	0.1288	30	0.1295	30
8-32	0.1481	3.75mm	0.1490	—	0.1503	25	0.1512	3.8mm	0.1524	24	0.1534	3.9mm
8-36	0.1498	25	0.1507	3.8mm	0.1518	24	0.1526	24	0.1537	3.9mm	0.1546	23
10-24	0.1688	—	0.1700	18	0.1717	23682	0.1729	23682	0.1746	—	0.1758	—
10-32	0.1741	17	0.1750	—	0.1763	—	0.1772	16	0.1784	4.5mm	0.1794	—
12-24	0.1948	10	0.1960	9	0.1977	5.0mm	0.1989	8	0.2006	5.1mm	0.2018	7
12-28	0.1978	5.0mm	0.1989	8	0.2003	8	0.2014	7	0.2028	—	0.2039	13/64

Fractional Sizes

Tap Size	75% Thread		70% Thread		65% Thread		60% Thread		55% Thread		50% Thread	
	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size	Theor. Hole Size	Nearest Drill Size
1/4-20	.2245	5.7mm	.2260	—	.2280	1	.2295	1	.2315	—	.2330	5.9mm
1/4-28	.2318	—	.2329	5.9mm	.2343	A	.2354	15/64	.2368	6.0mm	.2379	B
5/16-18	0.2842	7.2mm	.2861	7.25mm	.2879	7.3mm	.2898	L	.2917	7.4mm	.2936	—
5/16-24	0.2912	7.4mm	.2927	—	.2941	M	.2955	7.5mm	.2969	19/64	.2983	7.6mm
3/8-16	.3431	11/32	.3452	8.75mm	.3474	S	.3495	8.9mm	.3516	—	.3537	9.0mm
3/8-24	.3537	9.0mm	.3552	9.0mm	.3566	—	.3580	T	.3594	23/64	.3608	—
7/16-14	.4011	—	.4035	Y	.4059	13/32	.4084	—	.4108	—	.4132	Z
7/16-20	0.4120	Z	.4137	10.5mm	.4154	—	.4171	—	.4188	—	.4205	—
1/2-13	.4608	—	.4634	—	.4660	—	.4686	15/32	.4712	12mm	.4738	12mm
1/2-20	.4745	—	.4762	—	.4779	—	.4796	—	.4813	—	.4830	31/64

Metric Sizes

Metric Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percentage of thread %	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable Percent of Thread %
M3 x0.5	36	0.1065	86	.0026	.1091	67
—	2.7mm	0.1062	88	.0026	.1088	70
M4 x 0.7	27	0.1440	72	.0032	.1472	54
—	3.6mm	.1417	84	.0032	.1449	67
—	9/64	.1406	90	.0032	.1438	73
M5 x 0.8	14	0.1820	69	.0035	.1855	53
—	4.6mm	.1811	74	.0035	.1846	57
—	15	.1800	79	.0035	.1835	62
—	16	0.1770	92	.0035	.1805	76
M6 x 1	7/32	.2188	65	.0038	.2226	51
—	5.4mm	.2126	88	.0038	.2164	74

Metric Tap Size	Tap Drill Size	Decimal Equiv. of Tap Drill (inches)	Theoretical Percentage of thread %	Probable Mean Oversize (inches)	Probable Hole Size (inches)	Probable Percent of Thread %
M8 x 1.25	7.4mm	0.2910	71	.0042	.2952	59
—	L	0.2900	75	.0042	.2942	62
—	7.3mm	.2874	82	.0042	.2916	70
M10 x 1.5	U	0.3680	64	.0046	.3726	53
—	9.3mm	0.3660	69	.0046	.3706	58
—	9.2mm	0.3620	78	.0046	.3666	67
—	23/64	.3594	85	.0046	.3640	74
M12 x 1.5	11.3mm	.4449	70	.0047	.4496	57
—	7/16	.4375	86	.0047	.4422	75
M12 x 1.75	7/16	.4375	75	.0047	.4422	65
—	11mm	.4331	84	.0047	.4378	73

*Probable percent of full thread produced in tapped hole using standard drill sizes.

Tap Projection and Hole Size for Pipe Taps

Nominal Size	Tap Thread Limits L_2	L_2 Tolerance	Taper Per Ft. Limits Min.	Taper Per Ft. Limits Max.	Projection NPT & NPTF Min.	Projection NPT & NPTF Max.	Projection SAE - Short Min.	Projection SAE - Short Max.	Ream Dia. Large End	Gage Width L_1	L_3	A	Tap Drill Size B	Tap Drill Size BB
1/16 - 27	0.3120	±1/16	23/32	25/32	.250	0.3750	.222	.259	.2515	0.1600	.1111	.2711	15/64	C
1/8 - 27	0.3120	±1/16	23/32	25/32	.250	.375	.222	.259	.3440	0.1615	.1111	.2726	21/64	Q
1/4 - 18	0.4590	±1/16	23/32	25/32	.397	0.5210	.333	.389	.4472	0.2278	.1667	.3945	27/64	7/16
3/8 - 18	0.4540	±1/16	23/32	25/32	.392	.516	.333	0.3890	.5826	0.2400	.1667	.4067	9/16	9/16
1/2 - 14	0.5790	±1/16	23/32	25/32	.517	.641	.429	0.5000	.7213	0.3200	.2143	.5343	11/16	45/64
3/4 - 14	0.5650	±1/16	23/32	25/32	.503	0.6270	.429	.500	.9317	0.3390	.2143	.5533	57/64	29/32
1 - 11-1/2	0.6780	±3/32	23/32	25/32	.584	.772	—	—	1.1691	0.4000	.2609	.6609	1-1/8	1-9/64
1-1/4 - 11-1/2	0.6860	±3/32	23/32	25/32	.592	0.7800	—	—	1.5138	0.4200	.2609	.6809	1-15/32	1-31/64
1-1/2 - 11-1/2	0.6990	±3/32	23/32	25/32	.606	0.7920	—	—	1.7528	0.4200	.2609	.6809	1-45/64	1-23/32
2 - 11-1/2	0.6670	±3/32	23/32	25/32	.574	.760	—	—	2.2267	0.4360	.2609	.6909	2-11/64	2-3/16

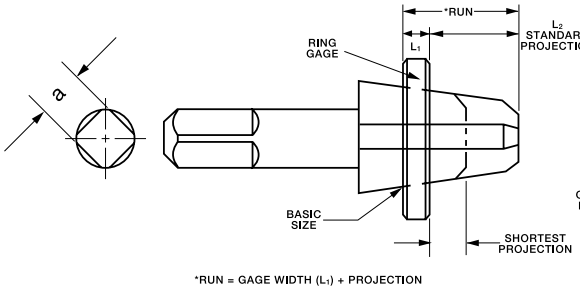
TOLERANCES

Ground Thread = A maximum lead deviation of plus or minus .0005" within any two threads no further apart than 1" is permitted.

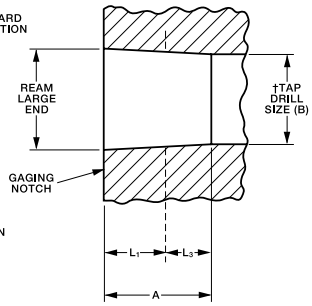
Threads per inch	Angle Tolerance
	Half Angle
	Ground Thread
8	25' Plus or Minus
11-1/2 to 27 inclusive	30' Plus or minus

*Distance small end of tap projects through L_1 Taper Thread Ring Gage.
**Recommended sizes given permit direct tapping without reaming the hole, but only give a full thread for approx. L_1 distance.
***TAP DRILL SIZE (B) is size for use with a taper reamer. The tap drill size for use without a taper reamer is shown in column BB

Projection thru ring gauge



Reamed hole data



Recommended Minor Diameters and Tap Drills for STI Spiral Point and Hand Taps

Nominal Diameter	T.R.I. UNC	T.R.I. UNF	Aluminum Diameter of Tapped Holes Min.	Aluminum Diameter of Tapped Holes Max.	Aluminum Recommended Minor/ Drill Size Tap Drill Size	Aluminum Recommended Minor/ Drill Size Dec Eq.	Plastic - Steel - Magnesium Diameter of Tapped Holes Min.	Plastic - Steel - Magnesium Diameter of Tapped Holes Max.	Plastic - Steel - Magnesium Recommended Minor/ Drill Size Tap Drill Size	Plastic - Steel - Magnesium Recommended Minor/ Drill Size Dec. Eq
4	40	—	.1160	.1210	31	.1200	.1190	.1240	31	.1200
6	32	—	.1440	.1500	26	.1470	.1480	.1540	25	.1495
8	32	—	.1700	.1760	17	.1730	.1740	.1800	16	.1770
10	24	—	.1990	.2050	13/64	.2031	.2030	.2090	5	.2055
10	—	32	.1960	.2020	7	.2010	.2000	.2060	13/64	.2031
1/4	20	—	.2610	.2670	H	.2660	.2650	.2710	H	.2660
1/4	—	28	.2570	.2640	G	.2610	.2610	.2680	6.7MM	.2638
5/16	18	—	.3280	.3340	Q	.3320	.3310	.3370	Q	.3320
5/16	—	24	.3230	.3300	21/64	.3281	.3270	.3340	21/64	.3281
3/8	16	—	.3900	.3980	X	.3970	.3960	.4020	X	.3970
3/8	—	24	.3850	.3920	25/64	.3906	.3890	.3960	25/64	.3906
7/16	14	—	.4530	.4630	29/64	.4531	.4610	.4710	29/64	.4531
7/16	—	20	.4500	.4580	29/64	.4531	.4530	.4610	29/64	.4531
1/2	13	—	.5150	.5250	33/64	.5156	.5230	.5330	17/64	.5312
1/2	—	20	.5130	.5220	33/64	.5156	.5150	.5240	17/64	.5312

Tap Size Recommendations for Classes 2B and 3B

Machine Screw Sizes

Size	Threads Per Inch NC	Threads Per Inch NF	Recommended Tap for Class of Thread Class 2B	Recommended Tap for Class of Thread Class 3B	Pitch Diameter Limits for Class of Thread Min. All Classes (Basic)	Pitch Diameter Limits for Class of Thread Max Class 2B	Pitch Diameter Limits for Class of Thread Max Class 3B
0	—	80	H2	H1	.0519	.0542	.0536
1	64	—	H2	H1	.0629	.0655	.0648
1	—	72	H2	H1	.0640	.0665	.0659
2	56	—	H2	H1	.0744	.0772	.0765
2	—	64	H2	H1	.0759	.0786	.0779
3	48	—	H2	H1	.0855	.0885	.0877
3	—	56	H2	H1	.0874	.0902	.0895
4	40	—	H2	H2	.0958	.0991	.0982
4	—	48	H2	H1	.0985	.1016	.1008
5	40	—	H2	H2	.1088	.1121	.1113
5	—	44	H2	H1	.1102	.1134	.1126
6	32	—	H3	H2	.1177	.1214	.1204
6	—	40	H2	H2	.1218	.1252	.1243
8	32	—	H3	H2	.1437	.1475	.1465
8	—	36	H2	H2	.1460	.1496	.1487
10	24	—	H3	H3	.1629	.1672	.1661
10	—	32	H3	H2	.1697	.1736	.1726
12	24	—	H3	H3	.1889	.1933	.1922
12	—	28	H3	H3	.1928	.1970	.1959

Fractional Sizes

Size	Threads Per Inch NC	Threads Per Inch NF	Recommended Tap For Class of Thread Class 2B	Recommended Tap For Class of Thread Class 3B	Pitch Diameter Limits For Class of Thread Min. All Classes (Basic)	Pitch Diameter Limits For Class of Thread Max Class 2B	Pitch Diameter Limits For Class of Thread Max Class 3B
1/4	20	—	H5	H3	.2175	.2223	.2211
1/4	—	28	*H4	H3	.2268	.2311	.2300
5/16	18	—	H5	H3	.2764	.2817	.2803
5/16	—	24	*H4	H3	.2854	.2902	.2890
3/8	16	—	H5	H3	.3344	.3401	.3387
3/8	—	24	*H4	H3	.3479	.3528	.3516
7/16	14	—	H5	H3	.3911	.3972	.3957
7/16	—	20	H5	H3	.4050	.4104	.4091
1/2	13	—	H5	H3	.4500	.4565	.4548
1/2	—	20	H5	H3	.4675	.4731	.4717
9/16	12	—	H5	H3	.5084	.5152	.5135
9/16	—	18	H5	H3	.5264	.5323	.5308
5/8	11	—	H5	H3	.5660	.5732	.5714
5/8	—	18	H5	H3	.5889	.5949	.5934
3/4	10	—	H5	H5	.6850	.6927	.6907
3/4	—	16	H5	H3	.7094	.7159	.7143
7/8	9	—	H6	H4	.8028	.8110	.8089
7/8	—	14	H6	H4	.8286	.8356	.8339
1	8	—	H6	H4	.9188	.9276	.9254
1	—	12	H6	H4	.9459	.9535	.9516

* Note: In cast iron applications we recommend style 1600 (H5 limit) for class 2B fit.

Metric Sizes for Class 6H

Thread Size Nominal Dia. (mm)	Thread Size Pitch (mm)	Internal Thread-Class 6H (Inches) Minor Dia. Min.	Minor Dia. Max.	Pitch Dia. Min.	Pitch Dia. Max.	Recommended Tap Major Dia.	Tap Size	Limit Number
1.6	0.35	.0481	.0520	.0541	.0574	.0630	M1.6 x 0.35	D-3
2	0.4	.0617	.0661	.0686	.0720	.0788	M2 x 0.4	D-3
2.5	0.45	.0793	.0841	.0870	.0906	.0985	M2.5 x 0.45	D-3
3	0.5	.0969	.1023	.1054	.1092	.1182	M3 x 0.5	D-3
3.5	0.6	.1123	.1185	.1225	.1268	.1378	M3.5 x 0.6	D-4
4	0.7	.1277	.1347	.1396	.1442	.1575	M4 x 0.7	D-4
4.5	0.75	.1452	.1526	.1580	.1626	.1772	M4.5 x 0.75	D-4
5	0.8	.1628	.1706	.1764	.1812	.1969	M5 x 0.8	D-4
6	1.0	.1936	.2028	.2107	.2165	.2363	M6 x 1	D-5
7	1.0	.2330	.2422	.2500	.2559	.2756	M7 x 1	D-5
8	1.25	.2617	.2721	.2830	.2892	.3150	M8 x 1.25	D-5
10	1.5	.3298	.3415	.3554	.3624	.3937	M10 x 1.5	D-6
12	1.75	.3979	.4110	.4277	.4355	.4725	M12 x 1.75	D-6
14	2.0	.4660	.4807	.5001	.5083	.5512	M14 x 2	D-7
16	2.0	.5447	.5594	.5788	.5871	.6300	M16 x 2	D-7
20	2.5	.6809	.6985	.7235	.7322	.7875	M20 x 2.5	D-7
24	3.0	.8171	.8366	.8682	.8785	.9449	M24 x 3	D-8
30	3.5	1.0320	1.0539	1.0917	1.1026	1.1812	M30 x 3.5	D-9
36	4.0	1.2469	1.2704	1.3151	1.3268	1.4174	M36 x 4	D-9

Forming Type Taps Machine Screw and Fractional Sizes

Tap Size UNC-NF	Basic P.D.	Tap Recommendations For Class 2B Fit Styles	Tap Recommendations For Class 2B Fit Max. PD. Thread	Tap Recommendations For Class 3B Fit Styles	Tap Recommendations For Class 3B Fit Max. PD. Thread	Oversize Forming Taps Styles	Oversize Forming Taps Max. PD. Thread
0-80	.0519	—	—	H-2	.0536	—	—
1-64	.0629	—	—	H-2	.0648	—	—
1-72	.0640	—	—	H-2	.0659	—	—
2-56	.0744	H-3	.0772	H-2	.0765	—	—
2-64	.0759	H-3	.0786	H-2	.0779	—	—
3-48	.0855	H-3	.0885	H-2	.0877	—	—
3-56	.0874	H-3	.0902	H-2	.0895	—	—
4-40	.0958	H-5	.0991	H-3	.0982	—	—
4-48	.0985	H-5	.1016	H-3	.1008	—	—
5-40	.1088	H-5	.1121	H-3	.1113	—	—
5-44	.1102	H-5	.1134	H-3	.1126	—	—
6-32	.1177	H-5	.1214	H-3	.1204	—	—
6-40	.1218	H-5	.1252	H-3	.1243	—	—
8-32	.1437	H-5	.1475	H-3	.1465	—	—
8-36	.1460	H-5	.1496	H-3	.1487	—	—

Tap Size UNC-NF	Basic P.D.	Tap Recommendations For Class 2B Fit Styles	Tap Recommendations For Class 2B Fit Max. PD. Thread	Tap Recommendations For Class 3B Fit Styles	Tap Recommendations For Class 3B Fit Max. PD. Thread	Oversize Forming Taps Styles	Oversize Forming Taps Max. PD. Thread
10-24	.1629	H-6	.1672	H-4	.1661	—	—
10-32	.1697	H-6	.1736	H-4	.1762	—	—
12-24	.1889	H-6	.1933	H-4	.1922	—	—
12-2 8	.1928	H-6	.1970	H-4	.1959	—	—
1/4-20	.2175	H-6	.2223	H-4	.2211	H-8	.2215
1/4-28	.2268	H-6	.2311	H-4	.2300	H-8	.2308
5/16-18	.2764	H-7	.2817	H-5	.2803	H-9	.2809
5/16-24	.2854	H-7	.2902	H-5	.2890	H-9	.2899
3/8-16	.3344	H-7	.3401	H-5	.3387	H-9	.3389
3/8-24	.3479	H-7	.3528	H-5	.3516	H-9	.3524
7/16-14	.3911	H-8	.3972	H-5	.3957	—	—
7/16-20	.4050	H-8	.4104	H-5	.4091	—	—
1/2-13	.4500	H-8	.4565	H-5	.4548	H-10	.4550
1/2-20	.4675	H-8	.4731	H-5	.4717	H-10	.4725

UNIFIED SCREW THREAD LIMITS

Diameter - Pitch Combinations for Class of Fit

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
0–80 UNF	2B	.0465	.0514	.0519	.0542	.0600
—	3B	.0465	.0514	.0519	.0536	.0600
1–64 UNC	2B	.0561	.0623	.0629	.0655	.0730
—	3B	.0561	.0623	.0629	.0648	.0730
1–72 UNF	2B	.0580	.0635	.0640	.0665	.0730
—	3B	.0580	.0635	.0640	.0659	.0730
2–56 UNC	2B	.0667	.0737	.0744	.0772	.0860
—	3B	.0667	.0737	.0744	.0765	.0860
2–64 UNF	2B	.0691	.0753	.0759	.0786	.0860
—	3B	.0691	.0753	.0759	.0779	.0860
3–48 UNC	2B	.0764	.0845	.0855	.0885	.0990
—	3B	.0764	.0845	.0855	.0877	.0990
3–56 UNF	2B	.0797	.0865	.0874	.0902	.0990
—	3B	.0797	.0865	.0874	.0895	.0990
4–40 UNC	2B	.0849	.0939	.0958	.0991	.1120
—	3B	.0849	.0939	.0958	.0982	.1120
4–48 UNF	2B	.0894	.0968	.0985	.1016	.1120
—	3B	.0894	.0968	.0985	.1008	.1120
5–40 UNC	2B	.0979	.1062	.1088	.1121	.1250

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
—	3B	.0979	.1062	.1088	.1113	.1250
5–44 UNF	2B	.1004	.1079	.1102	.1134	.1250
—	3B	.1004	.1079	.1102	.1126	.1250
6–32 UNC	2B	.1040	.1140	.1177	.1214	.1380
—	3B	.1040	.1140	.1177	.1204	.1380
6–40 UNF	2B	.1110	.1190	.1218	.1252	.1380
—	3B	.1110	.1186	.1218	.1243	.1380
8–32 UNC	2B	.1300	.1390	.1437	.1475	.1640
—	3B	.1300	.1389	.1437	.1465	.1640
8–36 UNF	2B	.1340	.1420	.1460	.1496	.1640
—	3B	.1340	.1416	.1460	.1487	.1640
10–24 UNC	2B	.1450	.1560	.1629	.1672	.1900
—	3B	.1450	.1555	.1629	.1661	.1900
10–32 UNF	2B	.1560	.1640	.1697	.1736	.1900
—	3B	.1560	.1641	.1697	.1726	.1900
12–24 UNC	2B	.1710	.1810	.1889	.1933	.2160
—	3B	.1710	.1807	.1889	.1922	.2160
12–28 UNF	2B	.1770	.1860	.1928	.1970	.2160
—	3B	.1770	.1857	.1928	.1959	.2160

Fractional Sizes

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
1/4–20 UNC	1B	.1960	.2070	.2175	.2248	.2500
—	2B	.1960	.2070	.2175	.2224	.2500
—	3B	.1960	.2067	.2175	.2211	.2500
1/4–28 UNF	1B	.2110	.2200	.2268	.2333	.2500
—	2B	.2110	.2200	.2268	.2311	.2500
—	3B	.2110	.2190	.2268	.2300	.2500
5/16–18 UNC	1B	.2520	.2650	.2764	.2843	.3125
—	2B	.2520	.2650	.2764	.2817	.3125
—	3B	.2520	.2630	.2764	.2803	.3125
5/16–24 UNF	1B	.2670	.2770	.2854	.2925	.3125
—	2B	.2670	.2770	.2854	.2902	.3125
—	3B	.2670	.2754	.2854	.2890	.3125
3/8–16 UNC	1B	.3070	.3210	.3344	.3429	.3750
—	2B	.3070	.3210	.3344	.3401	.3750
—	3B	.3070	.3182	.3344	.3387	.3750

Nominal Size Threads Per Inch and Series Designation	Class	Internal				
		Minor Diameter		Pitch Diameter		Major Diameter Min.
		Min.	Max.	Min.	Max.	
3/8–24 UNF	1B	.3300	.3400	.3479	.3553	.3750
—	2B	.3300	.3400	.3479	.3528	.3750
—	3B	.3300	.3372	.3479	.3516	.3750
7/16–14 UNC	1B	.3600	.3760	.3911	.4003	.4375
—	2B	.3600	.3760	.3911	.3972	.4375
—	3B	.3600	.3717	.3911	.3957	.4375
7/16–20 UNF	1B	.3830	.3950	.4050	.4131	.4375
—	2B	.3830	.3950	.4050	.4104	.4375
—	3B	.3830	.3916	.4050	.4091	.4375
1/2–13 UNC	1B	.4170	.4340	.4500	.4597	.5000
—	2B	.4170	.4340	.4500	.4565	.5000
—	3B	.4170	.4284	.4500	.4548	.5000
1/2–20 UNF	1B	.4460	.4570	.4675	.4759	.5000
—	2B	.4460	.4570	.4675	.4731	.5000
—	3B	.4460	.4537	.4675	.4717	.5000

Metric Sizes (ANSA B1.13M-1983) All dimensions are in millimeters.

Basic Thread Discription	Tol. Class	Minor Diameter		Pitch Diameter			Major Diameter Min.	
		Min.	Max.	Min.	Max.	Tol.	Min.	Max.
M1.6 x 0.35	6H	1.221	1.321	1.373	1.458	.085	1.600	1.736
M2 x 0.4	6H	1.567	1.679	1.740	1.830	.090	2.000	2.148
M2.5 x 0.45	6H	2.013	2.138	2.208	2.303	.095	2.500	2.660
M3 x 0.5	6H	2.459	2.599	2.675	2.775	.100	3.000	3.172
M3.5 x 0.6	6H	2.850	3.010	3.110	3.222	.112	3.500	3.699
M4 x 0.7	6H	3.242	3.422	3.545	3.663	.118	4.000	4.219
M5 x 0.8	6H	4.134	4.334	4.480	4.605	.125	5.000	5.240
M6 x 1	6H	4.917	5.153	5.350	5.500	.150	6.000	6.294
M8 x 1.25	6H	6.647	6.912	7.188	7.348	.160	8.000	8.340

Basic Thread Discription	Tol. Class	Minor Diameter		Pitch Diameter			Major Diameter Min.	
		Min.	Max.	Min.	Max.	Tol.	Min.	Max.
M8 x 1	6H	6.917	7.153	7.350	7.500	.150	8.000	8.294
M10 x 1.5	6H	8.376	8.676	9.026	9.206	.180	10.000	10.396
M10 x 1.25	6H	8.647	8.912	9.188	9.348	.160	10.000	10.340
M10 x 0.75	6H	9.188	9.378	9.513	9.645	.132	10.000	10.240
M12 x 1.75	6H	10.106	10.441	10.863	11.063	.200	12.000	12.453
M12 x 1.5	6H	10.376	10.676	11.026	11.216	.190	12.000	12.406
M12 x 1.25	6H	10.647	10.912	11.188	11.368	.180	12.000	12.360
M12 x 1	6H	10.917	11.153	11.350	11.510	.160	12.000	12.304

*Internal Thread Minor Diameter Tolerances. Internal thread minor diameter tolerances are based on a length of engagement equal to the nominal diameter. For general applications these tolerances are suitable for lengths of engagement up to 1-1/2 diameters. However, some thread applications have lengths of engagement which are greater than 1-1/2 diameters or less than the nominal diameter. For such applications it may be advantageous to increase or decrease the tolerance, respectively.

TAPPING SPEEDS

Conventional Table (Surface Feet Per Minute to Revolutions Per Minute)

Tap Sizes		Surface Feet Per Minute																	
		5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
UNC/ UNF	Pipe	Revolutions Per Minute																	
0	—	318	637	955	1273	1592	1910	2546	3183	3820	4456	5093	5729	6366	7003	7639	8276	8913	9549
1	—	273	546	819	1046	1308	1570	2093	2617	3140	3663	4186	4710	5233	5756	6279	6805	7326	7849
2	—	212	424	637	888	1110	1333	1777	2221	2665	3109	3554	3999	4442	4886	5330	5774	6218	6662
3	—	191	382	573	772	964	1157	1543	1929	2315	2701	3086	3472	3858	4244	4629	5015	5401	5787
4	—	174	347	521	682	853	1023	1364	1705	2046	2387	2728	3069	3411	3751	4092	4434	4775	5116
5	—	147	294	441	611	764	917	1222	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	4584
6	—	136	273	409	553	691	829	1106	1382	1659	1935	2212	2488	2766	3042	3318	3595	3871	4148
8	—	119	239	358	466	583	699	932	1165	1398	1631	1864	2097	2330	2563	2796	3029	3262	3495
10	—	101	201	302	402	502	603	804	1005	1205	1406	1607	1808	2009	2210	2411	2612	2813	3014
12	—	87	174	260	354	442	531	707	884	1061	1238	1415	1592	1769	1945	2122	2300	2476	2653
1/4	—	76	153	229	306	382	458	611	764	917	1070	1222	1375	1528	1681	1833	1986	2139	2292
5/16	—	62	123	185	245	306	367	489	611	733	856	978	1100	1222	1345	1467	1589	1711	1833
3/8	—	50	101	151	204	255	305	407	509	611	713	815	917	1019	1120	1222	1324	1426	1528
7/16	1/8	43	87	130	175	219	262	349	437	524	611	698	786	873	960	1048	1135	1222	1310
1/2	—	38	76	115	153	191	229	305	382	458	535	611	688	764	840	917	993	1070	1146
9/16	1/4	34	68	102	137	172	206	274	342	410	478	547	616	683	752	820	888	952	1020
5/8	—	32	64	96	122	153	183	244	306	367	428	489	550	611	672	733	794	856	917
11/16	3/8	28	55	83	111	138	167	222	278	333	389	444	500	556	611	667	722	778	833
3/4	—	25	51	76	102	128	153	203	255	305	357	407	458	509	560	611	662	713	764
7/8	1/2	22	43	65	87	109	131	175	218	262	306	350	392	437	480	524	568	611	655
1	—	19	38	57	76	96	115	153	191	230	268	305	344	382	420	458	497	535	573
1-1/8	3/4	17	34	51	68	84	102	136	170	204	238	272	306	340	373	407	441	475	509
1-1/4	—	15	31	46	61	76	92	122	153	183	214	244	275	305	336	367	397	428	458
1-3/8	1	14	28	42	56	69	83	111	139	167	194	222	250	278	306	333	361	389	417
1-1/2	—	13	25	38	51	63	76	102	127	153	178	204	229	255	280	305	331	356	382
1- 5/8	—	12	23	35	47	59	71	94	118	141	165	188	212	235	259	282	306	329	353
1-3/4	—	11	22	33	44	55	65	87	109	131	153	175	196	218	240	262	284	306	327
1-7/8	—	10	20	30	41	51	61	81	102	122	143	163	183	204	224	244	265	285	306
2	—	9	19	29	38	48	57	76	96	115	134	153	172	191	210	229	248	267	287

Metric Sizes

Tap Sizes	Surface Feet Per Minute																	
	5'	10'	15'	20'	25'	30'	40'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	150'
Metric	Revolutions Per Minute																	
M 1	490	979	1469	1959	2449	2938	3918	4897	5877	6856	7836	8815	9795	10774	11754	12733	13713	14692
M 2	242	484	725	967	1209	1451	1934	2418	2901	3385	3868	4352	4835	5319	5803	6286	6770	7253
M 3	162	324	486	647	809	971	1295	1619	1942	2266	2590	2914	3237	3561	3885	4208	4532	4856
M 3.5	138	277	415	554	692	830	1107	1384	1661	1938	2214	2491	2768	3045	3322	3599	3875	4152
M 4	122	243	365	487	608	730	973	1217	1460	1703	1946	2190	2433	2676	2920	3163	3406	3650
M 5	97	194	291	388	485	582	776	970	1163	1357	1551	1745	1939	2133	2327	2521	2715	2909
M 6	81	162	243	324	405	486	647	809	971	1133	1295	1457	1619	1781	1942	2104	2266	2428
M 7	69	138	208	277	346	415	554	692	830	969	1107	1246	1384	1522	1661	1799	1938	2076
M 8	61	121	182	243	303	364	485	606	728	849	970	1091	1213	1334	1455	1577	1698	1819
M 10	48	97	145	194	242	291	388	485	582	679	776	873	970	1067	1163	1260	1357	1454
M 12	40	81	121	162	202	243	324	405	486	567	647	728	809	890	971	1052	1133	1214
M 14	35	69	104	139	173	208	277	347	416	485	555	624	693	763	832	901	971	1040
M 16	30	61	91	121	152	182	243	303	364	424	485	546	606	667	728	788	849	910
M 18	27	54	81	108	135	162	216	269	323	377	431	485	539	593	647	700	754	808
M 20	24	49	73	97	121	146	194	243	291	340	388	437	485	534	582	631	680	728
M 22	22	44	66	88	110	132	176	221	265	309	353	397	441	485	529	573	618	662
M 24	20	40	61	81	101	121	162	202	243	283	323	364	404	445	485	526	566	606
M 27	18	36	54	72	90	108	144	180	216	252	287	323	359	395	431	467	503	539
M 30	16	32	49	65	81	97	129	162	194	226	259	291	323	356	388	420	453	485

Typical Tapping Problems

Problem	Cause	Solution
DIMENSIONAL ACCURACY		
Oversize Pitch Diameter		
	Incorrect Tap	1. Use correct H limit 2. Use longer chamfered taps 3. Consider less free cutting NR style
	Chip packing	1. Use spiral pointed or spiral fluted taps 2. Reduce number of flutes to create extra chip space 3. Use larger drill size 4. In blind hole applications, allow deeper holes where applicable or shorten the thread length of the parts 5. Use recommended lubricant
	Galling	1. Apply surface treatment such as steam oxide, TiN, TiCN or CrN 2. Use recommended lubricant 3. Reduce tapping speed 4. Use correct tap for the material being tapped
	Operating Conditions	1. Ensure correct tapping speeds to avoid torn threads 2. Check alignment of tap and drilled hole 3. Use lead screw tapper 4. Use tapping machine with adequate horsepower 5. Check misalignment of tap and drilled hole due to loose spindle or worn holder
	Tool Condition	1. Check accuracy of chamfer lead grinding 2. Ensure correct cutting angles 3. Land widths too narrow 4. Check burrs from regrinding not present
Oversize Internal Diameter		
	Hole Size	1. Use smaller drill size 2. Avoid tapered hole 3. Use taps with correct chamfer
	Galling	See solutions prescribed under Oversize Pitch Diameter
Undersized Pitch Diameter		
	Incorrect Tap	1. Use oversize taps » For cutting materials such as copper alloy, aluminum alloy and cast iron » For cutting tubing which will have “spring back” action after tapping 2. Use taps with correct chamfer angle 3. Use taps with higher cutting angle
	Damaged Thread	Use proper reversing speed to avoid damaging tapped thread on the existing hole
	Leftover Chips	1. Improve operating conditions to eliminate leftover chips in the hole 2. Remove left over chips prior to gage checking
Undersized Internal Diameter		
	Hole Size	Use larger drill size
SURFACE FINISH		
Torn or Rough Threads		
	Dull Tap	Resharpen
	Chamfer too short	Increase chamfer length
	Incorrect rake angle	Use correct rake angle suitable for material tapped
	Galling	1. Use thread relieved taps 2. Reduce land width 3. Apply surface treatment such as steam oxide, TiN, or chrome 4. Use recommended lubricant 5. Reduce tapping speed 6. Use larger drill size 7. Check alignment between tap and hole

Technical Section - Threading

Problem	*Cause*	*Solution*
	Chip Packing	1. Use spiral pointed or spiral fluted taps 2. Use larger drill size
Chattering on Tapped Thread		
	Too Positive	1. Use lower rake angle 2. Reduce amount of thread relief - consider NR style 3. Use taps with wider land
	Tool Condition	Use taps with wider land
TOOL LIFE		
Breakage		
	Incorrect Tap Selection	1. Tapping too deep. Avoid chip packing in the flutes or bottom of the hole. Use spiral pointed, spiral fluted or cold forming tap. 2. Use correct surface treatment such as steam oxide, TiN, TiCN or CrN
	Excessive Tapping Torque	1. Hole too small - use correct size drill 2. Shorten thread length 3. Increase rake angle 4. Use a tap with more thread relief and reduced land width 5. Use spiral pointed or spiral fluted taps
	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and the hole and tapered hole 3. Use floating type of tapping holder 4. Use tapping holder with torque adjustment 5. Avoid hitting bottom of the hole
	Tool Condition	1. Use taps with wider land width 2. Remove all worn sections when regrinding the flutes 3. Regrind tool more frequently
Chipping		
	Incorrect Tap Selection	1. Use tap with lower rake angle 2. Consider different tool steel 3. Reduce hardness of the tap 4. Increase chamfer length 5. Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps
	Operating Conditions	1. Reduce tapping speed 2. Avoid misalignment between tap and hole 3. Avoid sudden reverse in blind hole tapping 4. Avoid galling 5. Use larger drill size 6. Ensure adequate lubricant 7. Check for hard spots in the workpiece
Excessive Wear		
	Incorrect Tap Selection	1. Consider specially designed taps 2. Change to an Applix style of tap made from PM material 3. Apply special surface treatment such as steam oxide, TiN, TiCN or CrN 4. Increase chamfer length
	Operating Conditions	1. Reduce tapping speed 2. Apply adequate lubrication 3. Avoid work hardening the material being tapped 4. Use larger drill size
	Tool Condition	1. Ensure correct rake angle 2. Minimize heat in grinding process to avoid de-tempering

Technical Tips on Threading with Dies

1. Before starting the die or dienut, chamfer the end of the bar at an angle of 45 degrees to eliminate sudden loading of the leading edges. Ensure the die or dienut is presented to the bolt squarely.

2. Make use of the large tolerances associated with the major diameter of the bolt, by reducing the diameter of the bar (see below). This will reduce the cutting force to a minimum.

3. Use the gun nose type of die, as this ensures the chips are directed away from the cutting area.

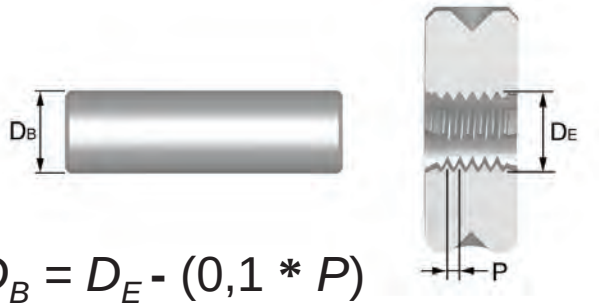
4. Ensure a good supply of the correct lubricant is aimed at the cutting area.

5. When adjusting split dies, avoid opening out as this will cause rubbing. Split dies may be closed down by approximately 0.15mm, by turning the adjustment screws equally. Pressure on one side of the die only may cause breakage.

6. Generally speaking, dienuts are used for reclaiming or cleaning out existing threads by hand. They tend to be of a more robust construction and should only be used in exceptional circumstances to cut a thread from solid.

Pre-machining Dimensions

The diameter of the bolt blank must be smaller than the max. external diameter of the screw thread.

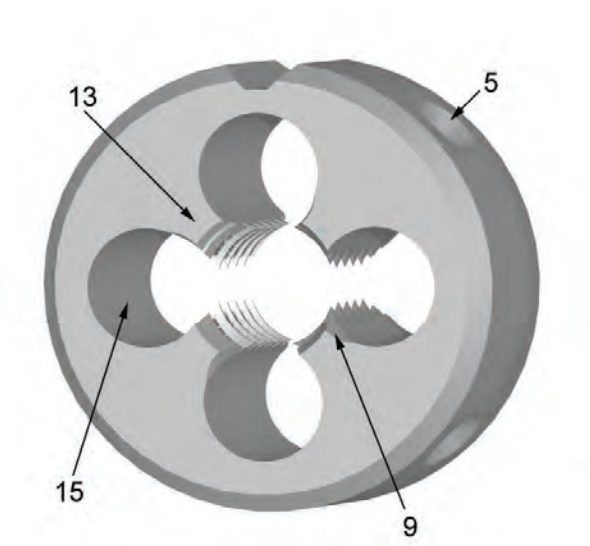


$$D_B = D_E - (0{,}1 * P)$$

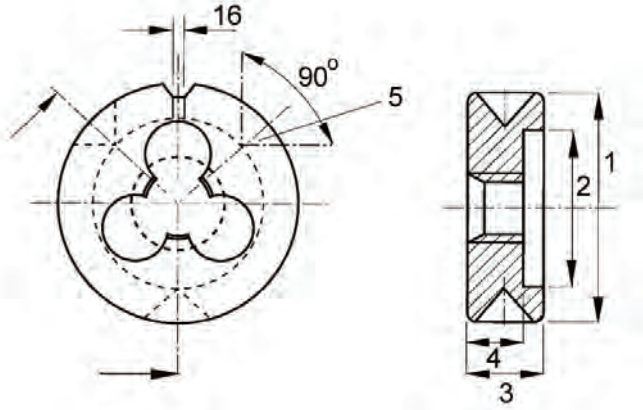
Trouble Shooting When Threading With Dies

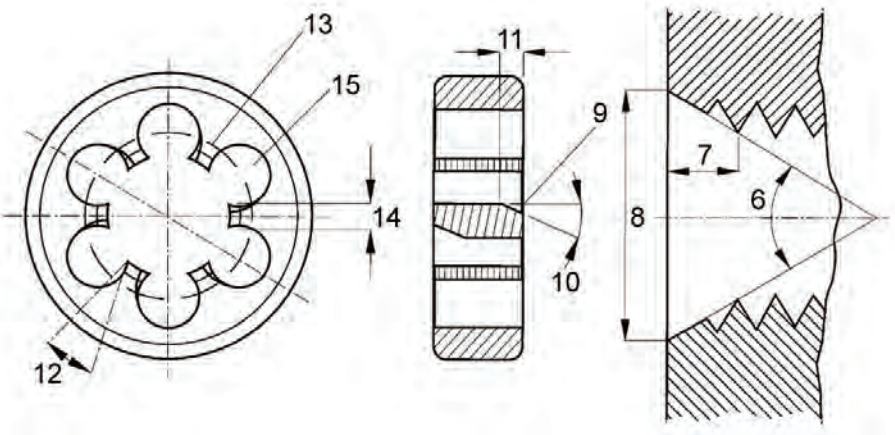
Problem	*Cause*	*Solution*
Oversize / Undersize		
	Misalignment	Correct alignment, ensure cleanliness
	Incorrect axial feed rate	Ensure axial feed rate is controlled accurately
Poor finish		
	Incorrect rake angle for the material	Try alternative dies or special die
	Incorrect/lack of lubricant	See lubricants section
	Incorrect speed	Follow recommendations in Catalog
	Bar diameter too large	Reduce to appropriate size
	Bar end not chamfered	Ensure bar end is chamfered
Chipping / Breakage		
	Wrong type of die	Follow recommendations in Catalog
	Speed too high	Follow recommendations in Catalog
	Bar diameter too large	Reduce to appropriate size
	Bar end not chamfered	Ensure bar end is chamfered
	Misalignment	Correct alignment, ensure cleanliness
Rapid wear		
	Incorrect/lack of lubricant	See lubricants section
	Speed too high	Follow recommendations in Catalog
Built up edge		
	Incorrect/lack of lubricant	See section lubricants
	Bar diameter too large	Reduce to appropriate size
	Speed too low	Follow recommendations in Catalog

Die Definitions / Nomenclature

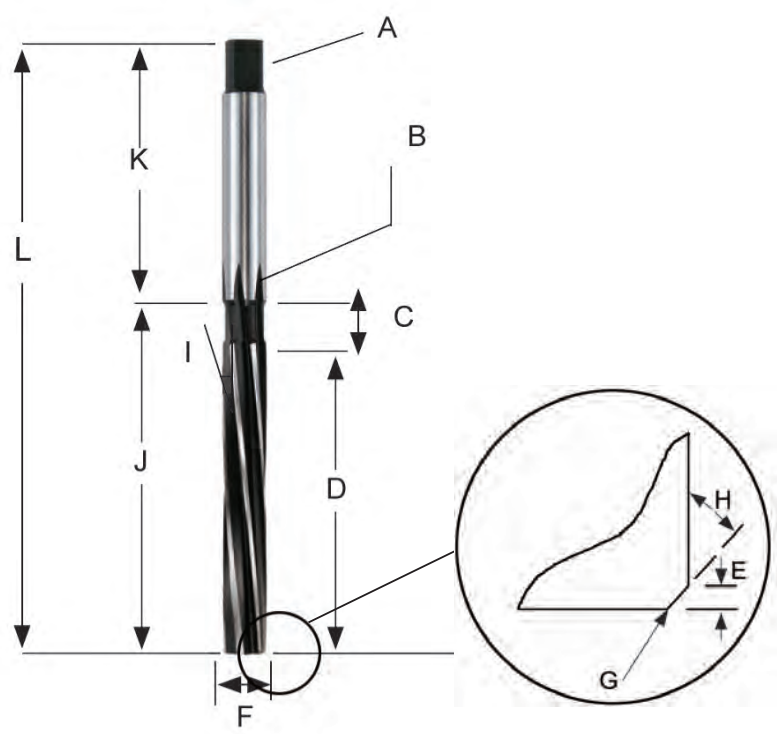


1 Outside Diameter
2 Recess Diameter
3 Thickness
4 Thread Length
5 Conical Hole for Fixing Screw
6 Chamfer Angle
7 Chamfer Length
8 Chamfer Diameter
9 Gun-nose
10 Spiral Angle
11 Spiral Length
12 Rake Angle
13 Land
14 Width of Land
15 Clearance Hole
16 Split of Adjustment

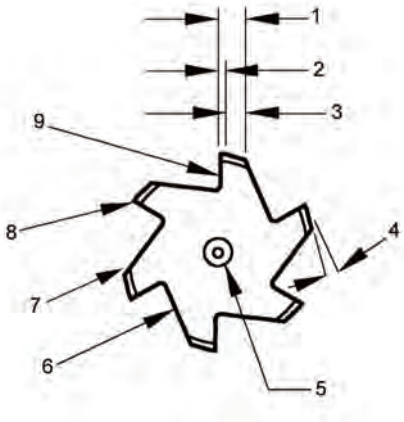




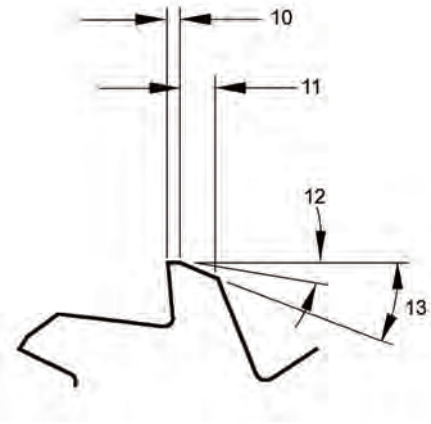
Reamer Definitions / Nomenclature



A Tang
B Recess
C Recess Length
D Cut Length
E Bevel Lead Length
F Diameter
G Bevel Lead
H Bevel Lead Angle
I Helix Angle
J Body Length
K Shank Length
L Overall Length



1 Width of Land
2 Circular Land
3 Clearance
4 Clearance Angle
5 Centre Hole
6 Flute
7 Heel
8 Cutting Edge
9 Face



10 Width of Primary Clearance

11 Width of Secondary Clearance

12 Primary Clearance Angle

13 Secondary Clearance Angle

Technical Tips On Reaming

To obtain the best results when using reamers it is essential to make them 'work'. It is a common fault to prepare holes for reaming with too little stock left in. If insufficient stock is left in the hole before reaming, then the reamer will rub, quickly show wear and will result in loss of diameter. It is equally important for performance not to leave too much stock in the hole. (See Stock Removal on next page).

1. Select the optimum type of reamer and the optimum speeds and feeds for the application. Ensure that pre-drilled holes are the correct diameter.

2. The workpiece must be held rigid and the machine spindle should have no play.

3. The chuck in which a straight shank reamer is held must be good quality. If the reamer slips in the chuck and the feed is automatic, breakage of the reamer may occur.

4. When driving a Morse Taper Shank reamer into a socket, sleeve or machine spindle, always use a soft faced hammer. Make sure there is a good fit between the reamer shank and the sleeve or socket otherwise misalignment will occur and the reamer may cut oversize.

5. Keep tool overhang from machine spindle to a minimum.

6. Use recommended lubricants to enhance the life of the reamer and ensure the fluid reaches the cutting edges. As reaming is not a heavy cutting operation, soluble oil 40:1 dilution is normally satisfactory. Air blasting may be used with grey cast iron, if dry machining.

7. Do not allow the flutes of a reamer to become blocked with chips.

8. Before the reamer is reground, check concentricity between centers. In most instances only the bevel lead will need regrinding.

9. Keep reamers sharp. Frequent regrinding is good economy, but it is important to understand that reamers cut only on the bevel and taper leads and not on the lands. Consequently only these leads need regrinding. Accuracy of regrinding is important to hole quality and tool life.

Hand / Machine Reamers

Although both hand and machine reamers offer the same capability regarding finished hole size, the use of each must be considered according to application. A hand reamer, for reasons of alignment, has a long taper lead, whereas a machine reamer has only a 45 degree bevel lead. A machine reamer cuts only on the bevel lead, a hand reamer cuts on the bevel lead and also on the taper lead.

Applications

The results obtained in reaming are to a great extent dependent upon the condition of the drilled hole. If deep scores or form deviations are inherent in the hole, reaming is probably not going to rectify these inaccuracies or produce a finish within tolerance requirements. A reamer can also be mounted in a floating holder with enough clearance to permit the reamer to move freely along the existing hole.

Suggested Stock Removal

Material ≥	Core-Drilled Hole Diameter (inches)					
	5/32	> 5/32 – 3/8	> 3/8 – 5/8	> 5/8 – 1	> 1 – 1-1/2	> 1-1/2 – 2-1/2
Steel* Hard cast-iron	.004	.004 – .008	.006 – .010	.008 – .014	.010 – .018	.016 – .025
Soft cast-iron Light alloys* Copper, soft Copper, alloys	.005	.005 – .012	.008 – .016	.010 – .020	.016 – .024	.024 – .031
Plastics (Duro plastics)	.007	.007 – .012	.010 – .016	.013 – .020	.016 – .024	.020 – .031

* For soft materials and quick spiral machine reamers add 50% of allowance.

Table of Speeds and Feeds

Type of Material	Speed Range (sfm) HSS	Speed Range (sfm) Carbide	Type of Feed
Magnesium	200 – 400	500 – 1000	M-H
Aluminum	150 – 300	500 – 1000	M-H
Brass and Bronze – Free Mach.	125 – 200	250 – 400	M
– Tough	75 – 125	150 – 250	M
Copper and Hard Bronze	50 – 75	100 – 150	L
Cast Iron – Soft (Ferritic)	50 – 100	150 – 250	H
– Medium (Pearlitic)	25 – 50	75 – 150	L-M
– Hard (Mart. or Acicular)	15 – 25	50 – 75	L
Steel – Under 200 BHN	55 – 80	200 – 300	M-H
– 200 - 300 BHN	30 – 55	125 – 200	M
– 300 - 400 BHN	20 – 30	50 – 125	L
– 400 - 500 BHN	10 – 20	35 – 50	L
– 500 - BHN Plus	—	15 – 35	L
Stainless – Free Mach. and 400 Ann.	40 – 60	150 – 250	M
– 300 Series	20 – 30	80 – 120	M
– P.H. and H.T. 400 series	15 – 25	60 – 100	L-M
High Temp Alloy – Nickel Base	10 – 20	40 – 70	L
– Cobalt Base	10 – 15	30 – 45	L
Titanium – Pure	35 – 50	50 – 100	M
– Alloys	10 – 20	35 – 50	L-M

Diameter Range	Feed (ipr) for Diameter Range Light (L)	Medium (M)	Heavy (H)
≥ 1/16”	.0002” – .001”	.0005” – .002”	.001” – .003”
> 1/16” – 1/8”	.001” – .002”	.002” – .004”	.003” – .006”
> 1/8” – 1/4”	.002” – .004”	.004” – .006”	.006” – .010”
> 1/4” – 1/2”	.004” – .006”	.006” – .010”	.010” – .015”
> 1/2” – 1”	.006” – .010”	.010” – .020”	.015” – .030”
> 1”	.010” – .020”	.020” – .040”	.030” – .050”

Technical Section - Reaming

Application Reamers

As with most cutting tools, the substrate and geometric configuration of reamers differs, dependent on the material they are intended to cut. As such, care should be taken to ensure that the correct choice of reamer is made.

CNC reamers are manufactured with a shank tolerance of h6. This enables the reamer to be used in hydraulic and heat shrink tool holding systems, offering enhanced accuracy and concentricity.

Adjustable Reamers

Several types of adjustable reamers are available, all offering varying degrees of diameter adjustment. It is an important aspect of adjustable reamers to follow this set procedure:

- Adjust the reamer to the required diameter.
- Check the reamer between centers for concentricity and lip height variation.
- If required, grind the reamer to eliminate any eccentricity or lip height variation.
- Re-check the diameter.

Stock Removal

The recommended stock removal in reaming is dependent on the application material and the surface finish of the pre-drilled hole. General guidelines for stock removal are shown in the following tables:

Size of reamed hole (mm)	When pre-drilled	When pre-core-drilled
Below 4	0.1	0.1
Over 4 to 11	0.2	0.15
Over 11 to 3	0.3	0.2
Over 39 to 50	0.4	0.3

Size of reamed hole (inches)	When pre-drilled	When Pre-core-drilled
Below 3/16	0.004	0.004
3/16 to ½	0.008	0.006
½ to 1. ½	0.010	0.008
1. ½ to 2	0.016	0.010

Selection Of Reamer Types

Reaming is a recognized method of producing dimensionally accurate holes of fine surface finish. Dormer offers a range of reamers for producing holes to H7 tolerance.

Reamers are classified into various types:

- Solid - available in two shank types, Straight (cylindrical) and Morse Taper.
- Shell - for use on arbors.
- Expanding - with adjustable HSS blades and used for light work.

Applications - Reamer Selection

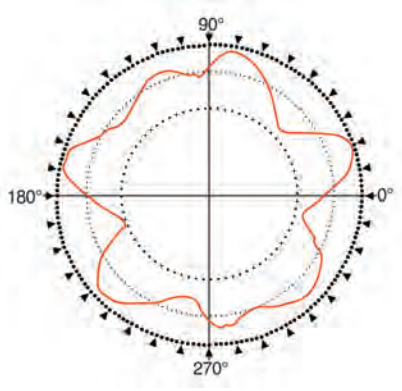
The most common types of reamers have a left-hand spiral because the main applications involve through holes requiring chips to be pushed forward. For blind holes, reamers with straight flutes or right hand spirals are recommended.

The most efficient reaming conditions depend on the application, material, quality of hole required, stock removal, lubrication and other factors. A general guide to surface speeds and feeds for machine reamers is shown in the reamer AMG and feed charts (see Dormer catalogue or Product Selector) and stock removal tables.

Extremely unequal spacing on reamers means that the divide is not the same for each tooth. As there are no two teeth diametrically opposite each other, the reamer produces a hole with a roundness variance of between 1 and 2 μm. This compared with a variance of up to 10μm with unequal spacing.

Carbide Reamers - Comparison spacing / EU spacing

unequal spacing
roundness error up to 10 µm



Results of roundness

extremely unequal spacing
roundness error up to 1 - 2 µm



Results of roundness

Trouble Shooting When Reaming

Problem	*Cause*	*Solution*
Broken or twisted tangs		
	Incorrect fit between shank and socket	Ensure the shank and the socket are clean and free from damage
Rapid Tool Wear		
	Insufficient stock to remove	Increase the amount of stock to be removed
Oversize Hole		
	Excessive lip height variation	Regrind to correct specification
	Displacement in the machine spindle	Repair and rectify spindle displacement
	Defects on the tool holder	Replace tool holder
	Tool shank is damaged	Replace or regrind the shank
	Ovality of the tool	Replace or regrind the tool
	Asymmetric bevel lead angle	Regrind to correct specification
	Too high feed or cutting speed	Adjust cutting conditions in accordance with Catalog or Product Selector
Undersize hole		
	Insufficient stock to remove	Increase the amount of stock to be removed
	Too much heat generated while reaming. The hole widens and shrinks.	Increase coolant flow
	The tool diameter is worn and is undersize.	Regrind to correct specification.
	Too low feed or cutting speed	Adjust cutting conditions in accordance with the Dormer Product Selector.
	Pre-drilled hole is too small	Decrease the amount of stock to be removed.
Oval and conical holes		
	Displacement in the machine spindle	Repair and rectify spindle displacement
	Misalignment between tool and hole	Use a bridge reamer
	Asymmetric bevel lead angle	Regrind to correct specification
Bad Hole finish		
	Excessive stock to remove	Decrease the amount of stock to be removed
	Worn out tool	Regrind to specification
	Too small cutting rake angle	Regrind to specification
	Too diluted emulsion or cutting oil	Increase % concentration
	Feed and/or speed too low	Adjust cutting conditions in accordance with Catalog/ Product Selector
	Cutting speed too high	Adjust cutting conditions in accordance with Catalog/ Product Selector
The tool clamps and breaks		
	Worn out tool	Regrind to correct specification
	Back taper of the tool is too small	Check and replace / modify the tool
	The width of the land is too wide	Check and replace / modify the tool
	Workpiece material tend to squeeze	Use an adjustable reamer to compensate for the displacement
	Pre-drilled hole is too small	Decrease the amount of stock to be removed
	Heterogeneous material with hard inclusions	Use solid carbide reamer

General Hints On Counterboring and Countersinking

COUNTERBORING

The counterbore is an end cutting tool which is used to enlarge a preformed hole when a flat bottom is required or to spotface when a machine finish is required. It may have a fixed pilot (solid pattern) Fig.1 or be designed Fig.2 for an interchangeable pilot Fig. 3.



Fig.1



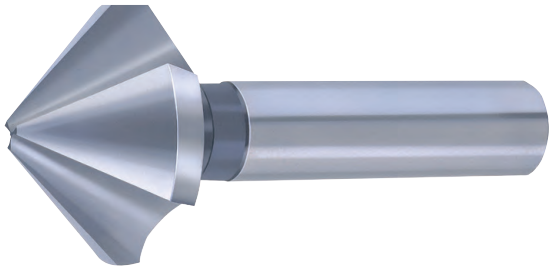
Fig.2



Fig. 3

COUNTERSINKING

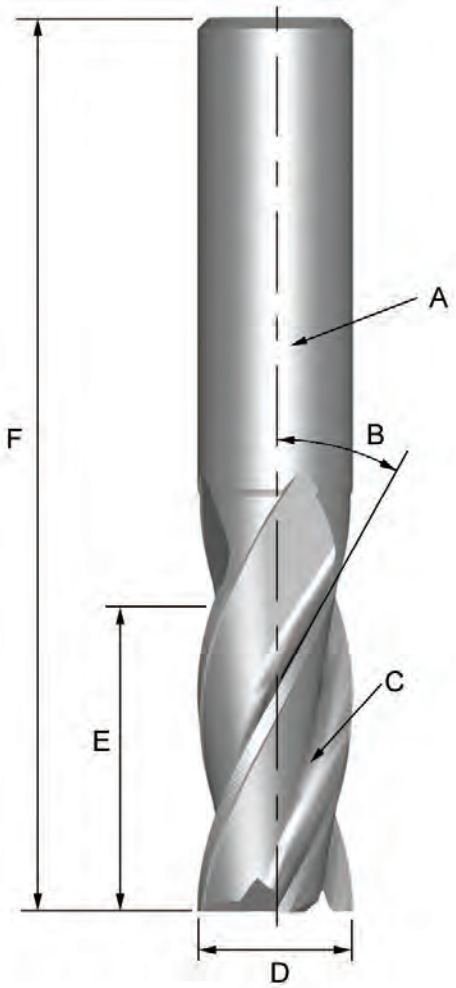
The countersink is an conical cutting tool, usually made with angular relief, having one or more flutes with specific size angle cutting edges. It is used for chamfering and countersinking holes. The countersink may have a straight shank, tapered shank, bit stock shank or special shank requiring a special holder, for holding in a power or hand operated machine.



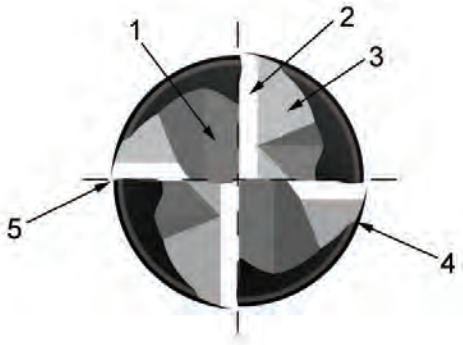
Trouble Shooting when Counterboring

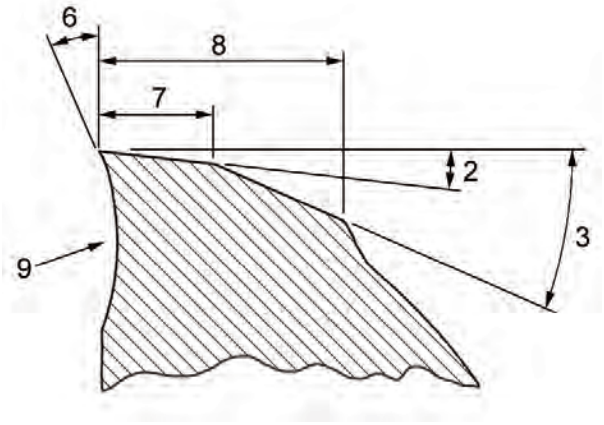
Problem / *Cause*	*Solution*
Excessive Cutting Edge Wear	
Incorrect feeds & speeds	Increase feed - especially when machining ductile or free machining materials. Also try reducing speed
Rough cutting edge	Lightly hone cutting edge with fine grit diamond hone
Insufficient coolant	Increase coolant flow - review type of coolant
Chipping	
Poor chip removal	Use tool with larger flute space - larger diameter or fewer flutes
Recutting work hardened chips	Increase coolant flow
Vibration	Increase rigidity of set-up, especially worn tool holders
Short Tool Life	
Excessive cratering	Increase speed or decrease feed
Abrasive material	Decrease speed and increase feed Increase coolant flow
Hard materials	Reduce speed - rigidity very important
Insufficient chip room	Use larger diameter tool
Delayed resharpening	Prompt resharpening to original geometry will increase tool life
Glazed Finish	
Feed too light	Increase feed
Dull cutting edge	Resharpen tool to original geometry
Insufficient clearance	Resharpen tool with more clearance
Rough Finish	
Dull cutting edge	Resharpen to original tool geometry
Wrong feeds & speeds	Increase speed - also try reducing feed
Chattering	
Insufficient machine horsepower	Use tool with fewer flutes as correct feeds & speeds must be maintained
Vibration	Resharpen tool with more clearance

Nomenclature



A Shank
B Helix Angle
C Flute
D Outside Diameter
E Cutting Length
F Overall Length





1 Gash
2 Primary Relief Angle
3 Secondary Relief Angle
4 Heel
5 Cutting Edge

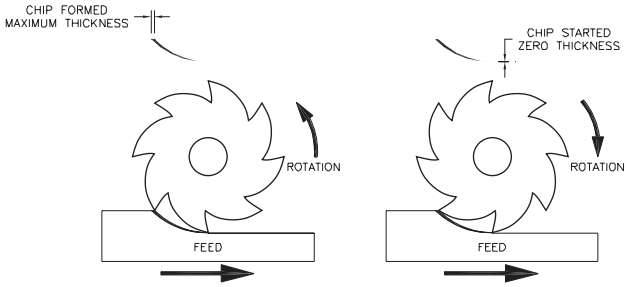
6 Rake Angle
7 Width of Primary Relief Land
8 Width of Secondary Relief Land
9 Undercut Face

MILLING EFFECTIVELY

Types Of Cuts

Climb Milling Versus Conventional Milling

CLIMB MILLING CONVENTIONAL MILLING



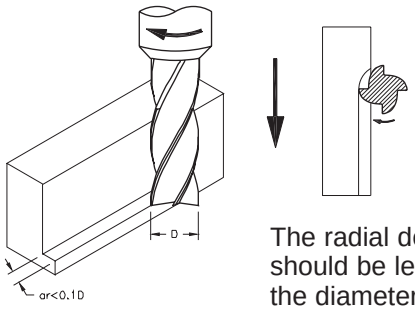
In conventional milling, the cutter revolves opposite to the direction of table feed. Therefore the width of the chip starts at zero and increases to a maximum at the end of the cut. This can lead to accelerated tool wear under some conditions. Conventional milling may be advantageous when milling hot rolled steel, surface hardened and steels with a surface scale.

In climb milling, the cutter revolves in the same direction as the table feed. The tooth meets the work at the top of the cut, producing the thickest part of the chip first. In horizontal applications the resultant force created by climb milling can act as a clamping force, acting towards the machine table.

It is important to make sure that the machine tool has no leadscrew backlash. Normally climb milling improves product surface finish and increases tool life.

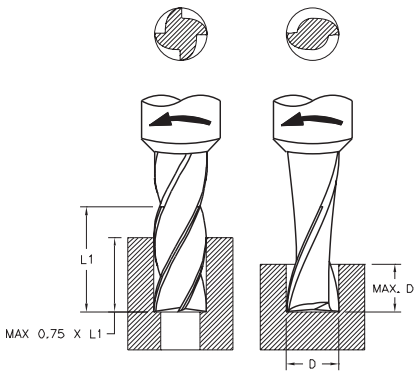
Peripheral Milling The milling of a surface which is parallel to the end mill axis.

Peripheral (Cylindrical, Slab) Milling



The radial depth of cut should be less than 0.1 of the diameter of the mill: $a_r < 0.1\ D$.

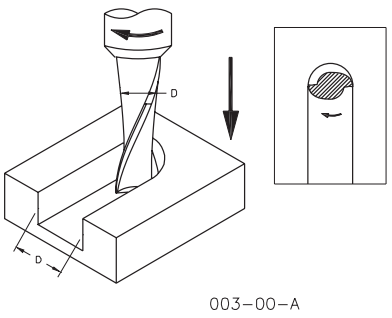
Plunge Milling The direct movement between the workpiece and the center line of the end mill when the end mill sinks directly into the workpiece.



In order to be able to "drill," i.e. mill with axial feed, an end mill must have an end face cutting edge that goes all the way to the center. An example of such a solid drilling operation is keyway milling in the middle of a shaft.

In boring, the depth of a hole may be up to 75% of the cutting edge length. In solid drilling, however, it should not exceed 0.5-1 D.

Slot Milling



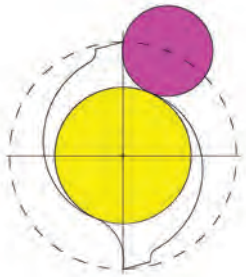
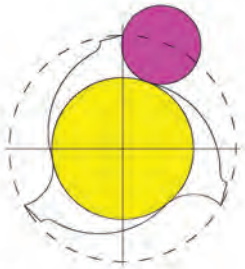
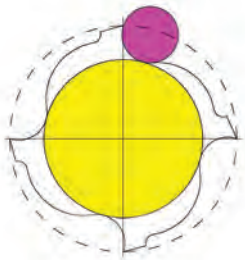
The radial depth of cut is equal to the diameter of the mill: $a_r = D$.

All slotting applications are a combination of conventional and climb milling. Refer to adjacent section.

FEATURES OF THE END MILL - CHOOSING THE NUMBER OF FLUTES

Number of flutes should be determined by:

- Milled material
- Dimension of workpiece
- Milling conditions

2 Flutes	3 Flutes	4 Flutes (or multi-flutes)
		
Flexural strength: Low ⟷ High		
Chip space: Big ⟷ Small		
• Large chip space. • Easy chip ejection. • Good for slot milling. • Good for heavy duty milling. • Less rigidity due to small section area. • Lower quality surface finish	• Chip space almost as large as for 2 flutes. • Larger section area - higher rigidity than 2 flutes • Improved surface finish	• Highest rigidity. • Largest section area – small chip space. • Gives best surface finish. • Recommended for profiling, side milling and shallow slotting.

FEATURES OF THE END MILL – HELIX ANGLE

Increasing the number of flutes makes the load on the single tooth more homogeneous and consequently, this allows for a better finish. But with a high helix angle, the load (FV) along the cutter axis is increased too. A high FV can give:

- Load problems on the bearings
- Cutter movement along the spindle axis. To avoid this problem it is necessary to use Weldon or screwed shanks.



Technical Section - Milling

DIRECTION OF USE OF THE CUTTER

We can split the range of the cutters in relationship to the possible working directions to the workpiece surface. There are three different types:

3 Directions	2 Directions	1 Direction
		

Please note that the axial direction is possible only with center cutting end mills.

MRR (MATERIAL REMOVAL RATE) Q

We can calculate material removal rate *Q* as the volume of material removed divided by the time taken to cut. The volume removed is the initial volume of the workpiece minus the final volume. The cutting time is the time needed for the tool to move through the length of the workpiece. This parameter strongly influences the finishing grade of the workpiece.

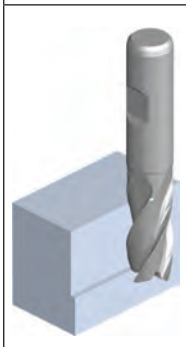
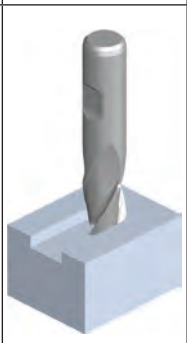
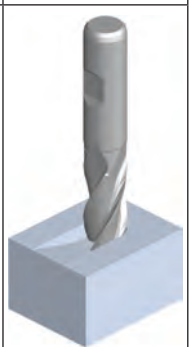
$$Q = \frac{a_p * a_e * v_f}{1000}$$

Q = MRR (cm^3/min) a_e = radial depth (mm)

a_p = axial depth (mm) v_f = feed rate mm/min

APPLICATIONS

The MRR and the applications are strongly related. For each different application we have a different MRR that increases with the engagement section of the cutter on the workpiece. The recent Dormer Catalogue was produced with simple icons that show the different applications.

Side Milling	Face Milling	Slot Milling	Plunge Milling	Ramping
				
The radial depth of cut should be less than 0.25 of the diameter of the end mill.	The radial depth of cut should be no more than 0.9 of the diameter, axial depth of cut less than 0.1 of the diameter.	Machining of a slot for keyways. The radial depth of cut is equal to the diameter on the end mill.	It is possible to drill the work-piece with an end mill only with the cutting centre. In this operation the feed has to be halved.	Both axial and radial entering into the workpiece.

MILLING EFFECTIVELY

End Mill Selection

Utilize the shortest possible tool available for the application with the largest diameter permissible and the shortest flute length as depth of cut allows. Extra length end mills have excessive overhang, thus a reduction in feed up to 25% may be required. Stub length end mills, due to their short overall and flute length, have more rigidity, thus an increase in feed rates of up to 25% may be required.

Speeds

Solid Carbide end mills must be run at higher speeds than High Speed Steel end mills. Many times, lighter cuts at higher speeds can improve the finish of the workpiece.

When the application is a slotting cut, the speed should be reduced by approximately 20%. Speeds should be decreased when milling hard or tough materials or when taking heavy cuts. Speeds should be increased when milling softer materials or when taking lighter cuts. Speeds should also be increased for finishing cuts.

Coolants

Coolants are recommended when milling mild steel and high temperature alloys. The purpose of the coolant media is to direct the chips away from the cutting tool and workpiece. This prevents damage to the cutting edges due to recutting the chips. When machining titanium, coolant flow must be heavy and directed at the area of cut to prevent overheating and assist in chip removal.

Milling Terminology/Operating Formulas

The following terms and formulas can be used to determine the appropriate operating parameters.

