

DORMER  PRAMET

**ROUND TOOL
CATALOG**

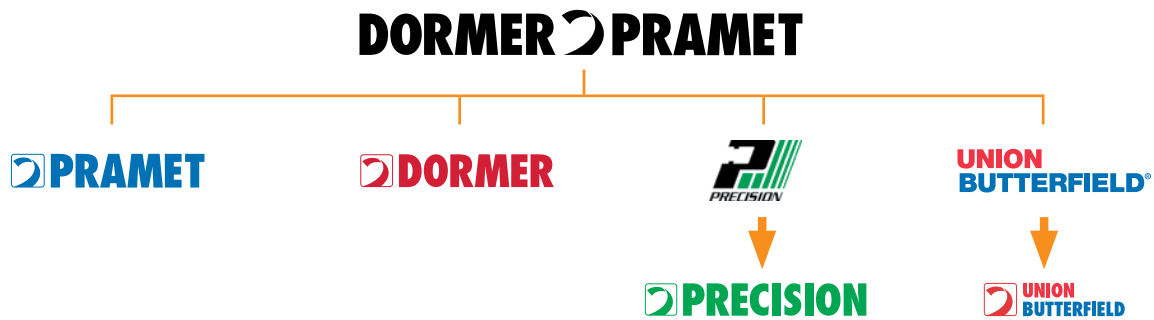


 **DORMER**

 **PRECISION**

 **UNION
BUTTERFIELD**

2020 VISION: CLARITY IN BRAND ALIGNMENT



We acknowledge a unified appearance of our product logos will show that Dormer Pramet manufactures all our product brands – Precision Twist Drill, Dormer, Union Butterfield and Pramet.

In 2020, we are educating on the evolution of the Precision Twist Drill and Union Butterfield logos. Beginning in 2021, these logos will adopt the chip - our unifying symbol across the company and product brands that communicates our promise of quality manufacturing, products and logistics.

The Union Butterfield and Precision Twist Drill brands are pioneer brands for the North American marketplace. Since launching in 1885 and 1952, respectively, they represent a legacy of local support and quality tooling. Adding the chip to these logos aligns all brands visually and confirms to customers that when they add any of our tools to their shop, they add our entire team, including quality production facilities, reliable delivery and nationwide support.

WORKPIECE MATERIAL GROUPS (WMG)

Available on our website www.dormerpramet.com or by downloading our NEW Machining Calculator App.

What is WMG?

Previous to 2019, we classified our tools according to WMG for indexable tools and AMG for round tools. We have begun to unify our technical data formats to only use WMG.

Workpiece material groups (“WMG”) are used to support easy and reliable selection of the right cutting tool and starting values for machining conditions in particular applications.

Dormer Pramet classifies workpiece materials into six different colored groups;

- **Blue:** Steel and cast steel (P-group)
- **Yellow:** Stainless steel (M-group)
- **Red:** Cast iron (K-group)
- **Green:** Non-ferrous metals (N-group)
- **Orange:** High-temperature alloys (S-group)
- **Grey:** Hardened materials (H-group)

Each of these are divided into subgroups based on their structure and/or composition. For example, P-group steel and cast steel is split into four subgroups, namely;

- P1 – **Free machining steel**
- P2 – **Plain carbon steel**
- P3 – **Alloy steel**
- P4 – **Tool steel**

A final division includes material properties, such as hardness and ultimate tensile strength. This is to provide our customers with a complete tool recommendation, including starting values for cutting speed and feed.

Speeds and feeds in the separate high performance catalogs are provided according to our new WMG groupings. The data in this catalog is still utilizing our traditional AMG groupings.

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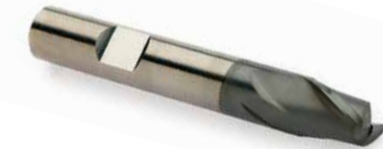
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|---------------------------|-----|
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General Purpose

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|--|--|-----|
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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, find your Alpha Code on the AMG Chart
(example: 279 U : U is the Alpha Code)
- 5) Find the closest diameter for your cutting application on the Feed Rate chart below to find your IPR

| 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 | 6Al4V, 6A14V-2Sn, Monel, Monel K | <28 |
| | 4.3 Titanium, alloyed | 6Al4V-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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB |
| | 6.2 β-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 | Amppo 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 | Ultradim, 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 | | --- |

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|-------------------|---|---|---|--|---|---|---|--|---|--|---|---|---|--|--|-----|
| |     | | | | | | | | | | | | | | | |
| |  | | | | |  | | | | |  | | | | | |
| Head Range: | 15/32 - 42.00 | 15/32 - 42.00 | 15/32 - 42.00 | 13.5 - 42.00 | 15/32 - 42.00 | 15/32 - 30.50 | 15/32 - 30.50 | 15/32 - 30.50 | 15/32 - 30.50 | 15/32 - 30.50 | 15/32 - 42.00 | 15/32 - 42.00 | 15/32 - 42.00 | 15/32 - 42.00 | 15/32 - 42.00 | |
| Body Style: | H851 | H853 | H855 | H858 | H8512 | H851 | H853 | H855 | H858 | H8512 | H851 | H853 | H855 | H858 | H8512 | |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Tool Material: | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | |
| Standard: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Depth of Cut: | 1.5XD | 3XD | 5XD | 8XD | 12XD | 1.5XD | 3XD | 5XD | 8XD | 12XD | 1.5XD | 3XD | 5XD | 8XD | 12XD | |
| Finish/Coating: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Shank: |  DIN 6535HE |  DIN 6535HE |  DIN 6535HE |  DIN 6535 HA |  DIN 6535HE |  DIN 6535HE |  DIN 6535HE |  DIN 6535 HA |  DIN 6535HE |  DIN 6535HE |  DIN 6535HE |  DIN 6535HE |  DIN 6535HE |  DIN 6535 HA |  DIN 6535 HE | |
| Direction of Cut: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Coolant: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| Range: | 15/32 - 30.50 | 15/32 - 42.00 | 15/32 - 42.00 | 13.5 - 42.00 | 13.5 - 1.1/64 | 15/32 - 30.50 | 15/32 - 42.00 | 15/32 - 42.00 | 13.5 - 42.00 | 13.5 - 1.1/64 | 15/32 - 30.50 | 15/32 - 42.00 | 15/32 - 42.00 | 13.5 - 42.00 | 13.5 - 1.1/64 | |
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| 1.2 | | | | | | 361W | 328W | 328V | 295U | 262U | 361W | 328W | 328V | 295U | 262U | P 1 |
| 1.3 | 361W | 328W | 328V | 295U | 262U | | | | | | | | | | | P 2 |
| 1.4 | 307W | 279W | 279V | 246U | 223U | | | | | | | | | | | P 3 |
| 1.5 | 307W | 279W | 279V | 246U | 223U | | | | | | | | | | | P 4 |
| 1.6 | 217T | 197T | 197T | 197S | 158S | | | | | | | | | | | H 1 |
| 1.7 | | | | | | | | | | | | | | | | H 3 |
| 1.8 | | | | | | | | | | | | | | | | H 4 |
| 2.1 | | | | | | 217V | 197V | 164V | 148U | 157U | | | | | | M 1 |
| 2.2 | | | | | | 180T | 164T | 164S | 131S | 131S | | | | | | M 3 |
| 2.3 | | | | | | 144T | 131T | 131S | 115S | 92S | | | | | | M 2 |
| 2.4 | 127T | 115T | 115T | 98S | 92S | | | | | | | | | | | S 2 |
| 3.1 | | | | | | 433V | 394V | 374V | 346U | 315U | 433V | 394V | 374V | 346U | 315U | K 1 |
| 3.2 | | | | | | 418V | 380V | 354V | 328U | 304U | 418V | 380V | 354V | 328U | 304U | K 2 |
| 3.3 | 318U | 289U | 279V | 262U | 231U | | | | | | 318U | 289U | 279V | 262U | 231U | K 3 |
| 3.4 | 318U | 289U | 279V | 262U | 231U | | | | | | 318U | 289U | 279V | 262U | 231U | K 4 |
| 4.1 | | | | | | 163T | 148T | 148T | 115S | 118S | | | | | | S 1 |
| 4.2 | | | | | | 127T | 115T | 115T | 98S | 92S | | | | | | S 2 |
| 4.3 | | | | | | 108S | 98S | 98S | 82S | 78S | | | | | | S 3 |
| 5.1 | | | | | | 127T | 115T | 115T | 98S | 92S | | | | | | S 1 |
| 5.2 | | | | | | 108S | 98S | 98S | 82S | 78S | | | | | | S 2 |
| 5.3 | | | | | | 90S | 82S | 82S | 66S | 66S | | | | | | S 3 |
| 6.1 | | | | | | | | | | | | | | | | N 3 |
| 6.2 | | | | | | | | | | | | | | | | N 4 |
| 6.3 | | | | | | | | | | | | | | | | N 3 |
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| 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:

- Determine your Workpiece Material from the Application Material Groups (AMG) below.
- Use the icons to find Product Features.
- 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)
- To find Cutting Feed Rate, find your Alpha Code on the AMG Chart (example: 279 U : U is the Alpha Code)
- Find the closest diameter for your cutting application on the Feed Rate 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, 6Al4V-2Sn, Monel, Monel K | <28 | S 2 |
| | 4.3 Titanium, alloyed | 6Al4V-4Mo, 7Al4V-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 β-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 | Ultradid, 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 | HM | HM | HSS | HSS-E | HSS-E | HSS | HSS-E | HSS-E |
|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Standard: | DIN 6539 | DIN 6537 K | DIN 6537 K | DIN 6537 K | DIN 338 | DIN 6537 L | DIN 6537 L | DIN 6537 L | DORMER | DIN 1897 | DIN ANSI | DIN ANSI | DIN 338 | DORMER | DIN ANSI |
| Depth of Cut: | 2.5XD | 3XD | 3XD | 3XD | 4XD | 5XD | 5XD | 5XD | 8XD | 2.5XD | 3XD | 3XD | 4XD | 5XD | 6XD |
| Point Style: | 130° | 140° | 140° | 140° | 130° | 140° | 140° | 140° | 140° | 130° | 130° | 130° | 130° | 130° | 130° |
| Finish/Coating: | TiN | TiAlN | TiAlN | TiAlN | TiN | TiAlN | TiAlN | TiAlN | TiAlN | TiN | | Altrona Top | TiN | TiAlN Top | |
| Shank: | | DIN 6535HA | DIN 6535HA | DIN 6535HA | | DIN 6535HA | DIN 6535HA | DIN 6535HA | DIN 6535HA | | | | | DIN 6535HA | |
| Flute Form: | N | CFW | CFW | CFW | N | CFW | CFW | CFW | CFW | | W | W | | | W |
| Direction of Cut: | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ | ↻ |
| Coolant Through: | | | ⌘ | ⌘ | | | ⌘ | ⌘ | ⌘ | | | | | ⌘ | |
| Style: | R520 | R458 | R457 | R467 | R510 | R454 | R453 | R463 | R459 | A520 | A920 | A921 | A510 | A553 | A900 |
| Range: | 3.00 - 16.50 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 16.00 | 3.00 - 14.25 | 3.00 - 20.00 | 3.00 - 20.00 | 3.00 - 16.00 | 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 |
| Page # | 45 | 47 | 47 | 51 | 54 | 56 | 56 | 60 | 63 | 66 | 69 | 69 | 73 | 76 | 78 |
| 1.1 | 328X | 510W | 510W | | 328W | 510V | 510V | | 443V | 187M | 131J | 197M | 187M | 279L | 125H |
| 1.2 | 295X | 440W | 460W | | 295W | 440V | 460V | | 394V | 154M | 112J | 171M | 154M | 230L | 108H |
| 1.3 | 295X | 360W | 440W | | 295W | 360V | 440V | | 361U | 131K | 105I | 174J | 131K | 197L | 85H |
| 1.4 | 262X | 330V | 375V | | 262W | 330V | 375V | | 328U | 105I | 105I | 174J | 98H | 148H | 85H |
| 1.5 | 180X | 245V | 295V | | 180V | 245V | 295V | | 262U | 69G | 75E | 125G | 69F | 92F | 69E |
| 1.6 | 148W | 164U | 213U | | 148V | 164U | 213U | | 180T | 36E | 62E | 98G | 36D | 49D | 52E |
| 1.7 | 115U | 98U | 98U | | 115T | 98U | 98U | | | | | | | | |
| 1.8 | 98T | 82U | 82U | | 98S | 82U | 82U | | | | | | | | |
| 2.1 | 164W | 148U | 246V | 279G | 164V | 148U | 246V | 279G | 246V | 98I | 49F | 56F | 92G | 131G | 49E |
| 2.2 | | 131T | 115V | 246G | | 131T | 115V | 246G | 115V | 52I | 23F | 30F | 46I | 62I | 23E |
| 2.3 | | 115T | 98U | 197F | | 115T | 98U | 197F | 98U | 66G | 30D | 36D | 62G | 89G | 30C |
| 2.4 | | 115T | | | | 115T | | | | | | | | | |
| 3.1 | 295Y | 295W | 394W | | 295X | 295W | 394W | | 394W | 157M | 112L | 174L | 138K | 230K | 79J |
| 3.2 | 295Y | 295W | 394W | | 295X | 295W | 394W | | 394W | 121K | 85L | 138L | 105J | 164J | 62J |
| 3.3 | 213X | 230V | 262V | | 213W | 230V | 262V | | 262V | 98J | 85L | 138L | 92J | 148J | 62J |
| 3.4 | 213X | 230V | 262V | | 213W | 230V | 262V | | 262V | 85F | 62J | 118J | 82F | 138F | 46I |
| 4.1 | 197W | 164U | 180V | 180V | 148V | 164U | 180V | 180V | | 112I | 98G | 157I | 105G | 148G | 72E |
| 4.2 | 148V | 131U | 148V | 148V | | 131U | 148V | 148V | | 66G | 59G | 95I | 66H | 98E | 49E |
| 4.3 | 115U | 115T | 131U | 131U | | 115T | 131U | 131U | | 13B | 33C | 52E | 13B | 26C | 20C |
| 5.1 | 164W | | | 180U | 164V | | | 180U | | 56I | 49I | 79L | 56I | 82I | 46G |
| 5.2 | | | | 148U | | | | 148U | | 36G | 30G | 46I | 30E | 49E | 23G |
| 5.3 | | | | 131U | | | | 131U | | 23E | 20E | 33G | 20E | 33E | 20C |
| 6.1 | | 328V | 410W | | | 328V | 410W | | 410V | 131E | 213H | | 131D | 230G | 213G |
| 6.2 | | 656V | 722W | | | 656V | 722W | | 722V | 164I | 216J | | 164I | 279I | 174I |
| 6.3 | | 656V | 722W | | | 656V | 722W | | 722V | 148K | 131J | 233J | 148I | 262I | 112H |
| 6.4 | | 262U | 328V | | | 262U | 328V | | 328U | 66F | 102G | 164I | 66F | 115G | 98G |
| 7.1 | 738Z | 738W | 820W | | 738Y | 738W | 820W | | 935W | 180I | 246L | | 164G | 230H | 197J |
| 7.2 | 738Z | 738W | 820W | | 738Y | 738W | 820W | | 935W | 164M | 148N | | 164M | 328M | 148N |
| 7.3 | 492Y | 590V | 656V | | 492X | 590V | 656V | | 623V | 121K | 131N | | 102I | 180I | 131N |
| 7.4 | 213Y | 394V | 492V | | 213X | 394V | 492V | | 312V | 115I | 118J | 157J | 108I | 180J | 92I |
| 8.1 | 246Z | | | | 246X | | | | | 213G | 180J | | 213G | 295G | 180I |
| 8.2 | 377V | | | | 377V | | | | | 164G | 131H | | 164G | | 131G |
| 8.3 | | | | | | | | | | 115F | | | 115F | | |
| 9.1 | | | | | | | | | | | | | | | |
| 10.1 | | | | | | | | | | | | | | | |

Visual Index - Drills

| | HSS-E | HSS-E | HSS-E | HSS-E | HSS-E | HSS-E | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | |
|------|--------------|--------------|--------------|--------------|--------------|--------------|----------------------|-------------------|-----------|------------|--------------|--------------|--------------|--------------|--------------|------------|
| | DIN ANSI | DIN ANSI | DIN ANSI | DIN 1869/1 | DIN 1869/2 | DIN 1869/3 | ANSI | ANSI | ANSI | ANSI | DIN 338 | DIN 338 | DIN 338 | DIN 338 | ANSI | |
| | 6XD | 10XD | 10XD | 15XD | 20XD | 25XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | |
| | 130° | 130° | 130° | 130° | 130° | 130° | 118° | 118° | 118° | 118° | 118° | 118° | 118° | 118° | 118° | |
| | Altrona Top | | Altrona Top | | | | ST | TIN | TIN | TIN | ST | ST | TIN | TIN | | |
| | W | W | W | W | W | W | | | N | N | N | N | N | N | N | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | A901 | A940 | A941 | A976 | A977 | A978 | R10P R15P R18P | R10 R15 R18 | A012 | A012S | 2A | 2AB | A100 | A002 | A002S | L10 |
| | 1.50 - 16.00 | 1.00 - 20.00 | 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 |
| | 78 | 81 | 81 | 84 | 84 | 84 | 87 | 87 | 91 | 91 | 95 | 95 | 95 | 95 | 95 | 102 |
| 1.1 | 197J | 125F | 174G | 102C | 102B | 102A | 115H | 115H | 154J | 154J | 115H | 115H | 115H | 154J | 154J | 115H |
| 1.2 | 164J | 108F | 151G | 85C | 85B | 85A | 98H | 98H | 131J | 131J | 98H | 98H | 98H | 131J | 131J | 98H |
| 1.3 | 144I | 72G | 118G | 72C | 72B | 72A | 82F | 82F | 115F | 115F | 82F | 82F | 82F | 115F | 115F | 82F |
| 1.4 | 144I | 72G | 118G | 72C | 72B | 72A | 66F | 66F | 98F | 98F | 66F | 66F | 66F | 98F | 98F | 66F |
| 1.5 | 108G | 56C | 75D | 39A | 39A | 39A | 43E | 43E | 59F | 59F | 43E | 43E | 43E | 59F | 59F | 43E |
| 1.6 | 85G | 39C | 56D | 33A | 33A | 33A | 30D | 30D | 33E | 33E | 30D | 30D | 30D | 33E | 33E | 30D |
| 1.7 | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | |
| 2.1 | 56E | 49C | 56C | 39B | 39B | 39A | 49E | 49E | 66F | 66F | 49E | 49E | 49E | 66F | 66F | 49E |
| 2.2 | 30E | 23E | 30E | 23C | 23B | 23A | 26G | 26G | 39G | 39G | 26G | 26G | 26G | 39G | 39G | 26G |
| 2.3 | 36C | 30B | 36B | 26A | 26A | 26A | 30C | 30C | 52C | 52C | 30C | 30C | 30C | 52C | 52C | 30C |
| 2.4 | | | | | | | | | | | | | | | | |
| 3.1 | 190I | | 118I | | | | 98H | 98H | 131J | 131J | 98H | 98H | 98H | 131J | 131J | 98H |
| 3.2 | 154I | 52I | 98I | 75C | 75B | 75A | 79F | 79F | 98E | 98E | 79F | 79F | 79F | 98E | 98E | 79F |
| 3.3 | 112J | 52I | 98I | 52C | 52B | 52A | 66E | 66E | 92E | 92E | 66E | 66E | 66E | 92E | 92E | 66E |
| 3.4 | 92I | 39H | 79H | 36A | 36A | 36A | 46E | 46E | 85E | 85E | 46E | 46E | 46E | 85E | 85E | 46E |
| 4.1 | 115G | 59E | 82F | 49C | 49B | 49A | 75E | 75E | 75F | 75F | 75E | 75E | 75E | 75F | 75F | 75E |
| 4.2 | 79G | 43C | 59D | 36A | 36A | 36A | 39D | 39D | 43D | 43D | 39D | 39D | 39D | 43D | 43D | 39D |
| 4.3 | 33E | 20C | 26D | 16A | 16A | 16A | 20B | 20B | 23B | 23B | 20B | 20B | 20B | 23B | 23B | 20B |
| 5.1 | 72I | | | | | | 33G | 33G | 43G | 43G | 33G | 33G | 33G | 43G | 43G | 33G |
| 5.2 | 36I | | | | | | 20E | 20E | 23E | 23E | 20E | 20E | 20E | 23E | 23E | 20E |
| 5.3 | 33E | | | | | | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A | 10A |
| 6.1 | | 213F | | | | | 108G | 108G | 164G | 164G | 108G | 108G | 108G | 164G | 164G | 108G |
| 6.2 | | 230F | | | | | 115I | 115I | 108I | 108I | 115I | 115I | 115I | 108I | 108I | 115I |
| 6.3 | 184I | 112G | 157H | 98D | 98C | 98B | 89H | 89H | 128H | 128H | 89H | 89H | 89H | 128H | 128H | 89H |
| 6.4 | 157I | 98G | 138H | 89D | 89C | 89B | 52G | 52G | 98G | 98G | 52G | 52G | 52G | 98G | 98G | 52G |
| 7.1 | | 174H | | | | | 108J | 108J | 134K | 134K | 108J | 108J | 108J | 134K | 134K | 108J |
| 7.2 | | 148N | | | | | 98I | 98I | 125J | 125J | 98I | 98I | 98I | 125J | 125J | 98I |
| 7.3 | | 131N | | | | | 89H | 89H | 108I | 108I | 89H | 89H | 89H | 108I | 108I | 89H |
| 7.4 | 157I | 98G | 138H | 89D | 89C | 89B | 79F | 79F | 108I | 108I | 79F | 79F | 79F | 108I | 108I | 79F |
| 8.1 | | 180H | | | | | 98J | 98J | 98I | 98I | 98J | 98J | 98J | 98I | 98I | 98J |
| 8.2 | | 131F | | | | | 92H | 92H | 164H | 164H | 92H | 92H | 92H | 164H | 164H | 92H |
| 8.3 | | | | | | | 46F | 46F | 115F | 115F | 46F | 46F | 46F | 115F | 115F | 46F |
| 9.1 | | | | | | | 10B | 10B | 10B | 10B | 10B | 10B | 10B | 10B | 10B | 10B |
| 10.1 | | | | | | | | | | | | | | | | |

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|------|--------------|----------------------|----------------------|----------------------|--------------|--------------|--------------|------------|--------------|--------------|-------------------------|--------------|----------------|-------------------|
| | DIN 338 | ANSI | NAS 907 | NAS 907 | ANSI | DIN 338 | ANSI | ANSI | DIN 338 | DIN 338 | NAS 907 | DIN 338 | NAS 907 | ANSI |
| | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 3XD | 2.5XD |
| | 118° | 135° | 118° | 135° | 118° | 135° | 135° | 135° | 135° | 135° | 135° | 135° | 135° | 118° |
| | ST | Powder Coat | ST | ST | | ST | | TiN | | TiN | Bronze | Bronze | Bronze | |
| | N | | | | W | W | | | | | N | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | A101 | HX10 HX15 HX18 | R10A R15A R18A | R10B R15B R18B | R10H R18H | A108 | QC21P | QC21G | QC21PM | QC21GM | R10CO R15CO R18CO | 2ACO | R88CO R89CO | R40 R41 R42 |
| | 1.00 - 12.00 | 1/16 - 1/2 | 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" |
| | 103 | 105 | 108 | 111 | 114 | 114 | 119 | 119 | 122 | 122 | 123 | 123 | 128 | 130 |
| 1.1 | 35H | 115H | 115J | 115J | 108I | 115I | 98F | 115F | 98F | 115F | 115J | 115J | 115J | 115J |
| 1.2 | 30H | 69H | 98H | 98H | 92I | 98I | 59F | 69F | 59F | 69F | 98H | 98H | 98H | 98J |
| 1.3 | 25F | 75I | 89G | 89G | | 82G | 66H | 75H | 66H | 75H | 89G | 89G | 89G | 89G |
| 1.4 | 20F | 69H | 79F | 79F | | 66F | 59F | 69F | 59F | 69F | 79F | 79F | 79F | 69G |
| 1.5 | 13E | 56F | 56E | 56E | | 43E | 46D | 56D | 46D | 56D | 56E | 56E | 56E | 46F |
| 1.6 | 9D | | 33D | 33D | | 30D | | | | | 33D | 33D | 33D | 33E |
| 1.7 | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | |
| 2.1 | 15E | 105I | 72E | 72E | | 49E | 89H | 105H | 89H | 105H | 72E | 72E | 72E | 52F |
| 2.2 | 8G | 59H | 36G | 36G | | 30G | 49F | 59F | 49F | 59F | 36G | 36G | 36G | 30H |
| 2.3 | 9C | 56F | 49C | 49C | | 33D | 49D | 59D | 49D | 59D | 49C | 49C | 49C | 33D |
| 2.4 | | | | | | | | | | | | | | |
| 3.1 | 30H | 171L | 115H | 115H | 82F | 98H | 151H | 171H | 151H | 171H | 115H | 115H | 115H | 105J |
| 3.2 | 24F | 89I | 92D | 92D | 66D | 79F | 79H | 89H | 79H | 89H | 92D | 92D | 92D | 89G |
| 3.3 | 20E | 95H | 72E | 72E | 52C | 66E | 79F | 95F | 79F | 95F | 72E | 72E | 72E | 66F |
| 3.4 | 14E | 59F | 56E | 56E | 33C | 46E | | 59D | | 59D | 56E | 56E | 56E | 52F |
| 4.1 | 23E | 95H | 92F | 92F | 49C | 82G | 89H | | 89H | | 92F | 92F | 92F | 89G |
| 4.2 | 12D | 75H | 66D | 66D | | 52E | 49F | | 49F | | 66D | 66D | 66D | 52E |
| 4.3 | 6B | | 36C | 36C | | 23B | | | | | 36C | 36C | 36C | 26C |
| 5.1 | 10G | 59H | 49G | 49G | 23E | 39G | 49F | 59H | 49F | 59H | 49G | 49G | 49G | 43H |
| 5.2 | 6E | | 23E | 23E | | 23G | | | | | 23E | 23E | 23E | 26F |
| 5.3 | 3A | | 20B | 20B | | 20E | | | | | 20B | 20B | 20B | 13B |
| 6.1 | 33G | | 125H | 125H | 115H | 108G | 89I | 98I | 89I | 98I | 125H | 125H | 125H | 118H |
| 6.2 | 35I | | 131F | 131F | 118G | 115I | 79H | 89H | 79H | 89H | 131F | 131F | 131F | 125J |
| 6.3 | 27H | | 89H | 89H | | 102H | 79H | 89H | 79H | 89H | 89H | 89H | 89H | 89I |
| 6.4 | 16G | | 69F | 69F | | 52G | | | | | 69F | 69F | 69F | 52H |
| 7.1 | 33J | | 108J | 108J | 148J | 108J | 351H | 400H | 351H | 400H | 108J | 108J | 108J | 108K |
| 7.2 | 30I | | 98I | 98I | 115J | 98I | 325H | 351H | 325H | 351H | 98I | 98I | 98I | 98J |
| 7.3 | 27H | | 98H | 98H | 98G | 89H | | | | | 98H | 98H | 98H | 98I |
| 7.4 | 24F | | 89F | 89F | 95G | 79F | 276H | 315H | 276H | 315H | 89F | 89F | 89F | 82I |
| 8.1 | 30J | | | | 138J | 98J | | | | | | | | 98K |
| 8.2 | 28H | | | | 131I | 92H | | | | | | | | 115I |
| 8.3 | 14F | | | | 66G | 46F | | | | | | | | 56G |
| 9.1 | 3B | | 20C | 20C | | 10B | | | | | 20C | 20C | 20C | 13C |
| 10.1 | | | | | | | | | | | | | | |

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|------|--------------|----------------------|--------------|--------------|------------|-------------|-------------------------|--------------|-------------------|--------------|------------|--------------|------------|--------------|--------------|----------------|
| | DIN ANSI | ANSI | DIN 1897 | ANSI | ANSI | DIN 1899 | ANSI | DIN 1897 | ANSI | DIN 340 | ANSI | ANSI | ANSI | DIN 340 | DIN 340 | ANSI |
| | 2.5XD | 2.5XD | 2.5XD | 3XD | 3XD | 2.5XD | 2.5XD | 2.5XD | 6XD | 6XD | 6XD | 6XD | 6XD | 6XD | 6XD | 6XD |
| | 135° | 135° | 135° | 135° | 135° | 118° | 135° | 135° | 118° | 118° | 118° | 135° | 135° | 135° | 135° | 135° |
| | TIN | ST | ST | | TIN | | Bronze | Bronze | | | | | TIN | | TIN | Bronze |
| | N | | N | | | N | | N | | N | W | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | A022 | R40C R41C R42C | 4ASM | QC41P | QC41G | A720 | M40CO M41CO M42CO | 4ASM- CO | R51 R52 R55 | 5ATL | R51FS | QC91P | QC91G | QC91PM | QC91GM | M51CO M52CO |
| | 0.50 - 16.00 | N60 - 1/2 | 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" |
| | 133 | 136 | 139 | 141 | 141 | 143 | 144 | 147 | 148 | 152 | 154 | 155 | 155 | 157 | 157 | 158 |
| 1.1 | 115K | 115J | 115J | 98F | 115F | 115A | 125K | 125K | 89G | 89G | | 98F | 115F | 98F | 115F | 89G |
| 1.2 | 105K | 98J | 98J | 59F | 69F | 98A | 108H | 108H | 82G | 82G | | 59F | 69F | 59F | 69F | 82G |
| 1.3 | 82I | 89G | 89G | 66H | 75H | 89A | 98G | 98G | 66E | 66E | | 66H | 75H | 66H | 75H | 66E |
| 1.4 | 75H | 69G | 69G | 59F | 69F | 75A | 89G | 89G | 52E | 52E | | 59F | 69F | 59F | 69F | 52E |
| 1.5 | 52G | 46F | 46F | 46D | 56D | 56A | 59F | 59F | 30D | 30D | | 46D | 56D | 46D | 56D | 30D |
| 1.6 | 33E | 33E | 33E | | | 33A | 36E | 36E | 20B | 20B | | | | | | 20B |
| 1.7 | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | |
| 2.1 | 49G | 52F | 52F | 89H | 105H | 72A | 72F | 72F | 33D | 33D | | 89H | 105H | 89H | 105H | 33D |
| 2.2 | 26I | 30H | 30H | 49F | 59F | 33A | 36H | 36H | 20F | 20F | | 49F | 59F | 49F | 59F | 20F |
| 2.3 | 30E | 33D | 33D | 49D | 59D | 49A | 49D | 49D | 13B | 13B | | 49D | 59D | 49D | 59D | 13B |
| 2.4 | | | | | | | | | | | | | | | | |
| 3.1 | 105K | 105J | 105J | 151H | 171H | 98A | 112K | 112K | 92H | 92H | | 151H | 171H | 151H | 171H | 92H |
| 3.2 | 82I | 89G | 89G | 79H | 89H | 79A | 98F | 98F | 69E | 69E | | 79H | 89H | 79H | 89H | 69E |
| 3.3 | 66G | 66F | 66F | 79F | 95F | 66A | 72F | 72F | 49D | 49D | | 79F | 95F | 79F | 95F | 49D |
| 3.4 | 52G | 52F | 52F | | 59D | 46A | 56F | 56F | 43D | 43D | | | 59D | | 59D | 43D |
| 4.1 | 82I | 89G | 89G | 89H | | 75A | 98G | 98G | 56E | 56E | | 89H | | 89H | | 56E |
| 4.2 | 46F | 52E | 52E | 49F | | 56A | 59F | 59F | 30C | 30C | | 49F | | 49F | | 30C |
| 4.3 | 26C | 26C | 26C | | | 26A | 33C | 33C | 13A | 13A | | | | | | 13A |
| 5.1 | 43H | 43H | 43H | 49F | 59H | 33A | 49H | 49H | 26F | 26F | | 49F | 59H | 49F | 59H | 26F |
| 5.2 | 26F | 26F | 26F | | | 23A | 30F | 30F | 13D | 13D | | | | | | 13D |
| 5.3 | 13B | 13B | 13B | | | 13A | 20C | 20C | 10A | 10A | | | | | | 10A |
| 6.1 | 118H | 118H | 118H | 89I | 98I | 115A | 125I | 125I | 98E | 98E | 89I | 89I | 98I | 89I | 98I | 98E |
| 6.2 | 125K | 125J | 125J | 79H | 89H | 131A | 131K | 131K | 105H | 105H | | 79H | 89H | 79H | 89H | 105H |
| 6.3 | 89I | 89I | 89I | 79H | 89H | 115A | 89J | 89J | 89G | 89G | | 79H | 89H | 79H | 89H | 89G |
| 6.4 | 52I | 52H | 52H | | | 89A | 52I | 52I | 52E | 52E | | | | | | 52E |
| 7.1 | 131F | 108K | 108K | 351H | | 115A | 115K | 115K | 105I | 105I | 348H | 351H | 400H | 351H | 400H | 105I |
| 7.2 | 105K | 98J | 98J | 325H | | 98A | 108J | 108J | 89H | 89H | 325H | 325H | 351H | 325H | 351H | 89H |
| 7.3 | 105J | 98I | 98I | | | 89A | 102I | 102I | 89G | 89G | | | | | | 89G |
| 7.4 | 82J | 82I | 82I | 276H | | 89A | 98G | 98G | 82E | 82E | 276H | 276H | 315H | 276H | 315H | 82E |
| 8.1 | 98K | 98K | 98K | | | 157A | 115M | 115M | 115I | 115I | | | | | | 115I |
| 8.2 | 115I | 115I | 115I | | | 82A | 92K | 92K | 85G | 85G | | | | | | 85G |
| 8.3 | 56G | 56G | 56G | | | | 56I | 56I | 39E | 39E | | | | | | 39E |
| 9.1 | 13C | 13C | 13C | | | | 20C | 20C | 10A | 10A | | | | | | 10A |
| 10.1 | | | | | | | | | | | | | | | | |

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|------|--------------|--------------|-----------|--------------------|------------|-----------|-------------------------|----------------------------|--------------------|----------------------|-------------|--------------|--------------|--------------|--------------|---------------|------|
| | ANSI | ANSI | 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 | |
| | 12XD | 15XD | 10XD | 10XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 4XD | 6XD | 10XD | 15XD |
| | 118° | 118° | 118° | 135° | 135° | 118° | 135° | 135° | 135° | 135° | 118° | 118° | 118° | 118° | 118° | 118° | 130° |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | N | | N | N | | | | | | N | N | N | N | N | W |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
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| | 0860 1290 | 1511 1813 | 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 | |
| | 1/8 - 3/4 | 3/16 - 1" | 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 - 40.00 | 10.00 - 30.00 | |
| | 160 | 162 | 162 | 167 | 169 | 169 | 170 | 173 | 175 | 175 | 177 | 180 | 180 | 180 | 183 | 185 | |
| 1.1 | 79E | 79E | 79E | 98F | | | | | | | 115I | 115I | 154I | 89I | 79G | 89G | |
| 1.2 | 72E | 72E | 72E | 59F | | | | | | | 98I | 98I | 131I | 82I | 72G | 72G | |
| 1.3 | 52C | 52C | 52C | 66H | 82F | 82F | 82F | 82F | | | 82F | 82F | 98F | 66G | 56E | 62E | |
| 1.4 | 49C | 49C | 49C | 59F | 66F | 66F | 66F | 66F | | | 66F | 66F | 89F | 52F | 49D | 49D | |
| 1.5 | 20A | 20A | 20A | 46D | 43E | 43E | 43E | 43E | | | 39E | 39E | 66E | 33E | 20C | 26C | |
| 1.6 | 16A | 16A | 16A | | 30D | 30D | 30D | 30D | 20B | 20B | 30D | 30D | 33D | 20D | 16B | 20B | |
| 1.7 | | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | | |
| 2.1 | 30C | 30C | 30C | 89H | 49E | 49E | 49E | 49E | 95H | 95H | 49E | 49E | 79E | 43E | 39C | 39C | |
| 2.2 | 13E | 13E | 13E | 49F | 26G | 26G | 26G | 26G | 56F | 56F | 30G | 30G | 43G | 13G | 13E | 20E | |
| 2.3 | 26A | 26A | 26A | 49D | 30C | 30C | 30C | 30C | 56D | 56D | 33C | 33C | 66C | 26C | 26A | 39A | |
| 2.4 | | | | | | | | | 30D | 30D | | | | | | | |
| 3.1 | 72G | 72G | 72G | 151H | 98I | 98I | 98I | 98I | 161H | 161H | 98I | 98I | 118I | 85I | 72G | 72G | |
| 3.2 | 59D | 59D | 59D | 79H | 79F | 79F | 79F | 79F | 85H | 85H | 79E | 79E | 92E | 66F | 59D | 52D | |
| 3.3 | 43C | 43C | 43C | 79F | 66E | 66E | 66E | 66E | 85F | 85F | 66E | 66E | 89E | 59E | 43C | 43C | |
| 3.4 | 30C | 30C | 30C | | 46E | 46E | 46E | 46E | 56D | 56D | 46E | 46E | 72E | 36E | 30C | 30C | |
| 4.1 | 36D | 36D | 36D | | 75F | 75F | 75F | 75F | | | 75F | 75F | 105F | 52F | 49D | 59D | |
| 4.2 | 30B | 30B | 30B | | 39D | 39D | 39D | 39D | | | 43D | 43D | 59D | 30D | 30B | 33B | |
| 4.3 | 16A | 16A | 16A | | 20B | 20B | 20B | 20B | 20D | 20D | 23B | 23B | 43B | 16B | 16A | 20A | |
| 5.1 | 16E | 16E | 16E | 49F | 33G | 33G | 33G | 33G | | | 33G | 33G | 43G | 26G | 26E | 23E | |
| 5.2 | 13C | 13C | 13C | | 20E | 20E | 20E | 20E | 20B | 20B | 23E | 23E | 20E | 13E | 13C | 16C | |
| 5.3 | 10A | 10A | 10A | | 10A | 10A | 10A | 10A | 16B | 16B | 13A | 13A | 10A | 10A | 10A | 10A | |
| 6.1 | 79D | 79D | 79D | | | | | | | | 108F | 108F | 197G | 108F | 89D | 72D | |
| 6.2 | 108G | 108G | 108G | 79H | | | | | | | 115I | 115I | 180I | 115I | 108G | 108G | |
| 6.3 | 72F | 72F | 72F | 75H | 89H | 89H | 89H | 89H | | | 115H | 115H | 131G | 115H | 89F | 72F | |
| 6.4 | 52D | 52D | 52D | | 52G | 52G | 52G | 52G | | | 52F | 52F | 115E | 52F | 52D | 52D | |
| 7.1 | 79H | 79H | 79H | 348H | | | | | | | 85J | 85J | 180I | 108J | 108H | 98H | |
| 7.2 | 72G | 72G | 72G | 325H | | | | | | | 98I | 98I | 148I | 82I | 89G | 89G | |
| 7.3 | 72F | 72F | 72F | | | | | | | | 92H | 92H | 115G | 89H | 89F | 79F | |
| 7.4 | 66E | 66E | 66E | 276H | 79F | 79F | 79F | 79F | | | 75H | 75H | 92G | 82H | 79F | 72F | |
| 8.1 | 98H | 98H | 98H | 151D | | | | | | | 98K | 98K | 164J | 115L | 98J | 98J | |
| 8.2 | 85F | 85F | 85F | 125D | | | | | | | 92J | 92J | 164H | 85J | 98H | 98H | |
| 8.3 | 33D | 33D | 33D | | | | | | | | 46H | 46H | 115F | 39H | 33F | 33F | |
| 9.1 | 10A | 10A | 10A | | 10B | 10B | 10B | 10B | | | 10B | 10B | 10B | 10B | 10A | 10A | |
| 10.1 | | | | | | | | | | | | | | | | | |

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|------|--------------|-------------|---------------|-------------|---------------|---------------|---------------|---------|------------|-----------|--------------|----------------------|--------------|---------------------------|----------|----------|
| | DIN 1870/2 | ANSI | DIN 345 | ANSI | DORMER | ANSI | ANSI | ANSI | ANSI | ANSI | DIN 338 | ANSI | | ANSI | ANSI | ANSI |
| | 20XD | 4XD | 4XD | 5XD | 4XD | 4XD | 4XD | 1.5XD | 4XD | 4XD | 4XD | 3XD | 3XD | 1XD | 1XD | 1XD |
| | 130° | 135° | 118° | | 118° | 118° | 118° | 118° | 118° | 118° | 118° | 118° | 118° | 90° | 90° | 90° |
| | ST | Bronze | Bronze | ST | ST | ST | ST | ST | ST | ST | ST | | | | | TN |
| | | | | | | | | | | | | | | | | |
| | W | | N | | N | | | | | | N | | | | | |
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| | | | | | | | | | | | | | | | | |
| | A952 | 209CO | A730 | T400 | A170 | R56 | R57 | R58 | R56CO | D444 | A160 | D33F D33W D33L | D33M | DS-90 DS-120 DS-142 | SPS-90 | SPSG-90 |
| | 8.00 - 40.00 | 1/4 - 1.1/2 | 10.00 - 32.00 | 1/2 - 1.5/8 | 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 | 1.00 - 12.00 | 1/8 - 1/2 | 1/4 - 1" | 1/4 - 1" |
| | 185 | 187 | 189 | 191 | 192 | 194 | 196 | 198 | 199 | 200 | 202 | 203 | 206 | 207 | 208 | 208 |
| 1.1 | 89G | 115J | 115J | 75E | 115H | 115H | 115H | 98F | 115H | 197E | 197E | 279S | 279S | 279S | 115E | 115E |
| 1.2 | 72G | 98H | 98H | 46F | 98H | 98H | 98H | 59F | 98H | 197E | 197E | 246S | 246S | 246S | 98E | 98E |
| 1.3 | 62E | 89G | 89G | 49F | 82F | 82F | 82F | 66H | 82F | 180D | 180D | 246S | 246S | 246S | 89C | 89C |
| 1.4 | 49D | 75F | 75F | 49D | 66E | 66E | 66E | 59F | 66E | 164D | 164D | 230S | 230S | 230S | 69C | 69C |
| 1.5 | 26C | 56E | 56E | 36D | 43D | 43D | 43D | 46D | 43D | 131C | 131C | 148S | 148S | 148S | 46C | 46C |
| 1.6 | 20B | 33D | 33D | | 30C | 30C | 30C | | 30C | 121A | 121A | 148S | 148S | 148S | 33B | 33B |
| 1.7 | | | | | | | | | | | | 98S | 98S | 98S | | |
| 1.8 | | | | | | | | | | | | 98S | 98S | 98S | | |
| 2.1 | 39C | 79E | 79E | 66F | 49D | 49D | 49D | 89H | 49D | 131B | 131B | 98S | 98S | 174S | 52C | 52C |
| 2.2 | 20E | 36G | 36G | 39D | 23F | 23F | 23F | 49F | 23F | 115C | 115C | | | 148S | 30D | 30D |
| 2.3 | 39A | 56C | 56C | 39D | 23B | 23B | 23B | 49D | 23B | 115A | 115A | | | | 33B | 33B |
| 2.4 | | | | | | | | | | | | | | | | |
| 3.1 | 72G | 115J | 115J | 108E | 89H | 89H | 89H | 151H | 89H | 164C | 164C | 246T | 246T | 246T | 105E | 105E |
| 3.2 | 52D | 92G | 92G | 59H | 72E | 72E | 72E | 79H | 72E | 131A | 131A | 246T | 246T | 246T | 89C | 89C |
| 3.3 | 43C | 72E | 72E | 59F | 62D | 62D | 62D | 79F | 62D | 115A | 115A | 180T | 180T | 180T | 66C | 66C |
| 3.4 | 30C | 56E | 56E | | 39D | 39D | 39D | | 39D | 98A | 98A | 180T | 180T | 180T | 52B | 52B |
| 4.1 | 59D | 92G | 92G | 69F | 56E | 56E | 56E | 89H | 56E | 115A | 115A | | | 148T | 89C | 89C |
| 4.2 | 33B | 66D | 66D | 36D | 30C | 30C | 30C | 49F | 30C | 115A | 115A | | | 115T | 39B | 39B |
| 4.3 | 20A | 36C | 36C | | 16A | 16A | 16A | | 16A | 82A | 82A | | | 82S | 23A | 23A |
| 5.1 | 23E | 49G | 49G | 49D | 26F | 26F | 26F | 49F | 26F | 98A | 98A | | | 148T | 43D | 43D |
| 5.2 | 16C | 23E | 23E | | 13D | 13D | 13D | 23F | 13D | 82A | 82A | | | 98S | 26C | 26C |
| 5.3 | 10A | 20B | 20B | | 10A | 10A | 10A | 13B | 10A | 66A | 66A | | | 66S | 13A | 13A |
| 6.1 | 72D | 125L | 125L | | 115F | 115F | 115F | 108F | 115F | 180D | 180D | | | 902V | 89D | 89D |
| 6.2 | 108G | 131J | 131J | | 108H | 108H | 108H | 115H | 108H | 230G | 230G | 820V | 820V | 820V | 108E | 108E |
| 6.3 | 72F | 89H | 89H | | 89G | 89G | 89G | 115H | 89G | 197C | 197C | 820V | 820V | 820V | 89D | 89D |
| 6.4 | 52D | 69F | 69F | | 52F | 52F | 52F | 52F | 52F | 164C | 164C | | | 230T | 52D | 52D |
| 7.1 | 98H | 108J | 108J | | 108I | 108I | 108I | 85I | 108I | 164I | 164I | 656V | 656V | 656V | 108E | 108E |
| 7.2 | 89G | 98I | 98I | | 98H | 98H | 98H | 98H | 98H | 148H | 148H | 656V | 656V | 656V | 98E | 98E |
| 7.3 | 79F | 98H | 98H | | 89G | 89G | 89G | 92H | 89G | 131G | 131G | 367V | 367V | 367V | 98D | 98D |
| 7.4 | 72F | 89F | 89F | | 72G | 72G | 72G | 75H | 72G | 115F | 115F | 197V | 197V | 197V | 82D | 82D |
| 8.1 | 98J | 115K | 115K | | 98I | 98I | 98I | 98I | 98I | | | 197X | 197X | 197X | 98F | 98F |
| 8.2 | 98H | 92J | 92J | | 92G | 92G | 92G | 92I | 92G | 197E | 197E | 328V | 328V | 328V | 115E | 115E |
| 8.3 | 33F | 66H | 66H | | 46E | 46E | 46E | 46H | 46E | | | | | | 56D | 56D |
| 9.1 | 10A | 16C | 16C | | 10A | 10A | 10A | 10B | 10A | 30C | 30C | | | | 39A | 39A |
| 10.1 | | | | | | | | | | | | | | | | |

List Number Index - Drills



Pgs. 9 - 241

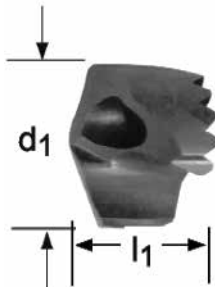
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|--------------|-----|-----------------|-----|---------------|-----|----------------|-----|
| 0860 | 160 | A951 | 185 | D444 | 200 | R42C | 136 |
| 209 | 177 | A952 | 185 | DC | 211 | R453 | 56 |
| 1290 | 160 | A976 | 84 | DS-90 | 207 | R454 | 56 |
| 1511 | 162 | A977 | 84 | DS-120 | 207 | R457 | 47 |
| 1813 | 162 | A978 | 84 | DS-142 | 207 | R458 | 47 |
| 209CO | 187 | ATR41 | 223 | H851 | 30 | R459 | 63 |
| 2A | 95 | C114COMB | 227 | H853 | 33 | R463 | 60 |
| 2AB | 95 | C114COMBC | 235 | H855 | 36 | R467 | 51 |
| 2ACO | 123 | C114COMBP | 226 | H858 | 39 | R51 | 148 |
| 4ASM | 139 | C115COMB | 227 | H8512 | 42 | R510 | 54 |
| 4ASMCO | 147 | C115COMBC | 235 | H860 | 44 | R51FS | 154 |
| 500-12 | 173 | C115COMBP | 226 | H861 | 44 | R52 | 148 |
| 500-6 | 170 | C13R10CO | 234 | HX10 | 105 | R520 | 45 |
| 501-12 | 173 | C15L10 | 231 | HX15 | 105 | R55 | 148 |
| 501-6 | 170 | C15R10 | 224 | HX18 | 105 | R56 | 194 |
| 502-12 | 173 | C15R10CO | 234 | L10 | 102 | R56CO | 199 |
| 502-6 | 170 | C15R10P | 224 | M40CO | 144 | R57 | 196 |
| 5ATL | 152 | C20R18 | 225 | M41CO | 144 | R58 | 198 |
| 5ATS | 180 | C20R18P | 225 | M42CO | 144 | R88CO | 128 |
| 76HA | 212 | C21R10CO | 234 | M51CO | 158 | R89CO | 128 |
| A002 | 95 | C252A | 228 | M52CO | 158 | R950 | 21 |
| A012 | 91 | C252AB | 228 | QC0860P | 167 | R960 | 24 |
| A022 | 133 | C26M42CO | 239 | QC1290P | 167 | R970 | 27 |
| A088 | 237 | C26R15 | 226 | QC21G | 119 | S209 | 177 |
| A094 | 229 | C26R15CO | 234 | QC21GM | 122 | SPL-120 | 210 |
| A095 | 230 | C26R15P | 226 | QC21P | 119 | SPL-90 | 210 |
| A097 | 225 | C26R42 | 236 | QC21PM | 122 | SPLG-120 | 210 |
| A100 | 95 | C29HX10 | 233 | QC41G | 141 | SPLG-90 | 210 |
| A101 | 103 | C29L10 | 231 | QC41P | 141 | SPR-120 | 209 |
| A108 | 114 | C29M40CO | 239 | QC91G | 155 | SPR-90 | 209 |
| A125 | 162 | C29R10 | 224 | QC91GM | 157 | SPRG-120 | 209 |
| A160 | 202 | C29R10CO | 234 | QC91P | 155 | SPRG-90 | 209 |
| A170 | 192 | C29R10P | 224 | QC91PM | 157 | SPS-120 | 208 |
| A190 | 228 | C29R40 | 236 | R10 | 87 | SPS-90 | 208 |
| A191 | 228 | C29R40C | 238 | R10A | 108 | SPSG-120 | 208 |
| A217 | 213 | C29R51 | 240 | R10B | 111 | SPSG-90 | 208 |
| A218 | 213 | C33R56 | 241 | R10CO | 123 | T400 | 191 |
| A221 | 214 | C502AB | 228 | R10H | 114 | TS10HS | 215 |
| A225 | 213 | C60M41CO | 239 | R10P | 87 | TS15HS | 215 |
| A243 | 169 | C60R18 | 225 | R15 | 87 | TS18HS | 215 |
| A244 | 169 | C60R18CO | 234 | R15A | 108 | TS40HS | 215 |
| A287 | 232 | C60R18P | 225 | R15B | 111 | TS41HS | 215 |
| A345 | 183 | C60R41 | 236 | R15CO | 123 | TS42HS | 215 |
| A350 | 180 | C60R41C | 238 | R15P | 87 | TS51HS | 215 |
| A510 | 73 | C8R56 | 241 | R18 | 87 | TS52HS | 215 |
| A520 | 66 | C8R56CO | 241 | R18A | 108 | TS55HS | 215 |
| A530 | 180 | C8R57 | 241 | R18B | 111 | TS10CO | 219 |
| A553 | 76 | CO500-12 | 175 | R18CO | 123 | TS15CO | 219 |
| A720 | 143 | CO500-6 | 175 | R18H | 114 | TS18CO | 219 |
| A730 | 189 | CO501-12 | 175 | R18P | 87 | TS40CO | 219 |
| A900 | 78 | CO501-6 | 175 | R40 | 130 | TS41CO | 219 |
| A901 | 78 | D33F | 203 | R40C | 136 | TS42CO | 219 |
| A920 | 69 | D33L | 203 | R41 | 130 | TS51CO | 219 |
| A921 | 69 | D33M | 206 | R41C | 136 | TS52CO | 219 |
| A940 | 81 | D33W | 203 | R42 | 130 | TS55CO | 219 |
| A941 | 81 | | | | | | |

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-phos coating for longer tool life.



R950




HM

15/32 - 42.00

* For more information on Hydra, see page 539

| d_1 $\varnothing h_7$ Inch | d_1 $\varnothing h_7$ mm | d_1 decimal Inch | l_1 mm | Pack Qty | R950 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|---------|
| 15/32 | 11.91 | 0.4688 | 9.1 | 1 | 5988695 |
| | 12.00 | 0.4724 | 9.1 | 1 | 5988624 |
| | 12.10 | 0.4764 | 9.1 | 1 | 5988627 |
| | 12.20 | 0.4803 | 9.1 | 1 | 5988630 |
| 31/64 | 12.30 | 0.4844 | 9.1 | 1 | 5988936 |
| | 12.50 | 0.4921 | 9.4 | 1 | 5988633 |
| 1/2 | 12.60 | 0.4961 | 9.4 | 1 | 5988640 |
| | 12.70 | 0.5000 | 9.4 | 1 | 5988620 |
| | 12.80 | 0.5039 | 9.4 | 1 | 5988641 |
| 33/64 | 12.90 | 0.5079 | 9.4 | 1 | 5988642 |
| | 13.00 | 0.5118 | 9.7 | 1 | 5988643 |
| | 13.10 | 0.5156 | 9.7 | 1 | 5988850 |
| | 13.20 | 0.5197 | 9.7 | 1 | 5988644 |
| 17/32 | 13.49 | 0.5313 | 9.7 | 1 | 5988697 |
| | 13.50 | 0.5315 | 10.3 | 1 | 5988645 |
| | 13.60 | 0.5354 | 10.3 | 1 | 5988646 |
| | 13.70 | 0.5394 | 10.3 | 1 | 5988647 |
| | 13.80 | 0.5433 | 10.3 | 1 | 5988648 |
| 35/64 | 13.89 | 0.5469 | 10.3 | 1 | 5988854 |
| | 14.00 | 0.5512 | 10.3 | 1 | 5988652 |
| | 14.10 | 0.5551 | 10.3 | 1 | 5988655 |
| | 14.20 | 0.5591 | 10.3 | 1 | 5988657 |
| 9/16 | 14.29 | 0.5625 | 10.3 | 1 | 5988904 |
| | 14.50 | 0.5709 | 10.3 | 1 | 5988660 |
| | 14.60 | 0.5748 | 11.0 | 1 | 5988663 |
| 37/64 | 14.68 | 0.5781 | 11.0 | 1 | 5988857 |
| | 14.70 | 0.5787 | 11.0 | 1 | 5988666 |
| | 14.80 | 0.5827 | 11.0 | 1 | 5988668 |
| | 15.00 | 0.5906 | 11.0 | 1 | 5988670 |
| 19/32 | 15.08 | 0.5938 | 11.0 | 1 | 5988779 |
| | 15.10 | 0.5945 | 11.0 | 1 | 5988672 |
| | 15.20 | 0.5984 | 11.0 | 1 | 5988674 |
| | 15.24 | 0.6000 | 11.0 | 1 | 5988678 |

HYDRA DRILL



| 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 | 5988860 |
| | 15.50 | 0.6102 | 11.0 | 1 | 5988680 |
| | 15.60 | 0.6142 | 11.6 | 1 | 5988683 |
| 5/8 | 15.70 | 0.6181 | 11.6 | 1 | 5988687 |
| | 15.88 | 0.6250 | 11.6 | 1 | 5988884 |
| | 16.00 | 0.6299 | 11.6 | 1 | 5988698 |
| | 16.08 | 0.6331 | 11.6 | 1 | 5988702 |
| | 16.10 | 0.6339 | 11.6 | 1 | 5988710 |
| 41/64 | 16.20 | 0.6378 | 11.6 | 1 | 5988715 |
| | 16.27 | 0.6406 | 11.6 | 1 | 5988864 |
| | 16.30 | 0.6417 | 11.6 | 1 | 5988725 |
| | 16.50 | 0.6496 | 11.6 | 1 | 5988690 |
| 21/32 | 16.60 | 0.6535 | 12.2 | 1 | 5988749 |
| | 16.67 | 0.6563 | 12.2 | 1 | 5988802 |
| | 16.70 | 0.6575 | 12.2 | 1 | 5988790 |
| | 17.00 | 0.6693 | 12.2 | 1 | 5988833 |
| 43/64 | 17.07 | 0.6719 | 12.2 | 1 | 5988867 |
| | 17.10 | 0.6732 | 12.2 | 1 | 5988873 |
| | 17.20 | 0.6772 | 12.2 | 1 | 5988881 |
| 11/16 | 17.46 | 0.6875 | 12.2 | 1 | 5988623 |
| | 17.50 | 0.6890 | 12.2 | 1 | 5988885 |
| | 17.60 | 0.6929 | 12.9 | 1 | 5988891 |
| | 17.70 | 0.6969 | 12.9 | 1 | 5988894 |
| 45/64 | 17.86 | 0.7031 | 12.9 | 1 | 5988872 |
| | 18.00 | 0.7087 | 12.9 | 1 | 5988701 |
| | 18.10 | 0.7126 | 12.9 | 1 | 5988706 |
| | 18.20 | 0.7165 | 12.9 | 1 | 5988713 |
| 23/32 | 18.26 | 0.7188 | 12.9 | 1 | 5988824 |
| | 18.50 | 0.7283 | 12.9 | 1 | 5988718 |
| | 18.60 | 0.7323 | 13.5 | 1 | 5988723 |
| 47/64 | 18.65 | 0.7344 | 13.5 | 1 | 5988877 |
| | 18.70 | 0.7362 | 13.5 | 1 | 5988728 |
| | 18.90 | 0.7441 | 13.5 | 1 | 5988733 |
| | 19.00 | 0.7480 | 13.5 | 1 | 5988740 |
| 3/4 | 19.05 | 0.7500 | 13.5 | 1 | 5988928 |
| | 19.10 | 0.7520 | 13.5 | 1 | 5988745 |
| | 19.20 | 0.7559 | 13.5 | 1 | 5988752 |
| | 19.25 | 0.7579 | 13.5 | 1 | 5988756 |
| | 19.30 | 0.7598 | 13.5 | 1 | 5988760 |
| 49/64 | 19.35 | 0.7618 | 13.5 | 1 | 5988764 |
| | 19.45 | 0.7656 | 13.5 | 1 | 5988880 |
| | 19.50 | 0.7677 | 13.5 | 1 | 5988767 |
| | 19.60 | 0.7717 | 14.1 | 1 | 5988771 |
| | 19.70 | 0.7756 | 14.1 | 1 | 5988775 |
| 25/32 | 19.84 | 0.7813 | 14.1 | 1 | 5988851 |
| | 20.00 | 0.7874 | 14.1 | 1 | 5988782 |
| | 20.24 | 0.7969 | 14.1 | 1 | 5988892 |
| 51/64 | 20.50 | 0.8071 | 14.1 | 1 | 5988786 |
| | 20.64 | 0.8125 | 14.8 | 1 | 5988649 |
| 13/16 | 21.00 | 0.8268 | 14.8 | 1 | 5988794 |
| | 21.03 | 0.8281 | 14.8 | 1 | 5988896 |
| 53/64 | 21.43 | 0.8438 | 14.8 | 1 | 5988869 |
| | 21.50 | 0.8465 | 14.8 | 1 | 5988798 |
| 27/32 | 21.83 | 0.8594 | 15.0 | 1 | 5988898 |
| | 22.00 | 0.8661 | 15.0 | 1 | 5988806 |
| 7/8 | 22.22 | 0.8750 | 15.0 | 1 | 5988903 |
| | 22.50 | 0.8858 | 15.0 | 1 | 5988810 |
| 57/64 | 22.62 | 0.8906 | 15.0 | 1 | 5988899 |
| | 22.70 | 0.8937 | 15.0 | 1 | 5988814 |
| | 23.00 | 0.9055 | 15.1 | 1 | 5988816 |
| 29/32 | 23.02 | 0.9063 | 15.1 | 1 | 5988917 |
| | 23.42 | 0.9219 | 15.1 | 1 | 5988900 |
| 59/64 | 23.50 | 0.9252 | 15.1 | 1 | 5988820 |
| | 23.81 | 0.9375 | 15.4 | 1 | 5988691 |
| 15/16 | 24.00 | 0.9449 | 15.4 | 1 | 5988828 |

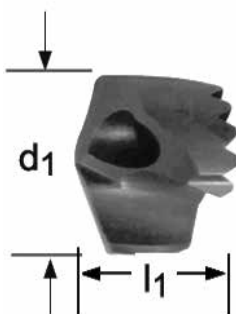
| d ₁ Øh ₇ Inch | d ₁ Øh ₇ mm | d ₁ decimal Inch | l ₁ mm | Pack Qty | R950 |
|---|---|-----------------------------------|----------------------|-------------|---------|
| 61/64 | 24.21 | 0.9531 | 15.4 | 1 | 5988901 |
| | 24.50 | 0.9646 | 15.4 | 1 | 5988837 |
| 31/32 | 24.61 | 0.9688 | 15.4 | 1 | 5988934 |
| | 25.00 | 0.9844 | 15.8 | 1 | 5988840 |
| 63/64 | 25.00 | 0.9844 | 15.8 | 1 | 5988902 |
| 1" | 25.40 | 1.0000 | 15.8 | 1 | 5988604 |
| | 25.50 | 1.0039 | 15.8 | 1 | 5988843 |
| | 25.65 | 1.0098 | 15.8 | 1 | 5988847 |
| 1.1/64 | 25.80 | 1.0156 | 15.8 | 1 | 5988676 |
| | 26.00 | 1.0236 | 16.4 | 1 | 5988855 |
| 1.1/32 | 26.19 | 1.0313 | 16.4 | 1 | 5988650 |
| | 26.50 | 1.0433 | 16.4 | 1 | 5988858 |
| 1.3/64 | 26.59 | 1.0469 | 16.4 | 1 | 5988744 |
| 1.1/16 | 26.99 | 1.0625 | 17.1 | 1 | 5988637 |
| | 27.00 | 1.0630 | 17.1 | 1 | 5988861 |
| 1.5/64 | 27.38 | 1.0781 | 17.1 | 1 | 5988611 |
| | 27.50 | 1.0827 | 17.1 | 1 | 5988865 |
| 1.3/32 | 27.78 | 1.0938 | 17.1 | 1 | 5988739 |
| | 28.00 | 1.1024 | 17.7 | 1 | 5988876 |
| 1.7/64 | 28.18 | 1.1094 | 17.7 | 1 | 5988614 |
| | 28.50 | 1.1220 | 17.7 | 1 | 5988844 |
| 1.1/8 | 28.58 | 1.1250 | 17.7 | 1 | 5988720 |
| 1.9/64 | 28.97 | 1.1406 | 18.3 | 1 | 5988617 |
| | 29.00 | 1.1417 | 18.3 | 1 | 5988888 |
| 1.5/32 | 29.37 | 1.1563 | 18.3 | 1 | 5988608 |
| | 29.50 | 1.1614 | 18.3 | 1 | 5988906 |
| 1.11/64 | 29.77 | 1.1719 | 18.3 | 1 | 5988730 |
| | 30.00 | 1.1811 | 19.0 | 1 | 5988930 |
| 1.3/16 | 30.16 | 1.1875 | 19.0 | 1 | 5988735 |
| | 30.50 | 1.2008 | 19.0 | 1 | 5988932 |
| 1.7/32 | 30.96 | 1.2188 | 21.0 | 1 | 6104481 |
| | 31.00 | 1.2205 | 21.0 | 1 | 6104482 |
| 1.1/4 | 31.75 | 1.2500 | 21.0 | 1 | 6104483 |
| | 32.00 | 1.2598 | 21.0 | 1 | 6104484 |
| | 32.50 | 1.2795 | 21.0 | 1 | 6104485 |
| 1.19/64 | 32.94 | 1.2969 | 21.0 | 1 | 6104486 |
| | 33.00 | 1.2992 | 21.0 | 1 | 6104487 |
| | 33.50 | 1.3189 | 21.0 | 1 | 6104488 |
| | 34.00 | 1.3386 | 23.0 | 1 | 6104489 |
| 1.11/32 | 34.13 | 1.3438 | 23.0 | 1 | 6104530 |
| | 34.50 | 1.3583 | 23.0 | 1 | 6104531 |
| 1.3/8 | 34.93 | 1.3750 | 23.0 | 1 | 6104532 |
| | 35.00 | 1.3780 | 23.0 | 1 | 6104533 |
| | 36.00 | 1.4173 | 23.0 | 1 | 6104534 |
| 1.27/64 | 36.12 | 1.4219 | 23.0 | 1 | 6104535 |
| | 36.50 | 1.4370 | 23.0 | 1 | 6104536 |
| | 37.00 | 1.4567 | 25.0 | 1 | 6104537 |
| 1.15/32 | 37.31 | 1.4688 | 25.0 | 1 | 6104538 |
| | 37.50 | 1.4764 | 25.0 | 1 | 6104539 |
| | 38.00 | 1.4961 | 25.0 | 1 | 6104540 |
| 1.1/2 | 38.10 | 1.5000 | 25.0 | 1 | 6104541 |
| | 38.50 | 1.5157 | 25.0 | 1 | 6104542 |
| 1.17/32 | 38.89 | 1.5313 | 25.0 | 1 | 6104543 |
| | 39.00 | 1.5354 | 25.0 | 1 | 6104544 |
| | 39.50 | 1.5551 | 25.0 | 1 | 6104545 |
| 1.9/16 | 39.69 | 1.5625 | 27.0 | 1 | 6104546 |
| | 40.00 | 1.5748 | 27.0 | 1 | 6104547 |
| | 41.00 | 1.6142 | 27.0 | 1 | 6104548 |
| 1.5/8 | 41.28 | 1.6250 | 27.0 | 1 | 6104549 |
| | 42.00 | 1.6535 | 27.0 | 1 | 6104550 |