Terms			Formulas		
SFM	=	Surface Feet Per Minute	DxRPMx.26	=	SFM
RPM	=	Revolutions Per Minute	$\frac{\text{SFM x 3.82}}{\text{D}}$	=	RPM
F	=	Feed in Inches Per Minute			
Ft	=	Feed Per Tooth	Ft x T x RPM	=	F
D	=	Cutting Diameter	$\frac{\text{F}}{\text{T x RPM}}$	=	Ft
T	=	Number of Teeth			

Technical Section - Milling

TABLE OF CUTTING SPEEDS

Conversion Table (Surface Feet Per Minute to Revolutions Per Minute)

DIA. In Inches	Surface Feet Per Minute: 15'	20'	25'	30'	35'	40'	45'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	DIA. In Inches
	Revolutions Per Minute																	
1/64	3667	4890	6112	7334	8559	9779	11002	12224	14669	17114	19558	22003	24448	26893	29338	31782	34227	1/64
1/32	1834	2445	3056	3667	4278	4890	5501	6112	7334	8557	9779	11002	12224	13446	14669	15891	17114	1/32
3/64	1222	1630	2037	2445	2852	3260	3667	4075	4890	5705	6519	7334	8149	8964	9779	10594	11409	3/64
1/16	917	1222	1528	1833	2139	2445	2750	3056	3667	4278	4889	5500	6112	6723	7333	7945	8556	1/16
3/32	611	815	1019	1222	1426	1630	1834	2037	2445	2852	3260	3667	4075	4482	4890	5297	5705	3/32
1/8	458	611	764	917	1070	1222	1375	1528	1833	2139	2445	2750	3056	3361	3667	3973	4278	1/8
5/32	367	489	611	733	856	978	1100	1222	1467	1711	1956	2200	2445	2689	2934	3178	3423	5/32
3/16	306	407	509	611	713	815	917	1019	1222	1426	1620	1833	2037	2241	2445	2648	2852	3/16
1/4	229	306	382	458	535	611	688	764	917	1070	1222	1375	1528	1681	1833	1986	2139	1/4
5/16	183	244	306	367	428	489	550	611	733	856	978	1100	1222	1345	1467	1589	1711	5/16
3/8	153	204	255	306	357	407	458	509	611	713	815	917	1019	1120	1222	1324	1426	3/8
7/16	131	175	218	262	306	349	393	437	524	611	698	786	873	960	1048	1135	1222	7/16
1/2	115	153	191	229	267	306	344	382	458	535	611	688	764	840	917	993	1070	1/2
5/8	92	122	153	183	214	244	275	306	367	428	489	550	611	672	733	794	856	5/8
3/4	76	102	127	153	178	204	229	255	306	357	407	458	509	560	611	662	713	3/4
7/8	66	87	109	131	153	175	196	218	262	306	349	393	473	480	524	568	611	7/8
1	57	76	96	115	134	153	172	191	229	267	306	344	382	420	458	479	535	1
1-1/8	51	68	85	102	119	136	153	170	204	238	272	306	340	373	407	441	475	1-1/8
1-1/4	46	61	76	92	107	122	138	153	183	214	244	275	306	336	367	397	428	1-1/4
1-3/8	42	56	70	83	97	111	125	139	167	194	222	250	278	306	333	361	389	1-3/8
1-1/2	38	51	64	76	89	102	115	127	153	178	204	229	255	280	309	331	357	1-1/2
1-5/8	35	47	59	71	82	94	106	118	141	165	188	212	235	259	282	306	329	1-5/8
1-3/4	33	44	55	66	76	87	98	109	131	153	175	196	218	240	262	284	306	1-3/4
1-7/8	31	41	51	61	71	82	92	102	122	143	163	183	204	224	244	265	285	1-7/8
2	29	38	48	57	67	76	86	96	115	134	153	172	191	210	229	248	267	2
2-1/4	26	34	42	51	59	68	76	85	102	119	136	153	170	187	204	221	238	2-1/4
2-1/2	23	31	38	46	54	61	69	76	92	107	122	138	153	168	183	199	214	2-1/2
2-3/4	21	28	35	42	49	56	62	70	83	97	111	125	139	153	167	181	194	2-3/4
3	19	26	32	38	45	51	57	64	76	89	102	115	127	140	153	166	178	3
3-1/4	18	24	29	35	41	47	53	59	71	82	94	106	118	129	141	153	165	3-1/4
3-1/2	16	22	27	33	38	44	49	55	66	76	87	98	109	120	131	142	153	3-1/2
3-3/4	15	20	26	31	36	41	46	51	61	71	81	92	102	112	122	132	143	3-3/4
4	14	19	24	29	33	38	43	48	57	67	76	86	96	105	115	124	134	4
4-1/2	13	17	21	26	30	34	38	42	51	59	68	76	85	93	102	110	119	4-1/2
5	12	15	19	23	27	31	34	38	46	54	61	69	76	84	92	99	107	5
5-1/2	10	14	17	21	24	28	31	35	42	49	56	63	70	76	83	90	97	5-1/2
6	10	13	16	19	22	26	29	32	38	45	51	57	64	70	76	83	89	6
6-1/2	9	12	15	18	21	24	26	29	35	41	47	53	59	65	71	76	82	6-1/2
7	8	11	14	16	19	22	25	27	33	38	44	49	55	60	66	71	76	7
7-1/2	8	10	13	15	18	20	23	26	31	36	41	46	51	56	61	66	71	7-1/2
8	7	10	12	14	17	19	22	24	29	33	38	43	48	53	57	62	67	8
8-1/2	7	9	11	14	16	18	20	23	27	32	36	40	45	49	54	58	63	8-1/2
9	6	9	11	13	15	17	19	21	26	30	34	38	42	47	51	55	59	9
9-1/2	6	8	10	12	14	16	18	20	24	28	32	36	40	44	48	52	56	9-1/2
10	6	8	10	12	13	15	17	19	23	27	31	34	38	42	46	50	54	10
11	5	7	9	10	12	14	16	17	21	24	28	31	35	38	42	45	49	11
12	5	6	8	10	11	13	14	16	19	22	26	29	32	35	38	41	45	12
	15'	20'	25'	30'	35'	40'	45'	50'	60'	70'	80'	90'	100'	110'	120'	130'	140'	

CUTTING DATA

S400HA
SLOTTING

Materials:	AMG 7.1 - 7.4 Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	RPM	IPM	SFM	IPR
1/16	15,600	29.44	255	0.0019
3/32	15,600	35.98	383	0.0039
1/8	15,600	42.52	511	0.0027
3/16	15,600	61.42	766	0.0039
1/4	15,600	70.87	1022	0.0045
5/16	12,000	85.05	983	0.0071
3/8	12,000	103.93	1179	0.0087
1/2	12,000	127.56	1572	0.0106
5/8	9,600	118.12	1572	0.0123
3/4	6,000	89.76	1179	0.0150
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S400HA
SIDE CUTTING

Materials	AMG 7.1 - 7.4 Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	RPM	IPM	SFM	IPR
1/16	12,000	40.01	197	0.0033
3/32	12,000	48.35	295	0.0040
1/8	12,000	56.69	393	0.0047
3/16	12,000	80.32	590	0.0067
1/4	12,000	94.49	786	0.0079
5/16	9,600	108.66	786	0.0113
3/8	9,600	127.56	943	0.0133
1/2	9,600	160.56	1258	0.0167
5/8	7,200	146.52	1179	0.0204
3/4	4,800	113.39	943	0.0236
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

S401HA
SLOTTING

Materials:	AMG 7.1 - 7.4 Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	RPM	IPM	SFM	IPR
5/32	12,400	36.4	508	0.0029
1/4	12,400	45.4	812	0.0037
5/16	9,920	54.5	812	0.0055
3/8	9,920	66.6	975	0.0067
1/2	9,920	81.8	1300	0.0082
5/8	7,440	75.7	1218	0.0102
3/4	4,960	60.6	975	0.0122
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S401HA
SIDE CUTTING

Materials	AMG 7.1 - 7.4 Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	RPM	IPM	SFM	IPR
5/32	12,400	42.4	508	0.0034
1/4	12,400	60.6	812	0.0049
5/16	9,920	69.6	812	0.0070
3/8	9,920	81.8	975	0.0082
1/2	9,920	103	1300	0.0104
5/8	7,440	93.9	1218	0.0126
3/4	4,960	75.7	975	0.0153
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

Materials:	AMG 6.1 - 6.4 Copper Alloys			
"D" Tool Dia.	RPM	IPM	SFM	IPR
5/32	3,720	9.1	152	0.0024
1/4	3,720	11.5	244	0.0031
5/16	2,852	13.6	234	0.0048
3/8	2,852	16.6	280	0.0058
1/2	2,852	20.5	374	0.0072
5/8	2,232	19.1	365	0.0086
3/4	1,426	15.2	280	0.0107
Axial DOC (maximum) = 0.5 x D				

Materials	AMG 6.1 - 6.4 Copper Alloys			
"D" Tool Dia.	RPM	IPM	SFM	IPR
5/32	3,720	10.6	152	0.0028
1/4	3,720	15.2	244	0.0041
5/16	2,852	17.6	234	0.0062
3/8	2,852	20.6	280	0.0072
1/2	2,852	25.8	374	0.0090
5/8	2,232	23.6	365	0.0106
3/4	1,426	19.1	280	0.0134
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 3/4)**				

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

Technical Section - Milling

CUTTING DATA

S402HA
PROFILING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	14,500	71.65	950	0.0049
5/16	11,200	81.9	917	0.0073
3/8	11,200	96.2	1100	0.0086
1/2	11,200	122.85	1467	0.0110
5/8	8,800	110.5	1441	0.0126
3/4	5,600	104	1100	0.0186
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

Axial Depth of Cut (DOC) recommendation = 0.2 x D
Radial Depth of Cut (DOC) recommendation = 0.5 x D
Note: Reduce the Feed in "Long Length" options by 50%

S403HA & S404HA
SLOTTING

Materials:	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	15,600	43	511	0.0028
3/16	15,600	61.4	766	0.0039
1/4	15,600	73.7	1022	0.0047
5/16	12,000	86	983	0.0072
3/8	12,000	104.4	1179	0.0087
7/16	12,000	116.65	1376	0.0097
1/2	12,000	128.9	1572	0.0107
5/8	9,600	116.65	1572	0.0122
3/4	6,000	92.15	1179	0.0154
1"	6,000	98.3	1572	0.0164
Axial DOC (maximum) = 0.5 x D				
Using Table Above...				
For AMG 6.1 & 6.4 — Use RPM & SFM x 0.3				
For AMG 8.1 - 8.3 — Use RPM & SFM x 0.3				

S403HA & S404HA
SIDE CUTTING

Materials	**AMG 7.1 - 7.4** Aluminum & Non-Ferrous Metals			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,000	55.25	393	0.0046
3/16	12,000	79.8	590	0.0067
1/4	12,000	92.2	786	0.0077
5/16	9,600	110.55	786	0.0115
3/8	9,600	129	943	0.0134
7/16	9,600	144.4	1100	0.0150
1/2	9,600	159.8	1258	0.0166
5/8	7,200	147.4	1179	0.0205
3/4	4,800	113.6	943	0.0237
1"	4,800	116.65	1258	0.0243
Axial DOC (maximum) = 1.0 x D **Radial DOC (maximum) = 0.25 x D (up to ø 3/8)** **Radial DOC (maximum) = 0.5 x D (ø 1/2 - ø 1")**				

S405HA
HIGH SPEED CUTTING (FINISHING)

Materials:	**AMG 1.3-1.6** Carbon Steels, Alloy Steels **AMG 3.4** Cast Iron (up to 50 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	16,800	240	1100	0.0143
5/16	12,600	240	1032	0.0190
3/8	10,000	235	983	0.0235
1/2	8,400	200	1100	0.0238
5/8	6,300	150	1032	0.0238
3/4	5,000	120	983	0.0240
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

Materials:	**AMG 1.7 - 1.8** Alloy Steels & Tool Steels (from 50 HRC up to 60 HRC)			
"D" Tool Dia."	***RPM***	***IPM***	***SFM***	***IPR***
1/4	8,400	120	550	0.0143
5/16	6,300	120	516	0.0190
3/8	5,000	120	491	0.0240
1/2	4,200	100	550	0.0238
5/8	3,150	75	516	0.0238
3/4	2,500	58	491	0.0232
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

Materials:	**AMG 1.8** Hardened Steels (from 60 HRC up to 65 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/4	4,200	58	275	0.0138
5/16	3,200	58	262	0.0181
3/8	2,500	58	246	0.0232
1/2	2,100	50	275	0.0238
5/8	1,600	37	262	0.0231
3/4	1,260	30	248	0.0238
Axial DOC (maximum) = 1.5 x D **Radial DOC (maximum) = 0.05 x D**				

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

Technical Section - Milling

S406HA & S406HB

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.1-1.5** Carbon Steels, Alloy Steels, and Cast Iron (under 40 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,735	10.2	417	0.0008
3/16	8,490	10.9	417	0.0013
1/4	6,370	11.5	417	0.0018
5/16	5,100	13	418	0.0025
3/8	4,245	18.4	417	0.0043
7/16	4,010	24.5	460	0.0061
1/2	3,500	25.9	459	0.0074
9/16	3,110	26	458	0.0084
5/8	2,800	26.1	459	0.0093
3/4	2,340	24	460	0.0103
1"	1,755	17.4	460	0.0099

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 2.2-2.4** Stainless Steels (300 Series)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	9,625	7.3	315	0.0008
3/16	6,385	8.3	314	0.0013
1/4	4,810	9.6	315	0.0020
5/16	3,850	10.7	315	0.0028
3/8	3,210	15.4	315	0.0048
7/16	2,750	20.9	315	0.0076
1/2	2,400	21	314	0.0088
9/16	2,140	21.2	315	0.0099
5/8	1,925	21.2	315	0.0110
3/4	1,600	19.4	314	0.0121
1"	1,200	14.7	314	0.0123

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 2.1-2.3** Stainless Steels (400 Series)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	13,475	7.6	441	0.0006
3/16	12,000	8.4	590	0.0007
1/4	6,815	9.6	446	0.0014
5/16	5,390	10.7	441	0.0020
3/8	4,490	15.4	441	0.0034
7/16	3,850	20.9	441	0.0054
1/2	3,370	21	441	0.0062
9/16	2,990	21.2	441	0.0071
5/8	2,700	21.2	442	0.0079
3/4	2,250	19.4	442	0.0086
1"	1,685	15.1	441	0.0090

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 4.1-4.3** Titanium			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	8,320	7.6	272	0.0009
3/16	5,550	8.4	273	0.0015
1/4	4,160	9.6	272	0.0023
5/16	3,330	10.7	273	0.0032
3/8	2,770	15.4	272	0.0056
7/16	2,380	20.7	273	0.0087
1/2	2,080	21	272	0.0101
9/16	1,850	21.2	273	0.0115
5/8	1,660	21.2	272	0.0128
3/4	1,390	19.4	273	0.0140
1"	1,040	15.1	272	0.0145

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 5.1-5.3** Nickel Alloys, Inconel, Hastelloy			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	2,565	2.1	84	0.0008
3/16	1,685	1.8	83	0.0011
1/4	1,285	2.5	84	0.0019
5/16	1,025	2.8	84	0.0027
3/8	855	4.1	84	0.0048
7/16	735	5.5	84	0.0075
1/2	640	5.6	84	0.0088
9/16	570	5.7	84	0.0100
5/8	510	5.6	84	0.0110
3/4	425	5.2	84	0.0122
1"	315	4.3	83	0.0137

Axial DOC (maximum) = 0.5 x D (Slotting)
Axial DOC (maximum) = 1.0 x D (Side Cutting)
Radial DOC (maximum) = 0.35 x D (Side Cutting)

RPM = Revolutions per Minute
IPM = Inches per Minute
SFM = Surface Feet per Minute
IPR = Inches per Revolution
DOC = Depth of Cut
FT (Feet per Tooth) = IPR / # of Teeth

CUTTING DATA

S407HA

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.1-1.4** Alloy Steels			
	AMG 3.1-3.3 Cast Iron (up to 30 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	12,735	10.2	417	0.0008
3/16	8,490	10.9	417	0.0013
1/4	6,370	11.5	417	0.0018
5/16	5,100	13	418	0.0025
3/8	4,245	18.4	417	0.0043
7/16	4,010	24.5	460	0.0061
1/2	3,500	25.9	459	0.0074
9/16	3,110	26	458	0.0084
5/8	2,800	26.1	459	0.0093
3/4	2,340	24	460	0.0103
1"	1,755	17.4	460	0.0099

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

SLOTTING & SIDE CUTTING

Materials:	**AMG 1.4-1.6** Alloy Steels			
	AMG 3.2-3.4 Cast Iron (from 30 HRC to 40 HRC)			
"D" Tool Dia.	**RPM**	**IPM**	**SFM**	**IPR**
1/8	8,910	7.1	292	0.0008
3/16	5,940	7.6	292	0.0013
1/4	4,460	8.1	292	0.0018
5/16	3,560	9.1	291	0.0026
3/8	2,970	12.7	292	0.0043
7/16	2,800	17	321	0.0061
1/2	2,460	18	322	0.0073
9/16	2,180	18.1	321	0.0083
5/8	1,960	18.3	321	0.0093
3/4	1,640	16.7	322	0.0102
1"	1,230	12.2	322	0.0099

Axial DOC (maximum) = 1 x D (Slotting)
Axial DOC (maximum) = 1.5 x D (Side Cutting)
Radial DOC (maximum) = 0.5 x D (Side Cutting)

MILLING TROUBLESHOOTING GUIDE

Problem	***Solution***	
Chipping of the Cutting Edge	• Apply hone .0005" to .001" • Try air blow or coolant • Reduce depth of cut • Check amount of wear on collet	•Reduce feed per tooth •If wet cutting, change to dry cutting •Check tool runout •Improve the stability of the work-holding
Extreme Flank Wear	• Use coated end mill • If conventional milling, change to climb • If using water soluble cutting fluid, change to non-water soluble cutting fluid	•Increase helix angle •If conventional milling, change to climb
Vibration / Chattering	• Use larger diameter end mill • Increase feed per tooth • Increase helix angle • Reduce length of flutes or overhang	• Reduce cutting speed • Check or change the holder • Increase number of flutes • Tighten chuck or use stronger chuck
Deflection	• Reduce depth of cut • Increase feed per tooth • Increase helix angle • If using water soluble cutting fluid, change to non-water soluble cutting fluid	• Use larger diameter end mill • Reduce length of flutes or overhang • If using 2-flute type, change to 4-flute type • If climb milling, change to conventional milling
Poor Surface Finish	• Reduce end mill runout • Increase cutting speed • Reduce feed per tooth • Use small hone .0003" to .0006" • Increase helix angle	•Increase number of flutes •Increase volume of air or cutting fluid •Reduce depth of cut •If dry cutting, change to wet cutting
Waviness	• Reduce helix angle • Check end mill runout	•Reduce depth of cut •Check or change the holder
End Mill Fracturing	• Reduce depth of cut • Reduce feed per tooth	•Reduce length of flutes or overhang •If chip jamming occurs, reduce the number of flutes
Poor Chip Disposal	• Use air blow • Reduce depth of cut • Reduce feed per tooth	•Reduce the number of flutes •Increase volume of air or cutting fluid •Increase cutting speed
Burring Workpiece Chipping	• Reduce helix angle • Reduce feed per tooth	•Reduce depth of cut
Chip Welding	• Use coolant • Use coated end mill	•Increase volume of cutting fluid •Increase helix angle



APPLICATION MATERIAL GROUP (AMG) CHART WITH MATERIAL EXAMPLES

Application Material Groups (AMG)			Hardness HRC
1. Steel	1.1 Magnetic soft steel	12L14, 12L15	<120 HB
	1.2 Structural Steel/ case carburising steel	1005-1025, 1214, 1215, A36	<200 HB
	1.3 Plain Carbon steel	1030-1060, 1050-1060, 1144-1146	<24
	1.4 Alloy steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	<24
	1.5 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>24<38
	1.6 Alloy steel/ Hardened and tempered steel	4140,4340,52100,8620 H11-H41,A2,D2,01,P20,420	>38
	1.7 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	49-55
	1.8 Alloy steel Hardened	A2-D2, H10-H41, L1-L6, M1-M42, T1	55-63
2.Stainless Steel	2.1 Free machining Stainless Steel	200, 303, 416, 420F, 430F, 440	<24
	2.2 Austenitic	301, 302, 304, 316, 321, 330, CUSTOM 455, AM-350	<24
	2.3 Ferritic + Austenitic, Martensitic	318-329, 400-446, DUPLEX	<32
	2.4 Precipitation Hardened	15-5PH, Custom 450 17-4PH	<32
3.Cast Iron	3.1 Lamellar graphite	Grey, G10, Gg40, J431C, A48 CLASS 20	<150 HB
	3.2 Lamellar graphite	Grey, GG25-Gg40, J158, A48 CLASS 40-60	>150 HB<32
	3.3 Nodular graphite/ Malleable Cast Iron	A220, A436, A439, A602, Black, GGG40-GGG70	<200 HB
	3.4 Nodular graphite/ Malleable Cast Iron	Black Gts/Gtw, J434C	>200 HB<32
4.Titanium	4.1 Titanium, unalloyed	Commercially Pure	<200 HB
	4.2 Titanium, alloyed	6AI4V, 6A14V-2Sn, Monel, Monel K	<28
	4.3 Titanium, alloyed	6AI4V-4Mo, 7A14V-4Mo, 4911-4967	>28<38
5.Nickel	5.1 Nickel, unalloyed	Commercially Pure, 17644, 200, 5553	<150 HB
	5.2 Nickel, alloyed	Monel 400, Hastelloy C, Inconel 625, Waspaloy	<28
	5.3 Nickel, alloyed	Iconel 718,Nimonic 75-95,Rene 41,Iconel 825,A286	>28<38
6.Copper	6.1 Copper	Commercially Pure	<100 HB
	6.2 ß-Brass, Bronze	314-340, 350-370	<200 HB
	6.3 α-Brass	Alloyed Cu + Al + Fe, Long Chipping	<200 HB
	6.4 High Strength Bronze	Ampco 18-25	<49
7.Aluminium Magnesium	7.1 Al, Mg, unalloyed	Commercially Pure	<100 HB
	7.2 Al alloyed, Si<0.5%	6061 T6, 7075, 314-340	<150 HB
	7.3 Al alloyed, Si>0.5%<10%	6061 T6, 380-390	<120 HB
	7.4 Al alloyed, Si>10% Mg alloys	Magnesium Whisker Reinforced	<120 HB
8.Synthetic Materials	8.1 Thermoplastics	Ultramid, Polystrol	---
	8.2 Thermosetting plastics	Bakelit, Pertinax	---
	8.3 Reinforced plastic materials	CFK, GFKAFK	---
9.Hard Mat.	9.1 Cermets (Metal-ceramics)	Ferrotic	<54
10.Graphite	10.1 Standard graphite		---

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
209	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F
0860	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1290	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1511	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
1813	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
209CO	115J	98H	89G	75F	56E	33D			79E	36G	56C		115J	92G	72E	56E	92G
2A	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
2AB	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
2ACO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
4ASM	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
4ASMCO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
500-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
500-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
501-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
501-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
502-12			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
502-6			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
5ATL	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
5ATS	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F
76HA	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A002	154J	131J	115F	98F	59F	33E			66F	39G	52C		131J	98E	92E	85E	75F
A012	154J	131J	115F	98F	59F	33E			66F	39G	52C		131J	98E	92E	85E	75F
A022	115K	105K	82I	75H	52G	33E			49G	26I	30E		105K	82I	66G	52G	82I
A100	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
A101	35H	30H	25F	20F	13E	9D			15E	8G	9C		30H	24F	20E	14E	23E
A108	115I	98I	82G	66F	43E	30D			49E	30G	33D		98H	79F	66E	46E	82G
A125	79E	72E	52C	49C	20A	16A			30C	13E	26A		72G	59D	43C	30C	36D
A160	197E	197E	180D	164D	131C	121A			131B	115C	115A		164C	131A	115A	98A	115A
A170	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
A217	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A218	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A221	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A225	115I	98I	82G	66F	43E	30D			49E	26G	33C		98I	79F	66E	46E	79F
A243			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
A244			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
A245	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
A345	79G	72G	56E	49D	20C	16B			39C	13E	26A		72G	59D	43C	30C	49D
A350	89I	82I	66G	52F	33E	20D			43E	13G	26C		85I	66F	59E	36E	52F
A510	187M	154M	131K	98H	69F	36D			92G	46I	62G		138K	105J	92J	82F	105G
A520	187M	154M	131K	105I	69G	36E			98I	52I	66G		157M	121K	98J	85F	112I
A530	154I	131I	98F	89F	66E	33D			79E	43G	66C		118I	92E	89E	72E	105F
A553	279L	230L	197L	148H	92F	49D			131G	62I	89G		230K	164J	148J	138F	148G
A554	279L	230L	197L	148H	92F	49D			131G	62I	89G		230K	164J	148J	138F	148G
A720	115A	98A	89A	75A	56A	33A			72A	33A	49A		98A	79A	66A	46A	75A
A900	125H	108H	85H	85H	69E	52E			49E	23E	30C		79J	62J	62J	46I	72E
A901	197J	164J	144I	144I	108G	85G			56E	30E	36C		190I	154I	112J	92I	115G
A920	131J	112J	105I	105I	75E	62E			49F	23F	30D		112L	85L	85L	62J	98G
A921	197M	171M	174J	174J	125G	98G			56F	30F	36D		174L	138L	138L	118J	157I
A940	125F	108F	72G	72G	56C	39C			49C	23E	30B			52I	52I	39H	59E
A941	174G	151G	118G	118G	75D	56D			56C	30E	36B		118I	98I	98I	79H	82F
A951	89G	72G	62E	49D	26C	20B			39C	20E	39A		72G	52D	43C	30C	59D
A952	89G	72G	62E	49D	26C	20B			39C	20E	39A		72G	52D	43C	30C	59D
A976	102C	85C	72C	72C	39A	33A			39B	23C	26A			75C	52C	36A	49C
A977	102B	85B	72B	72B	39A	33A			39B	23B	26A			75B	52B	36A	49B
A978	102A	85A	72A	72A	39A	33A			39A	23A	26A			75A	52A	36A	49A
ATR41			82F	66F	43E	30D			49E	26G	30C		98I	79F	66E	46E	75F
CO500-12						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO500-6						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO501-12						20B			95H	56F	56D	30D	161H	85H	85F	56D	
CO501-6						20B			95H	56F	56D	30D	161H	85H	85F	56D	
D33F	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33L	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33M	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D33W	279S	246S	246S	230S	148S	148S	98S	98S	98S				246T	246T	180T	180T	
D444	197E	197E	180D	164D	131C	121A			131B	115C	115A		164C	131A	115A	98A	115A
DC	279S	246S	246S	230S	148S	148S	98S	98S					246T	246T	180T	180T	
DS-90	279S	246S	246S	230S	148S	148S	98S	98S	174S	148S			246T	246T	180T	180T	148T

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
209	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	
0860	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1290	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1511	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
1813	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
209CO	66D	36C	49G	23E	20B	125L	131J	89H	69F	108J	98I	98H	89F	115K	92J	66H	16C	
2A	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
2AB	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
2ACO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
4ASM	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
4ASMCO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
500-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
500-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
501-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
501-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
502-12	39D	20B	33G	20E	10A			89H	52G				79F				10B	
502-6	39D	20B	33G	20E	10A			89H	52G				79F				10B	
5ATL	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
5ATS	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	
76HA	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A002	43D	23B	43G	23E	10A	164G	108I	128H	98G	134K	125J	108I	108I	98I	164H	115F	10B	
A012	43D	23B	43G	23E	10A	164G	108I	128H	98G	134K	125J	108I	108I	98I	164H	115F	10B	
A022	46F	26C	43H	26F	13B	118H	125K	89I	52I	131F	105K	105J	82J	98K	115I	56G	13C	
A100	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
A101	12D	6B	10G	6E	3A	33G	35I	27H	16G	33J	30I	27H	24F	30J	28H	14F	3B	
A108	52E	23B	39G	23G	20E	108G	115I	102H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
A125	30B	16A	16E	13C	10A	79D	108G	72F	52D	79H	72G	72F	66E	98H	85F	33D	10A	
A160	115A	82A	98A	82A	66A	180D	230G	197C	164C	164I	148H	131G	115F		197E		30C	
A170	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
A217	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A218	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A221	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A225	43D	23B	33G	16E	13A	115G	108I	89H	52G	108J	98I	89H	72H	98J	92H	46F	10B	
A243	39D	20B	33G	20E	10A			89H	52G				79F				10B	
A244	39D	20B	33G	20E	10A			89H	52G				79F				10B	
A245	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
A345	30B	16A	26E	13C	10A	89D	108G	89F	52D	108H	89G	89F	79F	98J	98H	33F	10A	
A350	30D	16B	26G	13E	10A	108F	115I	115H	52F	108J	82I	89H	82H	115L	85J	39H	10B	
A510	66H	13B	56I	30E	20E	131D	164I	148I	66F	164G	164M	102I	108I	213G	164G	115F		
A520	66G	13B	56I	36G	23E	131E	164I	148K	66F	180I	164M	121K	115I	213G	164G	115F		
A530	59D	43B	43G	20E	10A	197G	180I	131G	115E	180I	148I	115G	92G	164J	164H	115F	10B	
A553	98E	26C	82I	49E	33G	230G	279I	262I	115G	230H	328M	180I	180J	295G				
A554	98E	26C	82I	49E	33G	230G	279I	262I	115G	230H	328M	180I	180J	295G				
A720	56A	26A	33A	23A	13A	115A	131A	115A	89A	115A	98A	89A	89A	157A	82A			
A900	49E	20C	46G	23G	20C	213G	174I	112H	98G	197J	148N	131N	92I	180I	131G			
A901	79G	33E	72I	36I	33E			184I	157I				157I					
A920	59G	33C	49I	30G	20E	213H	216J	131J	102G	246L	148N	131N	118J	180J	131H			
A921	95I	52E	79L	46I	33G			233J	164I				157J					
A940	43C	20C				213F	230F	112G	98G	174H	148N	131N	98G	180H	131F			
A941	59D	26D						157H	138H				138H					
A951	33B	20A	23E	16C	10A	72D	108G	72F	52D	98H	89G	79F	72F	98J	98H	33F	10A	
A952	33B	20A	23E	16C	10A	72D	108G	72F	52D	98H	89G	79F	72F	98J	98H	33F	10A	
A976	36A	16A						98D	89D				89D					
A977	36A	16A						98C	89C				89C					
A978	36A	16A						98B	89B				89B					
ATR41	39D	20B	33G	20E	10A			89H	52G				79F				10B	
CO500-12		20D		20B	16B													
CO500-6		20D		20B	16B													
CO501-12		20D		20B	16B													
CO501-6		20D		20B	16B													
D33F							820V	820V		656V	656V	367V	197V	197X	328V			
D33L							820V	820V		656V	656V	367V	197V	197X	328V			
D33M							820V	820V		656V	656V	367V	197V	197X	328V			
D33W							820V	820V		656V	656V	367V	197V	197X	328V			
D444	115A	82A	98A	82A	66A	180D	230G	197C	164C	164I	148H	131G	115F		197E		30C	
DC							820V	820V		656V	656V	367V	197V	197X	328V			
DS-90	115T	82S	148T	98S	66S	902V	820V	820V	230T	656V	656V	367V	197V	197X	328V			

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
HX10	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
HX15	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
HX18	115H	69H	75I	69H	56F				105I	59H	56F		171L	89I	95H	59F	95H
L10	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
M40CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M41CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M42CO	125K	108H	98G	89G	59F	36E			72F	36H	49D		112K	98F	72F	56F	98G
M51CO	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
M52CO	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
QC0860P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		
QC1290P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		
QC21G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC21GM	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC21P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC21PM	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC41G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC41P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC91G	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC91GM	115F	69F	75H	69F	56D				105H	59F	59D		171H	89H	95F	59D	
QC91P	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
QC91PM	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
R10	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R10A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R10H	108I	92I											82F	66D	52C	33C	49C
R10P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R15	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R15A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R15P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R18	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R18A	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18B	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R18H	108I	92I											82F	66D	52C	33C	49C
R18P	115H	98H	82F	66F	43E	30D			49E	26G	30C		98H	79F	66E	46E	75E
R40	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R40C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R41	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R41C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R42	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R42C	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
R453	443V	394V	361V	328V	262V	213U	98U	82U	246V	115V	98U		394W	394W	262V	262V	180V
R454	410V	361V	295V	262V	197V	164U	98U	82U	148U	131T	115T	115T	295W	295W	230V	230V	164U
R457	443W	394W	361W	328W	262W	213U	98U	82U	246V	115V	98U		394W	394W	262V	262V	180V
R458	410W	361W	295W	262V	197V	164U	98U	82U	148U	131T	115T	115T	295W	295W	230V	230V	164U
R459	443V	394V	361U	328U	262U	180T			246V	115V	98U		394W	394W	262V	262V	
R51	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R510	328W	295W	295W	262W	180V	148V	115T	98S	164V				295X	295X	213W	213W	148V
R51FS																	
R52	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R520	328X	295X	295X	262X	180X	148W	115U	98T	164W				295Y	295Y	213X	213X	197W
R55	89G	82G	66E	52E	30D	20B			33D	20F	13B		92H	69E	49D	43D	56E
R56	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R56CO	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R57	115H	98H	82F	66E	43D	30C			49D	23F	23B		89H	72E	62D	39D	56E
R58	98F	59F	66H	59F	46D				89H	49F	49D		151H	79H	79F		89H
R88CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R89CO	115J	98H	89G	79F	56E	33D			72E	36G	49C		115H	92D	72E	56E	92F
R950 3x			328W	279W	279W	230U						115T			289V	289V	
R950 5x			328V	279V	279V	213U						115S			279V	279V	
R950 8x			295U	246U	246U	197T						98S			262U	262U	
R960 3x	361W	328W							197V	164T	131T		394V	380V			148T
R960 5x	361V	328V							164V	164S	131S		374V	354V			148T
R960 8x	328U	295U							148U	131S	115S		348U	328U			115S
S209	115I	98I	82F	66F	39E	30D			49E	30G	33C		98I	79E	66E	46E	75F

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
HX10	75H		59H															
HX15	75H		59H															
HX18	75H		59H															
L10	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
M40CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M41CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M42CO	59F	33C	49H	30F	20C	125I	131K	89J	52I	115K	108J	102I	98G	115M	92K	56I	20C	
M51CO	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
M52CO	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
QC0860P			49F				79H	75H		348H	325H		276H	151D	125D			
QC1290P			49F				79H	75H		348H	325H		276H	151D	125D			
QC21G			59H			98I	89H	89H		400H	351H		315H					
QC21GM			59H			98I	89H	89H		400H	351H		315H					
QC21P	49F		49F			89I	79H	79H		351H	325H		276H					
QC21PM	49F		49F			89I	79H	79H		351H	325H		276H					
QC41G			59H			98I	89H	89H										
QC41P	49F		49F			89I	79H	79H		351H	325H		276H					
QC91G			59H			98I	89H	89H		400H	351H		315H					
QC91GM			59H			98I	89H	89H		400H	351H		315H					
QC91P	49F		49F			89I	79H	79H		351H	325H		276H					
QC91PM	49F		49F			89I	79H	79H		351H	325H		276H					
R10	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R10A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R10H			23E			115H	118G			148J	115J	98G	95G	138J	131I	66G		
R10P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R15	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R15A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R15P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R18	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R18A	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18B	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R18H			23E			115H	118G			148J	115J	98G	95G	138J	131I	66G		
R18P	39D	20B	33G	20E	10A	108G	115I	89H	52G	108J	98I	89H	79F	98J	92H	46F	10B	
R40	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R40C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R41	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R41C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R42	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R42C	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
R453	148V	131U				410W	722W	722W	328V	820W	820W	656V	492V					
R454	131U	115T				328V	656V	656V	262U	738W	738W	590V	394V					
R457	148V	131U				410W	722W	722W	328V	820W	820W	656V	492V					
R458	131U	115T				328V	656V	656V	262U	738W	738W	590V	394V					
R459						410V	722V	722V	328U	935W	935W	623V	312V					
R51	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R510			164V							738Y	738Y	492X	213X	246X	377V			
R51FS						89I				348H	325H		276H					
R52	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R520	148V	115U	164W							738Z	738Z	492Y	213Y	246Z	377V			
R55	30C	13A	26F	13D	10A	98E	105H	89G	52E	105I	89H	89G	82E	115I	85G	39E	10A	
R56	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R56CO	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R57	30C	16A	26F	13D	10A	115F	108H	89G	52F	108I	98H	89G	72G	98I	92G	46E	10A	
R58	49F		49F	23F	13B	108F	115H	115H	52F	85I	98H	92H	75H	98I	92I	46H	10B	
R88CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R89CO	66D	36C	49G	23E	20B	125H	131F	89H	69F	108J	98I	98H	89F				20C	
R950 3x																		
R950 5x																		
R950 8x																		
R960 3x	115T	98S	115T	98S	82S													
R960 5x	115T	98S	115T	98S	82S													
R960 8x	98S	82S	98S	82S	66S													
S209	43D	23B	33G	23E	13A	108F	115I	115H	52F	85J	98I	92H	75H	98K	92J	46H	10B	

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
SPL-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPL-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPLG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPLG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPR-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPR-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPRG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPRG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPS-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPS-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPSG-120	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
SPSG-90	115E	98E	89C	69C	46C	33B			52C	30D	33B		105E	89C	66C	52B	89C
TS10	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS18	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS41	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS51	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G
TS52	115J	98J	89G	69G	46F	33E			52F	30H	33D		105J	89G	66F	52F	89G

Calculations:
(inch)

RPM	=	SFM/D x 3.82
SFM	=	RPM x D x .262
IPM	=	IPR x RPM
IPR	=	IPM ÷ RPM
Inch	=	mm x .0394

Terms:

D	=	Drill Diameter
RPM	=	Revolutions Per Minute
SFM	=	Surface Feet per Minute
IPM	=	Inches Per Minute
IPR	=	Inches Per Revolution

APPLICATION MATERIAL GROUPS - DRILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see page 573. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
SPL-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPL-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPLG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPLG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPR-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPR-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPRG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPRG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPS-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPS-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPSG-120	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
SPSG-90	39B	23A	43D	26C	13A	89D	108E	89D	52D	108E	98E	98D	82D	98F	115E	56D	39A	
TS10	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS18	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS41	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS51	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	
TS52	52E	26C	43H	26F	13B	118H	125J	89I	52H	108K	98J	98I	82I	98K	115I	56G	13C	

Feed Rate Chart - Drills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
2. Find the closest diameter for your cutting application on the chart to find your IPR

Alpha Code	Feed in Inches per Revolution (IPR) ± 25% — Ø Diameter																
	1mm/ 1/32”	2mm/ 3/32”	3mm/ 1/8”	4mm/ 5/32”	5mm/ 3/16”	6mm/ 1/4”	8mm/ 5/16”	10mm/ 3/8”	12mm/ 1/2”	15mm/ 9/16”	16mm/ 5/8”	20mm/ 3/4”	25mm/ 1”	30mm/ 1.1/8”	40mm/ 1.5/8”	50mm/ 2”
A	0.0004	0.0009	0.0011	0.0013	0.0014	0.0017	0.0021	0.0024	0.0027	0.0032	0.0034	0.0043	0.0049	0.0053	0.0061	0.0069
B	0.0006	0.0011	0.0015	0.0016	0.0018	0.0021	0.0026	0.0031	0.0035	0.0041	0.0043	0.0053	0.0060	0.0065	0.0074	0.0082
C	0.0006	0.0013	0.0017	0.0020	0.0022	0.0025	0.0031	0.0039	0.0043	0.0049	0.0051	0.0063	0.0071	0.0077	0.0087	0.0094
D	0.0006	0.0015	0.0021	0.0024	0.0027	0.0031	0.0039	0.0047	0.0051	0.0059	0.0061	0.0074	0.0083	0.0090	0.0100	0.0108
E	0.0007	0.0017	0.0024	0.0028	0.0031	0.0037	0.0045	0.0055	0.0059	0.0068	0.0071	0.0085	0.0094	0.0102	0.0112	0.0122
F	0.0007	0.0020	0.0029	0.0033	0.0037	0.0043	0.0054	0.0065	0.0070	0.0080	0.0083	0.0098	0.0108	0.0116	0.0126	0.0135
G	0.0007	0.0022	0.0033	0.0038	0.0043	0.0050	0.0063	0.0075	0.0081	0.0091	0.0094	0.0110	0.0122	0.0130	0.0140	0.0148
H	0.0008	0.0026	0.0040	0.0046	0.0051	0.0059	0.0075	0.0090	0.0096	0.0107	0.0110	0.0126	0.0140	0.0148	0.0157	0.0165
I	0.0008	0.0030	0.0047	0.0053	0.0059	0.0068	0.0087	0.0104	0.0110	0.0122	0.0126	0.0142	0.0157	0.0165	0.0173	0.0181
J	0.0009	0.0033	0.0053	0.0060	0.0067	0.0078	0.0098	0.0117	0.0124	0.0137	0.0142	0.0159	0.0175	0.0183	0.0191	0.0198
K	0.0010	0.0036	0.0059	0.0067	0.0075	0.0087	0.0110	0.0130	0.0138	0.0153	0.0157	0.0177	0.0193	0.0201	0.0209	0.0215
L	0.0011	0.0040	0.0065	0.0073	0.0082	0.0094	0.0120	0.0142	0.0152	0.0165	0.0169	0.0191	0.0207	0.0215	0.0224	0.0231
M	0.0012	0.0043	0.0071	0.0080	0.0089	0.0102	0.0130	0.0154	0.0165	0.0177	0.0181	0.0205	0.0220	0.0228	0.0238	0.0248
N	0.0013	0.0047	0.0077	0.0086	0.0095	0.0110	0.0140	0.0165	0.0179	0.0189	0.0193	0.0219	0.0234	0.0242	0.0253	0.0265
S	0.0003	0.0006	0.0008	0.0010	0.0012	0.0015	0.0020	0.0031	0.0039	0.0048	0.0051	0.0059	0.0070	0.0070	0.0090	
T	0.0006	0.0011	0.0016	0.0020	0.0024	0.0028	0.0035	0.0043	0.0051	0.0063	0.0067	0.0075	0.0080	0.0090	0.0100	
U	0.0010	0.0019	0.0028	0.0031	0.0035	0.0042	0.0055	0.0067	0.0079	0.0088	0.0091	0.0094	0.0110	0.0120	0.0140	
V	0.0015	0.0027	0.0039	0.0045	0.0051	0.0060	0.0079	0.0098	0.0110	0.0122	0.0126	0.0134	0.0160	0.0170	0.0200	
W	0.0019	0.0035	0.0051	0.0059	0.0067	0.0079	0.0102	0.0130	0.0150	0.0165	0.0169	0.0177	0.0190	0.0190	0.0200	
X	0.0022	0.0041	0.0059	0.0071	0.0083	0.0098	0.0130	0.0165	0.0189	0.0210	0.0217	0.0228				
Y	0.0027	0.0049	0.0071	0.0087	0.0102	0.0125	0.0169	0.0217	0.0276	0.0276	0.0276	0.0291				
Z	0.0037	0.0068	0.0098	0.0128	0.0157	0.0210	0.0315	0.0394	0.0433	0.0463	0.0472	0.0472				

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
1500	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500A	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500L	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1500OV	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1505	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1508	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1519	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1528	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1534	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1534NE	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1534NR	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1541	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1542	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1543	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1544													65	40	40	25	
1545	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1545A	60	45	30	30	20	10			25	15	15						20
1548	60	50	35	35					25	20	20						20
1549	60	50	35	35					25	20	20						20
1567	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1568	45	35	25	15	10				25	15	15						20
1572	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1578	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1580	120	100	60	60	40				50	30	40						40
1582	60	50	35	35					25	20	20						20
1585	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1585A	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1585NR	65	60	40	40	25	15			20	13	10		50	30	30	20	20
1585OV	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1586	60	50	35	35					26	20	20						20
1587																	
1588																	
1590	70	60	40	40	30				30	26	20						20
1591	70	60	40	40	30				30	26	20						20
1592	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1593	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1595	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1599													65	40	40	25	
1599SB													65	40	40	25	
1600													65	40	40	25	
1629AP					45	25						30	90	70	65	35	
1630AP					45	25						30	90	70	65	35	
1634	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1641	150	125	90	90					70	60	50						60
1659AP					45	25						30	90	70	65	35	
1660AP					45	25						30	90	70	65	35	
1671	150	125	90	90					70	60	50						60
1672AP	110	90	55	55	45				50	40	40						35
1673AP	110	90	55	55	45				50	40	40						35
1674	120	100	65	65	50				60	40	45						40
1675	120	100	65	65	50				60	40	45						40
1676AP	100	80	50	50	40				45	30	35						30
1677AP	100	80	50	50	40				45	30	35						30
1678	110	90	55	55	45				50	40	40						35
1679	110	90	55	55	45				50	40	40						35
1681AP	150	125	90	90					70	50	60						60
1687AP	150	125	90	90					70	50	60						60
1691AP	165	135	100	100					80	70	60						70
1697AP	165	135	100	100					80	70	60						70
1700M	60	45	30	30	20	10			25	15	15		50	30	30	15	20
1785M	65	60	40	40	25	15			30	20	20		50	30	30	20	20
1785NR	66	59	46	33	16	10			20	13	10		46	26	26	16	

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
1500	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500A	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500L	15		20	10		25	80	60	10	50	100	75	20	25	15			
1500OV	15		20	10		25	80	60	10	50	100	75	20	25	15			
1505	15		20	10		25	80	60	10	50	100	75	20	25	15			
1508	15		20	10		25	80	60	10	50	100	75	20	25	15			
1519	15		20	10		25	80	60	10	50	100	75	20	25	15			
1528	15		20	10		25	80	60	10	50	100	75	20	25	15			
1534	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1534NE	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1534NR	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1541	15		20	10		25	80	60	10	50	100	75	20	25	15			
1542	15		20	10		25	80	60	10	50	100	75	20	25	15			
1543	15		20	10		25	80	60	10	50	100	75	20	25	15			
1544									15									
1545	15		20	10		25	80	60	10	50	100	75	20	25	15			
1545A	15		20	10		25	80	60	10	50	100	75	20	25	15			
1548	15	5	20	15														
1549	15	5	20	15														
1567	15		20	10		25	80	60	10	50	100	75	20	25	15			
1568	10		20	10		30	50	50		50	75	50		25	15			
1572	15		20	10		25	80	60	10	50	100	75	20	25	15			
1578	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1580	30		40			50	150	120		100	200	125						
1582	15	5	20	15														
1585	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585A	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585NR	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1585OV	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1586	15	5	20	15														
1587						30	80	60		50	60	60						
1588						30	80	60		50	60	60						
1590	15	5			10													
1591	15	5			10													
1592	15		20	10		25	80	60	10	50	100	75	20	25	15			
1593	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1595	15		20	10		25	80	60	10	50	100	75	20	25	15			
1599									15									
1599SB									15									
1600									15									
1629AP		10			15				25									
1630AP		10			15				25									
1634	16	7	26	10		30	89	69	10	49	98	66	20	98	26			
1641			45			55	180	130		180	200	230						
1659AP		10			15				25									
1660AP		10			15				25									
1671			45			55	180	130		180	200	230						
1672AP	25		35	20		45	120	100		85	100	85	30					
1673AP	25		35	20		45	120	100		85	100	85	30					
1674	30		40	25		50	125	110		95	120	95	40					
1675	30		40	25		50	125	110		95	120	95	40					
1676AP	20		30	15		40	100	90		80	95	80	30					
1677AP	20		30	15		40	100	90		80	95	80	30					
1678	25		35	20		45	120	100		85	100	85	30					
1679	25		35	20		45	120	100		85	100	85	30					
1681AP			45			55	180	130		180	200	230						
1687AP			45			55	180	130		180	200	230						
1691AP			55			70	200	160		200	240	260						
1697AP			55			70	200	160		200	240	260						
1700M	15		20	10		25	80	60	10	50	100	75	20	25	15			
1785M	15	5	25	10		30	90	70	10	70	100	75	20	90	25			
1785NR		10	33	13		33		49		33	82	43	33	66				

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
1788(M)																	
1985	75	69	49	49	30	16			36	20							20
1994	82	72	59	49										26			
3300	98	79	49	49	30				39	30							30
3306E	98	79	49	49	30				39	30							30
6541	16	16	23	20	13								23	16	23	16	
E000	82	72	59	52	33	16							49	26	49	26	33
E000TIN	131	131	105	89	43	36			26	23	16		72	23	16		49
E001	82	72	59	52	33	16			23	20	13		49	26	49	26	
E002	82	72	59	52	33												33
E003	82	72	59	52	33				23	20	13						
E005	82	72	59	52	33	16							49	26	49	26	33
E006	82	72	59	52	33	16			26	23	16		49	26	49	26	
E007	82	72	59	52	33												33
E008	82	72	59	52	33				23	20	13						
E011	82	72	59	52	33	16			23	20	13		49	26	49	26	
E013	82	72	59	52	33				23	20	13						
E016	82	72	59	52	33	16			26	23	16		49	26	49	26	
E018	82	72	59	52	33				23	20	13						
E021	82	72	59	52	33	16			23	20	13		49	26	49	26	
E023	82	72	59	52	33				23	20	13						
E025	82	72	59	52	33	16							49	26	49	26	33
E026	82	72	59	52	33	16			26	23	16		49	26	49	26	
E027	82	72	59	52	33												33
E028	82	72	59	52	33				23	20	13						
E031	82	72	59	52	33	16			23	20	13		49	26	49	26	
E033	82	72	59	52	33	16			23	20	13						
E035	82	72	59	52	33	16							49	26	49	26	33
E036	82	72	59	52	33	16			26	23	16		49	26	49	26	
E037	82	72	59	52	33	16											33
E038	82	72	59	52	33	16			23	20	13						
E041	82	72	59	52	33	16			23	20	13		49	26	49	26	
E043	82	72	59	52	33	16			23	20	13						
E052	82	72	59	52	33												
E061	72	66	52	39	23	13							39	23	33	16	
E071	72	66	52	39	23	13							39	23	33	16	
E201													49	26	49	26	
E252													49	26	49	26	
E500	23	20	16	13	10								39	23	33	16	
E501	23	20	16	13	10								39	23	33	16	
E504	46	39	33	26	20								59	39	72	39	
E513	23	20	16	13	10								39	23	33	16	
E547	23	20	16	13	10								39	23	33	16	
E550	72	66	52	39	23	13			23	16	23		39	23	33	16	
E620	23	20	16	13	10								39	23	33	16	
E621		59	46	33	16				20	13	10						
E650	82	72	59	49										26			
E651	82	72	59	49										26			
E653	82	72	59	49										26			
E654	82	72	59	49										26			
E710	13	13	20	16	10								20	13	20	13	
E711	13	13	20	16	10								20	13	20	13	
E712	13	13	20	16	10								20	13	20	13	
E721	13	13	20	16	10								20	13	20	13	
EP006H	82	72	59	52	33	16							49	26	49	26	33
EP016H	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP10	82	72	59	52	33	16							49	26	49	26	33
EP11	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP20	82	72	59	52	33	16							49	26	49	26	33
EP21	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP30	82	72	59	52	33	16							49	26	49	26	33
EP31	82	72	59	52	33	16			23	20	13		49	26	49	26	
EP40	82	72	59	52	33	16							49	26	49	26	33

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
1788(M)						30	79	79		49	66	66						
1985	16	7	30	16	10													
1994							98	66		59	115			98				
3300	26		30			39	121	98		79	161	98						
3306E	26		30			39	121	98		79	161	98						
6541							39					39	26	16				
E000	16		39	16		39	98	66		52	115	66	49	98				
E000TIN	23		59	26		59	148	115				98	72		148			
E001																		
E002	16		39	16						52	115	66	49					
E003																		
E005	16		39	16		39	98	66		52	115	66	49	98				
E006																		
E007	16		39	16						52	115	66	49					
E008																		
E011																		
E013																		
E016																		
E018																		
E021																		
E023																		
E025	16		39	16		39	98	66		52	115	66	49	98				
E026																		
E027	16		39	16		39	98	66		52	115	66	49	98				
E028																		
E031																		
E033																		
E035	16		39	16		39	98	66		52	115	66	49	98				
E036																		
E037	16		39	16						52	115	66	49	98				
E038																		
E041																		
E043																		
E052						39	98	66		52	115	66	49					
E061						39	98	66				66	49		39	23		
E071						39	98	66				66	49		39	23		
E201							66		16				49		33			
E252							66		16				49		33			
E500						13	33	23	7		39	23	16		16	10		
E501						13	33	23	7		39	23	16		16	10		
E504							66	46	13		79	46	33		33	20		
E513						13	33	23	7		39	23	16		16	10		
E547						13	33	23	7		39	23	16		16	10		
E550						39	98	66	13		115	66	49		39	23		
E620						13	33	23	7		39	23	16		16	10		
E621				13						33	82	43	33					
E650							98	66		59	115			98				
E651							98	66		59	115			98				
E653							98	66		59	115			98				
E654							98	66		59	115			98				
E710							36					36	23	13				
E711							36					36	23	13				
E712							36					36	23	13				
E721							36					36	23	13				
EP006H	16		39	16		39	98	66		52	115	66	49	98				
EP016H																		
EP10	16		39	16		39	98	66		52	115	66	49	98				
EP11																		
EP20	16		39	16		39	98	66		52	115	66	49	98				
EP21																		
EP30	16		39	16		39	98	66		52	115	66	49	98				
EP31																		
EP40	16		39	16		39	98	66		52	115	66	49	98				

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
EP41	82	72	59	52	33	16			23	20	13		49	26	49	26	
EX006H	82	72	59	52	33												33
EX016H	82	72	59	52	33				23	20	13						
EX10	82	72	59	52	33												33
EX11	82	72	59	52	33				23	20	13						
EX20	82	72	59	52	33												33
EX21	82	72	59	52	33				23	20	13						
EX30	82	72	59	52	33												33
EX31	82	72	59	52	33				23	20	13						
EX40	82	72	59	52	33												33
EX41	82	72	59	52	33				23	20	13						
TN1500	59	46	30	30	20	10			26	26	16		49	30	30	16	20
TN1534	79	75	49	49	30	20			39	26	26		49	30	30	20	
TN1541	16	16	23	20	13								23	16	23	16	
TN1543	16	16	23	20	13								23	16	23	16	
TN1585	79	75	49	49	30	20			39	26	26		49	30	30	20	
TN1785	79	75	49	49	30	20			39	26	26		49	30	30	20	
U1511	39	33	26	20	16								46	26	39		

APPLICATION MATERIAL GROUPS - DIES
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
2010	26	23	20	16					13	7			26	23	20	16	
2025	26	23	20	16					13	7			26	23	20	16	
2325M	26	23	20	16					13	7			26	23	20	16	
2510	26	23	20	16					13	7			26	23	20	16	
2710M	26	23	20	16					13	7			26	23	20	16	
F201	26	23	20	16					13	7			26	23	20	16	
F302	26	23	20	16					13	7			26	23	20	16	
F312	26	23	20	16					13	7			26	23	20	16	
F320	26	23	20	16					13	7			26	23	20	16	
F330	26	23	20	16					13	7			26	23	20	16	
F370	26	23	20	16					13	7			26	23	20	16	

APPLICATION MATERIAL GROUPS - TAPS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
EP41																		
EX006H	16		39	16						52	115	66	49					
EX016H																		
EX10	16		39	16						52	115	66	49					
EX11																		
EX20	16		39	16						52	115	66	49					
EX21																		
EX30	16		39	16						52	115	66	49					
EX31																		
EX40	16		39	16						52	115	66	49	98				
EX41																		
TN1500	16		20	10		26	79	59	10	49	98	75	20	30	16			
TN1534			30	13		39	115	89	13	66	125	79	26	121	30			
TN1541							39					39	26	16				
TN1543							39					39	26	16				
TN1585			30	13		39	115	89	13	66	125	79	26	121	30			
TN1785			30	13		39	115	89	13	66	125	79	26	121	30			
U1511							52	39			66	39			26			

APPLICATION MATERIAL GROUPS - DIES
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
2010		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2025		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2325M		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2510		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
2710M		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F201		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F302		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F312		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F320		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F330		7	30	7	7	30	26	23		33	49	49	33	49	33	16		
F370		7	30	7	7	30	26	23		33	49	49	33	49	33	16		

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
883	66P	66P	52P	46P	33P	26P			43P	30P	20R	16R	59R	49R	52R	33R	52N
905	112S	89S	79T										89S	72S	89T		62V
920	98A	89A	75B										82A	66A	82B		59D
923	98A	89A	75B										82A	66A	82B		59D
930		131A	115B	98B	66C					62F				75A	131B	82B	92D
940	115S	92S	79T	69T					52Y				92S	75S	92T	56T	62V
945	164S	131S	115T	98T					75Y				92S	75S	131T	82T	92V
948	115S	92S	79T	69T					52Y				92S	75S	92T	56T	62V
960	164S	131S	115T	98T					75Y				92S	75S	131T	82T	92V
963	164A	131A	115B	98B					75F				92A	75A	131B	82B	92D
980	164A	131A	115B						75F	62F							92D
981	148A	118A	102B						66F	56F							82D
9002	164G	131G	115H	98H					75L				92G	75G	131H	82H	92J
9003	164G	131G	115H	98H					75L				92G	75G	131H	82H	92J
9008	148G	118G	102H	89H					66L				82G	66G	118H	72H	82J
9009	148G	118G	102H	89H					66L				82G	66G	118H	72H	82J
920K	98A	89A	75B										82A	66A	82B		59D
C110	197A	164A	131B	115B					98F				115A	98A	164B	98B	115D
C123	180A	148A	131B	115B					82F				98A	82A	148B	98B	98D
C247	180S	148S	131T	115T					82Y				98S	82S	148T	82T	98V
C273	164S	164S	115T	98T					33Y				82S	66S	131T	82T	82V
C346	148A	115A	98B	82B					66F				82A	66A	115B	66B	82D
E3302	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
E3302M	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
E3302V	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
E3303	289B	223B	223B	180B	161B	148B			200A	141A	108A		374B	318B	318B	249B	
E3303V	400B	298B	298B	259B	230B	200B			325A	223A	174A		551B	525B	525B	374B	230B
E3304	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
E3304M	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
E3304MV	499B	449B	449B	423B	400B	328B			351A	276A	200A	164A	699B	649B	649B	430B	259B
E3304V	499B	449B	449B	423B	400B	328B			351A	276A	200A	164A	699B	649B	649B	430B	259B
E4302	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
E4304	361B	325B	325B	298B	249B	230B			239A	171A	131A	105A	449B	377B	377B	279B	
E5302	269B	212B	212B	171B	152B	140B			190A	125A	103A	78A	336B	284B	284B	225B	
E5304	343B	312B	312B	287B	238B	205B			220A	156A	123A	97A	405B	338B	338B	254B	
E5304V	474B	425B	425B	406B	380B	313B			338A	251A	182A	140A	650B	578B	578B	415B	245B
E6302	249B	200B	200B	161B	144B	131B			180A	108A	98A	66A	298B	249B	249B	200B	
E6302V	361B	269B	269B	239B	200B	180B			298A	180A	171A	131A	499B	400B	400B	341B	200B
E6304	325B	298B	298B	276B	226B	180B			200A	141A	115A	89A	361B	298B	298B	230B	
E6304V	449B	400B	400B	390B	361B	298B			325A	226A	164A	115A	600B	508B	508B	400B	230B
EB3302	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
EB3302M	289B	223B	223B	180B	161B	148B			200A	141A	108A	89A	374B	318B	318B	249B	
EB3302MV	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
EB3302V	400B	298B	298B	259B	230B	200B			325A	223A	174A	131A	551B	525B	525B	374B	230B
EB3304	361B	325B	325B	298B	249B	230B			239A	171A	131A	98A	449B	377B	377B	279B	
EB3304M	361B	325B	325B	298B	249B	230B			239A	171A	131A	98A	449B	377B	377B	279B	
EB3304MV	499B	449B	449B	423B	400B	328B			351A	276A	200A	148A	699B	649B	649B	430B	259B
EB3304V	499B	449B	449B	423B	400B	328B			351A	276A	200A	148A	699B	649B	649B	430B	259B
EB5302	269B	212B	212B	171B	152B	140B			190A	125A	103A	78A	336B	284B	284B	225B	
EB5304	343B	312B	312B	287B	238B	205B			220A	156A	123A		405B	338B	338B	255B	
EB5304V	450B	412B	412B	387B	363B	288B			288A	233A	176A	135A	500B	540B	540B	384B	230B
EB6302	249B	200B	200B	161B	144B	131B			180A	108A	98A	82A	298B	249B	249B	200B	
EB6302V	361B	269B	269B	239B	200B	180B			298A	180A	171A	89A	499B	400B	400B	341B	200B
EB6304	325B	298B	298B	276B	226B	180B			200A	141A	115A		361B	298B	298B	230B	
EB6304V	400B	374B	374B	351B	325B	249B			226A	190A	151A	121A	499B	430B	430B	338B	200B
TC9002	197G	184G	161H	138H					105L				128G	105G	184H	128H	128J
TC9003	197G	184G	161H	138H					105L				128G	105G	184H	128H	128J

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
883	36P	20O	66P	13O	7M	131P	148P	148P	16M	180R	134R	85R	56R					56R
905	49V		108V	20U		200U	223U	223U		243X	194X	144X		200U				
920	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
923	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
930	75D	33D		43C	20D		410C	410C	49C			295E	197A		410C			
940	52V		108V	20U		203U	223U	223U			197X	148X		203U				
945	75V		157V	43U		410U	410U	410U		984X	984X	295X		410U				
948	52V		108V	20U		203U	223U	223U			197X	148X		203U				
960	75V		157V	43U		410U	410U	410U		984X	984X	295X		410U				
963	75D		157D	43C		410C	410C	410C		984E	984E	295E		410C				
980			157D			410C				984E	984E	295E		410C				
981			141D			367C				886E	886E	266E		367C				
9002	75J		157J	43I		410I	410I	410I			984K	295K		410I				
9003	75J		157J	43I		410I	410I	410I			984K	295K		410I				
9008	66J		141J	36I		367I	367I	367I			886K	266K		367I				
9009	66J		141J	36I		367I	367I	367I			886K	266K		367I				
920K	49D		98D	20C		180C	197C	197C		197E	180E	115E		197C				
C110	82D		197D	49C		279C	279C	279C		722E	722E	279E		295C				
C123	82D		164D	49C		262C	262C	262C		656E	656E	262E		262C				
C247	82V		164V	49U		262U	262U	262U		656X	656X	262X		262U				
C273	66V		148V	33U		230U	230U	230U		590X	590X	230X		230U				
C346	66D		148D	33C		230C	230C	230C		590E	590E			230C				
E3302						649C	499C	499C	125B	1499C	1499C	649C	400B					
E3302M						649C	499C	499C	125B	1499C	1499C	649C	400B					
E3302V	200B	190B	230B	161A	98A													
E3303						649C	499C	499C	125B	1499C	1499C	649C	400B					
E3303V	200B	190B	230B	161A	98A													
E3304						679C	574C	574C	144B	1601C	1601C	708C	479B					
E3304M						679C	574C	574C	144B	1601C	1601C	708C	479B					
E3304MV	230B	200B	266B	200A	131A													
E3304V	230B	200B	266B	200A	131A													
E4302						649C	499C	499C	125B	1499C	1499C	649C	400B					
E4304						679C	574C	574C	144B	1601C	1601C	708C	479B					
E5302						617C	474C	474C	117B	1424C	1424C	617C	380B					
E5304						646C	546C	546C	138B	1525C	1525C	674C	455B					
E5304V	220B	190B	251B	190A	123A													
E6302						584C	449C	449C	108B	1348C	1348C	584C	361B					
E6302V	180B	174B	200B	141A	85A													
E6304						613C	518C	518C	131B	1450C	1450C	640C	430B					
E6304V	210B	180B	236B	180A	115A													
EB3302						649C	499C	499C	125B	1499C	1499C	649C	400B					
EB3302M						649C	499C	499C	125B	1499C	1499C	649C	400B					
EB3302MV	200B	190B	230B	161A	98A													
EB3302V	200B	190B	230B	161A	98A													
EB3304						679C	574C	574C	144B	1601C	1601C	708C	479B					
EB3304M						679C	574C	574C	144B	1601C	1601C	708C	479B					
EB3304MV	230B	200B	266B	200A	131A													
EB3304V	230B	200B	266B	200A	131A													
EB5302						617C	474C	474C	117B	1424C	1424C	617C	380B					
EB5304						646C	546C	546C	137B	1526C	1526C	674C	455B					
EB5304V	210B	180B	238B	176A														
EB6302			148B			584C	449C	449C	108B	1348C	1348C	584C	361B					
EB6302V	180B	174B	200B	141A	85A													
EB6304						613C	518C	518C	131B	1450C	1450C	640C	430B					
EB6304V	190B		210B			699C	571C	571C	180B	1650C	1650C	708C	410B					
TC9002	105J		220J	59I		574I	574I	574I			1378K	413K		574I				
TC9003	105J		220J	59I		574I	574I	574I			1378K	413K		574I				

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
S400HA																	
S401HA																	
S402HA																	
S403HA																	
S404HA																	
S405HA			*	*	*	*	*	*									
S406HA	*	*	*	*	*				*	*	*	*					*
S406HB	*	*	*	*	*				*	*	*	*					*
S407HA	*	*	*	*	*	*							*	*	*	*	

Feed Rate Chart - Solid Carbide End Mills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # Flutes to find your Ft Range.

# of Flutes	Type of Cut	Depth/ Width of Cut	Alpha Code	Feed Per Tooth (Ft) Dia Inches										
				1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4
>4		↕ 1,5 ↔ 0,05	A				0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002
			B				0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.004
			C				0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.007
3-4		↕ 1,5 ↔ 0,1	A	0.001	0.001	0.002	0.002	0.002	0.002	0.003	0.003	0.004	0.004	0.005
			B	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005	0.006	0.007
			C	0.001	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
3-4		↕ 1 ↔ 0,5	A	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002
			B	0.003	0.000	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.004
			C	0.000	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005
2-3		↕ 0,5 ↔ 1	A	0.000	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.003
			B	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004
			C	0.001	0.001	0.001	0.002	0.002	0.003	0.003	0.004	0.004	0.005	0.005
3-4		↕ 0,5 ↔ 1 ↕ 1 ↔ 0,5												
			B				0.001	0.002	0.003	0.003	0.003	0.004	0.004	0.004
2 & 4		↕ 0,1 - 0,5mm ↔ 0,1 - 0,5mm	A											
			BC	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003		
				0.001	0.001	0.001	0.002	0.002	0.002	0.003	0.003	0.004		
4		↕ 0,01 - 0,1 ↔ ≤ 1	A											
			BC				0.002	0.002	0.002	0.003		0.003		
							0.002	0.002	0.003	0.003		0.004		

APPLICATION MATERIAL GROUPS - END MILLS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 582 & 583. For material examples, see page 567.*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
S400HA						*	*	*	*	*	*	*	*	*	*	*		
S401HA						*	*	*	*	*	*	*	*	*	*	*		
S402HA						*	*	*	*	*	*	*	*	*	*	*		
S403HA						*	*	*	*	*	*	*	*	*	*	*		
S404HA						*	*	*	*	*	*	*	*	*	*	*		
S405HA																		
S406HA	*	*	*	*	*													
S406HB	*	*	*	*	*													
S407HA																		

Feed Rate Chart - HSS End Mills

How To Use This Chart to Find Cutting Feed Rate (IPR):

1. Find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code).
2. Find the closest diameter for your cutting application on the chart.
3. Select the type of cut and # Flutes to find your Ft Range.

		Feed per Tooth (Ft) Dia Inches															
Type of Cut	Alpha Code	0.078	1/8	5/32	3/16	1/4	5/16	13/32	1/2	9/16	5/8	11/16	3/4	7/8	1"	1.1/4	1.1/2
 ↕ 0,5D ↔ D	A	0.0003	0.0005	0.0007	0.0009	0.0011	0.0017	0.0024	0.0028	0.0033	0.0038	0.0038	0.0038	0.0039	0.0041	0.0042	0.0043
	B	0.0003	0.0005	0.0006	0.0009	0.0010	0.0015	0.0021	0.0026	0.0030	0.0034	0.0034	0.0034	0.0035	0.0037	0.0037	0.0038
	C	0.0003	0.0004	0.0006	0.0007	0.0009	0.0014	0.0019	0.0023	0.0027	0.0031	0.0031	0.0031	0.0031	0.0033	0.0034	0.0034
	D	0.0003	0.0004	0.0006	0.0008	0.0009	0.0015	0.0020	0.0024	0.0028	0.0032	0.0032	0.0032	0.0033	0.0035	0.0038	0.0040
	E	0.0005	0.0007	0.0009	0.0014	0.0017	0.0025	0.0034	0.0041	0.0048	0.0055	0.0056	0.0006	0.0057	0.0060	0.0066	0.0069
	F	0.0004	0.0005	0.0007	0.0008	0.0010	0.0013	0.0016	0.0020	0.0022	0.0025	0.0028	0.0031	0.0031	0.0033	0.0033	0.0033
 ↕ D ↔ 0,8D	G					0.0010	0.0013	0.0014	0.0017	0.0020	0.0022	0.0025	0.0028	0.0028	0.0021	0.0021	0.0022
	H					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0026	0.0026	0.0019	0.0019	0.0020
	I					0.0008	0.0011	0.0011	0.0014	0.0016	0.0018	0.0020	0.0023	0.0023	0.0017	0.0017	0.0018
	J					0.0009	0.0012	0.0013	0.0015	0.0018	0.0020	0.0023	0.0026	0.0026	0.0019	0.0019	0.0020
	K					0.0014	0.0019	0.0026	0.0031	0.0036	0.0059	0.0035	0.0039	0.0038	0.0043	0.0043	0.0046
	L					0.0004	0.0005	0.0007	0.0008	0.0010	0.0011	0.0012	0.0013	0.0013	0.0013	0.0015	0.0017
 ↕ 1,5D ↔ 0,25D	M	0.0003	0.0005	0.0007	0.0009	0.0012	0.0016	0.0022	0.0027	0.0031	0.0036	0.0041	0.0045	0.0035	0.0041	0.0038	0.0042
	N	0.0003	0.0004	0.0006	0.0008	0.0011	0.0015	0.0020	0.0024	0.0028	0.0032	0.0037	0.0041	0.0024	0.0037	0.0034	0.0038
	O	0.0002	0.0004	0.0006	0.0007	0.0010	0.0013	0.0018	0.0022	0.0026	0.0029	0.0033	0.0036	0.0029	0.0033	0.0031	0.0034
	P	0.0003	0.0004	0.0006	0.0008	0.0011	0.0014	0.0019	0.0023	0.0027	0.0031	0.0015	0.0039	0.0031	0.0035	0.0033	0.0036
	Q	0.0004	0.0006	0.0008	0.0010	0.0015	0.0019	0.0026	0.0031	0.0036	0.0041	0.0035	0.0039	0.0039	0.0044	0.0050	0.0055
	R	0.0005	0.0006	0.0008	0.0010	0.0011	0.0015	0.0019	0.0022	0.0026	0.0029	0.0033	0.0036	0.0036	0.0036	0.0041	0.0043
 ↕ 1,5D ↔ 0,1D	S	0.0004	0.0006	0.0009	0.0011	0.0015	0.0020	0.0028	0.0034	0.0039	0.0045	0.0051	0.0056	0.0044	0.0051	0.0048	0.0052
	T	0.0004	0.0006	0.0008	0.0010	0.0014	0.0018	0.0025	0.0030	0.0035	0.0051	0.0046	0.0051	0.0040	0.0046	0.0043	0.0047
	U	0.0003	0.0005	0.0007	0.0009	0.0013	0.0016	0.0023	0.0028	0.0032	0.0036	0.0041	0.0046	0.0036	0.0041	0.0039	0.0043
	V	0.0004	0.0005	0.0008	0.0010	0.0013	0.0017	0.0024	0.0029	0.0034	0.0039	0.0043	0.0048	0.0038	0.0043	0.0041	0.0045
	X	0.0005	0.0007	0.0010	0.0013	0.0018	0.0023	0.0032	0.0039	0.0045	0.0052	0.0044	0.0049	0.0048	0.0055	0.0062	0.0068
	Y	0.0006	0.0008	0.0010	0.0012	0.0014	0.0019	0.0023	0.0028	0.0024	0.0036	0.0041	0.0045	0.0045	0.0045	0.0051	0.0054

Easy Calculations: (inch)
RPM = SFM/D x 3.82 **F** = Ft x T x RPM
RPM = [(m/min.) x 1000] ÷ (3.14 x D)

Terms: **RPM** = Revolutions Per Minute **F** = Feed Inches Per Minute
Ft = Feed Per Tooth **T** = Number of Teeth **D** = Cutting Dia.
SFM = Surface Feet per Minute

APPLICATION MATERIAL GROUPS - REAMERS
SURFACE FEET PER MINUTE (SFM)

For material examples, see page 567.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
4500	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4531	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4532	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4533	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4535	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4536	82C	66C	52C	49B	30B	16A			36C	20B	26B	20B	52E	49D	43C	36C	49C
4537	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4579	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4587	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4588	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4591	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
4600	59C	46C	36C	33B	16B	13A			26C	16B	20B	20B	46E	36D	33C	30C	36C
B100	59C	46C	36C	33B	16B	13A			26F				46E	36D	33C	30C	36C
B101	59C	46C	36C	33B	16B	13A			26C				46E	36D	33C	30C	36C
B121	59C	46C	36C	33B	16B	13A							46E	36D	33C	30C	36C
B122	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
B157	82C	66C	52C	49B	30B	16A			36C	20B	26B						49C
B170	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
B301	59C	46C	36C	33B	16B	13A			26C	16B	20B		46E	36D	33C	30C	36C
B334	59C	46C	36C	33B	16B	13A			26F				46E	36D	33C	30C	36C
B400	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B411	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B441	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B442	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B481	59B	59B	46B	46B	33C	33C							56D	56D	56D	46D	46C
B901	59C	46C	36C	33B	16B	13A			26C				46E	36D	33C	30C	36C
T400	75F	46F	49F	49D	36D				66F	39D	39D		108E	59H	59F		69F

APPLICATION MATERIAL GROUPS - COUNTERSINKS
SURFACE FEET PER MINUTE (SFM)

Feed rate chart see page 584.

	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	4.1
4602	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
4603	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
4608	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4702	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4703	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4705	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
4706	82C	66C	52C	49B	30B	16A			36C	20B	26B		52E	49D	43C	36C	49C
G171	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G132			66E	49D	33D	20B					13B					26D	
G135	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G136	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G137	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G138	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G142	98F	82E	66D	49D					26C	20B	13A						39C
G149	98D	82D	66C	49B	33A	20A			26B	20A			82D	49C	39A	26A	39B
G154	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G335	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G338	164F	131E	98D	66D	49B	33A							148F	115D	98C	98C	66C
G400	98F	82E	66D	49D	33B	20A			26C	20B	13A		82F	49D	39C	26C	39C
G560	164E	131E	98D	66D	49B	33B							148F	115D	98C	98C	66C
G570	148E	118E	89D	72D	56B	39B			56C	39B	49A	33A	131C	105C	89C	79C	
G600	72F	56E	49D	39D	26B	20A			26C	20B	13A		82F	49D	39C		

Feed Rate Chart - Reamers

Alpha Code	Reamers - Feed in Inches per Revolution Ø Diameter												
	1/16	5/64	1/8	3/16	5/16	25/64	1/2	5/8	25/32	1"	1-13/16	1-1/2	2"
A	0.002	0.002	0.003	0.004	0.006	0.007	0.007	0.009	0.010	0.011	0.013	0.015	0.017
B	0.002	0.003	0.004	0.006	0.007	0.008	0.009	0.011	0.012	0.014	0.016	0.020	0.022
C	0.003	0.003	0.005	0.007	0.009	0.010	0.011	0.013	0.015	0.017	0.019	0.024	0.027
D	0.031	0.004	0.006	0.008	0.011	0.013	0.014	0.016	0.019	0.021	0.024	0.029	0.033
E	0.004	0.006	0.007	0.010	0.014	0.015	0.017	0.020	0.021	0.025	0.030	0.036	0.043
F	0.006	0.007	0.010	0.014	0.017	0.020	0.022	0.025	0.028	0.031	0.037	0.047	0.059

APPLICATION MATERIAL GROUPS - REAMERS
SURFACE FEET PER MINUTE (SFM)

**Feed rate chart - see pages 584. For material examples, see page 567*

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
4500	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4531	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4532	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4533	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4535	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4536	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4537	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4579	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4587	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4588	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4591	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
4600	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
B100	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B101	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B121															69B			
B122	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
B157	30B	16B	26D	16C	10C	82D	92E			92F	82F	66E	52D	98B			10A	
B170	30B	16B	26D	16C	10C	82D	92E	82D	46D									
B301	16B	13B	16D			59D	66E	59D	36D	75F	59F	49E	46D		69B			
B334	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
B400	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B411	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B441	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B442	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B481	46C	33B	33C	33B	33B	125E	125E	125E	125D	197D	197D	82D	82D	82C	43C			
B901	16B	13B	16D	10C	7C	59D	66E	59D	36D	75F	59F				69B			
T400	36D		49D															

APPLICATION MATERIAL GROUPS - COUNTERSINKS
SURFACE FEET PER MINUTE (SFM)

Material examples page 585.

	4.2	4.3	5.1	5.2	5.3	6.1	6.2	6.3	6.4	7.1	7.2	7.3	7.4	8.1	8.2	8.3	9.1	10.1
4602	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
4603	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
4608	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4702	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4703	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4705	30B	16B	26D	16C	10C	82D	92E	82D	46D									
4706	30B	16B	26D	16C	10C	82D	92E	82D	46D									
G171	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G132	26A	26A		20C	13B				33F							16G		
G135	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G136	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G137	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G138	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G142	33A		39C	20B		82D	66F	82F		98G	82F	66F	33F	98G	66G			
G149	33A	26A	39B	20A	13A	82B	66C	82C	33B	98D	82C	66C	33C	98D	66D			
G154	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G335	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G338	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G400	33A	26A	39C	20B	13A	82D	66F	82F	33D	98G	82F	66F	33F	98G	66G			
G560	49A	33A	66C	33B	20A	131D	98F	131F	49D	164G	131F	98F	49F	164G	98G			
G570				20A	13A	131D	98F	131F	49D	148G	118F	89F	43F					
G600						82D	66F	82F	33D	98G	82F	66F	33F					

Feed Rate Chart - Countersinks, Counterbores

Alpha Code	Countersinks, Counterbores - Feed in Inches per Revolution — Ø Diameter									
	1/4	5/16	5/64	5/8	25/32	1"	1-1/4	1-1/2	2-3/8	3"
A	0.001	0.002	0.002	0.002	0.003	0.004	0.004	0.005	0.006	0.006
B	0.002	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008
C	0.002	0.002	0.003	0.004	0.005	0.006	0.006	0.007	0.008	0.009
D	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.010	0.011
E	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.012	0.013
F	0.004	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.014
G	0.004	0.005	0.006	0.007	0.008	0.009	0.011	0.013	0.014	0.016
H	0.005	0.006	0.007	0.008	0.009	0.010	0.012	0.014	0.016	0.018

EDP NUMBER INDEX - 000000 - 001344

EDP#	E-Code	Page #
000000	E53021/8	390
000001	E53023/16	390
000002	E53021/4	390
000004	E53023/8	390
000006	E53021/2	390
000009	E53021	390
000020	E53041/8	400
0000021	A100.2	82
000021	E53043/16	400
000022	E53041/4	400
000023	E53045/16	400
000024	E53043/8	400
000025	E53047/16	400
000026	E53041/2	400
000027	E53045/8	400
000028	E53043/4	400
000030	E5304V1/8	400
000031	E5304V3/16	400
000032	E5304V1/4	400
000033	E5304V5/16	400
000034	E5304V3/8	400
000035	E5304V7/16	400
000036	E5304V1/2	400
000037	E5304V5/8	400
0000038	A100.25	82
000038	E5304V3/4	400
000039	E5304V1	400
000040	EB53021/8	394
000041	EB53023/16	394
000042	EB53021/4	394
000043	EB53025/16	394
000044	EB53023/8	394
0000045	A100.3	82
000046	EB53021/2	394
000047	EB53025/8	394
0000052	A100.32	82
000061	EB53043/16	404
000062	EB53041/4	404
000063	EB53045/16	404
000064	EB53043/8	404
000066	EB53041/2	404
000067	EB53045/8	404
0000069	A100.35	82
000072	EB5304V1/4	404
000074	EB5304V3/8	404
0000076	A100.38	82
000076	EB5304V1/2	404
000077	EB5304V5/8	404
0000083	A100.4	82
0000090	A100.42	82
0000106	A100.45	82
0000113	A100.48	82
0000120	A100.5	82
0000137	A100.52	82
0000144	A100.55	82
0000151	A100.58	82
0000168	A100.6	82
0000175	A100.62	82
0000182	A100.65	82
0000199	A100.68	82
0000205	A100.7	82
0000212	A100.72	82
0000229	A100.75	82
0000236	A100.78	82
0000243	A100.8	82
0000250	A100.82	82
0000267	A100.85	82
0000274	A100.88	82
0000281	A100.9	82
0000298	A100.92	82
0000304	A100.95	82
0000311	A100.98	82
0000328	A1001.0	82
0000335	A1001.05	82
0000342	A1001.1	82
0000359	A1001.15	82
0000366	A1001.2	82
0000373	A1001.25	82
0000380	A1001.3	82
0000397	A1001.35	82
0000403	A1001.4	82
0000410	A1001.45	82
0000427	A1001.5	82
0000434	A1001.55	82
0000441	A1001.6	82
0000458	A1001.65	82
0000465	A1001.7	82
0000472	A1001.75	82
0000489	A1001.8	82
0000496	A1001.85	82
0000502	A1001.9	82
0000519	A1001.95	82
0000526	A10010.0	82
0000533	A10010.1	82
0000540	A10010.2	82
0000557	A10010.25	82
0000564	A10010.3	82
0000571	A10010.4	82
0000588	A10010.5	82
0000595	A10010.6	82
0000601	A10010.7	82
0000618	A10010.75	82
0000625	A10010.8	82
0000632	A10010.9	82
0000649	A10011.0	82
0000656	A10011.1	82
0000663	A10011.2	82
0000670	A10011.25	82
0000687	A10011.3	82
0000694	A10011.4	82
0000700	A10011.5	82
0000717	A10011.6	82
0000724	A10011.7	82
0000731	A10011.75	82
0000748	A10011.8	82
0000755	A10011.9	82
0000762	A10011/16	82
0000779	A10011/32	82
0000786	A1001/16	82
0000793	A10011/64	82
0000809	A1001/2	82
0000816	A10012.0	82
0000823	A10012.1	82
0000830	A10012.2	82
0000847	A10012.25	82
0000854	A10012.3	82
0000861	A10012.4	82
0000878	A10012.5	82
0000885	A10012.6	82
0000892	A10012.7	82
0000908	A10012.75	82
0000915	A10012.8	82
0000922	A10012.9	82
0000939	A10013.0	82
0000946	A10013.1	82
0000953	A10013.2	82
0000960	A10013.25	82
0000977	A10013.3	82
0000984	A10013.4	82
0000991	A10013.5	82
001000	E33021/16	388
001001	E33025/64	388
001002	E33023/32	388
0001004	A10013.6	82
001004	E33021/8	388
001005	E33029/64	388
001006	E33025/32	388
001007	E330211/64	388
001008	E33023/16	388
001009	E330213/64	388
001010	E33027/32	388
0001011	A10013.7	82
001011	E330215/64	388
001012	E33021/4	388
001016	E33025/16	388
001017	E33023/8	388
001018	E33027/16	388
001019	E33021/2	388
001020	E33029/16	388
001021	E33025/8	388
001022	E330211/16	388
001023	E33023/4	388
001025	E33021	388
0001028	A10013.75	82
001028	E3302M2.0	389
001029	E3302M2.5	389
001030	E3302M3.0	389
001031	E3302M3.5	389
001032	E3302M4.0	389
001033	E3302M4.5	389
001034	E3302M5.0	389
0001035	A10013.8	82
001035	E3302M6.0	389
001036	E3302M7.0	389
001037	E3302M8.0	389
001038	E3302M9.0	389
001039	E3302M10.0	389
001040	E3302M11.0	389
001041	E3302M12.0	389
0001042	A10013.9	82
001043	E3302M14.0	389
001044	E3302M16.0	389
001046	E3302M20.0	389
001047	E3302M25.0	389
001050	E33031/16	396
001052	E33033/32	396
001054	E33031/8	396
001056	E33035/32	396
001058	E33033/16	396
0001059	A1001/32	82
001062	E33031/4	396
0001066	A10013/32	82
001066	E33035/16	396
001067	E33033/8	396
001069	E33031/2	396
0001073	A10013/64	82
0001080	A1001/4	82
0001097	A10014.0	82
001100	E33041/16	398
001101	E33045/64	398
001102	E33043/32	398
0001103	A10014.25	82
001103	E33047/64	398
001104	E33041/8	398
001105	E33049/64	398
001106	E33045/32	398
001107	E330411/64	398
001108	E33043/16	398
001109	E330413/64	398
0001110	A10014.5	82
001110	E33047/32	398
001112	E33041/4	398
001116	E33045/16	398
001117	E33043/8	398
001118	E33047/16	398
001119	E33041/2	398
001120	E33049/16	398
001121	E33045/8	398
001122	E330411/16	398
001123	E33043/4	398
001124	E33047/8	398
001125	E33041	398
0001127	A10014.75	82
001128	E3304M2.0	399
001129	E3304M2.5	399
001130	E3304M3.0	399
001131	E3304M3.5	399
001132	E3304M4.0	399
001133	E3304M4.5	399
0001134	A10015.0	82
001134	E3304M5.0	399
001135	E3304M6.0	399
001136	E3304M7.0	399
001137	E3304M8.0	399
001138	E3304M9.0	399
001139	E3304M10.0	399
001140	E3304M11.0	399
0001141	A10015.25	82
001141	E3304M12.0	399
001143	E3304M14.0	399
001144	E3304M16.0	399
001145	E3304M18.0	399
001146	E3304M20.0	399
001147	E3304M25.0	399
0001158	A10015.5	82
0001165	A10015.75	82
0001172	A10015/32	82
0001189	A10015/64	82
0001196	A10016.0	82
001200	EB33021/16	392
001201	EB33025/64	392
0001202	A10016.5	82
001202	EB33023/32	392
001203	EB33027/64	392
001204	EB33021/8	392
001206	EB33025/32	392
001208	EB33023/16	392
001210	EB33027/32	392
001211	EB330215/64	392
001212	EB33021/4	392
001216	EB33025/16	392
001217	EB33023/8	392
0001219	A1001/64	82
001219	EB33021/2	392
001222	EB330211/16	392
0001226	A10017.0	82
001228	EB3302M2.0	393
001229	EB3302M2.5	393
001230	EB3302M3.0	393
001232	EB3302M4.0	393
0001233	A10017.5	82
001234	EB3302M5.0	393
001235	EB3302M6.0	393
001236	EB3302M7.0	393
001237	EB3302M8.0	393
001238	EB3302M9.0	393
001239	EB3302M10.0	393
0001240	A10017/32	82
001241	EB3302M12.0	393
001243	EB3302M16.0	393
001244	EB3302M18.0	393
001245	EB3302M20.0	393
0001257	A10017/64	82
0001264	A1001/8	82
0001271	A10018.0	82
0001288	A10018.5	82
0001295	A10019.0	82
001300	EB33041/16	402
0001301	A10019.5	82
001301	EB33045/64	402
001302	EB33043/32	402
001304	EB33041/8	402
001305	EB33049/64	402
001306	EB33045/32	402
001307	EB330411/64	402
001308	EB33043/16	402
001310	EB33047/32	402
001311	EB330415/64	402
001312	EB33041/4	402
001316	EB33045/16	402
001317	EB33043/8	402
0001318	A10019/32	82
001318	EB33047/16	402
001319	EB33041/2	402
001320	EB33049/16	402
001321	EB33045/8	402
001323	EB33043/4	402
0001325	A10019/64	82
001330	EB3304M14.0	403
001331	EB3304M12.0	403
0001332	A1002.0	82
001333	EB3304M10.0	403
001335	EB3304M8.0	403
1336	EB3304M7.0	403
001337	EB3304M6.0	403
001338	EB3304M5.0	403
001339	EB3304M4.5	403
001340	EB3304M4.0	403
001342	EB3304M3.0	403
001344	EB3304M2.0	403

EDP NUMBER INDEX - 0001349 - 003500

EDP#	E-Code	Page #
0001349	A1002.05	82
0001356	A1002.1	82
0001363	A1002.15	82
0001370	A1002.2	82
0001387	A1002.25	82
0001394	A1002.3	82
0001400	A1002.35	82
0001417	A1002.4	82
0001424	A1002.45	82
0001431	A1002.5	82
0001448	A1002.55	82
0001455	A1002.6	82
0001462	A1002.65	82
0001479	A1002.7	82
0001486	A1002.75	82
0001493	A1002.8	82
0001509	A1002.85	82
0001516	A1002.9	82
0001523	A1002.95	82
0001530	A10020.0	82
0001547	A10021/32	82
0001554	A10021/64	82
0001561	A10023/64	82
0001578	A10025/64	82
0001585	A10027/64	82
0001592	A10029/64	82
0001608	A1003.0	82
0001615	A1003.1	82
0001622	A1003.15	82
0001639	A1003.2	82
0001646	A1003.25	82
0001653	A1003.3	82
0001660	A1003.4	82
0001677	A1003.5	82
0001684	A1003.6	82
0001691	A1003.7	82
0001707	A1003.75	82
0001714	A1003.8	82
0001721	A1003.9	82
0001738	A1003/16	82
0001745	A10031/64	82
0001752	A1003/32	82
0001769	A10033/64	82
0001776	A10035/64	82
0001783	A1003/64	82
0001790	A10037/64	82
0001806	A1003/8	82
0001813	A10039/64	82
0001820	A1004.0	82
0001837	A1004.1	82
0001844	A1004.2	82
0001851	A1004.25	82
0001868	A1004.3	82
0001875	A1004.4	82
0001882	A1004.5	82
0001899	A1004.6	82
0001905	A1004.7	82
0001912	A1004.75	82
0001929	A1004.8	82
0001936	A1004.9	82
0001943	A10041/64	82
0001950	A10043/64	82
0001967	A1005.0	82
0001974	A1005.1	82
0001981	A1005.2	82
0001998	A1005.25	82
0002001	A1005.3	82
0002018	A1005.4	82
0002025	A1005.5	82
0002032	A1005.6	82
0002049	A1005.7	82
0002056	A1005.75	82
0002063	A1005.8	82
0002070	A1005.9	82
0002087	A1005/16	82
0002094	A1005/32	82
0002100	A1005/64	82
0002117	A1005/8	82
0002124	A1006.0	82
0002131	A1006.1	82
0002148	A1006.2	82
0002155	A1006.25	82
0002162	A1006.3	82
0002179	A1006.4	82
0002186	A1006.5	82
0002193	A1006.6	82
002200	E43021/8	386
0002201	E43025/32	386
002202	E43023/16	386
002204	E43021/4	386
002206	E43025/16	386
002208	E43023/8	386
0002209	A1006.7	82
002210	E43021/2	386
0002216	A1006.75	82
0002223	A1006.8	82
0002230	A1006.9	82
0002247	A1007.0	82
002250	E43041/8	397
002251	E43045/32	397
002252	E43043/16	397
0002254	A1007.1	82
002254	E43041/4	397
002256	E43045/16	397
002258	E43043/8	397
002260	E43041/2	397
0002261	A1007.2	82
0002278	A1007.25	82
0002285	A1007.3	82
0002292	A1007.4	82
0002308	A1007.5	82
0002315	A1007.6	82
0002322	A1007.7	82
0002339	A1007.75	82
0002346	A1007.8	82
0002353	A1007.9	82
0002360	A1007/16	82
0002377	A1007/32	82
0002384	A1007/64	82
0002391	A1008.0	82
0002407	A1008.1	82
0002414	A1008.2	82
0002421	A1008.25	82
0002438	A1008.3	82
0002445	A1008.4	82
0002452	A1008.5	82
0002469	A1008.6	82
0002476	A1008.7	82
0002483	A1008.75	82
0002490	A1008.8	82
0002506	A1008.9	82
0002513	A1009.0	82
0002520	A1009.1	82
0002537	A1009.2	82
0002544	A1009.25	82
0002551	A1009.3	82
0002568	A1009.4	82
0002575	A1009.5	82
0002582	A1009.6	82
0002599	A1009.7	82
0002605	A1009.75	82
0002612	A1009.8	82
0002629	A1009.9	82
002630	EB3302V1/16	392
002634	EB3302V1/8	392
0002636	A1009/16	82
002636	EB3302V5/32	392
002638	EB3302V3/16	392
002640	EB3302V7/32	392
002642	EB3302V1/4	392
0002643	A1009/32	82
002643	EB3302V5/16	392
002644	EB3302V3/8	392
002645	EB3302V7/16	392
002646	EB3302V1/2	392
0002650	A1009/64	82
002651	EB3302V7/8	392
0002667	A1011.0	90
0002674	A1011.1	90
0002681	A1011.2	90
002690	E3304V1/16	398
002691	E3304V5/64	398
002692	E3304V3/32	398
002693	E3304V7/64	398
002694	E3304V1/8	398
002695	E3304V9/64	398
002696	E3304V5/32	398
002697	E3304V11/64	398
0002698	A1011.25	90
002698	E3304V3/16	398
002699	E3304V13/64	398
002700	E3304V7/32	398
002702	E3304V1/4	398
002703	E3304V5/16	398
0002704	A1011.3	90
002704	E3304V3/8	398
002705	E3304V7/16	398
002706	E3304V1/2	398
002707	E3304V9/16	398
002708	E3304V5/8	398
002709	E3304V11/16	398
002710	E3304V3/4	398
0002711	A1011.4	90
002711	E3304V7/8	398
002712	E3304V1	398
0002728	A1011.5	90
0002735	A1011.6	90
0002742	A1011.7	90
0002759	A1011.75	90
0002766	A1011.8	90
0002773	A1011.9	90
0002780	A10110.0	90
0002797	A10112.0	90
0002803	A1012.0	90
0002810	A1012.1	90
0002827	A1012.2	90
0002834	A1012.3	90
0002841	A1012.4	90
002850	E3302V1/16	388
002851	E3302V5/64	388
002852	E3302V3/32	388
002854	E3302V1/8	388
002856	E3302V5/32	388
002857	E3302V11/64	388
0002858	A1012.5	90
002858	E3302V3/16	388
002859	E3302V13/64	388
002860	E3302V7/32	388
002862	E3302V1/4	388
002863	E3302V5/16	388
002864	E3302V3/8	388
0002865	A1012.6	90
002865	E3302V7/16	388
002866	E3302V1/2	388
002867	E3302V9/16	388
002868	E3302V5/8	388
0002872	A1012.7	90
0002889	A1012.8	90
0002896	A1012.9	90
0002902	A1013.0	90
0002919	A1013.2	90
002920	E3303V1/16	396
002921	E3303V3/32	396
002922	E3303V1/8	396
002923	E3303V5/32	396
002924	E3303V3/16	396
0002926	A1013.3	90
002926	E3303V1/4	396
002927	E3303V5/16	396
002928	E3303V3/8	396
002929	E3303V7/16	396
002930	E3303V1/2	396
0002933	A1013.5	90
0002940	A1013.8	90
0002957	A1014.0	90
0002964	A1014.2	90
0002971	A1014.5	90
0002988	A1014.8	90
0002995	A1015.0	90
0003008	A1015.1	90
0003015	A1015.2	90
0003022	A1015.5	90
0003039	A1016.0	90
0003046	A1016.5	90
0003053	A1017.0	90
0003060	A1017.5	90
003070	EB3304V1/16	402
003072	EB3304V3/32	402
003074	EB3304V1/8	402
003076	EB3304V5/32	402
0003077	A1018.0	90
003077	EB3304V11/64	402
003078	EB3304V3/16	402
003082	EB3304V1/4	402
003083	EB3304V5/16	402
0003084	A1018.5	90
003084	EB3304V3/8	402
003085	EB3304V7/16	402
003086	EB3304V1/2	402
003088	EB3304V5/8	402
003090	EB3304V3/4	402
0003091	A1019.0	90
003092	EB3304V1	402
003130	E6302V1/8	391
003131	E6302V3/16	391
003132	E6302V1/4	391
003134	E6302V3/8	391
003136	E6302V1/2	391
003165	E6304V1/8	401
003166	E6304V3/16	401
003167	E6304V1/4	401
003168	E6304V5/16	401
003169	E6304V3/8	401
003170	E6304V7/16	401
003171	E6304V1/2	401
003172	E6304V5/8	401
003173	E6304V3/4	401
003174	E6304V1	401
003251	DCN0	195
003252	DCN1	195
003253	DCN2	195
003254	DCN3	195
003255	DCN4	195
003256	DCN5	195
003257	DCN6	195
003332	DS901/8	191
003334	DS903/16	191
003336	DS901/4	191
003338	DS905/16	191
003340	DS903/8	191
003342	DS901/2	191
003470	D33M.8	190
003471	D33M.9	190
003472	D33M1.0	190
003473	D33M1.5	190
003474	D33M2.0	190
003475	D33M2.05	190
003476	D33M2.5	190
003477	D33M3.0	190
003478	D33M3.5	190
003479	D33M4.5	190
003480	D33M5.5	190
003481	D33M6.0	190
003482	D33M6.5	190
003483	D33M7.0	190
003484	D33M7.5	190
003485	D33M8.0	190
003486	D33M8.5	190
003487	D33M9.0	190
003488	D33M9.5	190
003489	D33M10.5	190
003490	D33M10.75	190
003491	D33M11.0	190
003492	D33M11.5	190
003493	D33M12.0	190
003500	D33WN68	187

EDP NUMBER INDEX - 003501 - 0008690

EDP#	E-Code	Page #
003501	D33F1/32	187
003502	D33WN67	187
003503	D33WN66	187
003504	D33WN65	187
003505	D33WN64	187
003506	D33WN63	187
003507	D33WN62	187
003508	D33WN61	187
003509	D33WN60	187
003510	D33WN59	187
003511	D33WN58	187
003512	D33WN57	187
003513	D33WN56	187
003514	D33F3/64	187
003515	D33WN55	187
003516	D33WN54	187
003517	D33WN53	187
003518	D33F1/16	187
003519	D33WN52	187
003520	D33WN51	187
003521	D33WN50	187
003522	D33WN49	187
003523	D33WN48	187
003524	D33F5/64	187
003525	D33WN47	187
003526	D33WN46	187
003527	D33WN45	187
003528	D33WN44	187
003529	D33WN43	187
003530	D33WN42	187
003531	D33F3/32	187
003532	D33WN41	187
003533	D33WN40	187
003534	D33WN39	187
003535	D33WN38	187
003536	D33WN37	187
003537	D33WN36	187
003538	D33F7/64	187
003539	D33WN35	187
003540	D33WN34	187
003541	D33WN33	187
003542	D33WN32	187
003543	D33WN31	187
003544	D33F1/8	187
003545	D33WN30	187
003546	D33WN29	187
003547	D33WN28	187
003548	D33F9/64	187
003549	D33WN27	187
003550	D33WN26	187
003551	D33WN25	187
003552	D33WN24	187
003553	D33WN23	187
003554	D33F5/32	187
003555	D33WN22	187
003556	D33WN21	187
003557	D33WN20	187
003558	D33WN19	187
003559	D33WN18	187
003560	D33F11/64	187
003561	D33WN17	187
003562	D33WN16	187
003563	D33WN15	187
003564	D33WN14	187
003565	D33WN13	187
003566	D33F3/16	187
003567	D33WN12	187
003568	D33WN11	187
003569	D33WN10	187
003570	D33WN9	187
003571	D33WN8	187
003572	D33WN7	187
003573	D33F13/64	187
003574	D33WN6	187
003575	D33WN5	187
003576	D33WN4	187
003577	D33WN3	187
003578	D33F7/32	187
003579	D33WN2	187
003580	D33WN1	187
003581	D33LA	187
003582	D33F15/64	187
003583	D33LB	187
003584	D33LC	187
003585	D33LD	187
003586	D33F1/4	187
003587	D33LF	187
003588	D33LG	187
003589	D33F17/64	187
003590	D33LH	187
003591	D33LI	187
003592	D33LJ	187
003593	D33LK	187
003594	D33F9/32	187
003595	D33LL	187
003596	D33LM	187
003597	D33F19/64	187
003598	D33LN	187
003599	D33F5/16	187
003600	D33LO	187
003601	D33LP	187
003602	D33F21/64	187
003603	D33LQ	187
003604	D33LR	187
003605	D33F11/32	187
003606	D33LS	187
003607	D33LT	187
003608	D33F23/64	187
003609	D33LU	187
003610	D33F3/8	187
003611	D33LV	187
003612	D33LW	187
003613	D33F25/64	187
003614	D33LX	187
003615	D33LY	187
003616	D33F13/32	187
003617	D33LZ	187
003618	D33F27/64	187
003619	D33F7/16	187
003620	D33F29/64	187
003621	D33F15/32	187
003622	D33F31/64	187
003623	D33F1/2	187
003624	D33M3.3	190
003626	D33M4.0	190
003630	D33M5.0	190
003631	D33M10.0	190
003700	EB6302V1/8	395
003701	EB6302V3/16	395
003702	EB6302V1/4	395
003703	EB6302V5/16	395
003704	EB6302V3/8	395
003706	EB6302V1/2	395
003745	EB6304V1/8	405
003746	EB6304V3/16	405
003747	EB6304V1/4	405
003748	EB6304V5/16	405
003749	EB6304V3/8	405
003751	EB6304V1/2	405
003752	EB6304V5/8	405
004325	E3304MV2.0	399
004326	E3304MV2.5	399
004327	E3304MV3.0	399
004328	E3304MV3.5	399
004329	E3304MV4.0	399
004330	E3304MV4.5	399
004331	E3304MV5.0	399
004332	E3304MV6.0	399
004333	E3304MV7.0	399
004334	E3304MV8.0	399
004335	E3304MV9.0	399
004336	E3304MV10.0	399
004337	E3304MV11.0	399
004338	E3304MV12.0	399
004339	E3304MV14.0	399
004340	E3304MV16.0	399
004341	E3304MV18.0	399
004342	E3304MV20.0	399
004402	EB3302MV3.0	393
004403	EB3302MV3.5	393
004404	EB3302MV4.0	393
004406	EB3302MV5.0	393
004407	EB3302MV6.0	393
004408	EB3302MV7.0	393
004409	EB3302MV8.0	393
004410	EB3302MV9.0	393
004411	EB3302MV10.0	393
004413	EB3302MV12.0	393
4416	EB3302MV18.0	393
004750	EB3304MV2.0	403
004752	EB3304MV3.0	403
004754	EB3304MV4.0	403
004756	EB3304MV5.0	403
004757	EB3304MV6.0	403
004759	EB3304MV8.0	403
004761	EB3304MV10.0	403
004763	EB3304MV12.0	403
004800	E63021/8	391
004801	E63023/16	391
004802	E63021/4	391
004803	E63025/16	391
004804	E63023/8	391
004805	E63027/16	391
004806	E63021/2	391
004808	E63023/4	391
004900	E63041/8	401
004901	E63043/16	401
004902	E63041/4	401
004903	E63045/16	401
004904	E63043/8	401
004905	E63047/16	401
004906	E63041/2	401
004907	E63045/8	401
004908	E63043/4	401
004909	E63041	401
005400	EB63021/8	395
005401	EB63023/16	395
005402	EB63021/4	395
005403	EB63025/16	395
005404	EB63023/8	395
005406	EB63021/2	395
005700	EB63041/8	405
005701	EB63043/16	405
005702	EB63041/4	405
005703	EB63045/16	405
005704	EB63043/8	405
005705	EB63047/16	405
005706	EB63041/2	405
005707	EB63045/8	405
0007549	A1081.0	101
0007556	A1081.1	101
0007563	A1081.2	101
0007570	A1081.3	101
0007587	A1081.4	101
0007594	A1081.5	101
0007600	A1081.6	101
0007617	A1081.7	101
0007624	A1081.8	101
0007631	A1081.9	101
0007648	A10810.0	101
0007655	A10810.2	101
0007662	A10810.5	101
0007679	A10810.8	101
0007686	A10811.0	101
0007693	A10811.5	101
0007709	A10811.8	101
0007716	A10811/32	101
0007723	A1081/16	101
0007730	A10811/64	101
0007747	A1081/2	101
0007754	A10812.0	101
0007761	A10812.2	101
0007778	A10812.5	101
0007785	A10812.8	101
0007792	A10812.9	101
0007808	A10813.0	101
0007815	A10813.5	101
0007822	A10813/32	101
0007839	A10813/64	101
0007846	A1081/4	101
0007853	A10814.0	101
0007860	A10814.5	101
0007877	A10815.0	101
0007884	A10815.25	101
0007891	A10815.5	101
0007907	A10815/32	101
0007921	A10816.0	101
0007945	A1081/8	101
0007969	A1082.0	101
0007976	A1082.1	101
0007983	A1082.2	101
0007990	A1082.3	101
0008003	A1082.4	101
0008010	A1082.5	101
0008027	A1082.6	101
0008034	A1082.7	101
0008041	A1082.8	101
0008058	A1082.9	101
0008119	A1083.0	101
0008126	A1083.1	101
0008133	A1083.2	101
0008140	A1083.3	101
0008157	A1083.4	101
0008164	A1083.5	101
0008171	A1083.6	101
0008188	A1083.7	101
0008195	A1083.8	101
0008201	A1083.9	101
0008218	A1083/16	101
0008232	A1083/32	101
0008249	A1083/8	101
0008256	A1084.0	101
0008263	A1084.1	101
0008270	A1084.2	101
0008287	A1084.3	101
0008294	A1084.4	101
0008300	A1084.5	101
0008317	A1084.6	101
0008324	A1084.7	101
0008331	A1084.8	101
0008348	A1084.9	101
0008355	A1085.0	101
0008362	A1085.1	101
0008379	A1085.2	101
0008386	A1085.3	101
0008393	A1085.4	101
0008409	A1085.5	101
0008416	A1085.6	101
0008423	A1085.7	101
0008430	A1085.8	101
0008447	A1085.9	101
0008454	A1085/16	101
0008461	A1085/32	101
0008478	A1085/64	101
0008485	A1086.0	101
0008492	A1086.1	101
0008508	A1086.2	101
0008515	A1086.3	101
0008522	A1086.4	101
0008539	A1086.5	101
0008546	A1086.6	101
0008553	A1086.7	101
0008560	A1086.8	101
0008577	A1086.9	101
0008584	A1087.0	101
0008591	A1087.1	101
0008607	A1087.2	101
0008614	A1087.3	101
0008621	A1087.4	101
0008638	A1087.5	101
0008645	A1087.6	101
0008652	A1087.7	101
0008669	A1087.8	101
0008676	A1087.9	101
0008683	A1087/16	101
0008690	A1087/32	101

EDP NUMBER INDEX - 0008706 - 014970

EDP#	E-Code	Page #
0008706	A1087/64	101
0008713	A1088.0	101
0008720	A1088.1	101
0008737	A1088.2	101
0008744	A1088.3	101
0008751	A1088.4	101
0008768	A1088.5	101
0008775	A1088.6	101
0008782	A1088.7	101
0008799	A1088.8	101
0008805	A1088.9	101
0008812	A1089.0	101
0008829	A1089.1	101
0008836	A1089.2	101
0008843	A1089.3	101
0008850	A1089.4	101
0008867	A1089.5	101
0008874	A1089.6	101
0008881	A1089.7	101
0008898	A1089.8	101
0008904	A1089.9	101
0008911	A1089/32	101
0008928	A1089/64	101
010001	R101/64	74
010002	R101/32	74
010003	R103/64	74
010004	R101/16	74
010005	R105/64	74
010006	R103/32	74
010007	R107/64	74
010008	R101/8	74
010009	R109/64	74
010010	R105/32	74
010011	R1011/64	74
010012	R103/16	74
010013	R1013/64	74
010014	R107/32	74
010015	R1015/64	74
010016	R101/4	74
010017	R1017/64	74
010018	R109/32	74
010019	R1019/64	74
010020	R105/16	74
010021	R1021/64	74
010022	R1011/32	74
010023	R1023/64	74
010024	R103/8	74
010025	R1025/64	74
010026	R1013/32	74
010027	R1027/64	74
010028	R107/16	74
010029	R1029/64	74
010030	R1015/32	74
010031	R1031/64	74
010032	R101/2	74
010033	R1033/64	74
010034	R1017/32	74
010035	R1035/64	74
010036	R109/16	74
010037	R1037/64	74
010038	R1019/32	74
010039	R1039/64	74
010040	R105/8	74
010041	R1041/64	74
010042	R1021/32	74
010043	R1043/64	74
010044	R1011/16	74
010104	R10A1/16	95
010105	R10A5/64	95
010106	R10A3/32	95
010107	R10A7/64	95
010108	R10A1/8	95
010109	R10A9/64	95
010110	R10A5/32	95
010111	R10A11/64	95
010112	R10A3/16	95
010113	R10A13/64	95
010114	R10A7/32	95
010115	R10A15/64	95
010116	R10A1/4	95
010117	R10A17/64	95
010118	R10A9/32	95
010119	R10A19/64	95
010120	R10A5/16	95
010121	R10A21/64	95
010122	R10A11/32	95
010123	R10A23/64	95
010124	R10A3/8	95
010125	R10A25/64	95
010126	R10A13/32	95
010127	R10A27/64	95
010128	R10A7/16	95
010129	R10A29/64	95
010130	R10A15/32	95
010131	R10A31/64	95
010132	R10A1/2	95
010204	R10B1/16	98
010205	R10B5/64	98
010206	R10B3/32	98
010207	R10B7/64	98
010208	R10B1/8	98
010209	R10B9/64	98
010210	R10B5/32	98
010211	R10B11/64	98
010212	R10B3/16	98
010213	R10B13/64	98
010214	R10B7/32	98
010215	R10B15/64	98
010216	R10B1/4	98
010217	R10B17/64	98
010218	R10B9/32	98
010219	R10B19/64	98
010220	R10B5/16	98
010221	R10B21/64	98
010222	R10B11/32	98
010223	R10B23/64	98
010224	R10B3/8	98
010225	R10B25/64	98
010226	R10B13/32	98
010227	R10B27/64	98
010228	R10B7/16	98
010229	R10B29/64	98
010230	R10B15/32	98
010231	R10B31/64	98
010232	R10B1/2	98
010301	R10CO1/64	110
010302	R10CO1/32	110
010303	R10CO3/64	110
010304	R10CO1/16	110
010305	R10CO5/64	110
010306	R10CO3/32	110
010307	R10CO7/64	110
010308	R10CO1/8	110
010309	R10CO9/64	110
010310	R10CO5/32	110
010311	R10CO11/64	110
010312	R10CO3/16	110
010313	R10CO13/64	110
010314	R10CO7/32	110
010315	R10CO15/64	110
010316	R10CO1/4	110
010317	R10CO17/64	110
010318	R10CO9/32	110
010319	R10CO19/64	110
010320	R10CO5/16	110
010321	R10CO21/64	110
010322	R10CO11/32	110
010323	R10CO23/64	110
010324	R10CO3/8	110
010325	R10CO25/64	110
010326	R10CO13/32	110
010327	R10CO27/64	110
010328	R10CO7/16	110
010329	R10CO29/64	110
010330	R10CO15/32	110
010331	R10CO31/64	110
010332	R10CO1/2	110
010333	R10CO33/64	110
010334	R10CO17/32	110
010335	R10CO35/64	110
010336	R10CO9/16	110
010337	R10CO37/64	110
010338	R10CO19/32	110
010339	R10CO39/64	110
010340	R10CO5/8	110
010341	R10CO41/64	110
010342	R10CO21/32	110
010343	R10CO43/64	110
010344	R10CO11/16	110
0010396	E0212-56	256
0010419	E0215-40	256
0010440	E0232-56	270
0010471	E0235-40	270
010502	R10H1/32	101
010503	R10H3/64	101
010504	R10H1/16	101
010505	R10H5/64	101
010506	R10H3/32	101
010507	R10H7/64	101
010508	R10H1/8	101
010509	R10H9/64	101
010510	R10H5/32	101
010511	R10H11/64	101
010512	R10H3/16	101
010513	R10H13/64	101
010514	R10H7/32	101
010515	R10H15/64	101
010516	R10H1/4	101
010517	R10H17/64	101
010518	R10H9/32	101
010519	R10H19/64	101
010520	R10H5/16	101
010521	R10H21/64	101
010522	R10H11/32	101
010523	R10H23/64	101
010524	R10H3/8	101
010525	R10H25/64	101
010526	R10H13/32	101
010527	R10H27/64	101
010528	R10H7/16	101
010529	R10H29/64	101
010530	R10H15/32	101
010531	R10H31/64	101
010532	R10H1/2	101
010601	R10P1/64	74
010602	R10P1/32	74
010603	R10P3/64	74
010604	R10P1/16	74
010605	R10P5/64	74
010606	R10P3/32	74
010607	R10P7/64	74
010608	R10P1/8	74
010609	R10P9/64	74
010610	R10P5/32	74
010611	R10P11/64	74
010612	R10P3/16	74
010613	R10P13/64	74
010614	R10P7/32	74
010615	R10P15/64	74
010616	R10P1/4	74
010617	R10P17/64	74
010618	R10P9/32	74
010619	R10P19/64	74
010620	R10P5/16	74
010621	R10P21/64	74
010622	R10P11/32	74
010623	R10P23/64	74
010624	R10P3/8	74
010625	R10P25/64	74
010626	R10P13/32	74
010627	R10P27/64	74
010628	R10P7/16	74
010629	R10P29/64	74
010630	R10P15/32	74
010631	R10P31/64	74
010632	R10P1/2	74
010633	R10P33/64	74
010634	R10P17/32	74
010635	R10P35/64	74
010636	R10P9/16	74
010637	R10P37/64	74
010638	R10P19/32	74
010639	R10P39/64	74
010640	R10P5/8	74
010641	R10P41/64	74
010642	R10P21/32	74
010643	R10P43/64	74
010644	R10P11/16	74
010902	L101/32	89
010903	L103/64	89
010904	L101/16	89
010905	L105/64	89
010906	L103/32	89
010907	L107/64	89
010908	L101/8	89
010909	L109/64	89
010910	L105/32	89
010911	L1011/64	89
010912	L103/16	89
010913	L1013/64	89
010914	L107/32	89
010915	L1015/64	89
010916	L101/4	89
010917	L1017/64	89
010918	L109/32	89
010919	L1019/64	89
010920	L105/16	89
010921	L1021/64	89
010922	L1011/32	89
010923	L1023/64	89
010924	L103/8	89
010925	L1025/64	89
010926	L1013/32	89
010927	L1027/64	89
010928	L107/16	89
010929	L1029/64	89
010930	L1015/32	89
010931	L1031/64	89
010932	L101/2	89
013115	QC21PM1.5	109
013120	QC21PM2.0	109
013125	QC21PM2.5	109
013130	QC21PM3.0	109
013135	QC21PM3.5	109
013140	QC21PM4.0	109
013145	QC21PM4.5	109
013150	QC21PM5.0	109
013152	QC21PM5.2	109
013155	QC21PM5.5	109
013156	QC21PM5.6	109
013160	QC21PM6.0	109
013165	QC21PM6.5	109
013168	QC21PM6.8	109
013170	QC21PM7.0	109
013175	QC21PM7.5	109
013180	QC21PM8.0	109
013182	QC21PM8.2	109
013185	QC21PM8.5	109
013186	QC21PM8.6	109
013190	QC21PM9.0	109
013195	QC21PM9.5	109
014900	QC21PM10.0	109
014905	QC21PM10.5	109
014910	QC21PM11.0	109
014915	QC21PM11.5	109
014920	QC21PM12.0	109
014925	QC21PM12.5	109
014930	QC21PM13.0	109
014935	QC21PM13.5	109
014940	QC21PM14.0	109
014945	QC21PM14.5	109
014950	QC21PM15.0	109
014955	QC21PM15.5	109
014960	QC21PM16.0	109
014965	QC21PM16.5	109
014970	QC21PM17.0	109

EDP NUMBER INDEX - 014975 - 016252

EDP#	E-Code	Page #
014975	QC21PM17.5	109
015001	R15A	74
015002	R15B	74
015003	R15C	74
015004	R15D	74
015005	R15E	74
015006	R15F	74
015007	R15G	74
015008	R15H	74
015009	R15I	74
015010	R15J	74
015011	R15K	74
015012	R15L	74
015013	R15M	74
015014	R15N	74
015015	R15O	74
015016	R15P	74
015017	R15Q	74
015018	R15R	74
015019	R15S	74
015020	R15T	74
015021	R15U	74
015022	R15V	74
015023	R15W	74
015024	R15X	74
015025	R15Y	74
015026	R15Z	74
015101	R15AA	95
015102	R15AB	95
015103	R15AC	95
015104	R15AD	95
015105	R15AE	95
015106	R15AF	95
015107	R15AG	95
015108	R15AH	95
015109	R15AI	95
015110	R15AJ	95
015111	R15AK	95
015112	R15AL	95
015113	R15AM	95
015114	R15AN	95
015115	R15AO	95
015116	R15AP	95
015117	R15AQ	95
015118	R15AR	95
015119	R15AS	95
015120	R15AT	95
015121	R15AU	95
015122	R15AV	95
015123	R15AW	95
015124	R15AX	95
015125	R15AY	95
015126	R15AZ	95
015201	R15BA	98
015202	R15BB	98
015203	R15BC	98
015204	R15BD	98
015205	R15BE	98
015206	R15BF	98
015207	R15BG	98
015208	R15BH	98
015209	R15BI	98
015210	R15BJ	98
015211	R15BK	98
015212	R15BL	98
015213	R15BM	98
015214	R15BN	98
015215	R15BO	98
015216	R15BP	98
015217	R15BQ	98
015218	R15BR	98
015219	R15BS	98
015220	R15BT	98
015221	R15BU	98
015222	R15BV	98
015223	R15BW	98
015224	R15BX	98
015225	R15BY	98
015226	R15BZ	98
015301	R15COA	110
015302	R15COB	110
015303	R15COC	110
015304	R15COD	110
015305	R15COE	110
015306	R15COF	110
015307	R15COG	110
015308	R15COH	110
015309	R15COI	110
015310	R15COJ	110
015311	R15COK	110
015312	R15COL	110
015313	R15COM	110
015314	R15CON	110
015315	R15COO	110
015316	R15COP	110
015317	R15COQ	110
015318	R15COR	110
015319	R15COS	110
015320	R15COT	110
015321	R15COU	110
015322	R15COV	110
015323	R15COW	110
015324	R15COX	110
015325	R15COY	110
015326	R15COZ	110
015601	R15PA	74
015602	R15PB	74
015603	R15PC	74
015604	R15PD	74
015605	R15PE	74
015606	R15PF	74
015607	R15PG	74
015608	R15PH	74
015609	R15PI	74
015610	R15PJ	74
015611	R15PK	74
015612	R15PL	74
015613	R15PM	74
015614	R15PN	74
015615	R15PO	74
015616	R15PP	74
015617	R15PQ	74
015618	R15PR	74
015619	R15PS	74
015620	R15PT	74
015621	R15PU	74
015622	R15PV	74
015623	R15PW	74
015624	R15PX	74
015625	R15PY	74
015626	R15PZ	74
015804	QC21P1/16	106
015805	QC21P5/64	106
015806	QC21P3/32	106
015807	QC21P7/64	106
015808	QC21P1/8	106
015809	QC21P9/64	106
015810	QC21P5/32	106
015811	QC21P11/64	106
015812	QC21P3/16	106
015813	QC21P13/64	106
015814	QC21P7/32	106
015815	QC21P15/64	106
015816	QC21P1/4	106
015817	QC21P17/64	106
015818	QC21P9/32	106
015819	QC21P19/64	106
015820	QC21P5/16	106
015821	QC21P21/64	106
015822	QC21P11/32	106
015823	QC21P23/64	106
015824	QC21P3/8	106
015825	QC21P25/64	106
015826	QC21P13/32	106
015827	QC21P27/64	106
015828	QC21P7/16	106
015829	QC21P29/64	106
015830	QC21P15/32	106
015831	QC21P31/64	106
015832	QC21P1/2	106
015833	QC21P33/64	106
015834	QC21P17/32	106
015835	QC21P35/64	106
015836	QC21P9/16	106
015837	QC21P37/64	106
015838	QC21P19/32	106
015839	QC21P39/64	106
015840	QC21P5/8	106
015841	QC21P41/64	106
015842	QC21P21/32	106
015843	QC21P43/64	106
015844	QC21P11/16	106
016002	2A.2	82
016003	2A.3	82
016004	2A.4	82
016005	2A.5	82
016006	2A.6	82
016007	2A.7	82
016008	2A.8	82
016009	2A.9	82
016010	2A1.00	82
016011	2A1.1	82
016012	2A1.2	82
016013	2A1.3	82
016014	2A1.4	82
016015	2A1.5	82
016016	2A1.6	82
016017	2A1.7	82
016018	2A1.8	82
016019	2A1.9	82
016020	2A2.0	82
016021	2A2.1	82
016022	2A2.2	82
016023	2A2.3	82
016024	2A2.4	82
016025	2A2.5	82
016026	2A2.6	82
016027	2A2.7	82
016029	2A2.9	82
016030	2A3.0	82
016031	2A3.1	82
016032	2A3.2	82
016033	2A3.3	82
016034	2A3.4	82
016035	2A3.5	82
016036	2A3.6	82
016037	2A3.7	82
016040	2A4.0	82
016041	2A4.1	82
016042	2A4.2	82
016043	2A4.3	82
016044	2A4.4	82
016045	2A4.5	82
016046	2A4.6	82
016048	2A4.8	82
016050	2A5.0	82
016051	2A5.1	82
016052	2A5.2	82
016053	2A5.3	82
016054	2A5.4	82
016055	2A5.5	82
016056	2A5.6	82
016057	2A5.7	82
016058	2A5.8	82
016060	2A6.0	82
016061	2A6.1	82
016062	2A6.2	82
016063	2A6.3	82
016064	2A6.4	82
016065	2A6.5	82
016066	2A6.6	82
016067	2A6.7	82
016068	2A6.8	82
016070	2A7.0	82
016072	2A7.2	82
016073	2A7.3	82
016074	2A7.4	82
016075	2A7.5	82
016076	2A7.6	82
016078	2A7.8	82
016079	2A7.9	82
016080	2A8.0	82
016081	2A8.1	82
016082	2A8.2	82
016084	2A8.4	82
016085	2A8.5	82
016086	2A8.6	82
016087	2A8.7	82
016088	2A8.8	82
016089	2A8.9	82
016090	2A9.0	82
016093	2A9.3	82
016094	2A9.4	82
016095	2A9.5	82
016096	2A9.6	82
016097	2A9.7	82
016098	2A9.8	82
016099	2A9.9	82
016100	2A10.0	82
016102	2A10.2	82
016103	2A10.3	82
016105	2A10.5	82
016106	2A10.6	82
016108	2A10.8	82
016109	2A10.9	82
016110	2A11.0	82
016112	2A11.2	82
016113	2A11.3	82
016114	2A11.4	82
016115	2A11.5	82
016117	2A11.7	82
016118	2A11.8	82
016120	2A12.0	82
016121	2A12.1	82
016122	2A12.2	82
016125	2A12.5	82
016127	2A12.7	82
016128	2A12.8	82
016129	2A12.9	82
016130	2A13.0	82
016135	2AB13.5	82
016140	2AB14.0	82
016145	2AB14.5	82
016150	2AB15.0	82
016155	2AB15.5	82
016160	2AB16.0	82
016165	2AB16.5	82
016170	2AB17.0	82
016175	2AB17.5	82
016215	2A.15	82
016216	2A.16	82
016217	2A.17	82
016218	2A.18	82
016219	2A.19	82
016221	2A.21	82
016222	2A.22	82
016223	2A.23	82
016224	2A.24	82
016225	2A.25	82
016226	2A.26	82
016227	2A.27	82
016228	2A.28	82
016229	2A.29	82
016232	2A.32	82
016234	2A.34	82
016235	2A.35	82
016236	2A.36	82
016238	2A.38	82
016242	2A.42	82
016244	2A.44	82
016245	2A.45	82
016246	2A.46	82
016248	2A.48	82
016250	2A.55	82
016251	2A.65	82
016252	2A.75	82

EDP NUMBER INDEX - 016253 - 018248

EDP#	E-Code	Page #
016253	2A.85	82
016254	2A.95	82
016256	2A1.15	82
016257	2A1.25	82
016258	2A1.35	82
016259	2A1.45	82
016260	2A1.55	82
016261	2A1.65	82
016262	2A1.75	82
016266	2A2.15	82
016267	2A2.25	82
016268	2A2.35	82
016270	2A2.75	82
016271	2A3.25	82
016276	2A5.75	82
016278	2A6.75	82
016279	2A7.25	82
016282	2A8.25	82
016283	2A8.75	82
016300	2ACO10.0	110
016302	2ACO10.2	110
016305	2ACO10.5	110
016308	2ACO10.8	110
016310	2ACO11.0	110
016312	2ACO11.2	110
016315	2ACO11.5	110
016318	2ACO11.8	110
016320	2ACO12.0	110
016322	2ACO12.2	110
016325	2ACO12.5	110
016330	2ACO13.0	110
016355	2ACO1.05	110
016356	2ACO1.15	110
016357	2ACO1.25	110
016358	2ACO1.35	110
016359	2ACO1.45	110
016360	2ACO1.55	110
016361	2ACO1.65	110
016362	2ACO1.75	110
016363	2ACO1.85	110
016364	2ACO1.95	110
016365	2ACO2.05	110
016368	2ACO2.35	110
016371	2ACO3.25	110
016372	2ACO3.75	110
016373	2ACO4.25	110
016375	2ACO5.25	110
016379	2ACO7.25	110
016410	2ACO1.0	110
016411	2ACO1.1	110
016412	2ACO1.2	110
016413	2ACO1.3	110
016414	2ACO1.4	110
016415	2ACO1.5	110
016416	2ACO1.6	110
016417	2ACO1.7	110
016418	2ACO1.8	110
016419	2ACO1.9	110
016420	2ACO2.0	110
016421	2ACO2.1	110
016422	2ACO2.2	110
016423	2ACO2.3	110
016424	2ACO2.4	110
016425	2ACO2.5	110
016426	2ACO2.6	110
016427	2ACO2.7	110
016428	2ACO2.8	110
016429	2ACO2.9	110
016430	2ACO3.0	110
016431	2ACO3.1	110
016432	2ACO3.2	110
016433	2ACO3.3	110
016434	2ACO3.4	110
016435	2ACO3.5	110
016436	2ACO3.6	110
016437	2ACO3.7	110
016438	2ACO3.8	110
016440	2ACO4.0	110
016441	2ACO4.1	110
016442	2ACO4.2	110
016443	2ACO4.3	110
016444	2ACO4.4	110
016445	2ACO4.5	110
016447	2ACO4.7	110
016448	2ACO4.8	110
016450	2ACO5.0	110
016451	2ACO5.1	110
016452	2ACO5.2	110
016453	2ACO5.3	110
016455	2ACO5.5	110
016456	2ACO5.6	110
016457	2ACO5.7	110
016459	2ACO5.9	110
016460	2ACO6.0	110
016461	2ACO6.1	110
016462	2ACO6.2	110
016463	2ACO6.3	110
016464	2ACO6.4	110
016465	2ACO6.5	110
016466	2ACO6.6	110
016467	2ACO6.7	110
016468	2ACO6.8	110
016469	2ACO6.9	110
016470	2ACO7.0	110
016471	2ACO7.1	110
016472	2ACO7.2	110
016473	2ACO7.3	110
016475	2ACO7.5	110
016478	2ACO7.8	110
016479	2ACO7.9	110
016480	2ACO8.0	110
016482	2ACO8.2	110
016484	2ACO8.4	110
016485	2ACO8.5	110
016488	2ACO8.8	110
016489	2ACO8.9	110
016490	2ACO9.0	110
016491	2ACO9.1	110
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016498	2ACO9.8	110
017910	TS52N10	199
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017921	TS52N21	199
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017940	TS52N40	199
017958	TS511/8	199
017960	TS515/32	199
017962	TS513/16	199
017964	TS517/32	199
017966	TS511/4	199
018001	R18N1	74
018002	R18N2	74
018003	R18N3	74
018004	R18N4	74
018005	R18N5	74
018006	R18N6	74
018007	R18N7	74
018008	R18N8	74
018009	R18N9	74
018010	R18N10	74
018011	R18N11	74
018012	R18N12	74
018013	R18N13	74
018014	R18N14	74
018015	R18N15	74
018016	R18N16	74
018017	R18N17	74
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018101	R18AN1	95
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018103	R18AN3	95
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018111	R18AN11	95
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018115	R18AN15	95
018116	R18AN16	95
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018121	R18AN21	95
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018124	R18AN24	95
018125	R18AN25	95
018126	R18AN26	95
018127	R18AN27	95
018128	R18AN28	95
018129	R18AN29	95
018130	R18AN30	95
018131	R18AN31	95
018132	R18AN32	95
018133	R18AN33	95
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018135	R18AN35	95
018136	R18AN36	95
018137	R18AN37	95
018138	R18AN38	95
018139	R18AN39	95
018140	R18AN40	95
018141	R18AN41	95
018142	R18AN42	95
018143	R18AN43	95
018144	R18AN44	95
018145	R18AN45	95
018146	R18AN46	95
018147	R18AN47	95
018148	R18AN48	95
018149	R18AN49	95
018150	R18AN50	95
018151	R18AN51	95
018152	R18AN52	95
018201	R18BN1	98
018202	R18BN2	98
018203	R18BN3	98
018204	R18BN4	98
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018234	R18BN34	98
018235	R18BN35	98
018236	R18BN36	98
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018238	R18BN38	98
018239	R18BN39	98
018240	R18BN40	98
018241	R18BN41	98
018242	R18BN42	98
018243	R18BN43	98
018244	R18BN44	98
018245	R18BN45	98
018246	R18BN46	98
018247	R18BN47	98
018248	R18BN48	98

EDP NUMBER INDEX - 018249 - 019430

EDP#	E-Code	Page #
018249	R18BN49	98
018250	R18BN50	98
018251	R18BN51	98
018252	R18BN52	98
018301	R18CON1	110
018302	R18CON2	110
018303	R18CON3	110
018304	R18CON4	110
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018324	R18CON24	110
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018328	R18CON28	110
018329	R18CON29	110
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018331	R18CON31	110
018332	R18CON32	110
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018334	R18CON34	110
018335	R18CON35	110
018336	R18CON36	110
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018365	R18CON65	110
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018369	R18CON69	110
018370	R18CON70	110
018371	R18CON71	110
018372	R18CON72	110
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018375	R18CON75	110
018376	R18CON76	110
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018512	R18HN12	101
018513	R18HN13	101
018514	R18HN14	101
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018603	R18PN3	74
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018605	R18PN5	74
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018638	R18PN38	74
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018640	R18PN40	74
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018642	R18PN42	74
018643	R18PN43	74
018644	R18PN44	74
018645	R18PN45	74
018646	R18PN46	74
018647	R18PN47	74
018648	R18PN48	74
018649	R18PN49	74
018650	R18PN50	74
018651	R18PN51	74
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018655	R18PN55	74
018656	R18PN56	74
018657	R18PN57	74
018658	R18PN58	74
018659	R18PN59	74
018660	R18PN60	74
018661	R18PN61	74
018662	R18PN62	74
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018664	R18PN64	74
018665	R18PN65	74
018666	R18PN66	74
018667	R18PN67	74
018668	R18PN68	74
018669	R18PN69	74
018670	R18PN70	74
018671	R18PN71	74
018672	R18PN72	74
018673	R18PN73	74
018674	R18PN74	74
018675	R18PN75	74
018676	R18PN76	74
018677	R18PN77	74
018678	R18PN78	74
018679	R18PN79	74
018680	R18PN80	74
018681	R18PN81	74
018682	R18PN82	74
018683	R18PN83	74
018684	R18PN84	74
018685	R18PN85	74
018686	R18PN86	74
018687	R18PN87	74
018688	R18PN88	74
018689	R18PN89	74
018690	R18PN90	74
018691	R18PN91	74
018692	R18PN92	74
018693	R18PN93	74
018694	R18PN94	74
018695	R18PN95	74
018696	R18PN96	74
018697	R18PN97	74
019301	QC21PA	106
019302	QC21PB	106
019303	QC21PC	106
019304	QC21PD	106
019306	QC21PF	106
019307	QC21PG	106
019308	QC21PH	106
019309	QC21PI	106
019310	QC21PJ	106
019311	QC21PK	106
019312	QC21PL	106
019313	QC21PM	106
019314	QC21PN	106
019315	QC21PO	106
019316	QC21PP	106
019317	QC21PQ	106
019318	QC21PR	106
019319	QC21PS	106
019320	QC21PT	106
019321	QC21PU	106
019322	QC21PV	106
019323	QC21PW	106
019324	QC21PX	106
019325	QC21PY	106
019326	QC21PZ	106
019401	QC21PN1	106
019402	QC21PN2	106
019403	QC21PN3	106
019404	QC21PN4	106
019405	QC21PN5	106
019406	QC21PN6	106
019407	QC21PN7	106
019408	QC21PN8	106
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019410	QC21PN10	106
019411	QC21PN11	106
019412	QC21PN12	106
019413	QC21PN13	106
019414	QC21PN14	106
019415	QC21PN15	106
019416	QC21PN16	106
019417	QC21PN17	106
019418	QC21PN18	106
019419	QC21PN19	106
019420	QC21PN20	106
019421	QC21PN21	106
019422	QC21PN22	106
019423	QC21PN23	106
019424	QC21PN24	106
019425	QC21PN25	106
019426	QC21PN26	106
019427	QC21PN27	106
019428	QC21PN28	106
019429	QC21PN29	106
019430	QC21PN30	106

EDP NUMBER INDEX - 019431 - 022031

EDP#	E-Code	Page #
019431	QC21PN31	106
019432	QC21PN32	106
019433	QC21PN33	106
019434	QC21PN34	106
019435	QC21PN35	106
019436	QC21PN36	106
019437	QC21PN37	106
019438	QC21PN38	106
019439	QC21PN39	106
019440	QC21PN40	106
019441	QC21PN41	106
019442	QC21PN42	106
019443	QC21PN43	106
019444	QC21PN44	106
019445	QC21PN45	106
019446	QC21PN46	106
019447	QC21PN47	106
019448	QC21PN48	106
019449	QC21PN49	106
019450	QC21PN50	106
019451	QC21PN51	106
019452	QC21PN52	106
019815	QC21GM1.5	109
019820	QC21GM2.0	109
019825	QC21GM2.5	109
019830	QC21GM3.0	109
0019832	A1251.4X160	149
019840	QC21GM4.0	109
0019849	A1251.5X125	149
019850	QC21GM5.0	109
019852	QC21GM5.2	109
019855	QC21GM5.5	109
0019856	A1251.5X160	149
019856	QC21GM5.6	109
019860	QC21GM6.0	109
0019863	A1251.8X160	149
019865	QC21GM6.5	109
019868	QC21GM6.8	109
0019870	A12510.5X250	149
019870	QC21GM7.0	109
019875	QC21GM7.5	109
019880	QC21GM8.0	109
019882	QC21GM8.2	109
019885	QC21GM8.5	109
019886	QC21GM8.6	109
0019887	A12510.5X315	149
019890	QC21GM9.0	109
0019894	A12510.5X400	149
019895	QC21GM9.5	109
0019900	A12510.0X250	149
019900	QC21GM10.0	109
019905	QC21GM10.5	109
019910	QC21GM11.0	109
019915	QC21GM11.5	109
0019917	A12510.0X315	149
019920	QC21GM12.0	109
0019924	A12510.0X400	149
019925	QC21GM12.5	109
019930	QC21GM13.0	109
0019931	A12511.0X250	149
0019948	A12511.0X315	149
0019955	A12511.0X400	149
0019962	A12512.0X250	149
0019979	A12512.0X315	149
0019986	A12512.0X400	149
0019993	A12513.0X315	149
0020005	A12513.0X400	149
020008	2091/8	164
020009	2099/64	164
020010	2095/32	164
020011	20911/64	164
020012	2093/16	164
0020012	A12514.0X315	149
020013	20913/64	164
020014	2097/32	164
020015	20915/64	164
020016	2091/4	164
020017	20917/64	164
020018	2099/32	164
020019	20919/64	164
020020	2095/16	164
020021	20921/64	164
020022	20911/32	164
020023	20923/64	164
020024	2093/8	164
020025	20925/64	164
020026	20913/32	164
020027	20927/64	164
020028	2097/16	164
020029	20929/64	164
0020029	A12514.0X400	149
020030	20915/32	164
020031	20931/64	164
020032	2091/2	164
020033	20933/64	164
020034	20917/32	164
020035	20935/64	164
020036	2099/16	164
0020036	A1252.2X160	149
020037	20937/64	164
020038	20919/32	164
020039	20939/64	164
020040	2095/8	164
020041	20941/64	164
020042	20921/32	164
020043	20943/64	164
0020043	A1252.5X125	149
020044	20911/16	164
020045	20945/64	164
020046	20923/32	164
020047	20947/64	164
020048	2093/4	164
020049	20949/64	164
020050	20925/32	164
0020050	A1252.5X160	149
020051	20951/64	164
020052	20913/16	164
020053	20953/64	164
020054	20927/32	164
020055	20955/64	164
020056	2097/8	164
020057	20957/64	164
020058	20929/32	164
020059	20959/64	164
020060	20915/16	164
020061	20961/64	164
020062	20931/32	164
020063	20963/64	164
0020067	A1252.0X125	149
0020074	A1252.0X160	149
0020081	A1253.3X160	149
0020098	A1253.5X160	149
20100	2091	164
020101	2091.1/64	164
020102	2091.1/32	164
020103	2091.3/64	164
020104	2091.1/16	164
0020104	A1253.5X200	149
020105	2091.5/64	164
020106	2091.3/32	164
020107	2091.7/64	164
020108	2091.1/8	164
020109	2091.9/64	164
020110	2091.5/32	164
020111	2091.11/64	164
0020111	A1253.5X250	149
020112	2091.3/16	164
020114	2091.7/32	164
020115	2091.15/64	164
020116	2091.1/4	164
020117	2091.17/64	164
020118	2091.9/32	164
020119	2091.19/64	164
020120	2091.5/16	164
020121	2091.21/64	164
020122	2091.11/32	164
020123	2091.23/64	164
020124	2091.3/8	164
020125	2091.25/64	164
020126	2091.13/32	164
020127	2091.27/64	164
020128	2091.7/16	164
0020128	A1253.0X160	149
020130	2091.15/32	164
020131	2091.31/64	164
020132	2091.1/2	164
020134	2091.17/32	164
0020135	A1253.0X200	149
020136	2091.9/16	164
020140	2091.5/8	164
0020142	A1253.0X250	149
020144	2091.11/16	164
020146	2091.23/32	164
020148	2091.3/4	164
020150	2091.25/32	164
020152	2091.13/16	164
020154	2091.27/32	164
020156	2091.7/8	164
020158	2091.29/32	164
0020159	A1254.5X160	149
020160	2091.15/16	164
020162	2091.31/32	164
0020166	A1254.5X200	149
0020173	A1254.5X250	149
0020180	A1254.5X315	149
0020197	A1254.0X160	149
20200	2092	164
0020203	A1254.0X200	149
0020210	A1254.0X250	149
0020227	A1254.0X315	149
0020234	A1255.5X200	149
0020241	A1255.5X250	149
0020258	A1255.5X315	149
0020265	A1255.0X160	149
0020272	A1255.0X200	149
0020289	A1255.0X250	149
0020296	A1255.0X315	149
0020302	A1255.0X400	149
0020319	A1256.5X200	149
0020326	A1256.5X250	149
0020333	A1256.5X315	149
0020340	A1256.0X200	149
0020357	A1256.0X250	149
0020364	A1256.0X315	149
0020371	A1256.0X400	149
0020388	A1257.5X200	149
0020395	A1257.5X250	149
0020401	A1257.5X315	149
0020418	A1257.0X200	149
0020425	A1257.0X250	149
0020432	A1257.0X315	149
0020449	A1258.5X250	149
0020456	A1258.5X315	149
0020463	A1258.0X250	149
0020470	A1258.0X315	149
0020487	A1258.0X400	149
0020494	A1259.5X250	149
0020500	A1259.5X315	149
0020517	A1259.0X250	149
0020524	A1259.0X315	149
0020531	A1259.0X400	149
021316	209CO1/4	174
021318	209CO9/32	174
021320	209CO5/16	174
021322	209CO11/32	174
021324	209CO3/8	174
021326	209CO13/32	174
021327	209CO27/64	174
021328	209CO7/16	174
021329	209CO29/64	174
021330	209CO15/32	174
021331	209CO31/64	174
021332	209CO1/2	174
021333	209CO33/64	174
021334	209CO17/32	174
021335	209CO35/64	174
021336	209CO9/16	174
021337	209CO37/64	174
021338	209CO19/32	174
021339	209CO39/64	174
021340	209CO5/8	174
021341	209CO41/64	174
021342	209CO21/32	174
021343	209CO43/64	174
021344	209CO11/16	174
021345	209CO45/64	174
021347	209CO47/64	174
021348	209CO23/32	174
021349	209CO49/64	174
021350	209CO3/4	174
021351	209CO51/64	174
021352	209CO25/32	174
021353	209CO53/64	174
021354	209CO13/16	174
021355	209CO27/32	174
021356	209CO7/8	174
021357	209CO55/64	174
021358	209CO57/64	174
021359	209CO29/32	174
021360	209CO15/16	174
021362	209CO59/64	174
021363	209CO61/64	174
021364	209CO31/32	174
021365	209CO63/64	174
021400	209CO1	174
021401	209CO1.1/64	174
021402	209CO1.1/32	174
021404	209CO1.1/16	174
021406	209CO1.3/32	174
021407	209CO1.7/64	174
021408	209CO1.1/8	174
021409	209CO1.9/64	174
021411	209CO1.11/64	174
021412	209CO1.3/16	174
021414	209CO1.7/32	174
021415	209CO1.15/64	174
021416	209CO1.1/4	174
021418	209CO1.9/32	174
021419	209CO1.19/64	174
021420	209CO1.5/16	174
021422	209CO1.11/32	174
021423	209CO1.23/64	174
021424	209CO1.3/8	174
021427	209CO1.27/64	174
021428	209CO1.7/16	174
021430	209CO1.15/32	174
021431	209CO1.31/64	174
021432	209CO1.1/2	174
022004	HX101/16	92
022005	HX105/64	92
022006	HX103/32	92
022007	HX107/64	92
022008	HX101/8	92
022009	HX109/64	92
022010	HX105/32	92
022011	HX1011/64	92
022012	HX103/16	92
022013	HX1013/64	92
022014	HX107/32	92
022015	HX1015/64	92
022016	HX101/4	92
022017	HX1017/64	92
022018	HX109/32	92
022019	HX1019/64	92
022020	HX105/16	92
022021	HX1021/64	92
022022	HX1011/32	92
022023	HX1023/64	92
022024	HX103/8	92
022025	HX1025/64	92
022026	HX1013/32	92
022027	HX1027/64	92
022028	HX107/16	92
022029	HX1029/64	92
022030	HX1015/32	92
022031	HX1031/64	92

EDP NUMBER INDEX - 022032 - 029043

EDP#	E-Code	Page #
022032	HX101/2	92
022101	HX18N1	92
022102	HX18N2	92
022103	HX18N3	92
022104	HX18N4	92
022105	HX18N5	92
022106	HX18N6	92
022107	HX18N7	92
022108	HX18N8	92
022109	HX18N9	92
022110	HX18N10	92
022111	HX18N11	92
022112	HX18N12	92
022113	HX18N13	92
022114	HX18N14	92
022115	HX18N15	92
022116	HX18N16	92
022117	HX18N17	92
022118	HX18N18	92
022119	HX18N19	92
022120	HX18N20	92
022121	HX18N21	92
022122	HX18N22	92
022123	HX18N23	92
022124	HX18N24	92
022125	HX18N25	92
022126	HX18N26	92
022127	HX18N27	92
022128	HX18N28	92
022129	HX18N29	92
022130	HX18N30	92
022131	HX18N31	92
022132	HX18N32	92
022133	HX18N33	92
022134	HX18N34	92
022135	HX18N35	92
022136	HX18N36	92
022137	HX18N37	92
022138	HX18N38	92
022139	HX18N39	92
022140	HX18N40	92
022141	HX18N41	92
022142	HX18N42	92
022143	HX18N43	92
022144	HX18N44	92
022145	HX18N45	92
022146	HX18N46	92
022147	HX18N47	92
022148	HX18N48	92
022149	HX18N49	92
022150	HX18N50	92
022151	HX18N51	92
022152	HX18N52	92
022201	HX15A	92
022202	HX15B	92
022203	HX15C	92
022204	HX15D	92
022205	HX15E	92
022206	HX15F	92
022207	HX15G	92
022208	HX15H	92
022209	HX15I	92
022210	HX15J	92
022211	HX15K	92
022212	HX15L	92
022213	HX15M	92
022214	HX15N	92
022215	HX15O	92
022216	HX15P	92
022217	HX15Q	92
022218	HX15R	92
022219	HX15S	92
022220	HX15T	92
022221	HX15U	92
022222	HX15V	92
022223	HX15W	92
022224	HX15X	92
022225	HX15Y	92
022226	HX15Z	92
023032	S2091/2	164
023033	S20933/64	164
023034	S20917/32	164
023035	S20935/64	164
023036	S2099/16	164
023051	S20951/64	164
023052	S20913/16	164
023053	S20953/64	164
023054	S20927/32	164
023055	S20955/64	164
023056	S2097/8	164
023057	S20957/64	164
023058	S20929/32	164
023106	S2091.3/32	164
023107	S2091.7/64	164
023108	S2091.1/8	164
023109	S2091.9/64	164
023110	S2091.5/32	164
023111	S2091.11/64	164
023112	S2091.3/16	164
023113	S2091.13/64	164
023114	S2091.7/32	164
023115	S2091.15/64	164
023116	S2091.1/4	164
023133	S2091.33/64	164
023134	S2091.17/32	164
023135	S2091.35/64	164
023136	S2091.9/16	164
023137	S2091.37/64	164
023138	S2091.19/32	164
023139	S2091.39/64	164
023140	S2091.5/8	164
023141	S2091.41/64	164
023142	S2091.21/32	164
023144	S2091.11/16	164
023145	S2091.45/64	164
023147	S2091.47/64	164
023148	S2091.3/4	164
023150	S2091.25/32	164
023152	S2091.13/16	164
023156	S2091.7/8	164
023160	S2091.15/16	164
023162	S2091.31/32	164
023200	S2092	164
024532	T4001/2	461
024534	T40017/32	461
024536	T4009/16	461
024540	T4005/8	461
024542	T40021/32	461
024548	T4003/4	461
024550	T40025/32	461
024556	T4007/8	461
024558	T40029/32	461
024600	T4001	461
024602	T4001.1/32	461
024604	T4001.1/16	461
024608	T4001.1/8	461
024610	T4001.5/32	461
024616	T4001.1/4	461
024620	T4001.5/16	461
024622	T4001.11/32	461
024624	T4001.3/8	461
024626	T4001.13/32	461
024628	T4001.7/16	461
024632	T4001.1/2	461
024636	T4001.9/16	461
024640	T4001.5/8	461
024648	T4001.3/4	461
024650	T4001.25/32	461
024654	T4001.27/32	461
024656	T4001.7/8	461
024658	T4001.29/32	461
024662	T4001.31/32	461
024708	T4002.1/8	461
024716	T4002.1/4	461
024732	T4002.1/2	461
026050	5ATS5.0	167
026055	5ATS5.5	167
026060	5ATS6.0	167
026065	5ATS6.5	167
026068	5ATS6.8	167
026070	5ATS7.0	167
026075	5ATS7.5	167
026080	5ATS8.0	167
026085	5ATS8.5	167
026090	5ATS9.0	167
026095	5ATS9.5	167
026100	5ATS10.0	167
026102	5ATS10.2	167
026105	5ATS10.5	167
026110	5ATS11.0	167
026115	5ATS11.5	167
026120	5ATS12.0	167
026122	5ATS12.2	167
026125	5ATS12.5	167
026128	5ATS12.8	167
026130	5ATS13.0	167
026135	5ATS13.5	167
026138	5ATS13.8	167
026140	5ATS14.0	167
026142	5ATS14.25	167
026145	5ATS14.5	167
026147	5ATS14.75	167
026150	5ATS15.0	167
026152	5ATS15.25	167
026155	5ATS15.5	167
026157	5ATS15.75	167
026160	5ATS16.0	167
026162	5ATS16.25	167
026165	5ATS16.5	167
026170	5ATS17.0	167
026175	5ATS17.5	167
026180	5ATS18.0	167
026185	5ATS18.5	167
026190	5ATS19.0	167
026195	5ATS19.5	167
026200	5ATS20.0	167
026205	5ATS20.5	167
026210	5ATS21.0	167
026215	5ATS21.5	167
026220	5ATS22.0	167
026225	5ATS22.5	167
026230	5ATS23.0	167
026235	5ATS23.5	167
026240	5ATS24.0	167
026245	5ATS24.5	167
026250	5ATS25.0	167
026255	5ATS25.5	167
026260	5ATS26.0	167
026265	5ATS26.5	167
026270	5ATS27.0	167
026275	5ATS27.5	167
026280	5ATS28.0	167
026285	5ATS28.5	167
026290	5ATS29.0	167
026295	5ATS29.5	167
026300	5ATS30.0	167
026305	5ATS30.5	167
026310	5ATS31.0	167
026315	5ATS31.5	167
026320	5ATS32.0	167
026325	5ATS32.5	167
026330	5ATS33.0	167
026340	5ATS34.0	167
026350	5ATS35.0	167
026360	5ATS36.0	167
026365	5ATS36.5	167
026370	5ATS37.0	167
026375	5ATS37.5	167
026380	5ATS38.0	167
026390	5ATS39.0	167
026400	5ATS40.0	167
026420	5ATS42.0	167
026430	5ATS43.0	167
026440	5ATS44.0	167
026450	5ATS45.0	167
026480	5ATS48.0	167
026500	5ATS50.0	167
0028568	A100A	82
0028575	A100B	82
0028582	A100C	82
0028599	A100D	82
0028605	A100E	82
0028612	A100F	82
0028629	A100G	82
0028636	A100H	82
0028643	A100I	82
0028650	A100J	82
0028667	A100K	82
0028674	A100L	82
0028681	A100M	82
0028698	A100N	82
0028704	A100N1	82
0028711	A100N10	82
0028728	A100N11	82
0028735	A100N12	82
0028742	A100N13	82
0028759	A100N14	82
0028766	A100N15	82
0028773	A100N16	82
0028780	A100N17	82
0028797	A100N18	82
0028803	A100N19	82
0028810	A100N2	82
0028827	A100N20	82
0028834	A100N21	82
0028841	A100N22	82
0028858	A100N23	82
0028865	A100N24	82
0028872	A100N25	82
0028889	A100N26	82
0028896	A100N27	82
0028902	A100N28	82
0028919	A100N29	82
0028926	A100N3	82
0028933	A100N30	82
0028940	A100N31	82
0028957	A100N32	82
0028964	A100N33	82
0028971	A100N34	82
0028988	A100N35	82
0028995	A100N36	82
0029008	A100N37	82
029010	2AB1.0	82
029011	2AB1.1	82
029012	2AB1.2	82
029013	2AB1.3	82
029014	2AB1.4	82
029015	2AB1.5	82
0029015	A100N38	82
029016	2AB1.6	82
029017	2AB1.7	82
029018	2AB1.8	82
029019	2AB1.9	82
029020	2AB2.0	82
029021	2AB2.1	82
029022	2AB2.2	82
0029022	A100N39	82
029023	2AB2.3	82
029024	2AB2.4	82
029025	2AB2.5	82
029026	2AB2.6	82
029027	2AB2.7	82
029029	2AB2.9	82
029030	2AB3.0	82
029031	2AB3.1	82
029032	2AB3.2	82
029033	2AB3.3	82
029034	2AB3.4	82
029035	2AB3.5	82
029036	2AB3.6	82
029037	2AB3.7	82
0029039	A100N4	82
029040	2AB4.0	82
029041	2AB4.1	82
029042	2AB4.2	82
029043	2AB4.3	82