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



15/32 - 30.50

* For more information on Hydra, see page 539

| d_1 Øh ₇ Inch | d_1 Øh ₇ mm | d_1 decimal Inch | l_1 mm | Pack Qty | R960 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|---------|
| 15/32 | 11.91 | 0.4688 | 9.1 | 1 | 5988758 |
| | 12.00 | 0.4724 | 9.1 | 1 | 5988922 |
| | 12.10 | 0.4764 | 9.1 | 1 | 5988923 |
| 31/64 | 12.20 | 0.4803 | 9.1 | 1 | 5988924 |
| | 12.30 | 0.4844 | 9.1 | 1 | 5988575 |
| | 12.50 | 0.4921 | 9.4 | 1 | 5988925 |
| 1/2 | 12.60 | 0.4961 | 9.4 | 1 | 5988926 |
| | 12.70 | 0.5000 | 9.4 | 1 | 5988920 |
| | 12.80 | 0.5039 | 9.4 | 1 | 5988927 |
| 33/64 | 12.90 | 0.5079 | 9.4 | 1 | 5988929 |
| | 13.00 | 0.5118 | 9.7 | 1 | 5988685 |
| | 13.10 | 0.5156 | 9.7 | 1 | 5988579 |
| 17/32 | 13.20 | 0.5197 | 9.7 | 1 | 5988737 |
| | 13.49 | 0.5313 | 9.7 | 1 | 5988831 |
| | 13.50 | 0.5315 | 10.3 | 1 | 5988791 |
| 35/64 | 13.60 | 0.5354 | 10.3 | 1 | 5988839 |
| | 13.70 | 0.5394 | 10.3 | 1 | 5988883 |
| | 13.80 | 0.5433 | 10.3 | 1 | 5988889 |
| 9/16 | 13.89 | 0.5469 | 10.3 | 1 | 5988583 |
| | 14.00 | 0.5512 | 10.3 | 1 | 5988895 |
| | 14.10 | 0.5551 | 10.3 | 1 | 5988897 |
| 37/64 | 14.20 | 0.5591 | 10.3 | 1 | 5988692 |
| | 14.29 | 0.5625 | 10.3 | 1 | 5988664 |
| | 14.50 | 0.5709 | 10.3 | 1 | 5988696 |
| 19/32 | 14.60 | 0.5748 | 11.0 | 1 | 5988700 |
| | 14.68 | 0.5781 | 11.0 | 1 | 5988591 |
| | 14.70 | 0.5787 | 11.0 | 1 | 5988705 |
| 5.1 | 14.80 | 0.5827 | 11.0 | 1 | 5988709 |
| | 15.00 | 0.5906 | 11.0 | 1 | 5988714 |
| | 15.08 | 0.5938 | 11.0 | 1 | 5988621 |
| 5.2 | 15.10 | 0.5945 | 11.0 | 1 | 5988719 |
| | 15.20 | 0.5984 | 11.0 | 1 | 5988724 |
| | 15.24 | 0.6000 | 11.0 | 1 | 5988729 |

| 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 | 5988595 | |
| | 15.50 | 0.6102 | 11.0 | 1 | 5988734 | |
| | 15.60 | 0.6142 | 11.6 | 1 | 5988742 | |
| 5/8 | 15.70 | 0.6181 | 11.6 | 1 | 5988747 | |
| | 15.88 | 0.6250 | 11.6 | 1 | 5988612 | |
| | 16.00 | 0.6299 | 11.6 | 1 | 5988763 | |
| | 16.08 | 0.6331 | 11.6 | 1 | 5988769 | |
| | 16.10 | 0.6339 | 11.6 | 1 | 5988773 | |
| 41/64 | 16.20 | 0.6378 | 11.6 | 1 | 5988777 | |
| | 16.27 | 0.6406 | 11.6 | 1 | 5988599 | |
| | 16.30 | 0.6417 | 11.6 | 1 | 5988783 | |
| | 16.50 | 0.6496 | 11.6 | 1 | 5988787 | |
| | 16.60 | 0.6535 | 12.2 | 1 | 5988795 | |
| 21/32 | 16.67 | 0.6563 | 12.2 | 1 | 5988443 | |
| | 16.70 | 0.6575 | 12.2 | 1 | 5988799 | |
| | 17.00 | 0.6693 | 12.2 | 1 | 5988803 | |
| 43/64 | 17.07 | 0.6719 | 12.2 | 1 | 5988601 | |
| | 17.10 | 0.6732 | 12.2 | 1 | 5988807 | |
| | 17.20 | 0.6772 | 12.2 | 1 | 5988811 | |
| 11/16 | 17.46 | 0.6875 | 12.2 | 1 | 5988921 | |
| | 17.50 | 0.6890 | 12.2 | 1 | 5988818 | |
| | 17.60 | 0.6929 | 12.9 | 1 | 5988823 | |
| 45/64 | 17.70 | 0.6969 | 12.9 | 1 | 5988827 | |
| | 17.86 | 0.7031 | 12.9 | 1 | 5988603 | |
| | 18.00 | 0.7087 | 12.9 | 1 | 5988835 | |
| | 18.10 | 0.7126 | 12.9 | 1 | 5988841 | |
| | 18.20 | 0.7165 | 12.9 | 1 | 5988845 | |
| 23/32 | 18.26 | 0.7188 | 12.9 | 1 | 5988471 | |
| | 18.50 | 0.7283 | 12.9 | 1 | 5988848 | |
| | 18.60 | 0.7323 | 13.5 | 1 | 5988853 | |
| 47/64 | 18.65 | 0.7344 | 13.5 | 1 | 5988606 | |
| | 18.70 | 0.7362 | 13.5 | 1 | 5988856 | |
| | 18.90 | 0.7441 | 13.5 | 1 | 5988863 | |
| | 19.00 | 0.7480 | 13.5 | 1 | 5988868 | |
| | 3/4 | 19.05 | 0.7500 | 13.5 | 1 | 5988559 |
| 19.10 | | 0.7520 | 13.5 | 1 | 5988871 | |
| 19.20 | | 0.7559 | 13.5 | 1 | 5988875 | |
| 19.25 | | 0.7579 | 13.5 | 1 | 5988879 | |
| 19.30 | | 0.7598 | 13.5 | 1 | 5988887 | |
| 19.35 | | 0.7618 | 13.5 | 1 | 5988438 | |
| 49/64 | 19.45 | 0.7656 | 13.5 | 1 | 5988609 | |
| | 19.50 | 0.7677 | 13.5 | 1 | 5988495 | |
| | 19.60 | 0.7717 | 14.1 | 1 | 5988544 | |
| 25/32 | 19.70 | 0.7756 | 14.1 | 1 | 5988587 | |
| | 19.84 | 0.7813 | 14.1 | 1 | 5988511 | |
| | 20.00 | 0.7874 | 14.1 | 1 | 5988629 | |
| | 51/64 | 20.24 | 0.7969 | 14.1 | 1 | 5988615 |
| | | 20.50 | 0.8071 | 14.1 | 1 | 5988632 |
| 13/16 | 20.64 | 0.8125 | 14.8 | 1 | 5988893 | |
| | 21.00 | 0.8268 | 14.8 | 1 | 5988635 | |
| 53/64 | 21.03 | 0.8281 | 14.8 | 1 | 5988618 | |
| 27/32 | 21.43 | 0.8438 | 14.8 | 1 | 5988531 | |
| | 21.50 | 0.8465 | 14.8 | 1 | 5988638 | |
| 55/64 | 21.83 | 0.8594 | 15.0 | 1 | 5988626 | |
| | 22.00 | 0.8661 | 15.0 | 1 | 5988448 | |
| 7/8 | 22.22 | 0.8750 | 15.0 | 1 | 5988661 | |
| | 22.50 | 0.8858 | 15.0 | 1 | 5988453 | |
| 57/64 | 22.62 | 0.8906 | 15.0 | 1 | 5988651 | |
| | 22.70 | 0.8937 | 15.0 | 1 | 5988458 | |
| | 23.00 | 0.9055 | 15.1 | 1 | 5988462 | |
| | 29/32 | 23.02 | 0.9063 | 15.1 | 1 | 5988556 |
| 59/64 | 23.42 | 0.9219 | 15.1 | 1 | 5988653 | |
| | 23.50 | 0.9252 | 15.1 | 1 | 5988466 | |
| 15/16 | 23.81 | 0.9375 | 15.4 | 1 | 5988754 | |
| | 24.00 | 0.9449 | 15.4 | 1 | 5988476 | |
| 61/64 | 24.21 | 0.9531 | 15.4 | 1 | 5988656 | |

HYDRA DRILL



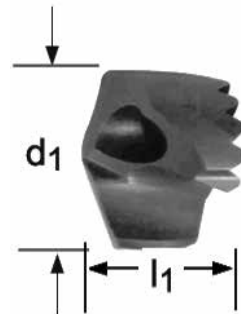
| d_1 $\varnothing h_7$ Inch | d_1 $\varnothing h_7$ mm | d_1 decimal Inch | l_1 mm | Pack Qty | R960 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|---------|
| | 24.50 | 0.9646 | 15.4 | 1 | 5988483 |
| 31/32 | 24.61 | 0.9688 | 15.4 | 1 | 5988572 |
| | 25.00 | 0.9844 | 15.8 | 1 | 5988488 |
| 63/64 | 25.00 | 0.9844 | 15.8 | 1 | 5988658 |
| 1" | 25.40 | 1.0000 | 15.8 | 1 | 5988905 |
| | 25.50 | 1.0039 | 15.8 | 1 | 5988499 |
| | 25.65 | 1.0098 | 15.8 | 1 | 5988506 |
| 1.1/64 | 25.80 | 1.0156 | 15.8 | 1 | 5988909 |
| | 26.00 | 1.0236 | 16.4 | 1 | 5988516 |
| 1.1/32 | 26.19 | 1.0312 | 16.4 | 1 | 5988908 |
| | 26.50 | 1.0433 | 16.4 | 1 | 5988519 |
| 1.3/64 | 26.59 | 1.0469 | 16.4 | 1 | 5988914 |
| 1.1/16 | 26.99 | 1.0625 | 17.1 | 1 | 5988907 |
| | 27.00 | 1.0630 | 17.1 | 1 | 5988523 |
| 1.5/64 | 27.38 | 1.0781 | 17.1 | 1 | 5988916 |
| | 27.50 | 1.0827 | 17.1 | 1 | 5988528 |
| 1.3/32 | 27.78 | 1.0938 | 17.1 | 1 | 5988913 |
| | 28.00 | 1.1024 | 17.7 | 1 | 5988535 |
| 1.7/64 | 28.18 | 1.1094 | 17.7 | 1 | 5988918 |
| | 28.50 | 1.1220 | 17.7 | 1 | 5988540 |
| 1.1/8 | 28.58 | 1.1250 | 17.7 | 1 | 5988910 |
| 1.9/64 | 28.97 | 1.1406 | 18.3 | 1 | 5988919 |
| | 29.00 | 1.1417 | 18.3 | 1 | 5988548 |
| 1.5/32 | 29.37 | 1.1563 | 18.3 | 1 | 5988915 |
| | 29.50 | 1.1614 | 18.3 | 1 | 5988552 |
| 1.11/64 | 29.77 | 1.1719 | 18.3 | 1 | 5988911 |
| | 30.00 | 1.1811 | 19.0 | 1 | 5988564 |
| 1.3/16 | 30.16 | 1.1875 | 19.0 | 1 | 5988912 |
| | 30.50 | 1.2008 | 19.0 | 1 | 5988568 |

Hydra Drill Head






R970

1.1 **1.2** 3.1 3.2 3.3 3.4

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

15/32 - 30.50

* For more information on Hydra, see page 539

| 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



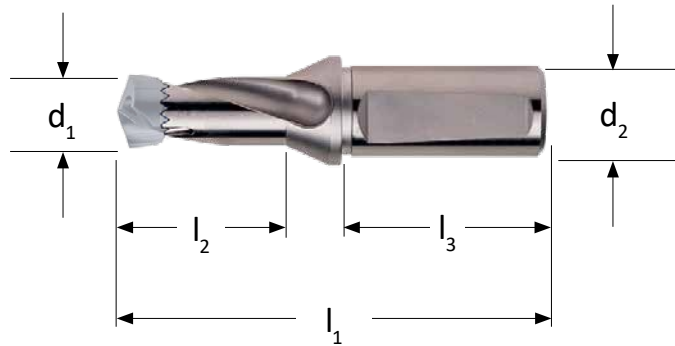
| d ₁ Øh ₇ Inch | d ₁ Øh ₇ mm | d ₁ decimal Inch | l ₁ mm | Pack Qty | R970 |
|---|---|-----------------------------------|----------------------|-------------|---------|
| | 15.24 | 0.6000 | 11.0 | 1 | 7333008 |
| 39/64 | | 0.6094 | 11.0 | 1 | 7333009 |
| | 15.5 | 0.6102 | 11.6 | 1 | 7333010 |
| | 15.6 | 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 |

| d_1 $\varnothing h_7$ Inch | d_1 $\varnothing h_7$ 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 |

1.5xD Hydra Bodies

H851

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

- * Fractional bodies have cylindrical shank
- * Metric bodies have whistle notch on shank
- * For more information on Hydra, see page 539

**H851
Coolant
Through**

ISO 9706

1.5XD

HSS

140°

NEW

31/64 – 30.5

| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 1.5xD Hydra Body - Fractional Shank | | | | | 1.5xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|--------------|---|----------------------|----------------------|----------------------|--------------|
| | | | | d ₂ Øh ₆ inch | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# |
| 15/32 | 5988695 | 5988758 | 7332946 | 5/8 | 25.5 | 88.5 | 47.63 | 7833294 | 16.00 | 25.5 | 88.5 | 48.0 | 7833297 |
| 12.0 | 5988624 | 5988922 | 7332947 | 5/8 | 25.5 | 88.5 | 47.63 | 7833294 | 16.00 | 25.5 | 88.5 | 48.0 | 7833297 |
| 12.1 | 5988627 | 5988923 | 7332948 | 5/8 | 25.5 | 88.5 | 47.63 | 7833294 | 16.00 | 25.5 | 88.5 | 48.0 | 7833297 |
| 12.2 | 5988630 | 5988924 | 7332949 | 5/8 | 25.5 | 88.5 | 47.63 | 7833294 | 16.00 | 25.5 | 88.5 | 48.0 | 7833297 |
| 31/64 | 5988936 | 5988575 | 7332980 | 5/8 | 25.5 | 88.5 | 47.63 | 7833294 | 16.00 | 25.5 | 88.5 | 48.0 | 7833297 |
| 12.5 | 5988633 | 5988925 | 7332981 | 5/8 | 25.8 | 88.8 | 47.63 | 7833295 | 16.00 | 25.8 | 88.8 | 48.0 | 7833298 |
| 12.6 | 5988640 | 5988926 | 7332982 | 5/8 | 25.8 | 88.8 | 47.63 | 7833295 | 16.00 | 25.8 | 88.8 | 48.0 | 7833298 |
| 1/2 | 5988620 | 5988920 | 7332983 | 5/8 | 25.8 | 88.8 | 47.63 | 7833295 | 16.00 | 25.8 | 88.8 | 48.0 | 7833298 |
| 12.8 | 5988641 | 5988927 | 7332984 | 5/8 | 25.8 | 88.8 | 47.63 | 7833295 | 16.00 | 25.8 | 88.8 | 48.0 | 7833298 |
| 12.9 | 5988642 | 5988929 | 7332985 | 5/8 | 25.8 | 88.8 | 47.63 | 7833295 | 16.00 | 25.8 | 88.8 | 48.0 | 7833298 |
| 13.0 | 5988643 | 5988685 | 7332986 | 5/8 | 30.9 | 93.9 | 47.63 | 7833296 | 16.00 | 27.0 | 90.0 | 48.0 | 7833299 |
| 33/64 | 5988850 | 5988579 | 7332987 | 5/8 | 30.9 | 93.9 | 47.63 | 7833296 | 16.00 | 27.0 | 90.0 | 48.0 | 7833299 |
| 13.2 | 5988644 | 5988737 | 7332988 | 5/8 | 30.9 | 93.9 | 47.63 | 7833296 | 16.00 | 27.0 | 90.0 | 48.0 | 7833299 |
| 17/32 | 5988697 | 5988831 | 7332989 | 5/8 | 30.9 | 93.9 | 47.63 | 7833296 | 16.00 | 27.0 | 90.0 | 48.0 | 7833299 |
| 13.5 | 5988645 | 5988791 | 7332990 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 13.6 | 5988646 | 5988839 | 7332991 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 13.7 | 5988647 | 5988883 | 7332992 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 13.8 | 5988648 | 5988889 | 7332993 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 35/64 | 5988854 | 5988583 | 7332994 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 14.0 | 5988652 | 5988895 | 7332995 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 14.1 | 5988655 | 5988897 | 7332996 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 14.2 | 5988657 | 5988692 | 7332997 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 9/16 | 5988904 | 5988664 | 7332998 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 14.5 | 5988660 | 5988696 | 7332999 | 3/4 | 30.3 | 93.9 | 50.8 | 7833331 | 16.00 | 30.9 | 93.9 | 48.0 | 7833330 |
| 14.6 | 5988663 | 5988700 | 7333000 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 37/64 | 5988857 | 5988591 | 7333001 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 14.7 | 5988666 | 5988705 | 7333002 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 14.8 | 5988668 | 5988709 | 7333003 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 15.0 | 5988670 | 5988714 | 7333004 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 19/32 | 5988779 | 5988621 | 7333005 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 15.1 | 5988672 | 5988719 | 7333006 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |

| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 1.5xD Hydra Body - Fractional Shank | | | | | 1.5xD Hydra Body - Metric Shank | | | | |
|-----------------------------|----------------------|----------------------|----------------------|-------------------------------------|-------------------|-------------------|-------------------|-----------|-----------------------------------|-------------------|-------------------|-------------------|-----------|
| | | | | d ₂ Øh ₆ inch | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# |
| 15.2 | 5988674 | 5988724 | 7333007 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 15.24 | 5988678 | 5988729 | 7333008 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 39/64 | 5988860 | 5988595 | 7333009 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 15.5 | 5988680 | 5988734 | 7333010 | 3/4 | 32.3 | 97.3 | 50.8 | 7833332 | 20.00 | 32.3 | 97.3 | 50.0 | 7833336 |
| 15.6 | 5988683 | 5988742 | 7333011 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 15.7 | 5988687 | 5988747 | 7333012 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 5/8 | 5988884 | 5988612 | 7333013 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.0 | 5988698 | 5988763 | 7333014 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.08 | 5988702 | 5988769 | 7333015 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.1 | 5988710 | 5988773 | 7333016 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.2 | 5988715 | 5988777 | 7333017 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 41/64 | 5988864 | 5988599 | 7333018 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.3 | 5988725 | 5988783 | 7333019 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.5 | 5988690 | 5988787 | 7333020 | 3/4 | 34.9 | 99.9 | 50.8 | 7833333 | 20.00 | 34.9 | 99.9 | 50.0 | 7833337 |
| 16.6 | 5988749 | 5988795 | 7333021 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 21/32 | 5988802 | 5988443 | 7333022 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 16.7 | 5988790 | 5988799 | 7333023 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 17.0 | 5988833 | 5988803 | 7333024 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 43/64 | 5988867 | 5988601 | 7333025 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 17.1 | 5988873 | 5988807 | 7333026 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 17.2 | 5988881 | 5988811 | 7333027 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 11/16 | 5988623 | 5988921 | 7333028 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 17.5 | 5988885 | 5988818 | 7333029 | 3/4 | 36.4 | 101.4 | 50.8 | 7833334 | 20.00 | 36.4 | 101.4 | 50.0 | 7833338 |
| 17.6 | 5988891 | 5988823 | 7333030 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 17.7 | 5988894 | 5988827 | 7333031 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 45/64 | 5988872 | 5988603 | 7333032 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 18.0 | 5988701 | 5988835 | 7333033 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 18.1 | 5988706 | 5988841 | 7333034 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 18.2 | 5988713 | 5988845 | 7333035 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 23/32 | 5988824 | 5988471 | 7333036 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 18.5 | 5988718 | 5988848 | 7333037 | 3/4 | 39.0 | 104.0 | 50.8 | 7833335 | 20.00 | 39.0 | 104.0 | 50.0 | 7833339 |
| 18.6 | 5988723 | 5988853 | 7333038 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 47/64 | 5988877 | 5988606 | 7333039 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 18.7 | 5988728 | 5988856 | 7333040 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 18.9 | 5988733 | 5988863 | 7333041 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.0 | 5988740 | 5988868 | 7333042 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 3/4 | 5988928 | 5988559 | 7333043 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.1 | 5988745 | 5988871 | 7333044 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.2 | 5988752 | 5988875 | 7333045 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.25 | 5988756 | 5988879 | 7333046 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.3 | 5988760 | 5988887 | 7333047 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.35 | 5988764 | 5988438 | 7333048 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 49/64 | 5988880 | 5988609 | 7333049 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.5 | 5988767 | 5988495 | 7333050 | 1" | 40.4 | 111.4 | 57.15 | 7833345 | 25.00 | 40.4 | 111.4 | 56.0 | 7833340 |
| 19.6 | 5988771 | 5988544 | 7333051 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 19.7 | 5988775 | 5988587 | 7333052 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 25/32 | 5988851 | 5988511 | 7333053 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 20.0 | 5988782 | 5988629 | 7333054 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 51/64 | 5988892 | 5988615 | 7333055 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 20.5 | 5988786 | 5988632 | 7333056 | 1" | 43.0 | 114.0 | 57.15 | 7833346 | 25.00 | 43.0 | 114.0 | 56.0 | 7833341 |
| 13/16 | 5988649 | 5988893 | 7333057 | 1" | 44.5 | 115.5 | 57.15 | 7833347 | 25.00 | 44.5 | 115.5 | 56.0 | 7833342 |
| 21.0 | 5988794 | 5988635 | 7333058 | 1" | 44.5 | 115.5 | 57.15 | 7833347 | 25.00 | 44.5 | 115.5 | 56.0 | 7833342 |
| 53/64 | 5988896 | 5988618 | 7333059 | 1" | 44.5 | 115.5 | 57.15 | 7833347 | 25.00 | 44.5 | 115.5 | 56.0 | 7833342 |
| 27/32 | 5988869 | 5988531 | 7333060 | 1" | 44.5 | 115.5 | 57.15 | 7833347 | 25.00 | 44.5 | 115.5 | 56.0 | 7833342 |
| 21.5 | 5988798 | 5988638 | 7333061 | 1" | 44.5 | 115.5 | 57.15 | 7833347 | 25.00 | 44.5 | 115.5 | 56.0 | 7833342 |
| 55/64 | 5988898 | 5988626 | 7333062 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 22.0 | 5988806 | 5988448 | 7333063 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 7/8 | 5988903 | 5988661 | 7333064 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 22.5 | 5988810 | 5988453 | 7333065 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 57/64 | 5988899 | 5988651 | 7333066 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 22.7 | 5988814 | 5988458 | 7333067 | 1" | 46.1 | 117.1 | 57.15 | 7833348 | 25.00 | 46.1 | 117.1 | 56.0 | 7833343 |
| 23.0 | 5988816 | 5988462 | 7333068 | 1" | 47.0 | 118.0 | 57.15 | 7833349 | 25.00 | 47.0 | 118.0 | 56.0 | 7833344 |
| 29/32 | 5988917 | 5988556 | 7333069 | 1" | 47.0 | 118.0 | 57.15 | 7833349 | 25.00 | 47.0 | 118.0 | 56.0 | 7833344 |
| 59/64 | 5988900 | 5988653 | 7333070 | 1" | 47.0 | 118.0 | 57.15 | 7833349 | 25.00 | 47.0 | 118.0 | 56.0 | 7833344 |
| 23.5 | 5988820 | 5988466 | 7333071 | 1" | 47.0 | 118.0 | 57.15 | 7833349 | 25.00 | 47.0 | 118.0 | 56.0 | 7833344 |

HYDRA DRILL

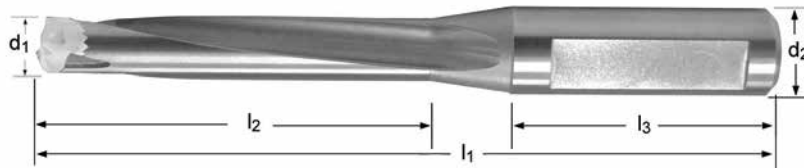


| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 1.5xD Hydra Body - Fractional Shank | | | | | 1.5xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|--------------|---|----------------------|----------------------|----------------------|--------------|
| | | | | d ₂ Øh ₆ inch | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H851 EDP# |
| 15/16 | 5988691 | 5988754 | 7333072 | 1" | 49.3 | 124.3 | 57.15 | 7833350 | 32.00 | 49.3 | 124.3 | 60.0 | 7833357 |
| 24.0 | 5988828 | 5988476 | 7333073 | 1" | 49.3 | 124.3 | 57.15 | 7833350 | 32.00 | 49.3 | 124.3 | 60.0 | 7833357 |
| 61/64 | 5988901 | 5988656 | 7333074 | 1" | 49.3 | 124.3 | 57.15 | 7833350 | 32.00 | 49.3 | 124.3 | 60.0 | 7833357 |
| 24.5 | 5988837 | 5988483 | 7333075 | 1" | 49.3 | 124.3 | 57.15 | 7833350 | 32.00 | 49.3 | 124.3 | 60.0 | 7833357 |
| 31/32 | 5988934 | 5988572 | 7333076 | 1" | 49.3 | 124.3 | 57.15 | 7833350 | 32.00 | 49.3 | 124.3 | 60.0 | 7833357 |
| 25.0 | 5988840 | 5988488 | 7333077 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 63/64 | 5988902 | 5988658 | 7333078 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 1 | 5988604 | 5988905 | 7333079 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 25.5 | 5988843 | 5988499 | 7333080 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 25.65 | 5988847 | 5988506 | 7333081 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 1.1/64 | 5988676 | 5988909 | 7333082 | 1.1/4 | 49.7 | 124.7 | 60.33 | 7833351 | 32.00 | 49.7 | 124.7 | 60.0 | 7833358 |
| 26.0 | 5988855 | 5988516 | 7333083 | 1.1/4 | 52.3 | 127.3 | 60.33 | 7833352 | 32.00 | 52.3 | 127.3 | 60.0 | 7833359 |
| 1.1/32 | 5988650 | 5988908 | 7333084 | 1.1/4 | 52.3 | 127.3 | 60.33 | 7833352 | 32.00 | 52.3 | 127.3 | 60.0 | 7833359 |
| 26.5 | 5988858 | 5988519 | 7333085 | 1.1/4 | 52.3 | 127.3 | 60.33 | 7833352 | 32.00 | 52.3 | 127.3 | 60.0 | 7833359 |
| 1.3/64 | 5988744 | 5988914 | 7333086 | 1.1/4 | 52.3 | 127.3 | 60.33 | 7833352 | 32.00 | 52.3 | 127.3 | 60.0 | 7833359 |
| 1.1/16 | 5988637 | 5988907 | 7333087 | 1.1/4 | 52.8 | 127.8 | 60.33 | 7833353 | 32.00 | 52.8 | 127.8 | 60.0 | 7833360 |
| 27.0 | 5988861 | 5988523 | 7333088 | 1.1/4 | 52.8 | 127.8 | 60.33 | 7833353 | 32.00 | 52.8 | 127.8 | 60.0 | 7833360 |
| 1.5/64 | 5988611 | 5988916 | 7333089 | 1.1/4 | 52.8 | 127.8 | 60.33 | 7833353 | 32.00 | 52.8 | 127.8 | 60.0 | 7833360 |
| 27.5 | 5988865 | 5988528 | 7333090 | 1.1/4 | 52.8 | 127.8 | 60.33 | 7833353 | 32.00 | 52.8 | 127.8 | 60.0 | 7833360 |
| 1.3/32 | 5988739 | 5988913 | 7333091 | 1.1/4 | 52.8 | 127.8 | 60.33 | 7833353 | 32.00 | 52.8 | 127.8 | 60.0 | 7833360 |
| 28.0 | 5988876 | 5988535 | 7333092 | 1.1/4 | 54.4 | 129.4 | 60.33 | 7833354 | 32.00 | 54.4 | 129.4 | 60.0 | 7833361 |
| 1.7/64 | 5988614 | 5988918 | 7333093 | 1.1/4 | 54.4 | 129.4 | 60.33 | 7833354 | 32.00 | 54.4 | 129.4 | 60.0 | 7833361 |
| 28.5 | 5988844 | 5988540 | 7333094 | 1.1/4 | 54.4 | 129.4 | 60.33 | 7833354 | 32.00 | 54.4 | 129.4 | 60.0 | 7833361 |
| 1.1/8 | 5988720 | 5988910 | 7333095 | 1.1/4 | 54.4 | 129.4 | 60.33 | 7833354 | 32.00 | 54.4 | 129.4 | 60.0 | 7833361 |
| 1.9/64 | 5988617 | 5988919 | 7333096 | 1.1/4 | 55.8 | 130.8 | 60.33 | 7833355 | 32.00 | 55.8 | 130.8 | 60.0 | 7833362 |
| 29.0 | 5988888 | 5988548 | 7333097 | 1.1/4 | 55.8 | 130.8 | 60.33 | 7833355 | 32.00 | 55.8 | 130.8 | 60.0 | 7833362 |
| 1.5/32 | 5988608 | 5988915 | 7333098 | 1.1/4 | 55.8 | 130.8 | 60.33 | 7833355 | 32.00 | 55.8 | 130.8 | 60.0 | 7833362 |
| 29.5 | 5988906 | 5988552 | 7333099 | 1.1/4 | 55.8 | 130.8 | 60.33 | 7833355 | 32.00 | 55.8 | 130.8 | 60.0 | 7833362 |
| 1.11/64 | 5988730 | 5988911 | 7333100 | 1.1/4 | 55.8 | 130.8 | 60.33 | 7833355 | 32.00 | 55.8 | 130.8 | 60.0 | 7833362 |
| 30.0 | 5988930 | 5988564 | 7333101 | 1.1/4 | 58.4 | 133.4 | 60.33 | 7833356 | 32.00 | 58.4 | 133.4 | 60.0 | 7833363 |
| 1.3/16 | 5988735 | 5988912 | 7333102 | 1.1/4 | 58.4 | 133.4 | 60.33 | 7833356 | 32.00 | 58.4 | 133.4 | 60.0 | 7833363 |
| 30.5 | 5988932 | 5988568 | 7333103 | 1.1/4 | 58.4 | 133.4 | 60.33 | 7833356 | 32.00 | 58.4 | 133.4 | 60.0 | 7833363 |

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

- * Fractional bodies have straight flat on shank
- * Metric bodies have whistle notch on shank
- * For more information on Hydra, see page 539

H853
Coolant Through

DIN 6535HB
DIN 6535HE

3XD

HSS

140°

15/32 - 42.00

| 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 | 5988695 | 5988758 | 7332946 | 5/8 | 44.0 | 105.0 | 48.0 | 5988068 | 16.0 | 44.0 | 105.0 | 48.0 | 5988132 |
| 12.0 | 5988624 | 5988922 | 7332947 | 5/8 | 44.0 | 105.0 | 48.0 | 5988068 | 16.0 | 44.0 | 105.0 | 48.0 | 5988132 |
| 12.1 | 5988627 | 5988923 | 7332948 | 5/8 | 44.0 | 105.0 | 48.0 | 5988068 | 16.0 | 44.0 | 105.0 | 48.0 | 5988132 |
| 12.2 | 5988630 | 5988924 | 7332949 | 5/8 | 44.0 | 105.0 | 48.0 | 5988068 | 16.0 | 44.0 | 105.0 | 48.0 | 5988132 |
| 31/64 | 5988936 | 5988575 | 7332980 | 5/8 | 44.0 | 105.0 | 48.0 | 5988068 | 16.0 | 44.0 | 105.0 | 48.0 | 5988132 |
| 12.5 | 5988633 | 5988925 | 7332981 | 5/8 | 44.0 | 105.0 | 48.0 | 5988126 | 16.0 | 44.0 | 105.0 | 48.0 | 5987969 |
| 12.6 | 5988640 | 5988926 | 7332982 | 5/8 | 44.0 | 105.0 | 48.0 | 5988126 | 16.0 | 44.0 | 105.0 | 48.0 | 5987969 |
| 1/2 | 5988620 | 5988920 | 7332983 | 5/8 | 44.0 | 105.0 | 48.0 | 5988126 | 16.0 | 44.0 | 105.0 | 48.0 | 5987969 |
| 12.8 | 5988641 | 5988927 | 7332984 | 5/8 | 44.0 | 105.0 | 48.0 | 5988126 | 16.0 | 44.0 | 105.0 | 48.0 | 5987969 |
| 12.9 | 5988642 | 5988929 | 7332985 | 5/8 | 44.0 | 105.0 | 48.0 | 5988126 | 16.0 | 44.0 | 105.0 | 48.0 | 5987969 |
| 13.0 | 5988643 | 5988685 | 7332986 | 5/8 | 47.0 | 110.0 | 48.0 | 5987992 | 16.0 | 47.0 | 110.0 | 48.0 | 5987973 |
| 33/64 | 5988850 | 5988579 | 7332987 | 5/8 | 47.0 | 110.0 | 48.0 | 5987992 | 16.0 | 47.0 | 110.0 | 48.0 | 5987973 |
| 13.2 | 5988644 | 5988737 | 7332988 | 5/8 | 47.0 | 110.0 | 48.0 | 5987992 | 16.0 | 47.0 | 110.0 | 48.0 | 5987973 |
| 17/32 | 5988697 | 5988831 | 7332989 | 5/8 | 47.0 | 110.0 | 48.0 | 5987992 | 16.0 | 47.0 | 110.0 | 48.0 | 5987973 |
| 13.5 | 5988645 | 5988791 | 7332990 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 13.6 | 5988646 | 5988839 | 7332991 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 13.7 | 5988647 | 5988883 | 7332992 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 13.8 | 5988648 | 5988889 | 7332993 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 35/64 | 5988854 | 5988583 | 7332994 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 14.0 | 5988652 | 5988895 | 7332995 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 14.1 | 5988655 | 5988897 | 7332996 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 14.2 | 5988657 | 5988692 | 7332997 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 9/16 | 5988904 | 5988664 | 7332998 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 14.5 | 5988660 | 5988696 | 7332999 | 3/4 | 52.5 | 116.5 | 48.0 | 5988093 | 16.0 | 52.5 | 116.5 | 48.0 | 5987976 |
| 14.6 | 5988663 | 5988700 | 7333000 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 37/64 | 5988857 | 5988591 | 7333001 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 14.7 | 5988666 | 5988705 | 7333002 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 14.8 | 5988668 | 5988709 | 7333003 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 15.0 | 5988670 | 5988714 | 7333004 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 19/32 | 5988779 | 5988621 | 7333005 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 15.1 | 5988672 | 5988719 | 7333006 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 15.2 | 5988674 | 5988724 | 7333007 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 15.24 | 5988678 | 5988729 | 7333008 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 39/64 | 5988860 | 5988595 | 7333009 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |
| 15.5 | 5988680 | 5988734 | 7333010 | 3/4 | 55.5 | 126.5 | 50.0 | 5988072 | 20.0 | 55.5 | 126.5 | 50.0 | 5987979 |

HYDRA DRILL



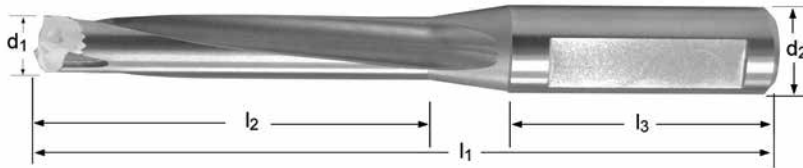
| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 3xD Hydra Body - Fractional Shank | | | | | 3xD Hydra Body - Metric Shank | | | | |
|-----------------------------|----------------------|----------------------|----------------------|-------------------------------------|-------------------|-------------------|-------------------|-----------|-----------------------------------|-------------------|-------------------|-------------------|-----------|
| | | | | 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 | 5988683 | 5988742 | 7333011 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 15.7 | 5988687 | 5988747 | 7333012 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 5/8 | 5988884 | 5988612 | 7333013 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.0 | 5988698 | 5988763 | 7333014 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.08 | 5988702 | 5988769 | 7333015 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.1 | 5988710 | 5988773 | 7333016 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.2 | 5988715 | 5988777 | 7333017 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 41/64 | 5988864 | 5988599 | 7333018 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.3 | 5988725 | 5988783 | 7333019 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.5 | 5988690 | 5988787 | 7333020 | 3/4 | 59.5 | 131.5 | 50.0 | 5988076 | 20.0 | 59.5 | 131.5 | 50.0 | 5987983 |
| 16.6 | 5988749 | 5988795 | 7333021 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 21/32 | 5988802 | 5988443 | 7333022 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 16.7 | 5988790 | 5988799 | 7333023 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 17.0 | 5988833 | 5988803 | 7333024 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 43/64 | 5988867 | 5988601 | 7333025 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 17.1 | 5988873 | 5988807 | 7333026 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 17.2 | 5988881 | 5988811 | 7333027 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 11/16 | 5988623 | 5988921 | 7333028 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 17.5 | 5988885 | 5988818 | 7333029 | 3/4 | 62.5 | 136.5 | 50.0 | 5988129 | 20.0 | 62.5 | 136.5 | 50.0 | 5987987 |
| 17.6 | 5988891 | 5988823 | 7333030 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 17.7 | 5988894 | 5988827 | 7333031 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 45/64 | 5988872 | 5988603 | 7333032 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 18.0 | 5988701 | 5988835 | 7333033 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 18.1 | 5988706 | 5988841 | 7333034 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 18.2 | 5988713 | 5988845 | 7333035 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 23/32 | 5988824 | 5988471 | 7333036 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 18.5 | 5988718 | 5988848 | 7333037 | 3/4 | 66.5 | 141.5 | 50.0 | 5988025 | 20.0 | 66.5 | 141.5 | 50.0 | 5987996 |
| 18.6 | 5988723 | 5988853 | 7333038 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 47/64 | 5988877 | 5988606 | 7333039 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 18.7 | 5988728 | 5988856 | 7333040 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 18.9 | 5988733 | 5988863 | 7333041 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.0 | 5988740 | 5988868 | 7333042 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 3/4 | 5988928 | 5988559 | 7333043 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.1 | 5988745 | 5988871 | 7333044 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.2 | 5988752 | 5988875 | 7333045 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.25 | 5988756 | 5988879 | 7333046 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.3 | 5988760 | 5988887 | 7333047 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.35 | 5988764 | 5988438 | 7333048 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 49/64 | 5988880 | 5988609 | 7333049 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.5 | 5988767 | 5988495 | 7333050 | 1 | 69.5 | 156.5 | 56.0 | 5988079 | 25.0 | 69.5 | 156.5 | 56.0 | 5987999 |
| 19.6 | 5988771 | 5988544 | 7333051 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 19.7 | 5988775 | 5988587 | 7333052 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 25/32 | 5988851 | 5988511 | 7333053 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 20.0 | 5988782 | 5988629 | 7333054 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 51/64 | 5988892 | 5988615 | 7333055 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 20.5 | 5988786 | 5988632 | 7333056 | 1 | 73.5 | 156.5 | 56.0 | 5988083 | 25.0 | 73.5 | 156.5 | 56.0 | 5988003 |
| 13/16 | 5988649 | 5988893 | 7333057 | 1 | 76.5 | 156.5 | 56.0 | 5988045 | 25.0 | 76.5 | 156.5 | 56.0 | 5988013 |
| 21.0 | 5988794 | 5988635 | 7333058 | 1 | 76.5 | 156.5 | 56.0 | 5988045 | 25.0 | 76.5 | 156.5 | 56.0 | 5988013 |
| 53/64 | 5988896 | 5988618 | 7333059 | 1 | 76.5 | 156.5 | 56.0 | 5988045 | 25.0 | 76.5 | 156.5 | 56.0 | 5988013 |
| 27/32 | 5988869 | 5988531 | 7333060 | 1 | 76.5 | 156.5 | 56.0 | 5988045 | 25.0 | 76.5 | 156.5 | 56.0 | 5988013 |
| 21.5 | 5988798 | 5988638 | 7333061 | 1 | 76.5 | 156.5 | 56.0 | 5988045 | 25.0 | 76.5 | 156.5 | 56.0 | 5988013 |
| 55/64 | 5988898 | 5988626 | 7333062 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 22.0 | 5988806 | 5988448 | 7333063 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 7/8 | 5988903 | 5988661 | 7333064 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 22.5 | 5988810 | 5988453 | 7333065 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 57/64 | 5988899 | 5988651 | 7333066 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 22.7 | 5988814 | 5988458 | 7333067 | 1 | 80.1 | 161.5 | 56.0 | 5988086 | 25.0 | 80.1 | 161.5 | 56.0 | 5988017 |
| 23.0 | 5988816 | 5988462 | 7333068 | 1 | 82.5 | 160.5 | 56.0 | 5988089 | 25.0 | 82.5 | 160.5 | 56.0 | 5988021 |
| 29/32 | 5988917 | 5988556 | 7333069 | 1 | 82.5 | 160.5 | 56.0 | 5988089 | 25.0 | 82.5 | 160.5 | 56.0 | 5988021 |
| 59/64 | 5988900 | 5988653 | 7333070 | 1 | 82.5 | 160.5 | 56.0 | 5988089 | 25.0 | 82.5 | 160.5 | 56.0 | 5988021 |
| 23.5 | 5988820 | 5988466 | 7333071 | 1 | 82.5 | 160.5 | 56.0 | 5988089 | 25.0 | 82.5 | 160.5 | 56.0 | 5988021 |

| 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 | 5988691 | 5988754 | 7333072 | 1 | 86.2 | 170.2 | 60.0 | 5988064 | 32.0 | 86.2 | 170.2 | 60.0 | 5988029 |
| 24.0 | 5988828 | 5988476 | 7333073 | 1 | 86.2 | 170.2 | 60.0 | 5988064 | 32.0 | 86.2 | 170.2 | 60.0 | 5988029 |
| 61/64 | 5988901 | 5988656 | 7333074 | 1 | 86.2 | 170.2 | 60.0 | 5988064 | 32.0 | 86.2 | 170.2 | 60.0 | 5988029 |
| 24.5 | 5988837 | 5988483 | 7333075 | 1 | 86.2 | 170.2 | 60.0 | 5988064 | 32.0 | 86.2 | 170.2 | 60.0 | 5988029 |
| 31/32 | 5988934 | 5988572 | 7333076 | 1 | 86.2 | 170.2 | 60.0 | 5988064 | 32.0 | 86.2 | 170.2 | 60.0 | 5988029 |
| 25.0 | 5988840 | 5988488 | 7333077 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 63/64 | 5988902 | 5988658 | 7333078 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 1 | 5988604 | 5988905 | 7333079 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 25.5 | 5988843 | 5988499 | 7333080 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 25.65 | 5988847 | 5988506 | 7333081 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 1.1/64 | 5988676 | 5988909 | 7333082 | 1.1/4 | 88.0 | 170.0 | 60.0 | 5987965 | 32.0 | 88.0 | 170.0 | 60.0 | 5988033 |
| 26.0 | 5988855 | 5988516 | 7333083 | 1.1/4 | 92.0 | 175.0 | 60.0 | 5988123 | 32.0 | 92.0 | 175.0 | 60.0 | 5988037 |
| 1.1/32 | 5988650 | 5988908 | 7333084 | 1.1/4 | 92.0 | 175.0 | 60.0 | 5988123 | 32.0 | 92.0 | 175.0 | 60.0 | 5988037 |
| 26.5 | 5988858 | 5988519 | 7333085 | 1.1/4 | 92.0 | 175.0 | 60.0 | 5988123 | 32.0 | 92.0 | 175.0 | 60.0 | 5988037 |
| 1.3/64 | 5988744 | 5988914 | 7333086 | 1.1/4 | 92.0 | 175.0 | 60.0 | 5988123 | 32.0 | 92.0 | 175.0 | 60.0 | 5988037 |
| 1.1/16 | 5988637 | 5988907 | 7333087 | 1.1/4 | 94.0 | 175.0 | 60.0 | 5988118 | 32.0 | 94.0 | 175.0 | 60.0 | 5988042 |
| 27.0 | 5988861 | 5988523 | 7333088 | 1.1/4 | 94.0 | 175.0 | 60.0 | 5988118 | 32.0 | 94.0 | 175.0 | 60.0 | 5988042 |
| 1.5/64 | 5988611 | 5988916 | 7333089 | 1.1/4 | 94.0 | 175.0 | 60.0 | 5988118 | 32.0 | 94.0 | 175.0 | 60.0 | 5988042 |
| 27.5 | 5988865 | 5988528 | 7333090 | 1.1/4 | 94.0 | 175.0 | 60.0 | 5988118 | 32.0 | 94.0 | 175.0 | 60.0 | 5988042 |
| 1.3/32 | 5988739 | 5988913 | 7333091 | 1.1/4 | 94.0 | 175.0 | 60.0 | 5988118 | 32.0 | 94.0 | 175.0 | 60.0 | 5988042 |
| 28.0 | 5988876 | 5988535 | 7333092 | 1.1/4 | 97.0 | 180.0 | 60.0 | 5988007 | 32.0 | 97.0 | 180.0 | 60.0 | 5988050 |
| 1.7/64 | 5988614 | 5988918 | 7333093 | 1.1/4 | 97.0 | 180.0 | 60.0 | 5988007 | 32.0 | 97.0 | 180.0 | 60.0 | 5988050 |
| 28.5 | 5988844 | 5988540 | 7333094 | 1.1/4 | 97.0 | 180.0 | 60.0 | 5988007 | 32.0 | 97.0 | 180.0 | 60.0 | 5988050 |
| 1.1/8 | 5988720 | 5988910 | 7333095 | 1.1/4 | 97.0 | 180.0 | 60.0 | 5988007 | 32.0 | 97.0 | 180.0 | 60.0 | 5988050 |
| 1.9/64 | 5988617 | 5988919 | 7333096 | 1.1/4 | 100.0 | 185.0 | 60.0 | 5988053 | 32.0 | 100.0 | 185.0 | 60.0 | 5988057 |
| 29.0 | 5988888 | 5988548 | 7333097 | 1.1/4 | 100.0 | 185.0 | 60.0 | 5988053 | 32.0 | 100.0 | 185.0 | 60.0 | 5988057 |
| 1.5/32 | 5988608 | 5988915 | 7333098 | 1.1/4 | 100.0 | 185.0 | 60.0 | 5988053 | 32.0 | 100.0 | 185.0 | 60.0 | 5988057 |
| 29.5 | 5988906 | 5988552 | 7333099 | 1.1/4 | 100.0 | 185.0 | 60.0 | 5988053 | 32.0 | 100.0 | 185.0 | 60.0 | 5988057 |
| 1.11/64 | 5988730 | 5988911 | 7333100 | 1.1/4 | 100.0 | 185.0 | 60.0 | 5988053 | 32.0 | 100.0 | 185.0 | 60.0 | 5988057 |
| 30.0 | 5988930 | 5988564 | 7333101 | 1.1/4 | 104.0 | 185.0 | 60.0 | 5988091 | 32.0 | 104.0 | 185.0 | 60.0 | 5988061 |
| 1.3/16 | 5988735 | 5988912 | 7333102 | 1.1/4 | 104.0 | 185.0 | 60.0 | 5988091 | 32.0 | 104.0 | 185.0 | 60.0 | 5988061 |
| 30.5 | 5988932 | 5988568 | 7333103 | 1.1/4 | 104.0 | 185.0 | 60.0 | 5988091 | 32.0 | 104.0 | 185.0 | 60.0 | 5988061 |
| 1.7/32 | 6104481 | — | 7333104 | — | — | — | — | — | 32.0 | 111.5 | 196.5 | 60.0 | 6111405 |
| 31.00 | 6104482 | — | 7333105 | — | — | — | — | — | 32.0 | 111.5 | 196.5 | 60.0 | 6111405 |
| 1.1/4 | 6104483 | — | 7333106 | — | — | — | — | — | 32.0 | 111.5 | 196.5 | 60.0 | 6111405 |
| 32.00 | 6104484 | — | 7333107 | — | — | — | — | — | 32.0 | 111.5 | 196.5 | 60.0 | 6111405 |
| 32.50 | 6104485 | — | 7333108 | — | — | — | — | — | 32.0 | 116.5 | 201.5 | 60.0 | 6111406 |
| 1.19/64 | 6104486 | — | 7333109 | — | — | — | — | — | 32.0 | 116.5 | 201.5 | 60.0 | 6111406 |
| 33.00 | 6104487 | — | 7333110 | — | — | — | — | — | 32.0 | 116.5 | 201.5 | 60.0 | 6111406 |
| 33.50 | 6104488 | — | 7333111 | — | — | — | — | — | 32.0 | 116.5 | 201.5 | 60.0 | 6111406 |
| 34.00 | 6104489 | — | 7333112 | — | — | — | — | — | 40.0 | 121.5 | 216.5 | 70.0 | 6111407 |
| 1.11/32 | 6104530 | — | 7333113 | — | — | — | — | — | 40.0 | 121.5 | 216.5 | 70.0 | 6111407 |
| 34.50 | 6104531 | — | 7333114 | — | — | — | — | — | 40.0 | 121.5 | 216.5 | 70.0 | 6111407 |
| 1.3/8 | 6104532 | — | 7333115 | — | — | — | — | — | 40.0 | 121.5 | 216.5 | 70.0 | 6111407 |
| 35.00 | 6104533 | — | 7333116 | — | — | — | — | — | 40.0 | 121.5 | 216.5 | 70.0 | 6111407 |
| 36.00 | 6104534 | — | 7333117 | — | — | — | — | — | 40.0 | 125.5 | 221.5 | 70.0 | 6111408 |
| 1.27/64 | 6104535 | — | 7333118 | — | — | — | — | — | 40.0 | 125.5 | 221.5 | 70.0 | 6111408 |
| 36.50 | 6104536 | — | 7333119 | — | — | — | — | — | 40.0 | 125.5 | 221.5 | 70.0 | 6111408 |
| 37.00 | 6104537 | — | 7333120 | — | — | — | — | — | 40.0 | 131.5 | 226.5 | 70.0 | 6111409 |
| 1.15/32 | 6104538 | — | 7333121 | — | — | — | — | — | 40.0 | 131.5 | 226.5 | 70.0 | 6111409 |
| 37.50 | 6104539 | — | 7333122 | — | — | — | — | — | 40.0 | 131.5 | 226.5 | 70.0 | 6111409 |
| 38.00 | 6104540 | — | 7333123 | — | — | — | — | — | 40.0 | 131.5 | 226.5 | 70.0 | 6111409 |
| 1.1/2 | 6104541 | — | 7333124 | — | — | — | — | — | 40.0 | 136.5 | 231.5 | 70.0 | 6111410 |
| 38.50 | 6104542 | — | 7333125 | — | — | — | — | — | 40.0 | 136.5 | 231.5 | 70.0 | 6111410 |
| 1.17/32 | 6104543 | — | 7333126 | — | — | — | — | — | 40.0 | 136.5 | 231.5 | 70.0 | 6111410 |
| 39.00 | 6104544 | — | 7333127 | — | — | — | — | — | 40.0 | 136.5 | 231.5 | 70.0 | 6111410 |
| 39.50 | 6104545 | — | 7333128 | — | — | — | — | — | 40.0 | 136.5 | 231.5 | 70.0 | 6111410 |
| 1.9/16 | 6104546 | — | 7333129 | — | — | — | — | — | 40.0 | 146.5 | 246.5 | 70.0 | 6111411 |
| 40.00 | 6104547 | — | 7333130 | — | — | — | — | — | 40.0 | 146.5 | 246.5 | 70.0 | 6111411 |
| 41.00 | 6104548 | — | 7333131 | — | — | — | — | — | 40.0 | 146.5 | 246.5 | 70.0 | 6111411 |
| 1.5/8 | 6104549 | — | 7333132 | — | — | — | — | — | 40.0 | 151.5 | 251.5 | 70.0 | 6111412 |
| 42.00 | 6104550 | — | 7333133 | — | — | — | — | — | 40.0 | 151.5 | 251.5 | 70.0 | 6111412 |

5xD Hydra Bodies

H855

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



**H855
Coolant
Through**

DIN
6535HB
DIN
6535HE

5XD

HSS

140°



15/32 - 42.00

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

- * Fractional bodies have straight flat on shank
- * Metric bodies have whistle notch on shank
- * For more information on Hydra, see page 539

| 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 | 5988695 | 5988758 | 7332946 | 5/8 | 69.0 | 130.0 | 48.0 | 5988755 | 16.0 | 69.0 | 130.0 | 48.0 | 5988115 |
| 12.0 | 5988624 | 5988922 | 7332947 | 5/8 | 69.0 | 130.0 | 48.0 | 5988755 | 16.0 | 69.0 | 130.0 | 48.0 | 5988115 |
| 12.1 | 5988627 | 5988923 | 7332948 | 5/8 | 69.0 | 130.0 | 48.0 | 5988755 | 16.0 | 69.0 | 130.0 | 48.0 | 5988115 |
| 12.2 | 5988630 | 5988924 | 7332949 | 5/8 | 69.0 | 130.0 | 48.0 | 5988755 | 16.0 | 69.0 | 130.0 | 48.0 | 5988115 |
| 31/64 | 5988936 | 5988575 | 7332980 | 5/8 | 69.0 | 130.0 | 48.0 | 5988755 | 16.0 | 69.0 | 130.0 | 48.0 | 5988115 |
| 12.5 | 5988633 | 5988925 | 7332981 | 5/8 | 69.0 | 130.0 | 48.0 | 5988109 | 16.0 | 69.0 | 130.0 | 48.0 | 5988120 |
| 12.6 | 5988640 | 5988926 | 7332982 | 5/8 | 69.0 | 130.0 | 48.0 | 5988109 | 16.0 | 69.0 | 130.0 | 48.0 | 5988120 |
| 1/2 | 5988620 | 5988920 | 7332983 | 5/8 | 69.0 | 130.0 | 48.0 | 5988109 | 16.0 | 69.0 | 130.0 | 48.0 | 5988120 |
| 12.8 | 5988641 | 5988927 | 7332984 | 5/8 | 69.0 | 130.0 | 48.0 | 5988109 | 16.0 | 69.0 | 130.0 | 48.0 | 5988120 |
| 12.9 | 5988642 | 5988929 | 7332985 | 5/8 | 69.0 | 130.0 | 48.0 | 5988109 | 16.0 | 69.0 | 130.0 | 48.0 | 5988120 |
| 13.0 | 5988643 | 5988685 | 7332986 | 5/8 | 74.0 | 140.0 | 48.0 | 5988878 | 16.0 | 74.0 | 140.0 | 48.0 | 5988681 |
| 33/64 | 5988850 | 5988579 | 7332987 | 5/8 | 74.0 | 140.0 | 48.0 | 5988878 | 16.0 | 74.0 | 140.0 | 48.0 | 5988681 |
| 13.2 | 5988644 | 5988737 | 7332988 | 5/8 | 74.0 | 140.0 | 48.0 | 5988878 | 16.0 | 74.0 | 140.0 | 48.0 | 5988681 |
| 17/32 | 5988697 | 5988831 | 7332989 | 5/8 | 74.0 | 140.0 | 48.0 | 5988878 | 16.0 | 74.0 | 140.0 | 48.0 | 5988681 |
| 13.5 | 5988645 | 5988791 | 7332990 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 13.6 | 5988646 | 5988839 | 7332991 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 13.7 | 5988647 | 5988883 | 7332992 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 13.8 | 5988648 | 5988889 | 7332993 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 35/64 | 5988854 | 5988583 | 7332994 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 14.0 | 5988652 | 5988895 | 7332995 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 14.1 | 5988655 | 5988897 | 7332996 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 14.2 | 5988657 | 5988692 | 7332997 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 9/16 | 5988904 | 5988664 | 7332998 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 14.5 | 5988660 | 5988696 | 7332999 | 3/4 | 81.5 | 146.5 | 48.0 | 5988785 | 16.0 | 81.5 | 146.5 | 48.0 | 5988738 |
| 14.6 | 5988663 | 5988700 | 7333000 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 37/64 | 5988857 | 5988591 | 7333001 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 14.7 | 5988666 | 5988705 | 7333002 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 14.8 | 5988668 | 5988709 | 7333003 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 15.0 | 5988670 | 5988714 | 7333004 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 19/32 | 5988779 | 5988621 | 7333005 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |

| 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 | 5988672 | 5988719 | 7333006 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 15.2 | 5988674 | 5988724 | 7333007 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 15.24 | 5988678 | 5988729 | 7333008 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 39/64 | 5988860 | 5988595 | 7333009 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 15.5 | 5988680 | 5988734 | 7333010 | 3/4 | 86.5 | 156.5 | 50.0 | 5988759 | 20.0 | 86.5 | 156.5 | 50.0 | 5988781 |
| 15.6 | 5988683 | 5988742 | 7333011 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 15.7 | 5988687 | 5988747 | 7333012 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 5/8 | 5988884 | 5988612 | 7333013 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.0 | 5988698 | 5988763 | 7333014 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.08 | 5988702 | 5988769 | 7333015 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.1 | 5988710 | 5988773 | 7333016 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.2 | 5988715 | 5988777 | 7333017 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 41/64 | 5988864 | 5988599 | 7333018 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.3 | 5988725 | 5988783 | 7333019 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.5 | 5988690 | 5988787 | 7333020 | 3/4 | 92.5 | 166.5 | 50.0 | 5988762 | 20.0 | 92.5 | 166.5 | 50.0 | 5988825 |
| 16.6 | 5988749 | 5988795 | 7333021 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 21/32 | 5988802 | 5988443 | 7333022 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 16.7 | 5988790 | 5988799 | 7333023 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 17.0 | 5988833 | 5988803 | 7333024 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 43/64 | 5988867 | 5988601 | 7333025 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 17.1 | 5988873 | 5988807 | 7333026 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 17.2 | 5988881 | 5988811 | 7333027 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 11/16 | 5988623 | 5988921 | 7333028 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 17.5 | 5988885 | 5988818 | 7333029 | 3/4 | 97.5 | 171.5 | 50.0 | 5988112 | 20.0 | 97.5 | 171.5 | 50.0 | 5988870 |
| 17.6 | 5988891 | 5988823 | 7333030 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 17.7 | 5988894 | 5988827 | 7333031 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 45/64 | 5988872 | 5988603 | 7333032 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 18.0 | 5988701 | 5988835 | 7333033 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 18.1 | 5988706 | 5988841 | 7333034 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 18.2 | 5988713 | 5988845 | 7333035 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 23/32 | 5988824 | 5988471 | 7333036 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 18.5 | 5988718 | 5988848 | 7333037 | 3/4 | 103.5 | 176.5 | 50.0 | 5988703 | 20.0 | 103.5 | 176.5 | 50.0 | 5988882 |
| 18.6 | 5988723 | 5988853 | 7333038 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 47/64 | 5988877 | 5988606 | 7333039 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 18.7 | 5988728 | 5988856 | 7333040 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 18.9 | 5988733 | 5988863 | 7333041 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.0 | 5988740 | 5988868 | 7333042 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 3/4 | 5988928 | 5988559 | 7333043 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.1 | 5988745 | 5988871 | 7333044 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.2 | 5988752 | 5988875 | 7333045 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.25 | 5988756 | 5988879 | 7333046 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.3 | 5988760 | 5988887 | 7333047 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.35 | 5988764 | 5988438 | 7333048 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 49/64 | 5988880 | 5988609 | 7333049 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.5 | 5988767 | 5988495 | 7333050 | 1 | 108.5 | 191.5 | 56.0 | 5988766 | 25.0 | 108.5 | 191.5 | 56.0 | 5988886 |
| 19.6 | 5988771 | 5988544 | 7333051 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 19.7 | 5988775 | 5988587 | 7333052 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 25/32 | 5988851 | 5988511 | 7333053 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 20.0 | 5988782 | 5988629 | 7333054 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 51/64 | 5988892 | 5988615 | 7333055 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 20.5 | 5988786 | 5988632 | 7333056 | 1 | 114.5 | 196.5 | 56.0 | 5988770 | 25.0 | 114.5 | 196.5 | 56.0 | 5988890 |
| 13/16 | 5988649 | 5988893 | 7333057 | 1 | 119.5 | 196.5 | 56.0 | 5988726 | 25.0 | 119.5 | 196.5 | 56.0 | 5988686 |
| 21.0 | 5988794 | 5988635 | 7333058 | 1 | 119.5 | 196.5 | 56.0 | 5988726 | 25.0 | 119.5 | 196.5 | 56.0 | 5988686 |
| 53/64 | 5988896 | 5988618 | 7333059 | 1 | 119.5 | 196.5 | 56.0 | 5988726 | 25.0 | 119.5 | 196.5 | 56.0 | 5988686 |
| 27/32 | 5988869 | 5988531 | 7333060 | 1 | 119.5 | 196.5 | 56.0 | 5988726 | 25.0 | 119.5 | 196.5 | 56.0 | 5988686 |
| 21.5 | 5988798 | 5988638 | 7333061 | 1 | 119.5 | 196.5 | 56.0 | 5988726 | 25.0 | 119.5 | 196.5 | 56.0 | 5988686 |
| 55/64 | 5988898 | 5988626 | 7333062 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 22.0 | 5988806 | 5988448 | 7333063 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 7/8 | 5988903 | 5988661 | 7333064 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 22.5 | 5988810 | 5988453 | 7333065 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 57/64 | 5988899 | 5988651 | 7333066 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 22.7 | 5988814 | 5988458 | 7333067 | 1 | 125.1 | 201.1 | 56.0 | 5988774 | 25.0 | 125.1 | 201.1 | 56.0 | 5988689 |
| 23.0 | 5988816 | 5988462 | 7333068 | 1 | 129.5 | 210.5 | 56.0 | 5988778 | 25.0 | 129.5 | 210.5 | 56.0 | 5988694 |
| 29/32 | 5988917 | 5988556 | 7333069 | 1 | 129.5 | 210.5 | 56.0 | 5988778 | 25.0 | 129.5 | 210.5 | 56.0 | 5988694 |