EDP NUMBER INDEX - 029044 - 0034033

EDP#	E-Code	Page #
029044	2AB4.4	82
029045	2AB4.5	82
029046	2AB4.6	82
0029046	A100N40	82
029048	2AB4.8	82
029050	2AB5.0	82
029051	2AB5.1	82
029052	2AB5.2	82
029053	2AB5.3	82
0029053	A100N41	82
029054	2AB5.4	82
029055	2AB5.5	82
029056	2AB5.6	82
029057	2AB5.7	82
029058	2AB5.8	82
029060	2AB6.0	82
0029060	A100N42	82
029061	2AB6.1	82
029062	2AB6.2	82
029063	2AB6.3	82
029064	2AB6.4	82
029065	2AB6.5	82
029066	2AB6.6	82
029067	2AB6.7	82
029068	2AB6.8	82
029070	2AB7.0	82
029072	2AB7.2	82
029073	2AB7.3	82
029074	2AB7.4	82
029075	2AB7.5	82
029076	2AB7.6	82
0029077	A100N43	82
029078	2AB7.8	82
029079	2AB7.9	82
029080	2AB8.0	82
029081	2AB8.1	82
029082	2AB8.2	82
029084	2AB8.4	82
0029084	A100N44	82
029085	2AB8.5	82
029086	2AB8.6	82
029087	2AB8.7	82
029088	2AB8.8	82
029089	2AB8.9	82
029090	2AB9.0	82
0029091	A100N45	82
029093	2AB9.3	82
029094	2AB9.4	82
029095	2AB9.5	82
029096	2AB9.6	82
029097	2AB9.7	82
029098	2AB9.8	82
029099	2AB9.9	82
029100	2AB10.0	82
029102	2AB10.2	82
029103	2AB10.3	82
029105	2AB10.5	82
0029107	A100N46	82
029108	2AB10.8	82
029109	2AB10.9	82
029110	2AB11.0	82
029112	2AB11.2	82
029113	2AB11.3	82
029114	2AB11.4	82
0029114	A100N47	82
029115	2AB11.5	82
029117	2AB11.7	82
029118	2AB11.8	82
029120	2AB12.0	82
029121	2AB12.1	82
0029121	A100N48	82
029122	2AB12.2	82
029125	2AB12.5	82
029127	2AB12.7	82
029128	2AB12.8	82
029129	2AB12.9	82
029130	2AB13.0	82
0029138	A100N49	82
0029145	A100N5	82
0029152	A100N50	82
0029169	A100N51	82
0029176	A100N52	82
0029183	A100N53	82
0029190	A100N54	82
0029206	A100N55	82
0029213	A100N56	82
0029220	A100N57	82
0029237	A100N58	82
0029244	A100N59	82
0029251	A100N6	82
029256	2AB1.15	82
029257	2AB1.25	82
029258	2AB1.35	82
029259	2AB1.45	82
029260	2AB1.55	82
029262	2AB1.75	82
029264	2AB1.95	82
029268	2AB2.35	82
0029268	A100N60	82
029271	2AB3.25	82
0029275	A100N61	82
029276	2AB5.75	82
029278	2AB6.75	82
029279	2AB7.25	82
029281	2AB7.85	82
029282	2AB8.25	82
0029282	A100N62	82
029283	2AB8.75	82
0029299	A100N63	82
0029305	A100N64	82
0029312	A100N65	82
0029329	A100N66	82
0029336	A100N67	82
0029343	A100N68	82
0029350	A100N69	82
0029367	A100N7	82
0029374	A100N70	82
0029381	A100N71	82
0029398	A100N72	82
0029404	A100N73	82
0029411	A100N74	82
0029428	A100N75	82
0029435	A100N76	82
0029442	A100N77	82
0029459	A100N78	82
0029466	A100N79	82
0029473	A100N8	82
0029480	A100N80	82
0029497	A100N9	82
0029503	A100O	82
0029510	A100P	82
0029527	A100Q	82
0029534	A100R	82
0029541	A100S	82
0029558	A100T	82
0029565	A100U	82
0029572	A100V	82
0029589	A100W	82
0029596	A100X	82
0029602	A100Y	82
0029619	A100Z	82
0029626	A16010.0	186
0029633	A16010.2	186
0029640	A16010.5	186
0029657	A16011.0	186
0029664	A16011.5	186
0029671	A16012.0	186
0029688	A16013.0	186
0029695	A16014.0	186
0029701	A16015.0	186
0029718	A16016.0	186
0029725	A1604.0	186
0029732	A1604.5	186
0029749	A1605.0	186
0029756	A1605.5	186
0029763	A1606.0	186
0029770	A1606.5	186
0029787	A1606.8	186
0029794	A1607.0	186
0029800	A1607.5	186
0029817	A1608.0	186
0029824	A1608.5	186
0029831	A1609.0	186
0029848	A1609.5	186
0030134	A1701	176
0030141	A17011/16	176
0030165	A17013.0	176
0030172	A17013.5	176
0030189	A17013/16	176
0030196	A17014.0	176
0030202	A17014.5	176
0030219	A17015.0	176
0030226	A17015.5	176
0030233	A17015/16	176
0030240	A17016.0	176
0030257	A17016.5	176
0030264	A17017.0	176
0030271	A17017.5	176
0030288	A17045/64	176
0030295	A17017/32	176
0030301	A17018.0	176
0030318	A17018.5	176
0030325	A17019.0	176
0030332	A17019.5	176
0030349	A17019/32	176
0030356	A17020.0	176
0030363	A17021.0	176
0030370	A17021/32	176
0030387	A17022.0	176
0030394	A17023.0	176
0030400	A17023/32	176
0030417	A17024.0	176
0030424	A17025.0	176
0030431	A17025/32	176
0030448	A17027/32	176
0030455	A17031/32	176
0030462	A1703/4	176
0030479	A17041/64	176
0030486	A17051/64	176
0030493	A17057/64	176
0030509	A1705/8	176
0030516	A1707/8	176
0030523	A1709/16	176
0030547	A190201	205
0030554	A190202	205
0030561	A190203	205
0030578	A190204	205
0030585	A190206	205
0030608	A191413	205
0030615	A191419	205
032230	4ASMCO2.3	134
032250	4ASMCO2.5	134
032300	4ASMCO3.0	134
032310	4ASMCO3.1	134
032320	4ASMCO3.2	134
032330	4ASMCO3.3	134
032340	4ASMCO3.4	134
032350	4ASMCO3.5	134
032360	4ASMCO3.6	134
032370	4ASMCO3.7	134
032400	4ASMCO4.0	134
032410	4ASMCO4.1	134
032420	4ASMCO4.2	134
032470	4ASMCO4.7	134
032480	4ASMCO4.8	134
032490	4ASMCO4.9	134
032500	4ASMCO5.0	134
032510	4ASMCO5.1	134
032550	4ASMCO5.5	134
032570	4ASMCO5.7	134
032600	4ASMCO6.0	134
032640	4ASMCO6.4	134
032650	4ASMCO6.5	134
032680	4ASMCO6.8	134
032700	4ASMCO7.0	134
032800	4ASMCO8.0	134
032850	4ASMCO8.5	134
032950	4ASMCO9.5	134
032980	4ASMCO9.8	134
033000	4ASMCO10.0	134
033002	4ASMCO10.2	134
033005	4ASMCO10.5	134
033110	4ASMCO11.0	134
033112	4ASMCO11.2	134
033115	4ASMCO11.5	134
033200	4ASMCO12.0	134
0033241	A35010.0	167
0033265	A35010.2	167
0033289	A35010.5	167
0033296	A35010.7	167
0033319	A35011.0	167
0033333	A35011.5	167
0033340	A35011.75	167
0033357	A35011.8	167
0033364	A35012.0	167
0033395	A35012.5	167
0033401	A35013.0	167
0033418	A35013.5	167
0033432	A35014.0	167
0033449	A35014.25	167
0033456	A35014.5	167
0033463	A35014.75	167
0033470	A35015.0	167
0033487	A35015.25	167
0033494	A35015.5	167
0033500	A35015.75	167
0033517	A35016.0	167
0033524	A35016.25	167
0033531	A35016.5	167
0033548	A35016.75	167
0033555	A35017.0	167
0033562	A35017.25	167
0033579	A35017.5	167
0033593	A35018.0	167
0033616	A35018.5	167
0033623	A35019.0	167
0033647	A35019.5	167
0033654	A35019.75	167
0033661	A35020.0	167
0033678	A35020.25	167
0033685	A35020.5	167
0033692	A35021.0	167
0033708	A35021.5	167
0033715	A35022.0	167
0033722	A35022.5	167
0033739	A35023.0	167
0033746	A35023.5	167
0033753	A35024.0	167
0033760	A35024.5	167
0033777	A35025.0	167
0033784	A35025.5	167
0033791	A35026.0	167
0033807	A35026.5	167
0033814	A35027.0	167
0033821	A35027.5	167
0033838	A35028.0	167
0033845	A35029.0	167
0033852	A35030.0	167
0033869	A35030.5	167
0033876	A35031.0	167
0033883	A35031.5	167
0033890	A35032.0	167
0033906	A35033.0	167
0033913	A35034.0	167
0033920	A35035.0	167
0033937	A35036.0	167
0033944	A35037.0	167
0033951	A35038.0	167
0033968	A35039.0	167
0033975	A35040.0	167
0033982	A35041.0	167
0033999	A35042.0	167
0034002	A35043.0	167
0034019	A35044.0	167
0034026	A35045.0	167
0034033	A35046.0	167

EDP NUMBER INDEX - 0034040 - 040032

EDP#	E-Code	Page #
0034040	A35047.0	167
0034057	A35048.0	167
0034071	A3505.0	167
0034088	A3505.5	167
0034101	A35050.0	167
0034118	A3506.0	167
0034125	A3506.7	167
034135	2A13.5	82
034140	2A14.0	82
034145	2A14.5	82
0034149	A3506.8	167
034150	2A15.0	82
0034156	A3507.0	167
0034163	A3507.5	167
0034187	A3508.0	167
0034200	A3508.4	167
0034217	A3508.5	167
0034224	A3508.75	167
0034248	A3509.0	167
0034279	A3509.5	167
0034293	A3509.8	167
034408	D4441/8	184
034409	D4449/64	184
034410	D4445/32	184
034411	D44411/64	184
034412	D4443/16	184
034413	D44413/64	184
034414	D4447/32	184
034415	D44415/64	184
034416	D4441/4	184
034417	D44417/64	184
034418	D4449/32	184
034419	D44419/64	184
034420	D4445/16	184
034421	D44421/64	184
034422	D44411/32	184
034423	D44423/64	184
034424	D4443/8	184
034425	D44425/64	184
034426	D44413/32	184
034427	D44427/64	184
034428	D4447/16	184
034429	D44429/64	184
034430	D44415/32	184
034431	D44431/64	184
034432	D4441/2	184
034502	D444B	184
034503	D444C	184
034505	D444E	184
034506	D444F	184
034507	D444G	184
034508	D444H	184
034509	D444I	184
034510	D444J	184
034511	D444K	184
034512	D444L	184
034514	D444N	184
034515	D444O	184
034516	D444P	184
034517	D444Q	184
034518	D444R	184
034519	D444S	184
034520	D444T	184
034521	D444U	184
034526	D444Z	184
034601	D444N1	184
034603	D444N3	184
034607	D444N7	184
034609	D444N9	184
034610	D444N10	184
034611	D444N11	184
034613	D444N13	184
034614	D444N14	184
034615	D444N15	184
034617	D444N17	184
034618	D444N18	184
034619	D444N19	184
034620	D444N20	184
034621	D444N21	184
034625	D444N25	184
034629	D444N29	184
034630	D444N30	184
034632	D444N32	184
0036174	A51010.0	60
0036181	A51010.1	60
0036198	A51010.2	60
0036204	A51010.3	60
0036211	A51010.4	60
0036228	A51010.5	60
0036235	A51010.6	60
0036242	A51010.7	60
0036259	A51010.8	60
0036266	A51010.9	60
0036273	A51011.0	60
0036280	A51011.1	60
0036297	A51011.2	60
0036303	A51011.3	60
0036310	A51011.4	60
0036327	A51011.5	60
0036334	A51011.6	60
0036341	A51011.7	60
0036358	A51011.8	60
0036365	A51011.9	60
0036372	A51012.0	60
0036389	A51012.1	60
0036396	A51012.2	60
0036402	A51012.3	60
0036419	A51012.4	60
0036426	A51012.5	60
0036433	A51012.6	60
0036440	A51012.7	60
0036457	A51012.8	60
0036464	A51012.9	60
0036471	A51013.0	60
0036488	A51014.0	60
0036495	A5103.0	60
0036501	A5103.1	60
0036518	A5103.2	60
0036525	A5103.3	60
0036532	A5103.4	60
0036549	A5103.5	60
0036556	A5103.6	60
0036563	A5103.7	60
0036570	A5103.8	60
0036587	A5103.9	60
0036594	A5104.0	60
0036600	A5104.1	60
0036617	A5104.2	60
0036624	A5104.3	60
0036631	A5104.4	60
0036648	A5104.5	60
0036655	A5104.6	60
0036662	A5104.7	60
0036679	A5104.8	60
0036686	A5104.9	60
0036693	A5105.0	60
0036709	A5105.1	60
0036716	A5105.2	60
0036723	A5105.3	60
0036730	A5105.4	60
0036747	A5105.5	60
0036754	A5105.6	60
0036761	A5105.7	60
0036778	A5105.8	60
0036785	A5105.9	60
0036792	A5106.0	60
0036808	A5106.1	60
0036815	A5106.2	60
0036822	A5106.3	60
0036839	A5106.4	60
0036846	A5106.5	60
0036853	A5106.6	60
0036860	A5106.7	60
0036877	A5106.8	60
0036884	A5106.9	60
0036891	A5107.0	60
0036907	A5107.1	60
0036914	A5107.2	60
0036921	A5107.3	60
0036938	A5107.4	60
0036945	A5107.5	60
0036952	A5107.6	60
0036969	A5107.7	60
0036976	A5107.8	60
0036983	A5107.9	60
0036990	A5108.0	60
0037003	A5108.1	60
0037010	A5108.2	60
0037027	A5108.3	60
0037034	A5108.4	60
0037041	A5108.5	60
0037058	A5108.6	60
0037065	A5108.7	60
0037072	A5108.8	60
0037089	A5108.9	60
0037096	A5109.0	60
0037102	A5109.1	60
0037119	A5109.2	60
0037126	A5109.3	60
0037133	A5109.4	60
0037140	A5109.5	60
0037157	A5109.6	60
0037164	A5109.7	60
0037171	A5109.8	60
0037188	A5109.9	60
0038598	A52010.0	53
0038604	A52010.1	53
0038611	A52010.2	53
0038628	A52010.3	53
0038635	A52010.4	53
0038642	A52010.5	53
0038659	A52010.6	53
0038666	A52010.7	53
0038673	A52010.8	53
0038680	A52010.9	53
0038697	A52011.0	53
0038703	A52011.1	53
0038710	A52011.2	53
0038727	A52011.3	53
0038734	A52011.4	53
0038741	A52011.5	53
0038758	A52011.6	53
0038765	A52011.7	53
0038772	A52011.8	53
0038789	A52011.9	53
0038796	A52012.0	53
0038802	A52012.1	53
0038819	A52012.2	53
0038826	A52012.3	53
0038833	A52012.4	53
0038840	A52012.5	53
0038857	A52012.6	53
0038864	A52012.7	53
0038871	A52012.8	53
0038888	A52012.9	53
0038895	A52013.0	53
0038901	A5203.0	53
0038918	A5203.1	53
0038925	A5203.2	53
0038932	A5203.3	53
0038949	A5203.4	53
0038956	A5203.5	53
0038963	A5203.6	53
0038970	A5203.7	53
0038987	A5203.8	53
0038994	A5203.9	53
0039007	A5204.0	53
0039014	A5204.1	53
0039021	A5204.2	53
0039038	A5204.3	53
0039045	A5204.4	53
0039052	A5204.5	53
0039069	A5204.6	53
0039076	A5204.7	53
0039083	A5204.8	53
0039090	A5204.9	53
0039106	A5205.0	53
0039113	A5205.1	53
0039120	A5205.2	53
0039137	A5205.3	53
0039144	A5205.4	53
0039151	A5205.5	53
0039168	A5205.6	53
0039175	A5205.7	53
0039182	A5205.8	53
0039199	A5205.9	53
0039205	A5206.0	53
0039212	A5206.1	53
0039229	A5206.2	53
0039236	A5206.3	53
0039243	A5206.4	53
0039250	A5206.5	53
0039267	A5206.6	53
0039274	A5206.7	53
0039281	A5206.8	53
0039298	A5206.9	53
0039304	A5207.0	53
0039311	A5207.1	53
0039328	A5207.2	53
0039335	A5207.3	53
0039342	A5207.4	53
0039359	A5207.5	53
0039366	A5207.6	53
0039373	A5207.7	53
0039380	A5207.8	53
0039397	A5207.9	53
0039403	A5208.0	53
0039410	A5208.1	53
0039427	A5208.2	53
0039434	A5208.3	53
0039441	A5208.4	53
0039458	A5208.5	53
0039465	A5208.6	53
0039472	A5208.7	53
0039489	A5208.8	53
0039496	A5208.9	53
0039502	A5209.0	53
0039519	A5209.1	53
0039526	A5209.2	53
0039533	A5209.3	53
0039540	A5209.4	53
0039557	A5209.5	53
0039564	A5209.6	53
0039571	A5209.7	53
0039588	A5209.8	53
0039595	A5209.9	53
040003	R403/64	117
040004	R401/16	117
040005	R405/64	117
040006	R403/32	117
040007	R407/64	117
040008	R401/8	117
040009	R409/64	117
040010	R405/32	117
040011	R4011/64	117
040012	R403/16	117
040013	R4013/64	117
040014	R407/32	117
040015	R4015/64	117
040016	R401/4	117
040017	R4017/64	117
040018	R409/32	117
040019	R4019/64	117
040020	R405/16	117
040021	R4021/64	117
040022	R4011/32	117
040023	R4023/64	117
040024	R403/8	117
040025	R4025/64	117
040026	R4013/32	117
040027	R4027/64	117
040028	R407/16	117
040029	R4029/64	117
040030	R4015/32	117
040031	R4031/64	117
040032	R401/2	117

EDP NUMBER INDEX - 040033 - 0041376

EDP#	E-Code	Page #
040033	R4033/64	117
040034	R4017/32	117
040035	R4035/64	117
040036	R409/16	117
040037	R4037/64	117
040038	R4019/32	117
040039	R4039/64	117
040040	R405/8	117
040041	R4041/64	117
040042	R4021/32	117
040043	R4043/64	117
040044	R4011/16	117
040304	M40CO1/16	131
040305	M40CO5/64	131
040306	M40CO3/32	131
040307	M40CO7/64	131
040308	M40CO1/8	131
040309	M40CO9/64	131
040310	M40CO5/32	131
040311	M40CO11/64	131
040312	M40CO3/16	131
040313	M40CO13/64	131
040314	M40CO7/32	131
040315	M40CO15/64	131
040316	M40CO1/4	131
040317	M40CO17/64	131
040318	M40CO9/32	131
040319	M40CO19/64	131
040320	M40CO5/16	131
040321	M40CO21/64	131
040322	M40CO11/32	131
040323	M40CO23/64	131
040324	M40CO3/8	131
040325	M40CO25/64	131
040326	M40CO13/32	131
040327	M40CO27/64	131
040328	M40CO7/16	131
040329	M40CO29/64	131
040330	M40CO15/32	131
040331	M40CO31/64	131
040332	M40CO1/2	131
40393	R453N30	46
40409	R453N29	46
40416	R453N28	46
40423	R453N27	46
40430	R453N26	46
40447	R453N25	46
40454	R453N24	46
40461	R453N23	46
40478	R453N22	46
40485	R453N21	46
40492	R453N20	46
40508	R453N19	46
40515	R453N18	46
40522	R453N17	46
40539	R453N16	46
040545	R4045/64	117
040546	R4023/32	117
40546	R453N15	46
040547	R4047/64	117
040548	R403/4	117
040549	R4049/64	117
040550	R4025/32	117
040551	R4051/64	117
040552	R4013/16	117
040553	R4053/64	117
40553	R453N14	46
040554	R4027/32	117
040555	R4055/64	117
040556	R407/8	117
040557	R4057/64	117
040558	R4029/32	117
040559	R4059/64	117
040560	R4015/16	117
40560	R453N13	46
040561	R4061/64	117
040562	R4031/32	117
040563	R4063/64	117
40577	R453N12	46
40584	R453N11	46
40591	R453N10	46
040600	R401	117
040604	R401.1/16	117
40607	R453N9	46
040608	R401.1/8	117
040612	R401.3/16	117
40614	R453N8	46
040616	R401.1/4	117
040620	R401.5/16	117
40621	R453N7	46
040624	R401.3/8	117
040628	R401.7/16	117
040632	R401.1/2	117
040636	R401.9/16	117
40638	R453N6	46
040640	R401.5/8	117
040644	R401.11/16	117
40645	R453N5	46
040648	R401.3/4	117
040652	R401.13/16	117
40652	R453N4	46
040656	R401.7/8	117
040660	R401.15/16	117
40669	R453N3	46
40676	R453N2	46
40683	R453N1	46
40690	R453A	46
040700	R402	117
40706	R453D	46
0040713	A53010.0	167
0040720	A53010.2	167
0040737	A53010.5	167
0040744	A53011.0	167
0040751	A53011.5	167
0040768	A53011.75	167
0040775	A53012.0	167
0040799	A53012.5	167
040804	R40C1/16	123
040805	R40C5/64	123
040806	R40C3/32	123
040807	R40C7/64	123
040808	R40C1/8	123
040809	R40C9/64	123
040810	R40C5/32	123
040811	R40C11/64	123
0040812	A53013.0	167
040812	R40C3/16	123
040813	R40C13/64	123
040814	R40C7/32	123
040815	R40C15/64	123
040816	R40C1/4	123
040817	R40C17/64	123
040818	R40C9/32	123
040819	R40C19/64	123
040820	R40C5/16	123
040821	R40C21/64	123
040822	R40C11/32	123
040823	R40C23/64	123
040824	R40C3/8	123
040825	R40C25/64	123
040826	R40C13/32	123
040827	R40C27/64	123
040828	R40C7/16	123
0040829	A53013.5	167
040829	R40C29/64	123
040830	R40C15/32	123
040831	R40C31/64	123
040832	R40C1/2	123
0040836	A53014.0	167
0040850	A53014.5	167
0040874	A53015.0	167
0040881	A53015.25	167
0040898	A53015.5	167
0040911	A53016.0	167
0040935	A53016.5	167
0040942	A53017.0	167
0040966	A53017.5	167
0040980	A53018.0	167
0040997	A53018.5	167
041001	R41N1	117
041002	R41N2	117
041003	R41N3	117
041004	R41N4	117
041005	R41N5	117
041006	R41N6	117
041007	R41N7	117
041008	R41N8	117
041009	R41N9	117
041010	R41N10	117
041011	R41N11	117
041012	R41N12	117
041013	R41N13	117
041014	R41N14	117
041015	R41N15	117
041016	R41N16	117
0041017	A53019.0	167
041017	R41N17	117
041018	R41N18	117
041019	R41N19	117
041020	R41N20	117
041021	R41N21	117
041022	R41N22	117
041023	R41N23	117
0041024	A53019.5	167
041024	R41N24	117
041025	R41N25	117
041026	R41N26	117
041027	R41N27	117
041028	R41N28	117
041029	R41N29	117
041030	R41N30	117
041031	R41N31	117
041032	R41N32	117
041033	R41N33	117
041034	R41N34	117
041035	R41N35	117
041036	R41N36	117
041037	R41N37	117
041038	R41N38	117
041039	R41N39	117
041040	R41N40	117
041041	R41N41	117
041042	R41N42	117
041043	R41N43	117
041044	R41N44	117
041045	R41N45	117
041046	R41N46	117
041047	R41N47	117
0041048	A53020.0	167
041048	R41N48	117
041049	R41N49	117
041050	R41N50	117
041051	R41N51	117
041052	R41N52	117
041053	R41N53	117
041054	R41N54	117
0041055	A53020.5	167
041055	R41N55	117
041056	R41N56	117
041057	R41N57	117
041058	R41N58	117
041059	R41N59	117
041060	R41N60	117
0041062	A53021.0	167
0041079	A53021.5	167
0041086	A53022.0	167
0041093	A53022.5	167
0041109	A53023.0	167
0041116	A53023.5	167
0041123	A53024.0	167
0041130	A53024.5	167
0041147	A53025.0	167
0041154	A53025.5	167
0041161	A53026.0	167
0041178	A53026.5	167
0041185	A53027.0	167
0041192	A53027.5	167
0041208	A53028.0	167
0041215	A53028.5	167
0041222	A53029.0	167
0041239	A53029.5	167
0041246	A53030.0	167
0041253	A53031.0	167
0041260	A53032.0	167
0041277	A5308.5	167
0041284	A5309.0	167
41291	R453H	46
041301	M41CON1	131
041302	M41CON2	131
041303	M41CON3	131
041304	M41CON4	131
041305	M41CON5	131
041306	M41CON6	131
041307	M41CON7	131
0041307	R453L	46
0041307	R453L	46
041308	M41CON8	131
041309	M41CON9	131
041310	M41CON10	131
041311	M41CON11	131
041312	M41CON12	131
041313	M41CON13	131
041314	M41CON14	131
41314	R453M	46
041315	M41CON15	131
041316	M41CON16	131
041317	M41CON17	131
041318	M41CON18	131
041319	M41CON19	131
041320	M41CON20	131
041321	M41CON21	131
41321	R453N	46
041322	M41CON22	131
041323	M41CON23	131
041324	M41CON24	131
041325	M41CON25	131
041326	M41CON26	131
041327	M41CON27	131
041328	M41CON28	131
041329	M41CON29	131
041330	M41CON30	131
041331	M41CON31	131
041332	M41CON32	131
041333	M41CON33	131
041334	M41CON34	131
041335	M41CON35	131
041336	M41CON36	131
041337	M41CON37	131
041338	M41CON38	131
41338	R453O	46
041339	M41CON39	131
041340	M41CON40	131
041341	M41CON41	131
041342	M41CON42	131
041343	M41CON43	131
041344	M41CON44	131
041345	M41CON45	131
41345	R453Q	46
041346	M41CON46	131
041347	M41CON47	131
041348	M41CON48	131
041349	M41CON49	131
041350	M41CON50	131
041351	M41CON51	131
041352	M41CON52	131
41352	R453T	46
041353	M41CON53	131
041354	M41CON54	131
041355	M41CON55	131
041356	M41CON56	131
041357	M41CON57	131
041358	M41CON58	131
041359	M41CON59	131
041360	M41CON60	131
0041369	R453U	46
0041376	R453X	46

EDP NUMBER INDEX - 0041383 - 042812

EDP#	E-Code	Page #
0041383	R453Y	46
0041390	R453Z	46
0041406	R454N30	46
0041406	R454N30	46
0041413	R454N29	46
0041420	R454N28	46
0041437	R454N27	46
0041444	R454N26	46
0041451	R454N25	46
0041468	R454N24	46
0041475	R454N23	46
0041482	R454N22	46
0041499	R454N21	46
0041505	R454N20	46
0041512	R454N19	46
0041529	R454N18	46
0041536	R454N17	46
0041543	R454N16	46
0041550	R454N15	46
0041567	R454N14	46
0041574	R454N13	46
0041581	R454N12	46
0041598	R454N11	46
0041604	R454N10	46
0041611	R454N9	46
0041628	R454N8	46
0041635	R454N7	46
0041642	R454N6	46
0041659	R454N5	46
0041666	R454N4	46
0041673	R454N3	46
0041680	R454N2	46
0041697	R454N1	46
041701	ATR41N1	200
041702	ATR41N2	200
041703	ATR41N3	200
0041703	R454A	46
041704	ATR41N4	200
0041710	R454D	46
0041727	R454H	46
0041727	R454H	46
0041734	R454L	46
0041741	R454M	46
0041758	R454N	46
0041765	R454O	46
0041772	R454Q	46
0041772	R454Q	46
0041789	R454T	46
0041796	R454U	46
041801	R41CN1	123
041802	R41CN2	123
0041802	R454X	46
041803	R41CN3	123
041804	R41CN4	123
041805	R41CN5	123
041806	R41CN6	123
041807	R41CN7	123
041808	R41CN8	123
041809	R41CN9	123
041810	R41CN10	123
041811	R41CN11	123
041812	R41CN12	123
041813	R41CN13	123
041814	R41CN14	123
041815	R41CN15	123
041816	R41CN16	123
041817	R41CN17	123
041818	R41CN18	123
041819	R41CN19	123
0041819	R454Y	46
041820	R41CN20	123
041821	R41CN21	123
041822	R41CN22	123
041823	R41CN23	123
041824	R41CN24	123
041825	R41CN25	123
041826	R41CN26	123
0041826	R454Z	46
041827	R41CN27	123
041828	R41CN28	123
041829	R41CN29	123
041830	R41CN30	123
041831	R41CN31	123
041832	R41CN32	123
041833	R41CN33	123
0041833	R457N30	40
0041833	R457N30	40
041834	R41CN34	123
041835	R41CN35	123
041836	R41CN36	123
041837	R41CN37	123
041838	R41CN38	123
041839	R41CN39	123
041840	R41CN40	123
0041840	R457N29	40
0041840	R457N29	40
041841	R41CN41	123
041842	R41CN42	123
041843	R41CN43	123
041844	R41CN44	123
041845	R41CN45	123
041846	R41CN46	123
041847	R41CN47	123
041848	R41CN48	123
041849	R41CN49	123
041850	R41CN50	123
041851	R41CN51	123
041852	R41CN52	123
041853	R41CN53	123
041854	R41CN54	123
041855	R41CN55	123
041856	R41CN56	123
041857	R41CN57	123
0041857	R457N28	40
0041857	R457N28	40
041858	R41CN58	123
041859	R41CN59	123
041860	R41CN60	123
0041864	R457N27	40
0041864	R457N27	40
0041871	R457N26	40
0041888	R457N25	40
0041888	R457N25	40
0041895	R457N24	40
0041901	R457N23	40
0041901	R457N23	40
0041918	R457N22	40
0041918	R457N22	40
0041925	R457N21	40
0041925	R457N21	40
0041932	R457N20	40
0041932	R457N20	40
0041949	R457N19	40
0041956	R457N18	40
0041956	R457N18	40
0041963	R457N17	40
0041970	R457N16	40
0041970	R457N16	40
0041987	R457N15	40
0041994	R457N14	40
042001	R42A	117
042002	R42B	117
042003	R42C	117
042004	R42D	117
042005	R42E	117
042006	R42F	117
042007	R42G	117
0042007	R457N13	40
042008	R42H	117
042009	R42I	117
042010	R42J	117
042011	R42K	117
042012	R42L	117
042013	R42M	117
042014	R42N	117
0042014	R457N12	40
0042014	R457N12	40
042015	R42O	117
042016	R42P	117
042017	R42Q	117
042018	R42R	117
042019	R42S	117
042020	R42T	117
042021	R42U	117
0042021	R457N11	40
0042021	R457N11	40
042022	R42V	117
042023	R42W	117
042024	R42X	117
042025	R42Y	117
042026	R42Z	117
042038	R457N10	40
042038	R457N10	40
0042045	R457N9	40
0042052	R457N8	40
0042052	R457N8	40
0042069	R457N7	40
0042069	R457N7	40
0042076	R457N6	40
0042076	R457N6	40
0042083	R457N5	40
0042083	R457N5	40
0042090	R457N4	40
0042106	R457N3	40
0042106	R457N3	40
0042113	R457N2	40
0042120	R457N1	40
0042120	R457N1	40
0042137	R457A	40
0042144	R457D	40
0042151	R457H	40
0042168	R457L	40
0042175	R457M	40
0042182	R457N	40
0042199	R457O	40
0042205	R457Q	40
0042212	R457T	40
0042229	R457U	40
0042229	R457U	40
0042236	R457X	40
0042243	R457Y	40
0042250	R457Z	40
0042267	R458N30	40
0042267	R458N30	40
0042274	R458N29	40
0042274	R458N29	40
0042281	R458N28	40
0042281	R458N28	40
0042298	R458N27	40
0042298	R458N27	40
042301	M42COA	131
042302	M42COB	131
042303	M42COC	131
042304	M42COD	131
0042304	R458N26	40
0042304	R458N26	40
042305	M42COE	131
042306	M42COF	131
042307	M42COG	131
042308	M42COH	131
042309	M42COI	131
042310	M42COJ	131
042311	M42COK	131
0042311	R458N25	40
0042311	R458N25	40
042312	M42COL	131
042313	M42COM	131
042314	M42CON	131
042315	M42COO	131
042316	M42COP	131
042317	M42COQ	131
042318	M42COR	131
042319	M42COS	131
042320	M42COT	131
042321	M42COU	131
042322	M42COV	131
042323	M42COW	131
042324	M42COX	131
042325	M42COY	131
042326	M42COZ	131
0042328	R458N24	40
0042328	R458N24	40
0042335	R458N23	40
0042335	R458N23	40
0042342	R458N22	40
0042342	R458N22	40
0042359	R458N21	40
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0042366	R458N20	40
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0042373	R458N19	40
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0042403	R458N16	40
0042403	R458N16	40
0042410	R458N15	40
0042410	R458N15	40
0042427	R458N14	40
0042427	R458N14	40
0042434	R458N13	40
0042434	R458N13	40
0042441	R458N12	40
0042441	R458N12	40
0042458	R458N11	40
0042458	R458N11	40
0042465	R458N10	40
0042465	R458N10	40
0042472	R458N9	40
0042472	R458N9	40
0042489	R458N8	40
0042489	R458N8	40
0042496	R458N7	40
0042496	R458N7	40
0042502	R458N6	40
0042502	R458N6	40
0042519	R458N5	40
0042519	R458N5	40
0042526	R458N4	40
0042526	R458N4	40
0042533	R458N3	40
0042533	R458N3	40
0042540	R458N2	40
0042540	R458N2	40
0042557	R458N1	40
0042557	R458N1	40
0042564	R458A	40
0042571	R458D	40
0042588	R458H	40
0042595	R458L	40
0042601	R458M	40
0042618	R458N	40
0042625	R458O	40
0042632	R458Q	40
0042632	R458Q	40
0042649	R458T	40
0042656	R458U	40
0042663	R458X	40
0042670	R458Y	40
0042687	R458Z	40
0042694	R45810.8	40
0042694	R45810.8	40
042801	R42CA	123
042802	R42CB	123
042803	R42CC	123
042804	R42CD	123
042805	R42CE	123
042806	R42CF	123
042807	R42CG	123
042808	R42CH	123
042809	R42CI	123
042810	R42CJ	123
042811	R42CK	123
042812	R42CL	123

EDP NUMBER INDEX - 042813 - 0048368

EDP#	E-Code	Page #
042813	R42CM	123
042814	R42CN	123
042815	R42CO	123
042816	R42CP	123
042817	R42CQ	123
042818	R42CR	123
042819	R42CS	123
042820	R42CT	123
042821	R42CU	123
042822	R42CV	123
042823	R42CW	123
042824	R42CX	123
042825	R42CY	123
042826	R42CZ	123
0044988	A720.15	130
0044995	A720.18	130
0045008	A720.2	130
0045015	A720.22	130
0045022	A720.25	130
0045039	A720.28	130
0045046	A720.3	130
0045053	A720.35	130
0045060	A720.38	130
0045077	A720.39	130
0045084	A720.4	130
0045107	A720.45	130
0045114	A720.5	130
0045121	A720.6	130
045610	TS18N10	199
045611	TS18N11	199
045620	TS18N20	199
045621	TS18N21	199
045630	TS18N30	199
045640	TS18N40	199
045708	TS101/8	199
045710	TS105/32	199
045712	TS103/16	199
045714	TS107/32	199
045716	TS101/4	199
045810	TS41N10	199
045811	TS41N11	199
045820	TS41N20	199
045830	TS41N30	199
045840	TS41N40	199
046033	M40CO33/64	131
046034	M40CO17/32	131
046035	M40CO35/64	131
046036	M40CO9/16	131
046037	M40CO37/64	131
046038	M40CO19/32	131
046039	M40CO39/64	131
046040	M40CO5/8	131
046041	M40CO41/64	131
046042	M40CO21/32	131
046043	M40CO43/64	131
046044	M40CO11/16	131
046045	M40CO45/64	131
046046	M40CO23/32	131
046047	M40CO47/64	131
046048	M40CO3/4	131
046100	4ASM1.0	126
046125	4ASM1.25	126
046130	4ASM1.3	126
046165	4ASM1.65	126
046200	4ASM2.0	126
046230	4ASM2.3	126
046240	4ASM2.4	126
046250	4ASM2.5	126
0046289	A9001.0	65
0046296	A9001.1	65
046300	4ASM3.0	126
0046302	A9001.2	65
046310	4ASM3.1	126
0046319	A9001.3	65
046320	4ASM3.2	126
0046326	A9001.4	65
046330	4ASM3.3	126
0046333	A9001.5	65
046340	4ASM3.4	126
0046340	A9001/16	65
046350	4ASM3.5	126
0046357	A9001.6	65
0046364	A9001.7	65
046370	4ASM3.7	126
0046371	A9001.8	65
0046388	A9001.9	65
0046395	A9005/64	65
046400	4ASM4.0	126
0046401	A9002.0	65
0046418	A9002.1	65
046420	4ASM4.2	126
0046425	A9002.2	65
0046432	A9002.3	65
0046449	A9003/32	65
046450	4ASM4.5	126
0046456	A9002.4	65
0046463	A9002.5	65
0046470	A9002.6	65
0046487	A9002.7	65
0046494	A9007/64	65
046500	4ASM5.0	126
0046500	A9002.8	65
0046517	A9002.9	65
0046524	A9003.0	65
0046531	A9003.1	65
0046548	A9001/8	65
046550	4ASM5.5	126
0046555	A9003.2	65
0046562	A9003.3	65
046570	4ASM5.7	126
0046579	A9003.4	65
046580	4ASM5.8	126
0046586	A9003.5	65
0046593	A9009/64	65
046600	4ASM6.0	126
0046609	A9003.6	65
0046616	A9003.7	65
046620	4ASM6.2	126
0046623	A9003.8	65
0046630	A9003.9	65
046640	4ASM6.4	126
0046647	A9005/32	65
046650	4ASM6.5	126
0046654	A9004.0	65
046660	4ASM6.6	126
0046661	A9004.1	65
0046678	A9004.2	65
046680	4ASM6.8	126
0046685	A9004.3	65
046690	4ASM6.9	126
0046692	A90011/64	65
046700	4ASM7.0	126
0046708	A9004.4	65
0046715	A9004.5	65
046720	4ASM7.2	126
0046722	A9004.6	65
0046739	A9004.7	65
0046746	A9003/16	65
046750	4ASM7.5	126
0046753	A9004.8	65
0046760	A9004.9	65
0046777	A9005.0	65
0046784	A9005.1	65
046800	4ASM8.0	126
0046807	A90013/64	65
046810	4ASM8.1	126
0046814	A9005.2	65
0046821	A9005.3	65
0046838	A9005.4	65
046840	4ASM8.4	126
0046845	A9005.5	65
046850	4ASM8.5	126
0046852	A9007/32	65
0046869	A9005.6	65
046870	4ASM8.7	126
0046876	A9005.7	65
0046883	A9005.8	65
0046890	A9005.9	65
046900	4ASM9.0	126
0046906	A90015/64	65
046910	4ASM9.1	126
0046913	A9006.0	65
046920	4ASM9.2	126
0046920	A9006.1	65
046930	4ASM9.3	126
0046937	A9006.2	65
0046944	A9006.3	65
046950	4ASM9.5	126
0046951	A9001/4	65
0046968	A9006.4	65
046970	4ASM9.7	126
0046975	A9006.5	65
0046999	A9006.6	65
047000	4ASM10.0	126
047002	4ASM10.2	126
0047002	A9006.7	65
047005	4ASM10.5	126
047008	4ASM10.8	126
0047019	A90017/64	65
0047026	A9006.8	65
0047033	A9006.9	65
0047057	A9007.0	65
0047064	A9007.1	65
0047071	A9009/32	65
0047088	A9007.2	65
0047095	A9007.3	65
0047101	A9007.4	65
047110	4ASM11.0	126
047112	4ASM11.2	126
047115	4ASM11.5	126
047118	4ASM11.8	126
0047118	A9007.5	65
0047125	A90019/64	65
0047132	A9007.6	65
0047149	A9007.7	65
0047156	A9007.8	65
0047163	A9007.9	65
0047170	A9005/16	65
0047187	A9008.0	65
0047194	A9008.1	65
047200	4ASM12.0	126
0047200	A9008.2	65
0047217	A9008.3	65
047220	4ASM12.2	126
0047224	A90021/64	65
0047231	A9008.4	65
047250	4ASM12.5	126
0047255	A9008.5	65
0047262	A9008.6	65
0047286	A9008.7	65
0047293	A90011/32	65
0047309	A9008.8	65
0047316	A9008.9	65
0047323	A9009.0	65
0047330	A9009.1	65
0047347	A90023/64	65
0047354	A9009.2	65
0047361	A9009.3	65
0047378	A9009.4	65
0047385	A9009.5	65
0047392	A9003/8	65
0047408	A9009.6	65
0047415	A9009.7	65
0047422	A9009.8	65
0047439	A9009.9	65
0047446	A90025/64	65
0047453	A90010.0	65
0047460	A90010.2	65
0047477	A90010.3	65
0047484	A90013/32	65
0047491	A90010.4	65
0047507	A90010.5	65
0047514	A90027/64	65
0047521	A90010.8	65
0047538	A90011.0	65
0047545	A9007/16	65
0047569	A90011.5	65
0047576	A90029/64	65
0047583	A90011.8	65
0047590	A90015/32	65
0047606	A90012.0	65
0047620	A90031/64	65
0047637	A90012.5	65
0047644	A9001/2	65
0047651	A90012.8	65
0047668	A90013.0	65
0047675	A90013.5	65
0047682	A90014.0	65
0047699	A90014.5	65
0047705	A90015.0	65
0047712	A90015.5	65
0047729	A90016.0	65
0047736	A90017.0	65
0047743	A90017.5	65
0047750	A90018.0	65
0047767	A90019.0	65
0047774	A90020.0	65
0047781	A9011.5	65
0047798	A9012.0	65
0047804	A9012.5	65
0047811	A9012.6	65
0047828	A9013.0	65
0047835	A9013.1	65
0047842	A9013.2	65
0047859	A9013.3	65
0047866	A9013.4	65
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0047880	A9013.6	65
0047897	A9013.7	65
0047903	A9013.8	65
0047910	A9013.9	65
0047927	A9014.0	65
0047934	A9014.1	65
0047941	A9014.2	65
0047958	A9014.3	65
0047965	A9014.4	65
0047972	A9014.5	65
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0047996	A9014.7	65
0048009	A9014.8	65
0048016	A9014.9	65
0048023	A9015.0	65
0048030	A9015.1	65
0048047	A9015.2	65
0048054	A9015.3	65
0048061	A9015.4	65
0048078	A9015.5	65
0048085	A9015.6	65
0048092	A9015.7	65
0048108	A9015.8	65
0048115	A9015.9	65
0048122	A9016.0	65
0048139	A9016.1	65
0048146	A9016.2	65
0048153	A9016.3	65
0048160	A9016.4	65
0048177	A9016.5	65
0048184	A9016.6	65
0048191	A9016.7	65
0048207	A9016.8	65
0048214	A9016.9	65
0048221	A9017.0	65
0048238	A9017.1	65
0048245	A9017.2	65
0048252	A9017.3	65
0048269	A9017.4	65
0048276	A9017.5	65
0048283	A9017.6	65
0048290	A9017.7	65
0048306	A9017.8	65
0048313	A9017.9	65
0048320	A9018.0	65
0048337	A9018.1	65
0048344	A9018.2	65
0048351	A9018.3	65
0048368	A9018.4	65

EDP NUMBER INDEX - 0048375 - 0051092

EDP#	E-Code	Page #
0048375	A9018.5	65
0048382	A9018.6	65
0048399	A9018.7	65
0048405	A9018.8	65
0048412	A9018.9	65
0048429	A9019.0	65
0048436	A9019.1	65
0048443	A9019.2	65
0048450	A9019.3	65
0048467	A9019.4	65
0048474	A9019.5	65
0048481	A9019.6	65
0048498	A9019.7	65
0048504	A9019.8	65
0048511	B10010.0	468
0048528	B10011.0	468
0048535	B10012.0	468
0048542	B10013.0	468
0048559	B10014.0	468
0048566	B10015.0	468
0048573	B10016.0	468
0048580	B10017.0	468
0048597	B10018.0	468
0048603	B10019.0	468
0048610	B1002.0	468
0048627	A9019.9	65
0048634	B1002.5	468
0048641	A90110.0	65
0048658	B10020.0	468
0048665	B10022.0	468
0048672	B10024.0	468
0048689	B10025.0	468
0048696	B10026.0	468
0048702	B10028.0	468
0048719	B1003.0	468
0048726	B1003.2	468
0048733	B1003.5	468
0048740	B10030.0	468
0048757	B10032.0	468
0048764	B10034.0	468
0048771	B10035.0	468
0048788	B10036.0	468
0048795	B10038.0	468
0048801	B1004.0	468
0048818	B1004.5	468
0048825	B10040.0	468
0048856	B10045.0	468
0048863	A90110.2	65
0048870	A90110.3	65
0048887	B1005.0	468
0048894	B1005.5	468
0048900	B10050.0	468
0048917	B1006.0	468
0048924	B1007.0	468
0048931	B1008.0	468
0048948	B1009.0	468
0048955	A90110.4	65
0049013	A90110.5	65
0049020	B12110.0	459
0049037	B12111.0	459
0049044	B12112.0	459
0049051	B12113.0	459
0049068	B12114.0	459
0049075	B12115.0	459
0049082	B12116.0	459
0049099	B12117.0	459
0049105	B12118.0	459
0049112	B12119.0	459
0049129	B12120.0	459
0049136	B12121.0	459
0049143	B12122.0	459
0049150	B12123.0	459
0049167	B12124.0	459
0049174	B12125.0	459
0049181	B12126.0	459
0049198	A90110.8	65
0049211	B12130.0	459
0049235	A90111.0	65
0049242	A90111.2	65
0049280	A90111.5	65
0049297	A90111.8	65
0049303	A90112.0	65
0049594	A90112.5	65
0049600	A90112.8	65
0049617	B15710.0	452
0049624	B15711.0	452
0049631	B15712.0	452
0049648	B1572.0	452
0049655	A90113.0	65
0049662	A90113.5	65
0049679	B1574.0	452
0049686	A90114.0	65
0049693	B1575.0	452
0049709	A90114.5	65
0049716	B1576.0	452
0049723	A90115.0	65
0049730	B1577.0	452
0049747	B1578.0	452
0049754	B1579.0	452
050015	QC91PM1.5	144
050020	QC91PM2.0	144
050025	QC91PM2.5	144
050030	QC91PM3.0	144
050035	QC91PM3.5	144
050040	QC91PM4.0	144
050045	QC91PM4.5	144
050050	QC91PM5.0	144
050052	QC91PM5.2	144
050055	QC91PM5.5	144
050060	QC91PM6.0	144
050065	QC91PM6.5	144
050068	QC91PM6.8	144
050070	QC91PM7.0	144
050080	QC91PM8.0	144
050082	QC91PM8.2	144
050085	QC91PM8.5	144
050086	QC91PM8.6	144
050090	QC91PM9.0	144
050095	QC91PM9.5	144
050100	QC91PM10.0	144
050105	QC91PM10.5	144
050110	QC91PM11.0	144
050115	QC91PM11.5	144
050120	QC91PM12.0	144
050125	QC91PM12.5	144
050130	QC91PM13.0	144
0050132	A90115.5	65
050135	QC91PM13.5	144
050140	QC91PM14.0	144
050150	QC91PM15.0	144
050155	QC91PM15.5	144
050160	QC91PM16.0	144
050165	QC91PM16.5	144
0050170	A90116.0	65
050170	QC91PM17.0	144
050215	QC91GM1.5	144
0050217	A9201.0	56
050220	QC91GM2.0	144
050225	QC91GM2.5	144
050230	QC91GM3.0	144
050235	QC91GM3.5	144
050240	QC91GM4.0	144
050245	QC91GM4.5	144
050250	QC91GM5.0	144
050252	QC91GM5.2	144
050255	QC91GM5.5	144
050260	QC91GM6.0	144
0050262	A9201.1	56
050265	QC91GM6.5	144
050270	QC91GM7.0	144
050280	QC91GM8.0	144
050285	QC91GM8.5	144
050286	QC91GM8.6	144
050290	QC91GM9.0	144
050300	QC91GM10.0	144
050305	QC91GM10.5	144
0050309	A9201.2	56
0050316	A9201.3	56
050320	QC91GM12.0	144
0050323	A9201.4	56
050325	QC91GM12.5	144
0050347	A9201.5	56
0050392	B1701.51	442
0050491	B1703.01	442
0050590	B1708.51	442
0050644	A9201/16	56
0050668	A9201.6	56
0050675	A9201.7	56
0050682	A9201.8	56
0050699	A9201.9	56
0050705	A9205/64	56
0050712	A9202.0	56
0050729	A9202.1	56
0050743	A9202.2	56
0050750	A9202.3	56
0050767	A9203/32	56
0050781	A9202.4	56
0050804	A9202.5	56
0050811	A9202.6	56
0050828	A9202.7	56
0050835	A9207/64	56
0050842	A9202.8	56
0050859	A9202.9	56
0050866	A9203.0	56
0050873	A9203.1	56
0050880	A9201/8	56
0050897	A9203.2	56
050902	QC91GN2	142
0050903	A9203.3	56
050903	QC91GN3	142
050904	QC91GN4	142
050905	QC91GN5	142
050906	QC91GN6	142
050907	QC91GN7	142
050908	QC91GN8	142
050909	QC91GN9	142
0050910	A9203.4	56
050911	QC91GN11	142
050912	QC91GN12	142
050913	QC91GN13	142
050914	QC91GN14	142
050915	QC91GN15	142
050916	QC91GN16	142
050917	QC91GN17	142
050918	QC91GN18	142
050919	QC91GN19	142
050920	QC91GN20	142
050921	QC91GN21	142
050923	QC91GN23	142
050924	QC91GN24	142
050925	QC91GN25	142
050926	QC91GN26	142
0050927	A9203.5	56
050928	QC91GN28	142
050929	QC91GN29	142
050930	QC91GN30	142
050931	QC91GN31	142
050932	QC91GN32	142
0050934	A9209/64	56
050934	QC91GN34	142
050935	QC91GN35	142
050936	QC91GN36	142
050937	QC91GN37	142
050938	QC91GN38	142
050939	QC91GN39	142
050940	QC91GN40	142
0050941	A9203.6	56
050941	QC91GN41	142
050942	QC91GN42	142
050943	QC91GN43	142
050944	QC91GN44	142
050945	QC91GN45	142
050946	QC91GN46	142
050947	QC91GN47	142
050948	QC91GN48	142
050949	QC91GN49	142
050950	QC91GN50	142
050951	QC91GN51	142
050952	QC91GN52	142
0050958	A9203.7	56
0050965	A9203.8	56
0050972	A9203.9	56
0050989	A9205/32	56
051001	R511/64	135
051002	R511/32	135
051003	R513/64	135
051004	R511/16	135
051005	R515/64	135
051006	R513/32	135
051007	R517/64	135
051008	R511/8	135
0051009	A9204.0	56
051009	R519/64	135
051010	R515/32	135
051011	R5111/64	135
051012	R513/16	135
051013	R5113/64	135
051014	R517/32	135
051015	R5115/64	135
0051016	A9204.1	56
051016	R511/4	135
051017	R5117/64	135
051018	R519/32	135
051019	R5119/64	135
051020	R515/16	135
051021	R5121/64	135
051022	R5111/32	135
0051023	A9204.2	56
051023	R5123/64	135
051024	R513/8	135
051025	R5125/64	135
051026	R5113/32	135
051027	R5127/64	135
051028	R517/16	135
051029	R5129/64	135
0051030	A9204.3	56
051030	R5115/32	135
051031	R5131/64	135
051032	R511/2	135
051033	R5133/64	135
051034	R5117/32	135
051035	R5135/64	135
051036	R519/16	135
051037	R5137/64	135
051038	R5119/32	135
051039	R5139/64	135
051040	R515/8	135
051041	R5141/64	135
051042	R5121/32	135
051043	R5143/64	135
051044	R5111/16	135
051045	R5145/64	135
051046	R5123/32	135
0051047	A92011/64	56
051047	R5147/64	135
051048	R513/4	135
051049	R5149/64	135
051050	R5125/32	135
051051	R5151/64	135
051052	R5113/16	135
051053	R5153/64	135
0051054	A9204.4	56
051054	R5127/32	135
051055	R5155/64	135
051056	R517/8	135
051057	R5157/64	135
051058	R5129/32	135
051059	R5159/64	135
051060	R5115/16	135
0051061	A9204.5	56
051061	R5161/64	135
051062	R5131/32	135
051063	R5163/64	135
0051078	A9204.6	56
0051085	A9204.7	56
0051092	A9203/16	56

EDP NUMBER INDEX - 051100 - 052313

EDP#	E-Code	Page #
051100	R511	135
051101	R511.1/64	135
051102	R511.1/32	135
051103	R511.3/64	135
051104	R511.1/16	135
051105	R511.5/64	135
051106	R511.3/32	135
051107	R511.7/64	135
0051108	A9204.8	56
051108	R511.1/8	135
051109	R511.9/64	135
051110	R511.5/32	135
051111	R511.11/64	135
051112	R511.3/16	135
051113	R511.13/64	135
051114	R511.7/32	135
0051115	A9204.9	56
051115	R511.15/64	135
051116	R511.1/4	135
051120	R511.5/16	135
0051122	A9205.0	56
051124	R511.3/8	135
051128	R511.7/16	135
051132	R511.1/2	135
051136	R511.9/16	135
0051139	A9205.1	56
051140	R511.5/8	135
0051146	A92013/64	56
051148	R511.3/4	135
0051153	A9205.2	56
0051160	A9205.3	56
0051177	A9205.4	56
0051191	A9205.5	56
0051207	A9207/32	56
0051214	A9205.6	56
0051221	A9205.7	56
0051238	A9205.8	56
0051245	A9205.9	56
0051269	A92015/64	56
0051276	A9206.0	56
0051283	A9206.1	56
0051290	A9206.2	56
051304	M51CO1/16	145
051305	M51CO5/64	145
0051306	A9206.3	56
051306	M51CO3/32	145
051307	M51CO7/64	145
051308	M51CO1/8	145
051309	M51CO9/64	145
051310	M51CO5/32	145
051311	M51CO11/64	145
051312	M51CO3/16	145
0051313	A9201/4	56
051313	M51CO13/64	145
051314	M51CO7/32	145
051315	M51CO15/64	145
051316	M51CO1/4	145
051317	M51CO17/64	145
051318	M51CO9/32	145
051319	M51CO19/64	145
0051320	A9206.4	56
051320	M51CO5/16	145
051321	M51CO21/64	145
051322	M51CO11/32	145
051323	M51CO23/64	145
051324	M51CO3/8	145
051325	M51CO25/64	145
051326	M51CO13/32	145
051327	M51CO27/64	145
051328	M51CO7/16	145
051329	M51CO29/64	145
051330	M51CO15/32	145
051331	M51CO31/64	145
051332	M51CO1/2	145
051333	M51CO33/64	145
051334	M51CO17/32	145
051335	M51CO35/64	145
051336	M51CO9/16	145
0051337	A9206.5	56
051337	M51CO37/64	145
051338	M51CO19/32	145
051339	M51CO39/64	145
051340	M51CO5/8	145
051341	M51CO41/64	145
051342	M51CO21/32	145
051343	M51CO43/64	145
0051344	A9206.6	56
051344	M51CO11/16	145
051345	M51CO45/64	145
051346	M51CO23/32	145
051347	M51CO47/64	145
051348	M51CO3/4	145
051349	M51CO49/64	145
051350	M51CO25/32	145
0051351	A9206.7	56
051351	M51CO51/64	145
051352	M51CO13/16	145
051353	M51CO53/64	145
051354	M51CO27/32	145
051355	M51CO55/64	145
051356	M51CO7/8	145
051357	M51CO57/64	145
051358	M51CO29/32	145
051359	M51CO59/64	145
051360	M51CO15/16	145
051361	M51CO61/64	145
051362	M51CO31/32	145
051363	M51CO63/64	145
051364	M51CO1	145
0051368	A92017/64	56
0051375	A9206.8	56
0051382	A9206.9	56
0051429	A9207.0	56
0051436	A9207.1	56
0051443	A9209/32	56
0051450	A9207.2	56
0051467	A9207.3	56
0051474	A9207.4	56
0051481	A9207.5	56
0051498	A92019/64	56
0051504	A9207.6	56
051504	R51FS1/16	141
051505	R51FS5/64	141
051506	R51FS3/32	141
051507	R51FS7/64	141
051508	R51FS1/8	141
051509	R51FS9/64	141
051510	R51FS5/32	141
0051511	A9207.7	56
051511	R51FS11/64	141
051512	R51FS3/16	141
051513	R51FS13/64	141
051514	R51FS7/32	141
051515	R51FS15/64	141
051516	R51FS1/4	141
051517	R51FS17/64	141
051518	R51FS9/32	141
051519	R51FS19/64	141
051520	R51FS5/16	141
051521	R51FS21/64	141
051522	R51FS11/32	141
051523	R51FS23/64	141
051524	R51FS3/8	141
051525	R51FS25/64	141
051526	R51FS13/32	141
051527	R51FS27/64	141
0051528	A9207.8	56
051528	R51FS7/16	141
051529	R51FS29/64	141
051530	R51FS15/32	141
051531	R51FS31/64	141
051532	R51FS1/2	141
0051535	A9207.9	56
0051542	A9205/16	56
0051566	A9208.0	56
0051580	A9208.1	56
0051603	A9208.2	56
0051610	A9208.3	56
0051627	A92021/64	56
0051634	A9208.4	56
0051658	A9208.5	56
0051665	A9208.6	56
0051672	A9208.7	56
0051689	A92011/32	56
0051702	A9208.8	56
0051719	A9208.9	56
0051726	A9209.0	56
0051733	A9209.1	56
0051740	A92023/64	56
0051757	A9209.2	56
0051764	A9209.3	56
0051771	A9209.4	56
0051788	A9209.5	56
0051795	A9203/8	56
0051801	A9209.6	56
0051818	A9209.7	56
0051825	A9209.8	56
0051832	A9209.9	56
0051849	A92025/64	56
0051856	A92010.0	56
0051863	A92010.2	56
0051870	A92010.3	56
0051887	A92013/32	56
0051894	A92010.4	56
0051900	A92010.5	56
0051917	A92027/64	56
0051924	A92010.8	56
0051931	A92011.0	56
0051948	A9207/16	56
0051962	A92011.5	56
0051979	A92029/64	56
0051986	A92011.8	56
0051993	A92015/32	56
052001	R52N1	135
052002	R52N2	135
052003	R52N3	135
052004	R52N4	135
052005	R52N5	135
0052006	A92012.0	56
052006	R52N6	135
052007	R52N7	135
052008	R52N8	135
052009	R52N9	135
052010	R52N10	135
052011	R52N11	135
052012	R52N12	135
0052013	A92012.2	56
052013	R52N13	135
052014	R52N14	135
052015	R52N15	135
052016	R52N16	135
052017	R52N17	135
052018	R52N18	135
052019	R52N19	135
0052020	A92031/64	56
052020	R52N20	135
052021	R52N21	135
052022	R52N22	135
052023	R52N23	135
052024	R52N24	135
052025	R52N25	135
052026	R52N26	135
052027	R52N27	135
052028	R52N28	135
052029	R52N29	135
052030	R52N30	135
052031	R52N31	135
052032	R52N32	135
052033	R52N33	135
052034	R52N34	135
052035	R52N35	135
052036	R52N36	135
0052037	A92012.5	56
052037	R52N37	135
052038	R52N38	135
052039	R52N39	135
052040	R52N40	135
052041	R52N41	135
052042	R52N42	135
052043	R52N43	135
0052044	A9201/2	56
052044	R52N44	135
052045	R52N45	135
052046	R52N46	135
052047	R52N47	135
052048	R52N48	135
052049	R52N49	135
052050	R52N50	135
052051	R52N51	135
052052	R52N52	135
052053	R52N53	135
052054	R52N54	135
052055	R52N55	135
052056	R52N56	135
052057	R52N57	135
052058	R52N58	135
052059	R52N59	135
052060	R52N60	135
052061	R52N61	135
052062	R52N62	135
052063	R52N63	135
052064	R52N64	135
052065	R52N65	135
052066	R52N66	135
052067	R52N67	135
0052068	A92013.0	56
052068	R52N68	135
052069	R52N69	135
052070	R52N70	135
052071	R52N71	135
052072	R52N72	135
052073	R52N73	135
052074	R52N74	135
0052075	A92013.5	56
052075	R52N75	135
052076	R52N76	135
052077	R52N77	135
052078	R52N78	135
052079	R52N79	135
052080	R52N80	135
0052082	A92014.0	56
0052099	A92014.5	56
0052105	A92015.0	56
0052112	A92015.5	56
0052129	A92016.0	56
0052136	A92017.0	56
0052143	A92017.5	56
0052150	B3340	463
0052167	B33400	463
0052174	B334000	463
0052181	B3341	463
0052198	B33410	463
0052204	B33411	463
0052211	B33412	463
0052228	B3342	463
0052235	B3343	463
0052242	B3344	463
0052259	B3345	463
0052266	B3346	463
0052273	B3347	463
0052280	B3348	463
0052297	B3349	463
052301	M52CON1	145
052302	M52CON2	145
0052303	B3350BLADES	464
052303	M52CON3	145
052304	M52CON4	145
052305	M52CON5	145
052307	M52CON7	145
052308	M52CON8	145
052309	M52CON9	145
0052310	B33500BLADES	464
052310	M52CON10	145
052311	M52CON11	145
052312	M52CON12	145
052313	M52CON13	145

EDP NUMBER INDEX - 052314 - 0055625

EDP#	E-Code	Page #
052314	M52CON14	145
052315	M52CON15	145
052316	M52CON16	145
052317	M52CON17	145
052318	M52CON18	145
052319	M52CON19	145
052320	M52CON20	145
052321	M52CON21	145
052322	M52CON22	145
052324	M52CON24	145
052325	M52CON25	145
052326	M52CON26	145
0052327	B335000BLADES	464
052327	M52CON27	145
052328	M52CON28	145
052329	M52CON29	145
052330	M52CON30	145
052331	M52CON31	145
052332	M52CON32	145
052333	M52CON33	145
0052334	B3351BLADES	464
052334	M52CON34	145
052335	M52CON35	145
052336	M52CON36	145
052339	M52CON39	145
052340	M52CON40	145
0052341	B33510BLADES	464
0052358	B33511BLADES	464
0052365	B33512BLADES	464
0052372	B3352BLADES	464
0052389	B3353BLADES	464
0052396	B3354BLADES	464
0052402	B3355BLADES	464
0052419	B3356BLADES	464
0052426	B3357BLADES	464
0052433	B3358BLADES	464
0052440	B3359BLADES	464
0052457	A92018.0	56
0052464	A92019.0	56
0052471	A92020.0	56
0052488	A9212.5	56
0052495	A9212.6	56
0052501	A9213.0	56
0052518	A9213.1	56
0052525	A9213.2	56
0052532	A9213.3	56
0052549	A9213.4	56
0052556	A9213.5	56
0052563	A9213.6	56
0052570	A9213.7	56
0052587	A9213.8	56
0052594	A9213.9	56
0052600	A9214.0	56
052604	CO500-121/16	162
052605	CO500-125/64	162
052606	CO500-123/32	162
052607	CO500-127/64	162
052608	CO500-121/8	162
052609	CO500-129/64	162
052610	CO500-125/32	162
052611	CO500-1211/64	162
052612	CO500-123/16	162
052613	CO500-1213/64	162
052614	CO500-127/32	162
052615	CO500-1215/64	162
052616	CO500-121/4	162
0052617	A9214.1	56
0052624	A9214.2	56
0052631	A9214.3	56
0052648	A9214.4	56
0052655	A9214.5	56
0052662	A9214.6	56
0052679	A9214.7	56
0052686	A9214.8	56
0052693	A9214.9	56
0052709	A9215.0	56
0052716	A9215.1	56
0052723	A9215.2	56
0052730	A9215.3	56
0052747	A9215.4	56
0052754	A9215.5	56
0052761	A9215.6	56
0052778	A9215.7	56
0052785	A9215.8	56
0052792	A9215.9	56
052802	CO501-12N2	162
0052808	A9216.0	56
052810	CO501-12N10	162
052811	CO501-12N11	162
0052815	A9216.1	56
052816	CO501-12N16	162
052819	CO501-12N19	162
052820	CO501-12N20	162
052821	CO501-12N21	162
0052822	A9216.2	56
052827	CO501-12N27	162
052829	CO501-12N29	162
052830	CO501-12N30	162
0052839	A9216.3	56
052840	CO501-12N40	162
0052846	A9216.4	56
0052853	A9216.5	56
0052860	A9216.6	56
0052877	A9216.7	56
0052884	A9216.8	56
0052891	A9216.9	56
0052907	A9217.0	56
0052914	A9217.1	56
0052921	A9217.2	56
0052938	A9217.3	56
0052945	A9217.4	56
0052952	A9217.5	56
0052969	A9217.6	56
0052976	A9217.7	56
0052983	B4001.0	437
0052990	B4001.2	437
0053003	B4001.4	437
0053010	B4001.5	437
0053027	B4001.6	437
0053034	B4001.8	437
0053041	B4002.0	437
0053058	B4002.2	437
0053065	B4002.5	437
0053072	B4002.8	437
0053089	A9217.8	56
0053096	A9217.9	56
0053102	A9218.0	56
0053119	A9218.1	56
0053126	B41110.0	439
0053133	A9218.2	56
0053140	B41112.0	439
0053157	A9218.3	56
0053164	B41114.0	439
0053171	B41115.0	439
0053188	B41116.0	439
0053195	B4115.0	439
0053201	B4116.0	439
0053218	B4117.0	439
0053225	B4118.0	439
0053232	B4119.0	439
0053249	A9218.4	56
0053256	A9218.5	56
0053263	A9218.6	56
0053270	A9218.7	56
0053287	A9218.8	56
0053294	A9218.9	56
0053300	A9219.0	56
0053317	A9219.1	56
0053324	A9219.2	56
0053331	A9219.3	56
0053348	A9219.4	56
0053355	A9219.5	56
0053362	A9219.6	56
0053379	A9219.7	56
0053386	A9219.8	56
0053393	A9219.9	56
0053409	A92110.0	56
0053416	A92110.2	56
0053423	A92110.3	56
0053430	A92110.4	56
0053447	A92110.5	56
0053454	A92110.8	56
0053461	A92111.0	56
0053478	A92111.2	56
0053485	A92111.5	56
0053492	A92111.8	56
0053508	A92112.0	56
0053522	A92112.5	56
0053546	A92113.0	56
0053553	A92113.5	56
0053560	A92114.0	56
0053577	A92114.5	56
0053584	A92115.0	56
0053591	A92115.5	56
053604	CO500-61/16	162
053605	CO500-65/64	162
053606	CO500-63/32	162
053607	A92116.0	56
053607	CO500-67/64	162
053608	CO500-61/8	162
053609	CO500-69/64	162
053610	CO500-65/32	162
053611	CO500-611/64	162
053612	CO500-63/16	162
053613	CO500-613/64	162
053614	A9401.0	68
053614	CO500-67/32	162
053615	CO500-615/64	162
053616	CO500-61/4	162
0053621	A9401.1	68
0053638	A9401.2	68
0053645	A9401.3	68
053701	CO501-6N1	162
053702	CO501-6N2	162
053703	CO501-6N3	162
053704	CO501-6N4	162
053705	CO501-6N5	162
053706	CO501-6N6	162
053707	CO501-6N7	162
053708	CO501-6N8	162
053709	CO501-6N9	162
053710	CO501-6N10	162
053711	CO501-6N11	162
053712	CO501-6N12	162
053713	CO501-6N13	162
053714	CO501-6N14	162
053715	CO501-6N15	162
053716	CO501-6N16	162
053717	CO501-6N17	162
053718	CO501-6N18	162
053719	CO501-6N19	162
053720	CO501-6N20	162
053721	CO501-6N21	162
053722	CO501-6N22	162
053723	CO501-6N23	162
053724	CO501-6N24	162
053725	CO501-6N25	162
053726	CO501-6N26	162
053727	CO501-6N27	162
053728	CO501-6N28	162
053729	CO501-6N29	162
053730	CO501-6N30	162
053731	CO501-6N31	162
053732	CO501-6N32	162
053733	CO501-6N33	162
053734	CO501-6N34	162
053735	CO501-6N35	162
053736	CO501-6N36	162
053737	CO501-6N37	162
053738	CO501-6N38	162
053739	CO501-6N39	162
053740	CO501-6N40	162
053741	CO501-6N41	162
053742	CO501-6N42	162
053743	CO501-6N43	162
053744	CO501-6N44	162
053745	CO501-6N45	162
053746	CO501-6N46	162
053747	CO501-6N47	162
053748	CO501-6N48	162
053749	CO501-6N49	162
053750	CO501-6N50	162
0053751	A9401.4	68
053751	CO501-6N51	162
053752	CO501-6N52	162
0053768	A9401.5	68
0053775	A9401/16	68
0054253	A9401.6	68
0054260	A9401.7	68
0054383	A9401.8	68
0054390	A9401.9	68
0054406	A9405/64	68
0054604	A9402.0	68
0054611	A9402.1	68
0054628	A9402.2	68
0054710	A9402.3	68
0054727	A9403/32	68
0054734	A9402.4	68
0054789	A9402.5	68
0054796	A9402.6	68
0054802	A9402.7	68
0054833	A9407/64	68
0054840	A9402.8	68
0054857	A9402.9	68
0054871	A9403.0	68
055001	R55A	135
055002	R55B	135
055003	R55C	135
055004	R55D	135
055005	R55E	135
055006	R55F	135
055007	R55G	135
055008	R55H	135
055009	R55I	135
055010	R55J	135
055011	R55K	135
055012	R55L	135
055013	R55M	135
055014	R55N	135
055015	R55O	135
055016	R55P	135
055017	R55Q	135
055018	R55R	135
055019	R55S	135
055020	R55T	135
055021	R55U	135
055022	R55V	135
055023	R55W	135
055024	R55X	135
055025	R55Y	135
055026	R55Z	135
0055465	A9403.1	68
0055472	A9401/8	68
0055533	A9403.2	68
0055540	A9403.3	68
0055588	A9403.4	68
0055595	A9403.5	68
055608	QC0860P1/8	154
055609	QC0860P9/64	154
055610	QC0860P5/32	154
055611	QC0860P11/64	154
055612	QC0860P3/16	154
055613	QC0860P13/64	154
055614	QC0860P7/32	154
055615	QC0860P15/64	154
055616	QC0860P1/4	154
055617	QC0860P17/64	154
0055618	A9409/64	68
055618	QC0860P9/32	154
055619	QC0860P19/64	154
055620	QC0860P5/16	154
055621	QC0860P21/64	154
055622	QC0860P11/32	154
055623	QC0860P23/64	154
055624	QC0860P3/8	154
0055625	A9403.6	68

EDP NUMBER INDEX - 055625 - 0058206

EDP#	E-Code	Page #
055625	QC0860P25/64	154
055626	QC0860P13/32	154
055627	QC0860P27/64	154
055628	QC0860P7/16	154
055629	QC0860P29/64	154
055630	QC0860P15/32	154
055631	QC0860P31/64	154
0055632	A9403.7	68
055632	QC0860P1/2	154
055904	QC91G1/16	142
055905	QC91G5/64	142
055906	QC91G3/32	142
055907	QC91G7/64	142
055908	QC91G1/8	142
055909	QC91G9/64	142
055910	QC91G5/32	142
055911	QC91G11/64	142
055912	QC91G3/16	142
055913	QC91G13/64	142
055914	QC91G7/32	142
055915	QC91G15/64	142
055916	QC91G1/4	142
055917	QC91G17/64	142
055918	QC91G9/32	142
055919	QC91G19/64	142
055920	QC91G5/16	142
055921	QC91G21/64	142
055922	QC91G11/32	142
055924	QC91G3/8	142
055925	QC91G25/64	142
055926	QC91G13/32	142
055927	QC91G27/64	142
055928	QC91G7/16	142
055929	QC91G29/64	142
055931	QC91G31/64	142
055932	QC91G1/2	142
0056011	A9403.8	68
0056028	A9403.9	68
056100	5ATL1.0	139
056120	5ATL1.2	139
056125	5ATL1.25	139
056130	5ATL1.3	139
056140	5ATL1.4	139
056150	5ATL1.5	139
056160	5ATL1.6	139
0056165	A9405/32	68
056170	5ATL1.7	139
0056172	A9404.0	68
056180	5ATL1.8	139
056190	5ATL1.9	139
056200	5ATL2.0	139
056210	5ATL2.1	139
056215	5ATL2.15	139
056220	5ATL2.2	139
0056226	A9404.1	68
056230	5ATL2.3	139
0056233	A9404.2	68
056240	5ATL2.4	139
056250	5ATL2.5	139
0056257	A9404.3	68
0056264	A94011/64	68
0056271	A9404.4	68
0056288	A9404.5	68
0056295	A9404.6	68
056300	5ATL3.0	139
0056301	A9404.7	68
056310	5ATL3.1	139
0056318	A9403/16	68
056320	5ATL3.2	139
056330	5ATL3.3	139
056340	5ATL3.4	139
056350	5ATL3.5	139
056360	5ATL3.6	139
056370	5ATL3.7	139
056380	5ATL3.8	139
056400	5ATL4.0	139
056420	5ATL4.2	139
056430	5ATL4.3	139
056450	5ATL4.5	139
056460	5ATL4.6	139
056480	5ATL4.8	139
056500	5ATL5.0	139
056550	5ATL5.5	139
056560	5ATL5.6	139
0056561	A9404.8	68
056570	5ATL5.7	139
056600	5ATL6.0	139
0056615	A9404.9	68
056640	5ATL6.4	139
0056646	A9405.0	68
056650	5ATL6.5	139
056680	5ATL6.8	139
056720	5ATL7.2	139
056750	5ATL7.5	139
056770	5ATL7.0	139
056780	5ATL7.8	139
056800	5ATL8.0	139
056820	5ATL8.2	139
0056820	A9405.1	68
056850	5ATL8.5	139
0056882	A94013/64	68
056900	5ATL9.0	139
056920	5ATL9.2	139
056950	5ATL9.5	139
0056974	A9405.2	68
056980	5ATL9.8	139
0057001	A9405.3	68
0057056	A9405.4	68
057100	5ATL10.0	139
057102	5ATL10.2	139
057105	5ATL10.5	139
057110	5ATL11.0	139
057112	5ATL11.2	139
057115	5ATL11.5	139
057120	5ATL12.0	139
057125	5ATL12.5	139
057130	5ATL13.0	139
057135	5ATL13.5	139
057138	5ATL13.8	139
057140	5ATL14.0	139
057145	5ATL14.5	139
057150	5ATL15.0	139
057155	5ATL15.5	139
057160	5ATL16.0	139
057165	5ATL16.5	139
057170	5ATL17.0	139
057175	5ATL17.5	139
057180	5ATL18.0	139
057185	5ATL18.5	139
057190	5ATL19.0	139
057195	5ATL19.5	139
057200	5ATL20.0	139
057205	5ATL20.5	139
057210	5ATL21.0	139
057215	5ATL21.5	139
057220	5ATL22.0	139
057225	5ATL22.5	139
057230	5ATL23.0	139
057235	5ATL23.5	139
057240	5ATL24.0	139
057245	5ATL24.5	139
057250	5ATL25.0	139
057255	5ATL25.5	139
057260	5ATL26.0	139
057265	5ATL26.5	139
057270	5ATL27.0	139
057280	5ATL28.0	139
057285	5ATL28.5	139
057290	5ATL29.0	139
057295	5ATL29.5	139
057300	5ATL30.0	139
057305	5ATL30.5	139
057310	5ATL31.0	139
057408	08601/8	147
057410	08605/32	147
057412	08603/16	147
057414	08607/32	147
057416	08601/4	147
057418	08609/32	147
057420	08605/16	147
057422	086011/32	147
057424	08603/8	147
057426	086013/32	147
057428	08607/16	147
057430	086015/32	147
057432	08601/2	147
0057780	A9405.5	68
0057797	A9407/32	68
0057810	A9405.6	68
0057827	A9405.7	68
0057834	A9405.8	68
0057841	A9405.9	68
0057858	A94015/64	68
0057865	A9406.0	68
0057872	A9406.1	68
057904	QC91P1/16	142
057905	QC91P5/64	142
057906	QC91P3/32	142
057907	QC91P7/64	142
057908	QC91P1/8	142
057909	QC91P9/64	142
057910	QC91P5/32	142
057911	QC91P11/64	142
057912	QC91P3/16	142
057913	QC91P13/64	142
057914	QC91P7/32	142
057915	QC91P15/64	142
057916	QC91P1/4	142
057917	QC91P17/64	142
057918	QC91P9/32	142
057919	QC91P19/64	142
057920	QC91P5/16	142
057921	QC91P21/64	142
057922	QC91P11/32	142
057923	QC91P23/64	142
057924	QC91P3/8	142
057925	QC91P25/64	142
057926	QC91P13/32	142
057927	QC91P27/64	142
057928	QC91P7/16	142
057929	QC91P29/64	142
057930	QC91P15/32	142
057931	QC91P31/64	142
057932	QC91P1/2	142
057933	QC91P33/64	142
057934	QC91P17/32	142
057935	QC91P35/64	142
057936	QC91P9/16	142
057937	QC91P37/64	142
057938	QC91P19/32	142
057940	QC91P5/8	142
057942	QC91P21/32	142
057944	QC91P11/16	142
058003	500-63/64	157
058004	500-61/16	157
058005	500-65/64	157
058006	500-63/32	157
058007	500-67/64	157
058008	500-61/8	157
058009	500-69/64	157
058010	500-65/32	157
058011	500-611/64	157
058012	500-63/16	157
058013	500-613/64	157
058014	500-67/32	157
058015	500-615/64	157
058016	500-61/4	157
058017	500-617/64	157
058018	500-69/32	157
058019	500-619/64	157
058020	500-65/16	157
058021	500-621/64	157
058022	500-611/32	157
058023	500-623/64	157
058024	500-63/8	157
058025	500-625/64	157
058026	500-613/32	157
058027	500-627/64	157
058028	500-67/16	157
058029	500-629/64	157
058030	500-615/32	157
058031	500-631/64	157
058032	500-61/2	157
058101	501-6N1	157
058102	501-6N2	157
058103	501-6N3	157
058104	501-6N4	157
058105	501-6N5	157
058106	501-6N6	157
058107	501-6N7	157
058108	501-6N8	157
058109	501-6N9	157
058110	501-6N10	157
058111	501-6N11	157
058112	501-6N12	157
058113	501-6N13	157
058114	501-6N14	157
058115	501-6N15	157
058116	501-6N16	157
058117	501-6N17	157
058118	501-6N18	157
058119	501-6N19	157
058120	501-6N20	157
058121	501-6N21	157
058122	501-6N22	157
058123	501-6N23	157
058124	501-6N24	157
058125	501-6N25	157
058126	501-6N26	157
058127	501-6N27	157
058128	501-6N28	157
058129	501-6N29	157
058130	501-6N30	157
058131	501-6N31	157
058132	501-6N32	157
058133	501-6N33	157
058134	501-6N34	157
058135	501-6N35	157
058136	501-6N36	157
058137	501-6N37	157
058138	501-6N38	157
058139	501-6N39	157
058140	501-6N40	157
058141	501-6N41	157
058142	501-6N42	157
058143	501-6N43	157
058144	501-6N44	157
058145	501-6N45	157
0058145	A9406.2	68
058146	501-6N46	157
058147	501-6N47	157
058148	501-6N48	157
058149	501-6N49	157
058150	501-6N50	157
058151	501-6N51	157
058152	501-6N52	157
0058152	A9406.3	68
058153	501-6N53	157
058154	501-6N54	157
058155	501-6N55	157
058156	501-6N56	157
058157	501-6N57	157
058158	501-6N58	157
058159	501-6N59	157
058160	501-6N60	157
0058169	A9401/4	68
0058176	A9406.4	68
0058183	A9406.5	68
0058190	A9406.6	68
058201	502-6A	157
058202	502-6B	157
058203	502-6C	157
058204	502-6D	157
058205	502-6E	157
058206	502-6F	157
0058206	A9406.7	68