HYDRA DRILL

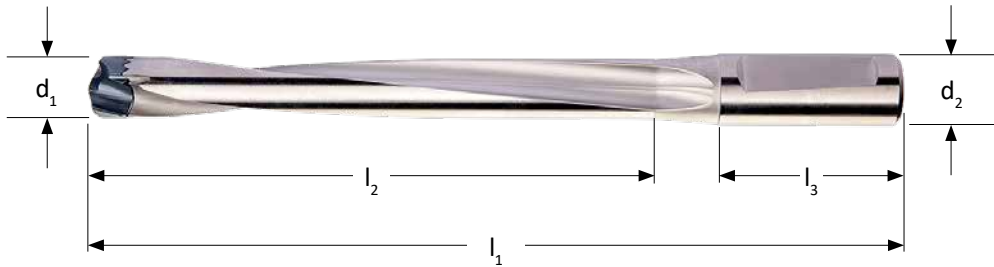


| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 5xD Hydra Body - Fractional Shank | | | | | 5xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|-----------|---|----------------------|----------------------|----------------------|-----------|
| | | | | 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 | 5988900 | 5988653 | 7333070 | 1 | 129.5 | 210.5 | 56.0 | 5988778 | 25.0 | 129.5 | 210.5 | 56.0 | 5988694 |
| 23.5 | 5988820 | 5988466 | 7333071 | 1 | 129.5 | 210.5 | 56.0 | 5988778 | 25.0 | 129.5 | 210.5 | 56.0 | 5988694 |
| 15/16 | 5988691 | 5988754 | 7333072 | 1 | 135.2 | 220.2 | 60.0 | 5988751 | 32.0 | 135.2 | 220.2 | 60.0 | 5988707 |
| 24.0 | 5988828 | 5988476 | 7333073 | 1 | 135.2 | 220.2 | 60.0 | 5988751 | 32.0 | 135.2 | 220.2 | 60.0 | 5988707 |
| 61/64 | 5988901 | 5988656 | 7333074 | 1 | 135.2 | 220.2 | 60.0 | 5988751 | 32.0 | 135.2 | 220.2 | 60.0 | 5988707 |
| 24.5 | 5988837 | 5988483 | 7333075 | 1 | 135.2 | 220.2 | 60.0 | 5988751 | 32.0 | 135.2 | 220.2 | 60.0 | 5988707 |
| 31/32 | 5988934 | 5988572 | 7333076 | 1 | 135.2 | 220.2 | 60.0 | 5988751 | 32.0 | 135.2 | 220.2 | 60.0 | 5988707 |
| 25.0 | 5988840 | 5988488 | 7333077 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 63/64 | 5988902 | 5988658 | 7333078 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 1 | 5988604 | 5988905 | 7333079 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 25.5 | 5988843 | 5988499 | 7333080 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 25.65 | 5988847 | 5988506 | 7333081 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 1.1/64 | 5988676 | 5988909 | 7333082 | 1.1/4 | 140.0 | 225.0 | 60.0 | 5988095 | 32.0 | 140.0 | 225.0 | 60.0 | 5988711 |
| 26.0 | 5988855 | 5988516 | 7333083 | 1.1/4 | 146.0 | 230.0 | 60.0 | 5988106 | 32.0 | 146.0 | 230.0 | 60.0 | 5988716 |
| 1.1/32 | 5988650 | 5988908 | 7333084 | 1.1/4 | 146.0 | 230.0 | 60.0 | 5988106 | 32.0 | 146.0 | 230.0 | 60.0 | 5988716 |
| 26.5 | 5988858 | 5988519 | 7333085 | 1.1/4 | 146.0 | 230.0 | 60.0 | 5988106 | 32.0 | 146.0 | 230.0 | 60.0 | 5988716 |
| 1.3/64 | 5988744 | 5988914 | 7333086 | 1.1/4 | 146.0 | 230.0 | 60.0 | 5988106 | 32.0 | 146.0 | 230.0 | 60.0 | 5988716 |
| 1.1/16 | 5988637 | 5988907 | 7333087 | 1.1/4 | 151.0 | 235.0 | 60.0 | 5988104 | 32.0 | 151.0 | 235.0 | 60.0 | 5988722 |
| 27.0 | 5988861 | 5988523 | 7333088 | 1.1/4 | 151.0 | 235.0 | 60.0 | 5988104 | 32.0 | 151.0 | 235.0 | 60.0 | 5988722 |
| 1.5/64 | 5988611 | 5988916 | 7333089 | 1.1/4 | 151.0 | 235.0 | 60.0 | 5988104 | 32.0 | 151.0 | 235.0 | 60.0 | 5988722 |
| 27.5 | 5988865 | 5988528 | 7333090 | 1.1/4 | 151.0 | 235.0 | 60.0 | 5988104 | 32.0 | 151.0 | 235.0 | 60.0 | 5988722 |
| 1.3/32 | 5988739 | 5988913 | 7333091 | 1.1/4 | 151.0 | 235.0 | 60.0 | 5988104 | 32.0 | 151.0 | 235.0 | 60.0 | 5988722 |
| 28.0 | 5988876 | 5988535 | 7333092 | 1.1/4 | 157.0 | 240.0 | 60.0 | 5988097 | 32.0 | 157.0 | 240.0 | 60.0 | 5988732 |
| 1.7/64 | 5988614 | 5988918 | 7333093 | 1.1/4 | 157.0 | 240.0 | 60.0 | 5988097 | 32.0 | 157.0 | 240.0 | 60.0 | 5988732 |
| 28.5 | 5988844 | 5988540 | 7333094 | 1.1/4 | 157.0 | 240.0 | 60.0 | 5988097 | 32.0 | 157.0 | 240.0 | 60.0 | 5988732 |
| 1.1/8 | 5988720 | 5988910 | 7333095 | 1.1/4 | 157.0 | 240.0 | 60.0 | 5988097 | 32.0 | 157.0 | 240.0 | 60.0 | 5988732 |
| 1.9/64 | 5988617 | 5988919 | 7333096 | 1.1/4 | 162.0 | 245.0 | 60.0 | 5988099 | 32.0 | 162.0 | 245.0 | 60.0 | 5988743 |
| 29.0 | 5988888 | 5988548 | 7333097 | 1.1/4 | 162.0 | 245.0 | 60.0 | 5988099 | 32.0 | 162.0 | 245.0 | 60.0 | 5988743 |
| 1.5/32 | 5988608 | 5988915 | 7333098 | 1.1/4 | 162.0 | 245.0 | 60.0 | 5988099 | 32.0 | 162.0 | 245.0 | 60.0 | 5988743 |
| 29.5 | 5988906 | 5988552 | 7333099 | 1.1/4 | 162.0 | 245.0 | 60.0 | 5988099 | 32.0 | 162.0 | 245.0 | 60.0 | 5988743 |
| 1.11/64 | 5988730 | 5988911 | 7333100 | 1.1/4 | 162.0 | 245.0 | 60.0 | 5988099 | 32.0 | 162.0 | 245.0 | 60.0 | 5988743 |
| 30.0 | 5988930 | 5988564 | 7333101 | 1.1/4 | 167.0 | 255.0 | 60.0 | 5988101 | 32.0 | 167.0 | 255.0 | 60.0 | 5988748 |
| 1.3/16 | 5988735 | 5988912 | 7333102 | 1.1/4 | 167.0 | 255.0 | 60.0 | 5988101 | 32.0 | 167.0 | 255.0 | 60.0 | 5988748 |
| 30.5 | 5988932 | 5988568 | 7333103 | 1.1/4 | 167.0 | 255.0 | 60.0 | 5988101 | 32.0 | 167.0 | 255.0 | 60.0 | 5988748 |
| 1.7/32 | 6104481 | — | 7333104 | — | — | — | — | — | 32.0 | 176.5 | 261.5 | 60.0 | 6111413 |
| 31.00 | 6104482 | — | 7333105 | — | — | — | — | — | 32.0 | 176.5 | 261.5 | 60.0 | 6111413 |
| 1.1/4 | 6104483 | — | 7333106 | — | — | — | — | — | 32.0 | 176.5 | 261.5 | 60.0 | 6111413 |
| 32.00 | 6104484 | — | 7333107 | — | — | — | — | — | 32.0 | 176.5 | 261.5 | 60.0 | 6111413 |
| 32.50 | 6104485 | — | 7333108 | — | — | — | — | — | 32.0 | 186.5 | 271.5 | 60.0 | 6111414 |
| 1.19/64 | 6104486 | — | 7333109 | — | — | — | — | — | 32.0 | 186.5 | 271.5 | 60.0 | 6111414 |
| 33.00 | 6104487 | — | 7333110 | — | — | — | — | — | 32.0 | 186.5 | 271.5 | 60.0 | 6111414 |
| 33.50 | 6104488 | — | 7333111 | — | — | — | — | — | 32.0 | 186.5 | 271.5 | 60.0 | 6111414 |
| 34.00 | 6104489 | — | 7333112 | — | — | — | — | — | 40.0 | 196.5 | 291.5 | 70.0 | 6111415 |
| 1.11/32 | 6104530 | — | 7333113 | — | — | — | — | — | 40.0 | 196.5 | 291.5 | 70.0 | 6111415 |
| 34.50 | 6104531 | — | 7333114 | — | — | — | — | — | 40.0 | 196.5 | 291.5 | 70.0 | 6111415 |
| 1.3/8 | 6104532 | — | 7333115 | — | — | — | — | — | 40.0 | 196.5 | 291.5 | 70.0 | 6111415 |
| 35.00 | 6104533 | — | 7333116 | — | — | — | — | — | 40.0 | 196.5 | 291.5 | 70.0 | 6111415 |
| 36.00 | 6104534 | — | 7333117 | — | — | — | — | — | 40.0 | 201.5 | 296.5 | 70.0 | 6111416 |
| 1.27/64 | 6104535 | — | 7333118 | — | — | — | — | — | 40.0 | 201.5 | 296.5 | 70.0 | 6111416 |
| 36.50 | 6104536 | — | 7333119 | — | — | — | — | — | 40.0 | 201.5 | 296.5 | 70.0 | 6111416 |
| 37.00 | 6104537 | — | 7333120 | — | — | — | — | — | 40.0 | 211.5 | 306.5 | 70.0 | 6111417 |
| 1.15/32 | 6104538 | — | 7333121 | — | — | — | — | — | 40.0 | 211.5 | 306.5 | 70.0 | 6111417 |
| 37.50 | 6104539 | — | 7333122 | — | — | — | — | — | 40.0 | 211.5 | 306.5 | 70.0 | 6111417 |
| 38.00 | 6104540 | — | 7333123 | — | — | — | — | — | 40.0 | 211.5 | 306.5 | 70.0 | 6111417 |
| 1.1/2 | 6104541 | — | 7333124 | — | — | — | — | — | 40.0 | 211.5 | 316.5 | 70.0 | 6111418 |
| 38.50 | 6104542 | — | 7333125 | — | — | — | — | — | 40.0 | 211.5 | 316.5 | 70.0 | 6111418 |
| 1.17/32 | 6104543 | — | 7333126 | — | — | — | — | — | 40.0 | 211.5 | 316.5 | 70.0 | 6111418 |
| 39.00 | 6104544 | — | 7333127 | — | — | — | — | — | 40.0 | 211.5 | 316.5 | 70.0 | 6111418 |
| 39.50 | 6104545 | — | 7333128 | — | — | — | — | — | 40.0 | 211.5 | 316.5 | 70.0 | 6111418 |
| 1.9/16 | 6104546 | — | 7333129 | — | — | — | — | — | 40.0 | 226.5 | 325.5 | 70.0 | 6111419 |
| 40.00 | 6104547 | — | 7333130 | — | — | — | — | — | 40.0 | 226.5 | 325.5 | 70.0 | 6111419 |
| 41.00 | 6104548 | — | 7333131 | — | — | — | — | — | 40.0 | 226.5 | 325.5 | 70.0 | 6111419 |
| 1.5/8 | 6104549 | — | 7333132 | — | — | — | — | — | 40.0 | 236.5 | 336.5 | 70.0 | 6111420 |
| 42.00 | 6104550 | — | 7333133 | — | — | — | — | — | 40.0 | 236.5 | 336.5 | 70.0 | 6111420 |

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

- * Metric bodies have whistle notch on shank
- * For more information on Hydra, see page 539

H858 Coolant Through

DIN 6535HB
DIN 6535HE

8XD

HSS

140°



13.50 - 42.00

| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 8xD Hydra Body - Metric Shank | | | | | 8xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|--------------|---|----------------------|----------------------|----------------------|-----------|
| | | | | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# |
| 13.5 | 5988645 | 5988791 | 7332990 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 13.6 | 5988646 | 5988839 | 7332991 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 13.7 | 5988647 | 5988883 | 7332992 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 13.8 | 5988648 | 5988889 | 7332993 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 35/64 | 5988854 | 5988583 | 7332994 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 14.0 | 5988652 | 5988895 | 7332995 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 14.1 | 5988655 | 5988897 | 7332996 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 14.2 | 5988657 | 5988692 | 7332997 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 9/16 | 5988904 | 5988664 | 7332998 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 14.5 | 5988660 | 5988696 | 7332999 | — | — | — | — | — | 16.0 | 124.5 | 191.5 | 48.0 | 5988789 |
| 14.6 | 5988663 | 5988700 | 7333000 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 37/64 | 5988857 | 5988591 | 7333001 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 14.7 | 5988666 | 5988705 | 7333002 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 14.8 | 5988668 | 5988709 | 7333003 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.0 | 5988670 | 5988714 | 7333004 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 19/32 | 5988779 | 5988621 | 7333005 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.1 | 5988672 | 5988719 | 7333006 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.2 | 5988674 | 5988724 | 7333007 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.24 | 5988678 | 5988729 | 7333008 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 39/64 | 5988860 | 5988595 | 7333009 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.5 | 5988680 | 5988734 | 7333010 | — | — | — | — | — | 20.0 | 133.5 | 201.5 | 50.0 | 5988793 |
| 15.6 | 5988683 | 5988742 | 7333011 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 15.7 | 5988687 | 5988747 | 7333012 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 5/8 | 5988884 | 5988612 | 7333013 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.0 | 5988698 | 5988763 | 7333014 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.08 | 5988702 | 5988769 | 7333015 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.1 | 5988710 | 5988773 | 7333016 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.2 | 5988715 | 5988777 | 7333017 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 41/64 | 5988864 | 5988599 | 7333018 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.3 | 5988725 | 5988783 | 7333019 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |

HYDRA DRILL



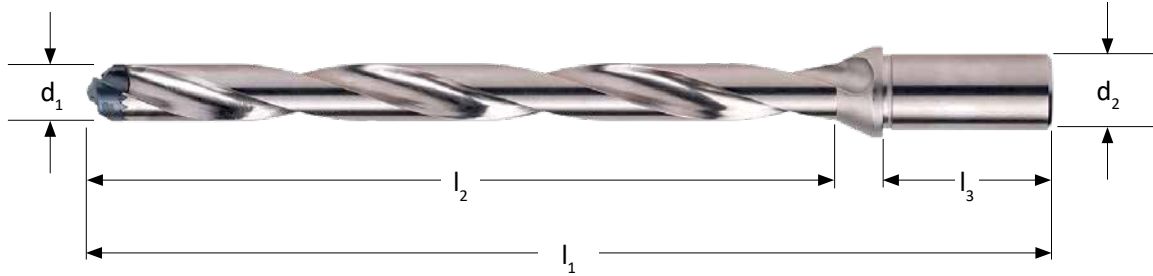
| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 8xD Hydra Body - Metric Shank | | | | | 8xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|--------------|---|----------------------|----------------------|----------------------|--------------|
| | | | | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# |
| 16.5 | 5988690 | 5988787 | 7333020 | — | — | — | — | — | 20.0 | 141.5 | 211.5 | 50.0 | 5988797 |
| 16.6 | 5988749 | 5988795 | 7333021 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 21/32 | 5988802 | 5988443 | 7333022 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 16.7 | 5988790 | 5988799 | 7333023 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 17.0 | 5988833 | 5988803 | 7333024 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 43/64 | 5988867 | 5988601 | 7333025 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 17.1 | 5988873 | 5988807 | 7333026 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 17.2 | 5988881 | 5988811 | 7333027 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 11/16 | 5988623 | 5988921 | 7333028 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 17.5 | 5988885 | 5988818 | 7333029 | — | — | — | — | — | 20.0 | 150.5 | 221.5 | 50.0 | 5988800 |
| 17.6 | 5988891 | 5988823 | 7333030 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 17.7 | 5988894 | 5988827 | 7333031 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 45/64 | 5988872 | 5988603 | 7333032 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 18.0 | 5988701 | 5988835 | 7333033 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 18.1 | 5988706 | 5988841 | 7333034 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 18.2 | 5988713 | 5988845 | 7333035 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 23/32 | 5988824 | 5988471 | 7333036 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 18.5 | 5988718 | 5988848 | 7333037 | — | — | — | — | — | 20.0 | 158.5 | 226.5 | 50.0 | 5988804 |
| 18.6 | 5988723 | 5988853 | 7333038 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 47/64 | 5988877 | 5988606 | 7333039 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 18.7 | 5988728 | 5988856 | 7333040 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 18.9 | 5988733 | 5988863 | 7333041 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.0 | 5988740 | 5988868 | 7333042 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 3/4 | 5988928 | 5988559 | 7333043 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.1 | 5988745 | 5988871 | 7333044 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.2 | 5988752 | 5988875 | 7333045 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.25 | 5988756 | 5988879 | 7333046 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.3 | 5988760 | 5988887 | 7333047 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.35 | 5988764 | 5988438 | 7333048 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 49/64 | 5988880 | 5988609 | 7333049 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.5 | 5988767 | 5988495 | 7333050 | — | — | — | — | — | 25.0 | 167.5 | 251.5 | 56.0 | 5988808 |
| 19.6 | 5988771 | 5988544 | 7333051 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 19.7 | 5988775 | 5988587 | 7333052 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 25/32 | 5988851 | 5988511 | 7333053 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 20.0 | 5988782 | 5988629 | 7333054 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 51/64 | 5988892 | 5988615 | 7333055 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 20.5 | 5988786 | 5988632 | 7333056 | — | — | — | — | — | 25.0 | 175.5 | 264.5 | 56.0 | 5988812 |
| 13/16 | 5988649 | 5988893 | 7333057 | — | — | — | — | — | 25.0 | 184.5 | 266.5 | 56.0 | 5988817 |
| 21.0 | 5988794 | 5988635 | 7333058 | — | — | — | — | — | 25.0 | 184.5 | 266.5 | 56.0 | 5988817 |
| 53/64 | 5988896 | 5988618 | 7333059 | — | — | — | — | — | 25.0 | 184.5 | 266.5 | 56.0 | 5988817 |
| 27/32 | 5988869 | 5988531 | 7333060 | — | — | — | — | — | 25.0 | 184.5 | 266.5 | 56.0 | 5988817 |
| 21.5 | 5988798 | 5988638 | 7333061 | — | — | — | — | — | 25.0 | 184.5 | 266.5 | 56.0 | 5988817 |
| 55/64 | 5988898 | 5988626 | 7333062 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 22.0 | 5988806 | 5988448 | 7333063 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 7/8 | 5988903 | 5988661 | 7333064 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 22.5 | 5988810 | 5988453 | 7333065 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 57/64 | 5988899 | 5988651 | 7333066 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 22.7 | 5988814 | 5988458 | 7333067 | — | — | — | — | — | 25.0 | 192.1 | 271.1 | 56.0 | 5988821 |
| 23.0 | 5988816 | 5988462 | 7333068 | — | — | — | — | — | 25.0 | 200.5 | 280.5 | 56.0 | 5988829 |
| 29/32 | 5988917 | 5988556 | 7333069 | — | — | — | — | — | 25.0 | 200.5 | 280.5 | 56.0 | 5988829 |
| 59/64 | 5988900 | 5988653 | 7333070 | — | — | — | — | — | 25.0 | 200.5 | 280.5 | 56.0 | 5988829 |
| 23.5 | 5988820 | 5988466 | 7333071 | — | — | — | — | — | 25.0 | 200.5 | 280.5 | 56.0 | 5988829 |
| 15/16 | 5988691 | 5988754 | 7333072 | — | — | — | — | — | 32.0 | 208.2 | 295.2 | 60.0 | 5988832 |
| 24.0 | 5988828 | 5988476 | 7333073 | — | — | — | — | — | 32.0 | 208.2 | 295.2 | 60.0 | 5988832 |
| 61/64 | 5988901 | 5988656 | 7333074 | — | — | — | — | — | 32.0 | 208.2 | 295.2 | 60.0 | 5988832 |
| 24.5 | 5988837 | 5988483 | 7333075 | — | — | — | — | — | 32.0 | 208.2 | 295.2 | 60.0 | 5988832 |
| 31/32 | 5988934 | 5988572 | 7333076 | — | — | — | — | — | 32.0 | 208.2 | 295.2 | 60.0 | 5988832 |
| 25.0 | 5988840 | 5988488 | 7333077 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 63/64 | 5988902 | 5988658 | 7333078 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 1 | 5988604 | 5988905 | 7333079 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 25.5 | 5988843 | 5988499 | 7333080 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 25.65 | 5988847 | 5988506 | 7333081 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 1.1/64 | 5988676 | 5988909 | 7333082 | — | — | — | — | — | 32.0 | 217.0 | 300.0 | 60.0 | 5988836 |
| 26.0 | 5988855 | 5988516 | 7333083 | — | — | — | — | — | 32.0 | 225.0 | 310.0 | 60.0 | 5988842 |
| 1.1/32 | 5988650 | 5988908 | 7333084 | — | — | — | — | — | 32.0 | 225.0 | 310.0 | 60.0 | 5988842 |

| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 8xD Hydra Body - Metric Shank | | | | | 8xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|--------------|---|----------------------|----------------------|----------------------|--------------|
| | | | | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H858 EDP# |
| 26.5 | 5988858 | 5988519 | 7333085 | — | — | — | — | — | 32.0 | 225.0 | 310.0 | 60.0 | 5988842 |
| 1.3/64 | 5988744 | 5988914 | 7333086 | — | — | — | — | — | 32.0 | 225.0 | 310.0 | 60.0 | 5988842 |
| 1.1/16 | 5988637 | 5988907 | 7333087 | — | — | — | — | — | 32.0 | 234.0 | 320.0 | 60.0 | 5988846 |
| 27.0 | 5988861 | 5988523 | 7333088 | — | — | — | — | — | 32.0 | 234.0 | 320.0 | 60.0 | 5988846 |
| 1.5/64 | 5988611 | 5988916 | 7333089 | — | — | — | — | — | 32.0 | 234.0 | 320.0 | 60.0 | 5988846 |
| 27.5 | 5988865 | 5988528 | 7333090 | — | — | — | — | — | 32.0 | 234.0 | 320.0 | 60.0 | 5988846 |
| 1.3/32 | 5988739 | 5988913 | 7333091 | — | — | — | — | — | 32.0 | 234.0 | 320.0 | 60.0 | 5988846 |
| 28.0 | 5988876 | 5988535 | 7333092 | — | — | — | — | — | 32.0 | 242.0 | 325.0 | 60.0 | 5988849 |
| 1.7/64 | 5988614 | 5988918 | 7333093 | — | — | — | — | — | 32.0 | 242.0 | 325.0 | 60.0 | 5988849 |
| 28.5 | 5988844 | 5988540 | 7333094 | — | — | — | — | — | 32.0 | 242.0 | 325.0 | 60.0 | 5988849 |
| 1.1/8 | 5988720 | 5988910 | 7333095 | — | — | — | — | — | 32.0 | 242.0 | 325.0 | 60.0 | 5988849 |
| 1.9/64 | 5988617 | 5988919 | 7333096 | — | — | — | — | — | 32.0 | 251.0 | 335.0 | 60.0 | 5988852 |
| 29.0 | 5988888 | 5988548 | 7333097 | — | — | — | — | — | 32.0 | 251.0 | 335.0 | 60.0 | 5988852 |
| 1.5/32 | 5988608 | 5988915 | 7333098 | — | — | — | — | — | 32.0 | 251.0 | 335.0 | 60.0 | 5988852 |
| 29.5 | 5988906 | 5988552 | 7333099 | — | — | — | — | — | 32.0 | 251.0 | 335.0 | 60.0 | 5988852 |
| 1.11/64 | 5988730 | 5988911 | 7333100 | — | — | — | — | — | 32.0 | 251.0 | 335.0 | 60.0 | 5988852 |
| 30.0 | 5988930 | 5988564 | 7333101 | — | — | — | — | — | 32.0 | 259.0 | 345.0 | 60.0 | 5988859 |
| 1.3/16 | 5988735 | 5988912 | 7333102 | — | — | — | — | — | 32.0 | 259.0 | 345.0 | 60.0 | 5988859 |
| 30.5 | 5988932 | 5988568 | 7333103 | — | — | — | — | — | 32.0 | 259.0 | 345.0 | 60.0 | 5988859 |
| 1.7/32 | 6104481 | — | 7333104 | — | — | — | — | — | 32.0 | 271.5 | 356.5 | 60.0 | 6111421 |
| 31.00 | 6104482 | — | 7333105 | — | — | — | — | — | 32.0 | 271.5 | 356.5 | 60.0 | 6111421 |
| 1.1/4 | 6104483 | — | 7333106 | — | — | — | — | — | 32.0 | 271.5 | 356.5 | 60.0 | 6111421 |
| 32.00 | 6104484 | — | 7333107 | — | — | — | — | — | 32.0 | 271.5 | 356.5 | 60.0 | 6111421 |
| 32.50 | 6104485 | — | 7333108 | — | — | — | — | — | 40.0 | 286.5 | 371.5 | 60.0 | 6111422 |
| 1.19/64 | 6104486 | — | 7333109 | — | — | — | — | — | 40.0 | 286.5 | 371.5 | 60.0 | 6111422 |
| 33.00 | 6104487 | — | 7333110 | — | — | — | — | — | 40.0 | 286.5 | 371.5 | 60.0 | 6111422 |
| 33.50 | 6104488 | — | 7333111 | — | — | — | — | — | 40.0 | 286.5 | 371.5 | 60.0 | 6111422 |
| 34.00 | 6104489 | — | 7333112 | — | — | — | — | — | 40.0 | 301.5 | 396.5 | 70.0 | 6111423 |
| 1.11/32 | 6104530 | — | 7333113 | — | — | — | — | — | 40.0 | 301.5 | 396.5 | 70.0 | 6111423 |
| 34.50 | 6104531 | — | 7333114 | — | — | — | — | — | 40.0 | 301.5 | 396.5 | 70.0 | 6111423 |
| 1.3/8 | 6104532 | — | 7333115 | — | — | — | — | — | 40.0 | 301.5 | 396.5 | 70.0 | 6111423 |
| 35.00 | 6104533 | — | 7333116 | — | — | — | — | — | 40.0 | 301.5 | 396.5 | 70.0 | 6111423 |
| 36.00 | 6104534 | — | 7333117 | — | — | — | — | — | 40.0 | 311.5 | 406.5 | 70.0 | 6111424 |
| 1.27/64 | 6104535 | — | 7333118 | — | — | — | — | — | 40.0 | 311.5 | 406.5 | 70.0 | 6111424 |
| 36.50 | 6104536 | — | 7333119 | — | — | — | — | — | 40.0 | 311.5 | 406.5 | 70.0 | 6111424 |
| 37.00 | 6104537 | — | 7333120 | — | — | — | — | — | 40.0 | 326.5 | 421.5 | 70.0 | 6111425 |
| 1.15/32 | 6104538 | — | 7333121 | — | — | — | — | — | 40.0 | 326.5 | 421.5 | 70.0 | 6111425 |
| 37.50 | 6104539 | — | 7333122 | — | — | — | — | — | 40.0 | 326.5 | 421.5 | 70.0 | 6111425 |
| 38.00 | 6104540 | — | 7333123 | — | — | — | — | — | 40.0 | 326.5 | 421.5 | 70.0 | 6111425 |
| 1.1/2 | 6104541 | — | 7333124 | — | — | — | — | — | 40.0 | 336.5 | 431.5 | 70.0 | 6111426 |
| 38.50 | 6104542 | — | 7333125 | — | — | — | — | — | 40.0 | 336.5 | 431.5 | 70.0 | 6111426 |
| 1.17/32 | 6104543 | — | 7333126 | — | — | — | — | — | 40.0 | 336.5 | 431.5 | 70.0 | 6111426 |
| 39.00 | 6104544 | — | 7333127 | — | — | — | — | — | 40.0 | 336.5 | 431.5 | 70.0 | 6111426 |
| 39.50 | 6104545 | — | 7333128 | — | — | — | — | — | 40.0 | 336.5 | 431.5 | 70.0 | 6111426 |
| 1.9/16 | 6104546 | — | 7333129 | — | — | — | — | — | 40.0 | 351.5 | 451.5 | 70.0 | 6111427 |
| 40.00 | 6104547 | — | 7333130 | — | — | — | — | — | 40.0 | 351.5 | 451.5 | 70.0 | 6111427 |
| 41.00 | 6104548 | — | 7333131 | — | — | — | — | — | 40.0 | 351.5 | 451.5 | 70.0 | 6111427 |
| 1.5/8 | 6104549 | — | 7333132 | — | — | — | — | — | 40.0 | 361.5 | 461.5 | 70.0 | 6111428 |
| 42.00 | 6104550 | — | 7333133 | — | — | — | — | — | 40.0 | 361.5 | 461.5 | 70.0 | 6111428 |

12xD Hydra Bodies

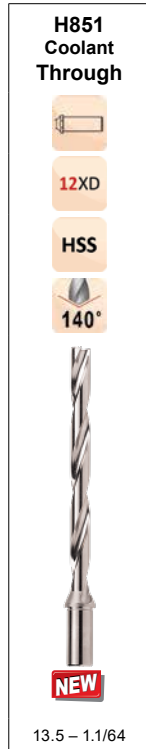
H8512

Metric body, Cylindrical shank



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

* For more information on Hydra, see page 539



| Hydra Head $d_1 \text{ } \varnothing$ | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 12xD Hydra Body - Fractional Shank | | | | | 12xD Hydra Body - Metric Shank | | | | |
|--|----------------------------|----------------------------|----------------------------|--------------------------------------|-------------|-------------|-------------|---------------|--------------------------------------|-------------|-------------|-------------|---------------|
| | | | | $d_2 \text{ } \varnothing h_6$ mm | l_2 mm | l_1 mm | l_3 mm | H8512 EDP# | $d_2 \text{ } \varnothing h_6$ mm | l_2 mm | l_1 mm | l_3 mm | H8512 EDP# |
| 13.5 | 5988645 | 5988791 | 7332990 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 13.6 | 5988646 | 5988839 | 7332991 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 13.7 | 5988647 | 5988883 | 7332992 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 13.8 | 5988648 | 5988889 | 7332993 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 35/64 | 5988854 | 5988583 | 7332994 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 14.0 | 5988652 | 5988895 | 7332995 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 14.1 | 5988655 | 5988897 | 7332996 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 14.2 | 5988657 | 5988692 | 7332997 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 9/16 | 5988904 | 5988664 | 7332998 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 14.5 | 5988660 | 5988696 | 7332999 | — | — | — | — | — | 16.00 | 168.0 | 236.0 | 48.0 | 7833364 |
| 14.6 | 5988663 | 5988700 | 7333000 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 37/64 | 5988857 | 5988591 | 7333001 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 14.7 | 5988666 | 5988705 | 7333002 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 14.8 | 5988668 | 5988709 | 7333003 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.0 | 5988670 | 5988714 | 7333004 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 19/32 | 5988779 | 5988621 | 7333005 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.1 | 5988672 | 5988719 | 7333006 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.2 | 5988674 | 5988724 | 7333007 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.24 | 5988678 | 5988729 | 7333008 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 39/64 | 5988860 | 5988595 | 7333009 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.5 | 5988680 | 5988734 | 7333010 | — | — | — | — | — | 20.00 | 180.0 | 250.3 | 50.0 | 7833365 |
| 15.6 | 5988683 | 5988742 | 7333011 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 15.7 | 5988687 | 5988747 | 7333012 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 5/8 | 5988884 | 5988612 | 7333013 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.0 | 5988698 | 5988763 | 7333014 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.08 | 5988702 | 5988769 | 7333015 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.1 | 5988710 | 5988773 | 7333016 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.2 | 5988715 | 5988777 | 7333017 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 41/64 | 5988864 | 5988599 | 7333018 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.3 | 5988725 | 5988783 | 7333019 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |
| 16.5 | 5988690 | 5988787 | 7333020 | — | — | — | — | — | 20.00 | 192.0 | 262.6 | 50.0 | 7833366 |

| Hydra Head d ₁ Ø | Hydra Head R950 EDP# | Hydra Head R960 EDP# | Hydra Head R970 EDP# | 12xD Hydra Body - Fractional Shank | | | | | 12xD Hydra Body - Metric Shank | | | | |
|--------------------------------|----------------------------|----------------------------|----------------------------|---|----------------------|----------------------|----------------------|---------------|---|----------------------|----------------------|----------------------|---------------|
| | | | | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H8512 EDP# | d ₂ Øh ₆ mm | l ₂ mm | l ₁ mm | l ₃ mm | H8512 EDP# |
| 16.6 | 5988749 | 5988795 | 7333021 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 21/32 | 5988802 | 5988443 | 7333022 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 16.7 | 5988790 | 5988799 | 7333023 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 17.0 | 5988833 | 5988803 | 7333024 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 43/64 | 5988867 | 5988601 | 7333025 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 17.1 | 5988873 | 5988807 | 7333026 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 17.2 | 5988881 | 5988811 | 7333027 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 11/16 | 5988623 | 5988921 | 7333028 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 17.5 | 5988885 | 5988818 | 7333029 | — | — | — | — | — | 20.00 | 204.0 | 275.0 | 50.0 | 7833367 |
| 17.6 | 5988891 | 5988823 | 7333030 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 17.7 | 5988894 | 5988827 | 7333031 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 45/64 | 5988872 | 5988603 | 7333032 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 18.0 | 5988701 | 5988835 | 7333033 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 18.1 | 5988706 | 5988841 | 7333034 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 18.2 | 5988713 | 5988845 | 7333035 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 23/32 | 5988824 | 5988471 | 7333036 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 18.5 | 5988718 | 5988848 | 7333037 | — | — | — | — | — | 20.00 | 216.0 | 287.2 | 50.0 | 7833368 |
| 18.6 | 5988723 | 5988853 | 7333038 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 47/64 | 5988877 | 5988606 | 7333039 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 18.7 | 5988728 | 5988856 | 7333040 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 18.9 | 5988733 | 5988863 | 7333041 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.0 | 5988740 | 5988868 | 7333042 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 3/4 | 5988928 | 5988559 | 7333043 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.1 | 5988745 | 5988871 | 7333044 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.2 | 5988752 | 5988875 | 7333045 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.25 | 5988756 | 5988879 | 7333046 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.3 | 5988760 | 5988887 | 7333047 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.35 | 5988764 | 5988438 | 7333048 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 49/64 | 5988880 | 5988609 | 7333049 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.5 | 5988767 | 5988495 | 7333050 | — | — | — | — | — | 25.00 | 228.0 | 305.6 | 56.0 | 7833369 |
| 19.6 | 5988771 | 5988544 | 7333051 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 19.7 | 5988775 | 5988587 | 7333052 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 25/32 | 5988851 | 5988511 | 7333053 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 20.0 | 5988782 | 5988629 | 7333054 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 51/64 | 5988892 | 5988615 | 7333055 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 20.5 | 5988786 | 5988632 | 7333056 | — | — | — | — | — | 25.00 | 240.0 | 317.8 | 56.0 | 7833370 |
| 13/16 | 5988649 | 5988893 | 7333057 | — | — | — | — | — | 25.00 | 252.0 | 330.1 | 56.0 | 7833371 |
| 21.0 | 5988794 | 5988635 | 7333058 | — | — | — | — | — | 25.00 | 252.0 | 330.1 | 56.0 | 7833371 |
| 53/64 | 5988896 | 5988618 | 7333059 | — | — | — | — | — | 25.00 | 252.0 | 330.1 | 56.0 | 7833371 |
| 27/32 | 5988869 | 5988531 | 7333060 | — | — | — | — | — | 25.00 | 252.0 | 330.1 | 56.0 | 7833371 |
| 21.5 | 5988798 | 5988638 | 7333061 | — | — | — | — | — | 25.00 | 252.0 | 330.1 | 56.0 | 7833371 |
| 55/64 | 5988898 | 5988626 | 7333062 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 22.0 | 5988806 | 5988448 | 7333063 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 7/8 | 5988903 | 5988661 | 7333064 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 22.5 | 5988810 | 5988453 | 7333065 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 57/64 | 5988899 | 5988651 | 7333066 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 22.7 | 5988814 | 5988458 | 7333067 | — | — | — | — | — | 25.00 | 264.0 | 343.0 | 56.0 | 7833372 |
| 23.0 | 5988816 | 5988462 | 7333068 | — | — | — | — | — | 25.00 | 276.0 | 354.8 | 56.0 | 7833373 |
| 29/32 | 5988917 | 5988556 | 7333069 | — | — | — | — | — | 25.00 | 276.0 | 354.8 | 56.0 | 7833373 |
| 59/64 | 5988900 | 5988653 | 7333070 | — | — | — | — | — | 25.00 | 276.0 | 354.8 | 56.0 | 7833373 |
| 23.5 | 5988820 | 5988466 | 7333071 | — | — | — | — | — | 25.00 | 276.0 | 354.8 | 56.0 | 7833373 |
| 15/16 | 5988691 | 5988754 | 7333072 | — | — | — | — | — | 32.00 | 288.0 | 371.7 | 60.0 | 7833374 |
| 24.0 | 5988828 | 5988476 | 7333073 | — | — | — | — | — | 32.00 | 288.0 | 371.7 | 60.0 | 7833374 |
| 61/64 | 5988901 | 5988656 | 7333074 | — | — | — | — | — | 32.00 | 288.0 | 371.7 | 60.0 | 7833374 |
| 24.5 | 5988837 | 5988483 | 7333075 | — | — | — | — | — | 32.00 | 288.0 | 371.7 | 60.0 | 7833374 |
| 31/32 | 5988934 | 5988572 | 7333076 | — | — | — | — | — | 32.00 | 288.0 | 371.7 | 60.0 | 7833374 |
| 25.0 | 5988840 | 5988488 | 7333077 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |
| 63/64 | 5988902 | 5988658 | 7333078 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |
| 1 | 5988604 | 5988905 | 7333079 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |
| 25.5 | 5988843 | 5988499 | 7333080 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |
| 25.65 | 5988847 | 5988506 | 7333081 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |
| 1.1/64 | 5988676 | 5988909 | 7333082 | — | — | — | — | — | 32.00 | 300.0 | 383.8 | 60.0 | 7833375 |

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



* For more information on Hydra, see page 539

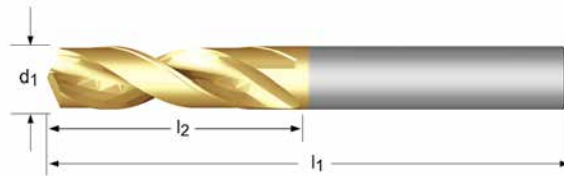
| H860 | H861 | For Hydra Head Range | Wrench Size / Bit | Pack Qty | H860 | H861 |
|--------|--------|----------------------|-------------------|----------|---------|---------|
| H860N1 | H861N1 | 15/32 - 15.5 | Torx 8IP | 1 | 5988862 | 5987939 |
| H860N2 | H861N2 | 15.6 - 18.5 | Torx 10IP | 1 | 5988866 | 5987942 |
| H860N3 | H861N3 | 18.6 - 21.5 | Torx 15IP | 1 | 5988874 | 5987945 |
| H860N4 | H861N3 | 55/64 - 31/32 | Torx 15IP | 1 | 5987928 | 5987945 |
| H860N5 | H861N4 | 25.0 - 1.3/32 | Torx 20IP | 1 | 5987933 | 5987947 |
| H860N6 | H861N5 | 28.0 - 33.5 | Torx 25IP | 1 | 5987936 | 5987950 |
| H860N7 | H861N6 | 34.0 - 42.0 | Torx 4mm | 1 | 6111949 | 6260354 |

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

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



R520

DIN
6539

2.5XD

HM

130°



3.00 - 16.50

| d_1 $\varnothing h_7$ Inch | d_1 $\varnothing h_7$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | R520 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|-------------|
| | 3.00 | 0.1181 | 16 | 46 | 1 | 5981147 |
| | 3.10 | 0.1220 | 18 | 49 | 1 | 5981152 |
| 1/8 | 3.18 | 0.1250 | 18 | 49 | 1 | 5980549 |
| | 3.20 | 0.1260 | 18 | 49 | 1 | 5981155 |
| | 3.30 | 0.1299 | 18 | 49 | 1 | 5981161 |
| | 3.40 | 0.1339 | 20 | 52 | 1 | 5981164 |
| | 3.50 | 0.1378 | 20 | 52 | 1 | 5981167 |
| | 3.60 | 0.1417 | 20 | 52 | 1 | 5981171 |
| | 3.70 | 0.1457 | 20 | 52 | 1 | 5981174 |
| | 3.80 | 0.1496 | 22 | 55 | 1 | 5981178 |
| | 3.90 | 0.1535 | 22 | 55 | 1 | 5981182 |
| | 4.00 | 0.1575 | 22 | 55 | 1 | 5981201 |
| | 4.10 | 0.1614 | 22 | 55 | 1 | 5981204 |
| | 4.20 | 0.1654 | 22 | 55 | 1 | 5981208 |
| | 4.30 | 0.1693 | 24 | 58 | 1 | 5981212 |
| | 4.40 | 0.1732 | 24 | 58 | 1 | 5981216 |
| | 4.50 | 0.1772 | 24 | 58 | 1 | 5981220 |
| | 4.60 | 0.1811 | 24 | 58 | 1 | 5981225 |
| | 4.70 | 0.1850 | 24 | 58 | 1 | 5981227 |
| | 4.80 | 0.1890 | 26 | 62 | 1 | 5981230 |
| | 4.90 | 0.1929 | 26 | 62 | 1 | 5981236 |
| | 5.00 | 0.1969 | 26 | 62 | 1 | 5981242 |
| | 5.10 | 0.2008 | 26 | 62 | 1 | 5981244 |
| | 5.20 | 0.2047 | 26 | 62 | 1 | 5981247 |
| | 5.30 | 0.2087 | 26 | 62 | 1 | 5981252 |
| | 5.40 | 0.2126 | 28 | 66 | 1 | 5981254 |
| | 5.50 | 0.2165 | 28 | 66 | 1 | 5981257 |
| | 5.60 | 0.2205 | 28 | 66 | 1 | 5981260 |
| | 5.70 | 0.2244 | 28 | 66 | 1 | 5981263 |
| | 5.80 | 0.2283 | 28 | 66 | 1 | 5981266 |
| | 5.90 | 0.2323 | 28 | 66 | 1 | 5981269 |
| | 6.00 | 0.2362 | 28 | 66 | 1 | 5981142 |
| | 6.10 | 0.2402 | 31 | 70 | 1 | 5981176 |

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 | R520 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 6.20 | 0.2441 | 31 | 70 | 1 | 5981218 |
| | 6.30 | 0.2480 | 31 | 70 | 1 | 5981226 |
| 1/4 | 6.35 | 0.2500 | 31 | 70 | 1 | 5980546 |
| | 6.40 | 0.2520 | 31 | 70 | 1 | 5981229 |
| | 6.50 | 0.2559 | 31 | 70 | 1 | 5981233 |
| | 6.60 | 0.2598 | 31 | 70 | 1 | 5981237 |
| | 6.70 | 0.2638 | 31 | 70 | 1 | 5981073 |
| | 6.80 | 0.2677 | 34 | 74 | 1 | 5981077 |
| | 6.90 | 0.2717 | 34 | 74 | 1 | 5981080 |
| | 7.00 | 0.2756 | 34 | 74 | 1 | 5981084 |
| | 7.10 | 0.2795 | 34 | 74 | 1 | 5981088 |
| | 7.20 | 0.2835 | 34 | 74 | 1 | 5981092 |
| | 7.30 | 0.2874 | 34 | 74 | 1 | 5981096 |
| | 7.40 | 0.2913 | 34 | 74 | 1 | 5981099 |
| | 7.50 | 0.2953 | 34 | 74 | 1 | 5981102 |
| | 7.60 | 0.2992 | 37 | 79 | 1 | 5981105 |
| | 7.70 | 0.3031 | 37 | 79 | 1 | 5981111 |
| | 7.80 | 0.3071 | 37 | 79 | 1 | 5981114 |
| | 7.90 | 0.3110 | 37 | 79 | 1 | 5981117 |
| 5/16 | 7.94 | 0.3125 | 37 | 79 | 1 | 5981275 |
| | 8.00 | 0.3150 | 37 | 79 | 1 | 5981126 |
| | 8.10 | 0.3189 | 37 | 79 | 1 | 5981129 |
| | 8.20 | 0.3228 | 37 | 79 | 1 | 5981131 |
| | 8.30 | 0.3268 | 37 | 79 | 1 | 5981135 |
| | 8.40 | 0.3307 | 37 | 79 | 1 | 5981138 |
| | 8.50 | 0.3346 | 37 | 79 | 1 | 5981145 |
| | 8.60 | 0.3386 | 40 | 84 | 1 | 5981148 |
| | 8.70 | 0.3425 | 40 | 84 | 1 | 5981150 |
| | 8.80 | 0.3465 | 40 | 84 | 1 | 5981153 |
| | 8.90 | 0.3504 | 40 | 84 | 1 | 5981156 |
| | 9.00 | 0.3543 | 40 | 84 | 1 | 5981159 |
| | 9.10 | 0.3583 | 40 | 84 | 1 | 5981163 |
| | 9.20 | 0.3622 | 40 | 84 | 1 | 5981166 |
| | 9.30 | 0.3661 | 40 | 84 | 1 | 5981169 |
| | 9.40 | 0.3701 | 40 | 84 | 1 | 5981173 |
| | 9.50 | 0.3740 | 40 | 84 | 1 | 5981180 |
| 3/8 | 9.52 | 0.3750 | 43 | 89 | 1 | 5981189 |
| | 9.60 | 0.3780 | 43 | 89 | 1 | 5981184 |
| | 9.70 | 0.3819 | 43 | 89 | 1 | 5981190 |
| | 9.80 | 0.3858 | 43 | 89 | 1 | 5981194 |
| | 9.90 | 0.3898 | 43 | 89 | 1 | 5981196 |
| | 10.00 | 0.3937 | 43 | 89 | 1 | 5980551 |
| | 10.10 | 0.3976 | 43 | 89 | 1 | 5980554 |
| | 10.20 | 0.4016 | 43 | 89 | 1 | 5980557 |
| | 10.30 | 0.4055 | 43 | 89 | 1 | 5980560 |
| | 10.40 | 0.4094 | 43 | 89 | 1 | 5980563 |
| | 10.50 | 0.4134 | 43 | 89 | 1 | 5980566 |
| | 11.00 | 0.4331 | 47 | 95 | 1 | 5980569 |
| 7/16 | 11.11 | 0.4375 | 47 | 95 | 1 | 5981120 |
| | 11.20 | 0.4409 | 47 | 95 | 1 | 5980575 |
| | 11.50 | 0.4528 | 47 | 95 | 1 | 5980579 |
| | 12.00 | 0.4724 | 51 | 102 | 1 | 5980589 |
| | 12.50 | 0.4921 | 51 | 102 | 1 | 5980591 |
| 1/2 | 12.70 | 0.5000 | 51 | 102 | 1 | 5980542 |
| | 13.00 | 0.5118 | 51 | 102 | 1 | 5980595 |
| | 13.50 | 0.5315 | 54 | 107 | 1 | 5980598 |
| | 14.00 | 0.5512 | 54 | 107 | 1 | 5980612 |
| | 14.20 | 0.5591 | 56 | 111 | 1 | 5981124 |
| | 14.25 | 0.5610 | 56 | 111 | 1 | 5981158 |
| | 14.50 | 0.5709 | 56 | 111 | 1 | 5981198 |
| | 15.00 | 0.5906 | 56 | 111 | 1 | 5981238 |
| | 15.10 | 0.5945 | 58 | 115 | 1 | 5981272 |
| 5/8 | 15.88 | 0.6250 | 58 | 115 | 1 | 5981108 |
| | 16.00 | 0.6299 | 58 | 115 | 1 | 5981285 |
| | 16.50 | 0.6496 | 60 | 119 | 1 | 5981289 |

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.

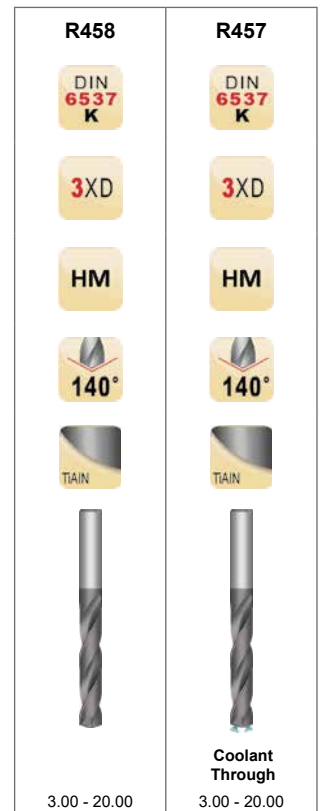
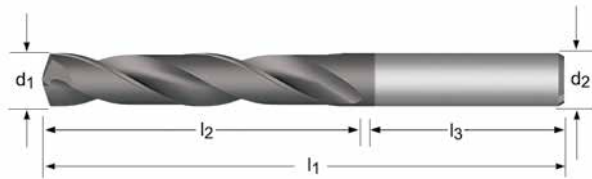
R457

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



| d ₁ Ø "Nr. | d ₁ Ø _{m7} mm | d ₁ decimal Inch | l ₂ mm | l ₁ mm | l ₃ mm | d ₂ Ø _{h6} mm | Pack Qty | R458 | R457 |
|-----------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|---------|
| | 3.00 | 0.1181 | 20 | 62 | 36 | 6 | 1 | 5981063 | 5979225 |
| | 3.10 | 0.1220 | 20 | 62 | 36 | 6 | 1 | 5981066 | 5979229 |
| 1/8 | 3.18 | 0.1252 | 20 | 62 | 36 | 6 | 1 | 5980514 | 5979015 |
| | 3.20 | 0.1260 | 20 | 62 | 36 | 6 | 1 | 5981070 | 5979232 |
| 30 | 3.26 | 0.1283 | 20 | 62 | 36 | 6 | 1 | 5980227 | 5979343 |
| | 3.30 | 0.1299 | 20 | 62 | 36 | 6 | 1 | 5981074 | 5979236 |
| | 3.40 | 0.1339 | 20 | 62 | 36 | 6 | 1 | 5981081 | 5979240 |
| 29 | 3.45 | 0.1358 | 20 | 62 | 36 | 6 | 1 | 5980221 | 5979338 |
| | 3.50 | 0.1378 | 20 | 62 | 36 | 6 | 1 | 5981086 | 5979244 |
| 28 | 3.57 | 0.1406 | 20 | 62 | 36 | 6 | 1 | 5980216 | 5979335 |
| 9/64 | 3.57 | 0.1406 | 20 | 62 | 36 | 6 | 1 | 5980470 | 5980283 |
| | 3.60 | 0.1417 | 20 | 62 | 36 | 6 | 1 | 5981090 | 5979246 |
| 27 | 3.66 | 0.1441 | 20 | 62 | 36 | 6 | 1 | 5980213 | 5979331 |
| | 3.70 | 0.1457 | 20 | 62 | 36 | 6 | 1 | 5981093 | 5979249 |
| 26 | 3.73 | 0.1469 | 24 | 66 | 36 | 6 | 1 | 5981095 | 5979324 |
| 25 | 3.80 | 0.1496 | 24 | 66 | 36 | 6 | 1 | 5981098 | 5979321 |
| 24 | 3.86 | 0.1520 | 24 | 66 | 36 | 6 | 1 | 5980204 | 5979318 |
| | 3.90 | 0.1535 | 24 | 66 | 36 | 6 | 1 | 5981101 | 5979260 |
| 23 | 3.91 | 0.1539 | 24 | 66 | 36 | 6 | 1 | 5980201 | 5979315 |
| 5/32 | 3.97 | 0.1563 | 24 | 66 | 36 | 6 | 1 | 5980485 | 5980298 |
| 22 | 3.99 | 0.1571 | 24 | 66 | 36 | 6 | 1 | 5980198 | 5979312 |
| | 4.00 | 0.1575 | 24 | 66 | 36 | 6 | 1 | 5981132 | 5979285 |
| 21 | 4.04 | 0.1591 | 24 | 66 | 36 | 6 | 1 | 5980192 | 5979309 |
| | 4.05 | 0.1594 | 24 | 66 | 36 | 6 | 1 | — | 5979287 |
| 20 | 4.09 | 0.1610 | 24 | 66 | 36 | 6 | 1 | 5980188 | 5979306 |
| | 4.10 | 0.1614 | 24 | 66 | 36 | 6 | 1 | 5981134 | 5979292 |
| | 4.20 | 0.1654 | 24 | 66 | 36 | 6 | 1 | 5981137 | 5979295 |
| 19 | 4.22 | 0.1661 | 24 | 66 | 36 | 6 | 1 | 5980180 | 5979300 |
| | 4.30 | 0.1693 | 24 | 66 | 36 | 6 | 1 | 5981140 | 5979298 |
| 18 | 4.31 | 0.1697 | 24 | 66 | 36 | 6 | 1 | 5980176 | 5979297 |
| 11/64 | 4.37 | 0.1720 | 24 | 66 | 36 | 6 | 1 | 5980411 | 5979050 |
| 17 | 4.39 | 0.1728 | 24 | 66 | 36 | 6 | 1 | 5980172 | 5979291 |
| | 4.40 | 0.1732 | 24 | 66 | 36 | 6 | 1 | 5981143 | 5979301 |

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 ₅ mm | Pack Qty | R458 | R457 |
|------------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|---------|
| 16 | 4.50 | 0.1772 | 24 | 66 | 36 | 6 | 1 | 5981149 | 5979289 |
| 15 | 4.57 | 0.1799 | 24 | 66 | 36 | 6 | 1 | 5980166 | 5979286 |
| | 4.60 | 0.1811 | 24 | 66 | 36 | 6 | 1 | 5981151 | 5979307 |
| 14 | 4.62 | 0.1819 | 24 | 66 | 36 | 6 | 1 | 5980163 | 5979284 |
| | 4.70 | 0.1850 | 24 | 66 | 36 | 6 | 1 | 5981154 | 5979310 |
| 13 | 4.70 | 0.1850 | 24 | 66 | 36 | 6 | 1 | 5980160 | 5979281 |
| 3/16 | 4.76 | 0.1875 | 28 | 66 | 36 | 6 | 1 | 5981103 | 5979263 |
| 12 | 4.80 | 0.1890 | 28 | 66 | 36 | 6 | 1 | 5981157 | 5979279 |
| 11 | 4.85 | 0.1909 | 28 | 66 | 36 | 6 | 1 | 5980153 | 5979277 |
| | 4.90 | 0.1929 | 28 | 66 | 36 | 6 | 1 | 5981160 | 5979319 |
| 10 | 4.92 | 0.1937 | 28 | 66 | 36 | 6 | 1 | 5980150 | 5979275 |
| 9 | 4.98 | 0.1961 | 28 | 66 | 36 | 6 | 1 | 5980253 | 5979369 |
| | 5.00 | 0.1969 | 28 | 66 | 36 | 6 | 1 | 5981175 | 5980432 |
| | 5.05 | 0.1988 | 28 | 66 | 36 | 6 | 1 | — | 5980440 |
| 8 | 5.06 | 0.1992 | 28 | 66 | 36 | 6 | 1 | 5980250 | 5979360 |
| | 5.10 | 0.2008 | 28 | 66 | 36 | 6 | 1 | 5981181 | 5980444 |
| 7 | 5.11 | 0.2012 | 28 | 66 | 36 | 6 | 1 | 5980247 | 5979357 |
| 13/64 | 5.16 | 0.2031 | 28 | 66 | 36 | 6 | 1 | 5980456 | 5979077 |
| 6 | 5.18 | 0.2039 | 28 | 66 | 36 | 6 | 1 | 5980243 | 5979353 |
| | 5.20 | 0.2047 | 28 | 66 | 36 | 6 | 1 | 5980322 | 5980447 |
| 5 | 5.22 | 0.2055 | 28 | 66 | 36 | 6 | 1 | 5980240 | 5979350 |
| | 5.30 | 0.2087 | 28 | 66 | 36 | 6 | 1 | 7361260 | 7361237 |
| 4 | 5.31 | 0.2091 | 28 | 66 | 36 | 6 | 1 | 5980237 | 5979346 |
| | 5.40 | 0.2126 | 28 | 66 | 36 | 6 | 1 | 7361261 | 7361238 |
| 3 | 5.41 | 0.2130 | 28 | 66 | 36 | 6 | 1 | 5980226 | 5979341 |
| | 5.50 | 0.2165 | 28 | 66 | 36 | 6 | 1 | 5980360 | 5980451 |
| 7/32 | 5.56 | 0.2189 | 28 | 66 | 36 | 6 | 1 | 5980394 | 5980386 |
| | 5.60 | 0.2205 | 28 | 66 | 36 | 6 | 1 | 5980397 | 5980287 |
| 2 | 5.61 | 0.2209 | 28 | 66 | 36 | 6 | 1 | 5980184 | 5979303 |
| | 5.70 | 0.2244 | 28 | 66 | 36 | 6 | 1 | 5980435 | 5980290 |
| 1 | 5.79 | 0.2280 | 28 | 66 | 36 | 6 | 1 | 5980146 | 5979273 |
| | 5.80 | 0.2283 | 28 | 66 | 36 | 6 | 1 | 5980474 | 5980293 |
| | 5.90 | 0.2323 | 28 | 66 | 36 | 6 | 1 | 7361262 | 7361239 |
| A | 5.94 | 0.2339 | 28 | 66 | 36 | 6 | 1 | 5980127 | 5979254 |
| 15/64 | 5.95 | 0.2343 | 28 | 66 | 36 | 6 | 1 | 5980494 | 5979114 |
| | 6.00 | 0.2362 | 28 | 66 | 36 | 6 | 1 | 5980492 | 5980303 |
| B | 6.03 | 0.2374 | 34 | 79 | 36 | 8 | 1 | 7361263 | 7361240 |
| | 6.05 | 0.2382 | 34 | 79 | 36 | 8 | 1 | — | 5980306 |
| | 6.10 | 0.2402 | 34 | 79 | 36 | 8 | 1 | 5980329 | 5980309 |
| C | 6.15 | 0.2421 | 34 | 79 | 36 | 8 | 1 | 7361264 | 7361241 |
| | 6.20 | 0.2441 | 34 | 79 | 36 | 8 | 1 | 5980333 | 5980312 |
| D | 6.25 | 0.2461 | 34 | 79 | 36 | 8 | 1 | 5980131 | 5979257 |
| | 6.30 | 0.2480 | 34 | 79 | 36 | 8 | 1 | 5980336 | 5980320 |
| 1/4 | 6.35 | 0.2500 | 34 | 79 | 36 | 8 | 1 | 5980479 | 5979135 |
| E | 6.35 | 0.2500 | 34 | 79 | 36 | 8 | 1 | 7361265 | 7361242 |
| | 6.40 | 0.2520 | 34 | 79 | 36 | 8 | 1 | 5980339 | 5980323 |
| | 6.50 | 0.2559 | 34 | 79 | 36 | 8 | 1 | 5980342 | 5980327 |
| F | 6.53 | 0.2571 | 34 | 79 | 36 | 8 | 1 | 7361266 | 7361243 |
| | 6.60 | 0.2598 | 34 | 79 | 36 | 8 | 1 | 5980345 | 5980331 |
| G | 6.63 | 0.2610 | 34 | 79 | 36 | 8 | 1 | 7361267 | 7361244 |
| | 6.70 | 0.2638 | 34 | 79 | 36 | 8 | 1 | 5980347 | 5980335 |
| 17/64 | 6.75 | 0.2657 | 34 | 79 | 36 | 8 | 1 | 5980517 | 5979316 |
| H | 6.76 | 0.2661 | 34 | 79 | 36 | 8 | 1 | 5980134 | 5979259 |
| | 6.80 | 0.2677 | 34 | 79 | 36 | 8 | 1 | 5980350 | 5980338 |
| | 6.90 | 0.2717 | 34 | 79 | 36 | 8 | 1 | 5980353 | 5980341 |
| I | 6.91 | 0.2720 | 34 | 79 | 36 | 8 | 1 | 7361268 | 7361245 |
| | 7.00 | 0.2756 | 34 | 79 | 36 | 8 | 1 | 5980356 | 5980344 |
| J | 7.04 | 0.2772 | 41 | 79 | 36 | 8 | 1 | 7361269 | 7361246 |
| | 7.10 | 0.2795 | 41 | 79 | 36 | 8 | 1 | 5980362 | 5980349 |
| K | 7.14 | 0.2811 | 41 | 79 | 36 | 8 | 1 | 7361270 | 7361247 |
| 9/32 | 7.14 | 0.2811 | 41 | 79 | 36 | 8 | 1 | 5980467 | 5980280 |
| | 7.20 | 0.2835 | 41 | 79 | 36 | 8 | 1 | 7361271 | 7361248 |
| | 7.30 | 0.2874 | 41 | 79 | 36 | 8 | 1 | 5980366 | 5980352 |
| L | 7.37 | 0.2902 | 41 | 79 | 36 | 8 | 1 | 5980136 | 5979262 |
| | 7.40 | 0.2913 | 41 | 79 | 36 | 8 | 1 | 5980369 | 5980358 |
| M | 7.49 | 0.2949 | 41 | 79 | 36 | 8 | 1 | 5980139 | 5979265 |

| 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 | 7.50 | 0.2953 | 41 | 79 | 36 | 8 | 1 | 5980373 | 5980363 |
| | 7.54 | 0.2969 | 41 | 79 | 36 | 8 | 1 | 5981188 | 5979192 |
| | 7.60 | 0.2992 | 41 | 79 | 36 | 8 | 1 | 5980377 | 5980367 |
| N | 7.67 | 0.3020 | 41 | 79 | 36 | 8 | 1 | 5980144 | 5979271 |
| | 7.70 | 0.3031 | 41 | 79 | 36 | 8 | 1 | 5980381 | 5980371 |
| | 7.80 | 0.3071 | 41 | 79 | 36 | 8 | 1 | 5980385 | 5980375 |
| | 7.90 | 0.3110 | 41 | 79 | 36 | 8 | 1 | 5980388 | 5980379 |
| | 7.94 | 0.3126 | 41 | 79 | 36 | 8 | 1 | 5980480 | 5980296 |
| 5/16 | 8.00 | 0.3150 | 41 | 79 | 36 | 8 | 1 | 5980400 | 5980389 |
| | O | 8.03 | 0.3161 | 47 | 89 | 40 | 10 | 5980256 | 5979013 |
| | 8.05 | 0.3169 | 47 | 89 | 40 | 10 | 1 | — | 5980392 |
| P | 8.10 | 0.3189 | 47 | 89 | 40 | 10 | 1 | 5980403 | 5980398 |
| | 8.20 | 0.3228 | 47 | 89 | 40 | 10 | 1 | 5980406 | 5980401 |
| | 8.20 | 0.3228 | 47 | 89 | 40 | 10 | 1 | 7361272 | 7361249 |
| | 8.30 | 0.3268 | 47 | 89 | 40 | 10 | 1 | 7361273 | 7361250 |
| | 8.33 | 0.3280 | 47 | 89 | 40 | 10 | 1 | 5981046 | 5979203 |
| 21/64 | 8.40 | 0.3307 | 47 | 89 | 40 | 10 | 1 | 5980409 | 5980404 |
| | Q | 8.43 | 0.3319 | 47 | 89 | 40 | 10 | 5980260 | 5979034 |
| | 8.50 | 0.3346 | 47 | 89 | 40 | 10 | 1 | 5980412 | 5980407 |
| R | 8.60 | 0.3386 | 47 | 89 | 40 | 10 | 1 | 5980415 | 5980410 |
| | 8.61 | 0.3390 | 47 | 89 | 40 | 10 | 1 | 7361274 | 7361251 |
| | 8.70 | 0.3425 | 47 | 89 | 40 | 10 | 1 | 5980418 | 5980413 |
| | 11/32 | 8.73 | 0.3437 | 47 | 89 | 40 | 10 | 5980408 | 5979048 |
| | 8.80 | 0.3465 | 47 | 89 | 40 | 10 | 1 | 5980421 | 5980416 |
| S | 8.84 | 0.3480 | 47 | 89 | 40 | 10 | 1 | 7361275 | 7361252 |
| | 8.90 | 0.3504 | 47 | 89 | 40 | 10 | 1 | 7361276 | 5980420 |
| | 9.00 | 0.3543 | 47 | 89 | 40 | 10 | 1 | 5980425 | 5980423 |
| T | 9.09 | 0.3579 | 47 | 89 | 40 | 10 | 1 | 5980263 | 5979055 |
| | 9.10 | 0.3583 | 47 | 89 | 40 | 10 | 1 | 5980428 | 5980429 |
| | 23/64 | 9.13 | 0.3594 | 47 | 89 | 40 | 10 | 5981051 | 5979209 |
| U | 9.20 | 0.3622 | 47 | 89 | 40 | 10 | 1 | 7361277 | 7361253 |
| | 9.30 | 0.3661 | 47 | 89 | 40 | 10 | 1 | 5980439 | 5980436 |
| | 9.35 | 0.3681 | 47 | 89 | 40 | 10 | 1 | 5980266 | 5979080 |
| | 9.40 | 0.3701 | 47 | 89 | 40 | 10 | 1 | 5980443 | 5980122 |
| | 9.50 | 0.3740 | 47 | 89 | 40 | 10 | 1 | 5980445 | 5980159 |
| 3/8 | 9.52 | 0.3748 | 47 | 89 | 40 | 10 | 1 | 5981109 | 5979269 |
| V | 9.58 | 0.3772 | 47 | 89 | 40 | 10 | 1 | 7361278 | 7361254 |
| | 9.60 | 0.3780 | 47 | 89 | 40 | 10 | 1 | 5980449 | 5980195 |
| | 9.70 | 0.3819 | 47 | 89 | 40 | 10 | 1 | 5980454 | 5980233 |
| | 9.80 | 0.3858 | 47 | 89 | 40 | 10 | 1 | 5980457 | 5980268 |
| | W | 9.80 | 0.3858 | 47 | 89 | 40 | 10 | 1 | 7361279 |
| 25/64 | 9.90 | 0.3898 | 47 | 89 | 40 | 10 | 1 | 5980461 | 5980274 |
| | 9.92 | 0.3906 | 47 | 89 | 40 | 10 | 1 | 5981055 | 5979212 |
| | 10.00 | 0.3937 | 47 | 89 | 40 | 10 | 1 | 5980520 | 5979017 |
| X | 10.05 | 0.3957 | 55 | 102 | 45 | 12 | 1 | — | 5979019 |
| | 10.08 | 0.3969 | 55 | 102 | 45 | 12 | 1 | 5980271 | 5979117 |
| | 10.10 | 0.3976 | 55 | 102 | 45 | 12 | 1 | 5980523 | 5979021 |
| | 10.20 | 0.4016 | 55 | 102 | 45 | 12 | 1 | 5980524 | 5979023 |
| | Y | 10.26 | 0.4039 | 55 | 102 | 45 | 12 | 1 | 5980359 |
| 13/32 | 10.30 | 0.4055 | 55 | 102 | 45 | 12 | 1 | 5980527 | 5979025 |
| | 10.32 | 0.4063 | 55 | 102 | 45 | 12 | 1 | 5980453 | 5979075 |
| | 10.40 | 0.4094 | 55 | 102 | 45 | 12 | 1 | 5980364 | 5979027 |
| Z | 10.49 | 0.4130 | 55 | 102 | 45 | 12 | 1 | 5980402 | 5979128 |
| | 10.50 | 0.4134 | 55 | 102 | 45 | 12 | 1 | 5980370 | 5979029 |
| | 10.60 | 0.4173 | 55 | 102 | 45 | 12 | 1 | 5980374 | 5979030 |
| | 10.70 | 0.4213 | 55 | 102 | 45 | 12 | 1 | 7361280 | — |
| | 27/64 | 10.72 | 0.4220 | 55 | 102 | 45 | 12 | 1 | 5981058 |
| 7/16 | 10.80 | 0.4252 | 55 | 102 | 45 | 12 | 1 | 5980378 | 7361256 |
| | 10.90 | 0.4291 | 55 | 102 | 45 | 12 | 1 | 7361281 | — |
| | 11.00 | 0.4331 | 55 | 102 | 45 | 12 | 1 | 5980384 | 5979032 |
| | 11.10 | 0.4370 | 55 | 102 | 45 | 12 | 1 | 7361282 | — |
| | 11.11 | 0.4374 | 55 | 102 | 45 | 12 | 1 | 5980391 | 5980382 |
| 7/16 | 11.20 | 0.4409 | 55 | 102 | 45 | 12 | 1 | 5980387 | 5979036 |
| | 11.30 | 0.4449 | 55 | 102 | 45 | 12 | 1 | 7361283 | 7361257 |

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 |
|------------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|---------|
| | 11.40 | 0.4488 | 55 | 102 | 45 | 12 | 1 | 5980390 | 5979038 |
| | 11.50 | 0.4528 | 55 | 102 | 45 | 12 | 1 | 5980393 | 5979040 |
| 29/64 | 11.51 | 0.4531 | 55 | 102 | 45 | 12 | 1 | 5981061 | 5979221 |
| | 11.60 | 0.4567 | 55 | 102 | 45 | 12 | 1 | 5980396 | 5979042 |
| | 11.70 | 0.4606 | 55 | 102 | 45 | 12 | 1 | 7361284 | — |
| | 11.80 | 0.4646 | 55 | 102 | 45 | 12 | 1 | 5980399 | 5979044 |
| | 11.90 | 0.4685 | 55 | 102 | 45 | 12 | 1 | 7361285 | — |
| 15/32 | 11.91 | 0.4689 | 55 | 102 | 45 | 12 | 1 | 5980490 | 5979110 |
| | 12.00 | 0.4724 | 55 | 102 | 45 | 12 | 1 | 5980414 | 5979052 |
| | 12.05 | 0.4744 | 60 | 107 | 45 | 14 | 1 | — | 5979053 |
| | 12.10 | 0.4764 | 60 | 107 | 45 | 14 | 1 | 5980419 | 5979057 |
| | 12.20 | 0.4803 | 60 | 107 | 45 | 14 | 1 | 5980422 | 5979060 |
| 31/64 | 12.30 | 0.4843 | 60 | 107 | 45 | 14 | 1 | 5981115 | 5979272 |
| | 12.50 | 0.4921 | 60 | 107 | 45 | 14 | 1 | 5980426 | 5979062 |
| | 12.70 | 0.5000 | 60 | 107 | 45 | 14 | 1 | 5980430 | 5979064 |
| 1/2 | 12.70 | 0.5000 | 60 | 107 | 45 | 14 | 1 | 5980442 | 5979132 |
| | 12.80 | 0.5039 | 60 | 107 | 45 | 14 | 1 | 5980433 | 5979066 |
| | 13.00 | 0.5118 | 60 | 107 | 45 | 14 | 1 | 5980438 | 5979068 |
| 33/64 | 13.10 | 0.5157 | 60 | 107 | 45 | 14 | 1 | 5981118 | 5979274 |
| | 13.30 | 0.5236 | 60 | 107 | 45 | 14 | 1 | 7361286 | 7361258 |
| 17/32 | 13.49 | 0.5311 | 60 | 107 | 45 | 14 | 1 | 5980511 | 5979282 |
| | 13.50 | 0.5315 | 60 | 107 | 45 | 14 | 1 | 5980446 | 5979070 |
| | 13.80 | 0.5433 | 60 | 107 | 45 | 14 | 1 | 5980450 | 5979072 |
| 35/64 | 13.89 | 0.5469 | 60 | 107 | 45 | 14 | 1 | 5981121 | 5979276 |
| | 14.00 | 0.5512 | 60 | 107 | 45 | 14 | 1 | 5980459 | 5979082 |
| | 14.25 | 0.5610 | 65 | 115 | 48 | 16 | 1 | 5980462 | 5979085 |
| 9/16 | 14.29 | 0.5626 | 65 | 115 | 48 | 16 | 1 | 5980464 | 5980276 |
| | 14.50 | 0.5709 | 65 | 115 | 48 | 16 | 1 | 5980465 | 5979088 |
| 37/64 | 14.68 | 0.5780 | 65 | 115 | 48 | 16 | 1 | 5981125 | 5979278 |
| | 14.80 | 0.5827 | 65 | 115 | 48 | 16 | 1 | 5980468 | 5979091 |
| | 15.00 | 0.5906 | 65 | 115 | 48 | 16 | 1 | 5980471 | 5979094 |
| 19/32 | 15.08 | 0.5937 | 65 | 115 | 48 | 16 | 1 | 5981185 | 5979188 |
| | 15.10 | 0.5945 | 65 | 115 | 48 | 16 | 1 | 5980475 | 5979098 |
| | 15.30 | 0.6024 | 65 | 115 | 48 | 16 | 1 | 7361287 | 7361259 |
| 39/64 | 15.48 | 0.6094 | 65 | 115 | 48 | 16 | 1 | 5981127 | 5979280 |
| | 15.50 | 0.6102 | 65 | 115 | 48 | 16 | 1 | 5980483 | 5979102 |
| | 15.80 | 0.6220 | 65 | 115 | 48 | 16 | 1 | 5980487 | 5979106 |
| 5/8 | 15.88 | 0.6252 | 65 | 115 | 48 | 16 | 1 | 5980489 | 5980301 |
| | 16.00 | 0.6299 | 65 | 115 | 48 | 16 | 1 | 5980496 | 5979120 |
| 41/64 | 16.27 | 0.6406 | 73 | 123 | 48 | 18 | 1 | 5981162 | 5980284 |
| | 16.50 | 0.6496 | 73 | 123 | 48 | 18 | 1 | 5980499 | 5979172 |
| 21/32 | 16.67 | 0.6563 | 73 | 123 | 48 | 18 | 1 | 5981197 | 5979200 |
| | 17.00 | 0.6693 | 73 | 123 | 48 | 18 | 1 | 5980503 | 5979215 |
| 43/64 | 17.07 | 0.6720 | 73 | 123 | 48 | 18 | 1 | 5981165 | 5980317 |
| 11/16 | 17.46 | 0.6874 | 73 | 123 | 48 | 18 | 1 | 5980405 | 5979046 |
| | 17.50 | 0.6890 | 73 | 123 | 48 | 18 | 1 | 5980506 | 5979253 |
| | 17.80 | 0.7008 | 73 | 123 | 48 | 18 | 1 | 5980509 | — |
| 45/64 | 17.86 | 0.7031 | 73 | 123 | 48 | 18 | 1 | 5981168 | 5980355 |
| | 18.00 | 0.7087 | 73 | 123 | 48 | 18 | 1 | 5981043 | 5979322 |
| 23/32 | 18.26 | 0.7189 | 79 | 131 | 50 | 20 | 1 | 5981049 | 5979206 |
| | 18.50 | 0.7283 | 79 | 131 | 50 | 20 | 1 | 5981078 | 5979325 |
| 47/64 | 18.65 | 0.7343 | 79 | 131 | 50 | 20 | 1 | 5981170 | 5980395 |
| | 18.80 | 0.7402 | 79 | 131 | 50 | 20 | 1 | — | 5979329 |
| | 19.00 | 0.7480 | 79 | 131 | 50 | 20 | 1 | 5981112 | 5979332 |
| 3/4 | 19.05 | 0.7500 | 79 | 131 | 50 | 20 | 1 | 5981106 | 5979266 |
| | 19.50 | 0.7677 | 79 | 131 | 50 | 20 | 1 | 5981146 | 5979180 |
| | 19.80 | 0.7795 | 79 | 131 | 50 | 20 | 1 | 5981177 | 5979184 |
| | 20.00 | 0.7874 | 79 | 131 | 50 | 20 | 1 | 5981192 | 5979196 |

Multi-Application, Short Length, Reinforced Shank

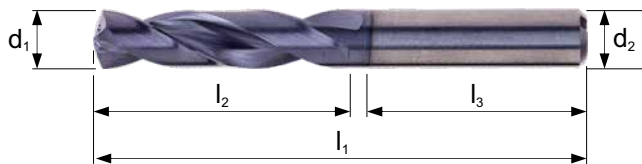
R467

2.1 2.2 2.3 2.4 4.1 4.2 4.3

5.1 5.2 5.3

Self-centering 4-facet split point and CTW flute construction for enhanced penetration rate specifically designed for Stainless Steel (ISO-M) materials. TiAlN coating increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cutting edges. Length designed for 3 x Diameter drilling depths.

High productivity in a wide range of materials



R467

DIN 6537 K

3XD

HM

140°

TiAlN

Coolant Through
3.00 - 16.00

| d_1 Ø "Nr. | d_1 Ø _{m7} mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø _{h6} mm | Pack Qty | R467 |
|--------------------|--------------------------------|--------------------------|-------------|-------------|-------------|--------------------------------|----------|---------|
| | 3.00 | 0.1181 | 20 | 62 | 36 | 6 | 1 | 7625100 |
| | 3.10 | 0.1220 | 20 | 62 | 36 | 6 | 1 | 7625101 |
| 1/8 | 3.18 | 0.1250 | 20 | 62 | 36 | 6 | 1 | 7625102 |
| | 3.20 | 0.1260 | 20 | 62 | 36 | 6 | 1 | 7625103 |
| | 3.30 | 0.1299 | 20 | 62 | 36 | 6 | 1 | 7625104 |
| | 3.40 | 0.1339 | 20 | 62 | 36 | 6 | 1 | 7625105 |
| 29 | 3.45 | 0.1360 | 20 | 62 | 36 | 6 | 1 | 7625106 |
| | 3.50 | 0.1378 | 20 | 62 | 36 | 6 | 1 | 7625107 |
| 9/64 | 3.57 | 0.1406 | 20 | 62 | 36 | 6 | 1 | 7625108 |
| | 3.60 | 0.1417 | 20 | 62 | 36 | 6 | 1 | 7625109 |
| | 3.70 | 0.1457 | 20 | 62 | 36 | 6 | 1 | 7625110 |
| | 3.80 | 0.1496 | 24 | 66 | 36 | 6 | 1 | 7625111 |
| | 3.90 | 0.1535 | 24 | 66 | 36 | 6 | 1 | 7625112 |
| 5/32 | 3.97 | 0.1563 | 24 | 66 | 36 | 6 | 1 | 7625113 |
| | 4.00 | 0.1575 | 24 | 66 | 36 | 6 | 1 | 7625114 |
| | 4.05 | 0.1594 | 24 | 66 | 36 | 6 | 1 | 7625115 |
| | 4.10 | 0.1614 | 24 | 66 | 36 | 6 | 1 | 7625116 |
| | 4.20 | 0.1654 | 24 | 66 | 36 | 6 | 1 | 7625117 |
| | 4.30 | 0.1693 | 24 | 66 | 36 | 6 | 1 | 7625118 |
| 11/64 | 4.37 | 0.1719 | 24 | 66 | 36 | 6 | 1 | 7625119 |
| | 4.40 | 0.1732 | 24 | 66 | 36 | 6 | 1 | 7625120 |
| | 4.50 | 0.1772 | 24 | 66 | 36 | 6 | 1 | 7625121 |
| | 4.60 | 0.1811 | 24 | 66 | 36 | 6 | 1 | 7625122 |
| | 4.70 | 0.1850 | 24 | 66 | 36 | 6 | 1 | 7625123 |
| 3/16 | 4.76 | 0.1875 | 28 | 66 | 36 | 6 | 1 | 7625124 |
| | 4.80 | 0.1890 | 28 | 66 | 36 | 6 | 1 | 7625125 |
| | 4.90 | 0.1929 | 28 | 66 | 36 | 6 | 1 | 7625126 |
| | 5.00 | 0.1969 | 28 | 66 | 36 | 6 | 1 | 7625127 |
| | 5.05 | 0.1988 | 28 | 66 | 36 | 6 | 1 | 7625128 |
| | 5.10 | 0.2008 | 28 | 66 | 36 | 6 | 1 | 7625129 |
| 7 | 5.11 | 0.2010 | 28 | 66 | 36 | 6 | 1 | 7625130 |
| 13/64 | 5.16 | 0.2031 | 28 | 66 | 36 | 6 | 1 | 7625131 |
| | 5.20 | 0.2047 | 28 | 66 | 36 | 6 | 1 | 7625132 |

FORCE M 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 | R467 |
|------------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|
| 5 | 5.22 | 0.2055 | 28 | 66 | 36 | 6 | 1 | 7625133 |
| | 5.30 | 0.2087 | 28 | 66 | 36 | 6 | 1 | 7625134 |
| | 5.40 | 0.2126 | 28 | 66 | 36 | 6 | 1 | 7625135 |
| 7/32 | 5.50 | 0.2165 | 28 | 66 | 36 | 6 | 1 | 7625136 |
| | 5.56 | 0.2188 | 28 | 66 | 36 | 6 | 1 | 7625137 |
| | 5.60 | 0.2205 | 28 | 66 | 36 | 6 | 1 | 7625138 |
| 7/32 | 5.70 | 0.2244 | 28 | 66 | 36 | 6 | 1 | 7625139 |
| | 5.80 | 0.2283 | 28 | 66 | 36 | 6 | 1 | 7625140 |
| | 5.90 | 0.2323 | 28 | 66 | 36 | 6 | 1 | 7625141 |
| 15/64 | 5.95 | 0.2344 | 28 | 66 | 36 | 6 | 1 | 7625142 |
| | 6.00 | 0.2362 | 28 | 66 | 36 | 6 | 1 | 7625143 |
| | 6.05 | 0.2382 | 34 | 79 | 36 | 8 | 1 | 7625144 |
| 15/64 | 6.10 | 0.2402 | 34 | 79 | 36 | 8 | 1 | 7625145 |
| | 6.20 | 0.2441 | 34 | 79 | 36 | 8 | 1 | 7625146 |
| | 6.30 | 0.2480 | 34 | 79 | 36 | 8 | 1 | 7625147 |
| 1/4 | 6.35 | 0.2500 | 34 | 79 | 36 | 8 | 1 | 7625148 |
| | 6.40 | 0.2520 | 34 | 79 | 36 | 8 | 1 | 7625149 |
| | 6.50 | 0.2559 | 34 | 79 | 36 | 8 | 1 | 7625150 |
| 1/4 | 6.60 | 0.2598 | 34 | 79 | 36 | 8 | 1 | 7625151 |
| | 6.70 | 0.2638 | 34 | 79 | 36 | 8 | 1 | 7625152 |
| | 6.75 | 0.2656 | 34 | 79 | 36 | 8 | 1 | 7625153 |
| 17/64 | 6.80 | 0.2677 | 34 | 79 | 36 | 8 | 1 | 7625154 |
| | 6.90 | 0.2717 | 34 | 79 | 36 | 8 | 1 | 7625155 |
| | 7.00 | 0.2756 | 34 | 79 | 36 | 8 | 1 | 7625156 |
| 9/32 | 7.10 | 0.2795 | 41 | 79 | 36 | 8 | 1 | 7625157 |
| | 7.14 | 0.2813 | 41 | 79 | 36 | 8 | 1 | 7625158 |
| | 7.20 | 0.2835 | 41 | 79 | 36 | 8 | 1 | 7625159 |
| 9/32 | 7.30 | 0.2874 | 41 | 79 | 36 | 8 | 1 | 7625160 |
| | 7.40 | 0.2913 | 41 | 79 | 36 | 8 | 1 | 7625161 |
| | 7.50 | 0.2953 | 41 | 79 | 36 | 8 | 1 | 7625162 |
| 19/64 | 7.54 | 0.2969 | 41 | 79 | 36 | 8 | 1 | 7625163 |
| | 7.60 | 0.2992 | 41 | 79 | 36 | 8 | 1 | 7625164 |
| | 7.70 | 0.3031 | 41 | 79 | 36 | 8 | 1 | 7625165 |
| 19/64 | 7.80 | 0.3071 | 41 | 79 | 36 | 8 | 1 | 7625166 |
| | 7.90 | 0.3110 | 41 | 79 | 36 | 8 | 1 | 7625167 |
| | 7.94 | 0.3125 | 41 | 79 | 36 | 8 | 1 | 7625168 |
| 5/16 | 8.00 | 0.3150 | 41 | 79 | 36 | 8 | 1 | 7625169 |
| | 8.05 | 0.3169 | 47 | 89 | 40 | 10 | 1 | 7625170 |
| | 8.10 | 0.3189 | 47 | 89 | 40 | 10 | 1 | 7625171 |
| 5/16 | 8.20 | 0.3228 | 47 | 89 | 40 | 10 | 1 | 7625172 |
| | 8.30 | 0.3268 | 47 | 89 | 40 | 10 | 1 | 7625173 |
| | 8.33 | 0.3281 | 47 | 89 | 40 | 10 | 1 | 7625174 |
| 21/64 | 8.40 | 0.3307 | 47 | 89 | 40 | 10 | 1 | 7625175 |
| | 8.50 | 0.3346 | 47 | 89 | 40 | 10 | 1 | 7625176 |
| | 8.60 | 0.3386 | 47 | 89 | 40 | 10 | 1 | 7625177 |
| 21/64 | 8.70 | 0.3425 | 47 | 89 | 40 | 10 | 1 | 7625178 |
| | 8.73 | 0.3438 | 47 | 89 | 40 | 10 | 1 | 7625179 |
| | 8.80 | 0.3465 | 47 | 89 | 40 | 10 | 1 | 7625180 |
| 11/32 | 8.90 | 0.3504 | 47 | 89 | 40 | 10 | 1 | 7625181 |
| | 9.00 | 0.3543 | 47 | 89 | 40 | 10 | 1 | 7625182 |
| | 9.10 | 0.3583 | 47 | 89 | 40 | 10 | 1 | 7625183 |
| 23/64 | 9.13 | 0.3594 | 47 | 89 | 40 | 10 | 1 | 7625184 |
| | 9.20 | 0.3622 | 47 | 89 | 40 | 10 | 1 | 7625185 |
| | 9.30 | 0.3661 | 47 | 89 | 40 | 10 | 1 | 7625186 |
| 23/64 | 9.40 | 0.3701 | 47 | 89 | 40 | 10 | 1 | 7625187 |
| | 9.50 | 0.3740 | 47 | 89 | 40 | 10 | 1 | 7625188 |
| | 9.53 | 0.3750 | 47 | 89 | 40 | 10 | 1 | 7625189 |
| 3/8 | 9.60 | 0.3780 | 47 | 89 | 40 | 10 | 1 | 7625190 |
| | 9.70 | 0.3819 | 47 | 89 | 40 | 10 | 1 | 7625191 |
| | 9.80 | 0.3858 | 47 | 89 | 40 | 10 | 1 | 7625192 |
| 3/8 | 9.90 | 0.3898 | 47 | 89 | 40 | 10 | 1 | 7625193 |
| | 9.92 | 0.3906 | 47 | 89 | 40 | 10 | 1 | 7625194 |
| | 10.00 | 0.3937 | 47 | 89 | 40 | 10 | 1 | 7625195 |
| 25/64 | 10.05 | 0.3957 | 55 | 102 | 45 | 12 | 1 | 7625196 |
| | 10.10 | 0.3976 | 55 | 102 | 45 | 12 | 1 | 7625197 |
| | 10.20 | 0.4016 | 55 | 102 | 45 | 12 | 1 | 7625198 |

| d_1 Ø "/Nr. | d_1 Ø m_7 mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø h_6 mm | Pack Qty | R467 |
|---------------------|------------------------|--------------------------|-------------|-------------|-------------|------------------------|-------------|---------|
| 13/32 | 10.30 | 0.4055 | 55 | 102 | 45 | 12 | 1 | 7625199 |
| | 10.32 | 0.4063 | 55 | 102 | 45 | 12 | 1 | 7625200 |
| | 10.40 | 0.4094 | 55 | 102 | 45 | 12 | 1 | 7625201 |
| 27/64 | 10.50 | 0.4134 | 55 | 102 | 45 | 12 | 1 | 7625202 |
| | 10.60 | 0.4173 | 55 | 102 | 45 | 12 | 1 | 7625203 |
| | 10.72 | 0.4219 | 55 | 102 | 45 | 12 | 1 | 7625204 |
| | 10.80 | 0.4252 | 55 | 102 | 45 | 12 | 1 | 7625205 |
| | 10.90 | 0.4291 | 55 | 102 | 45 | 12 | 1 | 7625206 |
| 7/16 | 11.00 | 0.4331 | 55 | 102 | 45 | 12 | 1 | 7625207 |
| | 11.11 | 0.4375 | 55 | 102 | 45 | 12 | 1 | 7625208 |
| | 11.20 | 0.4409 | 55 | 102 | 45 | 12 | 1 | 7625209 |
| | 11.30 | 0.4449 | 55 | 102 | 45 | 12 | 1 | 7625210 |
| | 11.40 | 0.4488 | 55 | 102 | 45 | 12 | 1 | 7625211 |
| 29/64 | 11.50 | 0.4528 | 55 | 102 | 45 | 12 | 1 | 7625212 |
| | 11.51 | 0.4531 | 55 | 102 | 45 | 12 | 1 | 7625213 |
| | 11.60 | 0.4567 | 55 | 102 | 45 | 12 | 1 | 7625214 |
| | 11.80 | 0.4646 | 55 | 102 | 45 | 12 | 1 | 7625215 |
| 15/32 | 11.91 | 0.4688 | 55 | 102 | 45 | 12 | 1 | 7625216 |
| | 12.00 | 0.4724 | 55 | 102 | 45 | 12 | 1 | 7625217 |
| | 12.05 | 0.4744 | 60 | 107 | 45 | 14 | 1 | 7625218 |
| | 12.10 | 0.4764 | 60 | 107 | 45 | 14 | 1 | 7625219 |
| 31/64 | 12.20 | 0.4803 | 60 | 107 | 45 | 14 | 1 | 7625220 |
| | 12.30 | 0.4844 | 60 | 107 | 45 | 14 | 1 | 7625221 |
| | 12.50 | 0.4921 | 60 | 107 | 45 | 14 | 1 | 7625222 |
| 1/2 | 12.70 | 0.5000 | 60 | 107 | 45 | 14 | 1 | 7625223 |
| | 12.70 | 0.5000 | 60 | 107 | 45 | 14 | 1 | 7625224 |
| | 12.80 | 0.5039 | 60 | 107 | 45 | 14 | 1 | 7625225 |
| 33/64 | 13.00 | 0.5118 | 60 | 107 | 45 | 14 | 1 | 7625226 |
| | 13.10 | 0.5156 | 60 | 107 | 45 | 14 | 1 | 7625227 |
| | 13.30 | 0.5236 | 60 | 107 | 45 | 14 | 1 | 7625228 |
| 17/32 | 13.49 | 0.5313 | 60 | 107 | 45 | 14 | 1 | 7625229 |
| | 13.50 | 0.5315 | 60 | 107 | 45 | 14 | 1 | 7625230 |
| | 13.80 | 0.5433 | 60 | 107 | 45 | 14 | 1 | 7625231 |
| 35/64 | 13.89 | 0.5469 | 60 | 107 | 45 | 14 | 1 | 7625232 |
| | 14.00 | 0.5512 | 60 | 107 | 45 | 14 | 1 | 7625233 |
| | 14.25 | 0.5610 | 65 | 115 | 48 | 16 | 1 | 7625234 |
| 9/16 | 14.29 | 0.5625 | 65 | 115 | 48 | 16 | 1 | 7625235 |
| | 14.50 | 0.5709 | 65 | 115 | 48 | 16 | 1 | 7625236 |
| 37/64 | 14.68 | 0.5781 | 65 | 115 | 48 | 16 | 1 | 7625237 |
| | 14.80 | 0.5827 | 65 | 115 | 48 | 16 | 1 | 7625238 |
| 19/32 | 15.00 | 0.5906 | 65 | 115 | 48 | 16 | 1 | 7625239 |
| | 15.08 | 0.5938 | 65 | 115 | 48 | 16 | 1 | 7625240 |
| | 15.10 | 0.5945 | 65 | 115 | 48 | 16 | 1 | 7625241 |
| | 15.30 | 0.6024 | 65 | 115 | 48 | 16 | 1 | 7625242 |
| 39/64 | 15.48 | 0.6094 | 65 | 115 | 48 | 16 | 1 | 7625243 |
| | 15.50 | 0.6102 | 65 | 115 | 48 | 16 | 1 | 7625244 |
| | 15.80 | 0.6220 | 65 | 115 | 48 | 16 | 1 | 7625245 |
| 5/8 | 15.88 | 0.6250 | 65 | 115 | 48 | 16 | 1 | 7625246 |
| | 16.00 | 0.6299 | 65 | 115 | 48 | 16 | 1 | 7625247 |

CDX SOLID CARBIDE DRILL

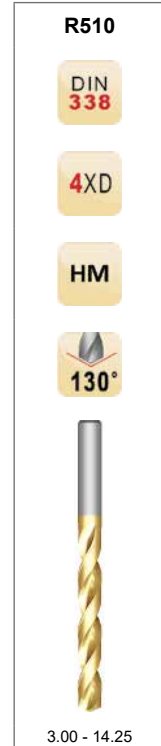


Multi-Application, Jobber Length, Parallel Shank

R510

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.



| d_1 Øh ₇ Inch | d_1 Øh ₇ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | R510 | |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|---------|---------|
| 1/8 | 3.00 | 0.1181 | 33 | 61 | 1 | 5980504 | |
| | 3.18 | 0.1250 | 36 | 65 | 1 | 5980502 | |
| | 3.20 | 0.1260 | 36 | 65 | 1 | 5980508 | |
| | 3.30 | 0.1299 | 36 | 65 | 1 | 5980512 | |
| | 3.40 | 0.1339 | 39 | 70 | 1 | 5980515 | |
| | 3.50 | 0.1378 | 39 | 70 | 1 | 5980518 | |
| | 3.70 | 0.1457 | 39 | 70 | 1 | 5980522 | |
| | 3.90 | 0.1535 | 43 | 75 | 1 | 5980526 | |
| | 4.00 | 0.1575 | 43 | 75 | 1 | 5980538 | |
| | 4.10 | 0.1614 | 43 | 75 | 1 | 5980540 | |
| | 4.20 | 0.1654 | 43 | 75 | 1 | 5980543 | |
| | 4.30 | 0.1693 | 47 | 80 | 1 | 5980545 | |
| | 4.50 | 0.1772 | 47 | 80 | 1 | 5980548 | |
| | 4.60 | 0.1811 | 47 | 80 | 1 | 5980553 | |
| 4.70 | 0.1850 | 47 | 80 | 1 | 5980556 | | |
| 3/16 | 4.76 | 0.1875 | 52 | 86 | 1 | 5980529 | |
| | 4.90 | 0.1929 | 52 | 86 | 1 | 5980559 | |
| | 5.00 | 0.1969 | 52 | 86 | 1 | 5980562 | |
| | 5.10 | 0.2008 | 52 | 86 | 1 | 5980565 | |
| | 5.50 | 0.2165 | 57 | 93 | 1 | 5980571 | |
| | 5.60 | 0.2205 | 57 | 93 | 1 | 5980472 | |
| | 5.70 | 0.2244 | 57 | 93 | 1 | 5980510 | |
| | 6.00 | 0.2362 | 57 | 93 | 1 | 5980607 | |
| | 1/4 | 6.35 | 0.2500 | 63 | 101 | 1 | 5980460 |
| | | 6.50 | 0.2559 | 63 | 101 | 1 | 5980615 |
| 6.60 | | 0.2598 | 63 | 101 | 1 | 5980619 | |
| 6.80 | | 0.2677 | 69 | 109 | 1 | 5980622 | |
| 6.90 | | 0.2717 | 69 | 109 | 1 | 5980626 | |
| 7.00 | | 0.2756 | 69 | 109 | 1 | 5980478 | |
| 7.30 | | 0.2874 | 69 | 109 | 1 | 5980481 | |
| 7.40 | | 0.2913 | 69 | 109 | 1 | 5980484 | |
| 7.50 | | 0.2953 | 69 | 109 | 1 | 5980488 | |
| 7.80 | | 0.3071 | 75 | 117 | 1 | 5980493 | |

| d_1 $\varnothing h_7$ Inch | d_1 $\varnothing h_7$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | R510 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|---------|
| 5/16 | 7.90 | 0.3110 | 75 | 117 | 1 | 5980497 |
| | 7.94 | 0.3125 | 75 | 117 | 1 | 5980539 |
| | 8.00 | 0.3150 | 75 | 117 | 1 | 5980505 |
| | 8.50 | 0.3346 | 75 | 117 | 1 | 5980507 |
| | 8.70 | 0.3425 | 81 | 125 | 1 | 5980513 |
| | 8.80 | 0.3465 | 81 | 125 | 1 | 5980516 |
| | 9.00 | 0.3543 | 81 | 125 | 1 | 5980519 |
| | 9.20 | 0.3622 | 81 | 125 | 1 | 5980521 |
| | 9.30 | 0.3661 | 81 | 125 | 1 | 5980525 |
| | 9.40 | 0.3701 | 81 | 125 | 1 | 5980528 |
| | 9.50 | 0.3740 | 81 | 125 | 1 | 5980531 |
| | 3/8 | 9.52 | 0.3750 | 87 | 133 | 1 |
| 9.90 | | 0.3898 | 87 | 133 | 1 | 5980533 |
| 10.00 | | 0.3937 | 87 | 133 | 1 | 5980534 |
| 10.20 | | 0.4016 | 87 | 133 | 1 | 5980568 |
| 10.30 | | 0.4055 | 87 | 133 | 1 | 5980574 |
| 10.40 | | 0.4094 | 87 | 133 | 1 | 5980577 |
| 10.50 | | 0.4134 | 87 | 133 | 1 | 5980581 |
| 10.80 | | 0.4252 | 94 | 142 | 1 | 5980585 |
| 11.00 | | 0.4331 | 94 | 142 | 1 | 5980424 |
| 7/16 | | 11.11 | 0.4375 | 94 | 142 | 1 |
| | 11.20 | 0.4409 | 94 | 142 | 1 | 5980427 |
| | 11.50 | 0.4528 | 94 | 142 | 1 | 5980431 |
| | 12.00 | 0.4724 | 101 | 151 | 1 | 5980441 |
| 1/2 | 12.70 | 0.5000 | 101 | 151 | 1 | 5980417 |
| | 13.00 | 0.5118 | 101 | 151 | 1 | 5980448 |
| | 14.00 | 0.5512 | 108 | 160 | 1 | 5980458 |
| | 14.25 | 0.5610 | 114 | 169 | 1 | 5980463 |

FORCE X SOLID CARBIDE DRILL



Multi-Application, Standard Length, Reinforced Shank

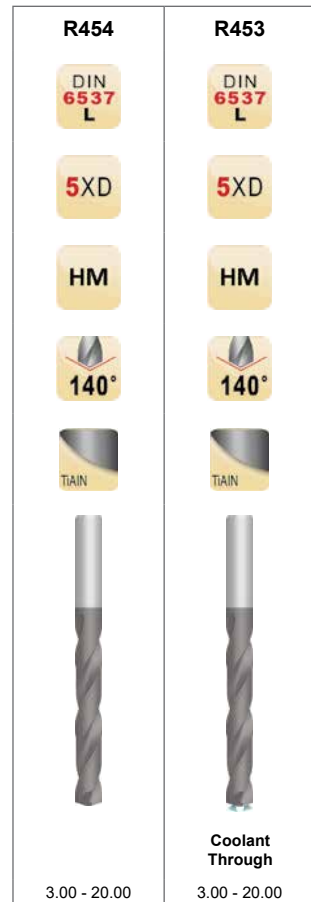
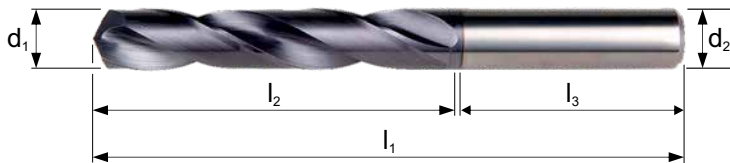
R454 Self centering 4-facet split point and CTW flute construction for enhanced penetration rate. TiAlN coating increases wear resistance, improves tool life at high RPM.

- 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



| d_1 Ø Inch | d_1 Ø _{m7} mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø _{h5} mm | Pack Qty | R454 | R453 |
|--------------------|--------------------------------|--------------------------|-------------|-------------|-------------|--------------------------------|-------------|---------|---------|
| | 3.00 | 0.1181 | 28 | 66 | 36 | 6 | 1 | 5979852 | 5979633 |
| | 3.10 | 0.1220 | 28 | 66 | 36 | 6 | 1 | 5979855 | 5979636 |
| 1/8 | 3.18 | 0.1252 | 28 | 66 | 36 | 6 | 1 | 5979974 | 5979930 |
| | 3.20 | 0.1260 | 28 | 66 | 36 | 6 | 1 | 5979858 | 5979642 |
| 30 | 3.26 | 0.1283 | 28 | 66 | 36 | 6 | 1 | 5980077 | 5979877 |
| | 3.30 | 0.1299 | 28 | 66 | 36 | 6 | 1 | 5979861 | 5979645 |
| | 3.40 | 0.1339 | 28 | 66 | 36 | 6 | 1 | 5979864 | 5979648 |
| 29 | 3.45 | 0.1358 | 28 | 66 | 36 | 6 | 1 | 5980006 | 5980039 |
| | 3.50 | 0.1378 | 28 | 66 | 36 | 6 | 1 | 5979868 | 5979651 |
| 28 | 3.57 | 0.1406 | 28 | 66 | 36 | 6 | 1 | 5979966 | 5980036 |
| 9/64 | 3.57 | 0.1406 | 28 | 66 | 36 | 6 | 1 | 5979250 | 5979488 |
| | 3.60 | 0.1417 | 28 | 66 | 36 | 6 | 1 | 5979871 | 5979654 |
| 27 | 3.66 | 0.1441 | 28 | 66 | 36 | 6 | 1 | 5979924 | 5980032 |
| | 3.70 | 0.1457 | 28 | 66 | 36 | 6 | 1 | 5979876 | 5979657 |
| 26 | 3.73 | 0.1469 | 36 | 74 | 36 | 6 | 1 | 5979572 | 5980028 |
| 25 | 3.80 | 0.1496 | 36 | 74 | 36 | 6 | 1 | 5979879 | 5979660 |
| 24 | 3.86 | 0.1520 | 36 | 74 | 36 | 6 | 1 | 5979561 | 5979982 |
| | 3.90 | 0.1535 | 36 | 74 | 36 | 6 | 1 | 5979885 | 5979663 |
| 23 | 3.91 | 0.1539 | 36 | 74 | 36 | 6 | 1 | 5979558 | 5979939 |
| 5/32 | 3.97 | 0.1563 | 36 | 74 | 36 | 6 | 1 | 5980068 | 5978954 |
| 22 | 3.99 | 0.1571 | 36 | 74 | 36 | 6 | 1 | 5979556 | 5979903 |
| | 4.00 | 0.1575 | 36 | 74 | 36 | 6 | 1 | 5979913 | 5978985 |
| 21 | 4.04 | 0.1591 | 36 | 74 | 36 | 6 | 1 | 5979553 | 5979867 |
| | 4.05 | 0.1594 | 36 | 74 | 36 | 6 | 1 | — | 5978987 |
| 20 | 4.09 | 0.1610 | 36 | 74 | 36 | 6 | 1 | 5979550 | 5979764 |
| | 4.10 | 0.1614 | 36 | 74 | 36 | 6 | 1 | 5979919 | 5978989 |
| | 4.20 | 0.1654 | 36 | 74 | 36 | 6 | 1 | 5980020 | 5978991 |
| 19 | 4.22 | 0.1661 | 36 | 74 | 36 | 6 | 1 | 5979544 | 5979757 |
| | 4.30 | 0.1693 | 36 | 74 | 36 | 6 | 1 | 5980061 | 5978932 |
| 18 | 4.31 | 0.1697 | 36 | 74 | 36 | 6 | 1 | 5979541 | 5979754 |
| 11/64 | 4.37 | 0.1720 | 36 | 74 | 36 | 6 | 1 | 5980033 | 5980001 |
| 17 | 4.39 | 0.1728 | 36 | 74 | 36 | 6 | 1 | 5979537 | 5979751 |
| | 4.40 | 0.1732 | 36 | 74 | 36 | 6 | 1 | 5980103 | 5978933 |

| 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 | 5980137 | 5978934 |
| 16 | 4.50 | 0.1772 | 36 | 74 | 36 | 6 | 1 | 5979533 | 5979745 |
| 15 | 4.57 | 0.1799 | 36 | 74 | 36 | 6 | 1 | 5979531 | 5979740 |
| | 4.60 | 0.1811 | 36 | 74 | 36 | 6 | 1 | 5980170 | 5978935 |
| 14 | 4.62 | 0.1819 | 36 | 74 | 36 | 6 | 1 | 5979529 | 5979736 |
| 13 | 4.70 | 0.1850 | 36 | 74 | 36 | 6 | 1 | 5980178 | 5978936 |
| 3/16 | 4.76 | 0.1874 | 44 | 82 | 36 | 6 | 1 | 5979889 | 5979666 |
| 12 | 4.80 | 0.1890 | 44 | 82 | 36 | 6 | 1 | 5980182 | 5978937 |
| 11 | 4.85 | 0.1909 | 44 | 82 | 36 | 6 | 1 | 5979522 | 5979724 |
| | 4.90 | 0.1929 | 44 | 82 | 36 | 6 | 1 | 5980187 | 5978938 |
| 10 | 4.92 | 0.1937 | 44 | 82 | 36 | 6 | 1 | 5979519 | 5979717 |
| 9 | 4.98 | 0.1961 | 44 | 82 | 36 | 6 | 1 | 5979937 | 5979894 |
| | 5.00 | 0.1969 | 44 | 82 | 36 | 6 | 1 | 5980038 | 5978944 |
| | 5.05 | 0.1988 | 44 | 82 | 36 | 6 | 1 | — | 5978945 |
| 8 | 5.06 | 0.1992 | 44 | 82 | 36 | 6 | 1 | 5979934 | 5979891 |
| | 5.10 | 0.2008 | 44 | 82 | 36 | 6 | 1 | 5980042 | 5978946 |
| 7 | 5.11 | 0.2012 | 44 | 82 | 36 | 6 | 1 | 5980097 | 5979888 |
| 13/64 | 5.16 | 0.2031 | 44 | 82 | 36 | 6 | 1 | 5980070 | 5979672 |
| 6 | 5.18 | 0.2039 | 44 | 82 | 36 | 6 | 1 | 5980093 | 5979886 |
| | 5.20 | 0.2047 | 44 | 82 | 36 | 6 | 1 | 5980045 | 5978947 |
| 5 | 5.22 | 0.2055 | 44 | 82 | 36 | 6 | 1 | 5980089 | 5979883 |
| | 5.30 | 0.2087 | 44 | 82 | 36 | 6 | 1 | — | 7361201 |
| 4 | 5.31 | 0.2091 | 44 | 82 | 36 | 6 | 1 | 5980085 | 5979880 |
| | 5.40 | 0.2126 | 44 | 82 | 36 | 6 | 1 | — | 7361202 |
| 3 | 5.41 | 0.2130 | 44 | 82 | 36 | 6 | 1 | 5980044 | 5979873 |
| | 5.50 | 0.2165 | 44 | 82 | 36 | 6 | 1 | 5980048 | 5978948 |
| 7/32 | 5.56 | 0.2189 | 44 | 82 | 36 | 6 | 1 | 5980148 | 5979507 |
| | 5.60 | 0.2205 | 44 | 82 | 36 | 6 | 1 | 5980051 | 5978949 |
| 2 | 5.61 | 0.2209 | 44 | 82 | 36 | 6 | 1 | 5979547 | 5979760 |
| | 5.70 | 0.2244 | 44 | 82 | 36 | 6 | 1 | 5980055 | 5978950 |
| 1 | 5.79 | 0.2280 | 44 | 82 | 36 | 6 | 1 | 5979516 | 5979712 |
| | 5.80 | 0.2283 | 44 | 82 | 36 | 6 | 1 | 5980058 | 5978951 |
| | 5.90 | 0.2323 | 44 | 82 | 36 | 6 | 1 | — | 7361203 |
| A | 5.94 | 0.2339 | 44 | 82 | 36 | 6 | 1 | 5979491 | 5979694 |
| 15/64 | 5.95 | 0.2343 | 44 | 82 | 36 | 6 | 1 | 5979928 | 5979555 |
| | 6.00 | 0.2362 | 44 | 82 | 36 | 6 | 1 | 5980075 | 5978956 |
| B | 6.03 | 0.2374 | 53 | 91 | 36 | 8 | 1 | 7361224 | 7361204 |
| | 6.05 | 0.2382 | 53 | 91 | 36 | 8 | 1 | — | 5978957 |
| | 6.10 | 0.2402 | 53 | 91 | 36 | 8 | 1 | 5980080 | 5978958 |
| C | 6.15 | 0.2421 | 53 | 91 | 36 | 8 | 1 | 7361225 | 7361205 |
| | 6.20 | 0.2441 | 53 | 91 | 36 | 8 | 1 | 5980084 | 5978959 |
| D | 6.25 | 0.2461 | 53 | 91 | 36 | 8 | 1 | 5979495 | 5979697 |
| | 6.30 | 0.2480 | 53 | 91 | 36 | 8 | 1 | 5980088 | 5978960 |
| 1/4 | 6.35 | 0.2500 | 53 | 91 | 36 | 8 | 1 | 5979970 | 5979925 |
| E | 6.35 | 0.2500 | 53 | 91 | 36 | 8 | 1 | 7361226 | 7361206 |
| | 6.40 | 0.2520 | 53 | 91 | 36 | 8 | 1 | 5980092 | 5978961 |
| | 6.50 | 0.2559 | 53 | 91 | 36 | 8 | 1 | 5980096 | 5978962 |
| F | 6.53 | 0.2571 | 53 | 91 | 36 | 8 | 1 | 7361227 | 7361207 |
| | 6.60 | 0.2598 | 53 | 91 | 36 | 8 | 1 | 5980100 | 5978963 |
| G | 6.63 | 0.2610 | 53 | 91 | 36 | 8 | 1 | 7361228 | 7361208 |
| | 6.70 | 0.2638 | 53 | 91 | 36 | 8 | 1 | 5980106 | 5978965 |
| 17/64 | 6.75 | 0.2657 | 53 | 91 | 36 | 8 | 1 | 5979798 | 5979579 |
| H | 6.76 | 0.2661 | 53 | 91 | 36 | 8 | 1 | 5979499 | 5979700 |
| | 6.80 | 0.2677 | 53 | 91 | 36 | 8 | 1 | 5980109 | 5978966 |
| | 6.90 | 0.2717 | 53 | 91 | 36 | 8 | 1 | 5980111 | 5978967 |
| I | 6.91 | 0.2720 | 53 | 91 | 36 | 8 | 1 | 7361229 | 7361209 |
| | 7.00 | 0.2756 | 53 | 91 | 36 | 8 | 1 | 5980113 | 5978968 |
| J | 7.04 | 0.2772 | 53 | 91 | 36 | 8 | 1 | 7361230 | 7361210 |
| | 7.10 | 0.2795 | 53 | 91 | 36 | 8 | 1 | 5980116 | 5978970 |
| K | 7.14 | 0.2811 | 53 | 91 | 36 | 8 | 1 | 7361231 | 7361211 |
| 9/32 | 7.14 | 0.2811 | 53 | 91 | 36 | 8 | 1 | 5979241 | 5979484 |
| | 7.20 | 0.2835 | 53 | 91 | 36 | 8 | 1 | — | 7361212 |
| | 7.30 | 0.2874 | 53 | 91 | 36 | 8 | 1 | 5980119 | 5978971 |
| L | 7.37 | 0.2902 | 53 | 91 | 36 | 8 | 1 | 5979503 | 5979702 |
| | 7.40 | 0.2913 | 53 | 91 | 36 | 8 | 1 | 5980123 | 5978973 |

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 ₅ mm | Pack Qty | R454 | R453 |
|-----------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|---------|
| M | 7.49 | 0.2949 | 53 | 91 | 36 | 8 | 1 | 5979510 | 5979705 |
| | 7.50 | 0.2953 | 53 | 91 | 36 | 8 | 1 | 5980126 | 5978975 |
| 19/64 | 7.54 | 0.2969 | 53 | 91 | 36 | 8 | 1 | 5979822 | 5979599 |
| | 7.60 | 0.2992 | 53 | 91 | 36 | 8 | 1 | 5980130 | 5978977 |
| N | 7.67 | 0.3020 | 53 | 91 | 36 | 8 | 1 | 5979513 | 5979708 |
| | 7.70 | 0.3031 | 53 | 91 | 36 | 8 | 1 | 5980133 | 5978979 |
| | 7.80 | 0.3071 | 53 | 91 | 36 | 8 | 1 | 5980140 | 5978983 |
| | 7.90 | 0.3110 | 53 | 91 | 36 | 8 | 1 | 5980142 | 5979424 |
| 5/16 | 7.94 | 0.3126 | 53 | 91 | 36 | 8 | 1 | 5980064 | 5978952 |
| | 8.00 | 0.3150 | 53 | 91 | 36 | 8 | 1 | 5980151 | 5979534 |
| O | 8.03 | 0.3161 | 61 | 103 | 40 | 10 | 1 | 5979940 | 5979897 |
| | 8.05 | 0.3169 | 61 | 103 | 40 | 10 | 1 | — | 5979568 |
| | 8.10 | 0.3189 | 61 | 103 | 40 | 10 | 1 | 5980155 | 5979575 |
| | 8.20 | 0.3228 | 61 | 103 | 40 | 10 | 1 | 5980157 | 5979578 |
| 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 | 5979831 | 5979612 |
| | 8.40 | 0.3307 | 61 | 103 | 40 | 10 | 1 | 5980162 | 5979581 |
| Q | 8.43 | 0.3319 | 61 | 103 | 40 | 10 | 1 | 5979944 | 5979900 |
| | 8.50 | 0.3346 | 61 | 103 | 40 | 10 | 1 | 5980164 | 5979584 |
| | 8.60 | 0.3386 | 61 | 103 | 40 | 10 | 1 | 5980167 | 5979429 |
| R | 8.61 | 0.3390 | 61 | 103 | 40 | 10 | 1 | 7361233 | 7361215 |
| | 8.70 | 0.3425 | 61 | 103 | 40 | 10 | 1 | 5980175 | 5979432 |
| 11/32 | 8.73 | 0.3437 | 61 | 103 | 40 | 10 | 1 | 5980029 | 5979998 |
| | 8.80 | 0.3465 | 61 | 103 | 40 | 10 | 1 | 5979222 | 5979436 |
| S | 8.84 | 0.3480 | 61 | 103 | 40 | 10 | 1 | 7361234 | 7361216 |
| | 8.90 | 0.3504 | 61 | 103 | 40 | 10 | 1 | 5979268 | 5979440 |
| | 9.00 | 0.3543 | 61 | 103 | 40 | 10 | 1 | 5979294 | 5979444 |
| T | 9.09 | 0.3579 | 61 | 103 | 40 | 10 | 1 | 5979947 | 5979906 |
| | 9.10 | 0.3583 | 61 | 103 | 40 | 10 | 1 | 5979327 | 5979448 |
| 23/64 | 9.13 | 0.3594 | 61 | 103 | 40 | 10 | 1 | 5979838 | 5979620 |
| | 9.20 | 0.3622 | 61 | 103 | 40 | 10 | 1 | — | 7361217 |
| | 9.30 | 0.3661 | 61 | 103 | 40 | 10 | 1 | 5979364 | 5979452 |
| U | 9.35 | 0.3681 | 61 | 103 | 40 | 10 | 1 | 5979949 | 5979909 |
| | 9.40 | 0.3701 | 61 | 103 | 40 | 10 | 1 | 5979372 | 5979454 |
| | 9.50 | 0.3740 | 61 | 103 | 40 | 10 | 1 | 5979376 | 5979458 |
| 3/8 | 9.52 | 0.3748 | 61 | 103 | 40 | 10 | 1 | 5979895 | 5979674 |
| V | 9.58 | 0.3772 | 61 | 103 | 40 | 10 | 1 | 7361235 | 7361218 |
| | 9.60 | 0.3780 | 61 | 103 | 40 | 10 | 1 | 5979381 | 5979461 |
| | 9.70 | 0.3819 | 61 | 103 | 40 | 10 | 1 | 5979385 | 5979467 |
| | 9.80 | 0.3858 | 61 | 103 | 40 | 10 | 1 | 5979228 | 5979472 |
| W | 9.80 | 0.3858 | 61 | 103 | 40 | 10 | 1 | 7361236 | 7361219 |
| | 9.90 | 0.3898 | 61 | 103 | 40 | 10 | 1 | 5979233 | 5979476 |
| 25/64 | 9.92 | 0.3906 | 61 | 103 | 40 | 10 | 1 | 5979840 | 5979624 |
| | 10.00 | 0.3937 | 61 | 103 | 40 | 10 | 1 | 5979978 | 5979933 |
| | 10.05 | 0.3957 | 70 | 118 | 45 | 12 | 1 | — | 5979936 |
| X | 10.08 | 0.3969 | 70 | 118 | 45 | 12 | 1 | 5979952 | 5979912 |
| | 10.10 | 0.3976 | 70 | 118 | 45 | 12 | 1 | 5979981 | 5979942 |
| | 10.20 | 0.4016 | 70 | 118 | 45 | 12 | 1 | 5979985 | 5979946 |
| Y | 10.26 | 0.4039 | 70 | 118 | 45 | 12 | 1 | 5979955 | 5979916 |
| | 10.30 | 0.4055 | 70 | 118 | 45 | 12 | 1 | 5979989 | 5979950 |
| 13/32 | 10.32 | 0.4063 | 70 | 118 | 45 | 12 | 1 | 5980067 | 5979639 |
| | 10.40 | 0.4094 | 70 | 118 | 45 | 12 | 1 | 5979993 | 5979953 |
| | 10.49 | 0.4130 | 70 | 118 | 45 | 12 | 1 | 5979959 | 5979918 |
| Z | 10.50 | 0.4134 | 70 | 118 | 45 | 12 | 1 | 5979996 | 5979956 |
| | 10.60 | 0.4173 | 70 | 118 | 45 | 12 | 1 | 5980000 | 5979960 |
| | 27/64 | 10.72 | 0.4220 | 70 | 118 | 45 | 12 | 5979843 | 5979627 |
| | 10.80 | 0.4252 | 70 | 118 | 45 | 12 | 1 | — | 7361220 |
| 7/16 | 11.00 | 0.4331 | 70 | 118 | 45 | 12 | 1 | 5980003 | 5979964 |
| | 11.11 | 0.4374 | 70 | 118 | 45 | 12 | 1 | 5980145 | 5979464 |
| | 11.20 | 0.4409 | 70 | 118 | 45 | 12 | 1 | 5980009 | 5979968 |
| | 11.30 | 0.4449 | 70 | 118 | 45 | 12 | 1 | — | 7361221 |
| | 11.40 | 0.4488 | 70 | 118 | 45 | 12 | 1 | 5980012 | 5979972 |
| | 11.50 | 0.4528 | 70 | 118 | 45 | 12 | 1 | 5980015 | 5979976 |

| 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 | 5979849 | 5979630 |
| | 11.60 | 0.4567 | 70 | 118 | 45 | 12 | 1 | 5980018 | 5979986 |
| | 11.80 | 0.4646 | 70 | 118 | 45 | 12 | 1 | 5980022 | 5979990 |
| 15/32 | 11.91 | 0.4689 | 70 | 118 | 45 | 12 | 1 | 5979926 | 5979552 |
| | 12.00 | 0.4724 | 70 | 118 | 45 | 12 | 1 | 5980037 | 5980005 |
| | 12.05 | 0.4744 | 76 | 124 | 45 | 14 | 1 | — | 5980008 |
| | 12.10 | 0.4764 | 76 | 124 | 45 | 14 | 1 | 5980040 | — |
| 31/64 | 12.20 | 0.4803 | 76 | 124 | 45 | 14 | 1 | 5980047 | 5980011 |
| | 12.30 | 0.4843 | 76 | 124 | 45 | 14 | 1 | 5979898 | 5978931 |
| | 12.50 | 0.4921 | 76 | 124 | 45 | 14 | 1 | 5980050 | 5980014 |
| 1/2 | 12.70 | 0.5000 | 76 | 124 | 45 | 14 | 1 | 5980053 | 5980017 |
| | 12.70 | 0.5000 | 76 | 124 | 45 | 14 | 1 | 5979962 | 5979921 |
| | 12.80 | 0.5039 | 76 | 124 | 45 | 14 | 1 | 5980057 | 5980023 |
| 33/64 | 13.00 | 0.5118 | 76 | 124 | 45 | 14 | 1 | 5980060 | 5979536 |
| | 13.10 | 0.5157 | 76 | 124 | 45 | 14 | 1 | 5979901 | 5978942 |
| | 13.30 | 0.5236 | 76 | 124 | 45 | 14 | 1 | — | 7361222 |
| 17/32 | 13.49 | 0.5311 | 76 | 124 | 45 | 14 | 1 | 5979795 | 5979576 |
| | 13.50 | 0.5315 | 76 | 124 | 45 | 14 | 1 | 5980062 | 5979570 |
| | 13.80 | 0.5433 | 76 | 124 | 45 | 14 | 1 | 5980065 | 5979602 |
| 35/64 | 13.89 | 0.5469 | 76 | 124 | 45 | 14 | 1 | 5979904 | 5978953 |
| | 14.00 | 0.5512 | 76 | 124 | 45 | 14 | 1 | 5980074 | 5979680 |
| | 14.25 | 0.5610 | 82 | 133 | 48 | 16 | 1 | 5980081 | 5979684 |
| 9/16 | 14.29 | 0.5626 | 82 | 133 | 48 | 16 | 1 | 5979237 | 5979480 |
| | 14.50 | 0.5709 | 82 | 133 | 48 | 16 | 1 | 5979778 | 5979688 |
| 37/64 | 14.68 | 0.5780 | 82 | 133 | 48 | 16 | 1 | 5979907 | 5978964 |
| | 14.80 | 0.5827 | 82 | 133 | 48 | 16 | 1 | 5979813 | 5979691 |
| | 15.00 | 0.5906 | 82 | 133 | 48 | 16 | 1 | 5979846 | 5979540 |
| 19/32 | 15.08 | 0.5937 | 82 | 133 | 48 | 16 | 1 | 5979820 | 5979596 |
| | 15.10 | 0.5945 | 82 | 133 | 48 | 16 | 1 | 5979882 | 5979543 |
| | 15.30 | 0.6024 | 82 | 133 | 48 | 16 | 1 | — | 7361223 |
| 39/64 | 15.48 | 0.6094 | 82 | 133 | 48 | 16 | 1 | 5979910 | 5978981 |
| | 15.50 | 0.6102 | 82 | 133 | 48 | 16 | 1 | 5979915 | 5979546 |
| | 15.80 | 0.6220 | 82 | 133 | 48 | 16 | 1 | 5979922 | 5979549 |
| 5/8 | 15.88 | 0.6252 | 82 | 133 | 48 | 16 | 1 | 5980071 | 5978955 |
| | 16.00 | 0.6299 | 82 | 133 | 48 | 16 | 1 | 5979931 | 5979559 |
| 41/64 | 16.27 | 0.6406 | 91 | 143 | 48 | 18 | 1 | 5980189 | 5978939 |
| | 16.50 | 0.6496 | 91 | 143 | 48 | 18 | 1 | 5979783 | 5979562 |
| 21/32 | 16.67 | 0.6563 | 91 | 143 | 48 | 18 | 1 | 5979828 | 5979608 |
| | 17.00 | 0.6693 | 91 | 143 | 48 | 18 | 1 | 5979786 | 5979564 |
| 43/64 | 17.07 | 0.6720 | 91 | 143 | 48 | 18 | 1 | 5980026 | 5978940 |
| 11/16 | 17.46 | 0.6874 | 91 | 143 | 48 | 18 | 1 | 5980025 | 5979995 |
| | 17.50 | 0.6890 | 91 | 143 | 48 | 18 | 1 | 5979789 | 5979567 |
| | 17.80 | 0.7008 | 91 | 143 | 48 | 18 | 1 | 5979792 | 5979573 |
| 45/64 | 17.86 | 0.7031 | 91 | 143 | 48 | 18 | 1 | 5980030 | 5978941 |
| | 18.00 | 0.7087 | 91 | 143 | 48 | 18 | 1 | 5979801 | 5979582 |
| 23/32 | 18.26 | 0.7189 | 99 | 153 | 50 | 20 | 1 | 5979834 | 5979616 |
| | 18.50 | 0.7283 | 99 | 153 | 50 | 20 | 1 | 5979804 | 5979585 |
| 47/64 | 18.65 | 0.7343 | 99 | 153 | 50 | 20 | 1 | 5980034 | 5978943 |
| | 19.00 | 0.7480 | 99 | 153 | 50 | 20 | 1 | 5979807 | 5979588 |
| 3/4 | 19.05 | 0.7500 | 99 | 153 | 50 | 20 | 1 | 5979892 | 5979669 |
| | 19.50 | 0.7677 | 99 | 153 | 50 | 20 | 1 | 5979810 | 5979590 |
| | 19.80 | 0.7795 | 99 | 153 | 50 | 20 | 1 | 5979816 | 5979593 |
| | 20.00 | 0.7874 | 99 | 153 | 50 | 20 | 1 | 5979824 | 5979605 |

FORCE M SOLID CARBIDE DRILL



Multi-Application, Standard Length, Reinforced Shank

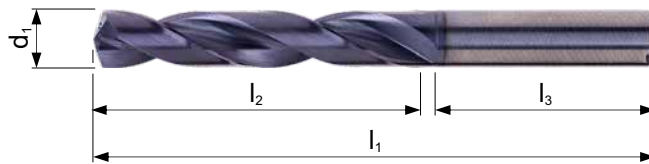
R463

2.1 2.2 2.3 2.4 4.1 4.2 4.3

5.1 5.2 5.3

Self-centering 4-facet split point and CTW flute construction for enhanced penetration rate specifically designed for Stainless Steel (ISO-M) materials. TiAlN coating increases wear resistance and improves tool life. Coolant through combined with an advanced point geometry prevents premature wear of the cutting edges. Length designed for 5 x Diameter drilling depths.