EDP NUMBER INDEX - 058207 - 059412

EDP#	E-Code	Page #
058207	502-6G	157
058208	502-6H	157
058209	502-6I	157
058210	502-6J	157
058211	502-6K	157
058212	502-6L	157
058213	502-6M	157
0058213	A94017/64	68
058214	502-6N	157
058215	502-6O	157
058216	502-6P	157
058217	502-6Q	157
058218	502-6R	157
058219	502-6S	157
058220	502-6T	157
0058220	A9406.8	68
058221	502-6U	157
058222	502-6V	157
058223	502-6W	157
058224	502-6X	157
058225	502-6Y	157
058226	502-6Z	157
0058237	A9406.9	68
0058244	A9407.0	68
0058251	A9407.1	68
0058268	A9409/32	68
0058275	A9407.2	68
0058282	A9407.3	68
0058299	A9407.4	68
058304	QC41P1/16	128
0058305	A9407.5	68
058305	QC41P5/64	128
058306	QC41P3/32	128
058307	QC41P7/64	128
058308	QC41P1/8	128
058309	QC41P9/64	128
058310	QC41P5/32	128
058311	QC41P11/64	128
0058312	A94019/64	68
058312	QC41P3/16	128
058313	QC41P13/64	128
058314	QC41P7/32	128
058315	QC41P15/64	128
058316	QC41P1/4	128
058317	QC41P17/64	128
058318	QC41P9/32	128
058319	QC41P19/64	128
058320	QC41P5/16	128
058321	QC41P21/64	128
058322	QC41P11/32	128
058323	QC41P23/64	128
058324	QC41P3/8	128
058325	QC41P25/64	128
058326	QC41P13/32	128
058327	QC41P27/64	128
058328	QC41P7/16	128
058329	QC41P29/64	128
058330	QC41P15/32	128
058331	QC41P31/64	128
058332	QC41P1/2	128
058333	QC41P33/64	128
058334	QC41P17/32	128
058335	QC41P35/64	128
058336	QC41P9/16	128
058337	QC41P37/64	128
058338	QC41P19/32	128
058340	QC41P5/8	128
058341	QC41P41/64	128
058342	QC41P21/32	128
0058343	A9407.6	68
058344	QC41P11/16	128
0058350	A9407.7	68
0058374	A9407.8	68
0058381	A9407.9	68
0058398	A9405/16	68
0058404	A9408.0	68
0058411	A9408.1	68
0058435	A9408.2	68
0058442	A9408.3	68
0058473	A94021/64	68
0058503	A9408.4	68
0058510	A9408.5	68
0058558	A9408.6	68
0058572	A9408.7	68
0058589	A94011/32	68
0058596	A9408.8	68
0058602	A9408.9	68
0058626	A9409.0	68
0058633	A9409.1	68
0058640	A94023/64	68
0058657	A9409.2	68
0058664	A9409.3	68
0058671	A9409.4	68
0058688	A9409.5	68
0058695	A9403/8	68
0058701	A9409.6	68
058704	R88CO1/16	115
058705	R88CO5/64	115
058706	R88CO3/32	115
058707	R88CO7/64	115
058708	R88CO1/8	115
058709	R88CO9/64	115
058710	R88CO5/32	115
058711	R88CO11/64	115
058712	R88CO3/16	115
058713	R88CO13/64	115
058714	R88CO7/32	115
058715	R88CO15/64	115
058716	R88CO1/4	115
058717	R88CO17/64	115
0058718	A9409.7	68
058718	R88CO9/32	115
058719	R88CO19/64	115
058720	R88CO5/16	115
058721	R88CO21/64	115
058722	R88CO11/32	115
058723	R88CO23/64	115
058724	R88CO3/8	115
0058725	A9409.8	68
058725	R88CO25/64	115
058726	R88CO13/32	115
058727	R88CO27/64	115
058728	R88CO7/16	115
058729	R88CO29/64	115
058730	R88CO15/32	115
058731	R88CO31/64	115
0058732	A9409.9	68
058732	R88CO1/2	115
0058749	A94025/64	68
0058756	A94010.0	68
0058763	A94010.2	68
0058770	A94010.3	68
0058787	A94013/32	68
0058794	A94010.4	68
0058800	A94010.5	68
058803	R89CON3	115
058805	R89CON5	115
058806	R89CON6	115
058807	R89CON7	115
058808	R89CON8	115
058809	R89CON9	115
058810	R89CON10	115
058811	R89CON11	115
058812	R89CON12	115
058813	R89CON13	115
058816	R89CON16	115
0058817	A94027/64	68
058820	R89CON20	115
058821	R89CON21	115
058822	R89CON22	115
0058824	A94010.8	68
058824	R89CON24	115
058825	R89CON25	115
058826	R89CON26	115
058827	R89CON27	115
058829	R89CON29	115
058830	R89CON30	115
0058831	A94011.0	68
058831	R89CON31	115
058836	R89CON36	115
058839	R89CON39	115
058840	R89CON40	115
058841	R89CON41	115
058842	R89CON42	115
058843	R89CON43	115
058844	R89CON44	115
058845	R89CON45	115
058846	R89CON46	115
058849	R89CON49	115
058850	R89CON50	115
058851	R89CON51	115
058852	R89CON52	115
0058855	A9407/16	68
0058862	A94011.2	68
0058886	A94011.5	68
0058893	A94029/64	68
0058909	A94011.8	68
0058916	A94015/32	68
0058923	A94012.0	68
0058930	A94012.2	68
0058978	A94031/64	68
0058985	A94012.5	68
0058992	A9401/2	68
059003	500-123/64	160
059004	500-121/16	160
059005	500-125/64	160
059006	500-123/32	160
059007	500-127/64	160
059008	500-121/8	160
059009	500-129/64	160
059010	500-125/32	160
059011	500-1211/64	160
059012	500-123/16	160
0059012	A94013.0	68
059013	500-1213/64	160
059014	500-127/32	160
059015	500-1215/64	160
059016	500-121/4	160
059017	500-1217/64	160
059018	500-129/32	160
059019	500-1219/64	160
059020	500-125/16	160
059021	500-1221/64	160
059022	500-1211/32	160
059023	500-1223/64	160
059024	500-123/8	160
059025	500-1225/64	160
059026	500-1213/32	160
059027	500-1227/64	160
059028	500-127/16	160
059029	500-1229/64	160
059030	500-1215/32	160
059031	500-1231/64	160
059032	500-121/2	160
0059043	A94033/64	68
0059050	A94017/32	68
0059067	A94013.5	68
0059081	A94014.0	68
059101	501-12N1	160
059103	501-12N3	160
059104	501-12N4	160
059105	501-12N5	160
059107	501-12N7	160
059109	501-12N9	160
059110	501-12N10	160
059111	501-12N11	160
0059111	A9409/16	68
059112	501-12N12	160
059113	501-12N13	160
059116	501-12N16	160
059117	501-12N17	160
059118	501-12N18	160
059119	501-12N19	160
059120	501-12N20	160
059121	501-12N21	160
059122	501-12N22	160
059123	501-12N23	160
059125	501-12N25	160
059126	501-12N26	160
059127	501-12N27	160
0059128	A94014.5	68
059129	501-12N29	160
059130	501-12N30	160
059131	501-12N31	160
059136	501-12N36	160
059137	501-12N37	160
059140	501-12N40	160
059141	501-12N41	160
059142	501-12N42	160
059143	501-12N43	160
059144	501-12N44	160
059145	501-12N45	160
059146	501-12N46	160
059147	501-12N47	160
059148	501-12N48	160
059149	501-12N49	160
059150	501-12N50	160
0059166	A94037/64	68
0059180	A94015.0	68
059201	502-12A	160
059202	502-12B	160
059203	502-12C	160
0059203	A94019/32	68
059204	502-12D	160
059205	502-12E	160
059206	502-12F	160
059207	502-12G	160
059208	502-12H	160
059209	502-12I	160
059210	502-12J	160
0059210	A94015.5	68
059211	502-12K	160
059212	502-12L	160
059213	502-12M	160
059214	502-12N	160
059215	502-12O	160
059216	502-12P	160
059217	502-12Q	160
059218	502-12R	160
059219	502-12S	160
059220	502-12T	160
059221	502-12U	160
059222	502-12V	160
059223	502-12W	160
059224	502-12X	160
059225	502-12Y	160
059226	502-12Z	160
0059227	A9405/8	68
0059234	A94016.0	68
0059241	A94016.5	68
0059258	A94021/32	68
0059265	A94017.0	68
0059272	A94011/16	68
0059289	A94017.5	68
0059296	A94045/64	68
0059302	A94018.0	68
0059326	A94023/32	68
0059333	A94047/64	68
0059340	A94019.0	68
0059357	A9403/4	68
0059364	A94020.0	68
0059371	A9411.0	68
0059388	A9411.5	68
0059401	A9412.0	68
059401	QC91PN1	142
059402	QC91PN2	142
059403	QC91PN3	142
059404	QC91PN4	142
059405	QC91PN5	142
059406	QC91PN6	142
059407	QC91PN7	142
059408	QC91PN8	142
059409	QC91PN9	142
059410	QC91PN10	142
059411	QC91PN11	142
059412	QC91PN12	142

EDP NUMBER INDEX - 059413 - 0061749

EDP#	E-Code	Page #
059413	QC91PN13	142
059414	QC91PN14	142
059415	QC91PN15	142
059416	QC91PN16	142
059417	QC91PN17	142
0059418	A9412.5	68
059418	QC91PN18	142
059419	QC91PN19	142
059420	QC91PN20	142
059421	QC91PN21	142
059422	QC91PN22	142
059423	QC91PN23	142
059424	QC91PN24	142
059425	QC91PN25	142
059426	QC91PN26	142
059427	QC91PN27	142
059428	QC91PN28	142
059429	QC91PN29	142
059430	QC91PN30	142
059431	QC91PN31	142
0059432	A9413.0	68
059432	QC91PN32	142
059433	QC91PN33	142
059434	QC91PN34	142
059435	QC91PN35	142
059436	QC91PN36	142
059437	QC91PN37	142
059438	QC91PN38	142
059439	QC91PN39	142
059440	QC91PN40	142
059441	QC91PN41	142
059442	QC91PN42	142
059443	QC91PN43	142
059444	QC91PN44	142
059445	QC91PN45	142
059446	QC91PN46	142
059447	QC91PN47	142
059448	QC91PN48	142
0059449	A9413.1	68
059449	QC91PN49	142
059450	QC91PN50	142
059451	QC91PN51	142
059452	QC91PN52	142
0059463	A9413.2	68
059512	15113/16	149
059516	15111/4	149
059520	15115/16	149
059522	151111/32	149
059524	15113/8	149
059528	15117/16	149
059532	15111/2	149
059534	151117/32	149
059536	15119/16	149
059540	15115/8	149
059542	151121/32	149
059544	151111/16	149
059546	151123/32	149
059548	15113/4	149
059550	151125/32	149
059552	151113/16	149
059554	15117/8	149
059556	151115/16	149
59558	15111	149
059608	12901/8	147
059609	12909/64	147
059610	12905/32	147
059611	129011/64	147
059612	12903/16	147
059613	129013/64	147
059614	12907/32	147
059615	129015/64	147
059616	12901/4	147
059617	129017/64	147
059618	12909/32	147
059619	129019/64	147
059620	12905/16	147
059621	129021/64	147
059622	129011/32	147
059623	129023/64	147
059624	12903/8	147
059625	129025/64	147
059626	129013/32	147
059627	129027/64	147
059628	12907/16	147
059629	129029/64	147
059630	129015/32	147
059631	129031/64	147
059632	12901/2	147
059633	129033/64	147
059634	129017/32	147
059635	129035/64	147
059636	12909/16	147
059637	129037/64	147
059638	129019/32	147
059639	129039/64	147
059640	12905/8	147
059642	129021/32	147
059644	129011/16	147
059646	129023/32	147
059648	12903/4	147
0059654	A9413.3	68
0059661	A9413.4	68
059716	18131/4	149
059717	181317/64	149
059718	18139/32	149
059719	181319/64	149
059720	18135/16	149
059721	181321/64	149
059722	181311/32	149
059723	181323/64	149
059724	18133/8	149
059725	181325/64	149
059726	181313/32	149
059727	181327/64	149
059728	18137/16	149
059729	181329/64	149
059730	181315/32	149
059731	181331/64	149
059732	18131/2	149
059733	181333/64	149
059734	181317/32	149
059735	181335/64	149
059736	18139/16	149
059737	181337/64	149
059738	181319/32	149
059739	181339/64	149
059740	18135/8	149
059742	181321/32	149
059744	181311/16	149
059746	181323/32	149
059748	18133/4	149
059750	181325/32	149
059752	181313/16	149
059756	18137/8	149
059760	181315/16	149
59764	18131	149
0059838	A9413.5	68
0059944	A9413.6	68
0059968	A9413.7	68
0059982	A9413.8	68
060001	QC41PN1	128
060002	QC41PN2	128
060003	QC41PN3	128
060004	QC41PN4	128
060005	QC41PN5	128
060006	QC41PN6	128
060007	QC41PN7	128
060008	QC41PN8	128
060009	QC41PN9	128
060010	QC41PN10	128
060011	QC41PN11	128
060012	QC41PN12	128
060013	QC41PN13	128
060014	QC41PN14	128
060015	QC41PN15	128
060016	QC41PN16	128
060017	QC41PN17	128
060018	QC41PN18	128
060019	QC41PN19	128
060020	QC41PN20	128
060021	QC41PN21	128
060022	QC41PN22	128
060023	QC41PN23	128
060024	QC41PN24	128
060025	QC41PN25	128
060026	QC41PN26	128
060027	QC41PN27	128
060028	QC41PN28	128
060029	QC41PN29	128
060030	QC41PN30	128
060031	QC41PN31	128
060032	QC41PN32	128
060033	QC41PN33	128
060034	QC41PN34	128
060035	QC41PN35	128
060036	QC41PN36	128
060037	QC41PN37	128
060038	QC41PN38	128
060039	QC41PN39	128
060040	QC41PN40	128
0060216	A9413.9	68
0060223	A9414.0	68
060308	QC1290P1/8	154
060309	QC1290P9/64	154
060310	QC1290P5/32	154
060311	QC1290P11/64	154
060312	QC1290P3/16	154
060313	QC1290P13/64	154
060314	QC1290P7/32	154
0060315	A9414.1	68
060315	QC1290P15/64	154
060316	QC1290P1/4	154
060317	QC1290P17/64	154
060318	QC1290P9/32	154
060319	QC1290P19/64	154
060320	QC1290P5/16	154
060321	QC1290P21/64	154
0060322	A9414.2	68
060322	QC1290P11/32	154
060323	QC1290P23/64	154
060324	QC1290P3/8	154
060325	QC1290P25/64	154
060326	QC1290P13/32	154
060327	QC1290P27/64	154
060328	QC1290P7/16	154
060330	QC1290P15/32	154
060331	QC1290P31/64	154
060332	QC1290P1/2	154
0060377	A9414.3	68
0060384	A9414.4	68
0060414	A9414.5	68
0060421	A9414.6	68
0060445	A9414.7	68
0060452	A9414.8	68
0060476	A9414.9	68
0060490	A9415.0	68
0060513	A9415.1	68
0060605	A9415.2	68
0060612	A9415.3	68
0060674	A9415.4	68
0060681	A9415.5	68
0060728	A9415.6	68
0060735	A9415.7	68
0060766	A9415.8	68
0060773	A9415.9	68
0060797	A9416.0	68
0060889	A9416.1	68
0060940	A9416.2	68
0060995	A9416.3	68
0061022	A9416.4	68
0061046	A9416.5	68
0061053	A9416.6	68
0061091	A9416.7	68
0061107	A9416.8	68
0061114	A9416.9	68
0061121	A9417.0	68
0061138	A9417.1	68
0061145	A9417.2	68
0061152	A9417.3	68
0061169	A9417.4	68
0061176	A9417.5	68
0061183	A9417.6	68
0061190	A9417.7	68
0061206	A9417.8	68
0061213	A9417.9	68
0061220	A9418.0	68
0061237	A9418.1	68
0061244	A9418.2	68
0061251	A9418.3	68
0061268	A9418.4	68
0061275	A9418.5	68
0061282	A9418.6	68
0061299	A9418.7	68
0061305	A9418.8	68
0061312	A9418.9	68
0061329	A9419.0	68
0061336	A9419.1	68
0061343	A9419.2	68
0061350	A9419.3	68
0061367	A9419.4	68
0061374	A9419.5	68
0061381	A9419.6	68
0061398	A9419.7	68
061401	QC41GN1	128
061402	QC41GN2	128
061403	QC41GN3	128
0061404	A9419.8	68
061404	QC41GN4	128
061405	QC41GN5	128
061406	QC41GN6	128
061407	QC41GN7	128
061408	QC41GN8	128
061409	QC41GN9	128
061410	QC41GN10	128
0061411	A9419.9	68
061411	QC41GN11	128
061412	QC41GN12	128
061413	QC41GN13	128
061414	QC41GN14	128
061415	QC41GN15	128
061416	QC41GN16	128
061417	QC41GN17	128
061418	QC41GN18	128
061419	QC41GN19	128
061420	QC41GN20	128
061421	QC41GN21	128
061422	QC41GN22	128
061423	QC41GN23	128
061424	QC41GN24	128
061425	QC41GN25	128
061426	QC41GN26	128
061427	QC41GN27	128
0061428	A94110.0	68
061428	QC41GN28	128
061429	QC41GN29	128
061430	QC41GN30	128
061431	QC41GN31	128
061432	QC41GN32	128
061433	QC41GN33	128
061434	QC41GN34	128
0061435	A94110.2	68
061435	QC41GN35	128
061436	QC41GN36	128
061437	QC41GN37	128
061438	QC41GN38	128
061439	QC41GN39	128
061440	QC41GN40	128
0061442	A94110.3	68
0061466	A94110.5	68
0061480	A94111.0	68
0061497	A94111.2	68
0061633	A94111.5	68
0061657	A94111.8	68
0061688	A94112.0	68
0061718	A94112.2	68
0061749	A94112.5	68

EDP NUMBER INDEX - 0061817 - 091549

EDP#	E-Code	Page #
0061817	A94113.0	68
0061848	A94113.5	68
0061862	A94114.0	68
0061886	A94114.5	68
0061909	A94115.0	68
0061916	A94115.5	68
0061930	A94116.0	68
062304	QC41G1/16	128
062305	QC41G5/64	128
062306	QC41G3/32	128
062307	QC41G7/64	128
062308	QC41G1/8	128
062309	QC41G9/64	128
062310	QC41G5/32	128
062311	QC41G11/64	128
062312	QC41G3/16	128
062313	QC41G13/64	128
062314	QC41G7/32	128
062315	QC41G15/64	128
062316	QC41G1/4	128
062317	QC41G17/64	128
062318	QC41G9/32	128
062319	QC41G19/64	128
062320	QC41G5/16	128
062321	QC41G21/64	128
062322	QC41G11/32	128
062323	QC41G23/64	128
062324	QC41G3/8	128
062325	QC41G25/64	128
062326	QC41G13/32	128
062327	QC41G27/64	128
062328	QC41G7/16	128
062329	QC41G29/64	128
062330	QC41G15/32	128
062331	QC41G31/64	128
062332	QC41G1/2	128
080501	QC21GN1	106
080502	QC21GN2	106
080503	QC21GN3	106
080504	QC21GN4	106
080505	QC21GN5	106
080506	QC21GN6	106
080507	QC21GN7	106
080508	QC21GN8	106
080509	QC21GN9	106
080510	QC21GN10	106
080511	QC21GN11	106
080512	QC21GN12	106
080513	QC21GN13	106
080514	QC21GN14	106
080515	QC21GN15	106
080516	QC21GN16	106
080517	QC21GN17	106
080518	QC21GN18	106
080519	QC21GN19	106
080520	QC21GN20	106
080521	QC21GN21	106
080522	QC21GN22	106
080523	QC21GN23	106
080524	QC21GN24	106
080525	QC21GN25	106
080526	QC21GN26	106
080527	QC21GN27	106
080528	QC21GN28	106
080529	QC21GN29	106
080530	QC21GN30	106
080531	QC21GN31	106
080532	QC21GN32	106
080533	QC21GN33	106
080534	QC21GN34	106
080535	QC21GN35	106
080536	QC21GN36	106
080537	QC21GN37	106
080538	QC21GN38	106
080539	QC21GN39	106
080540	QC21GN40	106
080541	QC21GN41	106
080542	QC21GN42	106
080543	QC21GN43	106
080544	QC21GN44	106
080545	QC21GN45	106
080546	QC21GN46	106
080547	QC21GN47	106
080548	QC21GN48	106
080549	QC21GN49	106
080550	QC21GN50	106
080551	QC21GN51	106
080552	QC21GN52	106
081704	QC21G1/16	106
081705	QC21G5/64	106
081706	QC21G3/32	106
081707	QC21G7/64	106
081708	QC21G1/8	106
081709	QC21G9/64	106
081710	QC21G5/32	106
081711	QC21G11/64	106
081712	QC21G3/16	106
081713	QC21G13/64	106
081714	QC21G7/32	106
081715	QC21G15/64	106
081716	QC21G1/4	106
081717	QC21G17/64	106
081718	QC21G9/32	106
081719	QC21G19/64	106
081720	QC21G5/16	106
081721	QC21G21/64	106
081722	QC21G11/32	106
081723	QC21G23/64	106
081724	QC21G3/8	106
081725	QC21G25/64	106
081726	QC21G13/32	106
081727	QC21G27/64	106
081728	QC21G7/16	106
081729	QC21G29/64	106
081730	QC21G15/32	106
081731	QC21G31/64	106
081732	QC21G1/2	106
0085189	E201M10	265
0085196	E201M4	265
0085202	E201M5	265
0085219	E201M6	265
0085226	E201M8	265
0087268	E252M10	265
0087275	E252M12	265
0087282	E252M14	265
0087299	E252M16	265
0087305	E252M18	265
0087312	E252M20	265
0087329	E252M22	265
0087336	E252M24	265
0087343	E252M8	265
087900	SPS-901/4	192
087901	SPS-903/8	192
087902	SPS-901/2	192
087903	SPS-905/8	192
087904	SPS-903/4	192
087905	SPS-901	192
087906	SPSG-901/4	192
087907	SPSG-903/8	192
087908	SPSG-901/2	192
087909	SPSG-905/8	192
087910	SPSG-903/4	192
087911	SPSG-901	192
087912	SPR-901/4	193
087913	SPR-903/8	193
087914	SPR-901/2	193
087915	SPR-905/8	193
087916	SPR-903/4	193
087917	SPR-901	193
087918	SPRG-901/4	193
087919	SPRG-903/8	193
087920	SPRG-901/2	193
087921	SPRG-905/8	193
087922	SPRG-903/4	193
087923	SPRG-901	193
087924	SPL-901/4	194
087925	SPL-903/8	194
087926	SPL-901/2	194
087927	SPL-905/8	194
087928	SPL-903/4	194
087929	SPL-901	194
087930	SPLG-901/4	194
087931	SPLG-903/8	194
087932	SPLG-901/2	194
087934	SPLG-903/4	194
087935	SPLG-901	194
087950	SPS-1201/4	192
087951	SPS-1203/8	192
087952	SPS-1201/2	192
087953	SPS-1205/8	192
087954	SPS-1203/4	192
087955	SPS-1201	192
087956	SPSG-1201/4	192
087957	SPSG-1203/8	192
087958	SPSG-1201/2	192
087959	SPSG-1205/8	192
087960	SPSG-1203/4	192
087961	SPSG-1201	192
087962	SPR-1201/4	193
087963	SPR-1203/8	193
087964	SPR-1201/2	193
087965	SPR-1205/8	193
087966	SPR-1203/4	193
087967	SPR-1201	193
087968	SPRG-1201/4	193
087969	SPRG-1203/8	193
087970	SPRG-1201/2	193
087971	SPRG-1205/8	193
087973	SPRG-1201	193
087974	SPL-1201/4	194
087975	SPL-1203/8	194
087976	SPL-1201/2	194
087977	SPL-1205/8	194
087978	SPL-1203/4	194
087980	SPLG-1201/4	194
087981	SPLG-1203/8	194
087982	SPLG-1201/2	194
087985	SPLG-1201	194
090101	C60R18PSET	202
090114	C114COMBPSET	203
090123	C115COMBPSET	203
090126	C26R15PSET	203
090154	C29R51SET	217
090161	C20R18PSET	202
090162	C29R10PSET	201
090163	C15R10PSET	201
090170	C29R40SET	213
090173	C26R42SET	213
090174	C60R41SET	213
090231	C33R56SET	218
090290	C29R10COSET	211
090291	C15R10COSET	211
090292	C26R15COSET	211
090328	C8R56COSET	218
090556	C8R56SET	218
090558	C8R57SET	218
090600	C60R18COSET	211
091010	C29HX10SET	210
091264	R581	182
091266	R581.1/32	182
091268	R581.1/16	182
091270	R581.3/32	182
091272	R581.1/8	182
091274	R581.5/32	182
091276	R581.3/16	182
091278	R581.7/32	182
091280	R581.1/4	182
091282	R581.9/32	182
091284	R581.5/16	182
091286	R581.11/32	182
091288	R581.3/8	182
091290	R581.13/32	182
091292	R581.7/16	182
091294	R581.15/32	182
091296	R581.1/2	182
091298	R581.9/16	182
091300	R581.5/8	182
091302	R581.11/16	182
091304	R581.3/4	182
091306	R581.13/16	182
091308	R581.7/8	182
091310	R581.15/16	182
091312	R582	182
091433	R5633/64	178
091434	R5617/32	178
091435	R5635/64	178
091436	R569/16	178
091437	R5637/64	178
091438	R5619/32	178
091439	R5639/64	178
091440	R565/8	178
091441	R5641/64	178
091442	R5621/32	178
091443	R5643/64	178
091444	R5611/16	178
091445	R5645/64	178
091446	R5623/32	178
091447	R5647/64	178
091448	R563/4	178
091449	R5649/64	178
091450	R5625/32	178
091451	R5651/64	178
091452	R5613/16	178
091453	R5653/64	178
091454	R5627/32	178
091455	R5655/64	178
091456	R567/8	178
091457	R5657/64	178
091458	R5629/32	178
091459	R5659/64	178
091460	R5615/16	178
091461	R5661/64	178
091462	R5631/32	178
091463	R5663/64	178
091464	R561	178
091465	R561.1/64	178
091467	R561.3/64	178
091468	R561.1/16	178
091469	R561.5/64	178
091470	R561.3/32	178
091471	R561.7/64	178
091472	R561.1/8	178
091473	R561.9/64	178
091474	R561.11/64	178
091475	R561.13/64	178
091476	R561.3/16	178
091477	R561.15/64	178
091479	R561.9/32	178
091480	R561.1/4	178
091482	R561.5/16	178
091483	R561.3/8	178
091484	R561.7/16	178
091485	R561.1/2	178
091486	R561.1/32	178
091487	R561.5/32	178
091488	R561.7/32	178
091492	R561.13/32	178
091495	R561.15/32	178
091497	R561.11/32	178
091533	R5733/64	180
091534	R5717/32	180
091535	R5735/64	180
091536	R579/16	180
091537	R5737/64	180
091538	R5719/32	180
091539	R5739/64	180
091540	R575/8	180
091541	R5741/64	180
091542	R5721/32	180
091543	R5743/64	180
091544	R5711/16	180
091545	R5745/64	180
091546	R5723/32	180
091547	R5747/64	180
091548	R573/4	180
091549	R5749/64	180

EDP NUMBER INDEX - 091550 - 099983

EDP#	E-Code	Page #
091550	R5725/32	180
091551	R5751/64	180
091552	R5713/16	180
091553	R5753/64	180
091554	R5727/32	180
091555	R5755/64	180
091556	R577/8	180
091557	R5757/64	180
091558	R5729/32	180
091559	R5759/64	180
091560	R5715/16	180
091561	R5761/64	180
091562	R5731/32	180
091563	R5763/64	180
091564	R571	180
091565	R571.1/64	180
091567	R571.3/64	180
091568	R571.1/16	180
091569	R571.5/64	180
091570	R571.3/32	180
091571	R571.7/64	180
091572	R571.1/8	180
091573	R571.9/64	180
091575	R571.11/64	180
091576	R571.3/16	180
091577	R571.13/64	180
091579	R571.15/64	180
091580	R571.1/4	180
091582	R571.5/16	180
091583	R571.3/8	180
091584	R571.7/16	180
091585	R571.1/2	180
091586	R571.1/32	180
091587	R571.5/32	180
091588	R571.7/32	180
091589	R571.9/32	180
091592	R571.11/32	180
091595	R571.13/32	180
091598	R571.15/32	180
092333	R56CO33/64	183
092334	R56CO17/32	183
092335	R56CO35/64	183
092336	R56CO9/16	183
092337	R56CO37/64	183
092338	R56CO19/32	183
092339	R56CO39/64	183
092340	R56CO5/8	183
092341	R56CO41/64	183
092342	R56CO21/32	183
092343	R56CO43/64	183
092344	R56CO11/16	183
092345	R56CO45/64	183
092346	R56CO23/32	183
092347	R56CO47/64	183
092348	R56CO3/4	183
092349	R56CO49/64	183
092350	R56CO25/32	183
092351	R56CO51/64	183
092352	R56CO13/16	183
092353	R56CO53/64	183
092354	R56CO27/32	183
092355	R56CO55/64	183
092356	R56CO7/8	183
092357	R56CO57/64	183
092358	R56CO29/32	183
092359	R56CO59/64	183
092360	R56CO15/16	183
092361	R56CO61/64	183
092362	R56CO31/32	183
092363	R56CO63/64	183
092364	R56CO1	183
0093900	E500M1.6NO3	292
0093924	E500M1.7NO2	292
0093931	E500M1.7NO3	292
0093948	E500M1.8NO2	292
0093955	E500M1.8NO3	292
0093979	E500M10NO2	292
0093986	E500M10NO3	292
0093993	E500M10NO8	292
0094006	E500M11NO2	292
0094013	E500M11NO3	292
0094037	E500M12NO2	292
0094044	E500M12NO3	292
0094051	E500M12NO6	292
0094068	E500M12NO8	292
0094075	E500M14NO2	292
0094082	E500M14NO3	292
0094099	E500M14NO8	292
0094105	E500M16NO2	292
0094112	E500M16NO3	292
0094129	E500M16NO8	292
0094136	E500M18NO2	292
0094143	E500M18NO3	292
0094167	E500M2.2NO2	292
0094174	E500M2.2NO3	292
0094198	E500M2.3NO2	292
0094204	E500M2.3NO3	292
0094228	E500M2.5NO2	292
0094235	E500M2.5NO3	292
0094242	E500M2.5NO8	292
0094259	E500M2NO1	292
0094266	E500M2NO2	292
0094273	E500M2NO3	292
0094280	E500M2NO8	292
0094297	E500M20NO3	292
0094303	E500M20NO8	292
0094310	E500M22NO2	292
0094327	E500M22NO3	292
0094341	E500M24NO2	292
0094358	E500M24NO3	292
0094365	E500M27NO2	292
0094372	E500M27NO3	292
0094402	E500M3.5NO1	292
0094419	E500M3.5NO2	292
0094426	E500M3.5NO3	292
0094433	E500M3.5NO8	292
0094440	E500M3NO2	292
0094457	E500M3NO3	292
0094464	E500M3NO6	292
0094471	E500M3NO8	292
0094488	E500M30NO2	292
0094495	E500M30NO3	292
0094525	E500M33NO3	292
0094549	E500M36NO2	292
0094556	E500M36NO3	292
0094587	E500M39NO3	292
0094617	E500M4.5NO2	292
0094624	E500M4.5NO3	292
0094648	E500M4NO2	292
0094655	E500M4NO3	292
0094662	E500M4NO6	292
0094679	E500M4NO8	292
0094686	E500M42NO3	292
0094709	E500M45NO3	292
0094730	E500M48NO3	292
0094761	E500M5NO2	292
0094778	E500M5NO3	292
0094785	E500M5NO8	292
0094792	E500M52NO3	292
0094808	E500M6NO1	292
0094815	E500M6NO2	292
0094822	E500M6NO3	292
0094839	E500M6NO8	292
0094846	E500M7NO3	292
0094853	E500M7NO6	292
0094860	E500M7NO8	292
0094877	E500M8NO2	292
0094884	E500M8NO3	292
0094891	E500M8NO6	292
0094907	E500M8NO8	292
0094914	E500M9NO3	292
0094938	E501M10NO2	300
0094945	E501M10NO3	300
0094952	E501M12NO2	300
0094969	E501M12NO3	300
0094976	E501M14NO2	300
0094983	E501M14NO3	300
0094990	E501M16NO2	300
0095003	E501M16NO3	300
0095010	E501M18NO3	300
0095027	E501M20NO2	300
0095034	E501M20NO3	300
0095041	E501M24NO3	300
0095058	E501M3NO2	300
0095065	E501M3NO3	300
0095072	E501M4NO2	300
0095089	E501M4NO3	300
0095096	E501M5NO2	300
0095102	E501M5NO3	300
0095119	E501M6NO2	300
0095126	E501M6NO3	300
0095133	E501M8NO2	300
0095140	E501M8NO3	300
0096079	E513M10X1.25NO3	294
0096086	E513M10X1.0NO3	294
0096093	E513M11X1.0NO2	294
0096109	E513M11X1.0NO3	294
0096116	E513M12X1.25NO3	294
0096123	E513M12X1.25NO7	294
0096130	E513M12X1.5NO2	294
0096147	E513M12X1.5NO3	294
0096154	E513M12X1.0NO3	294
0096161	E513M14X1.25NO3	294
0096178	E513M14X1.5NO3	294
0096185	E513M14X1.0NO3	294
0096192	E513M15X1.5NO2	294
0096208	E513M15X1.5NO3	294
0096222	E513M16X1.5NO3	294
0096239	E513M16X1.5NO7	294
0096246	E513M16X1.0NO3	294
0096253	E513M16X1.0NO7	294
0096260	E513M18X1.5NO3	294
0096277	E513M18X1.0NO2	294
0096284	E513M18X1.0NO3	294
0096291	E513M18X1.0NO7	294
0096307	E513M18X2.0NO2	294
0096314	E513M18X2.0NO3	294
0096321	E513M18X2.0NO7	294
0096338	E513M20X1.5NO3	294
0096345	E513M20X1.0NO2	294
0096352	E513M20X1.0NO3	294
0096369	E513M20X1.0NO7	294
0096376	E513M20X2.0NO2	294
0096383	E513M20X2.0NO3	294
0096390	E513M22X1.5NO3	294
0096406	E513M22X1.0NO2	294
0096413	E513M22X1.0NO3	294
0096420	E513M22X2.0NO2	294
0096437	E513M22X2.0NO3	294
0096444	E513M22X2.0NO7	294
0096451	E513M24X1.5NO3	294
0096468	E513M24X1.5NO7	294
0096475	E513M24X1.0NO2	294
0096482	E513M24X1.0NO3	294
0096499	E513M24X2.0NO2	294
0096505	E513M24X2.0NO3	294
0096512	E513M25X1.5NO3	294
0096529	E513M26X1.5NO2	294
0096536	E513M26X1.5NO3	294
0096543	E513M28X1.5NO2	294
0096550	E513M28X1.5NO3	294
0096567	E513M3X.35NO3	294
0096574	E513M30X1.5NO2	294
0096581	E513M30X1.5NO3	294
0096598	E513M32X1.5NO3	294
0096604	E513M33X2.0NO2	294
0096611	E513M33X2.0NO3	294
0096628	E513M35X1.5NO2	294
0096635	E513M35X1.5NO3	294
0096642	E513M36X2.0NO3	294
0096659	E513M36X3.0NO2	294
0096666	E513M36X3.0NO3	294
0096673	E513M39X3.0NO3	294
0096680	E513M4X.5NO3	294
0096697	E513M40X1.5NO3	294
0096703	E513M42X1.5NO3	294
0096710	E513M45X1.5NO3	294
0096727	E513M5X.5NO2	294
0096734	E513M5X.5NO3	294
0096741	E513M5X.5NO7	294
0096758	E513M50X1.5NO3	294
0096765	E513M6X.75NO3	294
0096772	E513M6X.75NO7	294
0096789	E513M7X.75NO2	294
0096796	E513M7X.75NO3	294
0096802	E513M8X.75NO3	294
0096819	E513M8X.75NO7	294
0096826	E513M8X1.0NO3	294
0096833	E513M9X1.0NO3	294
097601	76HAN1	196
097602	76HAN2	196
097603	76HAN3	196
097604	76HAN4	196
097605	76HAN5	196
097606	76HAN6	196
097607	76HAN7	196
097608	76HAN8	196
097610	76HAN0	196
097620	76HAN00	196
097630	76HAN000	196
0099193	E5471.1/2NO2	340
0099209	E5471.1/2NO3	340
0099216	E5471.1/4NO2	340
0099223	E5471.1/4NO3	340
0099254	E5471NO3	340
0099261	E5471/2NO3	340
0099278	E5471/4NO3	340
0099285	E5471/8NO3	340
0099292	E5472NO3	340
0099308	E5473/4NO3	340
0099315	E5473/8NO3	340
0099322	E5475/8NO2	340
0099339	E5475/8NO3	340
0099353	E5477/8NO2	340
0099360	E5477/8NO3	340
0099445	E5501	339
0099452	E5501.1/2	339
0099469	E5501.1/4	339
0099476	E5501/2	339
0099483	E5501/4	339
0099490	E5501/8	339
0099506	E5502	339
0099513	E5503/4	339
0099520	E5503/8	339
099701	C21R10COSET	211
099705	C114COMBCSET	212
099706	C115COMBCSET	212
0099834	E7101	327
0099841	E7101.1/2	327
0099858	E7101.1/4	327
0099865	E7101/2	327
0099872	E7101/4	327
0099889	E7101/8	327
0099896	E7102	327
0099902	E7103/4	327
099903	C29R40CSET	215
0099919	E7103/8	327
0099926	E7111	333
099930	C60R41CSET	215
0099933	E7111/2	333
099935	C29L10SET	208
0099940	E7111/4	333
099944	C13R10COSET	211
099955	C15L10SET	208
0099957	E7111/8	333
099960	C60M41COSET	216
099961	C26M42COSET	216
099962	C29M40COSET	216
0099964	E7113/4	333
0099971	E7113/8	333
099976	C60R18SET	202
099977	C29R10SET	201
099978	C15R10SET	201
099981	C20R18SET	202
099982	C115COMBSET	204
099983	C26R15SET	203

EDP NUMBER INDEX - 099985 - 0128930

EDP#	E-Code	Page #
099985	C502ABSET	205
099987	C252ASET	205
099988	C252ABSET	205
0099988	E7121	337
099990	C114COMBSET	204
0099995	E7121.1/4	337
0100004	E7121/16	337
0100011	E7121/2	337
0100028	E7121/4	337
0100035	E7121/8	337
0100042	E7123/4	337
0100059	E7123/8	337
0104996	F201M10	364
0105009	F201M12	364
0105016	F201M14	364
0105023	F201M16	364
0105030	F201M4	364
0105047	F201M5	364
0105054	F201M6	364
0105061	F201M8	364
0105528	F302M10	367
0105535	F302M11	367
0105542	F302M12	367
0105559	F302M14	367
0105566	F302M16	367
0105573	F302M18	367
0105580	F302M20	367
0105597	F302M22	367
0105603	F302M24	367
0105610	F302M27	367
0105627	F302M3	367
0105634	F302M30	367
0105641	F302M33	367
0105658	F302M36	367
0105672	F302M4	367
0105719	F302M5	367
0105733	F302M6	367
0105740	F302M7	367
0105757	F302M8	367
0108260	G13212.5	488
0108277	G13216.0	488
0108284	G13220.0	488
0108291	G1328.0	488
0108444	G13512.5	480
0108451	G13516.0	480
0108468	G13520.0	480
0108475	G13525.0	480
0108482	G1356.3	480
0108499	G1358.0	480
0108505	G13610.0	483
0108512	G13610.4	483
0108529	G13611.5	483
0108536	G13612.4	483
0108543	G13613.4	483
0108550	G13615.0	483
0108567	G13616.5	483
0108574	G13619.0	483
0108581	G13620.5	483
0108598	G13623.0	483
0108604	G13625.0	483
0108611	G13626.0	483
0108628	G13628.0	483
0108635	G13630.0	483
0108642	G13631.0	483
0108659	G1364.3	483
0108666	G1365.0	483
0108673	G1365.3	483
0108680	G1365.8	483
0108697	G1366.0	483
0108703	G1366.3	483
0108710	G1367.0	483
0108727	G1367.3	483
0108734	G1368.0	483
0108741	G1368.3	483
0108758	G1369.4	483
0108765	G13716.0	489
0108772	G13720.0	489
0108789	G13725.0	489
0108796	G13731.5	489
0108802	G13740.0	489
0108819	G13750.0	489
0108826	G13763.0	489
0108833	G13780.0	489
0108895	G13825.0	490
0108925	G13830.0	490
0108932	G13831.0	490
0108949	G13834.0	490
0108956	G13837.0	490
0108963	G13840.0	490
0108970	G13850.0	490
0108987	G13863.0	490
0108994	G13880.0	490
0109038	G14910	482
0109045	G14915	482
0109052	G14920	482
0109069	G14925	482
0109076	G14930	482
0109083	G14935	482
0109090	G14940	482
0109106	G1495	482
0109113	G14950	482
0109502	G33825.0	490
0109519	G33831.0	490
0109526	G33837.0	490
0109533	G33840.0	490
0109540	G33850.0	490
0109557	G33863.0	490
0109632	G56010.0	483
0109649	G56010.4	483
0109656	G56012.4	483
0109663	G56016.5	483
0109670	G56020.5	483
0109687	G56025.0	483
0109694	G5606.3	483
0111604	L1101	370
0111611	L1102A	370
0111628	L1102B	370
0111635	L1103	370
0111642	L1104	370
0111659	L1105F	370
0111666	L1105	370
0111673	L1106F	370
0111680	L1106	370
0111697	L1107F	370
0111703	L1107	370
0111710	L1108F	370
0111727	L1108	370
0111734	L1109F	370
0111741	L1109	370
0111758	L11010F	370
0111765	L11010	370
0115558	R51010.0	44
0115565	R51010.2	44
0115572	R51010.4	44
0115589	R51010.5	44
0115596	R51011.0	44
0115602	R51011.5	44
0115619	R51012.0	44
0115626	R51013.0	44
0115633	R51014.0	44
0115640	R51014.25	44
0115657	R5103.0	44
0115664	R5103.3	44
0115671	R5103.4	44
0115688	R5103.5	44
0115695	R5104.0	44
0115701	R5104.1	44
0115718	R5104.2	44
0115725	R5104.3	44
0115732	R5104.5	44
0115749	R5104.9	44
0115756	R5105.0	44
0115763	R5105.1	44
0115770	R5105.5	44
0115787	R5106.0	44
0115794	R5106.5	44
0115800	R5106.8	44
0115817	R5106.9	44
0115824	R5107.0	44
0115831	R5107.3	44
0115848	R5107.4	44
0115855	R5107.5	44
0115862	R5108.0	44
0115879	R5108.5	44
0115886	R5109.0	44
0115893	R5109.2	44
0115909	R5109.3	44
0115916	R5109.5	44
0115923	R52010.0	38
0115930	R52010.2	38
0115947	R52010.4	38
0115954	R52010.5	38
0115961	R52011.0	38
0115978	R52011.5	38
0115985	R52012.0	38
0115992	R52012.5	38
0116005	R52013.0	38
0116012	R52014.0	38
0116029	R52014.5	38
0116036	R52015.0	38
0116043	R52016.0	38
0116050	R52016.5	38
0116067	R5203.0	38
0116074	R5203.1	38
0116081	R5203.2	38
0116098	R5203.3	38
0116104	R5203.4	38
0116111	R5203.5	38
0116128	R5203.6	38
0116135	R5203.7	38
0116142	R5203.8	38
0116159	R5203.9	38
0116166	R5204.0	38
0116173	R5204.1	38
0116180	R5204.2	38
0116197	R5204.3	38
0116203	R5204.4	38
0116210	R5204.5	38
0116227	R5204.6	38
0116234	R5204.7	38
0116241	R5204.8	38
0116258	R5204.9	38
0116265	R5205.0	38
0116272	R5205.1	38
0116289	R5205.2	38
0116296	R5205.3	38
0116302	R5205.4	38
0116319	R5205.5	38
0116326	R5205.6	38
0116333	R5205.7	38
0116340	R5205.8	38
0116357	R5205.9	38
0116364	R5206.0	38
0116371	R5206.1	38
0116388	R5206.2	38
0116395	R5206.3	38
0116401	R5206.4	38
0116418	R5206.5	38
0116425	R5206.8	38
0116432	R5206.9	38
0116449	R5207.0	38
0116456	R5207.3	38
0116463	R5207.4	38
0116470	R5207.5	38
0116487	R5207.8	38
0116494	R5208.0	38
0116500	R5208.5	38
0116517	R5209.0	38
0116524	R5209.2	38
0116531	R5209.3	38
0116548	R5209.5	38
0121863	A17029/32	176
0121870	A17033/64	176
0121887	A17035/64	176
0121894	A17037/64	176
0121900	A17039/64	176
0121917	A17043/64	176
0121924	A17047/64	176
0121931	A17049/64	176
0121948	A17053/64	176
0121955	A17055/64	176
0121962	A17059/64	176
0121979	A17061/64	176
0121986	A17063/64	176
0122198	B1573.0	452
0122297	C3463.0	418
0122303	C3464.0	418
0122310	C3465.0	418
0122327	C3466.0	418
0122440	E500M2.6NO3	292
0122457	E500M56NO3	292
0122464	E500M1NO3	292
0122471	E500M1.2NO3	292
0122488	E500M1.4NO3	292
0122495	E501M22NO3	300
0122501	E504M5NO3	305
0122518	E504M6NO3	305
0122525	E504M8NO3	305
0122532	E504M10NO3	305
0122556	E504M4NO3	305
0122563	E504M3NO3	305
0122587	E504M16NO3	305
0123003	E513M30X2.0NO3	294
0123010	E513M27X1.5NO3	294
0123027	E513M5X.75NO3	294
0123034	E513M6X.5NO3	294
0123041	E513M27X2.0NO3	294
0123058	E513M8X.5NO3	294
0123065	E513M10X.75NO3	294
0123072	E513M11X.75NO3	294
0124079	E7111.1/2	333
0126233	C34610.0	418
0126240	C34611.0	418
0126257	C34612.0	418
0126264	C34613.0	418
0126271	C34614.0	418
0126288	C34615.0	418
0126295	C34616.0	418
0126301	C34618.0	418
0126318	C34620.0	418
0126325	C3467.0	418
0126332	C3468.0	418
0126349	C3469.0	418
0127513	E650M10	347
0127520	E650M12	347
0127537	E650M14	347
0127544	E650M16	347
0127551	E650M4	347
0127568	E650M5	347
0127575	E650M6	347
0127582	E650M8	347
0127711	G5608.0	483
0127728	G5608.3	483
0127735	G56031.0	483
0127957	B170.98	442
0127964	B170.99	442
0127971	B1701.0	442
0127988	B1701.01	442
0127995	B1701.02	442
0128008	B1701.03	442
0128015	B1701.04	442
0128022	B1701.05	442
0128459	B1701.49	442
0128466	B1701.5	442
0128473	B1701.52	442
0128725	G40010.4	476
0128732	G40012.4	476
0128749	G40016.5	476
0128756	G40020.5	476
0128763	G40025.0	476
0128770	G40031.0	476
0128787	G4006.3	476
0128794	G4008.3	476
0128916	B1701.98	442
0128923	B1701.99	442
0128930	B17010.0	442

EDP NUMBER INDEX - 0128947 - 0136133

EDP#	E-Code	Page #
0128947	B17010.01	442
0128954	B17010.02	442
0128961	B17010.03	442
0128978	B17010.04	442
0128985	B17010.05	442
0129463	B17010.49	442
0129470	B17010.51	442
0129487	B17010.52	442
0129883	B17010.98	442
0129890	B17010.99	442
0129906	B17011.0	442
0129913	B17011.01	442
0129920	B17011.02	442
0129937	B17011.03	442
0129944	B17011.04	442
0129951	B17011.05	442
0130384	B17011.49	442
0130391	B17011.5	442
0130407	B17011.51	442
0130414	B17011.52	442
0130865	B17011.98	442
0130872	B17011.99	442
0130889	B17012.0	442
0130896	B1702.0	442
0130902	B1702.01	442
0130919	B1702.02	442
0130926	B1702.03	442
0130933	B1702.04	442
0130940	B1702.05	442
0131367	B1702.49	442
0131374	B1702.5	442
0131381	B1702.51	442
0131398	B1702.52	442
0131848	B1702.98	442
0131855	B1702.99	442
0131862	B1703.0	442
0131879	B1703.02	442
0131886	B1703.03	442
0131893	B1703.04	442
0131909	B1703.05	442
0132302	B1703.49	442
0132319	B1703.5	442
0132326	B1703.51	442
0132333	B1703.52	442
0132784	B1703.98	442
0132791	B1703.99	442
0132807	B1704.0	442
0132814	B1704.01	442
0132821	B1704.02	442
0132838	B1704.03	442
0132845	B1704.04	442
0132852	B1704.05	442
0133286	B1704.49	442
0133293	B1704.5	442
0133309	B1704.51	442
0133316	B1704.52	442
0133767	B1704.98	442
0133774	B1704.99	442
0133781	B1705.0	442
0133798	B1705.01	442
0133804	B1705.02	442
0133811	B1705.03	442
0133828	B1705.04	442
0133835	B1705.05	442
0134191	R4534.4	46
0134191	R4534.4	46
0134207	R4534.8	46
0134207	R4534.8	46
0134214	R4534.9	46
0134214	R4534.9	46
0134221	R4535.2	46
0134221	R4535.2	46
0134238	R4536.2	46
0134238	R4536.2	46
0134245	R4536.4	46
0134245	R4536.4	46
0134252	R4536.7	46
0134252	R4536.7	46
0134269	B1705.49	442
0134276	B1705.5	442
0134283	B1705.51	442
0134290	B1705.52	442
0134306	R4537.7	46
0134306	R4537.7	46
0134313	R4537.9	46
0134313	R4537.9	46
0134320	R4538.2	46
0134320	R4538.2	46
0134337	R4538.4	46
0134337	R4538.4	46
0134344	R4538.9	46
0134344	R4538.9	46
0134351	R4539.4	46
0134351	R4539.4	46
0134368	R4539.9	46
0134368	R4539.9	46
0134375	R45311.4	46
0134375	R45311.4	46
0134382	R45311.6	46
0134382	R45311.6	46
0134399	R45312.8	46
0134399	R45312.8	46
0134405	R45313.8	46
0134405	R45313.8	46
0134412	R45314.8	46
0134412	R45314.8	46
0134429	R45315.8	46
0134429	R45315.8	46
0134436	R45317.8	46
0134436	R45317.8	46
0134443	R45319.8	46
0134443	R45319.8	46
0134450	R4544.4	46
0134450	R4544.4	46
0134467	R4544.8	46
0134467	R4544.8	46
0134474	R4544.9	46
0134474	R4544.9	46
0134481	R4545.2	46
0134481	R4545.2	46
0134498	R4546.2	46
0134498	R4546.2	46
0134504	R4546.4	46
0134504	R4546.4	46
0134511	R4547.7	46
0134511	R4547.7	46
0134528	R4547.9	46
0134528	R4547.9	46
0134535	R4548.2	46
0134535	R4548.2	46
0134542	R4548.4	46
0134542	R4548.4	46
0134559	R4548.9	46
0134559	R4548.9	46
0134566	R4549.4	46
0134566	R4549.4	46
0134573	R4549.7	46
0134573	R4549.7	46
0134580	R4549.9	46
0134580	R4549.9	46
0134597	R45411.4	46
0134597	R45411.4	46
0134603	R45411.6	46
0134603	R45411.6	46
0134610	R45412.8	46
0134610	R45412.8	46
0134627	R45413.8	46
0134627	R45413.8	46
0134634	R45414.8	46
0134634	R45414.8	46
0134641	R45415.8	46
0134641	R45415.8	46
0134658	R45416.5	46
0134658	R45416.5	46
0134665	R45417.0	46
0134665	R45417.0	46
0134672	R45417.5	46
0134672	R45417.5	46
0134689	R45417.8	46
0134689	R45417.8	46
0134696	R45418.0	46
0134696	R45418.0	46
0134702	R45418.5	46
0134702	R45418.5	46
0134719	R45419.0	46
0134719	R45419.0	46
0134726	R45419.5	46
0134726	R45419.5	46
0134733	R45419.8	46
0134733	R45419.8	46
0134740	R45420.0	46
0134740	R45420.0	46
0134757	B1705.98	442
0134764	B1705.99	442
0134771	B1706.0	442
0134788	B1706.01	442
0134795	B1706.02	442
0134801	B1706.03	442
0134818	B1706.04	442
0134825	B1706.05	442
0134832	R4574.4	40
0134832	R4574.4	40
0134849	R4574.8	40
0134849	R4574.8	40
0134856	R4575.2	40
0134856	R4575.2	40
0134863	R4576.2	40
0134863	R4576.2	40
0134870	R4576.4	40
0134870	R4576.4	40
0134887	R4576.7	40
0134887	R4576.7	40
0134894	R4577.7	40
0134894	R4577.7	40
0134900	R4577.9	40
0134900	R4577.9	40
0134917	R4578.2	40
0134917	R4578.2	40
0134924	R4578.4	40
0134924	R4578.4	40
0134931	R4578.9	40
0134931	R4578.9	40
0134948	R4579.4	40
0134948	R4579.4	40
0134955	R4579.9	40
0134955	R4579.9	40
0134962	R45711.4	40
0134962	R45711.4	40
0134979	R45711.6	40
0134979	R45711.6	40
0134986	R45712.8	40
0134986	R45712.8	40
0134993	R45713.8	40
0134993	R45713.8	40
0135006	R45714.8	40
0135006	R45714.8	40
0135013	R4584.4	40
0135013	R4584.4	40
0135020	R4584.7	40
0135020	R4584.7	40
0135037	R4584.8	40
0135037	R4584.8	40
0135044	R4584.9	40
0135044	R4584.9	40
0135051	R4585.2	40
0135051	R4585.2	40
0135068	R4586.2	40
0135068	R4586.2	40
0135075	R4586.4	40
0135075	R4586.4	40
0135082	R4586.7	40
0135082	R4586.7	40
0135099	R4587.7	40
0135099	R4587.7	40
0135105	R4587.9	40
0135105	R4587.9	40
0135112	R4588.2	40
0135112	R4588.2	40
0135129	R4588.4	40
0135129	R4588.4	40
0135136	R4589.4	40
0135136	R4589.4	40
0135143	R4589.7	40
0135143	R4589.7	40
0135150	R4589.9	40
0135150	R4589.9	40
0135167	R45811.4	40
0135167	R45811.4	40
0135174	R45811.6	40
0135174	R45811.6	40
0135181	R45812.8	40
0135181	R45812.8	40
0135198	R45813.8	40
0135198	R45813.8	40
0135204	R45815.8	40
0135204	R45815.8	40
0135211	R45816.5	40
0135211	R45816.5	40
0135228	R45817.0	40
0135228	R45817.0	40
0135235	R45817.5	40
0135235	R45817.5	40
0135242	B1706.49	442
0135259	B1706.5	442
0135266	B17010.5	442
0135273	R45817.8	40
0135273	R45817.8	40
0135280	R45818.0	40
0135280	R45818.0	40
0135297	R45818.5	40
0135297	R45818.5	40
0135303	B1706.51	442
0135310	B1706.52	442
0135327	R45819.0	40
0135327	R45819.0	40
0135334	R45819.5	40
0135334	R45819.5	40
0135341	R45819.8	40
0135341	R45819.8	40
0135358	R45820.0	40
0135358	R45820.0	40
0135709	EP00M3	259
0135716	EP00M3DIN376	259
0135723	EP00M3.5	259
0135730	EP00M4	259
0135747	EP00M4DIN376	259
0135754	EP00M4.5	259
0135761	B1706.98	442
0135778	B1706.99	442
0135785	B1707.0	442
0135792	B1707.01	442
0135808	B1707.02	442
0135815	B1707.03	442
0135822	B1707.04	442
0135839	B1707.05	442
0135846	EP00M5	259
0135853	EP00M5DIN376	259
0135860	EP00M6	259
0135877	EP00M6DIN376	259
0135884	EP00M7	259
0135891	EP00M8	259
0135907	EP00M8DIN376	259
0135914	EP00M10	259
0135921	EP00M10DIN376	259
0135938	EP00M12	259
0135945	EP00M14	259
0135952	EP00M16	259
0135969	EP00M18	259
0135976	EP00M20	259
0135983	EP00M22	259
0135990	EP00M24	259
0136003	EP00M27	259
0136010	EP00M30	259
0136119	EP01M3	259
0136126	EP01M3DIN376	259
0136133	EP01M3.5	259

EDP NUMBER INDEX - 0136140 - 0148532

EDP#	E-Code	Page #
0136140	EP01M4	259
0136157	EP01M4DIN376	259
0136164	EP01M4.5	259
0136171	EP01M5	259
0136188	EP01M5DIN376	259
0136195	EP01M6	259
0136201	EP01M6DIN376	259
0136218	EP01M7	259
0136225	EP01M8	259
0136232	EP01M8DIN376	259
0136249	EP01M10	259
0136256	EP01M10DIN376	259
0136263	EP01M12	259
0136270	B1707.49	442
0136287	B1707.5	442
0136294	B1707.51	442
0136300	B1707.52	442
0136317	EP01M14	259
0136324	EP01M16	259
0136331	EP01M18	259
0136348	EP01M20	259
0136355	EP01M22	259
0136362	EP01M24	259
0136379	EP01M27	259
0136386	EP01M30	259
0136591	EX00M3	273
0136607	EX00M3.5	273
0136614	EX00M4	273
0136621	EX00M5	273
0136638	EX00M6	273
0136645	EX00M6DIN376	273
0136652	EX00M7	273
0136669	EX00M8	273
0136676	EX00M8DIN376	273
0136683	EX00M10	273
0136690	EX00M10DIN376	273
0136706	EX00M12	273
0136713	EX00M14	273
0136720	EX00M16	273
0136737	EX00M18	273
0136744	EX00M20	273
0136751	B1707.98	442
0136768	B1707.99	442
0136775	B1708.01	442
0136782	B1708.02	442
0136799	B1708.03	442
0136805	B1708.04	442
0136812	B1708.05	442
0136829	EX00M22	273
0136836	EX00M24	273
0136843	EX00M27	273
0136850	EX00M30	273
0136867	EX00M33	273
0136874	EX00M36	273
0136881	EX00M39	273
0136898	EX00M42	273
0136904	EX00M48	273
0136911	EX00M52	273
0136928	EX00M56	273
0136935	EX00M64	273
0136942	EX01M3	273
0136959	B1708.0	442
0136966	EX01M3.5	273
0136973	EX01M4	273
0136980	EX01M5	273
0136997	EX01M6	273
0137000	EX01M6DIN376	273
0137017	EX01M7	273
0137024	EX01M8	273
0137031	EX01M8DIN376	273
0137048	EX01M10	273
0137055	EX01M10DIN376	273
0137062	EX01M12	273
0137079	EX01M14	273
0137086	EX01M16	273
0137093	EX01M18	273
0137109	EX01M20	273
0137116	EX01M22	273
0137123	EX01M24	273
0137130	EX01M27	273
0137147	EX01M30	273
0137154	EX01M33	273
0137161	EX01M36	273
0137178	EX01M39	273
0137185	EX01M42	273
0137192	EX01M48	273
0137208	EX01M52	273
0137215	EX01M56	273
0137222	EX01M64	273
0137239	EP00M2	259
0137246	EP00M2.5	259
0137253	EP01M2	259
0137260	B1708.49	442
0137277	B1708.5	442
0137284	B1708.52	442
0137291	EP01M2.5	259
0137307	EX00M2	273
0137314	EX00M2.5	273
0137321	EX01M2	273
0137338	EX01M2.5	273
0137345	EP10M4X.5	260
0137352	EP10M5X.5	260
0137369	EP10M6X.75	260
0137376	EP10M8X.75	260
0137383	EP10M8X1.0	260
0137390	EP10M10X.75	260
0137406	EP10M10X1.0	260
0137413	EP10M10X1.25	260
0137420	EP10M12X1.0	260
0137437	EP10M12X1.25	260
0137444	EP10M12X1.5	260
0137451	EP10M14X1.0	260
0137468	EP10M14X1.25	260
0137475	EP10M14X1.5	260
0137482	EP10M16X1.0	260
0137499	EP10M16X1.5	260
0137505	EP10M18X1.0	260
0137512	EP10M18X1.5	260
0137529	EP10M20X1.0	260
0137536	EP10M20X1.5	260
0137543	EP10M22X1.5	260
0137550	EP10M24X1.5	260
0137567	EP10M24X2.0	260
0137574	EP10M25X1.5	260
0137581	EP10M26X1.5	260
0137598	EP10M27X1.5	260
0137604	EP10M27X2.0	260
0137611	EP10M28X1.5	260
0137628	EP10M30X1.5	260
0137635	EP10M30X2.0	260
0137642	EP11M4X.5	260
0137659	EP11M5X.5	260
0137666	EP11M6X.75	260
0137673	EP11M8X.75	260
0137680	EP11M8X1.0	260
0137697	EP11M10X.75	260
0137703	EP11M10X1.0	260
0137710	EP11M10X1.25	260
0137727	EP11M12X1.0	260
0137734	B1708.98	442
0137741	B1708.99	442
0137758	B1709.0	442
0137765	B1709.01	442
0137772	B1709.02	442
0137789	B1709.03	442
0137796	B1709.04	442
0137802	B1709.05	442
0137819	EP11M12X1.25	260
0137826	EP11M12X1.5	260
0137833	EP11M14X1.0	260
0137840	EP11M14X1.25	260
0137857	EP11M14X1.5	260
0137864	EP11M16X1.0	260
0137871	EP11M16X1.5	260
0137888	EP11M18X1.0	260
0137895	EP11M18X1.5	260
0137901	EP11M20X1.0	260
0137918	EP11M20X1.5	260
0137925	EP11M22X1.5	260
0137932	EP11M24X1.5	260
0137949	EP11M24X2.0	260
0137956	EP11M25X1.5	260
0137963	EP11M26X1.5	260
0137970	EP11M27X1.5	260
0137987	EP11M27X2.0	260
0137994	EP11M28X1.5	260
0138007	EP11M30X1.5	260
0138014	EP11M30X2.0	260
0138021	EP204-40	255
0138038	EP205-40	255
0138045	EP206-32	255
0138052	EP208-32	255
0138069	EP2010-24	255
0138076	EP2012-24	255
0138083	EP201/4	255
0138090	EP205/16	255
0138106	EP203/8	255
0138113	EP207/16	255
0138120	EP201/2	255
0138137	EP205/8	255
0138144	EP203/4	255
0138151	EP207/8	255
0138168	EP201	255
0138175	EP214-40	255
0138182	EP215-40	255
0138199	EP216-32	255
0138205	EP218-32	255
0138212	EP2110-24	255
0138229	EP2112-24	255
0138236	B1709.49	442
0138243	B1709.5	442
0138250	B1709.51	442
0138267	B1709.52	442
0138274	EP211/4	255
0138281	EP215/16	255
0138298	EP213/8	255
0138304	EP217/16	255
0138311	EP211/2	255
0138328	EP215/8	255
0138335	EP213/4	255
0138342	EP217/8	255
0138359	EP211	255
0138366	EP308-36	255
0138373	EP3010-32	255
0138380	EP301/4	255
0138397	EP305/16	255
0138403	EP303/8	255
0138410	EP307/16	255
0138427	EP301/2	255
0138434	EP305/8	255
0138441	EP303/4	255
0138458	EP307/8	255
0138465	EP301	255
0138472	EP318-36	255
0138489	EP3110-32	255
0138496	EP311/4	255
0138502	EP315/16	255
0138519	EP313/8	255
0138526	EP317/16	255
0138533	EP311/2	255
0138540	EP315/8	255
0138557	EP313/4	255
0138564	EP317/8	255
0138571	EP311	255
0138588	EP401/8	283
0138595	EP401/4	283
0138601	EP403/8	283
0138618	EP401/2	283
0138625	EP405/8	283
0138632	EP403/4	283
0138649	EP407/8	283
0138656	EP401	283
0138663	EP411/8	283
0138670	EP411/4	283
0138687	EP413/8	283
0138694	EP411/2	283
0138700	EP415/8	283
0138717	B1709.98	442
0138724	B1709.99	442
0139950	E500M1.6NO2	292
0139967	E500M7NO2	292
0140314	B1006.5	468
0140321	B1007.5	468
0140338	B1008.5	468
0140345	B1009.5	468
0140352	B15713.0	452
0140369	B15714.0	452
0140376	B15715.0	452
0140383	B15716.0	452
0140390	B15717.0	452
0140406	B15718.0	452
0140413	B15719.0	452
0140420	B15720.0	452
0140819	B33413	463
0140826	B33414	463
0140833	B33415	463
0140840	B33416	463
0144152	B4003.0	437
0144169	B4003.2	437
0144176	B4003.5	437
0144183	B4004.0	437
0144190	B4004.5	437
0144206	B4005.0	437
0144213	B4005.5	437
0144220	B4006.0	437
0144237	B4006.5	437
0144244	B4007.0	437
0144251	B4008.0	437
0144268	B4009.0	437
0144275	B40010.0	437
0144282	B40012.0	437
0144299	B40014.0	437
0144305	B40016.0	437
0144312	B40018.0	437
0144329	B40020.0	437
0144336	B41117.0	439
0144343	B41118.0	439
0144350	B41119.0	439
0144367	B41120.0	439
0144374	B41122.0	439
0144381	B41124.0	439
0144398	B41125.0	439
0144404	B41126.0	439
0144411	B41130.0	439
0144589	B33513BLADES	464
0144596	B33514BLADES	464
0144602	B33515BLADES	464
0144619	B33516BLADES	464
0144626	B3350NUT	464
0144633	B33500NUT	464
0144640	B335000NUT	464
0144657	B3351NUT	464
0144664	B3352NUT	464
0144671	B3353NUT	464
0144688	B3354NUT	464
0144695	B3355NUT	464
0144701	B3356NUT	464
0144718	B3357NUT	464
0144725	B3358NUT	464
0144732	B3359NUT	464
0144749	B33510NUT	464
0144756	B33511NUT	464
0144763	B33512NUT	464
0144770	B33513NUT	464
0144787	B33514NUT	464
0144794	B33515NUT	464
0144800	B33516NUT	464
0144817	G13510.0	480
0147054	EP413/4	283
0148433	A53033.0	167
0148457	A53035.0	167
0148471	A53040.0	167
0148501	A9762.0X125	71
0148518	A9762.2X135	71
0148525	A9762.5X140	71
0148532	A9763.0X150	71