High productivity in a wide range of materials



R463

DIN
6537
L

5XD

HM

140°

TiAlN



Coolant
Through
3.00 - 16.00

| d_1 Ø Inch | d_1 Ø _{m7} mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø _{h6} mm | Pack Qty | R463 |
|--------------------|--------------------------------|--------------------------|-------------|-------------|-------------|--------------------------------|-------------|---------|
| | 3.00 | 0.1181 | 28 | 66 | 36 | 6 | 1 | 7624913 |
| | 3.10 | 0.1220 | 28 | 66 | 36 | 6 | 1 | 7624914 |
| 1/8 | 3.18 | 0.1250 | 28 | 66 | 36 | 6 | 1 | 7624915 |
| | 3.20 | 0.1260 | 28 | 66 | 36 | 6 | 1 | 7624916 |
| | 3.30 | 0.1299 | 28 | 66 | 36 | 6 | 1 | 7624917 |
| | 3.40 | 0.1339 | 28 | 66 | 36 | 6 | 1 | 7624918 |
| 29 | 3.45 | 0.1360 | 28 | 66 | 36 | 6 | 1 | 7624919 |
| | 3.50 | 0.1378 | 28 | 66 | 36 | 6 | 1 | 7624960 |
| 9/64 | 3.57 | 0.1406 | 28 | 66 | 36 | 6 | 1 | 7624961 |
| | 3.60 | 0.1417 | 28 | 66 | 36 | 6 | 1 | 7624962 |
| | 3.70 | 0.1457 | 28 | 66 | 36 | 6 | 1 | 7624963 |
| | 3.80 | 0.1496 | 36 | 74 | 36 | 6 | 1 | 7624964 |
| | 3.90 | 0.1535 | 36 | 74 | 36 | 6 | 1 | 7624965 |
| 5/32 | 3.97 | 0.1563 | 36 | 74 | 36 | 6 | 1 | 7624966 |
| | 4.00 | 0.1575 | 36 | 74 | 36 | 6 | 1 | 7624967 |
| | 4.05 | 0.1594 | 36 | 74 | 36 | 6 | 1 | 7624968 |
| | 4.10 | 0.1614 | 36 | 74 | 36 | 6 | 1 | 7624969 |
| | 4.20 | 0.1654 | 36 | 74 | 36 | 6 | 1 | 7624970 |
| | 4.30 | 0.1693 | 36 | 74 | 36 | 6 | 1 | 7624971 |
| 11/64 | 4.37 | 0.1719 | 36 | 74 | 36 | 6 | 1 | 7624972 |
| | 4.40 | 0.1732 | 36 | 74 | 36 | 6 | 1 | 7624973 |
| | 4.50 | 0.1772 | 36 | 74 | 36 | 6 | 1 | 7624974 |
| | 4.60 | 0.1811 | 36 | 74 | 36 | 6 | 1 | 7624975 |
| | 4.70 | 0.1850 | 36 | 74 | 36 | 6 | 1 | 7624976 |
| 3/16 | 4.76 | 0.1875 | 44 | 82 | 36 | 6 | 1 | 7624977 |
| | 4.80 | 0.1890 | 44 | 82 | 36 | 6 | 1 | 7624978 |
| | 4.90 | 0.1929 | 44 | 82 | 36 | 6 | 1 | 7624979 |
| | 5.00 | 0.1969 | 44 | 82 | 36 | 6 | 1 | 7624980 |
| | 5.05 | 0.1988 | 44 | 82 | 36 | 6 | 1 | 7624981 |
| | 5.10 | 0.2008 | 44 | 82 | 36 | 6 | 1 | 7624982 |
| 7 | 5.11 | 0.2010 | 44 | 82 | 36 | 6 | 1 | 7624983 |
| 13/64 | 5.16 | 0.2031 | 44 | 82 | 36 | 6 | 1 | 7624984 |
| | 5.20 | 0.2047 | 44 | 82 | 36 | 6 | 1 | 7624985 |

| 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 | R463 |
|-----------------------------|---|-----------------------------------|----------------------|----------------------|----------------------|---|-------------|---------|
| 5 | 5.22 | 0.2055 | 44 | 82 | 36 | 6 | 1 | 7624986 |
| | 5.30 | 0.2087 | 44 | 82 | 36 | 6 | 1 | 7624987 |
| | 5.40 | 0.2126 | 44 | 82 | 36 | 6 | 1 | 7624988 |
| | 5.50 | 0.2165 | 44 | 82 | 36 | 6 | 1 | 7624989 |
| 7/32 | 5.56 | 0.2188 | 44 | 82 | 36 | 6 | 1 | 7624990 |
| | 5.60 | 0.2205 | 44 | 82 | 36 | 6 | 1 | 7624991 |
| | 5.70 | 0.2244 | 44 | 82 | 36 | 6 | 1 | 7624992 |
| | 5.80 | 0.2283 | 44 | 82 | 36 | 6 | 1 | 7624993 |
| | 5.90 | 0.2323 | 44 | 82 | 36 | 6 | 1 | 7624994 |
| 15/64 | 5.95 | 0.2344 | 44 | 82 | 36 | 6 | 1 | 7624995 |
| | 6.00 | 0.2362 | 44 | 82 | 36 | 6 | 1 | 7624996 |
| | 6.05 | 0.2382 | 53 | 91 | 36 | 8 | 1 | 7624997 |
| | 6.10 | 0.2402 | 53 | 91 | 36 | 8 | 1 | 7624998 |
| | 6.20 | 0.2441 | 53 | 91 | 36 | 8 | 1 | 7624999 |
| 1/4 | 6.30 | 0.2480 | 53 | 91 | 36 | 8 | 1 | 7625000 |
| | 6.35 | 0.2500 | 53 | 91 | 36 | 8 | 1 | 7625001 |
| | 6.40 | 0.2520 | 53 | 91 | 36 | 8 | 1 | 7625002 |
| | 6.50 | 0.2559 | 53 | 91 | 36 | 8 | 1 | 7625003 |
| | 6.60 | 0.2598 | 53 | 91 | 36 | 8 | 1 | 7625004 |
| | 6.70 | 0.2638 | 53 | 91 | 36 | 8 | 1 | 7625005 |
| 17/64 | 6.75 | 0.2656 | 53 | 91 | 36 | 8 | 1 | 7625006 |
| | 6.80 | 0.2677 | 53 | 91 | 36 | 8 | 1 | 7625007 |
| | 6.90 | 0.2717 | 53 | 91 | 36 | 8 | 1 | 7625008 |
| | 7.00 | 0.2756 | 53 | 91 | 36 | 8 | 1 | 7625009 |
| | 7.10 | 0.2795 | 53 | 91 | 36 | 8 | 1 | 7625010 |
| 9/32 | 7.14 | 0.2813 | 53 | 91 | 36 | 8 | 1 | 7625011 |
| | 7.20 | 0.2835 | 53 | 91 | 36 | 8 | 1 | 7625012 |
| | 7.30 | 0.2874 | 53 | 91 | 36 | 8 | 1 | 7625013 |
| | 7.40 | 0.2913 | 53 | 91 | 36 | 8 | 1 | 7625014 |
| | 7.50 | 0.2953 | 53 | 91 | 36 | 8 | 1 | 7625015 |
| 19/64 | 7.54 | 0.2969 | 53 | 91 | 36 | 8 | 1 | 7625016 |
| | 7.60 | 0.2992 | 53 | 91 | 36 | 8 | 1 | 7625017 |
| | 7.70 | 0.3031 | 53 | 91 | 36 | 8 | 1 | 7625018 |
| | 7.80 | 0.3071 | 53 | 91 | 36 | 8 | 1 | 7625019 |
| | 7.90 | 0.3110 | 53 | 91 | 36 | 8 | 1 | 7625020 |
| 5/16 | 7.94 | 0.3125 | 53 | 91 | 36 | 8 | 1 | 7625021 |
| | 8.00 | 0.3150 | 53 | 91 | 36 | 8 | 1 | 7625022 |
| | 8.05 | 0.3169 | 61 | 103 | 40 | 10 | 1 | 7625023 |
| | 8.10 | 0.3189 | 61 | 103 | 40 | 10 | 1 | 7625024 |
| | 8.20 | 0.3228 | 61 | 103 | 40 | 10 | 1 | 7625025 |
| | 8.30 | 0.3268 | 61 | 103 | 40 | 10 | 1 | 7625026 |
| | 8.33 | 0.3281 | 61 | 103 | 40 | 10 | 1 | 7625027 |
| 21/64 | 8.40 | 0.3307 | 61 | 103 | 40 | 10 | 1 | 7625028 |
| | 8.50 | 0.3346 | 61 | 103 | 40 | 10 | 1 | 7625029 |
| | 8.60 | 0.3386 | 61 | 103 | 40 | 10 | 1 | 7625030 |
| | 8.70 | 0.3425 | 61 | 103 | 40 | 10 | 1 | 7625031 |
| | 8.73 | 0.3438 | 61 | 103 | 40 | 10 | 1 | 7625032 |
| | 8.80 | 0.3465 | 61 | 103 | 40 | 10 | 1 | 7625033 |
| | 8.90 | 0.3504 | 61 | 103 | 40 | 10 | 1 | 7625034 |
| 11/32 | 9.00 | 0.3543 | 61 | 103 | 40 | 10 | 1 | 7625035 |
| | 9.10 | 0.3583 | 61 | 103 | 40 | 10 | 1 | 7625036 |
| | 9.13 | 0.3594 | 61 | 103 | 40 | 10 | 1 | 7625037 |
| | 9.20 | 0.3622 | 61 | 103 | 40 | 10 | 1 | 7625038 |
| | 9.30 | 0.3661 | 61 | 103 | 40 | 10 | 1 | 7625039 |
| | 9.40 | 0.3701 | 61 | 103 | 40 | 10 | 1 | 7625040 |
| | 9.50 | 0.3740 | 61 | 103 | 40 | 10 | 1 | 7625041 |
| 3/8 | 9.53 | 0.3750 | 61 | 103 | 40 | 10 | 1 | 7625042 |
| | 9.60 | 0.3780 | 61 | 103 | 40 | 10 | 1 | 7625043 |
| | 9.70 | 0.3819 | 61 | 103 | 40 | 10 | 1 | 7625044 |
| | 9.80 | 0.3858 | 61 | 103 | 40 | 10 | 1 | 7625045 |
| | 9.90 | 0.3898 | 61 | 103 | 40 | 10 | 1 | 7625046 |
| 25/64 | 9.92 | 0.3906 | 61 | 103 | 40 | 10 | 1 | 7625047 |
| | 10.00 | 0.3937 | 61 | 103 | 40 | 10 | 1 | 7625048 |
| | 10.05 | 0.3957 | 70 | 118 | 45 | 12 | 1 | 7625049 |
| | 10.10 | 0.3976 | 70 | 118 | 45 | 12 | 1 | 7625050 |

FORCE M SOLID CARBIDE DRILL



| d_1 Ø Inch | d_1 Ø m_7 mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø h_6 mm | Pack Qty | R463 |
|--------------------|------------------------|--------------------------|-------------|-------------|-------------|------------------------|-------------|---------|
| | 10.20 | 0.4016 | 70 | 118 | 45 | 12 | 1 | 7625051 |
| | 10.30 | 0.4055 | 70 | 118 | 45 | 12 | 1 | 7625052 |
| 13/32 | 10.32 | 0.4063 | 70 | 118 | 45 | 12 | 1 | 7625053 |
| | 10.40 | 0.4094 | 70 | 118 | 45 | 12 | 1 | 7625054 |
| | 10.50 | 0.4134 | 70 | 118 | 45 | 12 | 1 | 7625055 |
| | 10.60 | 0.4173 | 70 | 118 | 45 | 12 | 1 | 7625056 |
| 27/64 | 10.72 | 0.4219 | 70 | 118 | 45 | 12 | 1 | 7625057 |
| | 10.80 | 0.4252 | 70 | 118 | 45 | 12 | 1 | 7625058 |
| | 10.90 | 0.4291 | 70 | 118 | 45 | 12 | 1 | 7625059 |
| | 11.00 | 0.4331 | 70 | 118 | 45 | 12 | 1 | 7625060 |
| 7/16 | 11.11 | 0.4375 | 70 | 118 | 45 | 12 | 1 | 7625061 |
| | 11.20 | 0.4409 | 70 | 118 | 45 | 12 | 1 | 7625062 |
| | 11.30 | 0.4449 | 70 | 118 | 45 | 12 | 1 | 7625063 |
| | 11.40 | 0.4488 | 70 | 118 | 45 | 12 | 1 | 7625064 |
| | 11.50 | 0.4528 | 70 | 118 | 45 | 12 | 1 | 7625065 |
| 29/64 | 11.51 | 0.4531 | 70 | 118 | 45 | 12 | 1 | 7625066 |
| | 11.60 | 0.4567 | 70 | 118 | 45 | 12 | 1 | 7625067 |
| | 11.80 | 0.4646 | 70 | 118 | 45 | 12 | 1 | 7625068 |
| 15/32 | 11.91 | 0.4688 | 70 | 118 | 45 | 12 | 1 | 7625069 |
| | 12.00 | 0.4724 | 70 | 118 | 45 | 12 | 1 | 7625070 |
| | 12.05 | 0.4744 | 76 | 124 | 45 | 14 | 1 | 7625071 |
| | 12.20 | 0.4803 | 76 | 124 | 45 | 14 | 1 | 7625072 |
| 31/64 | 12.30 | 0.4844 | 76 | 124 | 45 | 14 | 1 | 7625073 |
| | 12.50 | 0.4921 | 76 | 124 | 45 | 14 | 1 | 7625074 |
| 1/2 | 12.70 | 0.5000 | 76 | 124 | 45 | 14 | 1 | 7625075 |
| | 12.70 | 0.5000 | 76 | 124 | 45 | 14 | 1 | 7625076 |
| | 12.80 | 0.5039 | 76 | 124 | 45 | 14 | 1 | 7625077 |
| | 13.00 | 0.5118 | 76 | 124 | 45 | 14 | 1 | 7625078 |
| 33/64 | 13.10 | 0.5156 | 76 | 124 | 45 | 14 | 1 | 7625079 |
| | 13.30 | 0.5236 | 76 | 124 | 45 | 14 | 1 | 7625080 |
| 17/32 | 13.49 | 0.5313 | 76 | 124 | 45 | 14 | 1 | 7625081 |
| | 13.50 | 0.5315 | 76 | 124 | 45 | 14 | 1 | 7625082 |
| | 13.80 | 0.5433 | 76 | 124 | 45 | 14 | 1 | 7625083 |
| 35/64 | 13.89 | 0.5469 | 76 | 124 | 45 | 14 | 1 | 7625084 |
| | 14.00 | 0.5512 | 76 | 124 | 45 | 14 | 1 | 7625085 |
| | 14.25 | 0.5610 | 82 | 133 | 48 | 16 | 1 | 7625086 |
| 9/16 | 14.29 | 0.5625 | 82 | 133 | 48 | 16 | 1 | 7625087 |
| | 14.50 | 0.5709 | 82 | 133 | 48 | 16 | 1 | 7625088 |
| 37/64 | 14.68 | 0.5781 | 82 | 133 | 48 | 16 | 1 | 7625089 |
| | 14.80 | 0.5827 | 82 | 133 | 48 | 16 | 1 | 7625090 |
| | 15.00 | 0.5906 | 82 | 133 | 48 | 16 | 1 | 7625091 |
| 19/32 | 15.08 | 0.5938 | 82 | 133 | 48 | 16 | 1 | 7625092 |
| | 15.10 | 0.5945 | 82 | 133 | 48 | 16 | 1 | 7625093 |
| | 15.30 | 0.6024 | 82 | 133 | 48 | 16 | 1 | 7625094 |
| 39/64 | 15.48 | 0.6094 | 82 | 133 | 48 | 16 | 1 | 7625095 |
| | 15.50 | 0.6102 | 82 | 133 | 48 | 16 | 1 | 7625096 |
| | 15.80 | 0.6220 | 82 | 133 | 48 | 16 | 1 | 7625097 |
| 5/8 | 15.88 | 0.6250 | 82 | 133 | 48 | 16 | 1 | 7625098 |
| | 16.00 | 0.6299 | 82 | 133 | 48 | 16 | 1 | 7625099 |

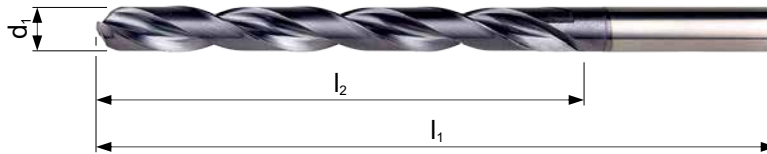
Multi-Application, 8xD, Reinforced Shank

R459 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 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



8XD

HM



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 | 6718973 |
| | 3.10 | 0.1220 | 37 | 79 | 36 | 6 | 1 | 6718974 |
| 1/8 | 3.18 | 0.1252 | 37 | 79 | 36 | 6 | 1 | 6718975 |
| | 3.20 | 0.1260 | 37 | 79 | 36 | 6 | 1 | 6718976 |
| | 3.30 | 0.1299 | 37 | 79 | 36 | 6 | 1 | 6718977 |
| | 3.40 | 0.1339 | 37 | 79 | 36 | 6 | 1 | 6718978 |
| | 3.50 | 0.1378 | 37 | 79 | 36 | 6 | 1 | 6718979 |
| 9/64 | 3.57 | 0.1406 | 37 | 79 | 36 | 6 | 1 | 6718990 |
| | 3.60 | 0.1417 | 37 | 79 | 36 | 6 | 1 | 6718991 |
| | 3.70 | 0.1457 | 37 | 79 | 36 | 6 | 1 | 6718992 |
| | 3.80 | 0.1496 | 48 | 90 | 36 | 6 | 1 | 6718993 |
| | 3.90 | 0.1535 | 48 | 90 | 36 | 6 | 1 | 6718994 |
| 5/32 | 3.97 | 0.1563 | 48 | 90 | 36 | 6 | 1 | 6718995 |
| | 4.00 | 0.1575 | 48 | 90 | 36 | 6 | 1 | 6718996 |
| | 4.10 | 0.1614 | 48 | 90 | 36 | 6 | 1 | 6718997 |
| | 4.20 | 0.1654 | 48 | 90 | 36 | 6 | 1 | 6718998 |
| | 4.30 | 0.1693 | 48 | 90 | 36 | 6 | 1 | 6718999 |
| 11/64 | 4.37 | 0.1720 | 48 | 90 | 36 | 6 | 1 | 6719000 |
| | 4.40 | 0.1732 | 48 | 90 | 36 | 6 | 1 | 6719001 |
| | 4.50 | 0.1772 | 48 | 90 | 36 | 6 | 1 | 6719002 |
| | 4.60 | 0.1811 | 48 | 90 | 36 | 6 | 1 | 6719003 |
| | 4.70 | 0.1850 | 62 | 104 | 36 | 6 | 1 | 6719004 |
| 3/16 | 4.76 | 0.1874 | 62 | 104 | 36 | 6 | 1 | 6719005 |
| | 4.80 | 0.1890 | 62 | 104 | 36 | 6 | 1 | 6719006 |
| | 4.90 | 0.1929 | 62 | 104 | 36 | 6 | 1 | 6719007 |
| | 5.00 | 0.1969 | 62 | 104 | 36 | 6 | 1 | 6719008 |
| | 5.10 | 0.2008 | 62 | 104 | 36 | 6 | 1 | 6719009 |
| 13/64 | 5.16 | 0.2031 | 62 | 104 | 36 | 6 | 1 | 6719010 |
| | 5.20 | 0.2047 | 62 | 104 | 36 | 6 | 1 | 6719011 |
| | 5.30 | 0.2087 | 62 | 104 | 36 | 6 | 1 | 6719012 |
| | 5.40 | 0.2126 | 62 | 104 | 36 | 6 | 1 | 6719013 |
| | 5.50 | 0.2165 | 62 | 104 | 36 | 6 | 1 | 6719014 |

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 | 6719015 |
| | 5.60 | 0.2205 | 62 | 104 | 36 | 6 | 1 | 6719016 |
| | 5.70 | 0.2244 | 62 | 104 | 36 | 6 | 1 | 6719017 |
| | 5.80 | 0.2283 | 62 | 104 | 36 | 6 | 1 | 6719018 |
| | 5.90 | 0.2323 | 62 | 104 | 36 | 6 | 1 | 6719019 |
| 15/64 | 5.95 | 0.2343 | 62 | 104 | 36 | 6 | 1 | 6719020 |
| | 6.00 | 0.2362 | 62 | 104 | 36 | 6 | 1 | 6719021 |
| | 6.10 | 0.2402 | 84 | 126 | 36 | 8 | 1 | 6719022 |
| | 6.20 | 0.2441 | 84 | 126 | 36 | 8 | 1 | 6719023 |
| | 6.30 | 0.2480 | 84 | 126 | 36 | 8 | 1 | 6719024 |
| 1/4 | 6.35 | 0.2500 | 84 | 126 | 36 | 8 | 1 | 6719025 |
| | 6.40 | 0.2520 | 84 | 126 | 36 | 8 | 1 | 6719026 |
| | 6.50 | 0.2559 | 84 | 126 | 36 | 8 | 1 | 6719027 |
| | 6.60 | 0.2598 | 84 | 126 | 36 | 8 | 1 | 6719028 |
| | 6.70 | 0.2638 | 84 | 126 | 36 | 8 | 1 | 6719029 |
| 17/64 | 6.75 | 0.2657 | 84 | 126 | 36 | 8 | 1 | 6719030 |
| | 6.80 | 0.2677 | 84 | 126 | 36 | 8 | 1 | 6719031 |
| | 6.90 | 0.2717 | 84 | 126 | 36 | 8 | 1 | 6719032 |
| | 7.00 | 0.2756 | 84 | 126 | 36 | 8 | 1 | 6719033 |
| | 7.10 | 0.2795 | 84 | 126 | 36 | 8 | 1 | 6719034 |
| 9/32 | 7.14 | 0.2811 | 84 | 126 | 36 | 8 | 1 | 6719035 |
| | 7.20 | 0.2835 | 84 | 126 | 36 | 8 | 1 | 6719036 |
| | 7.30 | 0.2874 | 84 | 126 | 36 | 8 | 1 | 6719037 |
| | 7.40 | 0.2913 | 84 | 126 | 36 | 8 | 1 | 6719038 |
| | 7.50 | 0.2953 | 84 | 126 | 36 | 8 | 1 | 6719039 |
| 19/64 | 7.54 | 0.2969 | 84 | 126 | 36 | 8 | 1 | 6719040 |
| | 7.60 | 0.2992 | 84 | 126 | 36 | 8 | 1 | 6719041 |
| | 7.70 | 0.3031 | 84 | 126 | 36 | 8 | 1 | 6719042 |
| | 7.80 | 0.3071 | 84 | 126 | 36 | 8 | 1 | 6719043 |
| | 7.90 | 0.3110 | 84 | 126 | 36 | 8 | 1 | 6719044 |
| 5/16 | 7.94 | 0.3126 | 84 | 126 | 36 | 8 | 1 | 6719045 |
| | 8.00 | 0.3150 | 84 | 126 | 36 | 8 | 1 | 6719046 |
| | 8.10 | 0.3189 | 106 | 152 | 40 | 10 | 1 | 6719047 |
| | 8.20 | 0.3228 | 106 | 152 | 40 | 10 | 1 | 6719048 |
| | 8.30 | 0.3268 | 106 | 152 | 40 | 10 | 1 | 6719049 |
| 21/64 | 8.33 | 0.3280 | 106 | 152 | 40 | 10 | 1 | 6719050 |
| | 8.40 | 0.3307 | 106 | 152 | 40 | 10 | 1 | 6719051 |
| | 8.50 | 0.3346 | 106 | 152 | 40 | 10 | 1 | 6719052 |
| | 8.60 | 0.3386 | 106 | 152 | 40 | 10 | 1 | 6719053 |
| | 8.70 | 0.3425 | 106 | 152 | 40 | 10 | 1 | 6719054 |
| 11/32 | 8.73 | 0.3437 | 106 | 152 | 40 | 10 | 1 | 6719055 |
| | 8.80 | 0.3465 | 106 | 152 | 40 | 10 | 1 | 6719056 |
| | 8.90 | 0.3504 | 106 | 152 | 40 | 10 | 1 | 6719057 |
| | 9.00 | 0.3543 | 106 | 152 | 40 | 10 | 1 | 6719058 |
| | 9.10 | 0.3583 | 106 | 152 | 40 | 10 | 1 | 6719059 |
| 23/64 | 9.13 | 0.3594 | 106 | 152 | 40 | 10 | 1 | 6719060 |
| | 9.20 | 0.3622 | 106 | 152 | 40 | 10 | 1 | 6719061 |
| | 9.30 | 0.3661 | 106 | 152 | 40 | 10 | 1 | 6719062 |
| | 9.40 | 0.3701 | 106 | 152 | 40 | 10 | 1 | 6719063 |
| | 9.50 | 0.3740 | 106 | 152 | 40 | 10 | 1 | 6719064 |
| 3/8 | 9.53 | 0.3748 | 106 | 152 | 40 | 10 | 1 | 6719065 |
| | 9.60 | 0.3780 | 106 | 152 | 40 | 10 | 1 | 6719066 |
| | 9.70 | 0.3819 | 106 | 152 | 40 | 10 | 1 | 6719067 |
| | 9.80 | 0.3858 | 106 | 152 | 40 | 10 | 1 | 6719068 |
| | 9.90 | 0.3898 | 106 | 152 | 40 | 10 | 1 | 6719069 |
| 25/64 | 9.92 | 0.3906 | 106 | 152 | 40 | 10 | 1 | 6719070 |
| | 10.00 | 0.3937 | 106 | 152 | 40 | 10 | 1 | 6719071 |
| | 10.20 | 0.4016 | 128 | 180 | 45 | 12 | 1 | 6719072 |
| | 10.30 | 0.4055 | 128 | 180 | 45 | 12 | 1 | 6719073 |
| 13/32 | 10.32 | 0.4063 | 128 | 180 | 45 | 12 | 1 | 6719074 |
| | 10.40 | 0.4094 | 128 | 180 | 45 | 12 | 1 | 6719075 |
| | 10.50 | 0.4134 | 128 | 180 | 45 | 12 | 1 | 6719076 |
| 27/64 | 10.72 | 0.4220 | 128 | 180 | 45 | 12 | 1 | 6719077 |
| | 10.80 | 0.4252 | 128 | 180 | 45 | 12 | 1 | 6719078 |

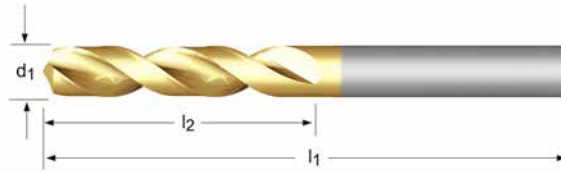
| d_1 Ø _{m7} Inch | d_1 Ø _{m7} mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 Ø _{h6} mm | Pack Qty | R459 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|--------------------------------|-------------|---------|
| | 11.00 | 0.4331 | 128 | 180 | 45 | 12 | 1 | 6719079 |
| 7/16 | 11.11 | 0.4374 | 128 | 180 | 45 | 12 | 1 | 6719080 |
| | 11.20 | 0.4409 | 128 | 180 | 45 | 12 | 1 | 6719081 |
| | 11.30 | 0.4449 | 128 | 180 | 45 | 12 | 1 | 6719082 |
| | 11.50 | 0.4528 | 128 | 180 | 45 | 12 | 1 | 6719083 |
| 29/64 | 11.51 | 0.4531 | 128 | 180 | 45 | 12 | 1 | 6719084 |
| | 11.80 | 0.4646 | 128 | 180 | 45 | 12 | 1 | 6719085 |
| 15/32 | 11.91 | 0.4689 | 128 | 180 | 45 | 12 | 1 | 6719086 |
| | 12.00 | 0.4724 | 128 | 180 | 45 | 12 | 1 | 6719087 |
| | 12.20 | 0.4803 | 151 | 202 | 48 | 14 | 1 | 6719088 |
| 31/64 | 12.30 | 0.4843 | 151 | 202 | 48 | 14 | 1 | 6719089 |
| | 12.50 | 0.4921 | 151 | 202 | 48 | 14 | 1 | 6719090 |
| 1/2 | 12.70 | 0.5000 | 151 | 202 | 48 | 14 | 1 | 6719091 |
| | 12.80 | 0.5039 | 151 | 202 | 48 | 14 | 1 | 6719092 |
| | 13.00 | 0.5118 | 151 | 202 | 48 | 14 | 1 | 6719093 |
| 33/64 | 13.10 | 0.5157 | 151 | 202 | 48 | 14 | 1 | 6719094 |
| 17/32 | 13.49 | 0.5311 | 151 | 202 | 48 | 14 | 1 | 6719095 |
| | 13.50 | 0.5315 | 151 | 202 | 48 | 14 | 1 | 6719096 |
| 35/64 | 13.89 | 0.5469 | 151 | 202 | 48 | 14 | 1 | 6719097 |
| | 14.00 | 0.5512 | 151 | 202 | 48 | 14 | 1 | 6719098 |
| | 14.25 | 0.5610 | 172 | 227 | 48 | 16 | 1 | 6719099 |
| 9/16 | 14.29 | 0.5626 | 172 | 227 | 48 | 16 | 1 | 6719100 |
| | 14.50 | 0.5709 | 172 | 227 | 48 | 16 | 1 | 6719101 |
| 37/64 | 14.68 | 0.5780 | 172 | 227 | 48 | 16 | 1 | 6719102 |
| | 15.00 | 0.5906 | 172 | 227 | 48 | 16 | 1 | 6719103 |
| 19/32 | 15.08 | 0.5937 | 172 | 227 | 48 | 16 | 1 | 6719104 |
| | 15.10 | 0.5945 | 172 | 227 | 48 | 16 | 1 | 6719105 |
| 39/64 | 15.48 | 0.6094 | 172 | 227 | 48 | 16 | 1 | 6719106 |
| | 15.50 | 0.6102 | 172 | 227 | 48 | 16 | 1 | 6719107 |
| 5/8 | 15.88 | 0.6252 | 172 | 227 | 48 | 16 | 1 | 6719108 |
| | 16.00 | 0.6299 | 172 | 227 | 48 | 16 | 1 | 6719109 |

Multi-Application, Screw Machine Length

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 Ø _{h8} Inch | d_1 Ø _{h8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A520 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 3.00 | 0.1181 | 16 | 46 | 1 | 5970286 |
| | 3.10 | 0.1220 | 18 | 49 | 1 | 5970447 |
| 1/8 | 3.18 | 0.1250 | 18 | 49 | 1 | 5970282 |
| | 3.20 | 0.1260 | 18 | 49 | 1 | 5970483 |
| | 3.30 | 0.1299 | 18 | 49 | 1 | 5970513 |
| | 3.40 | 0.1339 | 20 | 52 | 1 | 5970545 |
| | 3.50 | 0.1378 | 20 | 52 | 1 | 5970567 |
| 9/64 | 3.57 | 0.1406 | 20 | 52 | 1 | 5970032 |
| | 3.60 | 0.1417 | 20 | 52 | 1 | 5970571 |
| | 3.70 | 0.1457 | 20 | 52 | 1 | 5970574 |
| | 3.80 | 0.1496 | 22 | 55 | 1 | 5970576 |
| | 3.90 | 0.1535 | 22 | 55 | 1 | 5970578 |
| 5/32 | 3.97 | 0.1563 | 22 | 55 | 1 | 5970528 |
| | 4.00 | 0.1575 | 22 | 55 | 1 | 5970462 |
| | 4.10 | 0.1614 | 22 | 55 | 1 | 5970466 |
| | 4.20 | 0.1654 | 22 | 55 | 1 | 5970469 |
| | 4.30 | 0.1693 | 24 | 58 | 1 | 5970471 |
| 11/64 | 4.37 | 0.1719 | 24 | 58 | 1 | 5970200 |
| | 4.40 | 0.1732 | 24 | 58 | 1 | 5970474 |
| | 4.50 | 0.1772 | 24 | 58 | 1 | 5970477 |
| | 4.60 | 0.1811 | 24 | 58 | 1 | 5970480 |
| | 4.70 | 0.1850 | 24 | 58 | 1 | 5970485 |
| 3/16 | 4.76 | 0.1875 | 26 | 62 | 1 | 5970451 |
| | 4.80 | 0.1890 | 26 | 62 | 1 | 5970488 |
| | 4.90 | 0.1929 | 26 | 62 | 1 | 5970490 |
| | 5.00 | 0.1969 | 26 | 62 | 1 | 5970493 |
| | 5.10 | 0.2008 | 26 | 62 | 1 | 5970496 |
| 13/64 | 5.16 | 0.2031 | 26 | 62 | 1 | 5970240 |
| | 5.20 | 0.2047 | 26 | 62 | 1 | 5970499 |
| | 5.30 | 0.2087 | 26 | 62 | 1 | 5970502 |
| | 5.40 | 0.2126 | 28 | 66 | 1 | 5970505 |
| | 5.50 | 0.2165 | 28 | 66 | 1 | 5970508 |
| 7/32 | 5.56 | 0.2188 | 28 | 66 | 1 | 5970139 |

| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A520 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 5.60 | 0.2205 | 28 | 66 | 1 | 5970511 |
| | 5.70 | 0.2244 | 28 | 66 | 1 | 5970516 |
| | 5.80 | 0.2283 | 28 | 66 | 1 | 5970519 |
| | 5.90 | 0.2323 | 28 | 66 | 1 | 5970521 |
| 15/64 | 5.95 | 0.2344 | 28 | 66 | 1 | 5970248 |
| | 6.00 | 0.2362 | 28 | 66 | 1 | 5970532 |
| | 6.10 | 0.2402 | 31 | 70 | 1 | 5970537 |
| | 6.20 | 0.2441 | 31 | 70 | 1 | 5970539 |
| | 6.30 | 0.2480 | 31 | 70 | 1 | 5970541 |
| 1/4 | 6.35 | 0.2500 | 31 | 70 | 1 | 5970236 |
| | 6.40 | 0.2520 | 31 | 70 | 1 | 5970543 |
| | 6.50 | 0.2559 | 31 | 70 | 1 | 5970547 |
| | 6.60 | 0.2598 | 31 | 70 | 1 | 5970549 |
| | 6.70 | 0.2638 | 31 | 70 | 1 | 5970551 |
| 17/64 | 6.75 | 0.2656 | 34 | 74 | 1 | 5970254 |
| | 6.80 | 0.2677 | 34 | 74 | 1 | 5970553 |
| | 6.90 | 0.2717 | 34 | 74 | 1 | 5970555 |
| | 7.00 | 0.2756 | 34 | 74 | 1 | 5970557 |
| | 7.10 | 0.2795 | 34 | 74 | 1 | 5970559 |
| 9/32 | 7.14 | 0.2812 | 34 | 74 | 1 | 5970027 |
| | 7.20 | 0.2835 | 34 | 74 | 1 | 5970561 |
| | 7.30 | 0.2874 | 34 | 74 | 1 | 5970563 |
| | 7.40 | 0.2913 | 34 | 74 | 1 | 5970565 |
| | 7.50 | 0.2953 | 34 | 74 | 1 | 5970569 |
| 19/64 | 7.54 | 0.2969 | 37 | 79 | 1 | 5970258 |
| | 7.60 | 0.2992 | 37 | 79 | 1 | 5969952 |
| | 7.70 | 0.3031 | 37 | 79 | 1 | 5969987 |
| | 7.80 | 0.3071 | 37 | 79 | 1 | 5970042 |
| | 7.90 | 0.3110 | 37 | 79 | 1 | 5970092 |
| 5/16 | 7.94 | 0.3125 | 37 | 79 | 1 | 5970524 |
| | 8.00 | 0.3150 | 37 | 79 | 1 | 5970143 |
| | 8.10 | 0.3189 | 37 | 79 | 1 | 5970147 |
| | 8.20 | 0.3228 | 37 | 79 | 1 | 5970152 |
| | 8.30 | 0.3268 | 37 | 79 | 1 | 5969954 |
| 21/64 | 8.33 | 0.3281 | 37 | 79 | 1 | 5970261 |
| | 8.40 | 0.3307 | 37 | 79 | 1 | 5969957 |
| | 8.50 | 0.3346 | 37 | 79 | 1 | 5969960 |
| | 8.60 | 0.3386 | 40 | 84 | 1 | 5969963 |
| | 8.70 | 0.3425 | 40 | 84 | 1 | 5969966 |
| 11/32 | 8.73 | 0.3437 | 40 | 84 | 1 | 5970199 |
| | 8.80 | 0.3465 | 40 | 84 | 1 | 5969969 |
| | 8.90 | 0.3504 | 40 | 84 | 1 | 5969972 |
| | 9.00 | 0.3543 | 40 | 84 | 1 | 5969975 |
| | 9.10 | 0.3583 | 40 | 84 | 1 | 5969979 |
| 23/64 | 9.13 | 0.3594 | 40 | 84 | 1 | 5970265 |
| | 9.20 | 0.3622 | 40 | 84 | 1 | 5969983 |
| | 9.30 | 0.3661 | 40 | 84 | 1 | 5969990 |
| | 9.40 | 0.3701 | 40 | 84 | 1 | 5969997 |
| | 9.50 | 0.3740 | 40 | 84 | 1 | 5970004 |
| 3/8 | 9.52 | 0.3750 | 43 | 89 | 1 | 5970455 |
| | 9.60 | 0.3780 | 43 | 89 | 1 | 5970009 |
| | 9.70 | 0.3819 | 43 | 89 | 1 | 5970014 |
| | 9.80 | 0.3858 | 43 | 89 | 1 | 5970018 |
| | 9.90 | 0.3898 | 43 | 89 | 1 | 5970022 |
| 25/64 | 9.92 | 0.3906 | 43 | 89 | 1 | 5970269 |
| | 10.00 | 0.3937 | 43 | 89 | 1 | 5970290 |
| | 10.10 | 0.3976 | 43 | 89 | 1 | 5970294 |
| | 10.20 | 0.4016 | 43 | 89 | 1 | 5970298 |
| | 10.30 | 0.4055 | 43 | 89 | 1 | 5970302 |
| 13/32 | 10.32 | 0.4063 | 43 | 89 | 1 | 5970232 |
| | 10.40 | 0.4094 | 43 | 89 | 1 | 5970174 |
| | 10.50 | 0.4134 | 43 | 89 | 1 | 5970178 |
| | 10.60 | 0.4173 | 43 | 89 | 1 | 5970180 |
| | 10.70 | 0.4213 | 47 | 95 | 1 | 5970182 |
| 27/64 | 10.72 | 0.4219 | 47 | 95 | 1 | 5970274 |
| | 10.80 | 0.4252 | 47 | 95 | 1 | 5970184 |

ADX SCREW MACHINE DRILL



| d_1 \varnothing_{h_8} Inch | d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A520 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 10.90 | 0.4291 | 47 | 95 | 1 | 5970186 |
| | 11.00 | 0.4331 | 47 | 95 | 1 | 5970188 |
| | 11.10 | 0.4370 | 47 | 95 | 1 | 5970189 |
| 7/16 | 11.11 | 0.4375 | 47 | 95 | 1 | 5970132 |
| | 11.20 | 0.4409 | 47 | 95 | 1 | 5970190 |
| | 11.30 | 0.4449 | 47 | 95 | 1 | 5970191 |
| | 11.40 | 0.4488 | 47 | 95 | 1 | 5970193 |
| | 11.50 | 0.4528 | 47 | 95 | 1 | 5970194 |
| 29/64 | 11.51 | 0.4531 | 47 | 95 | 1 | 5970278 |
| | 11.60 | 0.4567 | 47 | 95 | 1 | 5970195 |
| | 11.70 | 0.4606 | 47 | 95 | 1 | 5970196 |
| | 11.80 | 0.4646 | 47 | 95 | 1 | 5970197 |
| | 11.90 | 0.4685 | 51 | 102 | 1 | 5970198 |
| 15/32 | 11.91 | 0.4688 | 51 | 102 | 1 | 5970244 |
| | 12.00 | 0.4724 | 51 | 102 | 1 | 5970201 |
| | 12.10 | 0.4764 | 51 | 102 | 1 | 5970202 |
| | 12.20 | 0.4803 | 51 | 102 | 1 | 5970205 |
| | 12.30 | 0.4843 | 51 | 102 | 1 | 5970208 |
| 31/64 | 12.30 | 0.4843 | 51 | 102 | 1 | 5970458 |
| | 12.40 | 0.4882 | 51 | 102 | 1 | 5970210 |
| | 12.50 | 0.4921 | 51 | 102 | 1 | 5970213 |
| | 12.60 | 0.4961 | 51 | 102 | 1 | 5970216 |
| | 12.70 | 0.5000 | 51 | 102 | 1 | 5970219 |
| 1/2 | 12.70 | 0.5000 | 51 | 102 | 1 | 5970203 |
| | 12.80 | 0.5039 | 51 | 102 | 1 | 5970222 |
| | 12.90 | 0.5079 | 51 | 102 | 1 | 5970225 |
| | 13.00 | 0.5118 | 51 | 102 | 1 | 5970228 |

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

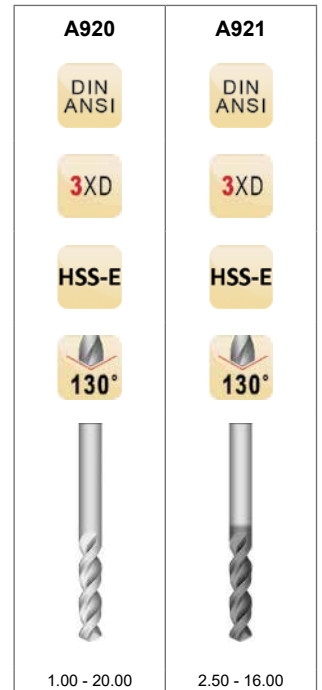
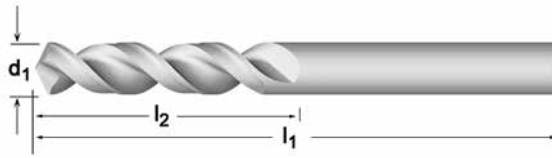
Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

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.



| d_1 Øh ₈ Inch | d_1 Øh ₈ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A920 | A921 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|---------|---------|
| | 1.00 | 0.0394 | 6 | 26 | 1 | 5972252 | — |
| | 1.10 | 0.0433 | 7 | 28 | 1 | 5972257 | — |
| 3/64 | 1.19 | 0.0469 | 13 | 35 | 1 | 5972320 | — |
| | 1.20 | 0.0472 | 8 | 30 | 1 | 5972261 | — |
| | 1.25 | 0.0492 | 8 | 30 | 1 | 5972265 | — |
| | 1.30 | 0.0512 | 8 | 30 | 1 | 5972269 | — |
| | 1.35 | 0.0531 | 9 | 32 | 1 | 5972273 | — |
| | 1.40 | 0.0551 | 9 | 32 | 1 | 5972277 | — |
| | 1.50 | 0.0591 | 9 | 32 | 1 | 5972292 | — |
| | 1.55 | 0.0610 | 10 | 34 | 1 | 5972352 | — |
| 1/16 | 1.59 | 0.0625 | 16 | 41 | 1 | 5972536 | — |
| | 1.60 | 0.0630 | 10 | 34 | 1 | 5972389 | — |
| | 1.70 | 0.0669 | 10 | 34 | 1 | 5972434 | — |
| | 1.75 | 0.0689 | 11 | 36 | 1 | 5972481 | — |
| | 1.80 | 0.0709 | 11 | 36 | 1 | 5972524 | — |
| | 1.90 | 0.0748 | 11 | 36 | 1 | 5972532 | — |
| 5/64 | 1.98 | 0.0781 | 17 | 43 | 1 | 5972343 | — |
| | 2.00 | 0.0787 | 12 | 38 | 1 | 5972340 | — |
| | 2.10 | 0.0827 | 12 | 38 | 1 | 5972344 | — |
| | 2.15 | 0.0846 | 13 | 40 | 1 | 5972346 | — |
| | 2.20 | 0.0866 | 13 | 40 | 1 | 5972348 | — |
| | 2.30 | 0.0906 | 13 | 40 | 1 | 5972350 | — |
| | 2.35 | 0.0925 | 14 | 43 | 1 | 5972208 | — |
| 3/32 | 2.38 | 0.0937 | 19 | 41 | 1 | 5972313 | — |
| | 2.40 | 0.0945 | 14 | 43 | 1 | 5972212 | — |
| | 2.50 | 0.0984 | 14 | 43 | 1 | 5972216 | 5972616 |
| | 2.60 | 0.1024 | 14 | 43 | 1 | 5972220 | 5972620 |
| | 2.70 | 0.1063 | 16 | 46 | 1 | 5972229 | 5972624 |
| 7/64 | 2.78 | 0.1094 | 21 | 46 | 1 | 5972429 | 5972962 |
| | 2.80 | 0.1102 | 16 | 46 | 1 | 5972233 | — |
| | 2.90 | 0.1142 | 16 | 46 | 1 | 5972236 | 5972628 |
| | 3.00 | 0.1181 | 16 | 46 | 1 | 5972279 | 5972655 |
| | 3.10 | 0.1220 | 18 | 49 | 1 | 5972282 | 5972659 |

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 | 5972355 | 5971789 |
| | 3.20 | 0.1260 | 18 | 49 | 1 | 5972286 | 5972663 |
| | 3.30 | 0.1299 | 18 | 49 | 1 | 5972294 | 5972667 |
| | 3.40 | 0.1339 | 20 | 52 | 1 | 5972297 | 5972671 |
| | 3.50 | 0.1378 | 20 | 52 | 1 | 5972301 | 5972675 |
| 9/64 | 3.57 | 0.1406 | 24 | 49 | 1 | 5971669 | 5972558 |
| | 3.60 | 0.1417 | 20 | 52 | 1 | 5972304 | 5972683 |
| | 3.70 | 0.1457 | 20 | 52 | 1 | 5972306 | 5972688 |
| | 3.80 | 0.1496 | 22 | 55 | 1 | 5972308 | 5972691 |
| | 3.90 | 0.1535 | 22 | 55 | 1 | 5972310 | 5972696 |
| 5/32 | 3.97 | 0.1563 | 25 | 52 | 1 | 5972341 | 5972844 |
| | 4.00 | 0.1575 | 22 | 55 | 1 | 5972334 | 5972737 |
| | 4.10 | 0.1614 | 22 | 55 | 1 | 5972336 | 5972741 |
| | 4.20 | 0.1654 | 22 | 55 | 1 | 5972338 | 5972745 |
| 11/64 | 4.30 | 0.1693 | 24 | 58 | 1 | 5972342 | 5972749 |
| | 4.37 | 0.1719 | 27 | 54 | 1 | 5972413 | 5971828 |
| | 4.40 | 0.1732 | 24 | 58 | 1 | 5972311 | 5972753 |
| | 4.50 | 0.1772 | 24 | 58 | 1 | 5972333 | 5972756 |
| | 4.60 | 0.1811 | 24 | 58 | 1 | 5972354 | 5972760 |
| 3/16 | 4.70 | 0.1850 | 24 | 58 | 1 | 5972391 | 5972764 |
| | 4.76 | 0.1875 | 29 | 56 | 1 | 5972312 | 5972701 |
| | 4.80 | 0.1890 | 26 | 62 | 1 | 5972436 | 5972769 |
| | 4.90 | 0.1929 | 26 | 62 | 1 | 5972446 | 5972777 |
| | 5.00 | 0.1969 | 26 | 62 | 1 | 5972317 | 5972834 |
| 13/64 | 5.10 | 0.2008 | 26 | 62 | 1 | 5972319 | 5972875 |
| | 5.16 | 0.2031 | 30 | 57 | 1 | 5972459 | 5972679 |
| | 5.20 | 0.2047 | 26 | 62 | 1 | 5972321 | 5972928 |
| | 5.30 | 0.2087 | 26 | 62 | 1 | 5972323 | 5972977 |
| | 5.40 | 0.2126 | 28 | 66 | 1 | 5972325 | 5973023 |
| 7/32 | 5.50 | 0.2165 | 28 | 66 | 1 | 5972327 | 5973030 |
| | 5.56 | 0.2188 | 32 | 60 | 1 | 5972425 | 5972956 |
| | 5.60 | 0.2205 | 28 | 66 | 1 | 5972329 | 5973034 |
| | 5.70 | 0.2244 | 28 | 66 | 1 | 5972331 | 5973038 |
| | 5.80 | 0.2283 | 28 | 66 | 1 | 5972335 | 5973041 |
| 15/64 | 5.90 | 0.2323 | 28 | 66 | 1 | 5972337 | 5972838 |
| | 5.95 | 0.2344 | 33 | 62 | 1 | 5972492 | 5972605 |
| | 6.00 | 0.2362 | 28 | 66 | 1 | 5972347 | 5972852 |
| | 6.10 | 0.2402 | 31 | 70 | 1 | 5972349 | 5972854 |
| | 6.20 | 0.2441 | 31 | 70 | 1 | 5972351 | 5972858 |
| 1/4 | 6.30 | 0.2480 | 31 | 70 | 1 | 5972353 | 5972863 |
| | 6.35 | 0.2500 | 35 | 64 | 1 | 5972544 | 5971780 |
| | 6.40 | 0.2520 | 31 | 70 | 1 | 5972356 | 5972867 |
| | 6.50 | 0.2559 | 31 | 70 | 1 | 5972359 | 5972870 |
| | 6.60 | 0.2598 | 31 | 70 | 1 | 5972362 | 5972879 |
| 17/64 | 6.70 | 0.2638 | 31 | 70 | 1 | 5972366 | 5972884 |
| | 6.75 | 0.2656 | 37 | 67 | 1 | 5972516 | 5972609 |
| | 6.80 | 0.2677 | 34 | 74 | 1 | 5972369 | 5972889 |
| | 6.90 | 0.2717 | 34 | 74 | 1 | 5972373 | 5972894 |
| | 7.00 | 0.2756 | 34 | 74 | 1 | 5972377 | 5972899 |
| 9/32 | 7.10 | 0.2795 | 34 | 74 | 1 | 5972381 | 5972902 |
| | 7.14 | 0.2812 | 38 | 68 | 1 | 5971666 | 5972556 |
| | 7.20 | 0.2835 | 34 | 74 | 1 | 5972385 | 5972909 |
| | 7.30 | 0.2874 | 34 | 74 | 1 | 5972388 | 5972914 |
| | 7.40 | 0.2913 | 34 | 74 | 1 | 5972396 | 5972918 |
| 19/64 | 7.50 | 0.2953 | 34 | 74 | 1 | 5972399 | 5972923 |
| | 7.54 | 0.2969 | 40 | 70 | 1 | 5972318 | 5972614 |
| | 7.60 | 0.2992 | 37 | 79 | 1 | 5972403 | 5972932 |
| | 7.70 | 0.3031 | 37 | 79 | 1 | 5972407 | 5972937 |
| | 7.80 | 0.3071 | 37 | 79 | 1 | 5972411 | 5972943 |
| 5/16 | 7.90 | 0.3110 | 37 | 79 | 1 | 5972418 | 5972948 |
| | 7.94 | 0.3125 | 41 | 71 | 1 | 5972339 | 5972841 |
| | 8.00 | 0.3150 | 37 | 79 | 1 | 5972433 | 5972965 |
| | 8.10 | 0.3189 | 37 | 79 | 1 | 5972442 | 5972969 |
| | 8.20 | 0.3228 | 37 | 79 | 1 | 5971617 | 5972973 |
| 21/64 | 8.30 | 0.3268 | 37 | 79 | 1 | 5971662 | 5972981 |
| | 8.33 | 0.3281 | 43 | 75 | 1 | 5972253 | 5972632 |

| 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 | 5971709 | 5972987 |
| | 8.50 | 0.3346 | 37 | 79 | 1 | 5971753 | 5972991 |
| | 8.60 | 0.3386 | 40 | 84 | 1 | 5971796 | 5972995 |
| | 8.70 | 0.3425 | 40 | 84 | 1 | 5971803 | 5972999 |
| 11/32 | 8.73 | 0.3437 | 43 | 76 | 1 | 5972409 | 5971826 |
| | 8.80 | 0.3465 | 40 | 84 | 1 | 5971806 | 5973003 |
| | 8.90 | 0.3504 | 40 | 84 | 1 | 5971808 | 5973007 |
| | 9.00 | 0.3543 | 40 | 84 | 1 | 5971809 | 5973011 |
| | 9.10 | 0.3583 | 40 | 84 | 1 | 5971624 | 5973015 |
| 23/64 | 9.13 | 0.3594 | 44 | 78 | 1 | 5972260 | 5972640 |
| | 9.20 | 0.3622 | 40 | 84 | 1 | 5971628 | 5973019 |
| | 9.30 | 0.3661 | 40 | 84 | 1 | 5971632 | 5973026 |
| | 9.40 | 0.3701 | 40 | 84 | 1 | 5971634 | 5972358 |
| | 9.50 | 0.3740 | 40 | 84 | 1 | 5971638 | 5972404 |
| 3/8 | 9.52 | 0.3750 | 46 | 79 | 1 | 5972322 | 5972708 |
| | 9.60 | 0.3780 | 43 | 89 | 1 | 5971642 | 5972449 |
| | 9.70 | 0.3819 | 43 | 89 | 1 | 5971646 | 5972494 |
| | 9.80 | 0.3858 | 43 | 89 | 1 | 5971650 | 5972539 |
| | 9.90 | 0.3898 | 43 | 89 | 1 | 5971654 | 5972547 |
| 25/64 | 9.92 | 0.3906 | 48 | 83 | 1 | 5972267 | 5972644 |
| | 10.00 | 0.3937 | 43 | 89 | 1 | 5972357 | 5971794 |
| | 10.20 | 0.4016 | 43 | 89 | 1 | 5972360 | 5971798 |
| | 10.30 | 0.4055 | 43 | 89 | 1 | 5972361 | 5971802 |
| 13/32 | 10.32 | 0.4063 | 49 | 84 | 1 | 5972453 | 5972636 |
| | 10.50 | 0.4134 | 43 | 89 | 1 | 5972367 | 5971807 |
| 27/64 | 10.72 | 0.4219 | 51 | 86 | 1 | 5972271 | 5972648 |
| | 10.80 | 0.4252 | 47 | 95 | 1 | 5972374 | 5971812 |
| | 11.00 | 0.4331 | 47 | 95 | 1 | 5972378 | 5971814 |
| 7/16 | 11.11 | 0.4375 | 52 | 87 | 1 | 5972421 | 5972953 |
| | 11.50 | 0.4528 | 47 | 95 | 1 | 5972395 | 5971822 |
| 29/64 | 11.51 | 0.4531 | 54 | 90 | 1 | 5972275 | 5972652 |
| | 11.80 | 0.4646 | 47 | 95 | 1 | 5972401 | 5971824 |
| 15/32 | 11.91 | 0.4688 | 54 | 92 | 1 | 5972489 | 5972792 |
| | 12.00 | 0.4724 | 51 | 102 | 1 | 5972415 | 5971830 |
| | 12.20 | 0.4803 | 51 | 102 | 1 | 5972422 | — |
| 31/64 | 12.30 | 0.4843 | 56 | 94 | 1 | 5972324 | 5972712 |
| | 12.50 | 0.4921 | 51 | 102 | 1 | 5972426 | 5971834 |
| 1/2 | 12.70 | 0.5000 | 57 | 95 | 1 | 5972540 | 5971776 |
| | 13.00 | 0.5118 | 51 | 102 | 1 | 5972444 | 5971842 |
| 33/64 | 13.10 | 0.5156 | 60 | 98 | 1 | 5972326 | 5972715 |
| | 13.50 | 0.5315 | 54 | 107 | 1 | 5972450 | 5972603 |
| 35/64 | 13.89 | 0.5469 | 64 | 102 | 1 | 5972328 | 5972719 |
| | 14.00 | 0.5512 | 54 | 107 | 1 | 5972464 | 5972726 |
| 9/16 | 14.29 | 0.5625 | 64 | 102 | 1 | 5971658 | 5972553 |
| | 14.50 | 0.5709 | 56 | 111 | 1 | 5972468 | 5972772 |
| 37/64 | 14.68 | 0.5781 | 67 | 105 | 1 | 5972330 | 5972723 |
| | 14.75 | 0.5807 | 56 | 111 | 1 | 5972474 | 5972781 |
| | 15.00 | 0.5906 | 56 | 111 | 1 | 5972477 | 5972785 |
| 19/32 | 15.08 | 0.5937 | 67 | 105 | 1 | 5972290 | 5972611 |
| 39/64 | 15.48 | 0.6094 | 70 | 108 | 1 | 5972332 | 5972730 |
| | 15.50 | 0.6102 | 58 | 115 | 1 | 5972485 | 5972789 |
| 5/8 | 15.88 | 0.6250 | 70 | 108 | 1 | 5972345 | 5972847 |
| | 16.00 | 0.6299 | 58 | 115 | 1 | 5972496 | 5972607 |
| 41/64 | 16.27 | 0.6406 | 73 | 114 | 1 | 5972451 | — |
| | 16.50 | 0.6496 | 60 | 119 | 1 | 5972500 | — |
| 21/32 | 16.67 | 0.6563 | 73 | 114 | 1 | 5972245 | — |
| | 16.75 | 0.6594 | 60 | 119 | 1 | 5972504 | — |
| | 17.00 | 0.6693 | 60 | 119 | 1 | 5972508 | — |
| 43/64 | 17.07 | 0.6719 | 73 | 117 | 1 | 5972456 | — |
| 11/16 | 17.46 | 0.6875 | 73 | 117 | 1 | 5972405 | — |
| | 17.50 | 0.6890 | 62 | 123 | 1 | 5972512 | — |
| 45/64 | 17.86 | 0.7031 | 76 | 121 | 1 | 5972461 | — |
| | 18.00 | 0.7087 | 62 | 123 | 1 | 5972520 | — |
| 23/32 | 18.26 | 0.7188 | 76 | 121 | 1 | 5972256 | — |
| | 18.50 | 0.7283 | 64 | 127 | 1 | 5972528 | — |
| 47/64 | 18.65 | 0.7344 | 79 | 127 | 1 | 5972314 | — |

PFX SCREW MACHINE DRILL



| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A920 | A921 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|---------|------|
| | 19.00 | 0.7480 | 64 | 127 | 1 | 5972202 | — |
| 3/4 | 19.05 | 0.7500 | 79 | 127 | 1 | 5972316 | — |
| 49/64 | 19.45 | 0.7656 | 83 | 130 | 1 | 5972315 | — |
| | 19.50 | 0.7677 | 66 | 131 | 1 | 5972249 | — |
| 25/32 | 19.84 | 0.7813 | 83 | 130 | 1 | 5972264 | — |
| | 20.00 | 0.7874 | 66 | 131 | 1 | 5972241 | — |

Multi-Application, Jobber Length

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 Ø _{h8} Inch | d_1 Ø _{h8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A510 |
|----------------------------------|--------------------------------|--------------------------|-------------|-------------|-------------|-------------|
| | 3.00 | 0.1181 | 33 | 61 | 1 | 5970433 |
| | 3.10 | 0.1220 | 36 | 65 | 1 | 5970435 |
| 1/8 | 3.18 | 0.1250 | 36 | 65 | 1 | 5970041 |
| | 3.20 | 0.1260 | 36 | 65 | 1 | 5970437 |
| | 3.30 | 0.1299 | 36 | 65 | 1 | 5970439 |
| | 3.40 | 0.1339 | 39 | 70 | 1 | 5970441 |
| | 3.50 | 0.1378 | 39 | 70 | 1 | 5970443 |
| 9/64 | 3.57 | 0.1406 | 39 | 70 | 1 | 5970449 |
| | 3.60 | 0.1417 | 39 | 70 | 1 | 5970445 |
| | 3.70 | 0.1457 | 39 | 70 | 1 | 5970448 |
| | 3.80 | 0.1496 | 43 | 75 | 1 | 5970453 |
| | 3.90 | 0.1535 | 43 | 75 | 1 | 5970457 |
| 5/32 | 3.97 | 0.1563 | 43 | 75 | 1 | 5970452 |
| | 4.00 | 0.1575 | 43 | 75 | 1 | 5970472 |
| | 4.10 | 0.1614 | 43 | 75 | 1 | 5970475 |
| | 4.20 | 0.1654 | 43 | 75 | 1 | 5970478 |
| | 4.30 | 0.1693 | 47 | 80 | 1 | 5970481 |
| 11/64 | 4.37 | 0.1719 | 47 | 80 | 1 | 5970138 |
| | 4.40 | 0.1732 | 47 | 80 | 1 | 5970486 |
| | 4.50 | 0.1772 | 47 | 80 | 1 | 5970491 |
| | 4.60 | 0.1811 | 47 | 80 | 1 | 5970494 |
| | 4.70 | 0.1850 | 47 | 80 | 1 | 5970497 |
| 3/16 | 4.76 | 0.1875 | 52 | 86 | 1 | 5970461 |
| | 4.80 | 0.1890 | 52 | 86 | 1 | 5970500 |
| | 4.90 | 0.1929 | 52 | 86 | 1 | 5970504 |
| | 5.00 | 0.1969 | 52 | 86 | 1 | 5970507 |
| | 5.10 | 0.2008 | 52 | 86 | 1 | 5970509 |
| 13/64 | 5.16 | 0.2031 | 52 | 86 | 1 | 5970403 |
| | 5.20 | 0.2047 | 52 | 86 | 1 | 5970512 |
| | 5.30 | 0.2087 | 52 | 86 | 1 | 5970515 |
| | 5.40 | 0.2126 | 57 | 93 | 1 | 5970518 |
| | 5.50 | 0.2165 | 57 | 93 | 1 | 5970525 |
| 7/32 | 5.56 | 0.2188 | 57 | 93 | 1 | 5970389 |

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 | 5970307 |
| | 5.70 | 0.2244 | 57 | 93 | 1 | 5970354 |
| | 5.80 | 0.2283 | 57 | 93 | 1 | 5970393 |
| | 5.90 | 0.2323 | 57 | 93 | 1 | 5970424 |
| 15/64 | 5.95 | 0.2344 | 57 | 93 | 1 | 5970412 |
| | 6.00 | 0.2362 | 57 | 93 | 1 | 5970456 |
| | 6.10 | 0.2402 | 63 | 101 | 1 | 5970459 |
| | 6.20 | 0.2441 | 63 | 101 | 1 | 5970463 |
| | 6.30 | 0.2480 | 63 | 101 | 1 | 5970313 |
| 1/4 | 6.35 | 0.2500 | 63 | 101 | 1 | 5970034 |
| | 6.40 | 0.2520 | 63 | 101 | 1 | 5970317 |
| | 6.50 | 0.2559 | 63 | 101 | 1 | 5970321 |
| | 6.60 | 0.2598 | 63 | 101 | 1 | 5970325 |
| | 6.70 | 0.2638 | 63 | 101 | 1 | 5970329 |
| 17/64 | 6.75 | 0.2656 | 69 | 109 | 1 | 5970415 |
| | 6.80 | 0.2677 | 69 | 109 | 1 | 5970332 |
| | 6.90 | 0.2717 | 69 | 109 | 1 | 5970336 |
| | 7.00 | 0.2756 | 69 | 109 | 1 | 5970340 |
| | 7.10 | 0.2795 | 69 | 109 | 1 | 5970345 |
| 9/32 | 7.14 | 0.2812 | 69 | 109 | 1 | 5970444 |
| | 7.20 | 0.2835 | 69 | 109 | 1 | 5970350 |
| | 7.30 | 0.2874 | 69 | 109 | 1 | 5970359 |
| | 7.40 | 0.2913 | 69 | 109 | 1 | 5970362 |
| | 7.50 | 0.2953 | 69 | 109 | 1 | 5970365 |
| 19/64 | 7.54 | 0.2969 | 75 | 117 | 1 | 5970418 |
| | 7.60 | 0.2992 | 75 | 117 | 1 | 5970369 |
| | 7.70 | 0.3031 | 75 | 117 | 1 | 5970372 |
| | 7.80 | 0.3071 | 75 | 117 | 1 | 5970379 |
| | 7.90 | 0.3110 | 75 | 117 | 1 | 5970383 |
| 5/16 | 7.94 | 0.3125 | 75 | 117 | 1 | 5970446 |
| | 8.00 | 0.3150 | 75 | 117 | 1 | 5970391 |
| | 8.10 | 0.3189 | 75 | 117 | 1 | 5970395 |
| | 8.20 | 0.3228 | 75 | 117 | 1 | 5970398 |
| | 8.30 | 0.3268 | 75 | 117 | 1 | 5970400 |
| 21/64 | 8.33 | 0.3281 | 75 | 117 | 1 | 5970421 |
| | 8.40 | 0.3307 | 75 | 117 | 1 | 5970404 |
| | 8.50 | 0.3346 | 75 | 117 | 1 | 5970406 |
| | 8.60 | 0.3386 | 81 | 125 | 1 | 5970410 |
| | 8.70 | 0.3425 | 81 | 125 | 1 | 5970413 |
| 11/32 | 8.73 | 0.3437 | 81 | 125 | 1 | 5970136 |
| | 8.80 | 0.3465 | 81 | 125 | 1 | 5970416 |
| | 8.90 | 0.3504 | 81 | 125 | 1 | 5970419 |
| | 9.00 | 0.3543 | 81 | 125 | 1 | 5970422 |
| | 9.10 | 0.3583 | 81 | 125 | 1 | 5970425 |
| 23/64 | 9.13 | 0.3594 | 81 | 125 | 1 | 5970423 |
| | 9.20 | 0.3622 | 81 | 125 | 1 | 5970428 |
| | 9.30 | 0.3661 | 81 | 125 | 1 | 5970430 |
| | 9.40 | 0.3701 | 81 | 125 | 1 | 5970432 |
| | 9.50 | 0.3740 | 81 | 125 | 1 | 5970434 |
| 3/8 | 9.52 | 0.3750 | 87 | 133 | 1 | 5970465 |
| | 9.60 | 0.3780 | 87 | 133 | 1 | 5970436 |
| | 9.70 | 0.3819 | 87 | 133 | 1 | 5970438 |
| | 9.80 | 0.3858 | 87 | 133 | 1 | 5970440 |
| | 9.90 | 0.3898 | 87 | 133 | 1 | 5970442 |
| 25/64 | 9.92 | 0.3906 | 87 | 133 | 1 | 5970426 |
| | 10.00 | 0.3937 | 87 | 133 | 1 | 5970046 |
| | 10.10 | 0.3976 | 87 | 133 | 1 | 5970051 |
| | 10.20 | 0.4016 | 87 | 133 | 1 | 5970055 |
| | 10.30 | 0.4055 | 87 | 133 | 1 | 5970066 |
| 13/32 | 10.32 | 0.4063 | 87 | 133 | 1 | 5970401 |
| | 10.40 | 0.4094 | 87 | 133 | 1 | 5970069 |
| | 10.50 | 0.4134 | 87 | 133 | 1 | 5970073 |
| | 10.60 | 0.4173 | 87 | 133 | 1 | 5970077 |
| | 10.70 | 0.4213 | 94 | 142 | 1 | 5970081 |
| 27/64 | 10.72 | 0.4219 | 94 | 142 | 1 | 5970429 |
| | 10.80 | 0.4252 | 94 | 142 | 1 | 5970085 |

| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A510 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 10.90 | 0.4291 | 94 | 142 | 1 | 5970089 |
| | 11.00 | 0.4331 | 94 | 142 | 1 | 5970093 |
| | 11.10 | 0.4370 | 94 | 142 | 1 | 5970097 |
| 7/16 | 11.11 | 0.4375 | 94 | 142 | 1 | 5970386 |
| | 11.20 | 0.4409 | 94 | 142 | 1 | 5970099 |
| | 11.30 | 0.4449 | 94 | 142 | 1 | 5970107 |
| | 11.40 | 0.4488 | 94 | 142 | 1 | 5970111 |
| | 11.50 | 0.4528 | 94 | 142 | 1 | 5970115 |
| 29/64 | 11.51 | 0.4531 | 94 | 142 | 1 | 5970431 |
| | 11.60 | 0.4567 | 94 | 142 | 1 | 5970119 |
| | 11.70 | 0.4606 | 94 | 142 | 1 | 5970124 |
| | 11.80 | 0.4646 | 94 | 142 | 1 | 5970128 |
| | 11.90 | 0.4685 | 101 | 151 | 1 | 5970131 |
| 15/32 | 11.91 | 0.4688 | 101 | 151 | 1 | 5970409 |
| | 12.00 | 0.4724 | 101 | 151 | 1 | 5970142 |
| | 12.10 | 0.4764 | 101 | 151 | 1 | 5970148 |
| | 12.20 | 0.4803 | 101 | 151 | 1 | 5970397 |
| | 12.30 | 0.4843 | 101 | 151 | 1 | 5970427 |
| 31/64 | 12.30 | 0.4843 | 101 | 151 | 1 | 5970467 |
| | 12.40 | 0.4882 | 101 | 151 | 1 | 5970450 |
| | 12.50 | 0.4921 | 101 | 151 | 1 | 5970489 |
| | 12.60 | 0.4961 | 101 | 151 | 1 | 5970522 |
| | 12.70 | 0.5000 | 101 | 151 | 1 | 5970527 |
| 1/2 | 12.70 | 0.5000 | 101 | 151 | 1 | 5970029 |
| | 12.80 | 0.5039 | 101 | 151 | 1 | 5970530 |
| | 12.90 | 0.5079 | 101 | 151 | 1 | 5970533 |
| | 13.00 | 0.5118 | 101 | 151 | 1 | 5970535 |
| | 14.00 | 0.5512 | 108 | 160 | 1 | 5970407 |

ADX STANDARD LENGTH DRILL

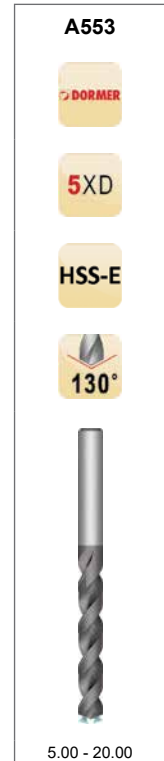
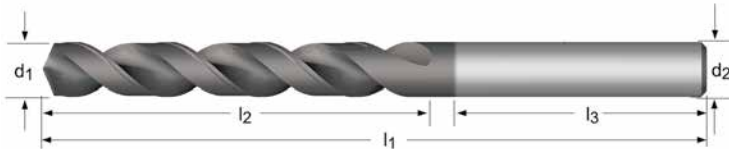


Multi-Application, Premium Cobalt Coolant Feed w/ Reinforced Shank

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.



| d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 $\varnothing h_6$ mm | Pack Qty | A553 |
|----------------------------------|--------------------------|-------------|-------------|-------------|----------------------------------|-------------|---------|
| 5.00 | 0.1969 | 36 | 79 | 36 | 6 | 1 | 5971370 |
| 5.20 | 0.2047 | 38 | 79 | 36 | 6 | 1 | 5971464 |
| 5.50 | 0.2165 | 40 | 79 | 36 | 6 | 1 | 5971554 |
| 6.00 | 0.2362 | 43 | 79 | 36 | 6 | 1 | 5971566 |
| 6.30 | 0.2480 | 46 | 87 | 36 | 8 | 1 | 5971376 |
| 6.50 | 0.2559 | 47 | 87 | 36 | 8 | 1 | 5971378 |
| 6.80 | 0.2677 | 48 | 87 | 36 | 8 | 1 | 5971386 |
| 6.90 | 0.2717 | 48 | 87 | 36 | 8 | 1 | 5971390 |
| 7.00 | 0.2756 | 48 | 87 | 36 | 8 | 1 | 5971395 |
| 7.40 | 0.2913 | 54 | 94 | 36 | 8 | 1 | 5971404 |
| 7.50 | 0.2953 | 54 | 94 | 36 | 8 | 1 | 5971409 |
| 8.00 | 0.3150 | 58 | 94 | 36 | 8 | 1 | 5971424 |
| 8.50 | 0.3346 | 75 | 130 | 40 | 10 | 1 | 5971428 |
| 8.70 | 0.3425 | 75 | 130 | 40 | 10 | 1 | 5971430 |
| 9.00 | 0.3543 | 75 | 130 | 40 | 10 | 1 | 5971434 |
| 9.50 | 0.3740 | 75 | 130 | 40 | 10 | 1 | 5971443 |
| 10.00 | 0.3937 | 75 | 130 | 40 | 10 | 1 | 5969984 |
| 10.20 | 0.4016 | 87 | 150 | 45 | 12 | 1 | 5969988 |
| 10.30 | 0.4055 | 87 | 150 | 45 | 12 | 1 | 5969993 |
| 10.50 | 0.4134 | 87 | 150 | 45 | 12 | 1 | 5969998 |
| 11.00 | 0.4330 | 94 | 150 | 45 | 12 | 1 | 5970005 |
| 11.30 | 0.4449 | 94 | 150 | 45 | 12 | 1 | 5970011 |
| 11.50 | 0.4528 | 94 | 150 | 45 | 12 | 1 | 5970017 |
| 12.00 | 0.4724 | 94 | 150 | 45 | 12 | 1 | 5970020 |
| 12.50 | 0.4921 | 101 | 160 | 45 | 14 | 1 | 5970030 |
| 13.00 | 0.5118 | 101 | 160 | 45 | 14 | 1 | 5970035 |
| 13.50 | 0.5315 | 101 | 160 | 45 | 14 | 1 | 5970048 |
| 14.00 | 0.5512 | 101 | 160 | 45 | 14 | 1 | 5970058 |
| 14.25 | 0.5610 | 108 | 170 | 48 | 16 | 1 | 5970063 |
| 14.50 | 0.5709 | 108 | 170 | 48 | 16 | 1 | 5970068 |
| 15.00 | 0.5906 | 108 | 170 | 48 | 16 | 1 | 5970080 |
| 15.25 | 0.6004 | 108 | 170 | 48 | 16 | 1 | 5970083 |
| 15.50 | 0.6102 | 108 | 170 | 48 | 16 | 1 | 5970088 |

| d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | l_3 mm | d_2 $\varnothing h_6$ mm | Pack Qty | A553 |
|----------------------------------|--------------------------|-------------|-------------|-------------|----------------------------------|-------------|---------|
| 16.00 | 0.6299 | 108 | 170 | 48 | 16 | 1 | 5970094 |
| 16.50 | 0.6496 | 125 | 190 | 48 | 18 | 1 | 5970104 |
| 17.00 | 0.6693 | 125 | 190 | 48 | 18 | 1 | 5970113 |
| 17.50 | 0.6890 | 130 | 190 | 48 | 18 | 1 | 5970127 |
| 17.75 | 0.6988 | 130 | 190 | 48 | 18 | 1 | 5970134 |
| 18.00 | 0.7087 | 130 | 190 | 48 | 18 | 1 | 5970137 |
| 19.00 | 0.7480 | 135 | 200 | 50 | 20 | 1 | 5970153 |
| 19.25 | 0.7579 | 140 | 200 | 50 | 20 | 1 | 5970156 |
| 20.00 | 0.7874 | 140 | 200 | 50 | 20 | 1 | 5970167 |

PFX JOBBER LENGTH DRILL



Premium Cobalt Jobber Length - Parabolic Flute for Advanced Chip Removal

A900

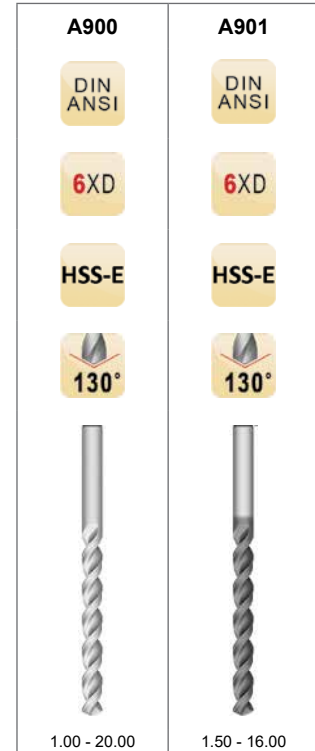
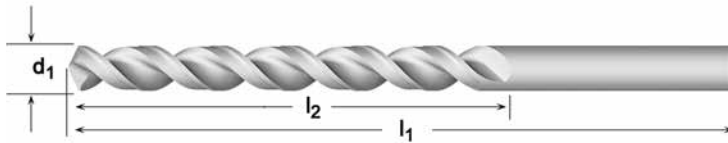
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
4.3 5.1 5.2 5.3 6.1 6.2 6.3 6.4 7.1 7.2 7.3 7.4 8.1 8.2

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.



| 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 | 5970610 | — |
| | 1.10 | 0.0433 | 14 | 36 | 1 | 5970612 | — |
| 3/64 | 1.19 | 0.0469 | 19 | 44 | 1 | 5971100 | — |
| | 1.20 | 0.0472 | 16 | 38 | 1 | 5970614 | — |
| | 1.25 | 0.0492 | 16 | 36 | 1 | 5970615 | — |
| | 1.30 | 0.0512 | 16 | 38 | 1 | 5970617 | — |
| | 1.40 | 0.0551 | 18 | 40 | 1 | 5970621 | — |
| | 1.50 | 0.0591 | 18 | 40 | 1 | 5970627 | 5971575 |
| | 1.55 | 0.0610 | 20 | 43 | 1 | 5970628 | 5971576 |
| 1/16 | 1.59 | 0.0625 | 22 | 48 | 1 | 5970644 | 5971586 |
| | 1.60 | 0.0630 | 20 | 43 | 1 | 5970630 | 5971578 |
| | 1.70 | 0.0669 | 20 | 43 | 1 | 5970633 | — |
| | 1.75 | 0.0689 | 22 | 46 | 1 | 5970635 | 5971580 |
| | 1.80 | 0.0709 | 22 | 46 | 1 | 5970638 | 5971582 |
| | 1.90 | 0.0748 | 22 | 46 | 1 | 5970641 | 5971585 |
| 5/64 | 1.98 | 0.0781 | 25 | 51 | 1 | 5971244 | 5971804 |
| | 2.00 | 0.0787 | 24 | 49 | 1 | 5971407 | 5971779 |
| | 2.10 | 0.0827 | 24 | 49 | 1 | 5971410 | 5971787 |
| | 2.15 | 0.0846 | 27 | 53 | 1 | 5971415 | 5971791 |
| | 2.20 | 0.0866 | 27 | 53 | 1 | 5971421 | — |
| | 2.30 | 0.0906 | 27 | 53 | 1 | 5971432 | — |
| 3/32 | 2.38 | 0.0937 | 32 | 57 | 1 | 5971289 | 5971688 |
| | 2.40 | 0.0945 | 30 | 57 | 1 | 5971442 | 5971799 |
| | 2.50 | 0.0984 | 30 | 57 | 1 | 5971445 | 5971606 |
| | 2.60 | 0.1024 | 30 | 57 | 1 | 5971450 | 5971609 |
| | 2.70 | 0.1063 | 33 | 61 | 1 | 5971455 | 5971611 |
| 7/64 | 2.78 | 0.1094 | 38 | 67 | 1 | 5970898 | 5971718 |
| | 2.80 | 0.1102 | 33 | 61 | 1 | 5971460 | — |
| | 2.90 | 0.1142 | 33 | 61 | 1 | 5971466 | 5971614 |
| | 3.00 | 0.1181 | 33 | 61 | 1 | 5971513 | 5971637 |
| | 3.10 | 0.1220 | 36 | 65 | 1 | 5971517 | 5971645 |
| 1/8 | 3.18 | 0.1250 | 41 | 70 | 1 | 5970659 | 5971592 |
| | 3.20 | 0.1260 | 36 | 65 | 1 | 5971521 | 5971649 |
| | 3.30 | 0.1299 | 36 | 65 | 1 | 5971529 | 5971653 |

| 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 | 5971098 | 5971656 |
| | 3.50 | 0.1378 | 39 | 70 | 1 | 5971123 | 5971661 |
| 9/64 | 3.57 | 0.1406 | 44 | 73 | 1 | 5971016 | 5971934 |
| | 3.60 | 0.1417 | 39 | 70 | 1 | 5971164 | 5971665 |
| | 3.70 | 0.1457 | 39 | 70 | 1 | 5971223 | 5971670 |
| | 3.80 | 0.1496 | 43 | 75 | 1 | 5971273 | 5971674 |
| | 3.90 | 0.1535 | 43 | 75 | 1 | 5971281 | 5971677 |
| 5/32 | 3.97 | 0.1563 | 51 | 79 | 1 | 5971240 | 5971801 |
| | 4.00 | 0.1575 | 43 | 75 | 1 | 5971115 | 5971719 |
| | 4.10 | 0.1614 | 43 | 75 | 1 | 5971117 | 5971726 |
| | 4.20 | 0.1654 | 43 | 75 | 1 | 5971120 | 5971730 |
| | 4.30 | 0.1693 | 47 | 80 | 1 | 5971126 | 5971738 |
| 11/64 | 4.37 | 0.1719 | 54 | 83 | 1 | 5970728 | 5971616 |
| | 4.40 | 0.1732 | 47 | 80 | 1 | 5971129 | 5971741 |
| | 4.50 | 0.1772 | 47 | 80 | 1 | 5971132 | 5971746 |
| | 4.60 | 0.1811 | 47 | 80 | 1 | 5971136 | 5971750 |
| | 4.70 | 0.1850 | 47 | 80 | 1 | 5971140 | 5971756 |
| 3/16 | 4.76 | 0.1875 | 59 | 89 | 1 | 5971285 | 5971681 |
| | 4.80 | 0.1890 | 52 | 86 | 1 | 5971144 | 5971759 |
| | 4.90 | 0.1929 | 52 | 86 | 1 | 5971147 | 5971763 |
| | 5.00 | 0.1969 | 52 | 86 | 1 | 5971183 | 5971767 |
| | 5.10 | 0.2008 | 52 | 86 | 1 | 5971188 | 5971771 |
| 13/64 | 5.16 | 0.2031 | 62 | 92 | 1 | 5971534 | 5971657 |
| | 5.20 | 0.2047 | 52 | 86 | 1 | 5971192 | 5971775 |
| | 5.30 | 0.2087 | 52 | 86 | 1 | 5971197 | 5971783 |
| | 5.40 | 0.2126 | 57 | 93 | 1 | 5971202 | 5971608 |
| | 5.50 | 0.2165 | 57 | 93 | 1 | 5971207 | 5971651 |
| 7/32 | 5.56 | 0.2188 | 64 | 95 | 1 | 5970891 | 5971714 |
| | 5.60 | 0.2205 | 57 | 93 | 1 | 5971212 | 5971700 |
| | 5.70 | 0.2244 | 57 | 93 | 1 | 5971218 | 5971744 |
| | 5.80 | 0.2283 | 57 | 93 | 1 | 5971227 | 5971786 |
| | 5.90 | 0.2323 | 57 | 93 | 1 | 5971231 | 5971793 |
| 15/64 | 5.95 | 0.2344 | 67 | 98 | 1 | 5971360 | 5971687 |
| | 6.00 | 0.2362 | 57 | 93 | 1 | 5971253 | 5971615 |
| | 6.10 | 0.2402 | 63 | 101 | 1 | 5971256 | 5971619 |
| | 6.20 | 0.2441 | 63 | 101 | 1 | 5971260 | 5971622 |
| | 6.30 | 0.2480 | 63 | 101 | 1 | 5971264 | 5971627 |
| 1/4 | 6.35 | 0.2500 | 70 | 102 | 1 | 5970655 | 5971588 |
| | 6.40 | 0.2520 | 63 | 101 | 1 | 5971277 | 5971631 |
| | 6.50 | 0.2559 | 63 | 101 | 1 | 5970865 | 5971636 |
| | 6.60 | 0.2598 | 63 | 101 | 1 | 5970907 | 5971639 |
| | 6.70 | 0.2638 | 63 | 101 | 1 | 5970963 | 5971643 |
| 17/64 | 6.75 | 0.2656 | 73 | 105 | 1 | 5971377 | 5971641 |
| | 6.80 | 0.2677 | 69 | 109 | 1 | 5971005 | 5971647 |
| | 6.90 | 0.2717 | 69 | 109 | 1 | 5971044 | 5971655 |
| | 7.00 | 0.2756 | 69 | 109 | 1 | 5971050 | 5971659 |
| | 7.10 | 0.2795 | 69 | 109 | 1 | 5971053 | 5971663 |
| 9/32 | 7.14 | 0.2812 | 75 | 108 | 1 | 5971009 | 5971927 |
| | 7.20 | 0.2835 | 69 | 109 | 1 | 5971056 | 5971667 |
| | 7.30 | 0.2874 | 69 | 109 | 1 | 5971059 | 5971671 |
| | 7.40 | 0.2913 | 69 | 109 | 1 | 5970869 | 5971675 |
| | 7.50 | 0.2953 | 69 | 109 | 1 | 5970872 | 5971680 |
| 19/64 | 7.54 | 0.2969 | 78 | 111 | 1 | 5971405 | 5971734 |
| | 7.60 | 0.2992 | 75 | 117 | 1 | 5970875 | 5971684 |
| | 7.70 | 0.3031 | 75 | 117 | 1 | 5970878 | 5971691 |
| | 7.80 | 0.3071 | 75 | 117 | 1 | 5970882 | 5971695 |
| | 7.90 | 0.3110 | 75 | 117 | 1 | 5970885 | 5971705 |
| 5/16 | 7.94 | 0.3125 | 81 | 114 | 1 | 5971234 | 5971797 |
| | 8.00 | 0.3150 | 75 | 117 | 1 | 5970902 | 5971722 |
| | 8.10 | 0.3189 | 75 | 117 | 1 | 5970914 | 5971725 |
| | 8.20 | 0.3228 | 75 | 117 | 1 | 5970918 | 5971729 |
| | 8.30 | 0.3268 | 75 | 117 | 1 | 5970924 | 5971733 |
| 21/64 | 8.33 | 0.3280 | 84 | 117 | 1 | 5971483 | 5971618 |
| | 8.40 | 0.3307 | 75 | 117 | 1 | 5970928 | 5971737 |
| | 8.50 | 0.3346 | 75 | 117 | 1 | 5970932 | 5971742 |
| | 8.60 | 0.3386 | 81 | 125 | 1 | 5970937 | 5971748 |

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 | 5970942 | 5971752 |
| 11/32 | 8.73 | 0.3437 | 87 | 121 | 1 | 5970723 | 5971613 |
| | 8.80 | 0.3465 | 81 | 125 | 1 | 5970949 | 5971755 |
| | 8.90 | 0.3504 | 81 | 125 | 1 | 5970953 | 5971758 |
| | 9.00 | 0.3543 | 81 | 125 | 1 | 5970958 | 5971762 |
| | 9.10 | 0.3583 | 81 | 125 | 1 | 5970967 | 5971766 |
| 23/64 | 9.13 | 0.3594 | 89 | 124 | 1 | 5971492 | 5971621 |
| | 9.20 | 0.3622 | 81 | 125 | 1 | 5970972 | 5971770 |
| | 9.30 | 0.3661 | 81 | 125 | 1 | 5970973 | 5971774 |
| | 9.40 | 0.3701 | 81 | 125 | 1 | 5970978 | 5971778 |
| | 9.50 | 0.3740 | 81 | 125 | 1 | 5970981 | 5971782 |
| 3/8 | 9.52 | 0.3750 | 92 | 127 | 1 | 5971102 | 5971693 |
| | 9.60 | 0.3780 | 87 | 133 | 1 | 5970986 | 5971790 |
| | 9.70 | 0.3819 | 87 | 133 | 1 | 5970989 | 5971811 |
| | 9.80 | 0.3858 | 87 | 133 | 1 | 5970993 | 5971833 |
| | 9.90 | 0.3898 | 87 | 133 | 1 | 5970997 | 5971853 |
| 25/64 | 9.92 | 0.3906 | 95 | 130 | 1 | 5971500 | 5971625 |
| | 10.00 | 0.3937 | 87 | 133 | 1 | 5970663 | 5971594 |
| | 10.20 | 0.4016 | 87 | 133 | 1 | 5970667 | 5971595 |
| | 10.30 | 0.4055 | 87 | 133 | 1 | 5970671 | 5971596 |
| 13/32 | 10.32 | 0.4063 | 98 | 133 | 1 | 5971525 | 5971652 |
| | 10.40 | 0.4094 | 87 | 133 | 1 | 5970674 | 5971597 |
| | 10.50 | 0.4134 | 87 | 133 | 1 | 5970679 | 5971598 |
| 27/64 | 10.72 | 0.4219 | 100 | 137 | 1 | 5971505 | 5971629 |
| | 10.80 | 0.4252 | 94 | 142 | 1 | 5970689 | 5971600 |
| | 11.00 | 0.4331 | 94 | 142 | 1 | 5970692 | 5971601 |
| 7/16 | 11.11 | 0.4375 | 103 | 140 | 1 | 5970888 | 5971710 |
| | 11.50 | 0.4528 | 94 | 142 | 1 | 5970709 | 5971607 |
| 29/64 | 11.51 | 0.4531 | 106 | 143 | 1 | 5971510 | 5971633 |
| | 11.80 | 0.4646 | 94 | 142 | 1 | 5970713 | 5971610 |
| 15/32 | 11.91 | 0.4688 | 110 | 146 | 1 | 5971358 | 5971679 |
| | 12.00 | 0.4724 | 101 | 151 | 1 | 5970732 | 5971620 |
| 31/64 | 12.30 | 0.4843 | 111 | 149 | 1 | 5971104 | 5971698 |
| | 12.50 | 0.4921 | 101 | 151 | 1 | 5970741 | 5971626 |
| 1/2 | 12.70 | 0.5000 | 101 | 151 | 1 | 5970648 | — |
| | 13.00 | 0.5118 | 101 | 151 | 1 | 5971429 | 5971644 |
| 33/64 | 13.10 | 0.5156 | 122 | 168 | 1 | 5971106 | 5971703 |
| | 13.50 | 0.5315 | 108 | 160 | 1 | 5971479 | 5971648 |
| 35/64 | 13.89 | 0.5469 | 122 | 168 | 1 | 5971109 | 5971708 |
| | 14.00 | 0.5512 | 108 | 160 | 1 | 5971537 | 5971660 |
| 9/16 | 14.29 | 0.5625 | 122 | 168 | 1 | 5971001 | 5971882 |
| | 14.50 | 0.5709 | 114 | 169 | 1 | 5971541 | 5971664 |
| 37/64 | 14.68 | 0.5781 | 122 | 168 | 1 | 5971111 | 5971713 |
| | 15.00 | 0.5906 | 114 | 169 | 1 | 5971354 | 5971672 |
| 19/32 | 15.08 | 0.5937 | 132 | 181 | 1 | 5971401 | 5971685 |
| 39/64 | 15.48 | 0.6094 | 132 | 181 | 1 | 5971113 | 5971715 |
| | 15.50 | 0.6102 | 120 | 178 | 1 | 5971356 | 5971676 |
| 5/8 | 15.88 | 0.6250 | 132 | 181 | 1 | 5971248 | 5971612 |
| | 16.00 | 0.6299 | 120 | 178 | 1 | 5971362 | 5971604 |
| 41/64 | 16.27 | 0.6406 | 132 | 181 | 1 | 5971152 | — |
| | 16.50 | 0.6496 | 125 | 184 | 1 | 5971364 | — |
| 21/32 | 16.67 | 0.6562 | 132 | 181 | 1 | 5971476 | — |
| | 17.00 | 0.6693 | 125 | 184 | 1 | 5971369 | — |
| 43/64 | 17.07 | 0.6719 | 143 | 194 | 1 | 5971156 | — |
| 11/16 | 17.46 | 0.6875 | 143 | 194 | 1 | 5970717 | — |
| | 17.50 | 0.6890 | 130 | 191 | 1 | 5971373 | — |
| 45/64 | 17.86 | 0.7031 | 130 | 191 | 1 | 5971161 | — |
| | 18.00 | 0.7087 | 130 | 191 | 1 | 5971385 | — |
| 23/32 | 18.26 | 0.7187 | 130 | 191 | 1 | 5971490 | — |
| | 18.50 | 0.7283 | 135 | 198 | 1 | 5971389 | — |
| 47/64 | 18.65 | 0.7344 | 135 | 198 | 1 | 5971169 | — |
| | 19.00 | 0.7480 | 135 | 198 | 1 | 5971393 | — |
| 3/4 | 19.05 | 0.7500 | 135 | 198 | 1 | 5971293 | — |
| 49/64 | 19.45 | 0.7656 | 135 | 198 | 1 | 5971177 | — |
| | 19.50 | 0.7677 | 140 | 205 | 1 | 5971397 | — |
| 25/32 | 19.84 | 0.7812 | 140 | 205 | 1 | 5971496 | — |
| | 20.00 | 0.7874 | 140 | 205 | 1 | 5971472 | — |

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

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

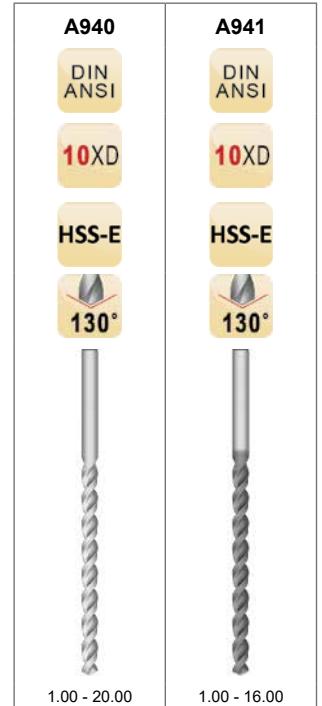
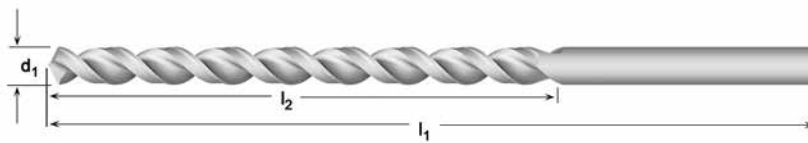
Heavy-Duty parabolic flute design allows greater drilling depths in one pass. Notched point improves chip formation. Premium cobalt material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.

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.



| 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 | 5973055 | 5972873 |
| | 1.10 | 0.0433 | 37 | 60 | 1 | 5973058 | — |
| 3/64 | 1.19 | 0.0469 | 29 | 57 | 1 | 5973218 | 5972521 |
| | 1.20 | 0.0472 | 41 | 65 | 1 | 5973059 | — |
| | 1.30 | 0.0512 | 41 | 65 | 1 | 5973060 | — |
| | 1.40 | 0.0551 | 45 | 70 | 1 | 5973062 | — |
| | 1.50 | 0.0591 | 45 | 70 | 1 | 5972881 | 5972878 |
| 1/16 | 1.59 | 0.0625 | 44 | 76 | 1 | 5972905 | 5972883 |
| | 1.60 | 0.0630 | 50 | 76 | 1 | 5972885 | — |
| | 1.70 | 0.0669 | 50 | 76 | 1 | 5972890 | — |
| | 1.80 | 0.0709 | 53 | 80 | 1 | 5972895 | — |
| | 1.90 | 0.0748 | 53 | 80 | 1 | 5972900 | — |
| 5/64 | 1.98 | 0.0781 | 51 | 95 | 1 | 5972177 | 5973006 |
| | 2.00 | 0.0787 | 56 | 85 | 1 | 5973278 | 5972594 |
| | 2.10 | 0.0827 | 56 | 85 | 1 | 5973282 | — |
| | 2.20 | 0.0866 | 59 | 90 | 1 | 5973286 | — |
| | 2.30 | 0.0906 | 59 | 90 | 1 | 5973289 | — |
| 3/32 | 2.38 | 0.0937 | 57 | 108 | 1 | 5973207 | 5972517 |
| | 2.40 | 0.0945 | 62 | 95 | 1 | 5973084 | — |
| | 2.50 | 0.0984 | 62 | 95 | 1 | 5973087 | 5972596 |
| | 2.60 | 0.1024 | 62 | 95 | 1 | 5973090 | — |
| | 2.70 | 0.1063 | 66 | 100 | 1 | 5973092 | — |
| 7/64 | 2.78 | 0.1094 | 64 | 117 | 1 | 5972281 | 5972945 |
| | 2.80 | 0.1102 | 66 | 100 | 1 | 5973095 | — |
| | 2.90 | 0.1142 | 66 | 100 | 1 | 5973098 | — |
| | 3.00 | 0.1181 | 66 | 100 | 1 | 5973142 | 5972469 |
| | 3.10 | 0.1220 | 69 | 106 | 1 | 5973146 | 5972471 |
| 1/8 | 3.18 | 0.1250 | 70 | 130 | 1 | 5972921 | 5972896 |
| | 3.20 | 0.1260 | 69 | 106 | 1 | 5973151 | 5972475 |
| | 3.30 | 0.1299 | 69 | 106 | 1 | 5973156 | 5972479 |
| | 3.40 | 0.1339 | 73 | 112 | 1 | 5973161 | 5972483 |
| | 3.50 | 0.1378 | 73 | 112 | 1 | 5973170 | 5972487 |
| 9/64 | 3.57 | 0.1406 | 76 | 137 | 1 | 5972865 | 5972365 |

PFX TAPER LENGTH DRILL



| 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 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-------------|---------|---------|
| | 3.60 | 0.1417 | 73 | 112 | 1 | 5973175 | 5972493 |
| | 3.70 | 0.1457 | 73 | 112 | 1 | 5973183 | 5972501 |
| | 3.80 | 0.1496 | 78 | 119 | 1 | 5973187 | 5972505 |
| | 3.90 | 0.1535 | 78 | 119 | 1 | 5973195 | 5972509 |
| 5/32 | 3.97 | 0.1563 | 76 | 137 | 1 | 5972173 | 5972958 |
| | 4.00 | 0.1575 | 78 | 119 | 1 | 5973252 | 5972551 |
| | 4.10 | 0.1614 | 78 | 119 | 1 | 5973256 | 5972554 |
| | 4.20 | 0.1654 | 78 | 119 | 1 | 5973259 | 5972557 |
| | 4.30 | 0.1693 | 82 | 126 | 1 | 5973263 | 5972559 |
| 11/64 | 4.37 | 0.1719 | 86 | 146 | 1 | 5972990 | 5972963 |
| | 4.40 | 0.1732 | 82 | 126 | 1 | 5973266 | 5972561 |
| | 4.50 | 0.1772 | 82 | 126 | 1 | 5973274 | 5972562 |
| | 4.60 | 0.1811 | 82 | 126 | 1 | 5972119 | 5972564 |
| | 4.70 | 0.1850 | 82 | 126 | 1 | 5972164 | 5972566 |
| 3/16 | 4.76 | 0.1875 | 86 | 146 | 1 | 5973202 | 5972513 |
| | 4.80 | 0.1890 | 87 | 132 | 1 | 5972210 | 5972570 |
| | 4.90 | 0.1929 | 87 | 132 | 1 | 5972254 | 5972572 |
| | 5.00 | 0.1969 | 87 | 132 | 1 | 5972125 | 5972574 |
| | 5.10 | 0.2008 | 87 | 132 | 1 | 5972129 | 5972576 |
| 13/64 | 5.16 | 0.2031 | 92 | 152 | 1 | 5973021 | 5972996 |
| | 5.20 | 0.2047 | 87 | 132 | 1 | 5972133 | 5972578 |
| | 5.30 | 0.2087 | 87 | 132 | 1 | 5972137 | 5972580 |
| | 5.40 | 0.2126 | 91 | 139 | 1 | 5972141 | 5972582 |
| | 5.50 | 0.2165 | 91 | 139 | 1 | 5972145 | 5972584 |
| 7/32 | 5.56 | 0.2188 | 92 | 152 | 1 | 5972278 | 5972940 |
| | 5.60 | 0.2205 | 91 | 139 | 1 | 5972148 | 5972586 |
| | 5.70 | 0.2244 | 91 | 139 | 1 | 5972152 | 5972588 |
| | 5.80 | 0.2283 | 91 | 139 | 1 | 5972156 | 5972592 |
| | 5.90 | 0.2323 | 91 | 139 | 1 | 5972160 | 5972850 |
| 15/64 | 5.95 | 0.2344 | 95 | 156 | 1 | 5973046 | 5972448 |
| | 6.00 | 0.2362 | 91 | 139 | 1 | 5972185 | 5973049 |
| | 6.10 | 0.2402 | 97 | 148 | 1 | 5972189 | 5973051 |
| | 6.20 | 0.2441 | 97 | 148 | 1 | 5972193 | 5973054 |
| | 6.30 | 0.2480 | 97 | 148 | 1 | 5972198 | 5973056 |
| 1/4 | 6.35 | 0.2500 | 95 | 156 | 1 | 5972916 | 5972892 |
| | 6.40 | 0.2520 | 97 | 148 | 1 | 5972203 | 5972856 |
| | 6.50 | 0.2559 | 97 | 148 | 1 | 5972206 | 5972860 |
| | 6.60 | 0.2598 | 97 | 148 | 1 | 5972214 | 5972864 |
| | 6.70 | 0.2638 | 97 | 148 | 1 | 5972218 | 5972868 |
| 17/64 | 6.75 | 0.2656 | 98 | 159 | 1 | 5973080 | 5972541 |
| | 6.80 | 0.2677 | 102 | 156 | 1 | 5972222 | 5972871 |
| | 6.90 | 0.2717 | 102 | 156 | 1 | 5972226 | 5972876 |
| | 7.00 | 0.2756 | 102 | 156 | 1 | 5972230 | 5972880 |
| | 7.10 | 0.2795 | 102 | 156 | 1 | 5972234 | 5972886 |
| 9/32 | 7.14 | 0.2812 | 98 | 159 | 1 | 5972861 | 5973047 |
| | 7.20 | 0.2835 | 102 | 156 | 1 | 5972238 | 5972891 |
| | 7.30 | 0.2874 | 102 | 156 | 1 | 5972243 | 5972897 |
| | 7.40 | 0.2913 | 102 | 156 | 1 | 5972247 | 5972906 |
| | 7.50 | 0.2953 | 102 | 156 | 1 | 5972250 | 5972910 |
| 19/64 | 7.54 | 0.2969 | 102 | 162 | 1 | 5973270 | 5972590 |
| | 7.60 | 0.2992 | 109 | 165 | 1 | 5972258 | 5972915 |
| | 7.70 | 0.3031 | 109 | 165 | 1 | 5972262 | 5972920 |
| | 7.80 | 0.3071 | 109 | 165 | 1 | 5972266 | 5972925 |
| | 7.90 | 0.3110 | 109 | 165 | 1 | 5972270 | 5972930 |
| 5/16 | 7.94 | 0.3125 | 102 | 162 | 1 | 5972167 | 5972901 |
| | 8.00 | 0.3150 | 109 | 165 | 1 | 5972285 | 5972950 |
| | 8.10 | 0.3189 | 109 | 165 | 1 | 5972289 | 5972961 |
| | 8.20 | 0.3228 | 109 | 165 | 1 | 5972293 | 5972966 |
| | 8.30 | 0.3268 | 109 | 165 | 1 | 5972299 | 5972972 |
| 21/64 | 8.33 | 0.3281 | 105 | 165 | 1 | 5973109 | 5972598 |
| | 8.40 | 0.3307 | 109 | 165 | 1 | 5972832 | 5972976 |
| | 8.50 | 0.3346 | 109 | 165 | 1 | 5972869 | 5972980 |
| | 8.60 | 0.3386 | 115 | 175 | 1 | 5972922 | 5972984 |
| | 8.70 | 0.3425 | 115 | 175 | 1 | 5972974 | 5972988 |
| 11/32 | 8.73 | 0.3438 | 105 | 165 | 1 | 5972986 | 5972957 |
| | 8.80 | 0.3465 | 115 | 175 | 1 | 5973017 | 5972992 |

| 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 | 5973027 | 5972997 |
| | 9.00 | 0.3543 | 115 | 175 | 1 | 5973031 | 5973001 |
| | 9.10 | 0.3583 | 115 | 175 | 1 | 5973035 | 5973009 |
| 23/64 | 9.13 | 0.3594 | 108 | 171 | 1 | 5973120 | 5972600 |
| | 9.20 | 0.3622 | 115 | 175 | 1 | 5973039 | 5973012 |
| | 9.30 | 0.3661 | 115 | 175 | 1 | 5972835 | 5973016 |
| | 9.40 | 0.3701 | 115 | 175 | 1 | 5972837 | 5973020 |
| | 9.50 | 0.3740 | 115 | 175 | 1 | 5972840 | 5973024 |
| 3/8 | 9.52 | 0.3750 | 108 | 171 | 1 | 5973223 | 5972525 |
| | 9.60 | 0.3780 | 121 | 184 | 1 | 5972843 ¹⁾ | 5973028 ¹⁾ |
| | 9.70 | 0.3819 | 121 | 184 | 1 | 5972846 ¹⁾ | 5973032 ¹⁾ |
| | 9.80 | 0.3858 | 121 | 184 | 1 | 5972849 ¹⁾ | 5973036 ¹⁾ |
| | 9.90 | 0.3898 | 121 | 184 | 1 | 5972853 ¹⁾ | 5973040 ¹⁾ |
| 25/64 | 9.92 | 0.3906 | 111 | 178 | 1 | 5973129 ¹⁾ | 5972455 ¹⁾ |
| | 10.00 | 0.3937 | 121 | 184 | 1 | 5972926 ¹⁾ | 5972904 ¹⁾ |
| | 10.20 | 0.4016 | 121 | 184 | 1 | 5972936 ¹⁾ | 5972908 ¹⁾ |
| | 10.30 | 0.4055 | 121 | 184 | 1 | 5972941 ¹⁾ | 5972913 ¹⁾ |
| 13/32 | 10.32 | 0.4063 | 111 | 178 | 1 | 5973018 ¹⁾ | 5972993 ¹⁾ |
| | 10.50 | 0.4134 | 121 | 184 | 1 | 5972954 ¹⁾ | 5972927 ¹⁾ |
| 27/64 | 10.72 | 0.4219 | 117 | 184 | 1 | 5973133 ¹⁾ | 5972460 ¹⁾ |
| | 11.00 | 0.4331 | 128 | 195 | 1 | 5972964 ¹⁾ | 5972938 ¹⁾ |
| 7/16 | 11.11 | 0.4375 | 117 | 184 | 1 | 5972274 ¹⁾ | 5972935 ¹⁾ |
| | 11.20 | 0.4409 | 128 | 195 | 1 | 5972968 ¹⁾ | 5972944 ¹⁾ |
| | 11.50 | 0.4528 | 128 | 195 | 1 | 5972971 ¹⁾ | 5972949 ¹⁾ |
| 29/64 | 11.51 | 0.4531 | 121 | 190 | 1 | 5973138 ¹⁾ | 5972465 ¹⁾ |
| | 11.80 | 0.4646 | 128 | 195 | 1 | 5972975 ¹⁾ | 5972952 ¹⁾ |
| 15/32 | 11.91 | 0.4688 | 121 | 190 | 1 | 5973044 ¹⁾ | 5973022 ¹⁾ |
| | 12.00 | 0.4724 | 134 | 205 | 1 | 5972994 ¹⁾ | 5972967 ¹⁾ |
| | 12.20 | 0.4803 | 134 | 205 | 1 | 5972998 ¹⁾ | 5972970 ¹⁾ |
| 31/64 | 12.30 | 0.4843 | 121 | 197 | 1 | 5973233 ¹⁾ | 5972529 ¹⁾ |
| | 12.50 | 0.4921 | 134 | 205 | 1 | 5973002 ¹⁾ | 5972978 ¹⁾ |
| 1/2 | 12.70 | 0.5000 | 121 | 197 | 1 | 5972911 ¹⁾ | 5972887 ¹⁾ |
| | 13.00 | 0.5118 | 134 | 205 | 1 | 5973010 ¹⁾ | 5972985 ¹⁾ |
| 33/64 | 13.10 | 0.5156 | 121 | 203 | 1 | 5973236 ¹⁾ | 5972533 ¹⁾ |
| 17/32 | 13.49 | 0.5311 | 121 | 203 | 1 | 5973057 ¹⁾ | — |
| | 13.50 | 0.5315 | 140 | 214 | 1 | 5973014 ¹⁾ | 5972989 ¹⁾ |
| 35/64 | 13.89 | 0.5469 | 124 | 210 | 1 | 5973240 ¹⁾ | 5972537 ¹⁾ |
| | 14.00 | 0.5512 | 140 | 214 | 1 | 5973029 ¹⁾ | 5973000 ¹⁾ |
| 9/16 | 14.29 | 0.5625 | 124 | 210 | 1 | 5972857 ¹⁾ | 5973043 ¹⁾ |
| | 14.50 | 0.5709 | 144 | 220 | 1 | 5973033 ¹⁾ | 5973004 ¹⁾ |
| 37/64 | 14.68 | 0.5781 | 124 | 222 | 1 | 5973244 ¹⁾ | 5972546 ¹⁾ |
| | 15.00 | 0.5906 | 144 | 220 | 1 | 5973037 ¹⁾ | 5973008 ¹⁾ |
| 19/32 | 15.08 | 0.5937 | 124 | 222 | 1 | 5973228 ¹⁾ | 5972568 ¹⁾ |
| 39/64 | 15.48 | 0.6094 | 124 | 222 | 1 | 5973248 ¹⁾ | 5972548 ¹⁾ |
| | 15.50 | 0.6102 | 149 | 227 | 1 | 5973042 ¹⁾ | 5973013 ¹⁾ |
| 5/8 | 15.88 | 0.6250 | 124 | 222 | 1 | 5972182 ¹⁾ | 5973045 ¹⁾ |
| | 16.00 | 0.6299 | 149 | 227 | 1 | 5973048 ¹⁾ | 5972497 ¹⁾ |
| 41/64 | 16.27 | 0.6406 | 130 | 229 | 1 | 5972296 ¹⁾ | — |
| | 16.50 | 0.6496 | 154 | 235 | 1 | 5973050 ¹⁾ | — |
| 21/32 | 16.67 | 0.6563 | 130 | 229 | 1 | 5973106 ¹⁾ | — |
| | 17.00 | 0.6693 | 154 | 235 | 1 | 5973052 ¹⁾ | — |
| 43/64 | 17.07 | 0.6719 | 137 | 235 | 1 | 5972302 ¹⁾ | — |
| 11/16 | 17.46 | 0.6875 | 137 | 235 | 1 | 5972979 ¹⁾ | — |
| | 17.50 | 0.6890 | 158 | 241 | 1 | 5973053 ¹⁾ | — |
| 45/64 | 17.86 | 0.7031 | 143 | 241 | 1 | 5972305 ¹⁾ | — |
| | 18.00 | 0.7087 | 158 | 241 | 1 | 5973116 ¹⁾ | — |
| 23/32 | 18.26 | 0.7188 | 143 | 241 | 1 | 5973113 ¹⁾ | — |
| 47/64 | 18.65 | 0.7344 | 149 | 248 | 1 | 5972307 ¹⁾ | — |
| | 19.00 | 0.7480 | 162 | 247 | 1 | 5973165 ¹⁾ | — |
| 3/4 | 19.05 | 0.7500 | 149 | 248 | 1 | 5973213 ¹⁾ | — |
| 49/64 | 19.45 | 0.7656 | 152 | 251 | 1 | 5972309 ¹⁾ | — |
| 25/32 | 19.84 | 0.7812 | 152 | 251 | 1 | 5973125 ¹⁾ | — |
| | 20.00 | 0.7874 | 166 | 254 | 1 | 5973101 ¹⁾ | — |

¹⁾ <10xD

PFX EXTRA LENGTH DRILL



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

A976

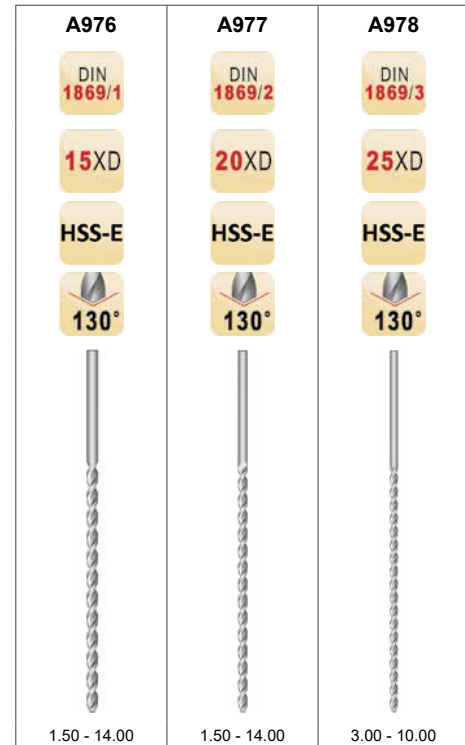
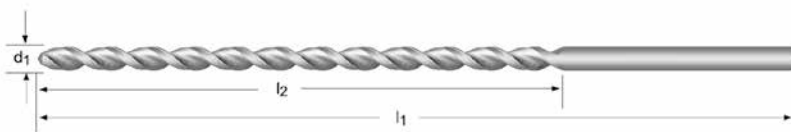
A977

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. Premium cobalt base material increases wear resistance. Bright finish improves chip flow in soft or non-ferrous materials.



| d_1 \varnothing_{h_8} Inch | d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A976 | A977 | A978 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-------------|---------|-----------------------|-----------------------|
| | 1.50 | 0.0591 | 100 | 150 | 1 | — | 5973247 ¹⁾ | — |
| | 1.50 | 0.0591 | 75 | 115 | 1 | 5972589 | — | — |
| 1/16 | 1.59 | 0.0625 | 100 | 150 | 1 | — | 5973251 ¹⁾ | — |
| | 2.00 | 0.0787 | 110 | 160 | 1 | — | 5973305 ¹⁾ | — |
| | 2.00 | 0.0787 | 85 | 125 | 1 | 5972618 | — | — |
| | 2.10 | 0.0827 | 85 | 125 | 1 | 5972622 | — | — |
| | 2.20 | 0.0866 | 90 | 135 | 1 | 5972625 | — | — |
| | 2.30 | 0.0906 | 90 | 135 | 1 | 5972629 | — | — |
| 3/32 | 2.38 | 0.0937 | 115 | 170 | 1 | — | 5973122 ¹⁾ | — |
| | 2.40 | 0.0945 | 95 | 140 | 1 | 5972633 | — | — |
| | 2.50 | 0.0984 | 95 | 140 | 1 | 5972642 | — | — |
| | 2.60 | 0.1024 | 95 | 140 | 1 | 5972646 | — | — |
| | 2.70 | 0.1063 | 100 | 150 | 1 | 5972650 | — | — |
| | 2.80 | 0.1102 | 100 | 150 | 1 | 5972654 | — | — |
| | 2.90 | 0.1142 | 100 | 150 | 1 | 5972658 | — | — |
| | 3.00 | 0.1181 | 100 | 150 | 1 | 5972662 | — | — |
| | 3.00 | 0.1181 | 130 | 190 | 1 | — | 5973110 | — |
| | 3.00 | 0.1181 | 160 | 240 | 1 | — | — | 5973199 ¹⁾ |
| | 3.10 | 0.1220 | 105 | 155 | 1 | 5972666 | — | — |
| 1/8 | 3.18 | 0.1250 | 105 | 155 | 1 | 5972595 | — | — |
| 1/8 | 3.18 | 0.1250 | 135 | 200 | 1 | — | 5973260 | — |
| | 3.20 | 0.1260 | 105 | 155 | 1 | 5972670 | — | — |
| | 3.30 | 0.1299 | 105 | 155 | 1 | 5972674 | — | — |
| | 3.40 | 0.1339 | 115 | 165 | 1 | 5972676 | — | — |
| | 3.50 | 0.1378 | 115 | 165 | 1 | 5972686 | — | — |
| | 3.50 | 0.1378 | 145 | 210 | 1 | — | 5973114 | — |
| | 3.50 | 0.1378 | 180 | 265 | 1 | — | — | 5973204 |
| | 3.60 | 0.1417 | 115 | 165 | 1 | 5973077 | — | — |
| | 3.70 | 0.1457 | 115 | 165 | 1 | 5973111 | — | — |

¹⁾ Dormer Standard

| 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 | 5973167 | — | — |
| | 3.90 | 0.1535 | 120 | 175 | 1 | 5973215 | — | — |
| 5/32 | 3.97 | 0.1563 | 120 | 175 | 1 | 5973155 | — | — |
| | 4.00 | 0.1575 | 120 | 175 | 1 | 5973276 | — | — |
| | 4.00 | 0.1575 | 150 | 220 | 1 | — | 5973127 | — |
| | 4.00 | 0.1575 | 190 | 280 | 1 | — | — | 5973220 |
| | 4.10 | 0.1614 | 120 | 175 | 1 | 5973279 | — | — |
| | 4.20 | 0.1654 | 120 | 175 | 1 | 5973284 | — | — |
| | 4.30 | 0.1693 | 125 | 185 | 1 | 5973081 | — | — |
| | 4.40 | 0.1732 | 125 | 185 | 1 | 5973083 | — | — |
| | 4.50 | 0.1772 | 125 | 185 | 1 | 5973086 | — | — |
| | 4.50 | 0.1772 | 160 | 235 | 1 | — | 5973132 | — |
| | 4.50 | 0.1772 | 200 | 295 | 1 | — | — | 5973216 |
| | 4.60 | 0.1811 | 125 | 185 | 1 | 5973089 | — | — |
| | 4.70 | 0.1850 | 125 | 185 | 1 | 5973093 | — | — |
| 3/16 | 4.76 | 0.1875 | 135 | 195 | 1 | 5973264 | — | — |
| 3/16 | 4.76 | 0.1875 | 170 | 245 | 1 | — | 5973118 | — |
| | 4.80 | 0.1890 | 135 | 195 | 1 | 5973096 | — | — |
| | 4.90 | 0.1929 | 135 | 195 | 1 | 5973097 | — | — |
| | 5.00 | 0.1969 | 135 | 195 | 1 | 5973102 | — | — |
| | 5.00 | 0.1969 | 170 | 245 | 1 | — | 5973136 | — |
| | 5.00 | 0.1969 | 210 | 315 | 1 | — | — | 5973220 |
| | 5.10 | 0.2008 | 135 | 195 | 1 | 5973104 | — | — |
| | 5.20 | 0.2047 | 135 | 195 | 1 | 5973107 | — | — |
| | 5.30 | 0.2087 | 135 | 195 | 1 | 5973115 | — | — |
| | 5.40 | 0.2126 | 140 | 205 | 1 | 5973119 | — | — |
| | 5.50 | 0.2165 | 140 | 205 | 1 | 5973124 | — | — |
| | 5.50 | 0.2165 | 180 | 260 | 1 | — | 5973141 | — |
| | 5.50 | 0.2165 | 225 | 330 | 1 | — | — | 5973226 |
| | 5.60 | 0.2205 | 140 | 205 | 1 | 5973128 | — | — |
| | 5.70 | 0.2244 | 140 | 205 | 1 | 5973135 | — | — |
| | 5.80 | 0.2283 | 140 | 205 | 1 | 5973140 | — | — |
| | 5.90 | 0.2323 | 140 | 205 | 1 | 5973145 | — | — |
| | 6.00 | 0.2362 | 140 | 205 | 1 | 5973160 | — | — |
| | 6.00 | 0.2362 | 180 | 260 | 1 | — | 5973148 | — |
| | 6.00 | 0.2362 | 225 | 330 | 1 | — | — | 5973231 |
| | 6.10 | 0.2402 | 150 | 215 | 1 | 5973171 | — | — |
| | 6.20 | 0.2441 | 150 | 215 | 1 | 5973176 | — | — |
| | 6.30 | 0.2480 | 150 | 215 | 1 | 5973180 | — | — |
| 1/4 | 6.35 | 0.2500 | 150 | 215 | 1 | 5972593 | — | — |
| 1/4 | 6.35 | 0.2500 | 190 | 275 | 1 | — | 5973220 | — |
| 1/4 | 6.35 | 0.2500 | 235 | 350 | 1 | — | — | 5973220 |
| | 6.40 | 0.2520 | 150 | 215 | 1 | 5973185 | — | — |
| | 6.50 | 0.2559 | 150 | 215 | 1 | 5973190 | — | — |
| | 6.50 | 0.2559 | 190 | 275 | 1 | — | 5973153 | — |
| | 6.50 | 0.2559 | 235 | 350 | 1 | — | — | 5973238 |
| | 6.60 | 0.2598 | 150 | 215 | 1 | 5973193 | — | — |
| | 6.70 | 0.2638 | 150 | 215 | 1 | 5973197 | — | — |
| | 6.80 | 0.2677 | 155 | 225 | 1 | 5973201 | — | — |
| | 6.90 | 0.2717 | 155 | 225 | 1 | 5973205 | — | — |
| | 7.00 | 0.2756 | 155 | 225 | 1 | 5973210 | — | — |
| | 7.00 | 0.2756 | 200 | 290 | 1 | — | 5973163 | — |
| | 7.00 | 0.2756 | 250 | 370 | 1 | — | — | 5973242 |
| | 7.50 | 0.2953 | 155 | 225 | 1 | 5973220 | — | — |
| | 7.50 | 0.2953 | 200 | 290 | 1 | — | 5973220 | — |
| | 7.50 | 0.2953 | 250 | 370 | 1 | — | — | 5973220 |
| 5/16 | 7.94 | 0.3125 | 165 | 240 | 1 | 5973150 | — | — |
| | 8.00 | 0.3150 | 165 | 240 | 1 | 5973230 | — | — |
| | 8.00 | 0.3150 | 210 | 305 | 1 | — | 5973172 | — |
| | 8.00 | 0.3150 | 265 | 390 | 1 | — | — | 5973250 |
| | 8.50 | 0.3346 | 165 | 240 | 1 | 5973235 | — | — |
| | 8.50 | 0.3346 | 210 | 305 | 1 | — | 5973220 | — |
| | 8.50 | 0.3346 | 265 | 390 | 1 | — | — | 5973220 |
| 11/32 | 8.73 | 0.3437 | 175 | 250 | 1 | 5972606 | — | — |
| 11/32 | 8.73 | 0.3437 | 220 | 320 | 1 | — | 5973220 | — |
| | 9.00 | 0.3543 | 175 | 250 | 1 | 5973239 | — | — |

PFX EXTRA LENGTH DRILL



| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A976 | A977 | A978 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-------------|---------|-----------------------|---------|
| | 9.00 | 0.3543 | 220 | 320 | 1 | — | 5973181 | — |
| | 9.00 | 0.3543 | 280 | 410 | 1 | — | — | 5973262 |
| | 9.50 | 0.3740 | 175 | 250 | 1 | 5973220 | — | — |
| | 9.50 | 0.3740 | 220 | 320 | 1 | — | 5973220 | — |
| | 9.50 | 0.3740 | 280 | 410 | 1 | — | — | 5973220 |
| 3/8 | 9.52 | 0.3750 | 185 | 265 | 1 | 5973220 | — | — |
| | 10.00 | 0.3937 | 185 | 265 | 1 | 5972597 | — | — |
| | 10.00 | 0.3937 | 235 | 340 | 1 | — | 5973268 | — |
| | 10.00 | 0.3937 | 295 | 430 | 1 | — | — | 5973194 |
| | 10.50 | 0.4134 | 185 | 265 | 1 | 5973220 | — | — |
| | 10.50 | 0.4134 | 235 | 340 | 1 | — | 5973220 | — |
| | 11.00 | 0.4331 | 195 | 280 | 1 | 5972601 | — | — |
| | 11.00 | 0.4331 | 250 | 365 | 1 | — | 5973158 | — |
| 7/16 | 11.11 | 0.4375 | 195 | 280 | 1 | 5973225 | — | — |
| | 11.50 | 0.4528 | 195 | 280 | 1 | 5972602 | — | — |
| | 11.50 | 0.4528 | 250 | 365 | 1 | — | 5973220 | — |
| | 12.00 | 0.4724 | 205 | 295 | 1 | 5972608 | — | — |
| | 12.00 | 0.4724 | 260 | 375 | 1 | — | 5973295 | — |
| | 12.50 | 0.4921 | 205 | 295 | 1 | 5972610 | — | — |
| | 12.50 | 0.4921 | 260 | 375 | 1 | — | 5973299 | — |
| 1/2 | 12.70 | 0.5000 | 205 | 295 | 1 | 5972591 | — | — |
| | 13.00 | 0.5118 | 205 | 295 | 1 | 5972613 | — | — |
| | 13.00 | 0.5118 | 260 | 375 | 1 | — | 5973220 | — |
| | 14.00 | 0.5512 | 215 | 310 | 1 | 5972615 | — | — |
| | 14.00 | 0.5512 | 270 | 390 | 1 | — | 5973303 ¹⁾ | — |

General Purpose Jobber Length

* Sets Available on pgs. 224--227

R10P - Fractional Sizes

R15P - Letter Sizes

R18P - Wire Gauge Sizes

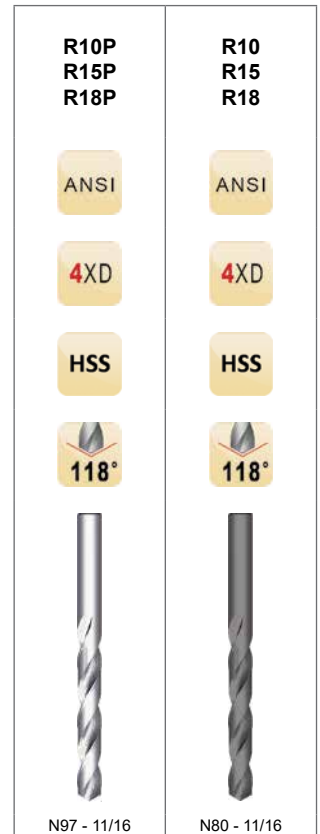
Bright Finish improves chip flow in soft or non-ferrous materials

R10 - Fractional Sizes

R15 - Letter Sizes

R18 - Wire Gauge Sizes

Steam tempered to reduce wear and chip welding in harder ferrous materials for increased wear resistance and lubricity.



| 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 | 5999308 | — |
| | 96 | | 0.0063 | 1/16 | 3/4 | 12 | 5999303 | — |
| | 95 | | 0.0067 | 1/16 | 3/4 | 12 | 5999300 | — |
| | 94 | | 0.0071 | 1/16 | 3/4 | 12 | 5999296 | — |
| | 93 | | 0.0075 | 1/16 | 3/4 | 12 | 5999292 | — |
| | 92 | | 0.0079 | 1/16 | 3/4 | 12 | 5999288 | — |
| | 91 | | 0.0083 | 5/64 | 3/4 | 12 | 5999280 | — |
| | 90 | | 0.0087 | 5/64 | 3/4 | 12 | 5999276 | — |
| | 89 | | 0.0091 | 5/64 | 3/4 | 12 | 5999269 | — |
| | 88 | | 0.0095 | 5/64 | 3/4 | 12 | 5999265 | — |
| | 87 | | 0.0100 | 5/64 | 3/4 | 12 | 5999261 | — |
| | 86 | | 0.0105 | 3/32 | 3/4 | 12 | 5999258 | — |
| | 85 | | 0.0110 | 3/32 | 3/4 | 12 | 5999254 | — |
| | 84 | | 0.0115 | 3/32 | 3/4 | 12 | 5999250 | — |
| | 83 | | 0.0120 | 3/32 | 3/4 | 12 | 5999247 | — |
| | 82 | | 0.0125 | 3/32 | 3/4 | 12 | 5999238 | — |
| | 81 | | 0.0130 | 3/32 | 3/4 | 12 | 5999234 | — |
| | 80 | | 0.0135 | 1/8 | 3/4 | 12 | 5999230 | 5999193 |
| | 79 | | 0.0145 | 1/8 | 3/4 | 12 | 5999223 | 5999190 |
| 1/64 | | | 0.0156 | 3/16 | 3/4 | 12 | 5998515 | 5998664 |
| | 78 | | 0.0160 | 3/16 | 7/8 | 12 | 5999220 | 5999189 |
| | 77 | | 0.0180 | 3/16 | 7/8 | 12 | 5999217 | 5999188 |
| | 76 | | 0.0200 | 3/16 | 7/8 | 12 | 5999214 | 5999187 |
| | 75 | | 0.0210 | 1/4 | 1" | 12 | 5999212 | 5999186 |
| | 74 | | 0.0225 | 1/4 | 1" | 12 | 5999209 | 5999184 |
| | 73 | | 0.0240 | 5/16 | 1.1/8 | 12 | 5999393 | 5999180 |
| | 72 | | 0.0250 | 5/16 | 1.1/8 | 12 | 5999389 | 5999178 |
| | 71 | | 0.0260 | 3/8 | 1.1/4 | 12 | 5999385 | 5999176 |
| | 70 | | 0.0280 | 3/8 | 1.1/4 | 12 | 5999382 | 5999174 |
| | 69 | | 0.0292 | 1/2 | 1.3/8 | 12 | 5999328 | 5999170 |