EDP NUMBER INDEX - 0148549 - 0157183

EDP#	E-Code	Page #
0148549	A9763.3X155	71
0148556	A9763.5X165	71
0148563	A9763.7X165	71
0148570	A9764.0X175	71
0148587	A9764.5X185	71
0148594	A9765.0X195	71
0148600	A9765.5X205	71
0148617	A9766.0X205	71
0148624	A9766.5X215	71
0148631	A9767.0X225	71
0148648	A9767.5X225	71
0148655	A9768.0X240	71
0148662	A9768.5X240	71
0148679	A9769.0X250	71
0148686	A9769.5X250	71
0148693	A97610.0X265	71
0148709	A9773.0X190	71
0148716	A9773.5X210	71
0148723	A9774.0X220	71
0148730	A9774.5X235	71
0148747	A9775.0X245	71
0148754	A9775.5X260	71
0148761	A9776.0X260	71
0148778	A9776.5X275	71
0148785	A9777.0X290	71
0148792	A9777.5X290	71
0148808	A9778.0X305	71
0148815	A9778.5X305	71
0148822	A9779.0X320	71
0148839	A9779.5X320	71
0148846	A97710.0X340	71
0148853	A9783.5X265	71
0148860	A9784.0X280	71
0148877	A9784.5X295	71
0148884	A9785.0X315	71
0148891	A9785.5X330	71
0148907	A9786.0X330	71
0148914	A9786.5X350	71
0148921	A9787.0X370	71
0148938	A9787.5X370	71
0148945	A9788.0X390	71
0148952	A9788.5X390	71
0148969	A9789.0X410	71
0148976	A9789.5X410	71
0148983	A97810.0X430	71
0148990	R5103.2	44
0149003	R5108.7	44
0149027	A10111.0	90
0149133	A19131M	205
0149270	G1426.3	484
0149287	G14210.4	484
0149294	G14212.4	484
0149300	G14216.5	484
0149317	G14220.5	484
0149324	G14225.0	484
0149331	G14231.0	484
0149348	G1546.3	481
0149355	G1548.3	481
0149362	G15410.4	481
0149379	G15412.4	481
0149386	G15416.5	481
0149393	G15420.5	481
0149409	G15425.0	481
0149546	G3356.3	480
0149553	G3358.0	480
0149560	G33510.0	480
0149577	G33512.5	480
0149584	G33516.0	480
0149591	G33520.0	480
0149607	G33525.0	480
0149645	EP417/8	283
0149652	EP411	283
0149669	EX10M4X.50	274
0149676	EX10M5X.50	274
0149683	EX10M6X.75	274
0149690	EX10M8X.75	274
0149706	EX10M8X1.0	274
0149713	EX10M10X.75	274
0149720	EX10M10X1.0	274
0149737	EX10M10X1.25	274
0149744	EX10M12X1.0	274
0149751	EX10M12X1.25	274
0149768	EX10M12X1.5	274
0149775	EX10M14X1.0	274
0149782	EX10M14X1.25	274
0149799	EX10M14X1.5	274
0149805	EX10M16X1.0	274
0149812	EX10M16X1.5	274
0149829	EX10M18X1.0	274
0149836	EX10M18X1.5	274
0149843	EX10M20X1.0	274
0149850	EX10M20X1.5	274
0149867	EX10M22X1.5	274
0149874	EX10M24X1.5	274
0149881	EX10M24X2.0	274
0149898	EX10M25X1.5	274
0149904	EX10M26X1.5	274
0149911	EX10M27X1.5	274
0149928	EX10M27X2.0	274
0149935	EX10M28X1.5	274
0149942	EX10M30X1.5	274
0149959	EX10M30X2.0	274
0149966	EX11M4X.50	274
0149973	EX11M5X.50	274
0149980	EX11M6X.75	274
0149997	EX11M8X.75	274
0150009	EX11M8X1.0	274
0150016	EX11M10X.75	274
0150023	EX11M10X1.0	274
0150030	EX11M10X1.25	274
0150047	EX11M12X1.0	274
0150054	EX11M12X1.25	274
0150061	EX11M12X1.5	274
0150078	EX11M14X1.0	274
0150085	EX11M14X1.25	274
0150092	EX11M14X1.5	274
0150108	EX11M16X1.0	274
0150115	EX11M16X1.5	274
0150122	EX11M18X1.0	274
0150139	EX11M18X1.5	274
0150146	EX11M20X1.0	274
0150153	EX11M20X1.5	274
0150160	EX11M22X1.5	274
0150177	EX11M24X1.5	274
0150184	EX11M24X2.0	274
0150191	EX11M25X1.5	274
0150207	EX11M26X1.5	274
0150214	EX11M27X1.5	274
0150221	EX11M27X2.0	274
0150238	EX11M28X1.5	274
0150245	EX11M30X1.5	274
0150252	EX11M30X2.0	274
0150269	EX204-40	269
0150276	EX205-40	269
0150283	EX206-32	269
0150290	EX208-32	269
0150306	EX2010-24	269
0150313	EX2012-24	269
0150320	EX201/4	269
0150337	EX205/16	269
0150344	EX203/8	269
0150351	EX207/16	269
0150368	EX201/2	269
0150375	EX205/8	269
0150382	EX203/4	269
0150399	EX207/8	269
0150405	EX201	269
0150412	EX214-40	269
0150429	EX215-40	269
0150436	EX216-32	269
0150443	EX218-32	269
0150450	EX2110-24	269
0150467	EX2112-24	269
0150474	EX211/4	269
0150627	EX215/16	269
0150658	G1428.3	484
0150719	E500M20NO2	292
0150740	E513M25X1.5NO7	294
0150757	E5473/4NO2	340
0151945	EX213/8	269
0152119	E500M9NO2	292
0152225	E500M33NO2	292
0152232	E500M39NO2	292
0152249	E500M42NO2	292
0152256	E500M45NO2	292
0152263	E500M48NO2	292
0152447	E501M24NO2	300
0152454	E513M4X.5NO2	294
0152461	E513M6X.75NO2	294
0152478	E513M8X.75NO2	294
0152485	E513M8X1.0NO2	294
0152492	E513M10X1.0NO2	294
0152508	E513M10X1.25NO2	294
0152515	E513M12X1.0NO2	294
0152522	E513M12X1.25NO2	294
0152539	E513M14X1.0NO2	294
0152546	E513M14X1.25NO2	294
0152553	E513M14X1.5NO2	294
0152560	E513M16X1.0NO2	294
0152577	E513M16X1.5NO2	294
0152584	E513M18X1.5NO2	294
0152591	E513M20X1.5NO2	294
0152607	E513M22X1.5NO2	294
0152614	E513M24X1.5NO2	294
0152621	E513M25X1.5NO2	294
0152638	E513M36X2.0NO2	294
0152645	E513M39X3.0NO2	294
0152980	E500M14NO1	292
0153246	E500M10NO1	292
0154298	E500M48NO1	292
0154304	E500M45NO1	292
0154311	E500M42NO1	292
0154328	E500M39NO1	292
0154335	E500M36NO1	292
0154342	E500M33NO1	292
0154359	E500M30NO1	292
0154366	E500M27NO1	292
0154380	E500M24NO7	292
0154397	E500M24NO6	292
0154403	E500M24NO1	292
0154427	E500M22NO6	292
0154434	E500M22NO1	292
0154441	E500M20NO7	292
0154458	E500M20NO6	292
0154465	E500M20NO1	292
0154489	E500M18NO6	292
0154496	E500M18NO1	292
0154502	E500M16NO7	292
0154519	E500M16NO6	292
0154526	E500M16NO1	292
0154533	E500M14NO7	292
0154540	E500M14NO6	292
0154557	E500M12NO7	292
0154564	E500M12NO1	292
0154588	E500M11NO6	292
0154595	E500M11NO1	292
0154601	E500M10NO7	292
0154618	E500M10NO6	292
0154632	E500M9NO6	292
0154649	E500M9NO1	292
0154656	E500M8NO7	292
0154663	E500M8NO1	292
0154687	E500M7NO1	292
0154694	E500M6NO7	292
0154700	E500M6NO6	292
0154717	E500M5NO7	292
0154724	E500M5NO6	292
0154731	E500M5NO1	292
0154755	E500M4.5NO6	292
0154762	E500M4.5NO1	292
0154779	E500M4NO7	292
0154786	E500M4NO1	292
0154809	E500M3.5NO6	292
0154816	E500M3NO7	292
0154823	E500M3NO1	292
0154847	E500M2.5NO6	292
0154854	E500M2.5NO1	292
0154885	E500M2.3NO1	292
154908	E500M2.2NO6	292
0154915	E500M2.2NO1	292
0154939	E500M2NO6	292
0154960	E500M1.8NO1	292
0154977	E500M1.7NO8	292
0154991	E500M1.7NO6	292
0155004	E500M1.7NO1	292
0155028	E500M1.6NO6	292
0155035	E500M1.6NO1	292
0155431	E513M22X1.5NO7	294
0155448	E513M22X1.0NO7	294
0155455	E513M20X2.0NO7	294
0155462	E513M20X1.5NO7	294
0155479	E513M18X1.5NO7	294
0155486	E513M14X1.5NO7	294
0155493	E513M14X1.25NO7	294
0155509	E513M14X1.0NO7	294
0155516	E513M12X1.5NO7	294
0155523	E513M12X1.0NO7	294
0155530	E513M10X1.25NO7	294
0155547	E513M10X1.0NO7	294
0155554	E513M8X1.0NO7	294
0155561	E513M4X.5NO7	294
0155578	E513M32X1.5NO2	294
0155660	E513M50X1.5NO2	294
0155677	E513M45X1.5NO2	294
0155684	E513M42X1.5NO2	294
0155691	E513M40X1.5NO2	294
0155721	E513M30X2.0NO2	294
0155738	E513M27X1.5NO2	294
0155745	E513M24X2.0NO7	294
0155752	E513M9X1.0NO2	294
0156728	E513M5X.5NO1	294
0156735	E500M2.6NO1	292
0156742	E500M2.6NO2	292
0156766	E513M4X.5NO1	294
0156773	E513M5X.75NO2	294
0156780	E513M6X.5NO1	294
0156797	E513M6X.5NO2	294
0156803	E513M6X.75NO1	294
0156810	E513M14X1.0NO1	294
0156827	E513M14X1.25NO1	294
0156834	E513M14X1.25NO6	294
0156841	E513M14X1.5NO1	294
0156858	E513M14X1.5NO6	294
0156865	E513M16X1.0NO1	294
0156872	E513M16X1.5NO1	294
0156889	E513M16X1.5NO6	294
0156896	E513M18X1.0NO1	294
0156902	E513M18X1.5NO1	294
0156919	E513M18X1.5NO6	294
0156926	E513M18X2.0NO1	294
0156933	E513M20X1.0NO1	294
0156940	E513M20X1.5NO1	294
0156957	E513M20X1.5NO6	294
0156964	E513M20X2.0NO1	294
0156971	E513M22X1.5NO1	294
0156988	E513M22X2.0NO1	294
0156995	E513M24X1.5NO1	294
0157008	E513M24X2.0NO1	294
0157015	E513M25X1.5NO1	294
0157022	E513M25X1.5NO6	294
0157039	E513M32X1.5NO1	294
0157046	E513M5X.75NO1	294
0157053	E513M8X.75NO1	294
0157060	E513M8X1.0NO1	294
0157077	E513M10X1.0NO1	294
0157084	E513M10X1.0NO6	294
0157091	E513M10X1.25NO1	294
0157107	E513M10X1.25NO6	294
0157114	E513M12X1.0NO1	294
0157121	E513M12X1.25NO1	294
0157138	E513M12X1.25NO6	294
0157145	E513M12X1.5NO1	294
0157152	E513M12X1.5NO6	294
0157169	E5471/8NO1	340
0157176	E5471/8NO2	340
0157183	E5471/8NO7	340

EDP NUMBER INDEX - 0157190 - 0179826

EDP#	E-Code	Page #
0157190	E5471/4NO1	340
0157206	E5471/4NO2	340
0157213	E5471/4NO7	340
0157220	E5473/8NO1	340
0157237	E5473/8NO2	340
0157244	E5473/8NO7	340
0157251	E5471/2NO1	340
0157268	E5471/2NO2	340
0157275	E5471/2NO7	340
0157282	E5475/8NO1	340
0157299	E5473/4NO1	340
0157305	E5477/8NO1	340
0157312	E5471NO1	340
0157329	E5471NO2	340
0157336	E5471.1/4NO1	340
0157343	E5471.1/2NO1	340
0157367	E5472NO1	340
0157374	E5472NO2	340
0159408	E5501/8NO7	339
0159422	E5501/4NO7	339
0159446	E5503/8NO7	339
0159460	E5501/2NO7	339
0159484	E5503/4NO7	339
0159491	E7101/16NO3	327
0159507	EX217/16	269
0159514	EX211/2	269
0159552	EX215/8	269
0159576	EX213/4	269
0159590	EX217/8	269
0159644	E513M9X1.0NO1	294
0159651	E513M11X1.0NO1	294
0159828	E501M3NO1	300
0159835	E501M4NO1	300
0159859	E501M6NO1	300
0159866	E501M8NO1	300
0159873	E501M10NO1	300
0159880	E501M12NO1	300
0159897	E501M14NO1	300
0159903	E501M16NO1	300
0159910	E501M20NO1	300
0159927	E500M3X.6NO1	292
0159934	E500M3X.6NO2	292
0159941	E500M3X.6NO3	292
0159958	E500M5X.9NO1	292
0159965	E500M5X.9NO2	292
0159972	E500M5X.9NO3	292
0159989	E500M5X.9NO6	292
0159996	E500M5.5X.9NO1	292
0160008	E500M5.5X.9NO2	292
0160015	E500M5.5X.9NO3	292
0160039	E513M3X.35NO1	294
0160046	E513M3X.35NO2	294
0160053	E513M7X.75NO1	294
0160060	E513M8X.5NO1	294
0160077	E513M8X.5NO2	294
0160084	E513M10X.75NO1	294
0160091	E513M10X.75NO2	294
0160107	E513M11X.75NO1	294
0160114	E513M11X.75NO2	294
0160152	E500M1NO1	292
0160169	E500M1NO2	292
0160176	E500M1.2NO1	292
0160183	E500M1.2NO2	292
0160190	E500M1.4NO1	292
0160206	E500M1.4NO2	292
0160213	E500M4X.75NO1	292
0160220	E500M4X.75NO2	292
0160237	E500M4X.75NO3	292
0160244	E500M2X.45NO1	292
0160251	E500M2X.45NO2	292
0160268	E500M2X.45NO3	292
0160763	E5473/4NO7	340
0161463	E7211/8	327
0161470	E7211/4	327
0161487	E7213/8	327
0161494	E7211/2	327
0161500	E7213/4	327
0161517	E7211	327
0164747	F201M3	364
0164754	F201M18	364
0164761	F201M20	364
0165607	E201M3	265
0167861	E650M3	347
0168059	G1424.8	484
0168066	G1425.0	484
0168073	G1426.0	484
0168080	G1427.0	484
0168097	G1427.3	484
0168103	G1428.0	484
0168110	G14210.0	484
0168127	G14211.5	484
0168134	G14215.0	484
0168141	G14219.0	484
0168158	G14223.0	484
0168318	EX211	269
0168325	EX308-36	269
0168332	EX3010-32	269
0168349	EX301/4	269
0168356	EX305/16	269
0168363	EX303/8	269
0168370	EX307/16	269
0168387	EX301/2	269
0168394	EX305/8	269
0168400	EX303/4	269
0168417	EX307/8	269
0168424	EX301	269
0168431	EX318-36	269
0168448	EX3110-32	269
0168455	EX311/4	269
0168462	EX315/16	269
0168479	EX313/8	269
0168486	EX317/16	269
0168493	EX311/2	269
0168509	EX315/8	269
0168516	EX313/4	269
0168523	EX317/8	269
0168530	EX311	269
0168547	EX401/8	285
0168554	EX401/4	285
0168561	EX403/8	285
0168578	EX401/2	285
0168585	EX405/8	285
0168592	EX403/4	285
0168608	EX407/8	285
0168615	EX401	285
0168622	EX401.1/8	285
0168639	EX401.1/4	285
0168646	EX401.1/2	285
0168653	EX411/8	285
0168660	EX411/4	285
0168677	EX413/8	285
0168684	EX411/2	285
0168691	EX415/8	285
0168707	EX413/4	285
0168714	EX417/8	285
0168721	EX411	285
0168738	EX411.1/8	285
0168745	EX411.1/4	285
0168752	EX411.1/2	285
0168769	E000M1.6	261
0168776	E000M2	261
0168783	E000M2.5	261
0168790	E001M1.6	261
0168806	E001M2	261
0168813	E001M2.5	261
0168820	E002M2	275
0168837	E002M2.5	275
0168844	E003M2	275
0168851	E003M2.5	275
0168974	A5101/8	60
0168981	A5109/64	60
0168998	A5105/32	60
0169001	A51011/64	60
0169018	A5103/16	60
0169025	A51013/64	60
0169032	A5107/32	60
0169049	A51015/64	60
0169056	A5101/4	60
0169063	A51017/64	60
0169070	A5109/32	60
0169087	A51019/64	60
0169094	A5105/16	60
0169100	A51021/64	60
0169117	A51011/32	60
0169124	A51023/64	60
0169131	A5103/8	60
0169148	A51025/64	60
0169155	A51013/32	60
0169162	A51027/64	60
0169179	A5107/16	60
0169186	A51029/64	60
0169193	A51015/32	60
0169209	A51031/64	60
0169216	A5101/2	60
0171264	A5201/8	53
0171271	A5209/64	53
0171288	A5205/32	53
0171295	A52011/64	53
0171301	A5203/16	53
0171318	A52013/64	53
0171325	A5207/32	53
0171332	A52015/64	53
0171349	A5201/4	53
0171356	A52017/64	53
0171363	A5209/32	53
0171370	A52019/64	53
0171387	A5205/16	53
0171394	A52021/64	53
0171400	A52011/32	53
0171417	A52023/64	53
0171424	A5203/8	53
0171431	A52025/64	53
0171448	A52013/32	53
0171455	A52027/64	53
0171462	A5207/16	53
0171479	A52029/64	53
0171486	A52015/32	53
0171493	A52031/64	53
0171509	A5201/2	53
0172728	A1701.1/32	176
0172735	A1701.1/16	176
0172759	A1701.1/8	176
0172766	A1701.5/32	176
0172773	A1701.3/16	176
0172780	A1701.7/32	176
0172797	A1701.1/4	176
0172803	A1701.5/16	176
0172810	A1701.3/8	176
0172827	A1701.7/16	176
0172834	A1701.1/2	176
0172988	A225BS1	197
0172995	A225BS2	197
0173008	A225BS3	197
0173015	A225BS4	197
0173022	A225BS5	197
0173039	A225BS5A	197
0173046	A225BS6	197
0173053	A225BS7	197
0173657	A1251/16X125	149
0173664	A1251/16X160	149
0173671	A1255/64X125	149
0173688	A1255/64X160	149
0173695	A1253/32X125	149
0173701	A1253/32X160	149
0173718	A1257/64X125	149
0173725	A1257/64X160	149
0173732	A1251/8X160	149
0173749	A1251/8X200	149
0173756	A1251/8X250	149
0173763	A1251/8X315	149
0173770	A1259/64X160	149
0173787	A1259/64X200	149
0173794	A1255/32X160	149
0173800	A1255/32X200	149
0173817	A1255/32X250	149
0173824	A1255/32X315	149
0173831	A12511/64X160	149
0173848	A12511/64X200	149
0173855	A1253/16X160	149
0173862	A1253/16X200	149
0173879	A1253/16X250	149
0173886	A1253/16X315	149
0173893	A1253/16X400	149
0173909	A12513/64X200	149
0173916	A12513/64X250	149
0173923	A12513/64X315	149
0173930	A1257/32X200	149
0173947	A1257/32X250	149
0173954	A1257/32X315	149
0173961	A12515/64X200	149
0173978	A12515/64X250	149
0173985	A1251/4X200	149
0173992	A1251/4X250	149
0174005	A1251/4X315	149
0174012	A1251/4X400	149
0174029	A1251/4X500	149
0174036	A12517/64X200	149
0174043	A12517/64X250	149
0174050	A1259/32X200	149
0174067	A1259/32X250	149
0174074	A1259/32X315	149
0174081	A1255/16X200	149
0174098	A1255/16X250	149
0174104	A1255/16X315	149
0174111	A1255/16X400	149
0174128	A1255/16X500	149
0174135	A12521/64X315	149
0174142	A12511/32X250	149
0174159	A12511/32X315	149
0174166	A12511/32X400	149
0174180	A12523/64X315	149
0174197	A1253/8X250	149
0174203	A1253/8X315	149
0174210	A1253/8X400	149
0174227	A1253/8X500	149
0174234	A12513/32X250	149
0174241	A12513/32X315	149
0174265	A1257/16X250	149
0174272	A1257/16X315	149
0174289	A1257/16X400	149
0174296	A12515/32X250	149
0174302	A12515/32X315	149
0174319	A1251/2X250	149
0174326	A1251/2X315	149
0174333	A1251/2X400	149
0174340	A1251/2X500	149
0179413	A1903	205
0179437	A19012	205
0179451	A19018	205
0179468	A19020	205
0179482	A190209	205
0179499	A19161-80	205
0179598	B1001/16	468
0179604	B1005/64	468
0179611	B1003/32	468
0179628	B1007/64	468
0179635	B1001/8	468
0179642	B1009/64	468
0179659	B1005/32	468
0179666	B10011/64	468
0179673	B1003/16	468
0179680	B10013/64	468
0179697	B1007/32	468
0179703	B10015/64	468
0179710	B1001/4	468
0179727	B10017/64	468
0179734	B1009/32	468
0179741	B10019/64	468
0179758	B1005/16	468
0179765	B10021/64	468
0179772	B10011/32	468
0179789	B10023/64	468
0179796	B1003/8	468
0179802	B10025/64	468
0179819	B10013/32	468
0179826	B1007/16	468

EDP NUMBER INDEX - 0179840 - 0212547

EDP#	E-Code	Page #
0179840	B1001/2	468
0179857	B10017/32	468
0179864	B1009/16	468
0179871	B10019/32	468
0179888	B1005/8	468
0179895	B10011/16	468
0179901	B1003/4	468
0179925	B10013/16	468
0179949	B1007/8	468
0179970	B1001	468
0179987	B1001.5	468
0179994	B1001.6	468
0180006	B10010.5	468
0180013	B10011.5	468
0180020	B10012.5	468
0180037	B10013.5	468
0180044	B10014.5	468
0180051	B10021.0	468
0180068	B10023.0	468
0180075	B10027.0	468
0180082	B10029.0	468
0180099	B10031.0	468
0180105	B10033.0	468
0180112	B10037.0	468
0180129	B10039.0	468
0180808	B9011.5	451
0180815	B9011/16	451
0180822	B9012.0	451
0180839	B9013/32	451
0180846	B9012.5	451
0180853	B9013.0	451
0180860	B9011/8	451
0180877	B9013.5	451
0180884	B9019/64	451
0180891	B9015/32	451
0180907	B9014.0	451
0180921	B9014.5	451
0180938	B9013/16	451
0180945	B9015.0	451
0180952	B90113/64	451
0180969	B9015.5	451
0180976	B9017/32	451
0180983	B90115/64	451
0180990	B9016.0	451
0181003	B9011/4	451
0181010	B9017.0	451
0181027	B9019/32	451
0181034	B9015/16	451
0181041	B9018.0	451
0181058	B90111/32	451
0181065	B9019.0	451
0181072	B9013/8	451
0181089	B90110.0	451
0181102	B90111.0	451
0181119	B9017/16	451
0181126	B90112.0	451
0181133	B9011/2	451
0181140	B1011/8	457
0181157	B1015/32	457
0181164	B1013/16	457
0181188	B1011/4	457
0181201	B1015/16	457
0181225	B1013/8	457
0181232	B10113/32	457
0181249	B1017/16	457
0181256	B10115/32	457
0181263	B1011/2	457
0181287	B1019/16	457
0181300	B1015/8	457
0181348	B1013/4	457
0181362	B10113/16	457
0181386	B1017/8	457
0181423	B1011	457
0181447	B1011.1/8	457
0181461	B1011.1/4	457
0181485	B1011.3/8	457
0181508	B1011.1/2	457
0181522	B1011.3/4	457
0181546	B1012	457
0181560	B1013.0	457
0181577	B1013.5	457
0181584	B1014.0	457
0181591	B1014.5	457
0181607	B1015.0	457
0181614	B1015.5	457
0181621	B1016.0	457
0181638	B1016.5	457
0181645	B1017.0	457
0181669	B1018.0	457
0181676	B1018.5	457
0181683	B1019.0	457
0181690	B1019.5	457
0181706	B10110.0	457
0181713	B10110.5	457
0181720	B10111.0	457
0181744	B10112.0	457
0181751	B10112.5	457
0181768	B10113.0	457
0181775	B10113.5	457
0181782	B10114.0	457
0181799	B10114.5	457
0181805	B10115.0	457
0181812	B10115.5	457
0181829	B10116.0	457
0181836	B10116.5	457
0181843	B10117.0	457
0181850	B10118.0	457
0181867	B10119.0	457
0181874	B10120.0	457
0181881	B10121.0	457
0181898	B10122.0	457
0181904	B10123.0	457
0181911	B10124.0	457
0181928	B10125.0	457
0181935	B10126.0	457
0181942	B10127.0	457
0181959	B10128.0	457
0181966	B10129.0	457
0181973	B10130.0	457
0181980	B10131.0	457
0181997	B10132.0	457
0182017	B10134.0	457
0182024	B10135.0	457
0182031	B10136.0	457
0182048	B10137.0	457
0182055	B10138.0	457
0182062	B10139.0	457
0182079	B10140.0	457
0182086	B10141.0	457
0182093	B10142.0	457
0182109	B10143.0	457
0182116	B10144.0	457
0182123	B10145.0	457
0182130	B10146.0	457
0182147	B10147.0	457
0182154	B10148.0	457
0182178	B10150.0	457
0182277	B3011/16	470
0182284	B3015/64	470
0182291	B3013/32	470
0182307	B3017/64	470
0182314	B3011/8	470
0182321	B3019/64	470
0182338	B3015/32	470
0182345	B30111/64	470
0182352	B3013/16	470
0182369	B3017/32	470
0182376	B3011/4	470
0182383	B3019/32	470
0182390	B3015/16	470
0182406	B30111/32	470
0182413	B3013/8	470
0182420	B30113/32	470
0182437	B3017/16	470
0182444	B3011/2	470
0206331	F312M8X.75	368
0206348	F312M8X1.0	368
0206379	F312M10X1.0	368
0206386	F312M10X1.25	368
0206393	F312M12X1.0	368
0206409	F312M12X1.25	368
0206416	F312M12X1.5	368
0206430	F312M14X1.5	368
0206454	F312M16X1.5	368
0206461	F312M18X1.5	368
0206485	F312M20X1.5	368
0206508	F312M22X1.5	368
0206522	F312M24X1.5	368
0206539	F312M24X2.0	368
0206614	F3204-40X13/16	360
0206621	F3205-40X13/16	360
0206645	F3206-32X13/16	360
0206669	F3208-32X13/16	360
0206676	F3208-32X1	360
0206683	F32010-24X13/16	360
0206690	F32010-24X1	360
0206706	F32012-24X13/16	360
0206720	F3201/4X13/16	360
0206737	F3201/4X1	360
0206744	F3201/4X1.5/16	360
0206751	F3201/4X1.1/2	360
0206768	F3205/16X1	360
0206782	F3205/16X1.1/2	360
0206799	F3203/8X1	360
0206805	F3203/8X1.5/16	360
0206812	F3203/8X1.1/2	360
0206843	F3207/16X1.5/16	360
0206850	F3207/16X1.1/2	360
0206867	F3201/2X1.5/16	360
0206874	F3201/2X1.1/2	360
0206881	F3201/2X2	360
0206904	F3209/16X1.1/2	360
0206928	F3205/8X1.1/2	360
0206935	F3205/8X2	360
0206959	F3203/4X1.1/2	360
0206966	F3203/4X2	360
0206973	F3207/8X2	360
0206980	F3201X2	360
0206997	F3201.1/8X3	360
0207000	F3201.1/4X3	360
0207307	F3304-48X13/16	360
0207314	F3305-44X13/16	360
0207338	F3306-40X13/16	360
0207352	F3308-36X13/16	360
0207376	F33010-32X13/16	360
0207383	F33010-32X1	360
0207390	F33012-28X13/16	360
0207413	F3301/4X13/16	360
0207420	F3301/4X1	360
0207444	F3301/4X1.1/2	360
0207451	F3305/16X1	360
0207468	F3305/16X1.5/16	360
0207475	F3305/16X1.1/2	360
0207482	F3303/8X1	360
0207499	F3303/8X1.5/16	360
0207505	F3303/8X1.1/2	360
0207512	F3307/16X1	360
0207529	F3307/16X1.5/16	360
0207536	F3307/16X1.1/2	360
0207543	F3301/2X1.5/16	360
0207550	F3301/2X1.1/2	360
0207574	F3309/16X1.5/16	360
0207581	F3309/16X1.1/2	360
0207604	F3305/8X1.1/2	360
0207611	F3305/8X2	360
0207635	F3303/4X1.1/2	360
0207642	F3303/4X2	360
0207659	F3307/8X2	360
0207666	F3301X2	360
0207673	F3301.1/8X3	360
0207680	F3301.1/4X3	360
0207703	F3301.1/2X3	360
0209325	F3701/8X1	363
0209332	F3701/4X1.5/16	363
0209349	F3703/8X1.1/2	363
0209356	F3701/2X2	363
0209363	F3705/8X2	363
0209370	F3703/4X2	363
0209387	F3707/8X2.1/4	363
0209394	F3701X2.1/4	363
0209400	F3701.1/4X3	363
0209417	F3701.1/2X4	363
0210314	E7101/8NO7	327
0210321	E7101/4NO7	327
0210338	E7103/8NO7	327
0210345	E7101/2NO7	327
0210352	E7103/4NO7	327
0210666	R5201/8	38
0210673	R5209/64	38
0210680	R5205/32	38
0210697	R52011/64	38
0210703	R5203/16	38
0210710	R52013/64	38
0210727	R5207/32	38
0210734	R52015/64	38
0210741	R5201/4	38
0210758	R52017/64	38
0210765	R5209/32	38
0210789	R5205/16	38
0210802	R52011/32	38
0210819	R52023/64	38
0210826	R5203/8	38
0210840	R52013/32	38
0210857	R52027/64	38
0210864	R5207/16	38
0210871	R52029/64	38
0210888	R52015/32	38
0210895	R52031/64	38
0210901	R5201/2	38
0210918	R5209/16	38
0210925	R5205/8	38
0211427	A9203/64	56
0211434	A9201.25	56
0211441	A920N55	56
0211458	A9201.35	56
0211465	A9201.45	56
0211489	A9201.55	56
0211502	A9201.75	56
0211571	A9202.15	56
0211601	A9202.35	56
0211625	A920N41	56
0211670	A9202.65	56
0211717	A920N33	56
0211755	A920N29	56
0211830	A920N19	56
0211960	A920N3	56
0212103	A920N	56
0212196	A920Y	56
0212219	A92010.75	56
0212226	A92011.25	56
0212233	A92012.75	56
0212257	A92033/64	56
0212264	A92035/64	56
0212271	A9209/16	56
0212288	A92037/64	56
0212295	A92014.75	56
0212301	A92019/32	56
0212318	A92039/64	56
0212325	A9205/8	56
0212332	A92041/64	56
0212349	A92016.5	56
0212356	A92021/32	56
0212363	A92016.75	56
0212370	A92043/64	56
0212387	A92011/16	56
0212394	A92045/64	56
0212400	A92023/32	56
0212417	A92018.5	56
0212424	A92047/64	56
0212431	A9203/4	56
0212448	A92049/64	56
0212455	A92019.5	56
0212462	A92025/32	56
0212509	A9212.7	56
0212523	A9217/64	56
0212547	A921N34	56

EDP NUMBER INDEX - 0212554 - 0348512

EDP#	E-Code	Page #
0212554	A921N33	56
0212561	A9212.9	56
0212578	A921N32	56
0212585	A921N31	56
0212592	A9211/8	56
0212622	A9219/64	56
0212677	A9215/32	56
0214398	A1259/64X315	149
0214404	A12511/64X315	149
0214442	A12515/64X315	149
0214466	A12517/64X500	149
0214473	A1259/32X500	149
0214480	A12519/64X315	149
0214497	A12519/64X500	149
0214503	A12521/64X500	149
0214510	A12511/32X500	149
0214527	A12523/64X500	149
0214534	A12525/64X315	149
0214541	A12525/64X500	149
0214558	A12513/32X500	149
0214565	A12527/64X315	149
0214589	A1257/16X500	149
0214596	A12529/64X315	149
0214602	A12529/64X500	149
0214619	A12515/32X500	149
0214626	A12531/64X315	149
0214633	A12531/64X500	149
0214640	A12533/64X315	149
0214657	A12533/64X500	149
0214664	A12517/32X315	149
0214671	A12517/32X500	149
0214688	A12535/64X315	149
0214695	A12535/64X500	149
0214701	A1259/16X315	149
0214718	A1259/16X500	149
0214725	A12537/64X315	149
0214749	A12519/32X315	149
0214756	A12519/32X500	149
0214763	A12539/64X315	149
0214770	A12539/64X500	149
0214787	A1255/8X315	149
0214794	A1255/8X500	149
0214800	A12521/32X315	149
0214817	A12521/32X500	149
0214824	A12511/16X315	149
0214831	A12511/16X500	149
0214848	A12523/32X315	149
0214855	A12523/32X500	149
0214862	A1253/4X315	149
0214879	A1253/4X500	149
0214886	A12525/32X500	149
0214893	A12513/16X500	149
0214909	A1257/8X500	149
0214916	A12515/16X500	149
0214923	A1251X500	149
0216781	R5103.7	44
0216798	R5104.6	44
0216804	R5104.7	44
0216811	R5105.6	44
0216828	R5105.7	44
0216835	R5109.4	44
0216842	R51010.3	44
0216859	R51011.2	44
0216866	R5208.7	38
0216873	R5209.4	38
0216880	R52010.3	38
0216897	R52011.2	38
0216903	R52013.5	38
0216910	R52014.2	38
0216927	R52014.25	38
0216934	R52015.1	38
0217887	G2361	491
0218013	L11013/16	370
0218020	L1101INCH	370
0218037	L1101.5/16	370
0218044	L1101.1/2	370
0218051	L1102INCH	370
0218068	L1102.1/4	370
0218075	L1103INCH	370
0218082	L1104INCH	370
0234013	A245N10	123
0234099	A245N18	123
0234105	A245N19	123
0234136	A245N21	123
0234150	A245N23	123
0234167	A245N24	123
0234181	A245N26	123
0234198	A245N27	123
0234211	A245N29	123
0234242	A245N31	123
0234341	A245N40	123
0234594	A245N9	123
0235003	A24525/64	123
0235041	A24529/64	123
0235140	A2453/8	123
0235379	A2459/32	123
0238202	A1701.11/64	176
0238240	A1701.15/64	176
0238288	A1701.7/64	176
0238301	A1701.9/64	176
0239216	A217N1	197
0239223	A217N2	197
0239230	A217N3	197
0239247	A217N4	197
0239254	A217N5	197
0239261	A217N6	197
0239278	A217N7	197
0239285	A217N8	197
0239292	A218N1	197
0239308	A218N2	197
0239315	A218N3	197
0239322	A218N4	197
0239339	A218N5	197
0239346	A218N6	197
0239353	A218N7	197
0239360	A218N8	197
0240410	A2431/4X6	156
0240434	A2431/8X6	156
0240441	A2433/16X6	156
0240458	A2433/32X6	156
0240465	A2435/32X6	156
0240816	A243N10X6	156
0240823	A243N11X6	156
0240922	A243N20X6	156
0240939	A243N21X6	156
0241035	A243N30X6	156
0241141	A243N40X6	156
0241844	A221N0	198
0241851	A221N00	198
0241868	A221N1	198
0241875	A221N2	198
0241882	A221N3	198
0241899	A221N4	198
0241905	A221N5	198
0241912	A221N6	198
0241929	A221N7	198
0241936	A221N8	198
0252345	B1221	453
0252352	B1221.1/16	453
0252369	B12211/16	453
0252376	B1221/2	453
0252383	B12213/16	453
0252390	B12215/16	453
0252406	B1223/4	453
0252413	B1225/8	453
0252420	B1227/8	453
0252437	B1229/16	453
0259696	E0611.1/2NO6	297
0259702	E0611.1/4NO6	297
0259719	E0611.1/8NO6	297
259818	E0711.1/2NO6	297
259832	E0711.1/8NO6	297
0273197	E65110-24	346
0273203	E6511/2	346
0273210	E65112-24	346
0273227	E6511/4	346
0273234	E6513/8	346
0273241	E6515/16	346
0273258	E6515/8	346
0273265	E6517/16	346
0273272	E6518-32	346
0273289	E6519/16	346
0279717	A9762.3X135	71
0279724	A9762.1X125	71
0279731	A9762.4X140	71
0279748	A9762.6X140	71
0279755	A9762.7X150	71
0279762	A9762.8X150	71
0279779	A9762.9X150	71
0279786	A9763.1X155	71
0279793	A9763.2X155	71
0279809	A9763.4X165	71
0279816	A9763.6X165	71
0279823	A9763.8X175	71
0279830	A9763.9X175	71
0279847	A9764.1X175	71
0279854	A9764.2X175	71
0279861	A9764.3X185	71
0279878	A9764.4X185	71
0279885	A9764.6X185	71
0279892	A9764.7X185	71
0279908	A9764.8X195	71
0279915	A9764.9X195	71
0279922	A9765.1X195	71
0279939	A9765.2X195	71
0279946	A9765.3X195	71
0279953	A9765.4X205	71
0279960	A9765.6X205	71
0279977	A9765.7X205	71
0279984	A9765.8X205	71
0279991	A9765.9X205	71
0280003	A9766.1X215	71
0280010	A9766.2X215	71
0280027	A9766.3X215	71
0280034	A9766.4X215	71
0280041	A9766.6X215	71
0280058	A9766.7X215	71
0280065	A9766.8X225	71
0280072	A9766.9X225	71
0286012	A92111/64	56
0297247	E6531	348
0297261	E6531/2	348
0297278	E6531/4	348
0297285	E6531/8	348
0297292	E6533/4	348
0297308	E6533/8	348
0308523	A28718	209
0335635	A9213/16	56
0338971	E65410-32	346
0338988	E6541/2	346
0338995	E65412-28	346
0339008	E6541/4	346
0339015	E6543/8	346
0339022	E6545/16	346
0339039	E6545/8	346
0339046	E6547/16	346
0339053	E6548-36	346
0340684	E5475/8NO7	340
0343111	E513M3.5X.35NO3	294
0343128	E513M9X.75NO3	294
0343135	E513M10X.5NO3	294
0343142	E513M11X1.25NO3	294
0343166	E513M12X.75NO3	294
0343173	E513M13X1.5NO3	294
0343203	E513M16X1.25NO3	294
0343302	E513M36X1.5NO3	294
0343319	E513M42X3.0NO3	294
0343333	E513M48X1.5NO3	294
0343340	E513M48X2.0NO3	294
0343357	E513M48X3.0NO3	294
0344750	G2362	491
0345245	R5103.9	44
0345252	R5106.6	44
0345269	R5107.8	44
0345276	R5107.9	44
0345283	R5108.8	44
0345290	R5109.9	44
0345306	R51010.8	44
0346402	R5206.6	38
0346419	R5206.7	38
0346426	R5207.1	38
0346433	R5207.2	38
0346440	R5207.6	38
0346457	R5207.7	38
0346464	R5207.9	38
0346471	R5208.1	38
0346488	R5208.2	38
0346495	R5208.3	38
0346501	R5208.4	38
0346518	R5208.6	38
0346525	R5208.8	38
0346532	R5208.9	38
0346549	R5209.1	38
0346556	R5209.6	38
0346563	R5209.7	38
0346570	R5209.8	38
0346587	R5209.9	38
0346778	R52010.1	38
0347072	A9761/8	71
0347089	A9765/32	71
0347096	A9761/4	71
0347102	A9765/16	71
0347119	A97611/32	71
0347126	A9763/8	71
0347133	A97610.5	71
0347140	A97611.0	71
0347157	A97611.5	71
0347164	A97612.0	71
0347171	A97612.5	71
0347188	A9761/2	71
0347195	A97613.0	71
0347201	A97614.0	71
0347218	A9771/8	71
0347225	A9773/16	71
0347232	A9771/4	71
0347249	A97711/32	71
0347256	A97710.5	71
0347263	A97711.0	71
0347270	A97711.5	71
0347287	A97712.0	71
0347294	A97712.5	71
0347300	A97713.0	71
0347317	A97714.0	71
0347324	A9783.0	71
0347331	A9781/4	71
0347362	A9761.5	71
0347379	A9767/16	71
0347386	A9771.5	71
0347393	A9771/16	71
0347409	A9772.0	71
0347416	A9773/32	71
0347935	A9763/16	71
0348284	E0618-32NO1	297
0348291	E0616-32NO1	297
0348307	E0616-32NO2	297
0348314	E0616-32NO3	297
0348321	E0616-32NO6	297
0348338	E0618-32NO2	297
0348345	E0618-32NO3	297
0348352	E0618-32NO6	297
0348369	E06110-24NO1	297
0348376	E06110-24NO2	297
0348383	E06110-24NO3	297
0348390	E06110-24NO6	297
0348406	E06112-24NO1	297
0348413	E06112-24NO2	297
0348420	E06112-24NO3	297
0348437	E06112-24NO6	297
0348444	E0611/4NO1	297
0348451	E0611/4NO2	297
0348468	E0611/4NO3	297
0348475	E0611/4NO6	297
0348482	E0615/16NO1	297
0348499	E0615/16NO2	297
0348505	E0615/16NO3	297
0348512	E0615/16NO6	297

EDP NUMBER INDEX - 0348529 - 0354841

EDP#	E-Code	Page #
0348529	E0613/8NO1	297
0348536	E0613/8NO2	297
0348543	E0613/8NO3	297
0348550	E0613/8NO6	297
0348567	E0617/16NO1	297
0348574	E0617/16NO2	297
0348581	E0617/16NO3	297
0348598	E0617/16NO6	297
0348604	E0611/2NO1	297
0348611	E0611/2NO2	297
0348628	E0611/2NO3	297
0348635	E0611/2NO6	297
0348642	E0619/16NO2	297
0348659	E0619/16NO3	297
0348666	E0619/16NO6	297
0348673	E0615/8NO1	297
0348680	E0615/8NO2	297
0348697	E0615/8NO3	297
0348703	E0615/8NO6	297
0348710	E0613/4NO1	297
0348727	E0613/4NO2	297
0348734	E0613/4NO3	297
0348741	E0613/4NO6	297
0348758	E0617/8NO1	297
0348765	E0617/8NO2	297
0348772	E0617/8NO3	297
0348789	E0617/8NO6	297
0348796	E0611NO1	297
0348802	E0611NO2	297
0348819	E0611NO3	297
0348826	E0611NO6	297
0349427	E0716-40NO1	297
0349434	E0716-40NO2	297
0349441	E0716-40NO3	297
0349458	E0716-40NO6	297
0349465	E0718-36NO1	297
0349472	E0718-36NO2	297
0349489	E0718-36NO3	297
0349496	E0718-36NO6	297
0349502	E07110-32NO1	297
0349519	E07110-32NO2	297
0349526	E07110-32NO3	297
0349533	E07110-32NO6	297
0349540	E07112-28NO1	297
0349557	E07112-28NO2	297
0349564	E07112-28NO3	297
0349571	E07112-28NO6	297
0349588	E0711/4NO1	297
0349595	E0711/4NO2	297
0349601	E0711/4NO3	297
0349618	E0711/4NO6	297
0349625	E0715/16NO1	297
0349632	E0715/16NO2	297
0349649	E0715/16NO3	297
0349656	E0715/16NO6	297
0349663	E0713/8NO1	297
0349670	E0713/8NO2	297
0349687	E0713/8NO3	297
0349694	E0713/8NO6	297
0349700	E0717/16NO1	297
0349717	E0717/16NO2	297
0349724	E0717/16NO3	297
0349731	E0717/16NO6	297
0349748	E0711/2NO1	297
0349755	E0711/2NO2	297
0349762	E0711/2NO3	297
0349779	E0711/2NO6	297
0349786	E0719/16NO1	297
0349793	E0719/16NO2	297
0349809	E0719/16NO3	297
0349816	E0719/16NO6	297
0349823	E0715/8NO1	297
0349830	E0715/8NO2	297
0349847	E0715/8NO3	297
0349854	E0715/8NO6	297
0349861	E0713/4NO1	297
0349878	E0713/4NO2	297
0349885	E0713/4NO3	297
0349892	E0717/8NO1	297
0349908	E0717/8NO2	297
0349915	E0717/8NO3	297
0349922	E0717/8NO6	297
0349939	E0711X12NO1	297
0349946	E0711X12NO2	297
0349953	E0711X12NO3	297
0349960	E0711X12NO6	297
0349977	E0711X14NO1	297
0349984	E0711X14NO2	297
0349991	E0711X14NO3	297
0350003	E0711X14NO6	297
0350577	A0023.0	82
0350584	A0023.1	82
0350591	A0021/8	82
0350607	A0023.2	82
0350614	A0023.3	82
0350621	A0023.4	82
0350638	A0023.5	82
0350645	A0029/64	82
0350652	A0023.6	82
0350669	A0023.7	82
0350676	A0023.8	82
0350683	A0023.9	82
0350690	A0025/32	82
0350706	A0024.0	82
0350713	A0024.1	82
0350720	A0024.2	82
0350737	A0024.3	82
0350744	A00211/64	82
0350751	A0024.4	82
0350768	A0024.5	82
0350775	A0024.6	82
0350782	A0024.7	82
0350799	A0023/16	82
0350805	A0024.8	82
0350812	A0024.9	82
0350829	A0025.0	82
0350836	A0025.1	82
0350843	A00213/64	82
0350850	A0025.2	82
0350867	A0025.3	82
0350874	A0025.4	82
0350881	A0025.5	82
0350898	A0027/32	82
0350904	A0025.6	82
0350911	A0025.7	82
0350928	A0025.8	82
0350935	A0025.9	82
0350942	A00215/64	82
0350959	A0026.0	82
0350966	A0026.1	82
0350973	A0026.2	82
0350980	A0026.3	82
0350997	A0021/4	82
0351000	A0026.4	82
0351017	A0026.5	82
0351024	A0026.6	82
0351031	A0026.7	82
0351048	A00217/64	82
0351055	A0026.8	82
0351062	A0026.9	82
0351079	A0027.0	82
0351086	A0027.1	82
0351093	A0029/32	82
0351109	A0027.2	82
0351116	A0027.3	82
0351123	A0027.4	82
0351130	A0027.5	82
0351147	A00219/64	82
0351154	A0027.6	82
0351161	A0027.7	82
0351178	A0027.8	82
0351185	A0027.9	82
0351192	A0025/16	82
0351208	A0028.0	82
0351215	A0028.1	82
0351222	A0028.2	82
0351239	A0028.3	82
0351246	A00221/64	82
0351253	A0028.4	82
0351260	A0028.5	82
0351277	A0028.6	82
0351284	A0028.7	82
0351291	A00211/32	82
0351307	A0028.8	82
0351314	A0028.9	82
0351321	A0029.0	82
0351338	A0029.1	82
0351345	A00223/64	82
0351352	A0029.2	82
0351369	A0029.3	82
0351376	A0029.4	82
0351383	A0029.5	82
0351390	A0023/8	82
0351406	A0029.6	82
0351413	A0029.7	82
0351420	A0029.8	82
0351437	A0029.9	82
0351444	A00225/64	82
0351451	A00210.0	82
0351468	A00210.1	82
0351475	A00210.2	82
0351482	A00210.3	82
0351499	A00213/32	82
0351505	A00210.4	82
0351512	A00210.5	82
0351529	A00210.6	82
0351536	A00210.7	82
0351543	A00227/64	82
0351550	A00210.8	82
0351567	A00210.9	82
0351574	A00211.0	82
0351581	A00211.1	82
0351598	A0027/16	82
0351604	A00211.2	82
0351611	A00211.3	82
0351628	A00211.4	82
0351635	A00211.5	82
0351642	A00229/64	82
0351659	A00211.6	82
0351666	A00211.7	82
0351673	A00211.8	82
0351680	A00211.9	82
0351697	A00215/32	82
0351703	A00212.0	82
0351710	A00212.1	82
0351727	A00212.2	82
0351734	A00212.3	82
0351741	A00231/64	82
0351758	A00212.4	82
0351765	A00212.5	82
0351772	A00212.6	82
0351789	A0021/2	82
0351796	A00212.7	82
0351802	A00212.8	82
0351819	A00212.9	82
0351826	A00213.0	82
0351833	E0619/16NO1	297
0351932	E0713/4NO6	297
0353165	C1101.0	406
0353172	C1101.5	406
0353189	C1101.8	406
0353196	C11010.0	406
0353202	C11010.5	406
0353219	C11011.0	406
0353226	C11012.0	406
0353233	C11013.0	406
0353240	C11014.0	406
0353257	C11015.0	406
0353264	C11016.0	406
0353271	C11017.0	406
0353288	C11018.0	406
0353295	C11019.0	406
0353301	C1102.0	406
0353318	C1102.5	406
0353325	C1102.8	406
0353332	C11020.0	406
0353349	C11022.0	406
0353356	C11025.0	406
0353363	C11028.0	406
0353370	C1103.0	406
0353387	C1103.5	406
0353394	C1103.8	406
0353400	C11030.0	406
0353417	C11032.0	406
0353424	C1104.0	406
0353431	C1104.5	406
0353448	C1104.8	406
0353455	C1105.0	406
0353462	C1105.5	406
0353479	C1105.75	406
0353486	C1106.0	406
0353493	C1106.5	406
0353509	C1107.0	406
0353516	C1107.5	406
0353523	C1108.0	406
0353530	C1108.5	406
0353547	C1109.0	406
0353554	C1109.5	406
0353561	C12310.0	412
0353578	C12311.0	412
0353585	C12312.0	412
0353592	C12313.0	412
0353608	C12314.0	412
0353615	C12315.0	412
0353622	C12316.0	412
0353639	C12318.0	412
0353646	C1232.0	412
0353653	C1232.5	412
0353660	C12320.0	412
0353677	C12322.0	412
0353691	C12325.0	412
0353714	C1233.0	412
0353721	C1233.5	412
0353738	C12330.0	412
0353745	C12332.0	412
0353752	C12336.0	412
0353769	C1234.0	412
0353776	C1234.5	412
0353783	C12340.0	412
0353790	C1235.0	412
0353806	C1235.5	412
0353813	C1236.0	412
0353820	C1236.5	412
0353837	C1237.0	412
0353844	C1237.5	412
0353851	C1238.0	412
0353868	C1238.5	412
0353875	C1239.0	412
0353882	C1239.5	412
0354582	C24710.0	425
0354599	C24711.0	425
0354605	C24712.0	425
0354612	C24713.0	425
0354629	C24714.0	425
0354636	C24715.0	425
0354643	C24716.0	425
0354650	C24718.0	425
0354667	C2472.0	425
0354674	C2472.5	425
0354681	C24720.0	425
0354698	C24722.0	425
0354704	C24725.0	425
0354711	C24728.0	425
0354728	C2473.0	425
0354735	C2473.5	425
0354742	C24730.0	425
0354759	C24732.0	425
0354766	C2474.0	425
0354773	C2474.5	425
0354780	C2475.0	425
0354797	C2475.5	425
0354803	C2476.0	425
0354810	C2476.5	425
0354827	C2477.0	425
0354834	C2477.5	425
0354841	C2478.0	425

EDP NUMBER INDEX - 0354858 - 0419960

EDP#	E-Code	Page #
0354858	C2478.5	425
0354865	C2479.0	425
0354872	C2479.5	425
0354889	C27310.0	427
0354896	C27311.0	427
0354902	C27312.0	427
0354919	C27313.0	427
0354926	C27314.0	427
0354933	C27315.0	427
0354940	C27316.0	427
0354957	C27318.0	427
0354964	C2732.0	427
0354971	C2732.5	427
0354988	C27320.0	427
0354995	C27322.0	427
0355008	C27325.0	427
0355015	C27328.0	427
0355022	C2733.0	427
0355039	C2733.5	427
0355046	C27330.0	427
0355053	C27332.0	427
0355060	C2734.0	427
0355077	C2734.5	427
0355084	C2735.0	427
0355091	C2735.5	427
0355107	C2736.0	427
0355114	C2737.0	427
0355121	C2738.0	427
0355138	C2739.0	427
0372555	G17110.4	486
0372562	G17112.4	486
0372579	G17116.5	486
0372586	G17120.5	486
0372593	G17125.0	486
0372609	G1716.3	486
0372616	G1718.3	486
0375907	A2441/4X6	156
0375914	A2441/8X6	156
0375921	A2443/16X6	156
0375938	A2445/32X6	156
0376041	A0022.0	82
0376058	A0022.1	82
0376065	A0022.5	82
0376072	A0022.6	82
0376089	A0022.7	82
0376096	A0022.8	82
0376102	A0022.9	82
0376119	A0023/32	82
0376126	A0027/64	82
0376782	A0021.0	82
0376799	A0021.1	82
0376805	A0021.2	82
0376812	A0021.3	82
0376829	A0021.4	82
0376836	A0021.5	82
0376843	A0021.6	82
0376850	A0021.7	82
0376867	A0021.8	82
0376874	A0021.9	82
0376881	A0021/16	82
0376898	A0022.2	82
0376904	A0022.3	82
0376911	A0022.4	82
0376928	A0023/64	82
0376935	A0025/64	82
0380802	R5101/8	44
0380833	R51013/32	44
0380840	R51013/64	44
0380857	R51015/32	44
0380864	R51015/64	44
0380888	R51019/64	44
0380901	R51023/64	44
0380918	R51025/64	44
0380925	R51027/64	44
0380932	R51029/64	44
0380949	R5103/16	44
0380956	R51031/64	44
0380963	R5105/16	44
0380970	R5105/32	44
0380987	R5107/16	44
0380994	R5107/32	44
0381007	R5109/32	44
0381014	R5109/64	44
0381021	R5101/2	44
0381038	R5101/4	44
0381045	R5103/8	44
0384497	A00214.0	82
0384824	E620M3	342
0384831	E620M4	342
0384848	E620M5	342
0384855	E620M6	342
0384862	E620M8	342
0384879	E620M10	342
0384886	E620M12	342
0384893	E620M14	342
0384909	E620M16	342
0384916	E621M3	342
0384923	E621M4	342
0384930	E621M5	342
0384947	E621M6	342
0384954	E621M8	342
0384961	E621M10	342
0384978	E621M12	342
0384985	E621M14	342
0384992	E621M16	342
0385180	A00213.1	82
0385197	A00213.3	82
0385203	A00213.6	82
0385210	A00213.7	82
0385227	A00213.8	82
0385234	A00214.25	82
0385241	A00214.5	82
0385258	A00214.75	82
0385265	A00215.0	82
0385272	A00215.25	82
0385289	A00215.5	82
0385296	A00215.75	82
0385302	A00216.0	82
0385319	A00217/32	82
0385326	A00219/32	82
0385333	A00233/64	82
0385340	A00235/64	82
0385357	A00237/64	82
0385364	A00239/64	82
0385371	A0025/8	82
0385388	A0029/16	82
385395	A09518	207
0385418	A095201	207
0385425	A095202	207
0385432	A095203	207
0385449	A095204	207
0385494	A00213.9	82
0385524	A00213.2	82
0385531	A00213.4	82
0385548	A00213.5	82
0385562	A095209	207
0385579	A00213.25	82
0385586	A00213.75	82
0388112	E0611.1/8NO1	297
0388129	E0611.1/8NO2	297
0388136	E0611.1/8NO3	297
0388143	E0611.1/4NO1	297
0388150	E0611.1/4NO2	297
0388167	E0611.1/4NO3	297
0388174	E0611.3/8NO1	297
0388181	E0611.3/8NO2	297
0388198	E0611.3/8NO3	297
0388204	E0611.1/2NO1	297
0388211	E0611.1/2NO2	297
0388228	E0611.1/2NO3	297
0388235	E0711.1/8NO1	297
0388242	E0711.1/8NO2	297
0388259	E0711.1/8NO3	297
0388266	E0711.1/4NO1	297
0388273	E0711.1/4NO2	297
0388280	E0711.1/4NO3	297
0388297	E0711.3/8NO1	297
0388303	E0711.3/8NO2	297
0388310	E0711.3/8NO3	297
0388327	E0711.1/2NO1	297
0388334	E0711.1/2NO2	297
0388341	E0711.1/2NO3	297
0388907	E6516-32	346
0390795	A55310.0	63
0390801	A55310.2	63
0390818	A55310.3	63
0390825	A55310.5	63
0390849	A55311.0	63
0390856	A55311.3	63
0390863	A55311.5	63
0390870	A55312.0	63
0390887	A55312.5	63
0390894	A55313.0	63
0390924	A55313.5	63
0390948	A55314.0	63
0390955	A55314.25	63
0390962	A55314.5	63
0390986	A55315.0	63
0391006	A55315.25	63
0391013	A55315.5	63
0391037	A55316.0	63
0391051	A55316.5	63
0391075	A55317.0	63
0391099	A55317.5	63
0391105	A55317.75	63
0391112	A55318.0	63
0391150	A55319.0	63
0391167	A55319.25	63
0391198	A55320.0	63
0391204	A5535.0	63
0391228	A5535.2	63
0391242	A5535.5	63
0391280	A5536.0	63
0391297	A5536.3	63
0391303	A5536.5	63
0391327	A5536.8	63
0391334	A5536.9	63
0391341	A5537.0	63
0391365	A5537.4	63
0391372	A5537.5	63
0391402	A5538.0	63
0391419	A5538.5	63
0391426	A5538.7	63
0391433	A5539.0	63
0391457	A5539.5	63
0392331	A095206	207
0418031	A3451	170
0418048	A3451.1/4	170
0418055	A3451/2	170
0418062	A34510.0	170
0418079	A34511.0	170
0418086	A34511/16	170
0418093	A34512.0	170
0418109	A34513.0	170
0418116	A34513/32	170
0418123	A34514.0	170
0418130	A34515.0	170
0418147	A34516.0	170
0418154	A34517.0	170
0418161	A34517/32	170
0418178	A34518.0	170
0418185	A34519.0	170
0418192	A34520.0	170
0418208	A34521.0	170
0418215	A34521/32	170
0418222	A34522.0	170
0418239	A34524.0	170
0418246	A34525.0	170
0418253	A34526.0	170
0418260	A34527.0	170
0418277	A34528.0	170
0418284	A34529/64	170
0418291	A3453/4	170
0418307	A3453/8	170
0418314	A34530.0	170
0418321	A34537/64	170
0418338	A34539/64	170
0418345	A34541/64	170
0418352	A3455/8	170
0418369	A3457/16	170
0418376	A3457/8	170
0418383	A3458.0	170
0418390	A3458.5	170
0418406	A3459.0	170
0418413	A3459/16	170
0418420	A95110.0	172
0418437	A95111.0	172
0418444	A95112.0	172
0418451	A95112.5	172
0418468	A95113.0	172
0418475	A95113.5	172
0418482	A95114.0	172
0418499	A95114.5	172
0418505	A95115.0	172
0418512	A95115.5	172
0418529	A95116.0	172
0418536	A95116.5	172
0418543	A95117.0	172
0418550	A95117.5	172
0418567	A95118.0	172
0418574	A95118.5	172
0418581	A95119.0	172
0418598	A95119.5	172
0418604	A95120.0	172
0418611	A95121.0	172
0418628	A95122.0	172
0418635	A95123.0	172
0418642	A95124.0	172
0418659	A95125.0	172
0418666	A95126.0	172
0418673	A95127.0	172
0418680	A95128.0	172
0418697	A95129.0	172
0418703	A95130.0	172
0419540	A3451.1/2	170
0419557	A3451.3/4	170
0419564	A34511.5	170
0419571	A34512.5	170
0419588	A34513.5	170
0419601	A34515.5	170
0419618	A34516.5	170
0419625	A34517.5	170
0419632	A34518.5	170
0419649	A34519.5	170
0419656	A34520.5	170
0419663	A34521.5	170
0419670	A34522.5	170
0419687	A34523.0	170
0419694	A34523.5	170
0419700	A34524.5	170
0419717	A34525.5	170
0419724	A34526.5	170
0419731	A34529.0	170
0419748	A34531.0	170
0419755	A34532.0	170
0419762	A34534.0	170
0419779	A34535.0	170
0419786	A34536.0	170
0419793	A34537.0	170
0419809	A34538.0	170
0419816	A34539.0	170
0419823	A34540.0	170
0419830	A34541.0	170
0419847	A34542.0	170
0419854	A34545.0	170
0419861	A34548.0	170
0419878	A34550.0	170
0419885	A95210.0	172
0419892	A95210.5	172
0419908	A95211.0	172
0419915	A95211.5	172
0419922	A95212.0	172
0419939	A95212.5	172
0419946	A95213.5	172
0419953	A95214.0	172
0419960	A95214.5	172

EDP NUMBER INDEX - 0419977 - 0571309

EDP#	E-Code	Page #
0419977	A95215.0	172
0419984	A95215.5	172
0419991	A95216.5	172
0420003	A95217.0	172
0420010	A95217.5	172
0420027	A95218.0	172
0420034	A95218.5	172
0420041	A95219.0	172
0420058	A95219.5	172
0420065	A95220.0	172
0420072	A95221.0	172
0420089	A95222.0	172
0420096	A95223.0	172
0420102	A95224.0	172
0420119	A95225.0	172
0420126	A95226.0	172
0420133	A95227.0	172
0420140	A95228.0	172
0420157	A95229.0	172
0420164	A95230.0	172
0420171	A34510.5	170
0420188	A95213.0	172
0420195	A95216.0	172
0420201	A3459.5	170
0421086	B44110.0	436
0421093	B44111.0	436
0421109	B44112.0	436
0421116	B44114.0	436
0421123	B44115.0	436
0421130	B44116.0	436
0421147	B44117.0	436
0421154	B44118.0	436
0421161	B44119.0	436
0421178	B44120.0	436
0421185	B44210.0	438
0421192	B44212.0	438
0421208	B44214.0	438
0421215	B44215.0	438
0421222	B44216.0	438
0421239	B44217.0	438
0421246	B44218.0	438
0421253	B44220.0	438
0421567	B4810.98	440
0421574	B4810.99	440
0421581	B4811.00	440
0421598	B4811.01	440
0421604	B4811.02	440
0421611	B4811.03	440
0421628	B4811.48	440
0421635	B4811.49	440
0421642	B4811.50	440
0421659	B4811.51	440
0421666	B4811.52	440
0421673	B4811.53	440
0421680	B4811.98	440
0421697	B4811.99	440
0421703	B48110.00	440
0421710	B48110.01	440
0421727	B48110.02	440
0421734	B48110.03	440
0421741	B48110.04	440
0421758	B48110.05	440
0421765	B48111.97	440
0421772	B48111.98	440
0421789	B48111.99	440
0421796	B48112.00	440
0421802	B48112.01	440
0421819	B48112.02	440
0421826	B48112.03	440
0421833	B48112.04	440
0421840	B48112.05	440
0421857	B4812.00	440
0421864	B4812.01	440
0421871	B4812.02	440
0421888	B4812.03	440
0421895	B4812.48	440
0421901	B4812.49	440
0421918	B4812.50	440
0421925	B4812.51	440
0421932	B4812.52	440
0421949	B4812.53	440
0421956	B4812.97	440
0421963	B4812.98	440
0421970	B4812.99	440
0421987	B4813.00	440
0421994	B4813.01	440
0422007	B4813.02	440
0422014	B4813.03	440
0422021	B4813.97	440
0422038	B4813.98	440
0422045	B4813.99	440
0422052	B4814.00	440
0422069	B4814.01	440
0422076	B4814.02	440
0422083	B4814.03	440
0422090	B4814.97	440
0422106	B4814.98	440
0422113	B4814.99	440
0422120	B4815.00	440
0422137	B4815.01	440
0422144	B4815.02	440
0422151	B4815.03	440
0422168	B4815.97	440
0422175	B4815.98	440
0422182	B4815.99	440
0422199	B4816.00	440
0422205	B4816.01	440
0422212	B4816.02	440
0422229	B4816.03	440
0422236	B4817.97	440
0422243	B4817.98	440
0422250	B4817.99	440
0422267	B4818.00	440
0422274	B4818.01	440
0422281	B4818.02	440
0422298	B4818.03	440
0422304	B4818.04	440
0422311	B4819.97	440
0422328	B4819.98	440
0422335	B4819.99	440
0422564	A34533.0	170
0423585	A95231.0	172
0423592	A95232.0	172
0423608	A95233.0	172
0423615	A95238.0	172
0423622	A95240.0	172
0423639	A9528.0	172
0423646	A9528.5	172
0423653	A9529.0	172
0423660	A95234.0	172
0423677	A95235.0	172
0423912	A217SET	197
0423929	A218SET	197
0423936	A221SET	198
0426296	B1223/8	453
0426302	B44113.0	436
0426319	B44219.0	438
0441312	A921N7	56
0441336	A92113/64	56
0566961	A720.16	130
0566978	A720.27	130
0567586	E000M3	261
0567593	E000M3.5	261
0567609	E000M4	261
0567616	E000M5	261
0567623	E000M6	261
0567630	E000M8	261
0567647	E000M10	261
0567654	E000M12	261
0567661	E000M14	261
0567678	E000M16	261
0567685	E000M18	261
0567692	E000M20	261
0567708	E000M22	261
0567715	E000M24	261
0567722	E001M3	261
0567739	E001M3.5	261
0567746	E001M4	261
0567753	E001M5	261
0567760	E001M6	261
0567777	E001M8	261
0567784	E001M10	261
0567791	E001M12	261
0567807	E001M14	261
0567814	E001M16	261
0567821	E001M18	261
0567838	E001M20	261
0567845	E001M22	261
0567852	E001M24	261
0567869	E002M3	275
0567876	E002M3.5	275
0567883	E002M4	275
0567890	E002M5	275
0567906	E002M6	275
0567913	E002M8	275
0567920	E002M10	275
0567937	E002M12	275
0567944	E002M14	275
0567951	E002M16	275
0567968	E002M18	275
0567975	E002M20	275
0567982	E002M22	275
0567999	E002M24	275
0568002	E003M3	275
0568019	E003M3.5	275
0568026	E003M4	275
0568033	E003M5	275
0568040	E003M6	275
0568057	E003M8	275
0568064	E003M10	275
0568071	E003M12	275
0568088	E003M14	275
0568095	E003M16	275
0568101	E003M18	275
0568118	E003M20	275
0568125	E003M22	275
0568132	E003M24	275
0568385	E011M4X.5	261
0568392	E011M5X.5	261
0568408	E011M6X.5	261
0568415	E011M6X.75	261
0568422	E011M8X.75	261
0568439	E011M8X1.0	261
0568446	E011M10X1.0	261
0568453	E011M10X1.25	261
0568460	E011M12X1.0	261
0568477	E011M12X1.25	261
0568484	E011M12X1.5	261
0568491	E011M14X1.0	261
0568507	E011M14X1.25	261
0568514	E011M14X1.5	261
0568521	E011M16X1.0	261
0568538	E011M16X1.5	261
0568545	E011M18X1.0	261
0568552	E011M18X1.5	261
0568569	E011M20X1.0	261
0568576	E011M20X1.5	261
0568583	E011M20X2.0	261
0568590	E011M22X1.5	261
0568606	E011M24X1.5	261
0568613	E011M24X2.0	261
0568798	E013M4X.5	275
0568804	E013M5X.5	275
0568811	E013M6X.5	275
0568828	E013M6X.75	275
0568835	E013M8X.75	275
0568842	E013M8X1.0	275
0568859	E013M10X1.0	275
0568866	E013M10X1.25	275
0568873	E013M12X1.0	275
0568880	E013M12X1.25	275
0568897	E013M12X1.5	275
0568903	E013M14X1.5	275
0568910	E013M16X1.0	275
0568927	E013M16X1.5	275
0568934	E013M18X1.5	275
0568941	E013M20X1.5	275
0568958	E013M22X1.5	275
0569108	E0214-40	256
0569115	E0216-32	256
0569122	E0218-32	256
0569139	E02110-24	256
0569146	E02112-24	256
0569153	E0211/4	256
0569160	E0215/16	256
0569177	E0213/8	256
0569184	E0217/16	256
0569191	E0211/2	256
0569207	E0215/8	256
0569214	E0213/4	256
0569221	E0217/8	256
0569238	E0211	256
0569382	E0234-40	270
0569399	E0236-32	270
0569405	E0238-32	270
0569412	E02310-24	270
0569429	E02312-24	270
0569436	E0231/4	270
0569443	E0235/16	270
0569450	E0233/8	270
0569467	E0237/16	270
0569474	E0231/2	270
0569481	E0235/8	270
0569498	E0233/4	270
0569504	E0237/8	270
0569511	E0231	270
0569641	E0318-36	256
0569658	E03110-32	256
0569665	E0311/4	256
0569672	E0315/16	256
0569689	E0313/8	256
0569696	E0317/16	256
0569702	E0311/2	256
0569719	E0319/16	256
0569726	E0315/8	256
0569733	E0313/4	256
0569740	E0317/8	256
0569757	E0311	256
0569818	E0411/8	284
0569825	E0411/4	284
0569832	E0413/8	284
0569849	E0411/2	284
0569856	E0413/4	284
0569917	E0431/8	286
0569924	E0431/4	286
0569931	E0433/8	286
0569948	E0431/2	286
0569955	E0433/4	286
0570081	E0338-36	270
0570098	E03310-32	270
0570104	E0331/4	270
0570111	E0335/16	270
0570128	E0333/8	270
0570135	E0337/16	270
0570142	E0331/2	270
0570159	E0339/16	270
0570166	E0335/8	270
0570173	E0333/4	270
0570180	E0337/8	270
0570197	E0331	270
0571125	A0121/4	78
0571163	A012A	78
0571170	A012B	78
0571187	A012C	78
0571194	A012D	78
0571200	A012E	78
0571217	A012F	78
0571224	A012G	78
0571231	A012H	78
0571248	A012I	78
0571255	A012J	78
0571262	A012K	78
0571279	A012L	78
0571286	A012M	78
0571293	A012N	78
0571309	A012N1	78

EDP NUMBER INDEX - 0571316 - 0582282

EDP#	E-Code	Page #
0571316	A012N10	78
0571323	A012N11	78
0571330	A012N12	78
0571347	A012N13	78
0571354	A012N14	78
0571361	A012N15	78
0571378	A012N16	78
0571385	A012N17	78
0571392	A012N18	78
0571408	A012N19	78
0571415	A012N2	78
0571422	A012N20	78
0571439	A012N21	78
0571446	A012N22	78
0571453	A012N23	78
0571460	A012N24	78
0571477	A012N25	78
0571484	A012N26	78
0571491	A012N27	78
0571507	A012N28	78
0571514	A012N29	78
0571521	A012N3	78
0571538	A012N30	78
0571545	A012N31	78
0571552	A012N32	78
0571569	A012N33	78
0571576	A012N34	78
0571583	A012N35	78
0571590	A012N36	78
0571606	A012N37	78
0571613	A012N38	78
0571620	A012N39	78
0571637	A012N4	78
0571644	A012N40	78
0571651	A012N41	78
0571668	A012N42	78
0571675	A012N43	78
0571682	A012N44	78
0571699	A012N45	78
0571705	A012N46	78
0571712	A012N5	78
0571729	A012N6	78
0571736	A012N7	78
0571743	A012N8	78
0571750	A012N9	78
0571767	A012O	78
0571774	A012P	78
0571781	A012Q	78
0571798	A012R	78
0571804	A012S	78
0571811	A012T	78
0571828	A012U	78
0571835	A012V	78
0571842	A012W	78
0571859	A012X	78
0571866	A012Y	78
0571873	A012Z	78
0571880	A0121/2	78
0571897	A0121/8	78
0571903	A01211/32	78
0571910	A01211/64	78
0571927	A01213/32	78
0571934	A01213/64	78
0571941	A01215/32	78
0571958	A01215/64	78
0571965	A01217/32	78
0571972	A01217/64	78
0571989	A01219/32	78
0571996	A01219/64	78
0572009	A01221/64	78
0572016	A01223/64	78
0572023	A01225/64	78
0572030	A01227/64	78
0572047	A01229/64	78
0572054	A0123/16	78
0572061	A0123/32	78
0572078	A0123/8	78
0572085	A01231/64	78
0572092	A01233/64	78
0572108	A01235/64	78
0572115	A01237/64	78
0572122	A01239/64	78
0572139	A0125/16	78
0572146	A0125/32	78
0572153	A0125/8	78
0572160	A0127/16	78
0572177	A0127/32	78
0572184	A0127/64	78
0572191	A0129/16	78
0572207	A0129/32	78
0572214	A0129/64	78
0573433	C11011.5	406
0573440	C11011.7	406
0573457	C11012.5	406
0573464	C11013.7	406
0573471	C11015.7	406
0573488	C11024.0	406
0573495	C1107.75	406
0573501	C1109.7	406
0573952	A0121/64	78
0573969	A0121/32	78
0573976	A0123/64	78
0573983	A012N53	78
0573990	A012N54	78
0574003	A012N55	78
0574010	A012N56	78
0574027	A012N57	78
0574034	A012N58	78
0574041	A012N59	78
0574058	A012N60	78
0574065	A012N61	78
0574072	A012N62	78
0574089	A012N63	78
0574096	A012N64	78
0574102	A012N65	78
0574119	A012N66	78
0574126	A012N67	78
0574133	A012N68	78
0574140	A012N69	78
0574157	A012N70	78
0574164	A012N71	78
0574171	A012N72	78
0574188	A012N73	78
0574195	A012N74	78
0574201	A012N75	78
0574218	A012N76	78
0574225	A012N77	78
0574232	A012N78	78
0574249	A012N79	78
0574256	A012N80	78
0574317	A09718	202
0574324	A09712	202
0574331	A09714	202
0574348	A09720	202
0574355	A09760	202
0574362	A09730	202
0578636	A0121/16	78
0578643	A0125/64	78
0578650	A012N47	78
0578667	A012N48	78
0578674	A012N49	78
0578681	A012N50	78
0578698	A012N51	78
0578704	A012N52	78
0578711	A01211/16	78
0578728	A01221/32	78
0578735	A01223/32	78
0578742	A01245/64	78
0578759	A0123/4	78
0578766	A01247/64	78
0580301	E005M4	258
0580318	E005M43FL	258
0580325	E005M5	258
0580332	E005M53FL	258
0580349	E005M6	258
0580356	E005M63FL	258
0580363	E005M8	258
0580370	E005M83FL	258
0580387	E005M10	258
0580394	E005M103FL	258
0580400	E005M12	258
0580417	E005M123FL	258
0580424	E005M14	258
0580431	E005M16	258
0580448	E005M18	258
0580455	E005M20	258
0580462	E006M4	258
0580479	E006M5	258
0580486	E006M53FL	258
0580493	E006M6	258
0580509	E006M63FL	258
0580516	E006M8	258
0580523	E006M10	258
0580530	E006M103FL	258
0580547	E006M12	258
0580554	E006M123FL	258
0580561	E006M14	258
0580578	E006M16	258
0580585	E006M18	258
0580592	E006M20	258
0580608	E007M4	272
0580615	E007M5	272
0580622	E007M6	272
0580639	E007M8	272
0580646	E007M10	272
0580653	E007M12	272
0580660	E007M14	272
0580677	E007M16	272
0580684	E007M18	272
0580691	E007M20	272
0580707	E008M4	272
0580714	E008M5	272
0580721	E008M6	272
0580738	E008M8	272
0580745	E008M10	272
0580752	E008M12	272
0580769	E008M14	272
0580776	E008M16	272
0580783	E008M18	272
0580790	E008M20	272
0580950	E016M8X1.0	258
0580967	E016M10X1.0	258
0580974	E016M14X1.5	258
0580981	E016M18X1.5	258
0581032	E018M8X1.0	272
0581049	E018M10X1.0	272
0581056	E018M14X1.5	272
0581063	E018M18X1.5	272
0581070	E0256-32	253
0581087	E0258-32	253
0581094	E02510-24	253
0581100	E02512-24	253
0581117	E0251/4	253
0581124	E0251/43FL	253
0581131	E0255/16	253
0581148	E0255/163FL	253
0581155	E0253/8	253
0581162	E0253/83FL	253
0581179	E0257/16	253
0581186	E0251/2	253
0581193	E0251/23FL	253
0581209	E0259/16	253
0581216	E0255/8	253
0581223	E0253/4	253
0581230	E0257/8	253
0581247	E0251	253
0581254	E0264-40	253
0581261	E0265-40	253
0581278	E0266-32	253
0581285	E0268-32	253
0581292	E02610-24	253
0581308	E02612-24	253
0581315	E0261/4	253
0581322	E0261/4H11	253
0581339	E0261/43FL	253
0581346	E0265/16	253
0581353	E0265/16H11	253
0581360	E0265/163FL	253
0581377	E0263/8	253
0581384	E0263/8H11	253
0581391	E0263/83FL	253
0581407	E0267/16	253
0581414	E0261/2	253
0581421	E0261/2H11	253
0581438	E0261/23FL	253
0581445	E0269/16	253
0581452	E0265/8H11	253
0581469	E0265/8	253
0581476	E0263/4	253
0581483	E0267/8	253
0581490	E0261	253
0581506	E0276-32	268
0581513	E0278-32	268
0581520	E02710-24	268
0581537	E02712-24	268
0581544	E0271/4	268
0581551	E0275/16	268
0581568	E0273/8	268
0581575	E0277/16	268
0581582	E0271/2	268
0581599	E0279/16	268
0581605	E0275/8	268
0581612	E0273/4	268
0581629	E0277/8	268
0581636	E0271	268
0581643	E0284-40	268
0581650	E0285-40	268
0581667	E0286-32	268
0581674	E0288-32	268
0581681	E02810-24	268
0581698	E02812-24	268
0581704	E0281/4	268
0581711	E0285/16	268
0581728	E0283/8	268
0581735	E0283/8H5	268
0581742	E0287/16	268
0581759	E0281/2	268
0581766	E0289/16	268
0581773	E0285/8	268
0581780	E0283/4	268
0581797	E0287/8	268
0581803	E0281	268
0581957	E0356-40	253
0581964	E0358-36	253
0581971	E03510-32	253
0581988	E03512-28	253
0581995	E0351/4	253
0582008	E0351/43FL	253
0582015	E0355/16	253
0582022	E0355/163FL	253
0582039	E0353/8	253
0582046	E0353/83FL	253
0582053	E0357/163FL	253
0582060	E0351/2	253
0582077	E0351/23FL	253
0582084	E0359/16	253
0582091	E0355/8	253
0582107	E0353/4	253
0582114	E0357/8	253
0582121	E0351-12	253
0582138	E0351-14	253
0582145	E03610-32	253
0582152	E03612-28	253
0582169	E0361/4	253
0582176	E0361/43FL	253
0582183	E0365/16	253
0582190	E0365/163FL	253
0582206	E0363/8	253
0582213	E0363/83FL	253
0582220	E0367/163FL	253
0582237	E0361/2	253
0582244	E0361/23FL	253
0582251	E0369/16	253
0582268	E0365/8	253
0582275	E0363/4	253
0582282	E0367/8	253