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 | |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|----------------------|-------------------|---------|
| 1/32 | 68 | | 0.0310 | 1/2 | 1.3/8 | 12 | 5999284 | 5999166 | |
| | | | 0.0313 | 1/2 | 1.3/8 | 12 | 5998506 | 5998656 | |
| | 67 | | 0.0320 | 1/2 | 1.3/8 | 12 | 5999242 | 5999164 | |
| | 66 | | 0.0330 | 1/2 | 1.3/8 | 12 | 5999205 | 5999161 | |
| | 65 | | 0.0350 | 5/8 | 1.1/2 | 12 | 5999154 | 5999158 | |
| | 64 | | 0.0360 | 5/8 | 1.1/2 | 12 | 5999148 | 5999153 | |
| | 63 | | 0.0370 | 5/8 | 1.1/2 | 12 | 5999145 | 5999150 | |
| | 62 | | 0.0380 | 5/8 | 1.1/2 | 12 | 5999143 | 5999147 | |
| | 61 | | 0.0390 | 11/16 | 1.5/8 | 12 | 5999141 | 5999144 | |
| | 60 | | 0.0400 | 11/16 | 1.5/8 | 12 | 5999137 | 5999138 | |
| 3/64 | 59 | | 0.0410 | 11/16 | 1.5/8 | 12 | 5999128 | 5999131 | |
| | 58 | | 0.0420 | 11/16 | 1.5/8 | 12 | 5999124 | 5999127 | |
| | 57 | | 0.0430 | 3/4 | 1.3/4 | 12 | 5999120 | 5999123 | |
| | 56 | | 0.0465 | 3/4 | 1.3/4 | 12 | 5999116 | 5999119 | |
| | | | 0.0469 | 3/4 | 1.3/4 | 12 | 5998282 | 5998725 | |
| | 55 | | 0.0520 | 7/8 | 1.7/8 | 12 | 5999109 | 5999251 | |
| | 54 | | 0.0550 | 7/8 | 1.7/8 | 12 | 5999106 | 5999246 | |
| | 53 | | 0.0595 | 7/8 | 1.7/8 | 12 | 5999103 | 5999243 | |
| | 1/16 | | | 0.0625 | 7/8 | 1.7/8 | 12 | 5998498 | 5998648 |
| | | 52 | | 0.0635 | 7/8 | 1.7/8 | 12 | 5999100 | 5999239 |
| 51 | | | 0.0670 | 1" | 2" | 12 | 5999097 | 5999231 | |
| 50 | | | 0.0700 | 1" | 2" | 12 | 5999094 | 5999199 | |
| 49 | | | 0.0730 | 1" | 2" | 12 | 5999088 | 5999155 | |
| 48 | | | 0.0760 | 1" | 2" | 12 | 5999086 | 5999115 | |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 5998325 | 5998646 | |
| | 47 | | 0.0785 | 1" | 2" | 12 | 5999083 | 5998437 | |
| | 46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | 5999077 | 5998432 | |
| | 45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | 5999073 | 5998428 | |
| | 44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | 5999070 | 5998424 | |
| | 43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | 5999067 | 5998418 | |
| | 42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | 5999064 | 5998414 | |
| | 3/32 | | | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5998275 | 5998720 |
| | | 41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | 5999061 | 5998411 |
| | | 40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | 5999057 | 5998408 |
| 39 | | | 0.0995 | 1.3/8 | 2.3/8 | 12 | 5999049 | 5998400 | |
| 38 | | | 0.1015 | 1.7/16 | 2.1/2 | 12 | 5999045 | 5998396 | |
| 37 | | | 0.1040 | 1.7/16 | 2.1/2 | 12 | 5999037 | 5998389 | |
| 7/64 | 36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | 5999032 | 5998385 | |
| | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5998340 | 5998791 | |
| | 35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | 5999028 | 5998381 | |
| | 34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | 5999024 | 5998377 | |
| | 33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | 5999021 | 5998373 | |
| | 32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | 5999018 | 5998370 | |
| | 31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | 5999014 | 5998366 | |
| | 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5998519 | 5998672 |
| | | 30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | 5999010 | 5998363 |
| | | 29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | 5999001 | 5998357 |
| 28 | | | 0.1405 | 1.3/4 | 2.7/8 | 12 | 5999167 | 5998351 | |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5998350 | 5998809 | |
| | 27 | | 0.1440 | 1.7/8 | 3" | 12 | 5999163 | 5998348 | |
| | 26 | | 0.1470 | 1.7/8 | 3" | 12 | 5999160 | 5998345 | |
| | 25 | | 0.1495 | 1.7/8 | 3" | 12 | 5999157 | 5998342 | |
| | 24 | | 0.1520 | 2" | 3.1/8 | 12 | 5999151 | 5998339 | |
| | 23 | | 0.1540 | 2" | 3.1/8 | 12 | 5999112 | 5998336 | |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 5998323 | 5998764 | |
| | 22 | | 0.1570 | 2" | 3.1/8 | 12 | 5999080 | 5998333 | |
| | 21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | 5999041 | 5998330 | |
| | 20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | 5998996 | 5998327 | |
| | 19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | 5999228 | 5998318 | |
| | 18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | 5999224 | 5998315 | |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5998539 | 5998681 | |
| | 17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | 5999221 | 5998312 | |
| | 16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | 5999218 | 5998309 | |

| 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 | 5999215 | 5998306 |
| | 14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | 5999211 | 5998302 |
| | 13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | 5999208 | 5998297 |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5998272 | 5998718 |
| | 12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | 5999206 | 5998293 |
| | 11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | 5999203 | 5998288 |
| | 10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | 5999201 | 5998285 |
| | 9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | 5999272 | 5999195 |
| | 8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | 5999226 | 5999192 |
| | 7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | 5999374 | 5999172 |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5998296 | 5998687 |
| | 6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | 5999132 | 5999134 |
| | 5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | 5999091 | 5999182 |
| | 4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | 5999053 | 5998404 |
| | 3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | 5999005 | 5998360 |
| 7/32 | | | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5998337 | 5998745 |
| | 2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | 5999235 | 5998324 |
| | 1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | 5999197 | 5998450 |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | 5998837 | 5998811 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5998365 | 5998693 |
| | | B | 0.2380 | 2.3/4 | 4" | 12 | 5998840 | 5998732 |
| | | C | 0.2421 | 2.3/4 | 4" | 12 | 5998843 | 5998988 |
| | | D | 0.2461 | 2.3/4 | 4" | 12 | 5998845 | 5999093 |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 5998511 | 5998660 |
| | | F | 0.2571 | 2.7/8 | 4.1/8 | 12 | 5998854 | 5999099 |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | 5998857 | 5999102 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 5998417 | 5998699 |
| | | H | 0.2661 | 2.7/8 | 4.1/8 | 12 | 5998860 | 5999105 |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | 5998863 | 5998810 |
| | | J | 0.2772 | 2.7/8 | 4.1/8 | 12 | 5998866 | 5998814 |
| | | K | 0.2811 | 2.15/16 | 4.1/4 | 12 | 5998869 | 5998819 |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5998347 | 5998805 |
| | | L | 0.2902 | 2.15/16 | 4.1/4 | 12 | 5998873 | 5998822 |
| | | M | 0.2949 | 3.1/16 | 4.3/8 | 12 | 5998876 | 5998825 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5998425 | 5998704 |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | 5998882 | 5998828 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5998320 | 5998756 |
| | | O | 0.3161 | 3.3/16 | 4.1/2 | 6 | 5998889 | 5998831 |
| | | P | 0.3228 | 3.5/16 | 4.5/8 | 6 | 5998893 | 5998834 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5998252 | 5998708 |
| | | Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | 5998899 | 5999304 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | 5998902 | 5999347 |
| 11/32 | | | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5998530 | 5998678 |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | 5998906 | 5999396 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | 5998912 | 5999426 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5998255 | 5998710 |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | 5998916 | 5999430 |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 5998287 | 5998728 |
| | | V | 0.3772 | 3.5/8 | 5" | 6 | 5998922 | 5999432 |
| | | W | 0.3858 | 3.3/4 | 5.1/8 | 6 | 5998926 | 5999434 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 5998259 | 5998712 |
| | | X | 0.3969 | 3.3/4 | 5.1/8 | 6 | 5998929 | 5999436 |
| | | Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | 5998934 | 5999263 |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5998248 | 5998684 |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | 5999257 | 5999267 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5998264 | 5998714 |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5998334 | 5998713 |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5998268 | 5998716 |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5998331 | 5998690 |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5998292 | 5998731 |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 5998502 | 5998653 |
| 33/64 | | | 0.5156 | 4.13/16 | 6.5/8 | 1 | 5998300 | 5998735 |
| 17/32 | | | 0.5313 | 4.13/16 | 6.5/8 | 1 | 5998409 | 5998696 |

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 |
|--------------------|-------------------|----------------------|--------------------------|---------------|---------------|-------------|----------------------|-------------------|
| 35/64 | | | 0.5469 | 4.13/16 | 6.5/8 | 1 | 5998303 | 5998736 |
| 9/16 | | | 0.5625 | 4.13/16 | 6.5/8 | 1 | 5998343 | 5998800 |
| 37/64 | | | 0.5781 | 4.13/16 | 6.5/8 | 1 | 5998307 | 5998740 |
| 19/32 | | | 0.5937 | 5.3/16 | 7.1/8 | 1 | 5998421 | 5998703 |
| 39/64 | | | 0.6094 | 5.3/16 | 7.1/8 | 1 | 5998310 | 5998744 |
| 5/8 | | | 0.6250 | 5.3/16 | 7.1/8 | 1 | 5998328 | 5998686 |
| 41/64 | | | 0.6406 | 5.3/16 | 7.1/8 | 1 | 5998313 | 5998749 |
| 21/32 | | | 0.6563 | 5.3/16 | 7.1/8 | 1 | 5998429 | 5998706 |
| 43/64 | | | 0.6719 | 5.5/8 | 7.5/8 | 1 | 5998316 | 5998752 |
| 11/16 | | | 0.6875 | 5.5/8 | 7.5/8 | 1 | 5998525 | 5998675 |

General Purpose Jobber Length, Fractional

* Sets Available on pg. 225

A012

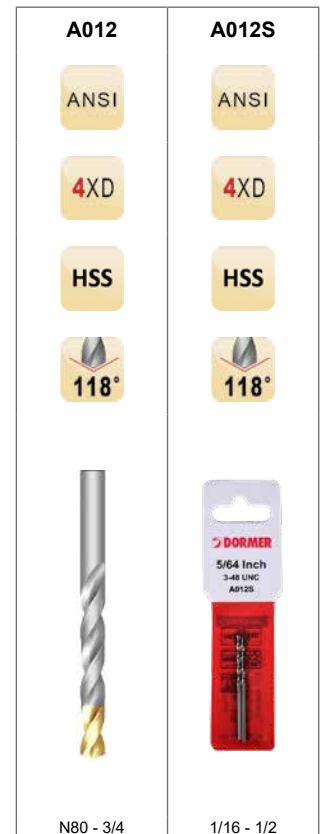
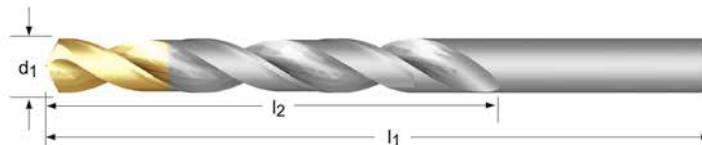
Low thrust design self centering Split Point for easier penetration.
TiN Coated Tip increases surface hardness and improves tool life.

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



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 | 5966768 * | — |
| | 79 | | 0.37 | 0.0145 | 1/8 | 3/4 | 10 | 5966762 * | — |
| 1/64 | | | 0.40 | 0.0156 | 3/16 | 3/4 | 10 | 5966740 * | — |
| | 78 | | 0.41 | 0.0160 | 3/16 | 7/8 | 10 | 5966758 * | — |
| | 77 | | 0.46 | 0.0180 | 3/16 | 7/8 | 10 | 5966754 * | — |
| | 76 | | 0.51 | 0.0200 | 3/16 | 7/8 | 10 | 5966749 * | — |
| | 75 | | 0.53 | 0.0210 | 1/4 | 1" | 10 | 5966746 * | — |
| | 74 | | 0.57 | 0.0225 | 1/4 | 1" | 10 | 5966741 * | — |
| | 73 | | 0.61 | 0.0240 | 5/16 | 1.1/8 | 10 | 5966735 * | — |
| | 72 | | 0.64 | 0.0250 | 5/16 | 1.1/8 | 10 | 5966731 * | — |
| | 71 | | 0.66 | 0.0260 | 3/8 | 1.1/4 | 10 | 5966727 * | — |
| | 70 | | 0.71 | 0.0280 | 3/8 | 1.1/4 | 10 | 5966723 * | — |
| | 69 | | 0.742 | 0.0292 | 1/2 | 1.3/8 | 10 | 5966716 * | — |
| | 68 | | 0.79 | 0.0310 | 1/2 | 1.3/8 | 10 | 5966711 * | — |
| 1/32 | | | 0.79 | 0.0313 | 1/2 | 1.3/8 | 10 | 5966639 * | — |
| | 67 | | 0.81 | 0.0320 | 1/2 | 1.3/8 | 10 | 5966708 * | — |
| | 66 | | 0.84 | 0.0330 | 1/2 | 1.3/8 | 10 | 5966703 * | — |
| | 65 | | 0.89 | 0.0350 | 5/8 | 1.1/2 | 10 | 5966697 * | — |
| | 64 | | 0.91 | 0.0360 | 5/8 | 1.1/2 | 10 | 5966687 * | — |
| | 63 | | 0.94 | 0.0370 | 5/8 | 1.1/2 | 10 | 5966682 * | — |
| | 62 | | 0.97 | 0.0380 | 5/8 | 1.1/2 | 10 | 5966677 * | — |
| | 61 | | 0.99 | 0.0390 | 11/16 | 1.5/8 | 10 | 5966672 * | — |
| | 60 | | 1.02 | 0.0400 | 11/16 | 1.5/8 | 10 | 5966668 * | — |
| | 59 | | 1.04 | 0.0410 | 11/16 | 1.5/8 | 10 | 5966662 * | — |
| | 58 | | 1.07 | 0.0420 | 11/16 | 1.5/8 | 10 | 5966658 * | — |
| | 57 | | 1.09 | 0.0430 | 3/4 | 1.3/4 | 10 | 5966654 * | — |
| | 56 | | 1.18 | 0.0465 | 3/4 | 1.3/4 | 10 | 5966650 * | — |
| 3/64 | | | 1.19 | 0.0469 | 3/4 | 1.3/4 | 10 | 5966635 * | — |
| | 55 | | 1.32 | 0.0520 | 7/8 | 1.7/8 | 10 | 5966828 * | — |
| | 54 | | 1.40 | 0.0550 | 7/8 | 1.7/8 | 10 | 5966825 * | — |
| | 53 | | 1.51 | 0.0595 | 7/8 | 1.7/8 | 10 | 5966822 * | — |
| 1/16 | | | 1.59 | 0.0625 | 7/8 | 1.7/8 | 2 | — | 6524892 * |

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 | 5966594 * | — |
| | 52 | | 1.61 | 0.0635 | 7/8 | 1.7/8 | 10 | 5966819 * | — |
| | 51 | | 1.70 | 0.0669 | 1" | 2" | 10 | 5966812 * | — |
| | 50 | | 1.78 | 0.0700 | 1" | 2" | 10 | 5966778 * | — |
| | 49 | | 1.85 | 0.0730 | 1" | 2" | 10 | 5966692 * | — |
| | 48 | | 1.93 | 0.0760 | 1" | 2" | 10 | 5966642 * | — |
| 5/64 | | | 1.98 | 0.0781 | 1" | 2" | 2 | — | 6524893 * |
| 5/64 | | | 1.98 | 0.0781 | 1" | 2" | 10 | 5966684 * | — |
| | 47 | | 1.99 | 0.0785 | 1" | 2" | 10 | 5967082 * | — |
| | 46 | | 2.06 | 0.0810 | 1.1/8 | 2.1/8 | 10 | 5967070 | — |
| | 45 | | 2.08 | 0.0820 | 1.1/8 | 2.1/8 | 10 | 5967067 | — |
| | 44 | | 2.18 | 0.0860 | 1.1/8 | 2.1/8 | 10 | 5967063 | — |
| | 43 | | 2.26 | 0.0890 | 1.1/4 | 2.1/4 | 10 | 5967061 | — |
| | 42 | | 2.38 | 0.0935 | 1.1/4 | 2.1/4 | 10 | 5967056 | — |
| 3/32 | | | 2.38 | 0.0938 | 1.1/4 | 2.1/4 | 2 | — | 6524894 |
| 3/32 | | | 2.38 | 0.0938 | 1.1/4 | 2.1/4 | 10 | 5966631 | — |
| | 41 | | 2.44 | 0.0960 | 1.3/8 | 2.3/8 | 10 | 5967053 | — |
| | 40 | | 2.49 | 0.0980 | 1.3/8 | 2.3/8 | 10 | 5967049 | — |
| | 39 | | 2.53 | 0.0995 | 1.3/8 | 2.3/8 | 10 | 5967043 | — |
| | 38 | | 2.58 | 0.1015 | 1.7/16 | 2.1/2 | 10 | 5967040 | — |
| | 37 | | 2.64 | 0.1040 | 1.7/16 | 2.1/2 | 10 | 5967034 | — |
| | 36 | | 2.71 | 0.1065 | 1.7/16 | 2.1/2 | 10 | 5967031 | — |
| 7/64 | | | 2.78 | 0.1094 | 1.1/2 | 2.5/8 | 2 | — | 6524895 |
| 7/64 | | | 2.78 | 0.1094 | 1.1/2 | 2.5/8 | 10 | 5966707 | — |
| | 35 | | 2.79 | 0.1100 | 1.1/2 | 2.5/8 | 10 | 5967029 | — |
| | 34 | | 2.82 | 0.1110 | 1.1/2 | 2.5/8 | 10 | 5967026 | — |
| | 33 | | 2.87 | 0.1130 | 1.1/2 | 2.5/8 | 10 | 5967023 | — |
| | 32 | | 2.95 | 0.1160 | 1.5/8 | 2.3/4 | 10 | 5967017 | — |
| | 31 | | 3.05 | 0.1200 | 1.5/8 | 2.3/4 | 10 | 5967014 | — |
| 1/8 | | | 3.18 | 0.1250 | 1.5/8 | 2.3/4 | 2 | — | 6524896 |
| 1/8 | | | 3.18 | 0.1250 | 1.5/8 | 2.3/4 | 10 | 5966747 | — |
| | 30 | | 3.26 | 0.1285 | 1.5/8 | 2.3/4 | 10 | 5967011 | — |
| | 29 | | 3.45 | 0.1360 | 1.3/4 | 2.7/8 | 10 | 5967005 | — |
| | 28 | | 3.57 | 0.1405 | 1.3/4 | 2.7/8 | 10 | 5966999 | — |
| 9/64 | | | 3.57 | 0.1405 | 1.3/4 | 2.7/8 | 2 | — | 6524897 |
| 9/64 | | | 3.57 | 0.1406 | 1.3/4 | 2.7/8 | 10 | 5966724 | — |
| | 27 | | 3.66 | 0.1440 | 1.7/8 | 3" | 10 | 5966996 | — |
| | 26 | | 3.73 | 0.1470 | 1.7/8 | 3" | 10 | 5966992 | — |
| | 25 | | 3.80 | 0.1495 | 1.7/8 | 3" | 10 | 5966987 | — |
| | 24 | | 3.86 | 0.1520 | 2" | 3.1/8 | 10 | 5966983 | — |
| | 23 | | 3.91 | 0.1540 | 2" | 3.1/8 | 10 | 5966979 | — |
| 5/32 | 5/32 | | 3.97 | 0.1563 | 2" | 3.1/8 | 2 | — | 6524898 |
| 5/32 | | | 3.97 | 0.1563 | 2" | 3.1/8 | 10 | 5966680 | — |
| | 22 | | 3.99 | 0.1570 | 2" | 3.1/8 | 10 | 5966975 | — |
| | 21 | | 4.04 | 0.1590 | 2.1/8 | 3.1/4 | 10 | 5966971 | — |
| | 20 | | 4.09 | 0.1610 | 2.1/8 | 3.1/4 | 10 | 5966969 | — |
| | 19 | | 4.22 | 0.1660 | 2.1/8 | 3.1/4 | 10 | 5966952 | — |
| | 18 | | 4.31 | 0.1695 | 2.1/8 | 3.1/4 | 10 | 5966948 | — |
| 11/64 | | | 4.37 | 0.1719 | 2.1/8 | 3.1/4 | 2 | — | 6524899 |
| 11/64 | | | 4.37 | 0.1719 | 2.1/8 | 3.1/4 | 10 | 5966759 | — |
| | 17 | | 4.39 | 0.1730 | 2.3/16 | 3.3/8 | 10 | 5966943 | — |
| | 16 | | 4.50 | 0.1770 | 2.3/16 | 3.3/8 | 10 | 5966938 | — |
| | 15 | | 4.57 | 0.1800 | 2.3/16 | 3.3/8 | 10 | 5966933 | — |
| | 14 | | 4.62 | 0.1820 | 2.3/16 | 3.3/8 | 10 | 5966928 | — |
| | 13 | | 4.70 | 0.1850 | 2.5/16 | 3.1/2 | 10 | 5966923 | — |
| 3/16 | | | 4.76 | 0.1875 | 2.5/16 | 3.1/2 | 2 | — | 6524900 |
| 3/16 | | | 4.76 | 0.1875 | 2.5/16 | 3.1/2 | 10 | 5966629 | — |
| | 12 | | 4.80 | 0.1890 | 2.5/16 | 3.1/2 | 10 | 5966919 | — |
| | 11 | | 4.85 | 0.1910 | 2.5/16 | 3.1/2 | 10 | 5966915 | — |
| | 10 | | 4.92 | 0.1935 | 2.7/16 | 3.5/8 | 10 | 5966910 | — |
| | 9 | | 4.98 | 0.1960 | 2.7/16 | 3.5/8 | 10 | 5966771 | — |
| | 8 | | 5.06 | 0.1990 | 2.7/16 | 3.5/8 | 10 | 5966765 | — |
| | 7 | | 5.11 | 0.2010 | 2.7/16 | 3.5/8 | 10 | 5966720 | — |
| 13/64 | | | 5.16 | 0.2031 | 2.7/16 | 3.5/8 | 1 | — | 6524901 |
| 13/64 | | | 5.16 | 0.2031 | 2.7/16 | 3.5/8 | 10 | 5966599 | — |

| 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 | 5966667 | — |
| | 5 | | 5.22 | 0.2055 | 2.1/2 | 3.3/4 | 10 | 5966739 | — |
| | 4 | | 5.31 | 0.2090 | 2.1/2 | 3.3/4 | 10 | 5967045 | — |
| | 3 | | 5.41 | 0.2130 | 2.1/2 | 3.3/4 | 10 | 5967008 | — |
| 7/32 | | | 5.56 | 0.2188 | 2.1/2 | 3.3/4 | 1 | — | 6524902 |
| 7/32 | | | 5.56 | 0.2188 | 2.1/2 | 3.3/4 | 10 | 5966704 | — |
| | 2 | | 5.61 | 0.2210 | 2.5/8 | 3.7/8 | 10 | 5966964 | — |
| | 1 | | 5.79 | 0.2280 | 2.5/8 | 3.7/8 | 10 | 5967094 | — |
| | | A | 5.94 | 0.2340 | 2.5/8 | 3.7/8 | 10 | 5967301 | — |
| 15/64 | | | 5.95 | 0.2344 | 2.5/8 | 3.7/8 | 1 | — | 6524903 |
| 15/64 | | | 5.95 | 0.2344 | 2.5/8 | 3.7/8 | 10 | 5966603 | — |
| | | B | 6.03 | 0.2380 | 2.3/4 | 4" | 10 | 5967304 | — |
| | | C | 6.15 | 0.2420 | 2.3/4 | 4" | 10 | 5967308 | — |
| | | D | 6.25 | 0.2460 | 2.3/4 | 4" | 10 | 5967312 | — |
| 1/4 | | | 6.35 | 0.2500 | 2.3/4 | 4" | 1 | — | 6524904 |
| 1/4 | | | 6.35 | 0.2500 | 2.3/4 | 4" | 10 | 5966688 | — |
| | | E | 6.35 | 0.2500 | 2.3/4 | 4" | 10 | 5967317 | — |
| | | F | 6.53 | 0.2570 | 2.7/8 | 4.1/8 | 10 | 5967323 | — |
| | | G | 6.63 | 0.2610 | 2.7/8 | 4.1/8 | 10 | 5966901 | — |
| 17/64 | | | 6.75 | 0.2656 | 2.7/8 | 4.1/8 | 1 | — | 6524905 |
| 17/64 | | | 6.75 | 0.2656 | 2.7/8 | 4.1/8 | 10 | 5966607 | — |
| | | H | 6.76 | 0.2660 | 2.7/8 | 4.1/8 | 10 | 5966958 | — |
| | | I | 6.91 | 0.2720 | 2.7/8 | 4.1/8 | 10 | 5967002 | — |
| | | J | 7.04 | 0.2770 | 2.7/8 | 4.1/8 | 10 | 5967037 | — |
| | | K | 7.14 | 0.2810 | 2.15/16 | 4.1/4 | 10 | 5967077 | — |
| 9/32 | | | 7.14 | 0.2813 | 2.15/16 | 4.1/4 | 1 | — | 6524906 |
| 9/32 | | | 7.14 | 0.2813 | 2.15/16 | 4.1/4 | 10 | 5966717 | — |
| | | L | 7.37 | 0.2900 | 2.15/16 | 4.1/4 | 10 | 5967086 | — |
| | | M | 7.49 | 0.2950 | 3.1/16 | 4.3/8 | 10 | 5967088 | — |
| 19/64 | | | 7.54 | 0.2968 | 3.1/16 | 4.3/8 | 1 | — | 6524907 |
| 19/64 | | | 7.54 | 0.2968 | 3.1/16 | 4.3/8 | 10 | 5966610 | — |
| | | N | 7.67 | 0.3020 | 3.1/16 | 4.3/8 | 10 | 5967091 | — |
| 5/16 | | | 7.94 | 0.3125 | 3.3/16 | 4.1/2 | 1 | — | 6524908 |
| 5/16 | | | 7.94 | 0.3125 | 3.3/16 | 4.1/2 | 10 | 5966676 | — |
| | | O | 8.03 | 0.3160 | 3.3/16 | 4.1/2 | 10 | 5966774 | — |
| | | P | 8.20 | 0.3230 | 3.5/16 | 4.5/8 | 10 | 5966782 | — |
| 21/64 | | | 8.33 | 0.3281 | 3.5/16 | 4.5/8 | 1 | — | 6524909 |
| 21/64 | | | 8.33 | 0.3281 | 3.5/16 | 4.5/8 | 10 | 5966615 | — |
| | | Q | 8.43 | 0.3320 | 3.7/16 | 4.3/4 | 10 | 5966785 | — |
| | | R | 8.61 | 0.3390 | 3.7/16 | 4.3/4 | 10 | 5966788 | — |
| 11/32 | | | 8.73 | 0.3437 | 3.7/16 | 4.3/4 | 1 | — | 6524910 |
| 11/32 | | | 8.73 | 0.3437 | 3.7/16 | 4.3/4 | 10 | 5966755 | — |
| | | S | 8.84 | 0.3480 | 3.1/2 | 4.7/8 | 10 | 5966792 | — |
| | | T | 9.09 | 0.3580 | 3.1/2 | 4.7/8 | 10 | 5966795 | — |
| 23/64 | | | 9.13 | 0.3594 | 3.1/2 | 4.7/8 | 1 | — | 6524911 |
| 23/64 | | | 9.13 | 0.3594 | 3.1/2 | 4.7/8 | 10 | 5966621 | — |
| | | U | 9.35 | 0.3680 | 3.5/8 | 5" | 10 | 5966797 | — |
| 3/8 | | | 9.52 | 0.3750 | 3.5/8 | 5" | 1 | — | 6524912 |
| 3/8 | | | 9.52 | 0.3750 | 3.5/8 | 5" | 10 | 5966637 | — |
| | | V | 9.58 | 0.3770 | 3.5/8 | 5" | 10 | 5966800 | — |
| | | W | 9.80 | 0.3860 | 3.3/4 | 5.1/8 | 10 | 5966803 | — |
| 25/64 | | | 9.92 | 0.3906 | 3.3/4 | 5.1/8 | 1 | — | 6524913 |
| 25/64 | | | 9.92 | 0.3906 | 3.3/4 | 5.1/8 | 10 | 5966623 | — |
| | | X | 10.08 | 0.3970 | 3.3/4 | 5.1/8 | 5 | 5966806 | — |
| | | Y | 10.26 | 0.4040 | 3.7/8 | 5.1/4 | 5 | 5966809 | — |
| 13/32 | | | 10.32 | 0.4063 | 3.7/8 | 5.1/4 | 1 | — | 6524914 |
| 13/32 | | | 10.32 | 0.4063 | 3.7/8 | 5.1/4 | 5 | 5966598 | — |
| | | Z | 10.49 | 0.4130 | 3.7/8 | 5.1/4 | 5 | 5966814 | — |
| 27/64 | | | 10.72 | 0.4219 | 3.15/16 | 5.3/8 | 1 | — | 6524915 |
| 27/64 | | | 10.72 | 0.4219 | 3.15/16 | 5.3/8 | 5 | 5966625 | — |
| 7/16 | | | 11.11 | 0.4375 | 4.1/16 | 5.1/2 | 1 | — | 6524916 |
| 7/16 | | | 11.11 | 0.4375 | 4.1/16 | 5.1/2 | 5 | 5966699 | — |
| 29/64 | | | 11.51 | 0.4531 | 4.3/16 | 5.5/8 | 1 | — | 6524917 |
| 29/64 | | | 11.51 | 0.4531 | 4.3/16 | 5.5/8 | 5 | 5966627 | — |
| 15/32 | | | 11.91 | 0.4687 | 4.5/16 | 5.3/4 | 1 | — | 6524918 |
| 15/32 | | | 11.91 | 0.4687 | 4.5/16 | 5.3/4 | 5 | 5966601 | — |

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 | — | 6524919 |
| 31/64 | | | 12.30 | 0.4844 | 4.3/8 | 5.7/8 | 5 | 5966643 | — |
| 1/2 | | | 12.70 | 0.5000 | 4.1/2 | 6" | 1 | — | 6524920 |
| 1/2 | | | 12.70 | 0.5000 | 4.1/2 | 6" | 5 | 5966617 | — |
| 33/64 | | | 13.10 | 0.5156 | 4.13/16 | 6.5/8 | 1 | 5966645 | — |
| 17/32 | | | 13.49 | 0.5313 | 4.13/16 | 6.5/8 | 1 | 5966605 | — |
| 35/64 | | | 13.89 | 0.5469 | 4.13/16 | 6.5/8 | 1 | 5966647 | — |
| 9/16 | | | 14.29 | 0.5625 | 4.13/16 | 6.5/8 | 1 | 5966713 | — |
| 37/64 | | | 14.68 | 0.5781 | 4.13/16 | 6.5/8 | 1 | 5966651 | — |
| 19/32 | | | 15.08 | 0.5937 | 5.3/16 | 7.1/8 | 1 | 5966609 | — |
| 39/64 | | | 15.48 | 0.6094 | 5.3/16 | 7.1/8 | 1 | 5966655 | — |
| 5/8 | | | 15.88 | 0.6250 | 5.3/16 | 7.1/8 | 1 | 5966693 | — |
| 21/32 | | | 16.67 | 0.6563 | 5.3/16 | 7.1/8 | 1 | 5966613 | — |
| 11/16 | | | 17.46 | 0.6875 | 5.5/8 | 7.5/8 | 1 | 5966751 | — |
| 45/64 | | | 17.86 | 0.7031 | 5.5/8 | 7.5/8 | 1 | 5966660 | — |
| 23/32 | | | 18.26 | 0.7188 | 5.5/8 | 7.5/8 | 1 | 5966619 | — |
| 47/64 | | | 18.65 | 0.7344 | 6" | 8" | 1 | 5966664 | — |
| 3/4 | | | 19.05 | 0.7500 | 6" | 8" | 1 | 5966633 | — |

General Purpose Jobber Length, DIN Standard

* Sets Available on pg. 228-230

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

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

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

- * 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 Øh ₈ mm | d ₁ Øh 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 | 6000290 | — | — | — | — |
| 0.16 | | 0.0063 | 1.5 | 19 | 6000292 | — | — | — | — |
| 0.17 | | 0.0067 | 1.5 | 19 | 6000294 | — | — | — | — |
| 0.18 | | 0.0070 | 1.5 | 19 | 6000297 | — | — | — | — |
| 0.19 | | 0.0075 | 1.5 | 19 | 6000300 | — | — | — | — |
| 0.20 | | 0.0078 | 2.5 | 19 | 6000303 | — | 5967598 | — | — |
| 0.21 | | 0.0083 | 2.5 | 19 | 6000308 | — | — | — | — |
| 0.22 | | 0.0087 | 2.5 | 19 | 6000311 | — | — | — | — |
| 0.23 | | 0.0091 | 2.5 | 19 | 6000314 | — | — | — | — |
| 0.24 | | 0.0094 | 2.5 | 19 | 6000317 | — | — | — | — |
| 0.25 | | 0.0098 | 3 | 19 | 6000320 | — | 5967601 | — | — |
| 0.26 | | 0.0102 | 3 | 19 | 6000323 | — | — | — | — |
| 0.27 | | 0.0106 | 3 | 19 | 6000326 | — | — | — | — |
| 0.28 | | 0.0110 | 3 | 19 | 6000329 | — | — | — | — |
| 0.29 | | 0.0114 | 3 | 19 | 6000332 | — | — | — | — |
| 0.30 | | 0.0118 | 3 | 19 | 6000335 | — | 5967603 | — | — |
| 0.32 | | 0.0126 | 4 | 19 | 6000339 | — | 5967605 | — | — |
| | 80 | 0.0135 | 4 | 19 | — | — | 5966767 | — | — |
| 0.34 | | 0.0134 | 4 | 19 | 6000342 | — | — | — | — |
| 0.35 | | 0.0138 | 4 | 19 | 6000345 | — | 5967609 | — | — |
| 0.36 | | 0.0142 | 4 | 19 | 6000348 | — | — | — | — |
| | 79 | 0.0145 | 4 | 19 | — | — | 5966761 | — | — |
| 0.38 | | 0.0150 | 4 | 19 | 6000351 | — | 5967611 | — | — |
| | 1/64 | 0.0156 | 5 | 20 | — | — | 5966604 | — | — |
| 0.40 | | 0.0157 | 5 | 20 | 6000354 | — | 5967613 | — | — |
| | 78 | 0.0160 | 5 | 20 | — | — | 5966757 | — | — |
| 0.42 | | 0.0165 | 5 | 20 | 6000357 | — | 5967614 | — | — |
| 0.44 | | 0.0173 | 5 | 20 | 6000361 | — | — | — | — |
| 0.45 | | 0.0177 | 5 | 20 | 6000365 | — | 5967616 | — | — |
| | 77 | 0.0180 | 5 | 20 | — | — | 5966753 | — | — |
| 0.46 | | 0.0181 | 5 | 20 | 6000370 | — | — | — | — |

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 $\varnothing h_8$ mm | d_1 $\varnothing h_8$ "/Nr./letter | d_1 decimal Inch | l_2 mm | l_1 mm | 2A | 2AB | A100 | A002 | A002S |
|----------------------------------|--|--------------------------|-------------|-------------|---------|---------|---------|---------|-------|
| 0.48 | | 0.0189 | 5 | 20 | 6000380 | — | 5967618 | — | — |
| 0.50 | | 0.0197 | 6 | 22 | 6000385 | — | 5967619 | — | — |
| | 76 | 0.0200 | 6 | 22 | — | — | 5966750 | — | — |
| 0.52 | | 0.0205 | 6 | 22 | — | — | 5967621 | — | — |
| | 75 | 0.0210 | 6 | 22 | — | — | 5966745 | — | — |
| 0.55 | | 0.0217 | 7 | 24 | 6000389 | — | 5967623 | — | — |
| | 74 | 0.0225 | 7 | 24 | — | — | 5966742 | — | — |
| 0.58 | | 0.0228 | 7 | 24 | — | — | 5967625 | — | — |
| 0.60 | | 0.0236 | 7 | 24 | 6000393 | — | 5967628 | — | — |
| | 73 | 0.0240 | 8 | 26 | — | — | 5966738 | — | — |
| 0.62 | | 0.0244 | 8 | 26 | — | — | 5967631 | — | — |
| | 72 | 0.0250 | 8 | 26 | — | — | 5966730 | — | — |
| 0.65 | | 0.0256 | 8 | 26 | 6000397 | — | 5967633 | — | — |
| | 71 | 0.0260 | 8 | 26 | — | — | 5966726 | — | — |
| 0.68 | | 0.0268 | 9 | 28 | — | — | 5967635 | — | — |
| 0.70 | | 0.0276 | 9 | 28 | 6000401 | — | 5967637 | — | — |
| | 70 | 0.0280 | 9 | 28 | — | — | 5966722 | — | — |
| 0.72 | | 0.0283 | 9 | 28 | — | — | 5967639 | — | — |
| | 69 | 0.0292 | 9 | 28 | — | — | 5966714 | — | — |
| 0.75 | | 0.0295 | 9 | 28 | 6000404 | — | 5967641 | — | — |
| 0.78 | | 0.0307 | 10 | 30 | — | — | 5967643 | — | — |
| | 68 | 0.0310 | 10 | 30 | — | — | 5966710 | — | — |
| | 1/32 | 0.0313 | 10 | 30 | — | — | 5966600 | — | — |
| 0.80 | | 0.0315 | 10 | 30 | 6000408 | — | 5967645 | — | — |
| | 67 | 0.0320 | 10 | 30 | — | — | 5966706 | — | — |
| 0.82 | | 0.0323 | 10 | 30 | — | — | 5967647 | — | — |
| | 66 | 0.0330 | 10 | 30 | — | — | 5966702 | — | — |
| 0.85 | | 0.0335 | 10 | 30 | 6000412 | — | 5967651 | — | — |
| 0.88 | | 0.0346 | 11 | 32 | — | — | 5967654 | — | — |
| | 65 | 0.0350 | 11 | 32 | — | — | 5966698 | — | — |
| 0.90 | | 0.0354 | 11 | 32 | 6000416 | — | 5967655 | — | — |
| | 64 | 0.0360 | 11 | 32 | — | — | 5966694 | — | — |
| 0.92 | | 0.0362 | 11 | 32 | — | — | 5967659 | — | — |
| | 63 | 0.0370 | 11 | 32 | — | — | 5966683 | — | — |
| 0.95 | | 0.0374 | 11 | 32 | 6000423 | — | 5967662 | — | — |
| | 62 | 0.0380 | 12 | 34 | — | — | 5966678 | — | — |
| 0.98 | | 0.0386 | 12 | 34 | — | — | 5967667 | — | — |
| | 61 | 0.0390 | 12 | 34 | — | — | 5966673 | — | — |
| 1.00 | | 0.0394 | 12 | 34 | 6000604 | 6000475 | 5966592 | 5966835 | — |
| | 60 | 0.0400 | 12 | 34 | — | — | 5966669 | — | — |
| | 59 | 0.0410 | 12 | 34 | — | — | 5966661 | — | — |
| 1.05 | | 0.0413 | 12 | 34 | — | — | 5966612 | — | — |
| | 58 | 0.0420 | 14 | 36 | — | — | 5966657 | — | — |
| | 57 | 0.0430 | 14 | 36 | — | — | 5966653 | — | — |
| 1.10 | | 0.0433 | 14 | 36 | 6000607 | 6000506 | 5966634 | 5966837 | — |
| 1.15 | | 0.0453 | 14 | 36 | 6000610 | 6000544 | 5966674 | — | — |
| | 56 | 0.0465 | 14 | 36 | — | — | 5966649 | — | — |
| | 3/64 | 0.0469 | 16 | 38 | — | — | 5967048 | 5967192 | — |
| 1.20 | | 0.0472 | 16 | 38 | 6000613 | 6000582 | 5966686 | 5966839 | — |
| 1.25 | | 0.0492 | 16 | 38 | 6000616 | 6000615 | 5966691 | — | — |
| 1.30 | | 0.0512 | 16 | 38 | 6000620 | 6000624 | 5966696 | 5966841 | — |
| | 55 | 0.0520 | 16 | 38 | — | — | 5966646 | — | — |
| 1.35 | | 0.0531 | 18 | 40 | 6000625 | 6000629 | 596701 | — | — |
| | 54 | 0.0550 | 18 | 40 | — | — | 5966820 | — | — |
| 1.40 | | 0.0551 | 18 | 40 | 6000630 | 6000633 | 5966572 | 5966842 | — |
| 1.45 | | 0.0571 | 18 | 40 | 6000634 | 6000638 | 5966573 | — | — |
| 1.50 | | 0.0591 | 18 | 40 | 6000637 | 6000478 | 5966574 | 5966846 | — |
| | 53 | 0.0595 | 20 | 43 | — | — | 5966817 | — | — |
| 1.55 | | 0.0610 | 20 | 43 | 6000647 | 6000481 | 5966575 | — | — |
| | 1/16 | 0.0625 | 20 | 43 | — | — | 5966596 | 5966856 | — |
| 1.60 | | 0.0630 | 20 | 43 | 6000652 | 6000485 | 5966576 | 5966848 | — |
| | 52 | 0.0635 | 20 | 43 | — | — | 5966813 | — | — |

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 Øh ₈ mm | d ₁ Øh ₈ "/Nr./letter | d ₁ decimal Inch | l ₂ mm | l ₁ mm | 2A | 2AB | A100 | A002 | A002S |
|---|---|-----------------------------------|----------------------|----------------------|---------|---------|---------|---------|---------|
| 1.65 | | 0.0650 | 20 | 43 | 6000655 | — | 5966577 | — | — |
| 1.70 | | 0.0669 | 20 | 43 | 6000659 | 6000487 | 5966578 | 5966850 | — |
| | 51 | 0.0670 | 22 | 46 | — | — | 5966810 | — | — |
| 1.75 | | 0.0689 | 22 | 46 | 6000663 | 6000490 | 5966579 | — | — |
| | 50 | 0.0700 | 22 | 46 | — | — | 5966805 | — | — |
| 1.80 | | 0.0709 | 22 | 46 | 6000667 | 6000493 | 5966590 | 5966852 | — |
| 1.85 | | 0.0728 | 22 | 46 | — | — | 5966591 | — | — |
| | 49 | 0.0730 | 22 | 46 | — | — | 5966734 | — | — |
| 1.90 | | 0.0748 | 22 | 46 | 6000671 | 6000495 | 5966593 | 5966854 | — |
| | 48 | 0.0760 | 24 | 49 | — | — | 5966689 | — | — |
| 1.95 | | 0.0768 | 24 | 49 | 6790303 | 6000498 | 5966595 | — | — |
| | 5/64 | 0.0781 | 24 | 49 | — | — | 5966763 | 5967299 | — |
| | 47 | 0.0785 | 24 | 49 | — | — | 5966640 | — | — |
| 2.00 | | 0.0787 | 24 | 49 | 6000694 | 6000609 | 5967000 | 5967411 | 6524831 |
| 2.05 | | 0.0807 | 24 | 49 | — | — | 5967030 | — | — |
| | 46 | 0.0810 | 24 | 49 | — | — | 5967060 | — | — |
| | 45 | 0.0820 | 24 | 49 | — | — | 5967055 | — | — |
| 2.10 | | 0.0827 | 24 | 49 | 6000697 | 6000612 | 5967066 | 5967415 | — |
| 2.15 | | 0.0846 | 27 | 53 | 6000700 | — | 5967075 | — | — |
| | 44 | 0.0860 | 27 | 53 | — | — | 5967052 | — | — |
| 2.20 | | 0.0866 | 27 | 53 | 6000703 | 6000619 | 5967078 | 5967419 | — |
| 2.25 | | 0.0886 | 27 | 53 | 6000705 | — | 5967080 | — | — |
| | 43 | 0.0890 | 27 | 53 | — | — | 5967050 | — | — |
| 2.30 | | 0.0906 | 27 | 53 | 6000707 | 6000517 | 5967084 | 5967424 | — |
| 2.35 | | 0.0925 | 27 | 53 | 6000711 | 6000554 | 5966904 | — | — |
| | 42 | 0.0935 | 30 | 57 | — | — | 5967047 | — | — |
| | 3/32 | 0.0937 | 30 | 57 | — | — | 5967046 | 5967187 | — |
| 2.40 | | 0.0945 | 30 | 57 | 6000713 | 6000587 | 5966908 | 5967429 | — |
| | 41 | 0.0960 | 30 | 57 | — | — | 5967044 | — | — |
| 2.45 | | 0.0965 | 30 | 57 | — | — | 5966912 | — | — |
| | 40 | 0.0980 | 30 | 57 | — | — | 5967041 | — | — |
| 2.50 | | 0.0984 | 30 | 57 | 6000716 | 6000623 | 5966920 | 5967434 | 6524832 |
| | 39 | 0.0995 | 30 | 57 | — | — | 5967035 | — | — |
| 2.55 | | 0.1004 | 30 | 57 | — | — | 5966925 | — | — |
| | 38 | 0.1015 | 30 | 57 | — | — | 5967032 | — | — |
| 2.60 | | 0.1024 | 30 | 57 | 6000718 | 6000668 | 5966929 | 5967439 | — |
| | 37 | 0.1040 | 30 | 57 | — | — | 5967027 | — | — |
| 2.65 | | 0.1043 | 30 | 57 | — | — | 5966935 | — | — |
| 2.70 | | 0.1063 | 33 | 61 | 6000719 | 6000677 | 5966941 | 5967444 | — |
| | 36 | 0.1065 | 33 | 61 | — | — | 5967021 | — | — |
| 2.75 | | 0.1083 | 33 | 61 | 6000722 | — | 5966946 | — | — |
| | 7/64 | 0.1093 | 33 | 61 | — | — | 5968101 | 5967216 | — |
| | 35 | 0.1100 | 33 | 61 | — | — | 5967019 | — | — |
| 2.82 | | 0.1102 | 33 | 61 | — | — | 5966951 | 5967449 | — |
| | 34 | 0.1110 | 33 | 61 | — | — | 5967016 | — | — |
| 2.85 | | 0.1122 | 33 | 61 | — | — | 5966961 | — | — |
| | 33 | 0.1130 | 33 | 61 | — | — | 5967013 | — | — |
| 2.90 | | 0.1142 | 33 | 61 | 6000725 | 6000681 | 5966965 | 5967453 | — |
| | 32 | 0.1160 | 33 | 61 | — | — | 5967010 | — | — |
| 2.95 | | 0.1161 | 33 | 61 | — | — | 5966968 | — | — |
| 3.00 | | 0.1181 | 33 | 61 | 6000728 | 6000686 | 5967003 | 5967311 | 6524833 |
| | 31 | 0.1200 | 36 | 65 | — | — | 5967007 | — | — |
| 3.10 | | 0.1220 | 36 | 65 | 6000730 | 6000690 | 5967006 | 5967320 | — |
| 3.15 | | 0.1240 | 36 | 65 | — | — | 5967009 | — | — |
| | 1/8 | 0.1250 | 36 | 65 | — | — | 5966606 | 5966862 | 6524834 |
| 3.20 | | 0.1260 | 36 | 65 | 6000732 | 6000522 | 5967012 | 5967325 | 6524835 |
| 3.25 | | 0.1280 | 36 | 65 | 6000736 | 6000526 | 5967015 | 5967327 | — |
| | 30 | 0.1285 | 36 | 65 | — | — | 5967004 | — | — |
| 3.30 | | 0.1299 | 36 | 65 | 6000738 | 6000530 | 5967018 | 5967331 | 6524836 |
| 3.40 | | 0.1339 | 39 | 70 | 6000740 | 6000534 | 5967020 | 5967150 | — |
| | 29 | 0.1360 | 39 | 70 | — | — | 5966998 | — | — |
| 3.50 | | 0.1378 | 39 | 70 | 6000742 | 6000537 | 5967022 | 5967154 | 6524837 |

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 Øh ₈ mm | d ₁ Øh ₈ "Nr./letter | d ₁ decimal Inch | l ₂ mm | l ₁ mm | 2A | 2AB | A100 | A002 | A002S |
|---|--|-----------------------------------|----------------------|----------------------|---------|---------|---------|---------|---------|
| | 28 | 0.1405 | 39 | 70 | — | — | 5966995 | — | — |
| | 9/64 | 0.1406 | 39 | 70 | — | — | 5968015 | 5967297 | — |
| 3.60 | | 0.1417 | 39 | 70 | 6000744 | 6000540 | 5967025 | 5967160 | — |
| | 27 | 0.1440 | 39 | 70 | — | — | 5966988 | — | — |
| 3.70 | | 0.1457 | 39 | 70 | 6000746 | 6000543 | 5967028 | 5967165 | — |
| | 26 | 0.1470 | 39 | 70 | — | — | 5966984 | — | — |
| 3.75 | | 0.1476 | 39 | 70 | — | — | 5967033 | — | — |
| | 25 | 0.1495 | 43 | 75 | — | — | 5966980 | — | — |
| 3.80 | | 0.1496 | 43 | 75 | — | — | 5967036 | 5967171 | — |
| | 24 | 0.1520 | 43 | 75 | — | — | 5966977 | — | — |
| 3.90 | | 0.1535 | 43 | 75 | — | — | 5967039 | 5967175 | — |
| | 23 | 0.1540 | 43 | 75 | — | — | 5966973 | — | — |
| | 5/32 | 0.1562 | 43 | 75 | — | — | 5966756 | 5967296 | 6524838 |
| | 22 | 0.1570 | 43 | 75 | — | — | 5966970 | — | — |
| 4.00 | | 0.1575 | 43 | 75 | 6000749 | 6000546 | 5966715 | 5967226 | 6524839 |
| | 21 | 0.1590 | 43 | 75 | — | — | 5966966 | — | — |
| | 20 | 0.1610 | 43 | 75 | — | — | 5966962 | — | — |
| 4.10 | | 0.1614 | 43 | 75 | 6000751 | 6000549 | 5966760 | 5967230 | 6524860 |
| 4.20 | | 0.1654 | 43 | 75 | 6000754 | 6000552 | 5966791 | 5967234 | 6524861 |
| | 19 | 0.1660 | 43 | 75 | — | — | 5966953 | — | — |
| 4.25 | | 0.1673 | 43 | 75 | — | — | 5966827 | — | — |
| 4.30 | | 0.1693 | 47 | 80 | — | — | 5966832 | 5967237 | — |
| 4.30 | | 0.1693 | 47 | 80 | 6000757 | 6000557 | 5966832 | 5967237 | — |
| | 18 | 0.1695 | 47 | 80 | — | — | 5966942 | — | — |
| | 11/64 | 0.1719 | 47 | 80 | — | — | 5967389 | 5966940 | — |
| | 17 | 0.1730 | 47 | 80 | — | — | 5966937 | — | — |
| 4.40 | | 0.1732 | 47 | 80 | 6000764 | 6000560 | 5966834 | 5967240 | — |
| | 16 | 0.1770 | 47 | 80 | — | — | 5966932 | — | — |
| 4.50 | | 0.1772 | 47 | 80 | 6000747 | 6000563 | 5966836 | 5967246 | 6524862 |
| | 15 | 0.1800 | 47 | 80 | — | — | 5966927 | — | — |
| 4.60 | | 0.1811 | 47 | 80 | 6000790 | 6000565 | 5966838 | 5967249 | — |
| | 14 | 0.1820 | 47 | 80 | — | — | 5966922 | — | — |
| 4.70 | | 0.1850 | 47 | 80 | — | — | 5966671 | 5967251 | — |
| | 13 | 0.1850 | 47 | 80 | — | — | 5966918 | — | — |
| 4.75 | | 0.1870 | 47 | 80 | — | — | 5966675 | — | — |
| | 3/16 | 0.1875 | 52 | 86 | — | — | 5967042 | 5967180 | 6524863 |
| | 12 | 0.1890 | 52 | 86 | — | — | 5966914 | — | — |
| 4.80 | | 0.1890 | 52 | 86 | 6000824 | 6000568 | 5966679 | 5967254 | — |
| | 11 | 0.1910 | 52 | 86 | — | — | 5966909 | — | — |
| 4.90 | | 0.1929 | 52 | 86 | — | — | 5966685 | 5967257 | — |
| | 10 | 0.1935 | 52 | 86 | — | — | 5966905 | — | — |
| | 9 | 0.1960 | 52 | 86 | — | — | 5966770 | — | — |
| 5.00 | | 0.1968 | 52 | 86 | 6000861 | 6000571 | 5966700 | 5967260 | 6524864 |
| | 8 | 0.1990 | 52 | 86 | — | — | 5966764 | — | — |
| 5.10 | | 0.2008 | 52 | 86 | 6000915 | 6000574 | 5966705 | 5967263 | — |
| | 7 | 0.2010 | 52 | 86 | — | — | 5966719 | — | — |
| | 13/64 | 0.2031 | 52 | 86 | — | — | 5967369 | 5967372 | 6524865 |
| | 6 | 0.2040 | 52 | 86 | — | — | 5966666 | — | — |
| 5.20 | | 0.2047 | 52 | 86 | 6000922 | 6000578 | 5966709 | 5967266 | — |
| | 5 | 0.2055 | 52 | 86 | — | — | 5966773 | — | — |
| 5.25 | | 0.2067 | 52 | 86 | — | — | 5966712 | — | — |
| 5.30 | | 0.2087 | 52 | 86 | 6000927 | 6000580 | 5966718 | 5967269 | — |
| | 4 | 0.2090 | 57 | 93 | — | — | 5967038 | — | — |
| 5.40 | | 0.2126 | 57 | 93 | 6000932 | 6000584 | 5966721 | 5967272 | — |
| | 3 | 0.2130 | 57 | 93 | — | — | 5967001 | — | — |
| 5.50 | | 0.2165 | 57 | 93 | 6000936 | 6000590 | 5966725 | 5967278 | 6524866 |
| | 7/32 | 0.2187 | 57 | 93 | — | — | 5968097 | 5967212 | 6524867 |
| 5.60 | | 0.2205 | 57 | 93 | 6000752 | 6000593 | 5966729 | 5967281 | — |
| | 2 | 0.2210 | 57 | 93 | — | — | 5966957 | — | — |
| 5.70 | | 0.2244 | 57 | 93 | 6000755 | 6000596 | 5966733 | 5967285 | — |
| 5.75 | | 0.2264 | 57 | 93 | 6000758 | 6000599 | 5966737 | — | — |
| | 1 | 0.2280 | 57 | 93 | — | — | 5966900 | — | — |

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 Øh ₈ mm | d ₁ Øh ₈ "/Nr./letter | d ₁ decimal Inch | l ₂ mm | l ₁ mm | 2A | 2AB | A100 | A002 | A002S |
|---|---|-----------------------------------|----------------------|----------------------|---------|---------|---------|---------|---------|
| 5.80 | | 0.2283 | 57 | 93 | 6000761 | 6000602 | 5966744 | 5967288 | — |
| 5.90 | | 0.2323 | 57 | 93 | — | — | 5966748 | 5967290 | — |
| | A | 0.2340 | 57 | 93 | — | — | 5967671 | — | — |
| | 15/64 | 0.2344 | 57 | 93 | — | — | 5967391 | 5967394 | — |
| 6.00 | | 0.2362 | 57 | 93 | 6000765 | 6000605 | 5966769 | 5967307 | 6524868 |
| | B | 0.2380 | 63 | 101 | — | — | 5967676 | — | — |
| 6.10 | | 0.2402 | 63 | 101 | 6000770 | 6000608 | 5966772 | 5967315 | — |
| | C | 0.2420 | 63 | 101 | — | — | 5967680 | — | — |
| 6.20 | | 0.2441 | 63 | 101 | 6000775 | 6000611 | 5966775 | 5967151 | — |
| | D | 0.2460 | 63 | 101 | — | — | 5967685 | — | — |
| 6.25 | | 0.2461 | 63 | 101 | — | — | 5966777 | — | — |
| 6.30 | | 0.2480 | 63 | 101 | 6000780 | 6000614 | 5966780 | 5967208 | — |
| | 1/4 | 0.2500 | 63 | 101 | — | — | 5966602 | 5966860 | 6524869 |
| | E | 0.2500 | 63 | 101 | — | — | 5967694 | — | — |
| 6.40 | | 0.2520 | 63 | 101 | 6000784 | 6000618 | 5966783 | 5967247 | — |
| 6.50 | | 0.2559 | 63 | 101 | 6000787 | 6000626 | 5966786 | 5967282 | 6524870 |
| | F | 0.2570 | 63 | 101 | — | — | 5966895 | — | — |
| 6.60 | | 0.2598 | 63 | 101 | 6000793 | 6000631 | 5966789 | 5967321 | — |
| | G | 0.2610 | 63 | 101 | — | — | 5966947 | — | — |
| 6.70 | | 0.2638 | 63 | 101 | 6000796 | 6000636 | 5966794 | 5967328 | — |
| | 17/64 | 0.2656 | 69 | 109 | — | — | 5967404 | 5967400 | 6524871 |
| 6.75 | | 0.2657 | 69 | 109 | 6000801 | 6000641 | 5966798 | — | — |
| | H | 0.2660 | 69 | 109 | — | — | 5966991 | — | — |
| 6.80 | | 0.2677 | 69 | 109 | 6000804 | 6000645 | 5966801 | 5967332 | 6524872 |
| 6.90 | | 0.2717 | 69 | 109 | — | — | 5966804 | 5967336 | — |
| | I | 0.2720 | 69 | 109 | — | — | 5967024 | — | — |
| 7.00 | | 0.2756 | 69 | 109 | 6000807 | 6000649 | 5966807 | 5967340 | 6524873 |
| | J | 0.2770 | 69 | 109 | — | — | 5967057 | — | — |
| 7.10 | | 0.2795 | 69 | 109 | — | — | 5966811 | 5967156 | — |
| | K | 0.2810 | 69 | 109 | — | — | 5967065 | — | — |
| | 9/32 | 0.2812 | 69 | 109 | — | — | 5968012 | 5967293 | — |
| 7.20 | | 0.2835 | 69 | 109 | 6000809 | 6000653 | 5966815 | 5967161 | — |
| 7.25 | | 0.2854 | 69 | 109 | 6000812 | 6000657 | 5966818 | — | — |
| 7.30 | | 0.2874 | 69 | 109 | 6000815 | 6000661 | 5966821 | 5967164 | — |
| | L | 0.2900 | 69 | 109 | — | — | 5967069 | — | — |
| 7.40 | | 0.2913 | 69 | 109 | 6000818 | 6000664 | 5966824 | 5967174 | — |
| | M | 0.2950 | 69 | 109 | — | — | 5967071 | — | — |
| 7.50 | | 0.2953 | 69 | 109 | 6000821 | 6000672 | 5966830 | 5967181 | 6524874 |
| | 19/64 | 0.2968 | 75 | 117 | — | — | 5966955 | 5967406 | — |
| 7.60 | | 0.2992 | 75 | 117 | 6000827 | 5999556 | 5967921 | 5967186 | — |
| | N | 0.3020 | 75 | 117 | — | — | 5967074 | — | — |
| 7.70 | | 0.3031 | 75 | 117 | — | — | 5967965 | 5967191 | — |
| 7.75 | | 0.3051 | 75 | 117 | — | — | 5967999 | — | — |
| 7.80 | | 0.3071 | 75 | 117 | 6000831 | 5999592 | 5968028 | 5967196 | — |
| 7.85 | | 0.3091 | 75 | 117 | — | 5999632 | — | — | — |
| 7.90 | | 0.3110 | 75 | 117 | 6000833 | 5999678 | 5968081 | 5967201 | — |
| | 5/16 | 0.3125 | 75 | 117 | — | — | 5966752 | 5967294 | 6524875 |
| 8.00 | | 0.3150 | 75 | 117 | 6000836 | 5999717 | 5968105 | 5967219 | 6524876 |
| | O | 0.3160 | 75 | 117 | — | — | 5966776 | — | — |
| 8.10 | | 0.3189 | 75 | 117 | 6000839 | 5999724 | 5967926 | 5967222 | — |
| | P | 0.3230 | 75 | 117 | — | — | 5966779 | — | — |
| 8.20 | | 0.3228 | 75 | 117 | 6000842 | 5999728 | 5967932 | 5967227 | 6524877 |
| 8.25 | | 0.3248 | 75 | 117 | 6000846 | 5999732 | 5967935 | — | — |
| 8.30 | | 0.3268 | 75 | 117 | — | — | 5967940 | 5967231 | — |
| | 21/64 | 0.3281 | 75 | 117 | — | — | 5966982 | 5967460 | — |
| 8.40 | | 0.3307 | 75 | 117 | 6000850 | 5999735 | 5967944 | 5967235 | — |
| | Q | 0.3320 | 75 | 117 | — | — | 5966781 | — | — |
| 8.50 | | 0.3346 | 75 | 117 | 6000853 | 5999561 | 5967950 | 5967239 | 6524878 |
| 8.60 | | 0.3386 | 81 | 125 | 6000857 | 5999564 | 5967954 | 5967242 | — |
| | R | 0.3390 | 81 | 125 | — | — | 5966784 | — | — |
| 8.70 | | 0.3425 | 81 | 125 | 6000864 | 5999565 | 5967956 | — | — |
| | 11/32 | 0.3437 | 81 | 125 | — | — | 5967367 | 5966930 | — |
| 8.75 | | 0.3445 | 81 | 125 | 6000868 | 5999568 | 5967959 | — | — |