EDP NUMBER INDEX - 0582299 - 0615034

EDP#	E-Code	Page #
0582299	E0361-12	253
0582305	E0361-14	253
0582312	E03710-32	268
0582329	E0371/4	268
0582336	E0375/16	268
0582343	E0373/8	268
0582350	E0377/16	268
0582367	E0371/2	268
0582374	E0379/16	268
0582381	E0375/8	268
0582398	E0373/4	268
0582404	E0377/8	268
0582411	E0371-12	268
0582428	E0371-14	268
0582435	E03810-32	268
0582442	E0381/4	268
0582459	E0385/16	268
0582466	E0383/8	268
0582473	E0387/16	268
0582480	E0381/2	268
0582497	E0389/16	268
0582503	E0385/8	268
0582510	E0383/4	268
0582527	E0387/8	268
0582534	E0381-12	268
0582541	E0381-14	268
0583180	E006M43FL	258
0583197	E006M83FL	258
0583203	E0262-56	253
0588697	A0223.0	120
0588703	A0221/2	120
0588710	A0221/4	120
0588727	A0221/8	120
0588734	A02210.0	120
0588741	A02210.1	120
0588758	A02210.2	120
0588765	A02210.3	120
0588772	A02210.4	120
0588789	A02210.5	120
0588796	A02210.6	120
0588802	A02210.7	120
0588819	A02210.8	120
0588826	A02210.9	120
0588833	A02211.0	120
0588840	A02211.1	120
0588857	A02211.2	120
0588864	A02211.3	120
0588871	A02211.5	120
0588888	A02211.6	120
0588895	A02211.7	120
0588901	A02211.8	120
0588918	A02211.9	120
0588925	A02211/32	120
0588932	A02211/64	120
0588949	A02212.0	120
0588956	A02212.1	120
0588963	A02212.2	120
0588970	A02212.5	120
0588987	A02213.0	120
0588994	A02213.5	120
0589007	A02213/32	120
0589014	A02213/64	120
0589021	A02214.0	120
0589038	A02214.5	120
0589045	A02215.0	120
0589052	A02215.5	120
0589069	A02215/64	120
0589076	A02216.0	120
0589083	A0223.1	120
0589090	A0223.2	120
0589106	A0223.25	120
0589113	A0223.3	120
0589120	A0223.4	120
0589137	A0223.5	120
0589144	A0223.6	120
0589151	A0223.7	120
0589168	A0223.8	120
0589175	A0223.9	120
0589182	A0223/16	120
0589199	A0223/8	120
0589205	A0224.0	120
0589212	A0224.1	120
0589229	A0224.2	120
0589236	A0224.3	120
0589243	A0224.4	120
0589250	A0224.5	120
0589267	A0224.6	120
0589274	A0224.7	120
0589281	A0224.8	120
0589298	A0224.9	120
0589304	A0225.0	120
0589311	A0225.1	120
0589328	A0225.2	120
0589335	A0225.3	120
0589342	A0225.4	120
0589359	A0225.5	120
0589366	A0225.6	120
0589373	A0225.7	120
0589380	A0225.8	120
0589397	A0225.9	120
0589403	A0225/16	120
0589410	A0225/32	120
0589427	A0225/8	120
0589434	A0226.0	120
0589441	A0226.1	120
0589458	A0226.2	120
0589465	A0226.3	120
0589472	A0226.4	120
0589489	A0226.5	120
0589496	A0226.6	120
0589502	A0226.7	120
0589519	A0226.8	120
0589526	A0226.9	120
0589533	A0227.0	120
0589540	A0227.1	120
0589557	A0227.2	120
0589564	A0227.3	120
0589571	A0227.4	120
0589588	A0227.5	120
0589595	A0227.6	120
0589601	A0227.7	120
0589618	A0227.8	120
0589625	A0227.9	120
0589632	A0227/16	120
0589649	A0227/32	120
0589656	A0228.0	120
0589663	A0228.1	120
0589670	A0228.2	120
0589687	A0228.3	120
0589694	A0228.4	120
0589700	A0228.5	120
0589717	A0228.6	120
0589724	A0228.7	120
0589731	A0228.8	120
0589748	A0228.9	120
0589755	A0229.0	120
0589762	A0229.1	120
0589779	A0229.2	120
0589786	A0229.3	120
0589793	A0229.4	120
0589809	A0229.5	120
0589816	A0229.6	120
0589823	A0229.7	120
0589830	A0229.8	120
0589847	A0229.9	120
0589854	A0229/16	120
0589861	A0229/32	120
0589878	A0229/64	120
0600115	A0222.0	120
0600122	A0222.1	120
0600139	A0222.2	120
0600146	A0222.25	120
0600153	A0222.3	120
0600160	A0222.4	120
0600177	A0222.5	120
0600184	A0222.6	120
0600191	A0222.65	120
0600207	A0222.7	120
0600214	A0222.8	120
0600221	A0222.9	120
0600238	A0223/32	120
0600245	A0227/64	120
0600382	A022.5	120
0600399	A022.6	120
0600405	A022.7	120
0600412	A022.8	120
0600429	A022.9	120
0600436	A0221.0	120
0600443	A0221.1	120
0600450	A0221.2	120
0600467	A0221.3	120
0600474	A0221.4	120
0600481	A0221.5	120
0600498	A0221.6	120
0600504	A0221.7	120
0600511	A0221.8	120
0600528	A0221.9	120
0600535	A0221/16	120
0600542	A0221/32	120
0600559	A0223/64	120
0600566	A0225/64	120
0605356	A0023.25	82
0609309	C27340.0	427
0609316	C24717.0	425
0609323	C24719.0	425
0609330	C24721.0	425
0609347	C24723.0	425
0609354	C24724.0	425
0609361	C24726.0	425
0609378	C24736.0	425
0609385	C24740.0	425
0612057	A720.17	130
0612064	A720.55	130
0612071	A720.62	130
0612088	A720.65	130
0612101	A720.75	130
0612125	A720.85	130
0612149	A720.95	130
0612163	A7201.05	130
0613870	R45310.0	46
0613887	R45310.2	46
0613894	R45310.3	46
0613900	R45310.5	46
0613917	R45311.0	46
0613924	R45311.2	46
0613931	R45311.5	46
0613948	R45312.0	46
0613955	R45312.2	46
0613962	R45312.5	46
0613979	R45313.0	46
0613986	R45313.5	46
0613993	R45314.0	46
0614006	R45314.25	46
0614013	R45314.5	46
0614020	R45315.0	46
0614037	R45315.5	46
0614044	R45316.0	46
0614051	R4533.0	46
0614068	R4533.4	46
0614075	R4533.5	46
0614082	R4534.0	46
0614099	R4534.3	46
0614105	R4534.5	46
0614112	R4535.0	46
0614129	R4535.1	46
0614136	R4535.5	46
0614143	R4536.0	46
0614150	R4536.5	46
0614167	R4536.9	46
0614174	R4537.0	46
0614181	R4537.5	46
0614198	R4538.0	46
0614204	R4538.5	46
0614211	R4538.7	46
0614228	R4539.0	46
0614235	R4539.5	46
0614242	R45410.0	46
0614259	R45410.2	46
0614266	R45410.3	46
0614273	R45410.4	46
0614280	R45410.5	46
0614297	R45411.0	46
0614303	R45411.2	46
0614310	R45411.5	46
0614327	R45412.0	46
0614334	R45412.2	46
0614341	R45412.5	46
0614358	R45413.0	46
0614365	R45413.5	46
0614372	R45414.0	46
0614389	R45414.25	46
0614396	R45414.5	46
0614402	R45415.0	46
0614419	R45415.5	46
0614426	R45416.0	46
0614433	R4543.0	46
0614440	R4543.3	46
0614457	R4543.4	46
0614464	R4543.5	46
0614471	R4544.0	46
0614488	R4544.2	46
0614495	R4544.3	46
0614501	R4544.5	46
0614518	R4545.0	46
0614525	R4545.1	46
0614532	R4545.5	46
0614549	R4546.0	46
0614556	R4546.5	46
0614563	R4546.7	46
0614570	R4546.8	46
0614587	R4546.9	46
0614594	R4547.0	46
0614600	R4547.4	46
0614617	R4547.5	46
0614624	R4548.0	46
0614631	R4548.5	46
0614648	R4548.6	46
0614655	R4548.7	46
0614662	R4549.0	46
0614679	R4549.3	46
0614686	R4549.5	46
0614693	R45710.0	40
0614709	R45710.2	40
0614716	R45710.3	40
0614723	R45710.4	40
0614730	R45710.5	40
0614747	R45711.0	40
0614754	R45711.2	40
0614761	R45711.5	40
0614778	R45712.0	40
0614785	R45712.2	40
0614792	R45712.5	40
0614808	R45713.0	40
0614815	R45713.5	40
0614822	R45714.0	40
0614839	R45714.25	40
0614846	R45714.5	40
0614853	R45715.0	40
0614860	R45715.5	40
0614877	R45716.0	40
0614884	R4573.0	40
0614891	R4573.3	40
0614907	R4573.4	40
0614914	R4573.5	40
0614921	R4574.0	40
0614938	R4574.2	40
0614945	R4574.3	40
0614952	R4574.5	40
0614969	R4575.0	40
0614976	R4575.1	40
0614983	R4575.5	40
0614990	R4576.0	40
0615003	R4576.5	40
0615010	R4576.8	40
0615027	R4576.9	40
0615034	R4577.0	40

EDP NUMBER INDEX - 0615041 - 0625989

EDP#	E-Code	Page #
0615041	R4577.4	40
0615058	R4577.5	40
0615065	R4578.0	40
0615072	R4578.5	40
0615089	R4578.6	40
0615096	R4578.7	40
0615102	R4579.0	40
0615119	R4579.3	40
0615126	R4579.5	40
0615133	R45810.0	40
0615140	R45810.2	40
0615157	R45810.3	40
0615164	R45810.4	40
0615171	R45810.5	40
0615188	R45811.0	40
0615195	R45811.2	40
0615201	R45811.5	40
0615218	R45812.0	40
0615225	R45812.2	40
0615232	R45812.5	40
0615249	R45813.0	40
0615256	R45813.5	40
0615263	R45814.0	40
0615270	R45814.25	40
0615287	R45814.5	40
0615294	R45815.0	40
0615300	R45815.5	40
0615317	R45816.0	40
0615324	R4583.0	40
0615331	R4583.3	40
0615348	R4583.4	40
0615355	R4583.5	40
0615362	R4584.0	40
0615379	R4584.2	40
0615386	R4584.3	40
0615393	R4584.5	40
0615409	R4585.0	40
0615416	R4585.1	40
0615423	R4585.5	40
0615430	R4586.0	40
0615447	R4586.5	40
0615454	R4586.8	40
0615461	R4586.9	40
0615478	R4587.0	40
0615485	R4587.4	40
0615492	R4587.5	40
0615508	R4588.0	40
0615515	R4588.5	40
0615522	R4588.6	40
0615539	R4588.7	40
0615546	R4589.0	40
0615553	R4589.3	40
0615560	R4589.5	40
0615577	A720.7	130
0615584	A720.8	130
0615591	A720.9	130
0615607	A7201.0	130
0615614	A7201.1	130
0615621	A7201.2	130
0615638	A7201.3	130
0615645	A7201.4	130
0616116	R4536.8	46
0616123	R4539.3	46
0616130	R45310.4	46
0616147	R4533.3	46
0616154	R4534.2	46
0616161	R4537.4	46
0616178	R4538.6	46
0616185	A088200S	214
0621929	C1101	406
0622032	R45814.8	40
0622049	R45715.8	40
0622056	R45718.8	40
0622063	R45719.8	40
0622070	R4574.9	40
0623596	R4531/2	46
0623602	R4531/4	46
0623619	R4531/8	46
0623626	R45311/16	46
0623633	R45311/32	46
0623640	R45311/64	46
0623657	R45313/32	46
0623664	R45313/64	46
0623671	R45315/32	46
0623688	R45315/64	46
0623695	R45317/32	46
0623701	R45317/64	46
0623718	R45319/32	46
0623725	R45319/64	46
0623732	R45321/32	46
0623749	R45321/64	46
0623756	R45323/32	46
0623763	R45323/64	46
0623770	R45325/64	46
0623787	R45327/64	46
0623794	R45329/64	46
0623800	R4533/16	46
0623817	R4533/4	46
0623824	R4533/8	46
0623831	R45331/64	46
0623848	R45333/64	46
0623855	R45335/64	46
0623862	R45337/64	46
0623879	R45339/64	46
0623886	R45341/64	46
0623893	R45343/64	46
0623909	R45345/64	46
0623916	R45347/64	46
0623923	R4535/16	46
0623930	R4535/32	46
0623947	R4535/8	46
0623954	R4537/16	46
0623961	R4537/32	46
0623978	R4539/16	46
0623985	R4539/32	46
0623992	R4539/64	46
0624005	R4541/2	46
0624012	R4541/4	46
0624029	R4541/8	46
0624036	R45411/16	46
0624043	R45411/32	46
0624050	R45411/64	46
0624067	R45413/32	46
0624074	R45413/64	46
0624081	R45415/32	46
0624098	R45415/64	46
0624104	R45417/32	46
0624111	R45417/64	46
0624128	R45419/32	46
0624135	R45419/64	46
0624142	R45421/32	46
0624159	R45421/64	46
0624166	R45423/32	46
0624173	R45423/64	46
0624180	R45425/64	46
0624180	R45425/64	46
0624197	R45427/64	46
0624203	R45429/64	46
0624210	R4543/16	46
0624227	R4543/4	46
0624234	R4543/8	46
0624241	R45431/64	46
0624258	R45433/64	46
0624265	R45435/64	46
0624272	R45437/64	46
0624289	R45439/64	46
0624296	R45441/64	46
0624302	R45443/64	46
0624319	R45445/64	46
0624326	R45447/64	46
0624333	R4545/16	46
0624340	R4545/32	46
0624357	R4545/8	46
0624364	R4547/16	46
0624371	R4547/32	46
0624388	R4549/16	46
0624395	R4549/32	46
0624401	R4549/64	46
0624418	R4571/2	40
0624425	R4571/4	40
0624432	R4571/8	40
0624449	R45711/16	40
0624456	R45711/32	40
0624463	R45711/64	40
0624470	R45713/32	40
0624487	R45713/64	40
0624494	R45715/32	40
0624500	R45715/64	40
0624517	R45717/32	40
0624524	R45717/64	40
0624531	R45719/32	40
0624548	R45719/64	40
0624555	R45721/32	40
0624562	R45721/64	40
0624579	R45723/32	40
0624586	R45723/64	40
0624593	R45725/64	40
0624609	R45727/64	40
0624616	R45729/64	40
0624623	R4573/16	40
0624630	R4573/4	40
0624647	R4573/8	40
0624654	R45731/64	40
0624661	R45733/64	40
0624678	R45735/64	40
0624685	R45737/64	40
0624692	R45739/64	40
0624708	R45741/64	40
0624715	R45743/64	40
0624722	R45745/64	40
0624739	R45747/64	40
0624746	R4575/16	40
0624753	R4575/32	40
0624760	R4575/8	40
0624777	R4577/16	40
0624784	R4577/32	40
0624791	R4579/16	40
0624807	R4579/32	40
0624814	R4579/64	40
0624821	R4581/2	40
0624838	R4581/4	40
0624845	R4581/8	40
0624852	R45811/16	40
0624869	R45811/32	40
0624876	R45811/64	40
0624883	R45813/32	40
0624890	R45813/64	40
0624906	R45815/32	40
0624913	R45815/64	40
0624920	R45817/32	40
0624937	R45817/64	40
0624944	R45819/32	40
0624951	R45819/64	40
0624968	R45821/32	40
0624975	R45821/64	40
0624982	R45823/32	40
0624999	R45823/64	40
0625002	R45825/64	40
0625019	R45827/64	40
0625026	R45829/64	40
0625033	R4583/16	40
0625040	R4583/4	40
0625057	R4583/8	40
0625064	R45831/64	40
0625071	R45833/64	40
0625088	R45835/64	40
0625095	R45837/64	40
0625101	R45839/64	40
0625118	R45841/64	40
0625125	R45843/64	40
0625132	R45845/64	40
0625149	R45847/64	40
0625156	R4585/16	40
0625163	R4585/32	40
0625170	R4585/8	40
0625187	R4587/16	40
0625194	R4587/32	40
0625200	R4589/16	40
0625217	R4589/32	40
0625224	R4589/64	40
0625231	R45310.05	46
0625248	R45310.1	46
0625255	R45310.6	46
0625262	R45311.8	46
0625279	R45312.05	46
0625286	R45312.7	46
0625293	R45315.1	46
0625309	R45316.5	46
0625316	R45317.0	46
0625323	R45317.5	46
0625330	R45318.0	46
0625347	R45318.5	46
0625354	R45319.0	46
0625361	R45319.5	46
0625378	R45320.0	46
0625385	R4533.1	46
0625392	R4533.2	46
0625408	R4533.6	46
0625415	R4533.7	46
0625422	R4533.8	46
0625439	R4534.05	46
0625446	R4534.1	46
0625453	R4534.6	46
0625460	R4534.7	46
0625477	R4535.05	46
0625484	R4535.6	46
0625491	R4535.7	46
0625507	R4535.8	46
0625514	R4536.05	46
0625521	R4536.1	46
0625538	R4536.3	46
0625545	R4536.6	46
0625552	R4537.1	46
0625569	R4537.3	46
0625576	R4537.6	46
0625583	R4537.8	46
0625590	R4538.05	46
0625606	R4538.1	46
0625613	R4538.8	46
0625620	R4539.1	46
0625637	R4539.6	46
0625644	R4539.8	46
0625651	R45410.1	46
0625668	R45410.6	46
0625675	R45411.8	46
0625682	R45412.1	46
0625699	R45412.7	46
0625705	R45415.1	46
0625712	R4543.1	46
0625729	R4543.2	46
0625736	R4543.6	46
0625743	R4543.7	46
0625750	R4543.8	46
0625767	R4543.9	46
0625774	R4544.1	46
0625781	R4544.6	46
0625798	R4544.7	46
0625804	R4545.6	46
0625811	R4545.7	46
0625828	R4545.8	46
0625835	R4546.1	46
0625842	R4546.3	46
0625859	R4546.6	46
0625866	R4547.1	46
0625873	R4547.3	46
0625880	R4547.6	46
0625897	R4547.8	46
0625903	R4548.1	46
0625910	R4548.8	46
0625927	R4549.1	46
0625934	R4549.6	46
0625941	R4549.8	46
0625958	R45710.05	40
0625965	R45710.1	40
0625972	R45710.6	40
0625989	R45711.8	40

EDP NUMBER INDEX - 0625996 - 0640258

EDP#	E-Code	Page #
0625996	R45712.05	40
0626009	R45712.1	40
0626016	R45712.7	40
0626023	R45715.1	40
0626030	R45716.5	40
0626047	R45717.0	40
0626054	R45717.5	40
0626061	R45718.0	40
0626078	R45718.5	40
0626085	R45719.0	40
0626092	R45719.5	40
0626108	R45720.0	40
0626115	R4573.1	40
0626122	R4573.2	40
0626139	R4573.6	40
0626146	R4573.7	40
0626153	R4573.8	40
0626160	R4573.9	40
0626177	R4574.05	40
0626184	R4574.1	40
0626191	R4574.6	40
0626207	R4574.7	40
0626214	R4575.05	40
0626221	R4575.6	40
0626238	R4575.7	40
0626245	R4575.8	40
0626252	R4576.05	40
0626269	R4576.1	40
0626276	R4576.3	40
0626283	R4576.6	40
0626290	R4577.1	40
0626306	R4577.3	40
0626313	R4577.6	40
0626320	R4577.8	40
0626337	R4578.05	40
0626344	R4578.8	40
0626351	R4579.1	40
0626368	R4579.6	40
0626375	R4579.8	40
0626382	R45810.1	40
0626399	R45810.6	40
0626405	R45811.8	40
0626412	R45812.1	40
0626429	R45812.7	40
0626436	R45815.1	40
0626443	R4583.1	40
0626450	R4583.2	40
0626467	R4583.6	40
0626474	R4583.7	40
0626481	R4583.73	40
0626498	R4583.8	40
0626504	R4583.9	40
0626511	R4584.1	40
0626528	R4584.6	40
0626535	R4585.6	40
0626542	R4585.7	40
0626559	R4585.8	40
0626566	R4586.1	40
0626573	R4586.3	40
0626580	R4586.6	40
0626597	R4587.1	40
0626603	R4587.3	40
0626610	R4587.6	40
0626627	R4587.8	40
0626634	R4588.1	40
0626641	R4588.8	40
0626658	R4589.1	40
0626665	R4589.6	40
0626672	R4589.8	40
0626689	R4578.1	40
0628911	R4533.9	46
0628942	C11017.7	406
0628959	C11019.7	406
0628966	C11021.7	406
0628973	C11024.7	406
0628980	C11026.0	406
0628997	C11036.0	406
0629000	C11040.0	406
0629017	C11045.0	406
0629024	C11050.0	406
0629031	C1106.75	406
0629055	R4539.7	46
0629055	R4539.7	46
0629062	R4579.7	40
0629062	R4579.7	40
0632956	A9217/32	56
0632994	A92115/64	56
0633038	A9211/4	56
0633069	A92117/64	56
0633106	A9219/32	56
0633113	A921L	56
0633137	A92119/64	56
0633151	A9215/16	56
0633175	A92121/64	56
0633205	A92111/32	56
0633236	A92123/64	56
0633250	A9213/8	56
0633274	A92125/64	56
0633304	A92113/32	56
0633328	A92127/64	56
0633335	A92110.75	56
0633342	A9217/16	56
0633359	A92111.25	56
0633366	A92129/64	56
0633373	A92115/32	56
0633380	A92131/64	56
0633397	A9211/2	56
0633403	A92112.75	56
0633410	A92133/64	56
0633427	A92135/64	56
0633434	A9219/16	56
0633441	A92137/64	56
0633458	A92114.75	56
0633465	A92119/32	56
0633472	A92139/64	56
0633489	A9215/8	56
0633519	A900N58	65
0633540	A9003/64	65
0633557	A9001.25	65
0633571	A9001.35	65
0633601	A9001.55	65
0633618	A900N52	65
0633625	A9001.75	65
0633632	A900N50	65
0633649	A900N49	65
0633694	A9002.15	65
0633717	A900N43	65
0633724	A9002.35	65
0633748	A900N41	65
0633755	A900N40	65
0633786	A900N37	65
0633830	A900N32	65
0633946	A900N19	65
0633984	A900N14	65
0634011	A900N9	65
0634066	A900N3	65
0634134	A900G	65
0634271	A90010.75	65
0634295	A90012.75	65
0634318	A90033/64	65
0634325	A90035/64	65
0634332	A9009/16	65
0634349	A90037/64	65
0634356	A90014.75	65
0634363	A90019/32	65
0634370	A90039/64	65
0634387	A9005/8	65
0634394	A90041/64	65
0634400	A90016.5	65
0634417	A90021/32	65
0634431	A90043/64	65
0634448	A90011/16	65
0634455	A90045/64	65
0634462	A90023/32	65
0634479	A90018.5	65
0634486	A90047/64	65
0634493	A9003/4	65
0634509	A90049/64	65
0634516	A90019.5	65
0634523	A90025/32	65
0634547	A9011.55	65
0634554	A9011/16	65
0634561	A9011.6	65
0634592	A9011.75	65
0634615	A9011.8	65
0634639	A9011.9	65
0634646	A901N48	65
0634653	A9015/64	65
0634677	A901N46	65
0634684	A901N45	65
0634691	A9012.1	65
0634707	A9012.15	65
0634738	A9012.35	65
0634752	A9013/32	65
0634769	A9012.4	65
0634776	A901N41	65
0634783	A901N40	65
0634820	A9012.7	65
0634844	A9017/64	65
0634882	A9012.9	65
0634912	A9011/8	65
0634929	A901N30	65
0634943	A9019/64	65
0634967	A901N26	65
0634998	A9015/32	65
0635001	A901N22	65
0635032	A901N19	65
0635056	A90111/64	65
0635094	A9013/16	65
0635155	A90113/64	65
0635209	A9017/32	65
0635216	A901N2	65
0635247	A90115/64	65
0635285	A9011/4	65
0635308	A901G	65
0635315	A90117/64	65
0635322	A901H	65
0635353	A9019/32	65
0635384	A90119/64	65
0635407	A9015/16	65
0635414	A901O	65
0635421	A90121/64	65
0635452	A90111/32	65
0635483	A90123/64	65
0635506	A9013/8	65
0635520	A90125/64	65
0635537	A901X	65
0635551	A90113/32	65
0635575	A90127/64	65
0635582	A90110.75	65
0635599	A9017/16	65
0635605	A90111.25	65
0635612	A90129/64	65
0635629	A90115/32	65
0635636	A90131/64	65
0635643	A90112.75	65
0635650	A90133/64	65
0635667	A90135/64	65
0635674	A9019/16	65
0635681	A90137/64	65
0635704	A90119/32	65
0635711	A90139/64	65
0635728	A9015/8	65
0635735	A9403/64	68
0635742	A94035/64	68
0635759	A94039/64	68
0635766	A94041/64	68
0635773	A94043/64	68
0635780	A94049/64	68
0635797	A94025/32	68
0635803	A9413/64	68
0635810	A9411/16	68
0635827	A9415/64	68
0635834	A9413/32	68
0635841	A9417/64	68
0635858	A9411/8	68
0635865	A9419/64	68
0635872	A9415/32	68
0635889	A94111/64	68
0635896	A9413/16	68
0635902	A94113/64	68
0635919	A9417/32	68
0635926	A94115/64	68
0635933	A9411/4	68
0635940	A94117/64	68
0635957	A9419/32	68
0635964	A94119/64	68
0635971	A9415/16	68
0635988	A94121/64	68
0635995	A94111/32	68
0636008	A94123/64	68
0636015	A9413/8	68
0636022	A94125/64	68
0636039	A94113/32	68
0636046	A94127/64	68
0636053	A9417/16	68
0636060	A94129/64	68
0636077	A94115/32	68
0636084	A94131/64	68
0636091	A9411/2	68
0636107	A94133/64	68
0636114	A94135/64	68
0636121	A9419/16	68
0636138	A94137/64	68
0636145	A94119/32	68
0636152	A94139/64	68
0636169	A9415/8	68
0636176	E000M7	261
0636183	E001M7	261
0636190	E002M7	275
0636206	E003M7	275
0639795	C1101/16	406
0639801	C1103/32	406
0639818	C1101/8	406
0639825	C1103/16	406
0639832	C1101/4	406
0639849	C1105/16	406
0639856	C1103/8	406
0639863	C11013/32	406
0639870	C1107/16	406
0639887	C1101/2	406
0639894	C11017/32	406
0639900	C1109/16	406
0639917	C1105/8	406
0639924	C11011/16	406
0639931	C1103/4	406
0639948	C1107/8	406
0639962	C1101.1/8	406
0639979	C1101.1/4	406
0639986	C11035.0	406
0639993	C1101.1/2	406
0640005	C1101.3/4	406
0640012	C1231/16	412
0640029	C1231/8	412
0640036	C1235/32	412
0640043	C1233/16	412
0640050	C1231/4	412
0640067	C1235/16	412
0640074	C1233/8	412
0640081	C1231/2	412
0640098	C1239/16	412
0640104	C1235/8	412
0640111	C1233/4	412
0640128	C1231	412
0640135	C1231.1/2	412
0640142	C2471/8	425
0640159	C2473/16	425
0640166	C2471/4	425
0640173	C2475/16	425
0640180	C2473/8	425
0640197	C2471/2	425
0640203	C2479/16	425
0640210	C2475/8	425
0640227	C2473/4	425
0640234	C2477/8	425
0640241	C2471	425
0640258	C24750.0	425

EDP NUMBER INDEX - 0640265 - 1010507

EDP#	E-Code	Page #
0640265	C2731/8	427
0640272	C2733/16	427
0640289	C2731/4	427
0640296	C2733/8	427
0640302	C2731/2	427
0640319	C2735/8	427
0640326	C2733/4	427
0640340	C2731	427
0640357	C2731.1/2	427
1010001	15001/4X20H1NO1	287
1010002	15001/4X20H2NO1	287
1010003	15001/4X20H3NO1	287
1010004	15001/4X20H1NO2	287
1010005	15001/4X20H2NO2	287
1010006	15001/4X20H3NO2	287
1010007	15001/4X20H5NO2	287
1010008	15001/4X20H1NO3	287
1010009	15001/4X20H2NO3	287
1010010	15001/4X20H3NO3	287
1010011	15001/4X20H5NO3	287
1010014	15001/4X28H3NO1	287
1010016	15001/4X28H2NO2	287
1010017	15001/4X28H3NO2	287
1010018	15001/4X28H4NO2	287
1010019	15001/4X28H1NO3	287
1010020	15001/4X28H2NO3	287
1010021	15001/4X28H3NO3	287
1010022	15001/4X28H4NO3	287
1010024	15005/16X18H2NO1	287
1010025	15005/16X18H3NO1	287
1010027	15005/16X18H2NO2	287
1010028	15005/16X18H3NO2	287
1010031	15005/16X18H2NO3	287
1010032	15005/16X18H3NO3	287
1010036	15005/16X24H3NO1	287
1010039	15005/16X24H3NO2	287
1010041	15005/16X24H1NO3	287
1010043	15005/16X24H3NO3	287
1010046	15003/8X16H2NO1	287
1010047	15003/8X16H3NO1	287
1010049	15003/8X16H2NO2	287
1010050	15003/8X16H3NO2	287
1010051	15003/8X16H5NO2	287
1010053	15003/8X16H2NO3	287
1010054	15003/8X16H3NO3	287
1010055	15003/8X16H5NO3	287
1010058	15003/8X24H3NO1	287
1010061	15003/8X24H3NO2	287
1010065	15003/8X24H3NO3	287
1010067	15007/16X14H3NO1	287
1010070	15007/16X14H3NO2	287
1010071	15007/16X14H5NO2	287
1010074	15007/16X14H3NO3	287
1010076	15007/16X20H3NO1	287
1010079	15007/16X20H3NO2	287
1010083	15007/16X20H3NO3	287
1010085	15001/2X13H3NO1	287
1010087	15001/2X13H2NO2	287
1010088	15001/2X13H3NO2	287
1010089	15001/2X13H5NO2	287
1010091	15001/2X13H2NO3	287
1010092	15001/2X13H3NO3	287
1010093	15001/2X13H5NO3	287
1010094	15001/2X20H3NO1	287
1010097	15001/2X20H3NO2	287
1010098	15001/2X20H5NO2	287
1010101	15001/2X20H3NO3	287
1010103	15009/16X12H3NO1	287
1010106	15009/16X12H3NO2	287
1010108	15009/16X12H3NO3	287
1010110	15009/16X18H3NO1	287
1010113	15009/16X18H3NO2	287
1010114	15009/16X18H5NO2	287
1010116	15009/16X18H3NO3	287
1010118	15005/8X11H3NO1	287
1010121	15005/8X11H3NO2	287
1010123	15005/8X11H3NO3	287
1010125	15005/8X18H3NO1	287
1010127	15005/8X18H2NO2	287
1010128	15005/8X18H3NO2	287
1010131	15005/8X18H3NO3	287
1010132	15005/8X18H5NO3	287
1010139	15003/4X10H3NO1	287
1010141	15003/4X10H2NO2	287
1010142	15003/4X10H3NO2	287
1010144	15003/4X10H3NO3	287
1010146	15003/4X16H3NO1	287
1010149	15003/4X16H3NO2	287
1010152	15003/4X16H3NO3	287
1010154	15007/8X9H4NO1	287
1010157	15007/8X9H4NO2	287
1010159	15007/8X9H4NO3	287
1010160	15007/8X14H4NO1	287
1010163	15007/8X14H4NO2	287
1010166	15007/8X14H4NO3	287
1010167	15001X8H4NO1	287
1010170	15001X8H4NO2	287
1010172	15001X8H4NO3	287
1010173	15001X12H4NO1	287
1010174	15001X12H4NO2	287
1010175	15001X12H4NO3	287
1010176	15001X14H4NO1	287
1010178	15001X14H4NO2	287
1010181	15001X14H4NO3	287
1010182	15001.1/8X7H4NO1	287
1010183	15001.1/8X7H4NO2	287
1010184	15001.1/8X7H4NO3	287
1010185	15001.1/8X12H4NO1	287
1010186	15001.1/8X12H4NO2	287
1010187	15001.1/8X12H4NO3	287
1010188	15001.1/4X7H4NO1	287
1010189	15001.1/4X7H4NO2	287
1010190	15001.1/4X7H4NO3	287
1010191	15001.1/4X12H4NO1	287
1010192	15001.1/4X12H4NO2	287
1010193	15001.1/4X12H4NO3	287
1010194	15001.3/8X6H4NO1	287
1010195	15001.3/8X6H4NO2	287
1010196	15001.3/8X6H4NO3	287
1010197	15001.3/8X12H4NO1	287
1010198	15001.3/8X12H4NO2	287
1010199	15001.3/8X12H4NO3	287
1010200	15001.1/2X6H4NO1	287
1010201	15001.1/2X6H4NO2	287
1010202	15001.1/2X6H4NO3	287
1010203	15001.1/2X12H4NO1	287
1010204	15001.1/2X12H4NO2	287
1010205	15001.1/2X12H4NO3	287
1010206	15951/4X20NO2	298
1010207	15951/4X20NO3	298
1010208	15951/4X28NO2	298
1010209	15951/4X28NO3	298
1010210	15955/16X18NO2	298
1010211	15955/16X18NO3	298
1010216	15081/4X20NO2	298
1010219	15081/4X20NO3	298
1010223	15081/4X28NO2	298
1010226	15081/4X28NO3	298
1010230	15085/16X18NO2	298
1010233	15085/16X18NO3	298
1010236	15085/16X24NO2	298
1010237	15085/16X24NO3	298
1010240	15083/8X16NO2	298
1010243	15083/8X16NO3	298
1010246	15083/8X24NO2	298
1010247	15083/8X24NO3	298
1010248	15087/16X14NO2	298
1010250	15087/16X20NO2	298
1010252	15081/2X13NO2	298
1010253	15081/2X13NO3	298
1010254	15081/2X20NO2	298
1010256	15991/4X20NO2	303
1010257	15991/4X20NO3	303
1010260	15995/16X18NO2	303
1010261	15995/16X18NO3	303
1010262	15995/16X24NO2	303
1010263	15995/16X24NO3	304
1010264	15993/8X16NO2	304
1010265	15993/8X16NO3	304
1010266	15993/8X24NO2	304
1010267	15993/8X24NO3	304
1010268	15997/16X14NO2	304
1010270	15997/16X20NO2	304
1010271	15997/16X20NO3	304
1010272	15991/2X13NO2	304
1010273	15991/2X13NO3	304
1010274	15991/2X20NO2	304
1010275	15991/2X20NO3	304
1010277	15999/16X12NO3	304
1010279	15999/16X18NO3	304
1010280	15995/8X11NO2	304
1010281	15995/8X11NO3	304
1010282	15995/8X18NO2	304
1010283	15995/8X18NO3	304
1010285	15993/4X10NO3	304
1010286	15993/4X16NO2	304
1010287	15993/4X16NO3	304
1010290	15851/4X20H12FLNO2	307
1010291	15851/4X20H22FLNO2	307
1010292	15851/4X20H32FLNO2	307
1010293	15851/4X20H52FLNO2	307
1010294	15851/4X20H32FLNO3	307
1010295	15851/4X20H33FLNO2	307
1010296	15851/4X20H53FLNO2	307
1010297	15851/4X28H12FLNO2	307
1010298	15851/4X28H22FLNO2	307
1010299	15851/4X28H32FLNO2	307
1010300	15851/4X28H42FLNO2	307
1010301	15851/4X28H32FLNO3	307
1010302	15851/4X28H23FLNO2	307
1010303	15851/4X28H43FLNO2	307
1010304	15855/16X18H12FLNO2	307
1010305	15855/16X18H22FLNO2	307
1010306	15855/16X18H32FLNO2	307
1010307	15855/16X18H52FLNO2	307
1010308	15855/16X18H32FLNO3	307
1010309	15855/16X18H33FLNO2	307
1010310	15855/16X18H53FLNO2	307
1010311	15855/16X24H12FLNO2	307
1010312	15855/16X24H22FLNO2	307
1010313	15855/16X24H32FLNO2	307
1010315	15855/16X24H32FLNO3	307
1010316	15855/16X24H23FLNO2	307
1010317	15855/16X24H43FLNO2	307
1010318	15853/8X16H13FLNO2	307
1010319	15853/8X16H23FLNO2	307
1010320	15853/8X16H33FLNO2	307
1010321	15853/8X16H53FLNO2	307
1010324	15853/8X24H33FLNO2	307
1010325	15853/8X24H43FLNO2	307
1010327	15857/16X14H23FLNO2	307
1010328	15857/16X14H33FLNO2	307
1010329	15857/16X14H53FLNO2	307
1010331	15857/16X20H23FLNO2	307
1010332	15857/16X20H33FLNO2	307
1010333	15857/16X20H53FLNO2	307
1010334	15851/2X13H13FLNO2	307
1010335	15851/2X13H23FLNO2	307
1010336	15851/2X13H33FLNO2	307
1010337	15851/2X13H53FLNO2	307
1010338	15851/2X20H13FLNO2	307
1010339	15851/2X20H23FLNO2	307
1010340	15851/2X20H33FLNO2	307
1010341	15851/2X20H53FLNO2	307
1010342	15855/8X11H33FLNO2	307
1010343	15855/8X11H53FLNO2	307
1010344	15853/4X10H33FLNO2	307
1010345	15853/4X10H53FLNO2	307
1010346	15861/4X202FLNO2	317
1010347	15861/4X202FLNO3	317
1010348	15861/4X203FLNO2	317
1010349	15861/4X203FLNO3	317
1010350	15861/4X282FLNO2	317
1010351	15861/4X282FLNO3	317
1010352	15861/4X283FLNO2	317
1010353	15861/4X283FLNO3	317
1010354	15865/16X183FLNO2	317
1010355	15865/16X183FLNO3	317
1010356	15865/16X243FLNO2	317
1010357	15865/16X243FLNO3	317
1010358	15863/8X163FLNO2	317
1010359	15863/8X163FLNO3	317
1010360	15863/8X243FLNO2	317
1010361	15863/8X243FLNO3	317
1010362	15867/16X143FLNO2	317
1010363	15867/16X143FLNO3	317
1010366	15861/2X133FLNO2	317
1010367	15861/2X133FLNO3	317
1010368	15861/2X203FLNO2	317
1010369	15861/2X203FLNO3	317
1010375	U15111/4	343
1010376	U15115/16	343
1010377	U15113/8	343
1010378	U15111/2	343
1010379	15191/4X20X6	344
1010380	15191/4X20X8	344
1010381	15195/16X18X6	344
1010382	15195/16X18X8	344
1010383	15193/8X16X6	344
1010384	15193/8X16X8	344
1010385	15193/8X16X10	344
1010388	15191/2X13X6	344
1010389	15191/2X13X8	344
1010390	15191/2X13X10	344
1010392	15195/8X11X6	344
1010393	15195/8X11X8	344
1010394	15195/8X11X10	344
1010396	15193/4X10X10	344
1010398	15881/4X20NO2	318
1010399	15881/4X20NO3	318
1010400	15881/4X28NO2	318
1010401	15881/4X28NO3	318
1010402	15885/16X18NO2	318
1010403	15885/16X18NO3	318
1010404	15885/16X24NO2	318
1010405	15885/16X24NO3	318
1010406	15883/8X16NO2	318
1010407	15883/8X16NO3	318
1010408	15883/8X24NO2	318
1010409	15883/8X24NO3	318
1010410	15887/16X14NO2	318
1010411	15887/16X14NO3	318
1010412	15887/16X20NO2	318
1010413	15887/16X20NO3	318
1010414	15881/2X13NO2	318
1010415	15881/2X13NO3	318
1010416	15881/2X20NO2	318
1010417	15881/2X20NO3	318
1010419	15724-40H2NO2	341
1010421	15724-40H2NO3	341
1010427	15726-32H3NO2	341
1010429	15726-32H3NO3	341
1010435	15728-32H3NO2	341
1010437	15728-32H3NO3	341
1010438	157210-24H2NO2	341
1010440	157210-24H2NO3	341
1010442	157210-32H2NO2	341
1010443	157210-32H3NO2	341
1010444	157210-32H2NO3	341
1010445	157210-32H3NO3	341
1010451	15721/4X20H3NO2	341
1010453	15721/4X20H3NO3	341
1010456	15721/4X28H3NO3	341
1010458	15725/16X18H3NO2	341
1010466	15723/8X16H3NO2	341
1010468	15723/8X16H3NO3	341
1010474	15727/16X14H3NO2	341
1010482	15721/2X13H3NO2	341
1010491	15784-40H2	341
1010494	15786-32H2	341
1010495	15786-32H3	341
1010498	15788-32H2	341
1010499	15788-32H3	341
1010502	157810-32H2	341
1010506	15781/4X20H2	341
1010507	15781/4X20H3	341

EDP NUMBER INDEX - 1010508 - 1011283

EDP#	E-Code	Page #
1010508	15781/4X28H2	341
1010509	15781/4X28H3	341
1010518	15411/16X27	326
1010519	15411/8X27	326
1010520	15411/4X18	326
1010521	15413/8X18	326
1010522	15411/2X14	326
1010523	15413/4X14	326
1010524	15411X11.1/2	326
1010525	15411.1/4X11.1/2	326
1010526	15411.1/2X11.1/2	326
1010527	15412X11.1/2	326
1010528	15411/8X27X.0313	326
1010529	15431/16X27	334
1010530	15431/8X27	334
1010531	15431/4X18	334
1010532	15433/8X18	334
1010533	15431/2X14	334
1010534	15433/4X14	334
1010535	15431X11.1/2	334
1010539	15431/8X27X0.313	334
1010551	15681/8X27	332
1010552	15681/4X18	332
1010553	15683/8X18	332
1010554	15681/2X14	332
1010555	15683/4X14	332
1010556	15681X11.1/2	332
1010557	15681.1/4X11.1/2	332
1010558	15681.1/2X11.1/2	332
1010560	15681/8X27X0.313	332
1010561	15671/8X27	336
1010562	15671/4X18	336
1010563	15673/8X18	336
1010564	15671/2X14	336
1010565	15673/4X14	336
1010566	15671X11.1/2	336
1010570	15671/8X27X0.313	336
1010581	15421/8X27	338
1010582	15421/4X18	338
1010583	15423/8X18	338
1010584	15421/2X14	338
1010585	15423/4X14	338
1010586	15421X11.1/2	338
1010587	15421/8X27X0.313	338
1010588	15921/8X27	338
1010589	15921/4X18	338
1010590	15923/8X18	338
1010591	15921/2X14	338
1010592	15921/8X27X0.313	338
1010593	15280-80H12FLNO1	287
1010594	15280-80H12FLNO2	287
1010595	15280-80H22FLNO2	287
1010596	15280-80H12FLNO3	287
1010597	15280-80H22FLNO3	287
1010598	15281-64H12FLNO1	287
1010599	15281-64H12FLNO2	287
1010601	15281-64H12FLNO3	287
1010603	15281-72H12FLNO1	287
1010604	15281-72H12FLNO2	287
1010606	15281-72H12FLNO3	287
1010607	15281-72H22FLNO3	287
1010608	15282-56H13FLNO1	287
1010609	15282-56H23FLNO1	287
1010610	15282-56H13FLNO2	287
1010611	15282-56H23FLNO2	287
1010612	15282-56H13FLNO3	287
1010613	15282-56H23FLNO3	287
1010615	15282-56H22FLNO2	287
1010617	15282-56H22FLNO3	287
1010625	15283-48H23FLNO1	287
1010627	15283-48H23FLNO2	287
1010629	15283-48H23FLNO3	287
1010631	15283-48H22FLNO2	287
1010634	15283-56H23FLNO1	287
1010636	15283-56H23FLNO2	287
1010637	15283-56H23FLNO3	287
1010643	15284-40H13FLNO1	287
1010644	15284-40H23FLNO1	287
1010645	15284-40H13FLNO2	287
1010646	15284-40H23FLNO2	287
1010647	15284-40H13FLNO3	287
1010648	15284-40H23FLNO3	287
1010649	15284-40H12FLNO2	287
1010650	15284-40H22FLNO2	287
1010652	15284-40H22FLNO3	287
1010653	15284-48H23FLNO1	287
1010655	15284-48H23FLNO2	287
1010656	15284-48H23FLNO3	287
1010660	15285-40H23FLNO1	287
1010662	15285-40H23FLNO2	287
1010664	15285-40H23FLNO3	287
1010669	15285-44H23FLNO1	287
1010671	15285-44H23FLNO2	287
1010672	15285-44H23FLNO3	287
1010673	15285-44H22FLNO2	287
1010675	15286-32H13FLNO1	287
1010676	15286-32H23FLNO1	287
1010677	15286-32H33FLNO1	287
1010678	15286-32H13FLNO2	287
1010679	15286-32H23FLNO2	287
1010680	15286-32H33FLNO2	287
1010681	15286-32H13FLNO3	287
1010682	15286-32H23FLNO3	287
1010683	15286-32H33FLNO3	287
1010685	15286-32H22FLNO2	287
1010686	15286-32H32FLNO2	287
1010688	15286-32H22FLNO3	287
1010689	15286-32H32FLNO3	287
1010690	15286-40H23FLNO1	287
1010692	15286-40H23FLNO2	287
1010693	15286-40H23FLNO3	287
1010697	15288-32H24FLNO1	287
1010698	15288-32H34FLNO1	287
1010699	15288-32H14FLNO2	287
1010700	15288-32H24FLNO2	287
1010701	15288-32H34FLNO2	287
1010703	15288-32H24FLNO3	287
1010704	15288-32H34FLNO3	287
1010706	15288-32H22FLNO2	287
1010707	15288-32H32FLNO2	287
1010709	15288-32H22FLNO3	287
1010710	15288-32H32FLNO3	287
1010712	15288-32H23FLNO2	287
1010713	15288-32H33FLNO2	287
1010715	15288-32H23FLNO3	287
1010716	15288-32H33FLNO3	287
1010717	15288-36H24FLNO1	287
1010719	15288-36H24FLNO2	287
1010720	15288-36H24FLNO3	287
1010724	152810-24H24FLNO1	287
1010725	152810-24H34FLNO1	287
1010726	152810-24H14FLNO2	287
1010727	152810-24H24FLNO2	287
1010728	152810-24H34FLNO2	287
1010730	152810-24H24FLNO3	287
1010731	152810-24H34FLNO3	287
1010733	152810-24H22FLNO2	287
1010734	152810-24H32FLNO2	287
1010736	152810-24H22FLNO3	287
1010737	152810-24H32FLNO3	287
1010739	152810-24H23FLNO2	287
1010740	152810-24H33FLNO2	287
1010743	152810-24H33FLNO3	287
1010745	152810-32H24FLNO1	287
1010746	152810-32H34FLNO1	287
1010748	152810-32H24FLNO2	287
1010749	152810-32H34FLNO2	287
1010751	152810-32H24FLNO3	287
1010752	152810-32H34FLNO3	287
1010754	152810-32H22FLNO2	287
1010755	152810-32H32FLNO2	287
1010757	152810-32H22FLNO3	287
1010758	152810-32H32FLNO3	287
1010760	152810-32H23FLNO2	287
1010761	152810-32H33FLNO2	287
1010763	152810-32H23FLNO3	287
1010764	152810-32H33FLNO3	287
1010765	152812-24H34FLNO1	287
1010767	152812-24H34FLNO2	287
1010768	152812-24H34FLNO3	287
1010769	152812-28H34FLNO1	287
1010771	152812-28H34FLNO2	287
1010772	152812-28H34FLNO3	287
1010775	1534NR0-80H1NO2	311
1010776	1534NR0-80H2NO2	311
1010778	1534NR0-80H2NO3	311
1010779	1534NR1-64H1NO2	311
1010780	1534NR1-64H2NO2	311
1010783	1534NR1-72H1NO2	311
1010784	1534NR1-72H2NO2	311
1010787	1534NR2-56H1NO2	311
1010788	1534NR2-56H2NO2	311
1010790	1534NR2-56H2NO3	311
1010791	1534NR2-64H1NO2	311
1010792	1534NR2-64H2NO2	311
1010796	1534NR3-48H2NO2	311
1010798	1534NR3-48H2NO3	311
1010799	1534NR3-56H1NO2	311
1010800	1534NR3-56H2NO2	311
1010803	1534NR4-36H2NO2	311
1010804	1534NR4-40H1NO2	311
1010805	1534NR4-40H2NO2	311
1010807	1534NR4-40H2NO3	311
1010809	1534NR4-48H2NO2	311
1010811	1534NR4-48H2NO3	311
1010813	1534NR5-40H2NO2	311
1010815	1534NR5-40H2NO3	311
1010817	1534NR5-44H2NO2	311
1010818	1534NR6-32H1NO2	311
1010819	1534NR6-32H2NO2	311
1010820	1534NR6-32H3NO2	311
1010822	1534NR6-32H2NO3	311
1010823	1534NR6-32H3NO3	311
1010825	1534NR6-40H2NO2	311
1010827	1534NR6-40H2NO3	311
1010828	1534NR8-32H1NO2	311
1010829	1534NR8-32H2NO2	311
1010830	1534NR8-32H3NO2	311
1010832	1534NR8-32H2NO3	311
1010833	1534NR8-32H3NO3	311
1010835	1534NR8-36H2NO2	311
1010837	1534NR10-24H1NO2	311
1010838	1534NR10-24H2NO2	311
1010839	1534NR10-24H3NO2	311
1010841	1534NR10-24H2NO3	311
1010842	1534NR10-24H3NO3	311
1010843	1534NR10-32H1NO2	311
1010844	1534NR10-32H2NO2	311
1010845	1534NR10-32H3NO2	311
1010847	1534NR10-32H2NO3	311
1010848	1534NR10-32H3NO3	311
1010853	1534NR12-28H3NO2	311
1010877	15936-32	316
1010879	15938-32	316
1010881	159310-24	316
1010883	159310-32	316
1010887	15874-40NO2	318
1010888	15874-40NO3	318
1010890	15875-40NO3	318
1010891	15876-32NO2	318
1010892	15876-32NO3	318
1010895	15878-32NO2	318
1010896	15878-32NO3	318
1010897	158710-24NO2	318
1010898	158710-24NO3	318
1010899	158710-32NO2	318
1010900	158710-32NO3	318
1010905	15824-40NO2	317
1010906	15824-40NO3	317
1010909	15826-32NO2	317
1010910	15826-32NO3	317
1010913	15828-32NO2	317
1010914	15828-32NO3	317
1010915	158210-24NO2	317
1010916	158210-24NO3	317
1010917	158210-32NO2	317
1010918	158210-32NO3	317
1010920	15481/16X27	331
1010921	15491/16X27	335
1010922	15481/8X27	331
1010923	15491/8X27	335
1010924	15481/8X27X0.313	331
1010925	15491/8X27X0.313	335
1010926	15481/4X18	331
1010927	15491/4X18	335
1010928	15483/8X18	331
1010929	15493/8X18	335
1010930	15481/2X14	331
1010931	15491/2X14	335
1010932	15483/4X14	331
1010933	15493/4X14	335
1010934	15481X11.1/2	331
1010935	15491X11.1/2	335
1010937	15906-32NO2	319
1010938	15906-32NO3	319
1010939	15906-40NO2	319
1010940	15906-40NO3	319
1010941	15908-32NO2	319
1010942	15908-32NO3	319
1010943	15908-36NO2	319
1010944	15908-36NO3	319
1010945	159010-24NO2	319
1010946	159010-24NO3	319
1010947	159010-32NO2	319
1010948	159010-32NO3	319
1010953	15911/4X20NO2	319
1010954	15911/4X20NO3	319
1010955	15911/4X28NO2	319
1010956	15911/4X28NO3	319
1010957	15915/16X18NO2	319
1010958	15915/16X18NO3	319
1010959	15915/16X24NO2	319
1010961	15913/8X16NO2	319
1010962	15913/8X16NO3	319
1010963	15913/8X24NO2	319
1010965	15917/16X14NO2	319
1010966	15917/16X14NO3	319
1010967	15917/16X20NO2	319
1010968	15917/16X20NO3	319
1010969	15911/2X13NO2	319
1010970	15911/2X13NO3	319
1010971	15911/2X20NO2	319
1011070	15923/4X14	338
1011071	1534NR12-24H3NO2	311
1011072	1534NR12-24H3NO3	311
1011102	16344-40	309
1011104	16346-32	309
1011105	16348-32	309
1011106	163410-32	309
1011256	16001/4X20NO2	303
1011257	16001/4X20NO3	303
1011258	16001/4X28NO2	303
1011259	16001/4X28NO3	303
1011260	16005/16X18NO2	303
1011261	16005/16X18NO3	303
1011262	16005/16X24NO2	303
1011263	16005/16X24NO3	303
1011264	16003/8X16NO2	303
1011265	16003/8X16NO3	303
1011266	16003/8X24NO2	303
1011267	16003/8X24NO3	303
1011268	16007/16X14NO2	303
1011269	16007/16X14NO3	303
1011270	16007/16X20NO2	303
1011271	16007/16X20NO3	303
1011272	16001/2X13NO2	303
1011273	16001/2X13NO3	303
1011274	16001/2X20NO2	303
1011275	16001/2X20NO3	303
1011276	16009/16X12NO2	303
1011277	16009/16X12NO3	303
1011278	16009/16X18NO2	303
1011279	16009/16X18NO3	303
1011280	16005/8X11NO2	303
1011281	16005/8X11NO3	303
1011283	16005/8X18NO3	303

EDP NUMBER INDEX - 1011285 - 1013320

EDP#	E-Code	Page #
1011285	16003/4X10NO3	303
1011287	16003/4X16NO3	303
1011748	15001/4	301
1011749	15005/16	301
1011750	15003/8	301
1011752	15001/2	301
1011753	15005/8	301
1011754	15851/4	316
1011755	15855/16	316
1011756	15853/8	316
1011757	15857/16	316
1011758	15851/2	316
1011759	15855/8	316
1011760	15441/16X27	329
1011761	15441/8X27	329
1011762	15441/4X18	329
1011763	15443/8X18	329
1011764	15441/2X14	329
1011765	15443/4X14	329
1011766	15441X11.1/2	329
1011767	15441.1/4X11.1/2	329
1011772	1500L1/4X20	296
1011775	1500L1/4X28	296
1011778	1500L5/16X18	296
1011781	1500L5/16X24	296
1011784	1500L3/8X16	296
1011787	1500L3/8X24	296
1011790	1500L7/16X14	296
1011793	1500L7/16X20	296
1011796	1500L1/2X13	296
1011799	1500L1/2X20	296
1011802	1500L9/16X12	296
1011805	1500L9/16X18	296
1011808	1500L5/8X11	296
1011811	1500L5/8X18	296
1011820	1500L3/4X10	296
1011823	1500L3/4X16	296
1011826	1500L7/8X9	296
1011829	1500L7/8X14	296
1011832	1500L1X8	296
1011835	1500L1X12	296
1011838	1500L1X14	296
1012276	1599M6	304
1012278	1599M8	304
1012280	1599M10	304
1012282	1599M12	304
1012356	15345-40H2NO2	306
1012357	15345-40H2NO3	306
1012358	15345-44H2NO2	306
1012359	15346-32H1NO2	306
1012360	15346-32H2NO2	306
1012361	15346-32H3NO2	306
1012363	15346-32H2NO3	306
1012364	15346-32H3NO3	306
1012366	15346-40H2NO2	306
1012367	15346-40H2NO3	306
1012368	15348-32H1NO2	306
1012369	15348-32H2NO2	306
1012370	15348-32H3NO2	306
1012372	15348-32H2NO3	306
1012373	15348-32H3NO3	306
1012375	15348-36H2NO2	306
1012376	153410-24H1NO2	306
1012377	153410-24H2NO2	306
1012378	153410-24H3NO2	306
1012379	153410-24H2NO3	306
1012380	153410-24H3NO3	306
1012381	153410-32H1NO2	306
1012382	153410-32H2NO2	306
1012383	153410-32H3NO2	306
1012385	153410-32H2NO3	306
1012386	153410-32H3NO3	306
1012388	153412-28H3NO2	306
1012389	153412-24H3NO2	306
1012408	1700M1.6X.35NO1	299
1012409	1700M1.6X.35NO2	299
1012410	1700M1.6X.35NO3	299
1012411	1700M1.8X.35NO1	299
1012412	1700M1.8X.35NO2	299
1012414	1700M2X.4NO1	299
1012415	1700M2X.4NO2	299
1012416	1700M2X.4NO3	299
1012421	1700M2.3X.4NO2	299
1012422	1700M2.3X.4NO3	299
1012423	1700M2.5X.45NO1	299
1012424	1700M2.5X.45NO2	299
1012425	1700M2.5X.45NO3	299
1012426	1700M2.6X.45NO1	299
1012427	1700M2.6X.45NO2	299
1012428	1700M2.6X.45NO3	299
1012432	1700M3X.5NO1	299
1012433	1700M3X.5NO2	299
1012434	1700M3X.5NO3	299
1012435	1700M3.5X.6NO1	299
1012436	1700M3.5X.6NO2	299
1012437	1700M3.5X.6NO3	299
1012441	1700M4X.7NO1	299
1012442	1700M4X.7NO2	299
1012443	1700M4X.7NO3	299
1012444	1700M4.5X.75NO1	299
1012445	1700M4.5X.75NO2	299
1012446	1700M4.5X.75NO3	299
1012453	1700M5X.8NO1	299
1012454	1700M5X.8NO2	299
1012455	1700M5X.8NO3	299
1012459	1700M6X1.0NO1	299
1012460	1700M6X1.0NO2	299
1012461	1700M6X1.0NO3	299
1012465	1700M7X1.0NO1	299
1012466	1700M7X1.0NO2	299
1012467	1700M7X1.0NO3	299
1012468	1700M8X1.0NO1	299
1012469	1700M8X1.0NO2	299
1012470	1700M8X1.0NO3	299
1012471	1700M8X1.25NO1	299
1012472	1700M8X1.25NO2	299
1012473	1700M8X1.25NO3	299
1012478	1700M9X1.25NO2	299
1012479	1700M9X1.25NO3	299
1012480	1700M10X1.25NO1	299
1012481	1700M10X1.25NO2	299
1012482	1700M10X1.25NO3	299
1012483	1700M10X1.5NO1	299
1012484	1700M10X1.5NO2	299
1012485	1700M10X1.5NO3	299
1012493	1700M11X1.5NO2	299
1012494	1700M11X1.5NO3	299
1012495	1700M12X1.75NO1	299
1012496	1700M12X1.75NO2	299
1012497	1700M12X1.75NO3	299
1012498	1700M12X1.25NO1	299
1012499	1700M12X1.25NO2	299
1012500	1700M12X1.25NO3	299
1012501	1700M14X1.5NO1	299
1012502	1700M14X1.5NO2	299
1012503	1700M14X1.5NO3	299
1012504	1700M14X2.0NO1	299
1012505	1700M14X2.0NO2	299
1012506	1700M14X2.0NO3	299
1012513	1700M16X1.5NO1	299
1012514	1700M16X1.5NO2	299
1012515	1700M16X1.5NO3	299
1012516	1700M16X2.0NO1	299
1012517	1700M16X2.0NO2	299
1012518	1700M16X2.0NO3	299
1012522	1700M18X1.5NO1	299
1012523	1700M18X1.5NO2	299
1012524	1700M18X1.5NO3	299
1012525	1700M18X2.5NO1	299
1012526	1700M18X2.5NO2	299
1012527	1700M18X2.5NO3	299
1012534	1700M20X1.5NO1	299
1012535	1700M20X1.5NO2	299
1012536	1700M20X1.5NO3	299
1012537	1700M20X2.5NO1	299
1012538	1700M20X2.5NO2	299
1012539	1700M20X2.5NO3	299
1012540	1700M22X1.5NO1	299
1012541	1700M22X1.5NO2	299
1012542	1700M22X1.5NO3	299
1012543	1700M22X2.5NO1	299
1012544	1700M22X2.5NO2	299
1012545	1700M22X2.5NO3	299
1012546	1700M24X2.0NO1	299
1012547	1700M24X2.0NO2	299
1012548	1700M24X2.0NO3	299
1012555	1700M24X3.0NO1	299
1012556	1700M24X3.0NO2	299
1012557	1700M24X3.0NO3	299
1012570	1700M30X3.5NO1	299
1012571	1700M30X3.5NO2	299
1012572	1700M30X3.5NO3	299
1012574	1700M36X4.0NO2	299
1012575	1700M36X4.0NO3	299
1012659	1785M2	310
1012661	1785M2.3	310
1012662	1785M2.5	310
1012663	1785M2.6	310
1012664	1785M3	310
1012666	1785M3.5	310
1012668	1785M4	310
1012669	1785M4.5	310
1012672	1785M5	310
1012674	1785M6	310
1012676	1785M7	310
1012678	1785M8	310
1012680	1785M9	310
1012682	1785M10	310
1012685	1785M11	310
1012686	1785M12	310
1012689	1785M14	310
1012693	1785M16	310
1012696	1785M18	310
1012699	153412-24H3NO3	306
1012700	15345-40H1NO2	306
1012774	15855/8X18H33FLNO2	307
1012775	15853/4X16H33FLNO2	307
1012813	1585NR1/4X20H12FLNO2	313
1012814	1585NR1/4X20H22FLNO2	313
1012815	1585NR1/4X20H32FLNO2	313
1012816	1585NR1/4X20H52FLNO2	313
1012817	1585NR1/4X20H32FLNO3	313
1012818	1585NR1/4X20H33FLNO2	313
1012820	1585NR1/4X28H12FLNO2	313
1012821	1585NR1/4X28H22FLNO2	313
1012822	1585NR1/4X28H32FLNO2	313
1012823	1585NR1/4X28H42FLNO2	313
1012824	1585NR1/4X28H32FLNO3	313
1012828	1585NR5/16X18H22FLNO2	313
1012829	1585NR5/16X18H32FLNO2	313
1012830	1585NR5/16X18H52FLNO2	313
1012832	1585NR5/16X18H33FLNO2	313
1012833	1585NR5/16X18H53FLNO2	313
1012836	1585NR5/16X24H32FLNO2	313
1012842	1585NR3/8X16H23FLNO2	313
1012843	1585NR3/8X16H33FLNO2	313
1012844	1585NR3/8X16H53FLNO2	313
1012845	1585NR3/8X24H13FLNO2	313
1012847	1585NR3/8X24H33FLNO2	313
1012849	1585NR7/16X14H23FLNO2	313
1012850	1585NR7/16X14H33FLNO2	313
1012851	1585NR7/16X14H53FLNO2	313
1012853	1585NR7/16X20H33FLNO2	313
1012856	1585NR1/2X13H23FLNO2	313
1012857	1585NR1/2X13H33FLNO2	313
1012858	1585NR1/2X13H53FLNO2	313
1012859	1585NR1/2X20H13FLNO2	313
1012860	1585NR1/2X20H23FLNO2	313
1012861	1585NR1/2X20H33FLNO2	313
1012862	1585NR1/2X20H53FLNO2	313
1012863	1585NR5/8X11H33FLNO2	313
1012864	1585NR5/8X11H53FLNO2	313
1012865	1585NR3/4X10H33FLNO2	313
1012866	1585NR3/4X10H53FLNO2	313
1012867	1585NR5/8X18H33FLNO2	313
1012868	1585NR3/4X16H33FLNO2	313
1012870	15451/8X27	330
1012871	15451/4X18	330
1012872	15453/8X18	330
1012873	15451/2X14	330
1012874	15453/4X14	330
1012875	15451X11.1/2	330
1012879	15451/8X27X0.313	330
1012890	1785NRM1.6	314
1012891	1785NRM2	314
1012893	1785NRM2.5	314
1012896	1785NRM3	314
1012897	1785NRM3.5	314
1012898	1785NRM4	314
1012899	1785NRM4.5	314
1012900	1785NRM5	314
1012901	1785NRM6	314
1012902	1785NRM7	314
1012903	1785NRM8	314
1012904	1785NRM10	314
1012905	1785NRM12	314
1012906	1785NRM14	314
1012907	1785NRM16	314
1012909	1785NRM20	314
1012920	1788M3X.5NO2	320
1012923	1788M4X.7NO2	320
1012925	1788M5X.8NO2	320
1012926	1788M6X1.0NO2	320
1012928	1788M8X1.25NO2	320
1012930	1788M10X1.5NO2	320
1012932	1788M12X1.75NO2	320
1012940	1788M3X.5NO3	320
1012942	1788M3.5X.6NO3	320
1012943	1788M4X.7NO3	320
1012945	1788M5X.8NO3	320
1012946	1788M6X1.0NO3	320
1012948	1788M8X1.25NO3	320
1012950	1788M10X1.5NO3	320
1012952	1788M12X1.75NO3	320
1013037	19854-40	266
1013038	19854-48	266
1013039	19855-40	266
1013040	19855-44	266
1013041	19856-32	266
1013042	19856-40	266
1013043	19858-32	266
1013044	19858-36	266
1013045	198510-24	266
1013046	198510-32	266
1013048	198512-28	266
1013049	19851/4X20	266
1013050	19851/4X28	266
1013051	19855/16X18	266
1013052	19855/16X24	266
1013053	19853/8X16	266
1013054	19853/8X24	266
1013055	19857/16X14	266
1013056	19857/16X20	266
1013057	19851/2X13	266
1013058	19851/2X20	266
1013059	19859/16X12	266
1013060	19859/16X18	266
1013061	19855/8X11	266
1013062	19855/8X18	266
1013065	19853/4X10	266
1013066	19853/4X16	266
1013067	19857/8X9	266
1013068	19857/8X14	266
1013069	19851X8	266
1013155	15001.1/4X7H9NO2	287
1013310	15051.1/8NO1	302
1013311	15051.1/8NO2	302
1013312	15051.1/8NO3	302
1013313	15051.1/4NO1	302
1013314	15051.1/4NO2	302
1013315	15051.1/4NO3	302
1013316	15051.3/8NO1	302
1013317	15051.3/8NO2	302
1013318	15051.3/8NO3	302
1013319	15051.1/2NO1	302
1013320	15051.1/2NO2	302

EDP NUMBER INDEX - 1013321- 1410087

EDP#	E-Code	Page #
1013321	15051.1/2NO3	302
1013322	15051.5/8NO1	302
1013323	15051.5/8NO2	302
1013324	15051.5/8NO3	302
1013325	15051.3/4NO1	302
1013326	15051.3/4NO2	302
1013327	15051.3/4NO3	302
1013328	15051.7/8NO1	302
1013329	15051.7/8NO2	302
1013330	15051.7/8NO3	302
1013331	15052NO1	302
1013332	15052NO2	302
1013333	15052NO3	302
1013352	15052.7/8NO1	302
1020002	1534NE4-40X4	315
1020004	1534NE6-32X4	315
1020006	1534NE6-32X6	315
1020008	1534NE8-32X4	315
1020010	1534NE8-32X6	315
1020012	1534NE10-24X4	315
1020014	1534NE10-24X6	315
1020016	1534NE10-32X4	315
1020018	1534NE10-32X6	315
1020020	1534NE1/4X20X4	315
1020022	1534NE1/4X20X6	315
1020024	1534NE1/4X28X4	315
1020026	1534NE1/4X28X6	315
1020028	1534NE5/16X18X4	315
1020030	1534NE5/16X18X6	315
1020032	1534NE5/16X24X4	315
1020034	1534NE5/16X24X6	315
1020036	1534NE3/8X16X4	315
1020038	1534NE3/8X16X6	315
1020040	1534NE3/8X24X4	315
1020042	1534NE3/8X24X6	315
1020044	1534NE7/16X14X6	315
1020046	1534NE7/16X20X6	315
1020048	1534NE1/2X13X6	315
1020050	1534NE1/2X20X6	315
1050006	1500A1/4X20	290
1050021	1500A1/4X28	290
1050028	1500A5/16X18	290
1050039	1500A5/16X24	290
1050050	1500A3/8X16	290
1050061	1500A3/8X24	290
1050070	1500A7/16X14	290
1050079	1500A7/16X20	290
1050088	1500A1/2X13	290
1050097	1500A1/2X20	290
1050106	1500A9/16X12	290
1050113	1500A9/16X18	290
1050121	1500A5/8X11	290
1050128	1500A5/8X18	290
1050142	1500A3/4X10	290
1050149	1500A3/4X16	290
1050157	1500A7/8X9	290
1050163	1500A7/8X14	290
1050170	1500A1X8	290
1050292	1585A1/4X20	307
1050299	1585A1/4X28	307
1050306	1585A5/16X18	307
1050313	1585A5/16X24	307
1050320	1585A3/8X16	307
1050324	1585A3/8X24	307
1050328	1585A7/16X14	307
1050332	1585A7/16X20	307
1050336	1585A1/2X13	307
1050340	1585A1/2X20	307
1050342	1585A5/8X11	307
1050344	1585A3/4X10	307
1052775	1585A3/4X16	307
1052869	1545A1/16	330
1052870	1545A1/8	330
1052871	1545A1/4	330
1052872	1545A3/8	330
1052873	1545A1/2	330
1052874	1545A3/4	330
1060006	TN15001/4X20NO2	291
1060017	TN15001/4X28NO2	291
1060028	TN15005/16X18NO2	291
1060039	TN15005/16X24NO2	291
1060050	TN15003/8X16NO2	291
1060061	TN15003/8X24NO2	291
1060070	TN15007/16X14NO2	291
1060079	TN15007/16X20NO2	291
1060088	TN15001/2X13NO2	291
1060092	TN15001/2X13NO3	291
1060097	TN15001/2X20NO2	291
1060121	TN15005/8X11NO2	291
1060123	TN15005/8X11NO3	291
1060131	TN15005/8X18NO3	291
1060144	TN15003/4X10NO3	291
1060152	TN15003/4X16NO3	291
1060157	TN15007/8X9NO2	291
1060292	TN15851/4-20H32FL	307
1060293	TN15851/4-20H52FL	307
1060295	TN15851/4-20H33FL	307
1060296	TN15851/4-20H53FL	307
1060299	TN15851/4-28H32FL	307
1060306	TN15855/16-18H32FL	307
1060309	TN15855/16-18H33FL	307
1060310	TN15855/16-18H53FL	307
1060313	TN15855/16-24H32FL	307
1060320	TN15853/8-16H33FL	307
1060321	TN15853/8-16H53FL	307
1060324	TN15853/8-24H33FL	307
1060328	TN15857/16-14H33FL	307
1060332	TN15857/16-20H33FL	307
1060336	TN15851/2-13H33FL	307
1060340	TN15851/2-20H33FL	307
1060519	TN15411/8	326
1060520	TN15411/4	326
1060521	TN15413/8	326
1060522	TN15411/2	326
1060523	TN15413/4	326
1060530	TN15431/8	334
1060531	TN15431/4	334
1060532	TN15433/8	334
1060533	TN15431/2	334
1060534	TN15433/4	334
1060805	TN15344-40	306
1062361	TN15346-32	306
1062370	TN15348-32	306
1062378	TN153410-24	306
1062383	TN153410-32	306
1062389	TN153412-24	306
1062668	TN1785M4	310
1062672	TN1785M5	310
1062674	TN1785M6	310
1062678	TN1785M8	310
1062682	TN1785M10	310
1062686	TN1785M12	310
1110010	19944-40	345
1110020	19945-40	345
1110024	19945-44	345
1110030	19946-32	345
1110040	19948-32	345
1110044	19948-36	345
1110050	199410-24	345
1110054	199410-32	345
1110060	199412-24	345
1110064	199412-28	345
1110080	19941/4X20	345
1110084	19941/4X28	345
1110090	19945/16X18	345
1110094	19945/16X24	345
1110100	19943/8X16	345
1110104	19943/8X24	345
1110110	19947/16X14	345
1110114	19947/16X20	345
1110120	19941/2X13	345
1110124	19941/2X20	345
1310004	15802-56H2NO3	321
1310005	15802-56H3NO3	321
1310012	15804-40H3NO2	321
1310014	15804-40H3NO3	321
1310015	15804-40H5NO3	321
1310016	15804-48H3NO2	321
1310018	15804-48H3NO3	321
1310022	15805-40H3NO3	321
1310028	15806-32H3NO2	321
1310029	15806-32H5NO2	321
1310031	15806-32H3NO3	321
1310032	15806-32H5NO3	321
1310038	15808-32H3NO2	321
1310039	15808-32H5NO2	321
1310041	15808-32H3NO3	321
1310042	15808-32H5NO3	321
1310048	158010-24H4NO2	321
1310051	158010-24H4NO3	321
1310055	158010-32H6NO2	321
1310057	158010-32H4NO3	321
1310058	158010-32H6NO3	321
1310068	15801/4X20H4NO2	321
1310069	15801/4X20H6NO2	321
1310071	15801/4X20H4NO3	321
1310074	15801/4X28H4NO2	321
1310076	15801/4X28H4NO3	321
1310078	15805/16X18H5NO2	321
1310080	15805/16X18H5NO3	321
1310081	15805/16X18H7NO3	321
1310082	15805/16X24H5NO2	321
1310084	15805/16X24H5NO3	321
1310086	15803/8X16H5NO2	321
1310088	15803/8X16H5NO3	321
1310090	15803/8X24H5NO2	321
1310092	15803/8X24H5NO3	321
1310104	15801/2X13H5NO3	321
1310110	33000-80H2NO3	323
1310111	33001-64H2NO3	323
1310112	33001-72H2NO3	323
1310113	33002-56H2NO3	323
1310114	33002-56H3NO3	323
1310121	33004-40H3NO2	323
1310122	33004-40H5NO2	323
1310123	33004-40H3NO3	323
1310124	33004-40H5NO3	323
1310127	33004-48H3NO3	323
1310131	33005-40H3NO3	323
1310132	33005-40H5NO3	323
1310137	33006-32H3NO2	323
1310138	33006-32H5NO2	323
1310140	33006-32H3NO3	323
1310141	33006-32H5NO3	323
1310147	33008-32H3NO2	323
1310148	33008-32H5NO2	323
1310150	33008-32H3NO3	323
1310151	33008-32H5NO3	323
1310157	330010-24H4NO2	323
1310158	330010-24H6NO2	323
1310160	330010-24H4NO3	323
1310161	330010-24H6NO3	323
1310163	330010-32H4NO2	323
1310164	330010-32H6NO2	323
1310166	330010-32H4NO3	323
1310167	330010-32H6NO3	323
1310169	330012-24H4NO2	323
1310171	330012-24H4NO3	323
1310177	33001/4X20H4NO2	323
1310178	33001/4X20H6NO2	323
1310180	33001/4X20H4NO3	323
1310181	33001/4X20H6NO3	323
1310183	33001/4X28H4NO2	323
1310185	33001/4X28H4NO3	323
1310187	33005/16X18H5NO2	323
1310188	33005/16X18H7NO2	323
1310189	33005/16X18H5NO3	323
1310190	33005/16X18H7NO3	323
1310193	33005/16X24H5NO3	323
1310195	33003/8X16H5NO2	323
1310196	33003/8X16H7NO2	323
1310197	33003/8X16H5NO3	323
1310198	33003/8X16H7NO3	323
1310200	33003/8X24H7NO2	323
1310202	33003/8X24H7NO3	323
1310205	33007/16X14H5NO3	323
1310211	33001/2X13H5NO2	323
1310213	33001/2X13H5NO3	323
1310215	33001/2X20H5NO2	323
1310217	33001/2X20H5NO3	323
1310400	1580M3X.5NO2	322
1310401	1580M3X.5NO3	322
1310402	1580M4X.7NO2	322
1310403	1580M4X.7NO3	322
1310404	1580M5X.8NO2	322
1310405	1580M5X.8NO3	322
1310406	1580M6X1.0NO2	322
1310407	1580M6X1.0NO3	322
1310408	1580M8X1.25NO2	322
1310409	1580M8X1.25NO3	322
1310410	1580M10X1.5NO2	322
1310411	1580M10X1.5NO3	322
1310412	1580M12X1.75NO2	322
1310413	1580M12X1.75NO3	322
1310500	3300M3X.5NO2	324
1310501	3300M3X.5NO3	324
1310502	3300M4X.7NO2	324
1310503	3300M4X.7NO3	324
1310504	3300M5X.8NO2	324
1310505	3300M5X.8NO3	324
1310506	3300M6X1.0NO2	324
1310507	3300M6X1.0NO3	324
1310508	3300M8X1.25NO2	324
1310509	3300M8X1.25NO3	324
1310510	3300M10X1.5NO2	324
1310511	3300M10X1.5NO3	324
1310512	3300M12X1.75NO2	324
1310513	3300M12X1.75NO3	324
1321002	3306E4-40X4H3	325
1321004	3306E4-40X4H5	325
1321006	3306E6-32X4H3	325
1321014	3306E8-32X4H3	325
1321016	3306E8-32X4H5	325
1321022	3306E10-24X4H4	325
1321030	3306E10-32X4H4	325
1321034	3306E10-32X6H4	325
1321038	3306E1/4X20X4H4	325
1321040	3306E1/4X20X4H6	325
1321042	3306E1/4X20X4H8	325
1321054	3306E1/4X28X4H8	325
1321062	3306E5/16X18X4H5	325
1321064	3306E5/16X18X4H7	325
1321080	3306E5/16X24X6H5	325
1410002	20100-80X13/16	356
1410006	20101-72X13/16	356
1410008	20102-56X13/16	356
1410010	20102-64X13/16	356
1410014	20103-56X13/16	356
1410016	20104-40X13/16	356
1410022	20105-40X13/16	356
1410024	20105-44X13/16	356
1410026	20106-32X13/16	356
1410027	20106-32X1	356
1410032	20108-32X13/16	356
1410033	20108-32X1	356
1410035	20108-36X13/16	356
1410038	201010-24X13/16	356
1410039	201010-24X1	356
1410041	201010-32X13/16	356
1410042	201010-32X1	356
1410044	201012-24X13/16	356
1410045	201012-24X1	356
1410047	201012-28X13/16	356
1410063	20101/4X20X13/16	356
1410064	20101/4X20X1	356
1410066	20101/4X20X1.1/2	356
1410069	20101/4X28X1	356
1410071	20101/4X28X1.1/2	356
1410074	20101/4X24X1	356
1410077	20101/4X32X1	356
1410079	20105/16X18X13/16	356
1410080	20105/16X18X1	356
1410082	20105/16X18X1.1/2	356
1410083	20105/16X18X2	356
1410085	20105/16X24X1	356
1410087	20105/16X24X1.1/2	356

EDP NUMBER INDEX - 1410090 - 3210138

EDP#	E-Code	Page #
1410090	20105/16X32X1	356
1410093	20103/8X16X1	356
1410095	20103/8X16X1.1/2	356
1410096	20103/8X16X2	356
1410097	20103/8X24X1	356
1410099	20103/8X24X1.1/2	356
1410101	20107/16X14X1	356
1410103	20107/16X14X1.1/2	356
1410104	20107/16X14X2	356
1410105	20107/16X20X1	356
1410107	20107/16X20X1.1/2	356
1410108	20107/16X20X2	356
1410110	20101/2X13X1.1/2	356
1410111	20101/2X13X2	356
1410114	20101/2X20X1.1/2	356
1410115	20101/2X20X2	356
1410117	20109/16X12X1.1/2	356
1410118	20109/16X12X2	356
1410120	20109/16X18X1.1/2	356
1410121	20109/16X18X2	356
1410123	20105/8X11X1.1/2	356
1410124	20105/8X11X2	356
1410126	20105/8X18X1.1/2	356
1410127	20105/8X18X2	356
1410131	20103/4X10X2	356
1410133	20103/4X16X2	356
1410135	20107/8X9X2	356
1410137	20107/8X14X2	356
1410140	20101X8X3	356
1410142	20101X12X3	356
1410144	20101X14X3	356
1410145	20101.1/8X7X3	356
1410146	20101.1/8X12X3	356
1410147	20101.1/4X7X3	356
1410148	20101.1/4X12X3	356
1410149	20101.3/8X6X3	356
1410150	20101.3/8X12X3	356
1410151	20101.1/2X6X3	356
1410152	20101.1/2X12X3	356
1410153	25105-40X13/16	358
1410154	25105-44X13/16	358
1410156	25106-32X1	358
1410157	25106-40X13/16	358
1410159	25108-32X13/16	358
1410160	25108-32X1	358
1410161	25108-36X13/16	358
1410163	251010-24X13/16	358
1410164	251010-24X1	358
1410165	251010-32X13/16	358
1410166	251010-32X1	358
1410167	251012-24X13/16	358
1410168	251012-24X1	358
1410169	251012-28X13/16	358
1410171	25101/4X20X13/16	358
1410172	25101/4X20X1	358
1410173	25101/4X20X1.1/2	358
1410174	25101/4X28X13/16	358
1410175	25101/4X28X1	358
1410176	25101/4X28X1.1/2	358
1410177	25105/16X18X13/16	358
1410178	25105/16X18X1	358
1410179	25105/16X18X1.1/2	358
1410180	25105/16X24X13/16	358
1410181	25105/16X24X1	358
1410182	25105/16X24X1.1/2	358
1410183	25103/8X16X1	358
1410184	25103/8X16X1.1/2	358
1410185	25103/8X24X1	358
1410186	25103/8X24X1.1/2	358
1410187	25107/16X14X1	358
1410188	25107/16X14X1.1/2	358
1410189	25107/16X20X1	358
1410190	25107/16X20X1.1/2	358
1410191	25101/2X13X1.1/2	358
1410192	25101/2X20X1.1/2	358
1410193	25109/16X12X1.1/2	358
1410194	25109/16X18X1.1/2	358
1410195	25105/8X11X1.1/2	358
1410196	25105/8X11X2	358
1410197	25105/8X18X1.1/2	358
1410198	25105/8X18X2	358
1410199	25103/4X10X2	358
1410200	25103/4X16X2	358
1410201	25107/8X9X2	358
1410202	25107/8X14X2	358
1410203	20101/8X27X1	356
1410204	20101/8X27X1.1/2	356
1410205	20101/4X18X1.1/2	356
1410206	20101/4X18X2	356
1410207	20103/8X18X1.1/2	356
1410208	20103/8X18X2	356
1410209	20101/2X14X2	356
1410239	20251/4X20	365
1410240	20251/4X28	365
1410241	20255/16X18	365
1410242	20255/16X24	365
1410243	20253/8X16	365
1410244	20253/8X24	365
1410245	20257/16X14	365
1410246	20257/16X20	365
1410247	20251/2X13	365
1410248	20251/2X20	365
1410249	20259/16X12	365
1410250	20259/16X18	365
1410251	20255/8X11	365
1410252	20255/8X18	365
1410253	202511/16X11	365
1410254	202511/16X16	365
1410255	20253/4X10	365
1410256	20253/4X16	365
1410257	20257/8X9	365
1410258	20257/8X14	365
1410259	20251X8	365
1410260	20251X12	365
1410261	20251X14	365
1410262	20251.1/8X7	365
1410263	20251.1/8X12	365
1410264	20251.1/4X7	365
1410265	20251.1/4X12	365
1410266	20251.3/8X6	365
1410267	20251.3/8X12	365
1410268	20251.1/2X6	365
1410269	20251.1/2X12	365
1410270	20251/8X27	365
1410271	20251/4X18	365
1410272	20253/8X18	365
1410273	20251/2X14	365
1410274	20253/4X14	365
1410275	20251X11.1/2	365
1410282	2025S824SET	365
1410573	2710M2X.4X13/16	362
1410575	2710M2.5X.45X13/16	362
1410577	2710M3X.5X13/16	362
1410579	2710M4X.7X13/16	362
1410580	2710M4.5X.75X13/16	362
1410581	2710M5X.8X1	362
1410582	2710M6X1.0X1	362
1410584	2710M8X1.25X1	362
1410585	2710M9X1.25X1	362
1410586	2710M10X1.5X1	362
1410588	2710M12X1.75X1.1/2	362
1410589	2710M14X2.0X1.1/2	362
1410590	2710M16X2.0X1.1/2	362
1410591	2710M18X2.5X2	362
1410592	2710M20X2.5X2	362
1410609	2325M6X1.0	366
1410611	2325M8X1.25	366
1410612	2325M9X1.25	366
1410613	2325M10X1.5	366
1410614	2325M11X1.5	366
1410615	2325M12X1.75	366
1410616	2325M14X2.0	366
1410617	2325M14X1.25	366
1410618	2325M16X2.0	366
1410619	2325M8X2.5	366
1410620	2325M18X1.5	366
1410621	2325M20X2.5	366
1410630	2710M12X1.75X1	362
1712221	16414-40H3	278
1712223	16414-40H5	278
1712233	16416-32H3	278
1712235	16416-32H5	278
1712239	16418-32H3	278
1712241	16418-32H5	278
1712245	16418-36H3	278
1712254	164110-24H6	278
1712258	164110-32H4	278
1712260	164110-32H6	278
1712264	16411/4X20H4	278
1712266	16411/4X20H6	278
1712270	16411/4X28H4	278
1712272	16411/4X28H6	278
1712277	16415/16X18H5	278
1712279	16415/16X18H7	278
1712285	16415/16X24H7	278
1712289	16413/8X16H5	278
1712291	16413/8X16H7	278
1712297	16413/8X24H7	278
1712301	16411/2X13H5	278
1712304	16411/2X13H8	278
1712307	16411/2X20H5	278
1712313	16417/16X14H5	278
1713051	1671M3X.5	279
1713052	1671M4X.7	279
1713053	1671M5X.8	279
1713054	1671M6X1.0	279
1713055	1671M8X1.0	279
1713056	1671M8X1.25	279
1713057	1671M10X1.5	279
1713059	1671M12X1.75	279
1716510	16741/4X20	252
1716512	16741/4X28	252
1716514	16745/16X18	252
1716516	16745/16X24	252
1716518	16743/8X16	252
1716530	16747/16X14	252
1716534	16741/2X13	252
1716536	16741/2X20	252
1716538	16745/8X11	252
1716542	16743/4X10	252
1716544	16743/4X16	252
1716546	16741X8	252
1716704	1675M6X1.0	257
1716706	1675M8X1.25	257
1716708	1675M10X1.25	257
1716710	1675M10X1.5	257
1716720	1675M12X1.5	257
1716722	1675M12X1.75	257
1716724	1675M14X1.5	257
1716728	1675M16X1.5	257
1716730	1675M16X2.0	257
1716738	1675M20X2.5	257
1717510	16781/4X20	267
1717512	16781/4X28	267
1717514	16785/16X18	267
1717516	16785/16X24	267
1717518	16783/8X16	267
1717520	16783/8X24	267
1717530	16787/16X14	267
1717532	16787/16X20	267
1717534	16781/2X13	267
1717538	16785/8X11	267
1717540	16785/8X18	267
1717542	16783/4X10	267
1717546	16781X8	267
1717704	1679M6X1.0	271
1717706	1679M8X1.25	271
1717708	1679M10X1.25	271
1717710	1679M10X1.5	271
1717722	1679M12X1.75	271
1717726	1679M14X2.0	271
1717730	1679M16X2.0	271
1717734	1679M18X2.5	271
1717736	1679M20X1.5	271
1717738	1679M20X2.5	271
1717740	1679M24X2.0	271
1717742	1679M24X3.0	271
1810007	46001/8	467
1810008	46001/4	467
1810009	46003/8	467
1810010	46001/2	467
1810011	46003/4	467
1810012	46001	467
1810017	3850N8	350
1810018	3850N9	350
1810019	3850N10	350
1810020	3850N11	350
1810021	3850N12	350
1810022	3850N14	350
1810034	1301D14	369
1810042	1301D2	369
1810043	1301D3	369
1810053	8007200	369
1810096	1301D6	369
1810372	1215T0	349
1810373	1215T1	349
1810374	1215T2	349
1910501	19004OZ	500
1910502	190016OZLT	500
1910503	19001GALLT	500
1910504	19005GALP	500
1910505	190055GAL	500
1910506	19005GALD	500
1910509	190020OZ	500
1910512	19001/2OZ	500
1930502	190016OZ	500
1930503	19001GAL	500
1950501	19001LB	500
3210001	1800N1	499
3210002	1800N2	499
3210003	1800N3	499
3210004	1800N4	499
3210005	1800N5	499
3210006	1800N6	499
3210007	1800N7	499
3210008	1800N8	499
3210009	1800N9	499
3210010	1800N10	499
3210011	1800N11	499
3210012	1800N12	499
3210013	1815SET	499
3210014	1816SET	499
3210046	4111-2	501
3210047	4111-3	501
3210048	4111-4	501
3210050	4112-3	501
3210051	4112-4	501
3210053	4113-4	501
3210054	4113-5	501
3210055	4114-5	501
3210057	4115-6	501
3210114	47041/8X3/32	496
3210115	47045/32X3/32	496
3210116	47043/16X3/32	496
3210117	47047/32X3/32	496
3210118	47041/4X3/32	496
3210119	47043/16X5/32	496
3210120	47047/32X5/32	496
3210121	47041/4X5/32	496
3210122	47049/32X5/32	496
3210123	47045/16X5/32	496
3210124	47043/8X5/32	496
3210125	47041/4X3/16	496
3210126	47045/16X3/16	496
3210127	47043/8X3/16	496
3210128	47047/16X3/16	496
3210129	47041/2X3/16	496
3210130	47049/16X3/16	496
3210131	47045/8X3/16	496
3210132	47045/16X1/4	496
3210133	47043/8X1/4	496
3210134	47047/16X1/4	496
3210135	47041/2X1/4	496
3210136	47049/16X1/4	496
3210137	47045/8X1/4	496
3210138	470411/16X1/4	496

EDP NUMBER INDEX - 3210139 - 5010713

EDP#	E-Code	Page #
3210139	47043/4X1/4	496
3210140	470413/16X1/4	496
3210141	47047/8X1/4	496
3210142	47043/8X5/16	496
3210143	47047/16X5/16	496
3210144	47041/2X5/16	496
3210145	47049/16X5/16	496
3210146	47045/8X5/16	496
3210147	470411/16X5/16	496
3210148	47043/4X5/16	496
3210149	470413/16X5/16	496
3210151	470415/16X5/16	496
3210152	47041X5/16	496
3210155	47047/16X3/8	496
3210156	47041/2X3/8	496
3210157	47049/16X3/8	496
3210158	47045/8X3/8	496
3210159	470411/16X3/8	496
3210160	47043/4X3/8	496
3210161	470413/16X3/8	496
3210162	47047/8X3/8	496
3210163	470415/16X3/8	496
3210173	47049/16X7/16	496
3210175	470411/16X7/16	496
3210176	47043/4X7/16	496
3210177	470413/16X7/16	496
3210178	47047/8X7/16	496
3210179	470415/16X7/16	496
3210180	47041X7/16	496
3210183	47041.3/16X7/16	496
3210184	47041.1/4X7/16	496
3210195	47049/16X1/2	496
3210197	470411/16X1/2	496
3210198	47043/4X1/2	496
3210201	470415/16X1/2	496
3210202	47041X1/2	496
3210203	47041.1/16X1/2	496
3210210	47041.1/2X1/2	496
3210249	47041/8X1/8	496
3210251	47045/32X1/8	496
3210255	47043/16X1/8	496
3210258	47047/32X1/8	496
3210259	47041/4X1/8	496
3210261	47049/32X1/8	496
3210262	47045/16X1/8	496
3210263	47043/8X1/8	496
3210264	47047/16X1/8	496
3210265	47041/2X1/8	496
3210266	47049/16X1/8	496
3210281	47043/16X3/16	496
3210284	47047/32X3/16	496
3210287	47049/32X3/16	496
3210294	470411/16X3/16	496
3210296	470413/16X3/16	496
3210297	47047/8X3/16	496
3210298	470415/16X3/16	496
3210300	47041/4X1/4	496
3210302	47049/32X1/4	496
3210313	470415/16X1/4	496
3210314	47041X1/4	496
3210338	430N1	501
3210339	430N2	501
3210340	430N3	501
3210341	430N4	501
3210342	430N5	501
3210444	470411/32X3/16	496
3210445	470413/32X3/16	496
3210446	470415/32X3/16	496
3210447	470417/32X1/4	496
4111502	229CSET	351
4710588	46021/2X60	479
4710589	46025/8X60	479
4710590	46023/4X60	479
4710591	46027/8X60	479
4710592	46021X60	479
4710593	46021/2X82	479
4710594	46025/8X82	479
4710595	46023/4X82	479
4710596	46027/8X82	479
4710597	46021X82	479
4710790	46033/8X60	477
4710791	46031/2X60	477
4710793	46033/4X60	477
4710794	46031X60	477
4710795	46031.1/4X60	477
4710796	46031.1/2X60	477
4710797	46031/4X82	477
4710798	46033/8X82	477
4710799	46031/2X82	477
4710800	46035/8X82	477
4710801	46033/4X82	477
4710802	46031X82	477
4710803	46031.1/4X82	477
4710804	46031.1/2X82	477
4710805	46031/4X90	477
4710806	46033/8X90	477
4710807	46031/2X90	477
4710808	46035/8X90	477
4710809	46033/4X90	477
4710810	46031X90	477
4710811	46031.1/4X90	477
4710812	46031.1/2X90	477
5010054	45351/16	450
5010055	45355/64	450
5010056	45353/32	450
5010057	45357/64	450
5010058	45351/8	450
5010060	45355/32	450
5010061	453511/64	450
5010062	45353/16	450
5010063	453513/64	450
5010064	45357/32	450
5010066	45351/4	450
5010067	453517/64	450
5010068	45359/32	450
5010069	453519/64	450
5010070	45355/16	450
5010071	453521/64	450
5010072	453511/32	450
5010073	453523/64	450
5010074	45353/8	450
5010075	453525/64	450
5010076	453513/32	450
5010077	453527/64	450
5010078	45357/16	450
5010079	453529/64	450
5010080	453515/32	450
5010081	453531/64	450
5010082	45351/2	450
5010083	453517/32	450
5010084	45359/16	450
5010085	453519/32	450
5010086	45355/8	450
5010088	453511/16	450
5010090	45353/4	450
5010091	453525/32	450
5010092	453513/16	450
5010094	45357/8	450
5010095	453529/32	450
5010096	453515/16	450
5010098	45351	450
5010140	45371/4	455
5010142	45375/16	455
5010144	45373/8	455
5010148	45371/2	455
5010152	45375/8	455
5010154	453711/16	455
5010156	45373/4	455
5010158	453713/16	455
5010160	45377/8	455
5010162	453715/16	455
5010164	45371	455
5010167	45371.3/16	455
5010173	4533N60	445
5010175	4533N59	445
5010177	4533N58	445
5010179	4533N57	445
5010186	4533N56	445
5010187	45333/64	445
5010198	4533N55	445
5010204	4533N54	445
5010213	4533N53	445
5010219	45331/16	445
5010221	4533N52	445
5010228	4533N51	445
5010234	4533N50	445
5010240	4533N49	445
5010246	4533N48	445
5010251	45335/64	445
5010252	4533N47	445
5010257	4533N46	445
5010259	4533N45	445
5010267	4533N44	445
5010273	4533N43	445
5010282	4533N42	445
5010283	45333/32	445
5010288	4533N41	445
5010292	4533N40	445
5010295	4533N39	445
5010299	4533N38	445
5010304	4533N37	445
5010309	4533N36	445
5010316	45337/64	445
5010318	4533N35	445
5010320	4533N34	445
5010324	4533N33	445
5010330	4533N32	445
5010338	4533N31	445
5010344	4533.1230	445
5010346	4533.1240	445
5010349	4533.1247	445
5010350	45331/8	445
5010354	4533.1260	445
5010359	4533N30	445
5010374	4533N29	445
5010383	4533N28	445
5010384	45339/64	445
5010391	4533N27	445
5010397	4533N26	445
5010402	4533N25	445
5010407	4533N24	445
5010411	4533N23	445
5010416	45335/32	445
5010418	4533N22	445
5010422	4533N21	445
5010426	4533N20	445
5010436	4533N19	445
5010443	4533N18	445
5010448	453311/64	445
5010451	4533N17	445
5010459	4533N16	445
5010465	4533N15	445
5010469	4533N14	445
5010475	4533N13	445
5010476	4533.1855	445
5010478	4533.1865	445
5010479	4533.1870	445
5010480	45333/16	445
5010482	4533.1885	445
5010483	4533N12	445
5010487	4533N11	445
5010492	4533N10	445
5010498	4533N9	445
5010504	4533N8	445
5010508	4533N7	445
5010513	453313/64	445
5010515	4533N6	445
5010518	4533N5	445
5010525	4533N4	445
5010533	4533N3	445
5010545	45337/32	445
5010550	4533N2	445
5010564	4533N1	445
5010576	4533A	445
5010577	453315/64	445
5010585	4533B	445
5010593	4533C	445
5010602	4533D	445
5010606	4533.2480	445
5010608	4533.2490	445
5010609	4533.2495	445
5010610	45331/4	445
5010612	4533.2510	445
5010619	4533F	445
5010622	4533G	445
5010623	453317/64	445
5010624	4533H	445
5010626	4533LETTERI	445
5010627	4533J	445
5010628	4533K	445
5010629	45339/32	445
5010630	4533L	445
5010631	4533M	445
5010632	453319/64	445
5010633	4533N	445
5010636	4533.3105	445
5010638	4533.3115	445
5010639	4533.3120	445
5010640	45335/16	445
5010642	4533.3135	445
5010645	4533O	445
5010647	4533P	445
5010648	453321/64	445
5010649	4533Q	445
5010650	4533R	445
5010651	453311/32	445
5010652	4533S	445
5010653	4533T	445
5010654	453323/64	445
5010655	4533U	445
5010658	4533.3730	445
5010659	4533.3740	445
5010660	4533.3745	445
5010661	45333/8	445
5010662	4533.3760	445
5010663	4533V	445
5010665	4533W	445
5010666	453325/64	445
5010667	4533X	445
5010668	4533Y	445
5010670	453313/32	445
5010671	4533Z	445
5010672	453327/64	445
5010673	4533.4355	445
5010674	4533.4365	445
5010675	4533.4370	445
5010676	45337/16	445
5010677	4533.4385	445
5010678	453329/64	445
5010679	453315/32	445
5010680	453331/64	445
5010681	4533.4980	445
5010682	4533.4990	445
5010683	4533.4995	445
5010684	45331/2	445
5010685	4533.5010	445
5010690	453333/64	445
5010691	453317/32	445
5010692	453335/64	445
5010693	45339/16	445
5010694	453337/64	445
5010695	453319/32	445
5010696	453339/64	445
5010698	45335/8	445
5010700	453341/64	445
5010701	453321/32	445
5010702	453343/64	445
5010703	453311/16	445
5010704	453345/64	445
5010705	453323/32	445
5010706	453347/64	445
5010708	45333/4	445
5010710	453349/64	445
5010711	453325/32	445
5010712	453351/64	445
5010713	453313/16	445

EDP NUMBER INDEX - 5010714 - 5110691

EDP#	E-Code	Page #
5010714	453353/64	445
5010715	453327/32	445
5010716	453355/64	445
5010717	45337/8	445
5010718	453357/64	445
5010719	453329/32	445
5010720	453359/64	445
5010721	453315/16	445
5010722	453361/64	445
5010723	453331/32	445
5010724	453363/64	445
5010725	45331	445
5010726	45331.1/16	445
5010727	45331.1/8	445
5010728	45331.3/16	445
5010729	45331.1/4	445
5010731	45331.3/8	445
5010733	45331.1/2	445
5010734	45361/4	455
5010735	45369/32	455
5010736	45365/16	455
5010737	453611/32	455
5010738	45363/8	455
5010739	453613/32	455
5010740	45367/16	455
5010742	45361/2	455
5010744	45369/16	455
5010746	45365/8	455
5010747	453621/32	455
5010748	453611/16	455
5010750	45363/4	455
5010751	453625/32	455
5010752	453613/16	455
5010754	45367/8	455
5010756	453615/16	455
5010758	45361	455
5010761	45361.3/16	455
5010778	45317/16	449
5010779	453115/32	449
5010780	45311/2	449
5010782	45319/16	449
5010784	45315/8	449
5010785	453121/32	449
5010786	453111/16	449
5010788	45313/4	449
5010790	453113/16	449
5010792	45317/8	449
5010796	45311	449
5010797	45311.1/32	449
5010799	45311.3/32	449
5010801	45311.5/32	449
5010802	45311.3/16	449
5010804	45311.1/4	449
5010805	45311.5/16	449
5010806	45311.3/8	449
5010807	45311.7/16	449
5010808	45311.1/2	449
5010809	45311.9/16	449
5010811	45311.11/16	449
5010812	45311.3/4	449
5010813	45311.13/16	449
5010814	45311.7/8	449
5010815	45311.15/16	449
5010820	45327/16	456
5010822	45321/2	456
5010826	45325/8	456
5010827	453221/32	456
5010828	453211/16	456
5010830	45323/4	456
5010834	45327/8	456
5010838	45321	456
5010839	45321.1/32	456
5010840	45321.1/16	456
5010841	45321.3/32	456
5010842	45321.1/8	456
5010846	45321.1/4	456
5010848	45321.3/8	456
5010849	45321.7/16	456
5010850	45321.1/2	456
5010852	45321.5/8	456
5010854	45321.3/4	456
5010858	45322	456
5010928	45001/8	462
5010929	45005/32	462
5010930	45003/16	462
5010932	45001/4	462
5010934	45005/16	462
5010936	45003/8	462
5010938	45007/16	462
5010940	45001/2	462
5010941	450017/32	462
5010942	45009/16	462
5010943	450019/32	462
5010944	45005/8	462
5010945	450021/32	462
5010948	45003/4	462
5010950	45007/8	462
5010952	45001	462
5010956	45001.1/2	462
5011055	45797/16	460
5011056	45791/2	460
5011057	45799/16	460
5011058	45795/8	460
5011059	457911/16	460
5011060	45793/4	460
5011061	457913/16	460
5011062	45797/8	460
5011063	457915/16	460
5011064	45791	460
5011065	45791.1/16	460
5011066	45791.1/8	460
5011068	45791.1/4	460
5011093	46081/4X60	478
5011094	46083/8X60	478
5011095	46081/2X60	478
5011096	46085/8X60	478
5011097	46083/4X60	478
5011098	46081/4X82	478
5011099	46083/8X82	478
5011100	46081/2X82	478
5011101	46085/8X82	478
5011102	46083/4X82	478
5011103	46081/4X90	478
5011104	46083/8X90	478
5011105	46081/2X90	478
5011106	46085/8X90	478
5011107	46083/4X90	478
5011108	46081/4X100	478
5011109	46083/8X100	478
5011110	46081/2X100	478
5011111	46085/8X100	478
5011112	46083/4X100	478
5011129	4587N0	465
5011130	4587N1	465
5011131	4587N2	465
5011132	4587N3	465
5011133	4587N4	465
5011134	4587N5	465
5011135	4587N6	465
5011136	4587N7	465
5011137	4587N8	465
5011138	4587N9	465
5011139	4587N10	465
5011146	4591N0	466
5011147	4591N1	466
5011148	4591N2	466
5011149	4591N3	466
5011150	4591N4	466
5011151	4591N5	466
5011152	4591N6	466
5011153	4591N7	466
5011154	4591N8	466
5011155	4591N9	466
5011156	4591N10	466
5011157	45887/0	454
5011158	45886/0	454
5011159	45885/0	454
5011160	45884/0	454
5011161	45883/0	454
5011162	45882/0	454
5011164	4588N1	454
5011165	4588N2	454
5011166	4588N3	454
5011167	4588N4	454
5011168	4588N5	454
5011169	4588N6	454
5011170	4588N7	454
5011171	4588N8	454
5011172	4588N9	454
5011173	4588N10	454
5011202	4533E	445
5011204	45313/8	449
5011205	453113/32	449
5011206	45323/8	456
5110001	9401/8X3/8	430
5110002	9403/16X3/8	430
5110003	9401/4X3/8	430
5110004	9405/16X3/8	430
5110005	9403/8X3/8	430
5110006	9407/16X3/8	430
5110007	9401/2X3/8	430
5110008	9401/2X1/2	430
5110009	9409/16X1/2	430
5110010	9405/8X1/2	430
5110011	94011/16X1/2	430
5110012	9403/4X1/2	430
5110013	9405/8X5/8	430
5110014	94011/16X5/8	430
5110015	9403/4X5/8	430
5110016	94013/16X5/8	430
5110017	9407/8X5/8	430
5110019	9401X5/8	430
5110020	9407/8X7/8	430
5110022	9401X7/8	430
5110025	9401X1	430
5110029	9401.1/2X1	430
5110071	9451/8	424
5110072	9453/16	424
5110073	9451/4	424
5110074	9455/16	424
5110075	9453/8	424
5110076	9451/2	424
5110077	9455/8	424
5110078	94511/16	424
5110079	9453/4	424
5110080	9457/8	424
5110081	9451	424
5110162	9481/8	423
5110163	9483/16	423
5110164	9481/4	423
5110165	9485/16	423
5110166	9483/8	423
5110167	9481/2	423
5110168	9485/8	423
5110169	9483/4	423
5110221	9301/8X3/8	417
5110222	9303/16X3/8	417
5110223	9301/4X3/8	417
5110224	9305/16X3/8	417
5110225	9303/8X3/8	417
5110226	9307/16X3/8	417
5110228	9301/2X1/2	417
5110229	9309/16X1/2	417
5110231	9303/4X1/2	417
5110232	9305/8X5/8	417
5110233	9303/4X5/8	417
5110235	9301X5/8	417
5110237	9301X1	417
5110243	9302X1.1/4	417
5110302	9201/8X3/8	409
5110303	9203/16X3/8	409
5110304	9201/4X3/8	409
5110305	9205/16X3/8	409
5110306	9203/8X3/8	409
5110307	9207/16X3/8	409
5110308	9201/2X3/8	409
5110309	9201/2X1/2	409
5110310	9209/16X1/2	409
5110311	9205/8X1/2	409
5110312	92011/16X1/2	409
5110313	9203/4X1/2	409
5110314	9205/8X5/8	409
5110315	92011/16X5/8	409
5110316	9203/4X5/8	409
5110317	92013/16X5/8	409
5110318	9207/8X5/8	409
5110319	92015/16X5/8	409
5110320	9201X5/8	409
5110321	9207/8X7/8	409
5110323	9201X7/8	409
5110324	9201.1/8X7/8	409
5110326	9201X1	409
5110327	9201.1/8X1	409
5110328	9201.1/4X1	409
5110329	9201.3/8X1	409
5110330	9201.1/2X1	409
5110331	9201.1/4X1.1/4	409
5110332	9201.1/2X1.1/4	409
5110364	9231/8	408
5110365	9235/32	408
5110366	9233/16	408
5110368	9231/4	408
5110369	9239/32	408
5110370	9235/16	408
5110371	92311/32	408
5110372	9233/8	408
5110373	92313/32	408
5110374	9237/16	408
5110376	9231/2	408
5110378	9235/8	408
5110380	9233/4	408
5110383	92315/16	408
5110390	9051/8X3/8	414
5110391	9053/16X3/8	414
5110392	9051/4X3/8	414
5110393	9055/16X3/8	414
5110394	9053/8X3/8	414
5110395	9057/16X1/2	414
5110396	9051/2X1/2	414
5110400	9051X1	414
5110602	9801/4	415
5110603	9805/16	415
5110604	9803/8	415
5110605	9807/16	415
5110606	9801/2	415
5110608	9803/4	415
5110609	9801	415
5110613	9811/4	416
5110614	9815/16	416
5110615	9813/8	416
5110617	9811/2	416
5110619	9813/4	416
5110633	9631/8	411
5110634	9633/16	411
5110635	9631/4	411
5110636	9635/16	411
5110637	9633/8	411
5110638	9631/2	411
5110639	9635/8	411
5110640	9633/4	411
5110641	9631	411
5110660	9601/8X4	431
5110661	9603/16X4	431
5110662	9601/4X4	431
5110663	9605/16X4	431
5110664	9603/8X4	431
5110665	9601/2X4	431
5110666	9605/8X4	431
5110667	9603/4X4	431
5110669	9601X4	431
5110686	8831/16	429
5110687	8833/32	429
5110688	8831/8	429
5110689	8835/32	429
5110690	8833/16	429
5110691	8831/4	429

EDP NUMBER INDEX - 5110692 - 7350335

EDP#	E-Code	Page #
5110692	8835/16	429
5110693	8833/8	429
5110694	8837/16	429
5110695	8831/2	429
5110696	9303/4X3/4	417
5110700	9059/16X1/2	414
5110701	9055/8X1/2	414
5110702	9053/4X1/2	414
5110704	9051X3/4	414
5110708	9203/4X3/4	409
5110709	9207/8X3/4	409
5110710	9201X3/4	409
5110711	9403/4X3/4	430
5110712	9407/8X3/4	430
5110713	9401X3/4	430
5110715	920K1/8	410
5110716	920K3/16	410
5110717	920K1/4	410
5110718	920K5/16	410
5110719	920K3/8	410
5110720	920K1/2	410
5110721	920K5/8	410
5110722	920K3/4	410
5110723	920K7/8	410
5110724	920K1	410
5110782	9602X6	431
5111714	9201.1/8X3/4	409
5111715	9201.1/4X3/4	409
5111717	9201.1/2X3/4	409
5111718	9201.3/4X3/4	409
5210014	90021/4	419
5210015	90025/16	419
5210016	90023/8	419
5210017	90027/16	419
5210018	90021/2	419
5210019	90029/16	419
5210020	90025/8	419
5210021	90023/4	419
5210022	90027/8	419
5210023	90021	419
5210024	90021.1/4	419
5210028	90031/4	420
5210029	90035/16	420
5210030	90033/8	420
5210031	90037/16	420
5210032	90031/2	420
5210033	90039/16	420
5210034	90035/8	420
5210035	90033/4	420
5210036	90037/8	420
5210037	90031	420
5210038	90031.1/4	420
5210039	90031.1/2	420
5210078	90081/4	422
5210079	90083/8	422
5210080	90081/2	422
5210081	90085/8	422
5210082	90083/4	422
5210084	90081	422
5210089	90091/4	421
5210090	90093/8	421
5210091	90091/2	421
5210092	90095/8	421
5210093	90093/4	421
5210094	90097/8	421
5210095	90091	421
5270014	TC90021/4	419
5270015	TC90025/16	419
5270016	TC90023/8	419
5270017	TC90027/16	419
5270018	TC90021/2	419
5270020	TC90025/8	419
5270021	TC90023/4	419
5270022	TC90027/8	419
5270023	TC90021	419
5270028	TC90031/4	420
5270029	TC90035/16	420
5270030	TC90033/8	420
5270031	TC90037/16	420
5270032	TC90031/2	420
5270034	TC90035/8	420
5270035	TC90033/4	420
5270036	TC90037/8	420
5270037	TC90031	420
6210031	47021/4	492
6210032	47029/32	492
6210033	47025/16	492
6210034	470211/32	492
6210035	47023/8	492
6210036	470213/32	492
6210037	47027/16	492
6210038	470215/32	492
6210039	47021/2	492
6210040	470217/32	492
6210041	47029/16	492
6210042	470219/32	492
6210043	47025/8	492
6210045	470211/16	492
6210046	470223/32	492
6210047	47023/4	492
6210048	470225/32	492
6210049	470213/16	492
6210050	470227/32	492
6210051	47027/8	492
6210055	47021	492
6210058	47021.3/16	492
6210065	47022	492
6210068	47035/16	495
6210074	47031/2	495
6210076	47039/16	495
6210080	470311/16	495
6210082	47033/4	495
6210084	470313/16	495
6210085	47037/8	495
6210086	470315/16	495
6210087	47031	495
6210088	47031.1/16	495
6210089	47031.1/8	495
6210090	47031.3/16	495
6210091	47031.1/4	495
6210092	47031.5/16	495
6210093	47031.3/8	495
6210094	47031.1/2	495
6210095	47031.5/8	495
6210096	47031.3/4	495
6210098	47032	495
6210099	47032.1/8	495
6210100	47032.1/4	495
6210102	47032.1/2	495
6210107	47051/4	493
6210109	47055/16	493
6210110	470511/32	493
6210111	47053/8	493
6210112	470513/32	493
6210113	47057/16	493
6210115	47051/2	493
6210116	470517/32	493
6210117	47059/16	493
6210118	470519/32	493
6210119	47055/8	493
6210120	470521/32	493
6210121	470511/16	493
6210123	47053/4	493
6210124	470525/32	493
6210125	470513/16	493
6210126	47057/8	493
6210127	470515/16	493
6210136	47051.1/2	493
6210137	47061/4	493
6210138	47069/32	493
6210139	47065/16	493
6210140	470611/32	493
6210141	47063/8	493
6210142	470613/32	493
6210143	47067/16	493
6210144	470615/32	493
6210145	47061/2	493
6210146	470617/32	493
6210147	47069/16	493
6210149	47065/8	493
6210151	470611/16	493
6210153	47063/4	493
6210155	470613/16	493
6210157	47067/8	493
6210159	470615/16	493
6210161	47061	493
6310293	7073/16	502
6310294	7071/4	502
6310295	7075/16	502
6310296	7073/8	502
6310297	7077/16	502
6310298	7071/2	502
6310299	7075/8	502
6310300	7073/4	502
6310302	7071	502
6310305	7573/16	502
6310306	7571/4	502
6310307	7575/16	502
6310308	7573/8	502
6310309	7577/16	502
6310310	7571/2	502
6310311	7575/8	502
6310312	7573/4	502
6310314	7571	502
6310317	7273/16	502
6310318	7271/4	502
6310319	7275/16	502
6310320	7273/8	502
6310321	7277/16	502
6310322	7271/2	502
6310323	7275/8	502
6310324	7273/4	502
6310326	7271	502
7350203	E8141/4	236
7350204	E8145/16	236
7350205	E8143/8	236
7350206	E8147/16	236
7350207	E8141/2	236
7350208	E8145/8	236
7350209	E8143/4	236
7350220	E8147/8	236
7350221	E8141	236
7350222	E91410-32	236
7350223	E9141/4	236
7350224	E9145/16	236
7350225	E9143/8	236
7350226	E9147/16	236
7350227	E9141/2	236
7350228	E9145/8	236
7350229	E9143/4	236
7350230	E9147/8	236
7350231	E8151/4	236
7350232	E8155/16	236
7350233	E8153/8	236
7350234	E8157/16	236
7350235	E8151/2	236
7350236	E8155/8	236
7350237	E8153/4	236
7350238	E8157/8	236
7350239	E8151	236
7350240	E9151/4	236
7350241	E9155/16	236
7350242	E9153/8	236
7350243	E9157/16	236
7350244	E9151/2	236
7350245	E9155/8	236
7350246	E9153/4	236
7350247	E9157/8	236
7350248	E9151	236
7350249	E630M5	237
7350250	E630M6	237
7350251	E630M8	237
7350252	E630M10	237
7350253	E630M12	237
7350254	E630M14	237
7350255	E630M16	237
7350256	E630M18	237
7350257	E630M20	237
7350258	E630M24	237
7350259	E770M8X1.0	237
7350260	E770M10X1.0	237
7350261	E770M10X1.25	237
7350262	E770M12X1.25	237
7350263	E770M12X1.5	237
7350264	E770M14X1.5	237
7350265	E631M6	237
7350266	E631M8	237
7350267	E631M10	237
7350268	E631M12	237
7350269	E631M14	237
7350270	E631M16	237
7350271	E631M18	237
7350272	E631M20	237
7350273	E631M24	237
7350274	E771M10X1.25	237
7350275	E771M12X1.25	237
7350276	E771M12X1.5	237
7350277	E771M14X1.5	237
7350278	E8134-40	239
7350279	E8136-32	239
7350280	E8138-32	239
7350281	E81310-24	239
7350282	E8131/4H5	239
7350283	E8131/4H3	239
7350284	E8135/16H5	239
7350285	E8135/16H3	239
7350286	E8133/8H5	239
7350287	E8133/8H3	239
7350288	E8137/16	239
7350289	E8131/2H5	239
7350290	E8131/2H3	239
7350291	E8135/8H5	239
7350292	E8135/8H3	239
7350293	E8133/4H5	239
7350294	E8133/4H3	239
7350295	E8137/8H6	239
7350296	E8137/8H4	239
7350297	E8131H6	239
7350298	E8131H4	239
7350299	E91310-32	239
7350300	E9131/4H5	239
7350301	E9131/4H3	239
7350302	E9135/16H4	239
7350303	E9135/16H3	239
7350304	E9133/8H4	239
7350305	E9133/8H3	239
7350306	E9137/16	239
7350307	E9131/2H5	239
7350308	E9131/2H3	239
7350309	E9135/8H5	239
7350310	E9135/8H3	239
7350311	E9133/4H5	239
7350312	E9133/4H3	239
7350313	E9137/8H6	239
7350314	E9137/8H4	239
7350315	E9131H6	239
7350316	E9131H4	239
7350317	E629M4	243
7350318	E629M5	243
7350319	E629M6	243
7350320	E629M8	243
7350321	E629M10	243
7350322	E629M12	243
7350323	E629M14	243
7350324	E629M16	243
7350325	E629M18	243
7350326	E629M20	243
7350327	E629M24	243
7350328	E769M8X1.0	243
7350329	E769M10X1.25	243
7350330	E769M12X1.25	243
7350331	E769M12X1.5	243
7350332	E769M14X1.5	243
7350333	E769M16X1.5	243
7350334	E769M18X1.5	243
7350335	E8124-40	246

EDP NUMBER INDEX - 7350336 - 8110602

EDP#	E-Code	Page #
7350336	E8126-32	246
7350337	E8128-32	246
7350338	E81210-24	246
7350339	E8121/4H5	246
7350340	E8121/4H3	246
7350341	E8125/16H5	246
7350342	E8125/16H3	246
7350343	E8123/8H5	246
7350344	E8123/8H3	246
7350345	E8127/16	246
7350346	E8121/2H5	246
7350347	E8121/2H3	246
7350348	E8125/8H5	246
7350349	E8125/8H3	246
7350350	E8123/4H5	246
7350351	E8123/4H3	246
7350352	E8127/8H6	246
7350353	E8127/8H4	246
7350354	E8121H6	246
7350355	E8121H4	246
7350356	E91210-32	246
7350357	E9121/4H5	246
7350358	E9121/4H3	246
7350359	E9125/16H4	246
7350360	E9125/16H3	246
7350361	E9123/8H4	246
7350362	E9123/8H3	246
7350363	E9127/16	246
7350364	E9121/2H5	246
7350365	E9121/2H3	246
7350366	E9125/8H5	246
7350367	E9125/8H3	246
7350368	E9123/4H5	246
7350369	E9123/4H3	246
7350370	E9127/8H6	246
7350371	E9127/8H4	246
7350372	E9121H6	246
7350373	E9121H4	246
7350374	E628M4	250
7350375	E628M5	250
7350376	E628M6	250
7350377	E628M8	250
7350378	E628M10	250
7350379	E628M12	250
7350380	E628M14	250
7350381	E628M16	250
7350382	E628M18	250
7350383	E628M20	250
7350384	E628M24	250
7350385	E768M8X1.0	250
7350386	E768M10X1.25	250
7350387	E768M12X1.5	250
7350388	E768M14X1.5	250
7350389	E768M16X1.5	250
7350390	E768M18X1.5	250
7350391	E8114-40	241
7350392	E8116-32	241
7350393	E8118-32	241
7350394	E81110-24	241
7350395	E8111/4	241
7350396	E8115/16	241
7350397	E8113/8	241
7350398	E8117/16	241
7350399	E8111/2	241
7350400	E8115/8	241
7350401	E8113/4	241
7350402	E8117/8	241
7350403	E8111	241
7350404	E91110-32	241
7350405	E9111/4	241
7350406	E9115/16	241
7350407	E9113/8	241
7350408	E9117/16	241
7350409	E9111/2	241
7350410	E9115/8	241
7350411	E9113/4	241
7350412	E9117/8	241
7350413	E9111	241
7350414	E627M3	244
7350415	E627M4	244
7350416	E627M5	244
7350417	E627M6	244
7350418	E627M8	244
7350419	E627M10	244
7350420	E627M12	244
7350421	E627M14	244
7350422	E627M16	244
7350423	E627M18	244
7350424	E627M20	244
7350425	E627M24	244
7350426	E767M8X1.0	244
7350427	E767M10X1.25	244
7350428	E767M12X1.5	244
7350429	E767M14X1.5	244
7350430	E8104-40	248
7350431	E8106-32	248
7350432	E8108-32	248
7350433	E81010-24	248
7350434	E8101/4	248
7350435	E8105/16	248
7350436	E8103/8	248
7350437	E8107/16	248
7350438	E8101/2	248
7350439	E8105/8	248
7350440	E8103/4	248
7350441	E8107/8	248
7350442	E8101	248
7350443	E91010-32	248
7350444	E9101/4	248
7350445	E9105/16	248
7350446	E9103/8	248
7350447	E9107/16	248
7350448	E9101/2	248
7350449	E9105/8	248
7350450	E9103/4	248
7350451	E9107/8	248
7350452	E9101	248
7350453	E626M3	251
7350454	E626M4	251
7350455	E626M5	251
7350456	E626M6	251
7350457	E626M8	251
7350458	E626M10	251
7350459	E626M12	251
7350460	E626M14	251
7350461	E626M16	251
7350462	E626M18	251
7350463	E626M20	251
7350464	E626M24	251
7350465	E766M8X1.0	251
7350466	E766M10X1.25	251
7350467	E766M12X1.25	251
7350468	E766M14X1.5	251
7350469	E8094-40	238
7350470	E8096-32	238
7350471	E8098-32	238
7350472	E80910-24	238
7350473	E8091/4	238
7350474	E8095/16	238
7350475	E8093/8	238
7350476	E8097/16	238
7350477	E8091/2	238
7350478	E8095/8	238
7350479	E8093/4	238
7350480	E8097/8	238
7350481	E8091	238
7350482	E90910-32	238
7350483	E9091/4	238
7350484	E9095/16	238
7350485	E9093/8	238
7350486	E9097/16	238
7350487	E9091/2	238
7350488	E9095/8	238
7350489	E9093/4	238
7350490	E9097/8	238
7350491	E9091	238
7350492	E625M4	242
7350493	E625M5	242
7350494	E625M6	242
7350495	E625M8	242
7350496	E625M10	242
7350497	E625M12	242
7350498	E625M14	242
7350499	E625M16	242
7350500	E625M18	242
7350501	E625M20	242
7350502	E625M24	242
7350503	E765M8X1.0	242
7350504	E765M10X1.25	242
7350505	E765M12X1.25	242
7350506	E765M12X1.5	242
7350507	E765M14X1.5	242
7350508	E765M16X1.5	242
7350509	E765M18X1.5	242
7350510	E8084-40	245
7350511	E8086-32	245
7350512	E8088-32	245
7350513	E80810-24	245
7350514	E8081/4	245
7350515	E8085/16	245
7350516	E8083/8	245
7350517	E8087/16	245
7350518	E8081/2	245
7350519	E8085/8	245
7350520	E8083/4	245
7350521	E8087/8	245
7350522	E8081	245
7350523	E90810-32	245
7350524	E9081/4	245
7350525	E9085/16	245
7350526	E9083/8	245
7350527	E9087/16	245
7350528	E9081/2	245
7350529	E9085/8	245
7350530	E9083/4	245
7350531	E9087/8	245
7350532	E9081	245
7350533	E624M4	249
7350534	E624M5	249
7350535	E624M6	249
7350536	E624M8	249
7350537	E624M10	249
7350538	E624M12	249
7350539	E624M14	249
7350540	E624M16	249
7350541	E624M18	249
7350542	E624M20	249
7350543	E624M24	249
7350544	E764M8X1.0	249
7350545	E764M10X1.25	249
7350546	E764M12X1.25	249
7350547	E764M12X1.5	249
7350548	E764M14X1.5	249
7350549	E764M16X1.5	249
7350550	E764M18X1.5	249
7361201	R4535.3	46
7361202	R4535.4	46
7361203	R4535.9	46
7361204	R453B	46
7361205	R453C	46
7361206	R453E	46
7361207	R453F	46
7361208	R453G	46
7361209	R453I	46
7361210	R453J	46
7361211	R453K	46
7361212	R4537.2	46
7361213	R453P	46
7361214	R4538.3	46
7361215	R453R	46
7361216	R453S	46
7361217	R4539.2	46
7361218	R453V	46
7361219	R453W	46
7361220	R45310.8	46
7361221	R45311.3	46
7361222	R45313.3	46
7361223	R45315.3	46
7361224	R454B	46
7361225	R454C	46
7361226	R454E	46
7361227	R454F	46
7361228	R454G	46
7361229	R454I	46
7361230	R454J	46
7361231	R454K	46
7361232	R454P	46
7361233	R454R	46
7361234	R454S	46
7361235	R454V	46
7361236	R454W	46
7361237	R4575.3	40
7361238	R4575.4	40
7361239	R4575.9	40
7361240	R457B	40
7361241	R457C	40
7361242	R457E	40
7361243	R457F	40
7361244	R457G	40
7361245	R457I	40
7361246	R457J	40
7361247	R457K	40
7361248	R4577.2	40
7361249	R457P	40
7361250	R4578.3	40
7361251	R457R	40
7361252	R457S	40
7361253	R4579.2	40
7361254	R457V	40
7361255	R457W	40
7361256	R45710.8	40
7361257	R45711.3	40
7361258	R45713.3	40
7361259	R45715.3	40
7361260	R4585.3	40
7361261	R4585.4	40
7361262	R4585.9	40
7361263	R458B	40
7361264	R458C	40
7361265	R458E	40
7361266	R458F	40
7361267	R458G	40
7361268	R458I	40
7361269	R458J	40
7361270	R458K	40
7361271	R4587.2	40
7361272	R458P	40
7361273	R4588.3	40
7361274	R458R	40
7361275	R458S	40
7361276	R4588.9	40
7361277	R4589.2	40
7361278	R458V	40
7361279	R458W	40
7361280	R45810.7	40
7361281	R45810.9	40
7361282	R45811.1	40
7361283	R45811.3	40
7361284	R45811.7	40
7361285	R45811.9	40
7361286	R45813.3	40
7361287	R45815.3	40
7378063	DS1201/8	191
7378064	DS1203/16	191
7378065	DS1203/8	191
7378066	DS1205/16	191
7378067	DS1201/2	191
7378068	DS1201/4	191
7378069	DS1421/8	191
7378970	DS1423/16	191
7378971	DS1423/8	191
7378972	DS1425/16	191
7378973	DS1421/2	191
7378974	DS1421/4	191
8110601	65411/8	328
8110602	65411/4	328

EDP NUMBER INDEX - 8110603 - 46524900

EDP#	E-Code	Page #
8110603	65413/8	328
8110604	65411/2	328
8110605	65413/4	328
8110606	65411	328
8110607	65411.1/4	328
8110608	65411.1/2	328
8110609	65412	328
46073789	A9011/2	65
46196635	E000TINM3	261
46196636	E000TINM4	261
46196637	E000TINM5	261
46196638	E000TINM6	261
46196639	E000TINM8	261
46196690	E000TINM10	261
46196691	E000TINM12	261
46196692	E000TINM16	261
46196693	E000TINM20	261
46204754	1629AP1/2X13	263
46204755	1629AP1/2X20	263
46204756	1629AP1/4X20	263
46204757	1629AP1/4X28	263
46204758	1629AP10X24	263
46204759	1629AP10X32	263
46204791	1629AP1X8	263
46204792	1629AP3/4X10	263
46204794	1629AP3/8X16	263
46204795	1629AP3/8X24	263
46204796	1629AP4X40	263
46204797	1629AP5/16X18	263
46204798	1629AP5/16X24	263
46204799	1629AP5/8X11	263
46204800	1629AP5/8X18	263
46204801	1629AP6X32	263
46204802	1629AP7/16X14	263
46204803	1629AP7/16X20	263
46204804	1629AP7/8X9	263
46204805	1629AP8X32	263
46204806	1630AP1/2X13	276
46204807	1630AP1/2X20	276
46204808	1630AP1/4X20	276
46204809	1630AP1/4X28	276
46204810	1630AP10X24	276
46204811	1630AP10X32	276
46204813	1630AP1X8	276
46204814	1630AP3/4X10	276
46204815	1630AP3/4X16	276
46204816	1630AP3/8X16	276
46204817	1630AP3/8X24	276
46204818	1630AP4X40	276
46204819	1630AP5/16X18	276
46204820	1630AP5/16X24	276
46204821	1630AP5/8X11	276
46204822	1630AP5/8X18	276
46204823	1630AP6X32	276
46204824	1630AP7/16X14	276
46204825	1630AP7/16X20	276
46204826	1630AP7/8X14	276
46204827	1630AP7/8X9	276
46204828	1630AP8X32	276
46204829	1659APM10X1.5	264
46204831	1659APM12X1.75	264
46204832	1659APM3X.5	264
46204833	1659APM4X.7	264
46204834	1659APM5X.8	264
46204835	1659APM6X1.0	264
46204836	1659APM8X1.0	264
46204837	1659APM8X1.25	264
46204838	1660APM10X1.5	277
46204839	1660APM12X1.5	277
46204840	1660APM12X1.75	277
46204841	1660APM3X.5	277
46204842	1660APM4X.7	277
46204843	1660APM5X.8	277
46204844	1660APM6X1.0	277
46204845	1660APM8X1.0	277
46204846	1660APM8X1.25	277
46204847	1672AP1/2X13	252
46204848	1672AP1/2X20	252
46204849	1672AP1/4X20	252
46204850	1672AP1/4X28	252
46204851	1672AP10X24	252
46204852	1672AP10X32	252
46204853	1672AP1X0X12	252
46204854	1672AP1X0X8	252
46204855	1672AP3/4X10	252
46204856	1672AP3/4X16	252
46204857	1672AP3/8X16	252
46204858	1672AP3/8X24	252
46204859	1672AP4X40	252
46204860	1672AP5/16X18	252
46204861	1672AP5/16X24	252
46204862	1672AP5/8X11	252
46204863	1672AP5/8X18	252
46204864	1672AP6X32	252
46204865	1672AP7/16X14	252
46204866	1672AP7/16X20	252
46204867	1672AP7/8X14	252
46204868	1672AP7/8X9	252
46204869	1672AP8X32	252
46204870	1673APM10X1.25	257
46204871	1673APM10X1.5	257
46204872	1673APM12X1.5	257
46204873	1673APM12X1.75	257
46204874	1673APM14X1.5	257
46204875	1673APM14X2.0	257
46204876	1673APM16X1.5	257
46204877	1673APM16X2.0	257
46204878	1673APM18X1.5	257
46204879	1673APM18X2.5	257
46204880	1673APM20X1.5	257
46204881	1673APM20X2.5	257
46204882	1673APM24X2.0	257
46204883	1673APM24X3.0	257
46204884	1673APM4X.7	257
46204885	1673APM5X.8	257
46204886	1673APM6X1.0	257
46204887	1673APM8X1.25	257
46204888	16747/8X14	252
46204889	16747/8X9	252
46204890	1676AP1/2X13	267
46204891	1676AP1/2X20	267
46204892	1676AP1/4X20	267
46204893	1676AP1/4X28	267
46204894	1676AP10X24	267
46204895	1676AP10X32	267
46204896	1676AP1X0X12	267
46204897	1676AP1X0X8	267
46204898	1676AP3/4X10	267
46204899	1676AP3/4X16	267
46204900	1676AP3/8X16	267
46204901	1676AP3/8X24	267
46204902	1676AP4X40	267
46204903	1676AP5/16X18	267
46204904	1676AP5/16X24	267
46204905	1676AP5/8X11	267
46204906	1676AP5/8X18	267
46204907	1676AP6X32	267
46204908	1676AP7/16X14	267
46204909	1676AP7/16X20	267
46204910	1676AP7/8X14	267
46204911	1676AP7/8X9	267
46204912	1676AP8X32	267
46204913	1677APM10X1.25	271
46204914	1677APM10X1.5	271
46204915	1677APM12X1.5	271
46204916	1677APM12X1.75	271
46204917	1677APM14X1.5	271
46204918	1677APM14X2.0	271
46204919	1677APM16X1.5	271
46204920	1677APM16X2.0	271
46204921	1677APM18X1.5	271
46204922	1677APM18X2.5	271
46204923	1677APM20X1.5	271
46204924	1677APM20X2.5	271
46204925	1677APM24X2.0	271
46204926	1677APM24X3.0	271
46204927	1677APM4X.7	271
46204928	1677APM5X.8	271
46204929	1677APM6X1.0	271
46204930	1677APM8X1.25	271
46204931	16787/8X14	267
46204932	16787/8X9	267
46204933	1681AP1/2X13	280
46204934	1681AP1/2X20	280
46204935	1681AP1/4X20	280
46204936	1681AP1/4X28	280
46204937	1681AP10X24	280
46204938	1681AP10X32	280
46204940	1681AP1X8	280
46204941	1681AP3/4X10	280
46204942	1681AP3/4X16	280
46204943	1681AP3/8X16	280
46204944	1681AP3/8X24	280
46204945	1681AP4X40	280
46204946	1681AP5/16X18	280
46204947	1681AP5/16X24	280
46204948	1681AP5/8X11	280
46204949	1681AP5/8X18	280
46204950	1681AP6X32	280
46204951	1681AP7/16X14	280
46204952	1681AP7/16X20	280
46204953	1681AP7/8X14	280
46204954	1681AP7/8X9	280
46204955	1681AP8X32	280
46204956	1687APM10X1.25	282
46204957	1687APM10X1.5	282
46204958	1687APM12X1.5	282
46204959	1687APM12X1.75	282
46204960	1687APM14X1.5	282
46204961	1687APM14X2.0	282
46204962	1687APM16X1.5	282
46204963	1687APM16X2.0	282
46204964	1687APM18X1.5	282
46204965	1687APM18X2.5	282
46204966	1687APM20X1.5	282
46204967	1687APM20X2.5	282
46204968	1687APM24X2.0	282
46204969	1687APM24X3.0	282
46204970	1687APM4X.7	282
46204971	1687APM5X.8	282
46204972	1687APM6X1.0	282
46204973	1687APM8X1.25	282
46204974	1691AP1/2X13	281
46204975	1691AP1/2X20	281
46204976	1691AP1/4X20	281
46204977	1691AP1/4X28	281
46204979	1691AP1X8	281
46204980	1691AP3/4X10	281
46204982	1691AP3/8X16	281
46204983	1691AP3/8X24	281
46204984	1691AP5/16X18	281
46204985	1691AP5/16X24	281
46204986	1691AP5/8X11	281
46204987	1691AP5/8X18	281
46204988	1691AP7/16X14	281
46204989	1691AP7/16X20	281
46204990	1697APM10X1.25	282
46204991	1697APM10X1.5	282
46204993	1697APM12X1.75	282
46204995	1697APM14X2.0	282
46204996	1697APM16X1.5	282
46204997	1697APM16X2.0	282
46205000	1697APM20X1.5	282
46205001	1697APM20X2.5	282
46205003	1697APM24X3.0	282
46205004	1697APM6X1.0	282
46205005	1697APM8X1.25	282
46205007	1660APM12X1.25	277
46205008	1673APM8X1.0	257
46205009	1673APM12X1.25	257
46205010	1677APM8X1.0	271
46262132	46081X60	478
46262133	46081X82	478
46262134	46081X90	478
46262135	46081X100	478
46305901	A108N10	101
46305902	A10815/64	101
46305903	A10817/64	101
46305904	A10819/64	101
46305905	A10821/64	101
46305906	A10823/64	101
46305907	A10825/64	101
46305908	A10827/64	101
46305909	A10829/64	101
46305920	A10831/64	101
46371643	1681AP12X24	280
46381760	G5706.3	485
46381761	G5708.3	485
46381762	G57010.4	485
46381763	G57012.4	485
46381764	G57016.5	485
46381765	G57020.5	485
46381766	G57025.0	485
46381767	G57031.0	485
46381768	G6006.3	487
46381769	G6008.3	487
46381770	G60010.4	487
46381771	G60012.4	487
46381772	G60015.0	487
46381773	G60016.5	487
46381774	G60020.5	487
46381775	G60025.0	487
46437347	190016OZLTSINGLE	500
46437348	190016OZSINGLE	500
46437349	190020OZSINGLE	500
46437430	19001LBSINGLE	500
46521338	G2363	491
46524831	A002S2.0	82
46524832	A002S2.5	82
46524833	A002S3.0	82
46524834	A002S1/8	82
46524835	A002S3.2	82
46524836	A002S3.3	82
46524837	A002S3.5	82
46524838	A002S5/32	82
46524839	A002S4.0	82
46524860	A002S4.1	82
46524861	A002S4.2	82
46524862	A002S4.5	82
46524863	A002S3/16	82
46524864	A002S5.0	82
46524865	A002S13/64	82
46524866	A002S5.5	82
46524867	A002S7/32	82
46524868	A002S6.0	82
46524869	A002S1/4	82
46524870	A002S6.5	82
46524871	A002S17/64	82
46524872	A002S6.8	82
46524873	A002S7.0	82
46524874	A002S7.5	82
46524875	A002S5/16	82
46524876	A002S8.0	82
46524877	A002S8.2	82
46524878	A002S8.5	82
46524879	A002S9.0	82
46524880	A002S9.5	82
46524881	A002S3/8	82
46524882	A002S10.0	82
46524883	A002S10.2	82
46524884	A002S10.5	82
46524885	A002S11.0	82
46524886	A002S11.5	82
46524887	A002S12.0	82
46524888	A002S12.5	82
46524889	A002S1/2	82
46524890	A002S13.0	82
46524892	A012S1/16	78
46524893	A012S5/64	78
46524894	A012S3/32	78
46524895	A012S7/64	78
46524896	A012S1/8	78
46524897	A012S9/64	78
46524898	A012S5/32	78
46524899	A012S11/64	78
46524900	A012S3/16	78

EDP NUMBER INDEX - 46524901 - 46719083

EDP#	E-Code	Page #
46524901	A012S13/64	78
46524902	A012S7/32	78
46524903	A012S15/64	78
46524904	A012S1/4	78
46524905	A012S17/64	78
46524906	A012S9/32	78
46524907	A012S19/64	78
46524908	A012S5/16	78
46524909	A012S21/64	78
46524910	A012S11/32	78
46524911	A012S23/64	78
46524912	A012S3/8	78
46524913	A012S25/64	78
46524914	A012S13/32	78
46524915	A012S27/64	78
46524916	A012S7/16	78
46524917	A012S29/64	78
46524918	A012S15/32	78
46524919	A012S31/64	78
46524920	A012S1/2	78
46610302	A094413	206
46610303	A094419	206
46610305	A09520	207
46610306	A095200	207
46612209	S400HA1/16	378
46612260	S400HA3/32	378
46612261	S400HA1/8	378
46612262	S400HA3/16	378
46612263	S400HA1/4	378
46612264	S400HA5/16	378
46612265	S400HA3/8	378
46612266	S400HA1/2X1	378
46612267	S400HA1/2X2	378
46612268	S400HA5/8	378
46612269	S400HA3/4X1.1/2	378
46612270	S400HA3/4X3	378
46612271	S401HA5/32	379
46612272	S401HA1/4	379
46612273	S401HA5/16	379
46612274	S401HA3/8	379
46612275	S401HA1/2	379
46612276	S401HA5/8	379
46612277	S401HA3/4	379
46612278	S402HA1/4X2.1/4	380
46612279	S402HA3/8X2.1/4	380
46612280	S402HA1/2X2.1/4	380
46612281	S402HA5/8X2.1/4	380
46612282	S402HA3/4X2.1/4	380
46612283	S402HA1X2.1/4	380
46612284	S402HA1/2X3.1/4	380
46612285	S402HA1/2X4	380
46612286	S402HA5/8X3.1/4	380
46612287	S402HA5/8X4.1/4	380
46612288	S402HA3/4X3.1/4	380
46612289	S402HA3/4X4.1/4	380
46612290	S402HA1X3.1/4	380
46612291	S402HA1X4.1/4	380
46612292	S403HA1/8	381
46612293	S403HA3/16	381
46612294	S403HA1/4	381
46612295	S403HA5/16	381
46612296	S403HA3/8	381
46612297	S403HA7/16	381
46612298	S403HA1/2	381
46612299	S403HA5/8	381
46612300	S403HA3/4	381
46612301	S403HA1	381
46612302	S404HA1/2XR.060	382
46612303	S404HA5/8XR.060	382
46612304	S404HA3/4XR.060	382
46612305	S404HA1XR.060	382
46612306	S404HA1/2XR.120	382
46612307	S404HA5/8XR.120	382
46612308	S404HA3/4XR.120	382
46612309	S404HA1XR.120	382
46612317	S407HA1/8	386
46612318	S407HA3/16	386
46612319	S407HA1/4	386
46612320	S407HA5/16	386
46612321	S407HA3/8	386
46612322	S407HA7/16	386
46612323	S407HA1/2	386
46612324	S407HA9/16	386
46612325	S407HA5/8	386
46612326	S407HA3/4	386
46612327	S407HA1	386
46612328	S406HA1/8	384
46612329	S406HA3/16	384
46612330	S406HA1/4	384
46612331	S406HA5/16	384
46612332	S406HA3/8	384
46612333	S406HA7/16	384
46612334	S406HA1/2	384
46612335	S406HA9/16	384
46612336	S406HA5/8	384
46612337	S406HA3/4	384
46612338	S406HA1	384
46612339	S406HB3/8	385
46612340	S406HB7/16	385
46612341	S406HB1/2	385
46612342	S406HB9/16	385
46612343	S406HB5/8	385
46612344	S406HB3/4	385
46612345	S406HB1	385
46660543	S405HA1/4XR.020	383
46660544	S405HA5/16XR.020	383
46660545	S405HA3/8XR.020	383
46660546	S405HA3/8XR.030	383
46660547	S405HA1/2XR.020	383
46660548	S405HA1/2XR.030	383
46660549	S405HA5/8XR.030	383
46660550	S405HA5/8XR.060	383
46660551	S405HA3/4XR.030	383
46660552	S405HA3/4XR.060	383
46660553	S405HA3/4XR.090	383
46718973	R4593.0	50
46718973	R4593.0	50
46718974	R4593.1	50
46718974	R4593.1	50
46718975	R4591/8	50
46718975	R4591/8	50
46718976	R4593.2	50
46718976	R4593.2	50
46718977	R4593.3	50
46718977	R4593.3	50
46718978	R4593.4	50
46718978	R4593.4	50
46718979	R4593.5	50
46718979	R4593.5	50
46718990	R4599/64	50
46718990	R4599/64	50
46718991	R4593.6	50
46718991	R4593.6	50
46718992	R4593.7	50
46718992	R4593.7	50
46718993	R4593.8	50
46718993	R4593.8	50
46718994	R4593.9	50
46718994	R4593.9	50
46718995	R4595/32	50
46718995	R4595/32	50
46718996	R4594.0	50
46718996	R4594.0	50
46718997	R4594.1	50
46718997	R4594.1	50
46718998	R4594.2	50
46718998	R4594.2	50
46718999	R4594.3	50
46718999	R4594.3	50
46719000	R45911/64	50
46719000	R45911/64	50
46719001	R4594.4	50
46719001	R4594.4	50
46719002	R4594.5	50
46719002	R4594.5	50
46719003	R4594.6	50
46719003	R4594.6	50
46719004	R4594.7	50
46719004	R4594.7	50
46719005	R4593/16	50
46719005	R4593/16	50
46719006	R4594.8	50
46719006	R4594.8	50
46719007	R4594.9	50
46719007	R4594.9	50
46719008	R4595.0	50
46719008	R4595.0	50
46719009	R4595.1	50
46719009	R4595.1	50
46719010	R45913/64	50
46719010	R45913/64	50
46719011	R4595.2	50
46719011	R4595.2	50
46719012	R4595.3	50
46719012	R4595.3	50
46719013	R4595.4	50
46719013	R4595.4	50
46719014	R4595.5	50
46719014	R4595.5	50
46719015	R4597/32	50
46719015	R4597/32	50
46719016	R4595.6	50
46719016	R4595.6	50
46719017	R4595.7	50
46719017	R4595.7	50
46719018	R4595.8	50
46719018	R4595.8	50
46719019	R4595.9	50
46719019	R4595.9	50
46719020	R45915/64	50
46719020	R45915/64	50
46719021	R4596.0	50
46719021	R4596.0	50
46719022	R4596.1	50
46719022	R4596.1	50
46719023	R4596.2	50
46719023	R4596.2	50
46719024	R4596.3	50
46719024	R4596.3	50
46719025	R4591/4	50
46719025	R4591/4	50
46719026	R4596.4	50
46719026	R4596.4	50
46719027	R4596.5	50
46719027	R4596.5	50
46719028	R4596.6	50
46719028	R4596.6	50
46719029	R4596.7	50
46719029	R4596.7	50
46719030	R45917/64	50
46719030	R45917/64	50
46719031	R4596.8	50
46719031	R4596.8	50
46719032	R4596.9	50
46719032	R4596.9	50
46719033	R4597.0	50
46719033	R4597.0	50
46719034	R4597.1	50
46719034	R4597.1	50
46719035	R4599/32	50
46719035	R4599/32	50
46719036	R4597.2	50
46719036	R4597.2	50
46719037	R4597.3	50
46719037	R4597.3	50
46719038	R4597.4	50
46719038	R4597.4	50
46719039	R4597.5	50
46719039	R4597.5	50
46719040	R45919/64	50
46719040	R45919/64	50
46719041	R4597.6	50
46719041	R4597.6	50
46719042	R4597.7	50
46719042	R4597.7	50
46719043	R4597.8	50
46719043	R4597.8	50
46719044	R4597.9	50
46719044	R4597.9	50
46719045	R4595/16	50
46719045	R4595/16	50
46719046	R4598.0	50
46719046	R4598.0	50
46719047	R4598.1	50
46719047	R4598.1	50
46719048	R4598.2	50
46719048	R4598.2	50
46719049	R4598.3	50
46719049	R4598.3	50
46719050	R45921/64	50
46719050	R45921/64	50
46719051	R4598.4	50
46719051	R4598.4	50
46719052	R4598.5	50
46719052	R4598.5	50
46719053	R4598.6	50
46719053	R4598.6	50
46719054	R4598.7	50
46719054	R4598.7	50
46719055	R45911/32	50
46719055	R45911/32	50
46719056	R4598.8	50
46719056	R4598.8	50
46719057	R4598.9	50
46719057	R4598.9	50
46719058	R4599.0	50
46719058	R4599.0	50
46719059	R4599.1	50
46719059	R4599.1	50
46719060	R45923/64	50
46719060	R45923/64	50
46719061	R4599.2	50
46719061	R4599.2	50
46719062	R4599.3	50
46719062	R4599.3	50
46719063	R4599.4	50
46719063	R4599.4	50
46719064	R4599.5	50
46719064	R4599.5	50
46719065	R4593/8	50
46719065	R4593/8	50
46719066	R4599.6	50
46719066	R4599.6	50
46719067	R4599.7	50
46719067	R4599.7	50
46719068	R4599.8	50
46719068	R4599.8	50
46719069	R4599.9	50
46719069	R4599.9	50
46719070	R45925/64	50
46719070	R45925/64	50
46719071	R45910.0	50
46719071	R45910.0	50
46719072	R45910.2	50
46719072	R45910.2	50
46719073	R45910.3	50
46719073	R45910.3	50
46719074	R45913/32	50
46719074	R45913/32	50
46719075	R45910.4	50
46719075	R45910.4	50
46719076	R45910.5	50
46719076	R45910.5	50
46719077	R45927/64	50
46719077	R45927/64	50
46719078	R45910.8	50
46719078	R45910.8	50
46719079	R45911.0	50
46719079	R45911.0	50
46719080	R4597/16	50
46719080	R4597/16	50
46719081	R45911.2	50
46719081	R45911.2	50
46719082	R45911.3	50
46719082	R45911.3	50
46719083	R45911.5	50

EDP NUMBER INDEX - 46719083 - 47197820

EDP#	E-Code	Page #
46719083	R45911.5	50
46719084	R45929/64	50
46719084	R45929/64	50
46719085	R45911.8	50
46719085	R45911.8	50
46719086	R45915/32	50
46719086	R45915/32	50
46719087	R45912.0	50
46719087	R45912.0	50
46719088	R45912.2	50
46719088	R45912.2	50
46719089	R45931/64	50
46719089	R45931/64	50
46719090	R45912.5	50
46719090	R45912.5	50
46719091	R4591/2	50
46719091	R4591/2	50
46719092	R45912.8	50
46719092	R45912.8	50
46719093	R45913.0	50
46719093	R45913.0	50
46719094	R45933/64	50
46719094	R45933/64	50
46719095	R45917/32	50
46719095	R45917/32	50
46719096	R45913.5	50
46719096	R45913.5	50
46719097	R45935/64	50
46719097	R45935/64	50
46719098	R45914.0	50
46719098	R45914.0	50
46719099	R45914.25	50
46719099	R45914.25	50
46719100	R4599/16	50
46719100	R4599/16	50
46719101	R45914.5	50
46719101	R45914.5	50
46719102	R45937/64	50
46719102	R45937/64	50
46719103	R45915.0	50
46719103	R45915.0	50
46719104	R45919/32	50
46719104	R45919/32	50
46719105	R45915.1	50
46719105	R45915.1	50
46719106	R45939/64	50
46719106	R45939/64	50
46719107	R45915.5	50
46719107	R45915.5	50
46719108	R4595/8	50
46719108	R4595/8	50
46719109	R45916.0	50
46719109	R45916.0	50
46790303	2A1.95	82
47147792	G2364	491
47147805	G2365	491
47197820	1585NR5/16X18H32FLNO3	307

PRODUCT WARRANTY

Precision Dormer, LLC (“The Company”).
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