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| 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 |
|----------------------------------|--|--------------------------|-------------|-------------|---------|---------|---------|---------|---------|
| 8.80 | | 0.3465 | 81 | 125 | 6000872 | 5999571 | 5967962 | 5967252 | — |
| | S | 0.3480 | 81 | 125 | — | — | 5966787 | — | — |
| 8.90 | | 0.3504 | 81 | 125 | 6000877 | 5999574 | 5967967 | 5967255 | — |
| 9.00 | | 0.3543 | 81 | 125 | 6000881 | 5999578 | 5967970 | 5967258 | 6524879 |
| | T | 0.3580 | 81 | 125 | — | — | 5966790 | — | — |
| 9.10 | | 0.3583 | 81 | 125 | — | — | 5967973 | 5967261 | — |
| | 23/64 | 0.3594 | 81 | 125 | — | — | 5966986 | 5967145 | — |
| 9.20 | | 0.3622 | 81 | 125 | — | — | 5967976 | 5967264 | — |
| 9.25 | | 0.3642 | 81 | 125 | — | — | 5967979 | — | — |
| 9.30 | | 0.3661 | 81 | 125 | 6000890 | 5999582 | 5967982 | 5967267 | — |
| | U | 0.3680 | 81 | 125 | — | — | 5966793 | — | — |
| 9.40 | | 0.3701 | 81 | 125 | 6000895 | 5999586 | 5967985 | 5967270 | — |
| 9.50 | | 0.3740 | 81 | 125 | 6000900 | 5999589 | 5967988 | 5967273 | 6524880 |
| | 3/8 | 0.3750 | 87 | 133 | — | — | 5967051 | 5967197 | 6524881 |
| | V | 0.3770 | 87 | 133 | — | — | 5966796 | — | — |
| 9.60 | | 0.3780 | 87 | 133 | 6000905 | 5999596 | 5967993 | 5967276 | — |
| 9.70 | | 0.3819 | 87 | 133 | 6000910 | 5999600 | 5967996 | 5967279 | — |
| 9.75 | | 0.3839 | 87 | 133 | — | — | 5968001 | — | — |
| 9.80 | | 0.3858 | 87 | 133 | 6000918 | 5999604 | 5968004 | 5967284 | — |
| | W | 0.3860 | 87 | 133 | — | — | 5966799 | — | — |
| 9.90 | | 0.3898 | 87 | 133 | 6000867 | 5999608 | 5968007 | 5967287 | — |
| | 25/64 | 0.3906 | 87 | 133 | — | — | 5966990 | 5967199 | — |
| 10.00 | | 0.3937 | 87 | 133 | 6000678 | 6000501 | 5966608 | 5966864 | 6524882 |
| | X | 0.3970 | 87 | 133 | — | — | 5966802 | — | — |
| 10.10 | | 0.3976 | 87 | 133 | — | — | 5966611 | 5966868 | — |
| 10.20 | | 0.4016 | 87 | 133 | 6000682 | 6000503 | 5966614 | 5966870 | 6524883 |
| 10.25 | | 0.4035 | 87 | 133 | — | — | 5966616 | — | — |
| | Y | 0.4040 | 87 | 133 | — | — | 5966808 | — | — |
| 10.30 | | 0.4055 | 87 | 133 | 6000689 | 6000510 | 5966618 | 5966872 | — |
| | 13/32 | 0.4062 | 87 | 133 | — | — | 5967365 | 5967370 | — |
| 10.40 | | 0.4094 | 87 | 133 | — | — | 5966620 | 5966874 | — |
| | Z | 0.4130 | 87 | 133 | — | — | 5966571 | — | — |
| 10.50 | | 0.4134 | 87 | 133 | 6000621 | 6000512 | 5966622 | 5966876 | 6524884 |
| 10.60 | | 0.4173 | 87 | 133 | 6000675 | — | 5966624 | 5966878 | — |
| 10.70 | | 0.4213 | 94 | 142 | — | — | 5966626 | 5966880 | — |
| | 27/64 | 0.4219 | 94 | 142 | — | — | 5966994 | 5967243 | — |
| 10.75 | | 0.4232 | 94 | 142 | — | — | 5966628 | — | — |
| 10.80 | | 0.4252 | 94 | 142 | 6000709 | 6000515 | 5966630 | 5966882 | — |
| 10.90 | | 0.4291 | 94 | 142 | 6000734 | 6000519 | 5966632 | 5966884 | — |
| 11.00 | | 0.4331 | 94 | 142 | 6000760 | 6000523 | 5966636 | 5966886 | 6524885 |
| 11.10 | | 0.4370 | 94 | 142 | — | — | 5966638 | 5966890 | — |
| | 7/16 | 0.4375 | 94 | 142 | — | — | 5968091 | 5967205 | — |
| 11.20 | | 0.4409 | 94 | 142 | 6000768 | 6000529 | 5966641 | 5966892 | — |
| 11.25 | | 0.4429 | 94 | 142 | — | — | 5966644 | — | — |
| 11.30 | | 0.4449 | 94 | 142 | 6000772 | 6000532 | 5966648 | 5966894 | — |
| 11.40 | | 0.4488 | 94 | 142 | 6000778 | 6000535 | 5966652 | 5966898 | — |
| 11.50 | | 0.4528 | 94 | 142 | 6000782 | 6000539 | 5966656 | 5966903 | 6524886 |
| | 29/64 | 0.4531 | 94 | 142 | — | — | 5966997 | 5967275 | — |
| 11.60 | | 0.4567 | 94 | 142 | — | — | 5966659 | 5966907 | — |
| 11.70 | | 0.4606 | 94 | 142 | 6000628 | 6000541 | 5966665 | 5966913 | — |
| 11.75 | | 0.4626 | 94 | 142 | — | — | 5966670 | — | — |
| 11.80 | | 0.4646 | 94 | 142 | 6000635 | 6000547 | 5966681 | 5966917 | — |
| 11.90 | | 0.4685 | 101 | 151 | — | — | 5967300 | 5966924 | — |
| | 15/32 | 0.4687 | 101 | 151 | — | — | 5967387 | 5967392 | — |
| 12.00 | | 0.4724 | 101 | 151 | 6000640 | 6000550 | 5967421 | 5967337 | 6524887 |
| 12.10 | | 0.4764 | 101 | 151 | 6000644 | 6000555 | 5967431 | 5967362 | — |
| 12.20 | | 0.4803 | 101 | 151 | 6000648 | 6000558 | 5967436 | 5967384 | — |
| 12.25 | | 0.4823 | 101 | 151 | — | — | 5967441 | — | — |
| 12.30 | | 0.4843 | 101 | 151 | — | — | 5967445 | 5967409 | — |
| | 31/64 | 0.4843 | 101 | 151 | — | — | 5967054 | 5967203 | — |
| 12.40 | | 0.4882 | 101 | 151 | — | — | 5967306 | 5967457 | — |
| 12.50 | | 0.4921 | 101 | 151 | 6000651 | 6000561 | 5967310 | 5967464 | 6524888 |

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A002S: 0.20mm - 5.00mm = **2**; 13/64 - 13.00mm = **1**

| 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 |
|---|---|-----------------------------------|----------------------|----------------------|---------|---------|---------|---------|---------|
| 12.60 | | 0.4961 | 101 | 151 | — | — | 5967314 | 5967469 | — |
| | 1/2 | 0.5000 | 101 | 151 | — | — | 5966597 | 5966858 | 6524889 |
| 12.70 | | 0.5000 | 101 | 151 | — | 6000566 | 5967318 | 5967473 | — |
| 12.75 | | 0.5020 | 101 | 151 | — | — | 5967322 | — | — |
| 12.80 | | 0.5039 | 101 | 151 | 6000660 | 6000569 | 5967326 | 5967476 | — |
| 12.90 | | 0.5079 | 101 | 151 | — | 6000572 | 5967330 | 5967342 | — |
| 13.00 | | 0.5118 | 101 | 151 | 6000670 | 6000575 | 5967334 | 5967345 | 6524890 |
| | 33/64 | 0.5156 | 101 | 151 | — | — | 5967058 | 5967209 | — |
| 13.10 | | 0.5157 | 101 | 151 | — | — | 5967338 | 5967346 | — |
| 13.20 | | 0.5197 | 101 | 151 | — | — | 5967341 | 5967348 | — |
| 13.25 | | 0.5217 | 108 | 160 | — | — | 5967347 | 5967350 | — |
| 13.30 | | 0.5236 | 108 | 160 | — | — | 5967349 | 5967352 | — |
| 13.40 | | 0.5276 | 108 | 160 | — | — | 5967351 | 5967354 | — |
| | 17/32 | 0.5313 | 108 | 160 | — | — | 5967402 | 5967398 | — |
| 13.50 | | 0.5315 | 108 | 160 | 6000679 | 6000579 | 5967353 | 5967356 | — |
| 13.60 | | 0.5354 | 108 | 160 | — | — | 5967355 | 5967358 | — |
| 13.70 | | 0.5394 | 108 | 160 | — | — | 5967357 | 5967360 | — |
| 13.75 | | 0.5413 | 108 | 160 | — | — | 5967359 | 5967364 | — |
| 13.80 | | 0.5433 | 108 | 160 | — | — | 5967361 | 5967366 | — |
| | 35/64 | 0.5469 | 108 | 160 | — | — | 5967062 | 5967215 | — |
| 13.90 | | 0.5472 | 108 | 160 | — | — | 5967363 | 5967368 | — |
| 14.00 | | 0.5512 | 108 | 160 | 6000683 | 6000585 | 5967371 | 5967374 | — |
| 14.25 | | 0.5610 | 114 | 169 | — | — | 5967373 | 5967376 | — |
| | 9/16 | 0.5625 | 114 | 169 | — | — | 5968009 | 5967291 | — |
| 14.50 | | 0.5709 | 114 | 169 | 6000687 | 6000588 | 5967375 | 5967378 | — |
| | 37/64 | 0.5781 | 114 | 169 | — | — | 5967072 | 5967220 | — |
| 14.75 | | 0.5807 | 114 | 169 | — | — | 5967377 | 5967380 | — |
| 15.00 | | 0.5906 | 114 | 169 | 6000691 | 6000591 | 5967379 | 5967382 | — |
| | 19/32 | 0.5937 | 120 | 178 | — | — | 5966897 | 5967403 | — |
| 15.25 | | 0.6004 | 120 | 178 | — | — | 5967381 | 5967386 | — |
| | 39/64 | 0.6094 | 120 | 178 | — | — | 5966663 | 5967223 | — |
| 15.50 | | 0.6102 | 120 | 178 | — | 6000594 | 5967383 | 5967388 | — |
| 15.75 | | 0.6201 | 120 | 178 | — | — | 5967385 | 5967390 | — |
| | 5/8 | 0.6250 | 120 | 178 | — | — | 5966766 | 5967303 | — |
| 16.00 | | 0.6299 | 120 | 178 | — | 6000597 | 5967393 | 5967396 | — |
| | 41/64 | 0.6406 | 125 | 184 | — | — | 5966690 | — | — |
| 16.50 | | 0.6496 | 125 | 184 | — | 6000600 | 5967395 | — | — |
| | 21/32 | 0.6562 | 125 | 184 | — | — | 5966978 | — | — |
| 17.00 | | 0.6693 | 125 | 184 | — | 6000603 | 5967397 | — | — |
| | 43/64 | 0.6719 | 130 | 191 | — | — | 5966695 | — | — |
| | 11/16 | 0.6875 | 130 | 191 | — | — | 5967344 | — | — |
| 17.50 | | 0.6890 | 130 | 191 | — | 6000606 | 5967399 | — | — |
| 18.00 | | 0.7087 | 130 | 191 | — | — | 5967408 | — | — |
| 18.50 | | 0.7283 | 135 | 198 | — | — | 5967412 | — | — |
| 19.00 | | 0.7480 | 135 | 198 | — | — | 5967417 | — | — |
| 19.50 | | 0.7677 | 140 | 205 | — | — | 5967426 | — | — |
| 20.00 | | 0.7874 | 140 | 205 | — | — | 5966974 | — | — |

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

* Sets Available on pg. 231

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

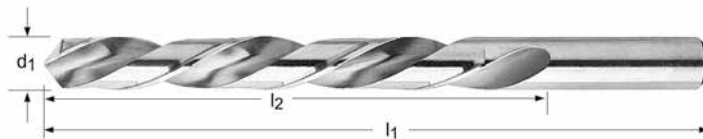
4XD

HSS

118°



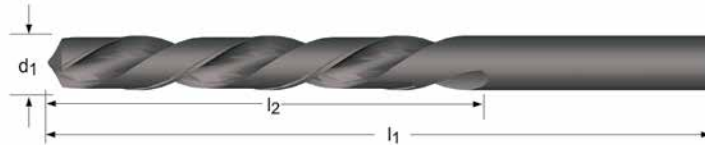
1/32 - 1/2



| 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 | 5995605 |
| 3/64 | 0.0469 | 3/4 | 1.3/4 | 12 | 5995489 |
| 1/16 | 0.0625 | 7/8 | 1.7/8 | 12 | 5995596 |
| 5/64 | 0.0781 | 1" | 2" | 12 | 5995508 |
| 3/32 | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5995486 |
| 7/64 | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5995519 |
| 1/8 | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5995464 |
| 9/64 | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5995527 |
| 5/32 | 0.1563 | 2" | 3.1/8 | 12 | 5995504 |
| 11/64 | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5995466 |
| 3/16 | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5995484 |
| 13/64 | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5995468 |
| 7/32 | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5995515 |
| 15/64 | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5995470 |
| 1/4 | 0.2500 | 2.3/4 | 4" | 12 | 5995463 |
| 17/64 | 0.2656 | 2.7/8 | 4.1/8 | 12 | 5995471 |
| 9/32 | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5995523 |
| 19/64 | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5995472 |
| 5/16 | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5995501 |
| 21/64 | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5995475 |
| 11/32 | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5995465 |
| 23/64 | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5995477 |
| 3/8 | 0.3750 | 3.5/8 | 5" | 6 | 5995492 |
| 25/64 | 0.3906 | 3.3/4 | 5.1/8 | 6 | 5995478 |
| 13/32 | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5995467 |
| 27/64 | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5995480 |
| 7/16 | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5995511 |
| 29/64 | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5995482 |
| 15/32 | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5995469 |
| 31/64 | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5995495 |
| 1/2 | 0.5000 | 4.1/2 | 6" | 6 | 5995602 |

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 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | A101 |
|----------------------------------|--------------------------|-------------|-------------|---------|
| 1.00 | 0.0394 | 12 | 34 | 5968016 |
| 1.10 | 0.0433 | 14 | 36 | 5968019 |
| 1.20 | 0.0472 | 16 | 38 | 5968022 |
| 1.25 | 0.0492 | 16 | 38 | 5968025 |
| 1.30 | 0.0512 | 16 | 38 | 5968032 |
| 1.40 | 0.0551 | 18 | 40 | 5968037 |
| 1.50 | 0.0591 | 18 | 40 | 5968042 |
| 1.60 | 0.0630 | 20 | 43 | 5968047 |
| 1.70 | 0.0669 | 20 | 43 | 5968052 |
| 1.80 | 0.0709 | 22 | 46 | 5968062 |
| 1.90 | 0.0748 | 22 | 46 | 5968067 |
| 2.00 | 0.0787 | 24 | 49 | 5967908 |
| 2.10 | 0.0827 | 24 | 49 | 5967955 |
| 2.20 | 0.0866 | 27 | 53 | 5967987 |
| 2.30 | 0.0906 | 27 | 53 | 5968021 |
| 2.40 | 0.0945 | 30 | 57 | 5968069 |
| 2.50 | 0.0984 | 30 | 57 | 5968082 |
| 2.60 | 0.1024 | 30 | 57 | 5968087 |
| 2.70 | 0.1063 | 33 | 61 | 5968093 |
| 2.80 | 0.1102 | 33 | 61 | 5968098 |
| 2.90 | 0.1142 | 33 | 61 | 5967912 |
| 3.00 | 0.1181 | 33 | 61 | 5967917 |
| 3.20 | 0.1260 | 36 | 65 | 5967920 |
| 3.30 | 0.1299 | 36 | 65 | 5967924 |
| 3.50 | 0.1378 | 39 | 70 | 5967928 |
| 3.80 | 0.1496 | 43 | 75 | 5967933 |
| 4.00 | 0.1575 | 43 | 75 | 5967939 |
| 4.20 | 0.1654 | 43 | 75 | 5967943 |
| 4.50 | 0.1772 | 47 | 80 | 5967948 |
| 4.80 | 0.1890 | 52 | 86 | 5967952 |
| 5.00 | 0.1969 | 52 | 86 | 5967958 |
| 5.10 | 0.2008 | 52 | 86 | 5967961 |
| 5.20 | 0.2047 | 52 | 86 | 5967964 |

JOBBER DRILL



| d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | A101 |
|----------------------------------|--------------------------|-------------|-------------|---------|
| 5.50 | 0.2165 | 57 | 93 | 5967966 |
| 6.00 | 0.2362 | 57 | 93 | 5967969 |
| 6.50 | 0.2559 | 63 | 101 | 5967972 |
| 7.00 | 0.2756 | 69 | 109 | 5967975 |
| 7.50 | 0.2953 | 69 | 109 | 5967978 |
| 8.00 | 0.3150 | 75 | 117 | 5967981 |
| 8.50 | 0.3346 | 75 | 117 | 5967984 |
| 9.00 | 0.3543 | 81 | 125 | 5967990 |
| 10.00 | 0.3937 | 87 | 133 | 5968072 |
| 11.00 | 0.4331 | 94 | 142 | 5968077 |
| 12.00 | 0.4724 | 101 | 151 | 5968086 |

Heavy Duty Jobber Length (HX Series)

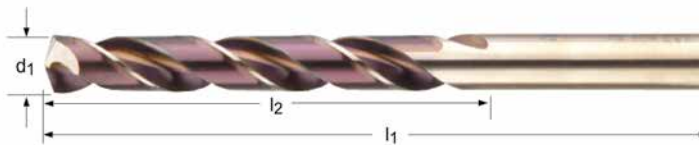
* HX10 set available on pg. 233

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 | 5996242 | — | — |
| | 52 | | 0.0635 | 7/8 | 1.7/8 | 12 | — | 5995473 | — |
| | 51 | | 0.0670 | 1" | 2" | 12 | — | 5995462 | — |
| | 50 | | 0.0700 | 1" | 2" | 12 | — | 5995923 | — |
| | 49 | | 0.0730 | 1" | 2" | 12 | — | 5995914 | — |
| | 48 | | 0.0760 | 1" | 2" | 12 | — | 5995910 | — |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 5996298 | — | — |
| | 47 | | 0.0785 | 1" | 2" | 12 | — | 5995907 | — |
| | 46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | — | 5995903 | — |
| | 45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | — | 5995897 | — |
| | 44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | — | 5995894 | — |
| | 43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | — | 5995890 | — |
| | 42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | — | 5995886 | — |
| 3/32 | | | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5996274 | — | — |
| | 41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | — | 5995881 | — |
| | 40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | — | 5995872 | — |
| | 39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | — | 5995864 | — |
| | 38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | — | 5995860 | — |
| | 37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | — | 5995857 | — |
| | 36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | — | 5995853 | — |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5996310 | — | — |
| | 35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | — | 5995850 | — |
| | 34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | — | 5995846 | — |
| | 33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | — | 5995843 | — |
| | 32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | — | 5995841 | — |
| | 31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | — | 5995833 | — |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5996326 | — | — |
| | 30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | — | 5995829 | — |
| | 29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | — | 5995823 | — |
| | 28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | — | 5995819 | — |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5996318 | — | — |
| | 27 | | 0.1440 | 1.7/8 | 3" | 12 | — | 5995815 | — |
| | 26 | | 0.1470 | 1.7/8 | 3" | 12 | — | 5995811 | — |

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 | — | 5995807 | — |
| | 24 | | 0.1520 | 2" | 3.1/8 | 12 | — | 5995804 | — |
| | 23 | | 0.1540 | 2" | 3.1/8 | 12 | — | 5995800 | — |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 5996295 | — | — |
| | 22 | | 0.1570 | 2" | 3.1/8 | 12 | — | 5995791 | — |
| | 21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | — | 5995788 | — |
| | 20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | — | 5995784 | — |
| | 19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | — | 5995777 | — |
| | 18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | — | 5995772 | — |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5996397 | — | — |
| | 17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | — | 5995768 | — |
| | 16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | — | 5995765 | — |
| | 15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | — | 5995760 | — |
| | 14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | — | 5995756 | — |
| | 13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | — | 5995932 | — |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5996270 | — | — |
| | 12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | — | 5995930 | — |
| | 11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | — | 5995929 | — |
| | 10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | — | 5995926 | — |
| | 9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | — | 5995592 | — |
| | 8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | — | 5995584 | — |
| | 7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | — | 5995539 | — |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5996407 | — | — |
| | 6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | — | 5995498 | — |
| | 5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | — | 5995917 | — |
| | 4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | — | 5995868 | — |
| | 3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | — | 5995825 | — |
| 7/32 | | | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5996307 | — | — |
| | 2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | — | 5995780 | — |
| | 1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | — | 5995920 | — |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | — | — | 5996320 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5996413 | — | — |
| | | B | 0.2374 | 2.3/4 | 4" | 12 | — | — | 5996329 |
| | | C | 0.2421 | 2.3/4 | 4" | 12 | — | — | 5996332 |
| | | D | 0.2461 | 2.3/4 | 4" | 12 | — | — | 5996334 |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 5996282 | — | — |
| | | F | 0.2571 | 2.7/8 | 4.1/8 | 12 | — | — | 5996340 |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | — | — | 5996342 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | — | — | — |
| | | H | 0.2661 | 2.7/8 | 4.1/8 | 12 | — | — | 5996345 |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | — | — | 5996346 |
| | | J | 0.2772 | 2.7/8 | 4.1/8 | 12 | — | — | 5996349 |
| | | K | 0.2811 | 2.15/16 | 4.1/4 | 12 | — | — | 5996352 |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5996314 | — | — |
| | | L | 0.2902 | 2.15/16 | 4.1/4 | 12 | — | — | 5996359 |
| | | M | 0.2949 | 3.1/16 | 4.3/8 | 12 | — | — | 5996362 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5996247 | — | — |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | — | — | 5996366 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5996290 | — | — |
| | | O | 0.3161 | 3.3/16 | 4.1/2 | 6 | — | — | 5996370 |
| | | P | 0.3228 | 3.5/16 | 4.5/8 | 6 | — | — | 5996374 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5996251 | — | — |
| | | Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | — | — | 5996378 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | — | — | 5996381 |
| 11/32 | | | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5996356 | — | — |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | — | — | 5996386 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | — | — | 5996390 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5996254 | — | — |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | — | — | 5996394 |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 5996278 | — | — |
| | | V | 0.3772 | 3.5/8 | 5" | 6 | — | — | 5996399 |
| | | W | 0.3858 | 3.3/4 | 5.1/8 | 6 | — | — | 5995751 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 5996258 | — | — |
| | | X | 0.3969 | 3.3/4 | 5.1/8 | 6 | — | — | 5995795 |
| | | Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | — | — | 5995837 |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5996403 | — | — |

| 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 |
|--------------------|-------------------|----------------------|--------------------------|---------------|---------------|-------------|---------|------|---------|
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | — | — | 5995876 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5996262 | — | — |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5996303 | — | — |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5996267 | — | — |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5996410 | — | — |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5996286 | — | — |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 5996236 | — | — |

JOBBER DRILL



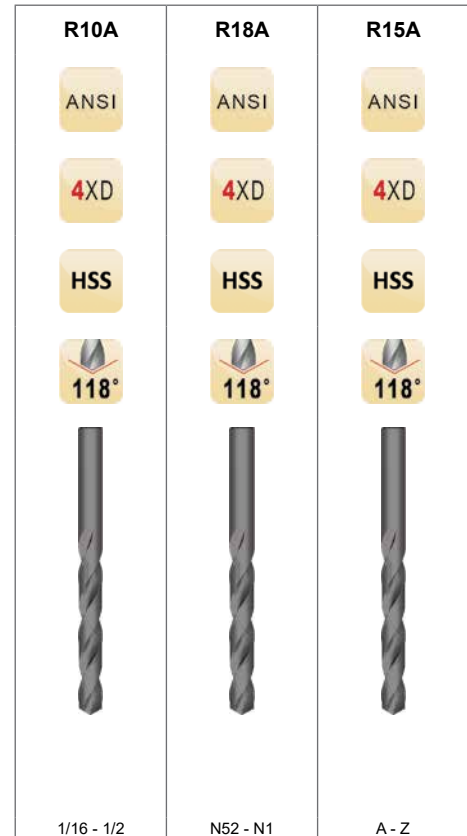
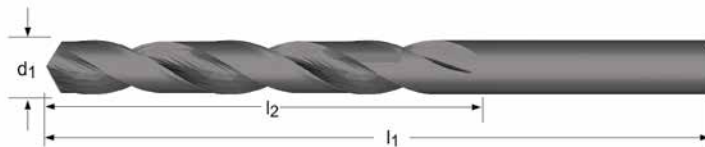
General Purpose Jobber Length (NAS 907 Type A)

R10A - Fractional Sizes

R18A - Wire Gauge Sizes

R15A - Letter Sizes

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



| 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 | 5997500 | — | — |
| | 52 | | 0.0635 | 7/8 | 1.7/8 | 12 | — | 5999185 | — |
| | 51 | | 0.0670 | 1" | 2" | 12 | — | 5999183 | — |
| | 50 | | 0.0700 | 1" | 2" | 12 | — | 5999181 | — |
| | 49 | | 0.0730 | 1" | 2" | 12 | — | 5999175 | — |
| | 48 | | 0.0760 | 1" | 2" | 12 | — | 5999146 | — |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 5997578 | — | — |
| | 47 | | 0.0785 | 1" | 2" | 12 | — | 5999101 | — |
| | 46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | — | 5999068 | — |
| | 45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | — | 5999026 | — |
| | 44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | — | 5999428 | — |
| | 43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | — | 5999424 | — |
| | 42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | — | 5999422 | — |
| 3/32 | | | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5997565 | — | — |
| | 41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | — | 5999419 | — |
| | 40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | — | 5999416 | — |
| | 39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | — | 5999410 | — |
| | 38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | — | 5999407 | — |
| | 37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | — | 5999404 | — |
| | 36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | — | 5999401 | — |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5997587 | — | — |
| | 35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | — | 5999399 | — |
| | 34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | — | 5999392 | — |
| | 33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | — | 5999388 | — |
| | 32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | — | 5999384 | — |
| | 31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | — | 5999380 | — |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5997510 | — | — |
| | 30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | — | 5999376 | — |
| | 29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | — | 5999368 | — |
| | 28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | — | 5999363 | — |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5997596 | — | — |
| | 27 | | 0.1440 | 1.7/8 | 3" | 12 | — | 5999359 | — |

| 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 | — | 5999352 | — |
| | 25 | | 0.1495 | 1.7/8 | 3" | 12 | — | 5999343 | — |
| | 24 | | 0.1520 | 2" | 3.1/8 | 12 | — | 5999339 | — |
| | 23 | | 0.1540 | 2" | 3.1/8 | 12 | — | 5999335 | — |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 5997576 | — | — |
| | 22 | | 0.1570 | 2" | 3.1/8 | 12 | — | 5999331 | — |
| | 21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | — | 5999327 | — |
| | 20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | — | 5999323 | — |
| | 19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | — | 5999313 | — |
| | 18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | — | 5999311 | — |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5997514 | — | — |
| | 17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | — | 5999307 | — |
| | 16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | — | 5999298 | — |
| | 15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | — | 5999294 | — |
| | 14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | — | 5999290 | — |
| | 13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | — | 5999286 | — |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5997560 | — | — |
| | 12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | — | 5999282 | — |
| | 11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | — | 5999278 | — |
| | 10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | — | 5999275 | — |
| | 9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | — | 5999042 | — |
| | 8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | — | 5999039 | — |
| | 7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | — | 5999035 | — |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5997523 | — | — |
| | 6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | — | 5999031 | — |
| | 5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | — | 5999179 | — |
| | 4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | — | 5999413 | — |
| | 3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | — | 5999372 | — |
| 7/32 | | | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5997584 | — | — |
| | 2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | — | 5999317 | — |
| | 1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | — | 5999271 | — |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | — | — | 5998650 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5997530 | — | — |
| | | B | 0.2374 | 2.3/4 | 4" | 12 | — | — | 5998654 |
| | | C | 0.2421 | 2.3/4 | 4" | 12 | — | — | 5998658 |
| | | D | 0.2461 | 2.3/4 | 4" | 12 | — | — | 5998662 |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 5997506 | — | — |
| | | E | 0.2571 | 2.7/8 | 4.1/8 | 12 | — | — | 5998670 |
| | | F | 0.2610 | 2.7/8 | 4.1/8 | 12 | — | — | 5998674 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 5997533 | — | — |
| | | G | 0.2661 | 2.7/8 | 4.1/8 | 12 | — | — | 5998677 |
| | | H | 0.2720 | 2.7/8 | 4.1/8 | 12 | — | — | 5998680 |
| | | I | 0.2722 | 2.7/8 | 4.1/8 | 12 | — | — | 5998683 |
| | | J | 0.2772 | 2.7/8 | 4.1/8 | 12 | — | — | 5998689 |
| 9/32 | | | 0.2811 | 2.15/16 | 4.1/4 | 12 | — | — | 5998689 |
| | | K | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5997593 | — | — |
| | | L | 0.2902 | 2.15/16 | 4.1/4 | 12 | — | — | 5998692 |
| | | M | 0.2949 | 3.1/16 | 4.3/8 | 12 | — | — | 5998695 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5997536 | — | — |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | — | — | 5998698 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5997573 | — | — |
| | | O | 0.3161 | 3.3/16 | 4.1/2 | 6 | — | — | 5998700 |
| | | P | 0.3228 | 3.5/16 | 4.5/8 | 6 | — | — | 5998702 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5997540 | — | — |
| | | Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | — | — | 5998705 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | — | — | 5998707 |
| 11/32 | | | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5997512 | — | — |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | — | — | 5998709 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | — | — | 5998711 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5997544 | — | — |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | — | — | 5998715 |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 5997568 | — | — |
| | | V | 0.3772 | 3.5/8 | 5" | 6 | — | — | 5998717 |
| | | W | 0.3858 | 3.3/4 | 5.1/8 | 6 | — | — | 5998719 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | — | — | — |
| | | X | 0.3969 | 3.3/4 | 5.1/8 | 6 | — | — | 5998722 |

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 |
|--------------------|-------------------|----------------------|--------------------------|---------------|---------------|-------------|---------|------|---------|
| | | Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | — | — | 5998726 |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5997517 | — | — |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | — | — | 5998729 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5997552 | — | — |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5997581 | — | — |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5997555 | — | — |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5997526 | — | — |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5997571 | — | — |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 5997503 | — | — |

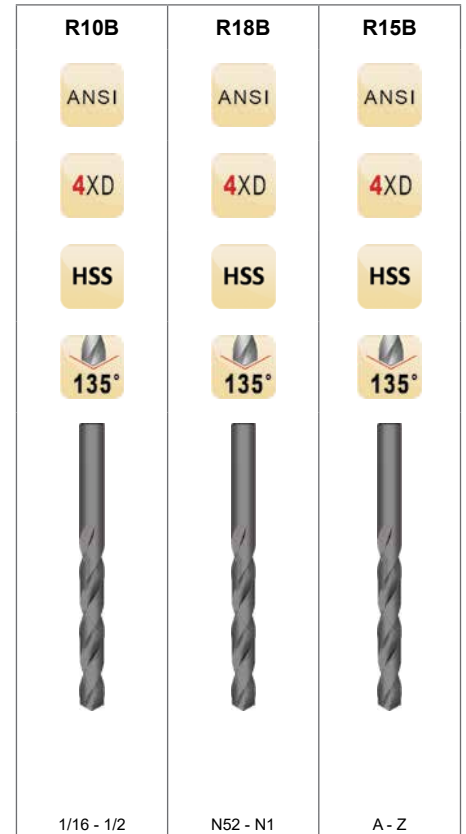
Heavy Duty Jobber Length (NAS 907 Type B)

R10B - Fractional Sizes

R18B - Wire Gauge Sizes

R15B - Letter Sizes

Low thrust design self centering Split Point for easier penetration. Steam tempered 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 | 5997600 | — | — |
| | 52 | | 0.0635 | 7/8 | 1.7/8 | 12 | — | 5997656 | — |
| | 51 | | 0.0670 | 1" | 2" | 12 | — | 5997649 | — |
| | 50 | | 0.0700 | 1" | 2" | 12 | — | 5997801 | — |
| | 49 | | 0.0730 | 1" | 2" | 12 | — | 5997792 | — |
| | 48 | | 0.0760 | 1" | 2" | 12 | — | 5997788 | — |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 5998027 | — | — |
| | 47 | | 0.0785 | 1" | 2" | 12 | — | 5997778 | — |
| | 46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | — | 5997739 | — |
| | 45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | — | 5997715 | — |
| | 44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | — | 5997686 | — |
| | 43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | — | 5997643 | — |
| | 42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | — | 5999177 | — |
| 3/32 | | | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5998007 | — | — |
| | 41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | — | 5999173 | — |
| | 40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | — | 5999171 | — |
| | 39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | — | 5999168 | — |
| | 38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | — | 5999165 | — |
| | 37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | — | 5999162 | — |
| | 36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | — | 5999159 | — |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5998037 | — | — |
| | 35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | — | 5999156 | — |
| | 34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | — | 5999152 | — |
| | 33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | — | 5999149 | — |
| | 32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | — | 5999139 | — |
| | 31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | — | 5999135 | — |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5997612 | — | — |
| | 30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | — | 5999130 | — |
| | 29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | — | 5999122 | — |
| | 28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | — | 5999118 | — |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5998049 | — | — |
| | 27 | | 0.1440 | 1.7/8 | 3" | 12 | — | 5999113 | — |

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 | — | 5999110 | — |
| | 25 | | 0.1495 | 1.7/8 | 3" | 12 | — | 5999107 | — |
| | 24 | | 0.1520 | 2" | 3.1/8 | 12 | — | 5999104 | — |
| | 23 | | 0.1540 | 2" | 3.1/8 | 12 | — | 5999098 | — |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 5998023 | — | — |
| | 22 | | 0.1570 | 2" | 3.1/8 | 12 | — | 5999095 | — |
| | 21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | — | 5999092 | — |
| | 20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | — | 5999089 | — |
| | 19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | — | 5999082 | — |
| | 18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | — | 5999079 | — |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5997620 | — | — |
| | 17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | — | 5999076 | — |
| | 16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | — | 5999074 | — |
| | 15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | — | 5999071 | — |
| | 14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | — | 5999065 | — |
| | 13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | — | 5999062 | — |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5998174 | — | — |
| | 12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | — | 5999058 | — |
| | 11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | — | 5999054 | — |
| | 10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | — | 5999050 | — |
| | 9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | — | 5997670 | — |
| | 8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | — | 5997666 | — |
| | 7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | — | 5997663 | — |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5997625 | — | — |
| | 6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | — | 5997660 | — |
| | 5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | — | 5997796 | — |
| | 4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | — | 5999169 | — |
| | 3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | — | 5999126 | — |
| 7/32 | | | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5998034 | — | — |
| | 2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | — | 5999085 | — |
| | 1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | — | 5999046 | — |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | — | — | 5998734 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5998001 | — | — |
| | | B | 0.2380 | 2.3/4 | 4" | 12 | — | — | 5998737 |
| | | C | 0.2421 | 2.3/4 | 4" | 12 | — | — | 5998741 |
| | | D | 0.2461 | 2.3/4 | 4" | 12 | — | — | 5998748 |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 5997608 | — | — |
| | | F | 0.2571 | 2.7/8 | 4.1/8 | 12 | — | — | 5998757 |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | — | — | 5998761 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 5998045 | — | — |
| | | H | 0.2661 | 2.7/8 | 4.1/8 | 12 | — | — | 5998765 |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | — | — | 5998768 |
| | | J | 0.2772 | 2.7/8 | 4.1/8 | 12 | — | — | 5998773 |
| | | K | 0.2811 | 2.15/16 | 4.1/4 | 12 | — | — | 5998777 |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5998041 | — | — |
| | | L | 0.2902 | 2.15/16 | 4.1/4 | 12 | — | — | 5998782 |
| | | M | 0.2949 | 3.1/16 | 4.3/8 | 12 | — | — | 5998787 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5998080 | — | — |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | — | — | 5998795 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5998020 | — | — |
| | | O | 0.3161 | 3.3/16 | 4.1/2 | 6 | — | — | 5998975 |
| | | P | 0.3228 | 3.5/16 | 4.5/8 | 6 | — | — | 5999015 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5998114 | — | — |
| | | Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | — | — | 5999055 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | — | — | 5999090 |
| 11/32 | | | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5997616 | — | — |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | — | — | 5999125 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | — | — | 5999133 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5998154 | — | — |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | — | — | 5999136 |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 5998011 | — | — |
| | | V | 0.3772 | 3.5/8 | 5" | 6 | — | — | 5999140 |
| | | W | 0.3858 | 3.3/4 | 5.1/8 | 6 | — | — | 5999142 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 5998162 | — | — |
| | | X | 0.3969 | 3.3/4 | 5.1/8 | 6 | — | — | 5998979 |
| | | Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | — | — | 5998983 |

| 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 |
|--------------------|-------------------|----------------------|--------------------------|---------------|---------------|-------------|---------|------|---------|
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5997622 | — | — |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | — | — | 5998986 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5998166 | — | — |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5998031 | — | — |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5998170 | — | — |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5997632 | — | — |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5998016 | — | — |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 5997604 | — | — |

High Helix Jobber Length

* Sets Available on pg. 232

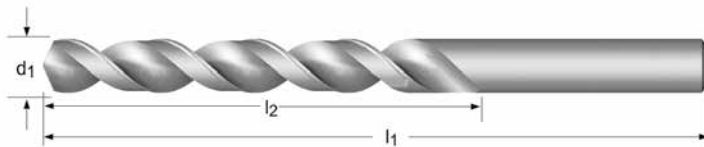
R10H - Fractional Sizes

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 tempered for increased wear resistance & lubricity. Fast spiral for stainless.



| 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 | — | 5998444 | — |
| | 79 | | 0.0145 | 1/8 | | 3/4 | | 12 | — | 5998435 | — |
| | 78 | | 0.0160 | 3/16 | | 7/8 | | 12 | — | 5998392 | — |
| | 77 | | 0.0180 | 3/16 | | 7/8 | | 12 | — | 5998354 | — |
| | 76 | | 0.0200 | 3/16 | | 7/8 | | 12 | — | 5998321 | — |
| | 75 | | 0.0210 | 1/4 | | 1" | | 12 | — | 5998278 | — |
| | 74 | | 0.0225 | 1/4 | | 1" | | 12 | — | 5998119 | — |
| | 73 | | 0.0240 | 5/16 | | 1.1/8 | | 12 | — | 5998112 | — |
| | 72 | | 0.0250 | 5/16 | | 1.1/8 | | 12 | — | 5998109 | — |
| | 71 | | 0.0260 | 3/8 | | 1.1/4 | | 12 | — | 5998106 | — |
| | 70 | | 0.0280 | 3/8 | | 1.1/4 | | 12 | — | 5998103 | — |
| | 69 | | 0.0292 | 1/2 | | 1.3/8 | | 12 | — | 5998097 | — |
| | 68 | | 0.0310 | 1/2 | | 1.3/8 | | 12 | — | 5998094 | — |
| 1/32 | | | 0.0313 | 1/2 | | 1.3/8 | | 12 | 5998353 | — | — |
| | 67 | | 0.0320 | 1/2 | | 1.3/8 | | 12 | — | 5998090 | — |
| | 66 | | 0.0330 | 1/2 | | 1.3/8 | | 12 | — | 5998087 | — |
| | 65 | | 0.0350 | 5/8 | | 1.1/2 | | 12 | — | 5998084 | — |
| | 64 | | 0.0360 | 5/8 | | 1.1/2 | | 12 | — | 5998078 | — |
| | 63 | | 0.0370 | 5/8 | | 1.1/2 | | 12 | — | 5998075 | — |
| | 62 | | 0.0380 | 5/8 | | 1.1/2 | | 12 | — | 5998072 | — |
| | 61 | | 0.0390 | 11/16 | | 1.5/8 | | 12 | — | 5998069 | — |
| | | 1.00 | 0.0394 | | 12 | | 34 | 10 | — | — | 5968323 |
| | 60 | | 0.0400 | 11/16 | | 1.5/8 | | 12 | — | 5998066 | — |
| | 59 | | 0.0410 | 11/16 | | 1.5/8 | | 12 | — | 5998060 | — |
| | 58 | | 0.0420 | 11/16 | | 1.5/8 | | 12 | — | 5998057 | — |
| | 57 | | 0.0430 | 3/4 | | 1.3/4 | | 12 | — | 5998055 | — |
| | | 1.10 | 0.0433 | | 14 | | 36 | 10 | — | — | 5968333 |
| | 56 | | 0.0465 | 3/4 | | 1.3/4 | | 12 | — | 5998051 | — |
| 3/64 | | | 0.0469 | 3/4 | | 1.3/4 | | 12 | 5998386 | — | — |
| | | 1.20 | 0.0472 | | 16 | | 38 | 10 | — | — | 5968338 |
| | | 1.30 | 0.0512 | | 16 | | 38 | 10 | — | — | 5968343 |
| | 55 | | 0.0520 | 7/8 | | 1.7/8 | | 12 | — | 5998043 | — |
| | 54 | | 0.0550 | 7/8 | | 1.7/8 | | 12 | — | 5998039 | — |

| 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 | — | — | 5968351 |
| | | 1.50 | 0.0591 | | 18 | | 40 | 10 | — | — | 5968176 |
| | 53 | | 0.0595 | 7/8 | | 1.7/8 | | 12 | — | 5998035 | — |
| 1/16 | | | 0.0625 | 7/8 | | 1.7/8 | | 12 | 5998346 | — | — |
| 1/16 | | | 0.0625 | | 20 | | 43 | 10 | — | — | 5968200 |
| | | 1.60 | 0.0630 | | 20 | | 43 | 10 | — | — | 5968184 |
| | 52 | | 0.0635 | 7/8 | | 1.7/8 | | 12 | — | 5998032 | — |
| | | 1.70 | 0.0669 | | 20 | | 43 | 10 | — | — | 5968188 |
| | 51 | | 0.0670 | 1" | | 2" | | 12 | — | 5998028 | — |
| | 50 | | 0.0700 | 1" | | 2" | | 12 | — | 5998024 | — |
| | | 1.80 | 0.0709 | | 22 | | 46 | 10 | — | — | 5968192 |
| | 49 | | 0.0730 | 1" | | 2" | | 12 | — | 5998015 | — |
| | | 1.90 | 0.0748 | | 22 | | 46 | 10 | — | — | 5968196 |
| | 48 | | 0.0760 | 1" | | 2" | | 12 | — | 5998012 | — |
| 5/64 | | | 0.0781 | 1" | | 2" | | 12 | 5998406 | — | — |
| 5/64 | | | 0.0781 | | 24 | | 49 | 10 | — | — | 5968398 |
| | 47 | | 0.0785 | 1" | | 2" | | 12 | — | 5998008 | — |
| | | 2.00 | 0.0787 | | 24 | | 49 | 10 | — | — | 5968295 |
| | 46 | | 0.0810 | 1.1/8 | | 2.1/8 | | 12 | — | 5998000 | — |
| | 45 | | 0.0820 | 1.1/8 | | 2.1/8 | | 12 | — | 5997997 | — |
| | | 2.10 | 0.0827 | | 24 | | 49 | 10 | — | — | 5968302 |
| | 44 | | 0.0860 | 1.1/8 | | 2.1/8 | | 12 | — | 5997994 | — |
| | | 2.20 | 0.0866 | | 27 | | 53 | 10 | — | — | 5968307 |
| | 43 | | 0.0890 | 1.1/4 | | 2.1/4 | | 12 | — | 5997991 | — |
| | | 2.30 | 0.0906 | | 27 | | 53 | 10 | — | — | 5968311 |
| | 42 | | 0.0935 | 1.1/4 | | 2.1/4 | | 12 | — | 5997988 | — |
| 3/32 | | | 0.0938 | 1.1/4 | | 2.1/4 | | 12 | 5998382 | — | — |
| 3/32 | | | 0.0938 | | 30 | | 57 | 10 | — | — | 5968314 |
| | | 2.40 | 0.0945 | | 30 | | 57 | 10 | — | — | 5968315 |
| | 41 | | 0.0960 | 1.3/8 | | 2.3/8 | | 12 | — | 5997985 | — |
| | 40 | | 0.0980 | 1.3/8 | | 2.3/8 | | 12 | — | 5997982 | — |
| | | 2.50 | 0.0984 | | 30 | | 57 | 10 | — | — | 5968318 |
| | 39 | | 0.0995 | 1.3/8 | | 2.3/8 | | 12 | — | 5997978 | — |
| | 38 | | 0.1015 | 1.7/16 | | 2.1/2 | | 12 | — | 5997975 | — |
| | | 2.60 | 0.1024 | | 30 | | 57 | 10 | — | — | 5968328 |
| | 37 | | 0.1040 | 1.7/16 | | 2.1/2 | | 12 | — | 5998135 | — |
| | | 2.70 | 0.1063 | | 33 | | 61 | 10 | — | — | 5968280 |
| | 36 | | 0.1065 | 1.7/16 | | 2.1/2 | | 12 | — | 5998131 | — |
| 7/64 | | | 0.1094 | 1.1/2 | | 2.5/8 | | 12 | 5998422 | — | — |
| 7/64 | | | 0.1094 | | 33 | | 61 | 10 | — | — | 5968179 |
| | 35 | | 0.1100 | 1.1/2 | | 2.5/8 | | 12 | — | 5998127 | — |
| | | 2.80 | 0.1102 | | 33 | | 61 | 10 | — | — | 5968341 |
| | 34 | | 0.1110 | 1.1/2 | | 2.5/8 | | 12 | — | 5998123 | — |
| | 33 | | 0.1130 | 1.1/2 | | 2.5/8 | | 12 | — | 5998116 | — |
| | | 2.90 | 0.1142 | | 33 | | 61 | 10 | — | — | 5968376 |
| | 32 | | 0.1160 | 1.5/8 | | 2.3/4 | | 12 | — | 5998081 | — |
| | | 3.00 | 0.1181 | | 33 | | 61 | 10 | — | — | 5968400 |
| | 31 | | 0.1200 | 1.5/8 | | 2.3/4 | | 12 | — | 5998047 | — |
| | | 3.10 | 0.1220 | | 36 | | 65 | 10 | — | — | 5968423 |
| 1/8 | | | 0.1250 | 1.5/8 | | 2.3/4 | | 12 | 5998358 | — | — |
| 1/8 | | | 0.1250 | | 36 | | 65 | 10 | — | — | 5968209 |
| | | 3.20 | 0.1260 | | 36 | | 65 | 10 | — | — | 5968427 |
| | 30 | | 0.1285 | 1.5/8 | | 2.3/4 | | 12 | — | 5998004 | — |
| | | 3.30 | 0.1299 | | 36 | | 65 | 10 | — | — | 5968428 |
| | | 3.40 | 0.1339 | | 39 | | 70 | 10 | — | — | 5968430 |
| | 29 | | 0.1360 | 1.3/4 | | 2.7/8 | | 12 | — | 5998265 | — |
| | | 3.50 | 0.1378 | | 39 | | 70 | 10 | — | — | 5968433 |
| | 28 | | 0.1405 | 1.3/4 | | 2.7/8 | | 12 | — | 5998257 | — |
| 9/64 | | | 0.1406 | 1.3/4 | | 2.7/8 | | 12 | 5998430 | — | — |
| 9/64 | | | 0.1406 | | 39 | | 70 | 10 | — | — | 5968256 |
| | | 3.60 | 0.1417 | | 39 | | 70 | 10 | — | — | 5968289 |
| | 27 | | 0.1440 | 1.7/8 | | 3" | | 12 | — | 5998253 | — |
| | | 3.70 | 0.1457 | | 39 | | 70 | 10 | — | — | 5968294 |
| | 26 | | 0.1470 | 1.7/8 | | 3" | | 12 | — | 5998249 | — |
| | 25 | | 0.1495 | 1.7/8 | | 3" | | 12 | — | 5998245 | — |
| | | 3.80 | 0.1496 | | 43 | | 75 | 10 | — | — | 5968299 |

| 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 | — | 5998242 | — |
| | | 3.90 | 0.1535 | | 43 | | 75 | 10 | — | — | 5968304 |
| | 23 | | 0.1540 | 2" | | 3.1/8 | | 12 | — | 5998239 | — |
| 5/32 | | | 0.1563 | 2" | | 3.1/8 | | 12 | 5998402 | — | — |
| 5/32 | | | 0.1563 | | 43 | | 75 | 10 | — | — | 5968396 |
| | 22 | | 0.1570 | 2" | | 3.1/8 | | 12 | — | 5998236 | — |
| | | 4.00 | 0.1575 | | 43 | | 75 | 10 | — | — | 5968322 |
| | 21 | | 0.1590 | 2.1/8 | | 3.1/4 | | 12 | — | 5998233 | — |
| | 20 | | 0.1610 | 2.1/8 | | 3.1/4 | | 12 | — | 5998229 | — |
| | | 4.10 | 0.1614 | | 43 | | 75 | 10 | — | — | 5968331 |
| | | 4.20 | 0.1654 | | 43 | | 75 | 10 | — | — | 5968336 |
| | 19 | | 0.1660 | 2.1/8 | | 3.1/4 | | 12 | — | 5998221 | — |
| | | 4.30 | 0.1693 | | 47 | | 80 | 10 | — | — | 5968346 |
| | 18 | | 0.1695 | 2.1/8 | | 3.1/4 | | 12 | — | 5998219 | — |
| 11/64 | | | 0.1719 | 2.1/8 | | 3.1/4 | | 12 | 5998364 | — | — |
| 11/64 | | | 0.1719 | | 47 | | 80 | 10 | — | — | 5968238 |
| | 17 | | 0.1730 | 2.3/16 | | 3.3/8 | | 12 | — | 5998216 | — |
| | | 4.40 | 0.1732 | | 47 | | 80 | 10 | — | — | 5968350 |
| | 16 | | 0.1770 | 2.3/16 | | 3.3/8 | | 12 | — | 5998214 | — |
| | | 4.50 | 0.1772 | | 47 | | 80 | 10 | — | — | 5968353 |
| | 15 | | 0.1800 | 2.3/16 | | 3.3/8 | | 12 | — | 5998212 | — |
| | | 4.60 | 0.1811 | | 47 | | 80 | 10 | — | — | 5968357 |
| | 14 | | 0.1820 | 2.3/16 | | 3.3/8 | | 12 | — | 5998210 | — |
| | 13 | | 0.1850 | 2.5/16 | | 3.1/2 | | 12 | — | 5998208 | — |
| | | 4.70 | 0.1850 | | 47 | | 80 | 10 | — | — | 5968360 |
| 3/16 | | | 0.1875 | 2.5/16 | | 3.1/2 | | 12 | 5998378 | — | — |
| 3/16 | | | 0.1875 | | 52 | | 86 | 10 | — | — | 5968310 |
| | 12 | | 0.1890 | 2.5/16 | | 3.1/2 | | 12 | — | 5998206 | — |
| | | 4.80 | 0.1890 | | 52 | | 86 | 10 | — | — | 5968363 |
| | 11 | | 0.1910 | 2.5/16 | | 3.1/2 | | 12 | — | 5998204 | — |
| | | 4.90 | 0.1929 | | 52 | | 86 | 10 | — | — | 5968366 |
| | 10 | | 0.1935 | 2.7/16 | | 3.5/8 | | 12 | — | 5998202 | — |
| | 10 | | 0.1935 | | 52 | | 86 | 10 | — | — | 6305901 |
| | 9 | | 0.1960 | 2.7/16 | | 3.5/8 | | 12 | — | 5998447 | — |
| | | 5.00 | 0.1969 | | 52 | | 86 | 10 | — | — | 5968369 |
| | 8 | | 0.1990 | 2.7/16 | | 3.5/8 | | 12 | — | 5998440 | — |
| | | 5.10 | 0.2008 | | 52 | | 86 | 10 | — | — | 5968371 |
| | 7 | | 0.2010 | 2.7/16 | | 3.5/8 | | 12 | — | 5998100 | — |
| 13/64 | | | 0.2031 | 2.7/16 | | 3.5/8 | | 12 | 5998369 | — | — |
| 13/64 | | | 0.2031 | | 52 | | 86 | 10 | — | — | 5968266 |
| | 6 | | 0.2040 | 2.1/2 | | 3.3/4 | | 12 | — | 5998063 | — |
| | | 5.20 | 0.2047 | | 52 | | 86 | 10 | — | — | 5968374 |
| | 5 | | 0.2055 | 2.1/2 | | 3.3/4 | | 12 | — | 5998019 | — |
| | | 5.30 | 0.2087 | | 52 | | 86 | 10 | — | — | 5968379 |
| | 4 | | 0.2090 | 2.1/2 | | 3.3/4 | | 12 | — | 5997980 | — |
| | | 5.40 | 0.2126 | | 57 | | 93 | 10 | — | — | 5968382 |
| | 3 | | 0.2130 | 2.1/2 | | 3.3/4 | | 12 | — | 5997970 | — |
| | | 5.50 | 0.2165 | | 57 | | 93 | 10 | — | — | 5968384 |
| 7/32 | | | 0.2188 | 2.1/2 | | 3.3/4 | | 12 | 5998419 | — | — |
| 7/32 | | | 0.2188 | | | | | 10 | — | — | 5968175 |
| | | 5.60 | 0.2205 | | 57 | | 93 | 10 | — | — | 5968386 |
| | 2 | | 0.2210 | 2.5/8 | | 3.7/8 | | 12 | — | 5998226 | — |
| | | 5.70 | 0.2244 | | 57 | | 93 | 10 | — | — | 5968388 |
| | 1 | | 0.2280 | 2.5/8 | | 3.7/8 | | 12 | — | 5998197 | — |
| | | 5.80 | 0.2283 | | 57 | | 93 | 10 | — | — | 5968390 |
| | | 5.90 | 0.2323 | | 57 | | 93 | 10 | — | — | 5968392 |
| 15/64 | | | 0.2344 | 2.5/8 | | 3.7/8 | | 12 | 5998451 | — | — |
| 15/64 | | | 0.2344 | | 57 | | 93 | 10 | — | — | 6305902 |
| | | 6.00 | 0.2362 | | 57 | | 93 | 10 | — | — | 5968402 |
| | | 6.10 | 0.2402 | | 63 | | 101 | 10 | — | — | 5968405 |
| | | 6.20 | 0.2441 | | 63 | | 101 | 10 | — | — | 5968406 |
| | | 6.30 | 0.2480 | | 63 | | 101 | 10 | — | — | 5968409 |
| 1/4 | | | 0.2500 | 2.3/4 | | 4" | | 12 | 5998356 | — | — |
| 1/4 | | | 0.2500 | | 63 | | 101 | 10 | — | — | 5968206 |
| | | 6.40 | 0.2520 | | 63 | | 101 | 10 | — | — | 5968411 |

| 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 | — | — | 5968412 |
| | | 6.60 | 0.2598 | | 63 | | 101 | 10 | — | — | 5968414 |
| | | 6.70 | 0.2638 | | 63 | | 101 | 10 | — | — | 5968417 |
| 17/64 | | | 0.2656 | 2.7/8 | | 4.1/8 | | 12 | 5998476 | — | — |
| 17/64 | | | 0.2656 | | 69 | | 109 | 10 | — | — | 6305903 |
| | | 6.80 | 0.2677 | | 69 | | 109 | 10 | — | — | 5968419 |
| | | 6.90 | 0.2717 | | 69 | | 109 | 10 | — | — | 5968421 |
| | | 7.00 | 0.2756 | | 69 | | 109 | 10 | — | — | 5968425 |
| | | 7.10 | 0.2795 | | 69 | | 109 | 10 | — | — | 5968167 |
| 9/32 | | | 0.2813 | 2.15/16 | | 4.1/4 | | 12 | 5998426 | — | — |
| 9/32 | | | 0.2813 | | 69 | | 109 | 10 | — | — | 5968253 |
| | | 7.20 | 0.2835 | | 69 | | 109 | 10 | — | — | 5968208 |
| | | 7.30 | 0.2874 | | 69 | | 109 | 10 | — | — | 5968239 |
| | | 7.40 | 0.2913 | | 69 | | 109 | 10 | — | — | 5968278 |
| | | 7.50 | 0.2953 | | 69 | | 109 | 10 | — | — | 5968330 |
| 19/64 | | | 0.2969 | 3.1/16 | | 4.3/8 | | 12 | 5998512 | — | — |
| 19/64 | | | 0.2969 | | 75 | | 117 | 10 | — | — | 6305904 |
| | | 7.60 | 0.2992 | | 75 | | 117 | 10 | — | — | 5968340 |
| | | 7.70 | 0.3031 | | 75 | | 117 | 10 | — | — | 5968345 |
| | | 7.80 | 0.3071 | | 75 | | 117 | 10 | — | — | 5968349 |
| | | 7.90 | 0.3110 | | 75 | | 117 | 10 | — | — | 5968354 |
| 5/16 | | | 0.3125 | 3.3/16 | | 4.1/2 | | 6 | 5998398 | — | — |
| 5/16 | | | 0.3125 | | 75 | | 117 | 10 | — | — | 5968394 |
| | | 8.00 | 0.3150 | | 75 | | 117 | 10 | — | — | 5968182 |
| | | 8.10 | 0.3189 | | 75 | | 117 | 10 | — | — | 5968187 |
| | | 8.20 | 0.3228 | | 75 | | 117 | 10 | — | — | 5968191 |
| | | 8.30 | 0.3268 | | 75 | | 117 | 10 | — | — | 5968195 |
| 21/64 | | | 0.3281 | 3.5/16 | | 4.5/8 | | 6 | 5998520 | — | — |
| 21/64 | | | 0.3281 | | 75 | | 117 | 10 | — | — | 6305905 |
| | | 8.40 | 0.3307 | | 75 | | 117 | 10 | — | — | 5968199 |
| | | 8.50 | 0.3346 | | 75 | | 117 | 10 | — | — | 5968202 |
| | | 8.60 | 0.3386 | | 81 | | 125 | 10 | — | — | 5968205 |
| | | 8.70 | 0.3425 | | 81 | | 125 | 10 | — | — | 5968211 |
| 11/32 | | | 0.3437 | 3.7/16 | | 4.3/4 | | 6 | 5998361 | — | — |
| 11/32 | | | 0.3437 | | 81 | | 125 | 10 | — | — | 5968235 |
| | | 8.80 | 0.3465 | | 81 | | 125 | 10 | — | — | 5968214 |
| | | 8.90 | 0.3504 | | 81 | | 125 | 10 | — | — | 5968216 |
| | | 9.00 | 0.3543 | | 81 | | 125 | 10 | — | — | 5968219 |
| | | 9.10 | 0.3583 | | 81 | | 125 | 10 | — | — | 5968221 |
| 23/64 | | | 0.3594 | 3.1/2 | | 4.7/8 | | 6 | 5998524 | — | — |
| 23/64 | | | 0.3594 | | 81 | | 125 | 10 | — | — | 6305906 |
| | | 9.20 | 0.3622 | | 81 | | 125 | 10 | — | — | 5968224 |
| | | 9.30 | 0.3661 | | 81 | | 125 | 10 | — | — | 5968227 |
| | | 9.40 | 0.3701 | | 81 | | 125 | 10 | — | — | 5968230 |
| | | 9.50 | 0.3740 | | 81 | | 125 | 10 | — | — | 5968233 |
| 3/8 | | | 0.3750 | 3.5/8 | | 5" | | 6 | 5998391 | — | — |
| 3/8 | | | 0.3750 | | 87 | | 133 | 10 | — | — | 5968317 |
| | | 9.60 | 0.3780 | | 87 | | 133 | 10 | — | — | 5968236 |
| | | 9.70 | 0.3819 | | 87 | | 133 | 10 | — | — | 5968242 |
| | | 9.80 | 0.3858 | | 87 | | 133 | 10 | — | — | 5968245 |
| | | 9.90 | 0.3898 | | 87 | | 133 | 10 | — | — | 5968250 |
| 25/64 | | | 0.3906 | 3.3/4 | | 5.1/8 | | 6 | 5998529 | — | — |
| 25/64 | | | 0.3906 | | 87 | | 133 | 10 | — | — | 6305907 |
| | | 10.00 | 0.3937 | | 87 | | 133 | 10 | — | — | 5968213 |
| | | 10.20 | 0.4016 | | 87 | | 133 | 5 | — | — | 5968217 |
| 13/32 | | | 0.4063 | 3.7/8 | | 5.1/4 | | 6 | 5998371 | — | — |
| 13/32 | | | 0.4063 | | 87 | | 133 | 5 | — | — | 5968263 |
| | | 10.50 | 0.4134 | | 87 | | 133 | 5 | — | — | 5968220 |
| 27/64 | | | 0.4219 | 3.15/16 | | 5.3/8 | | 6 | 5998534 | — | — |
| 27/64 | | | 0.4219 | | 94 | | 142 | 5 | — | — | 6305908 |
| | | 10.80 | 0.4252 | | 94 | | 142 | 5 | — | — | 5968223 |
| | | 11.00 | 0.4331 | | 94 | | 142 | 5 | — | — | 5968226 |
| 7/16 | | | 0.4375 | 4.1/16 | | 5.1/2 | | 6 | 5998410 | — | — |
| 7/16 | | | 0.4375 | | 94 | | 142 | 5 | — | — | 5968172 |
| | | 11.50 | 0.4528 | | 94 | | 142 | 5 | — | — | 5968229 |

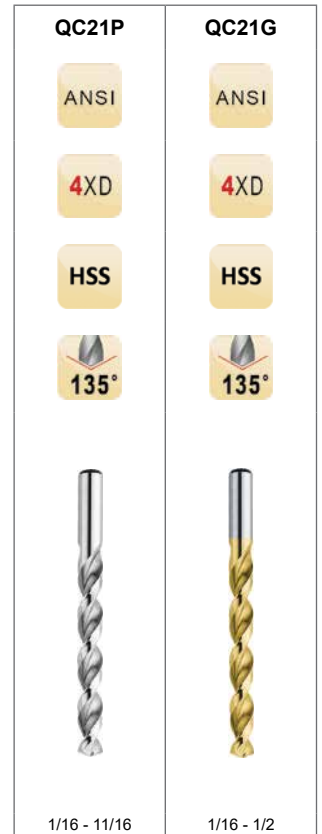
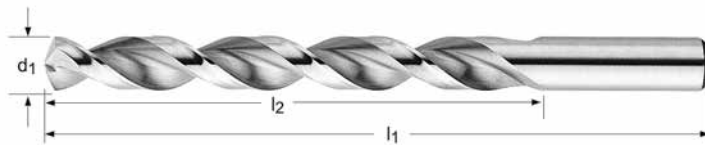
| d ₁ Ø Inch | d ₁ Ø Nr. | d ₁ Ø mm | d ₁ decimal Inch | l ₂ Inch | l ₂ mm | l ₁ Inch | l ₁ mm | Pack Qty | R10H | R18H | A108 |
|-----------------------------|----------------------------|---------------------------|-----------------------------------|------------------------|----------------------|------------------------|----------------------|-------------|---------|------|---------|
| 29/64 | | | 0.4531 | 4.3/16 | | 5.5/8 | | 6 | 5998374 | — | — |
| 29/64 | | | 0.4531 | | 94 | | 142 | 5 | — | — | 6305909 |
| | | 11.80 | 0.4646 | | 94 | | 142 | 5 | — | — | 5968232 |
| 15/32 | | | 0.4687 | 4.5/16 | | 5.3/4 | | 6 | 5998415 | — | — |
| 15/32 | | | 0.4687 | | 101 | | 151 | 5 | — | — | 5968285 |
| | | 12.00 | 0.4724 | | 101 | | 151 | 5 | — | — | 5968241 |
| 31/64 | | | 0.4844 | 4.3/8 | | 5.7/8 | | 6 | 5998394 | — | — |
| 31/64 | | | 0.4844 | | 101 | | 151 | 5 | — | — | 6305920 |
| | | 12.50 | 0.4921 | | 101 | | 151 | 5 | — | — | 5968248 |
| 1/2 | | | 0.5000 | 4.1/2 | | 6 | | 5 | 5967881 | — | — |
| 1/2 | | | 0.5000 | | 101 | | 151 | 5 | — | — | 5968203 |
| | | 12.80 | 0.5039 | | 101 | | 151 | 5 | — | — | 5968251 |
| | | 12.90 | 0.5079 | | 101 | | 151 | 5 | — | — | 5968254 |
| | | 13.00 | 0.5118 | | 101 | | 151 | 5 | — | — | 5968257 |
| | | 13.50 | 0.5315 | | 108 | | 160 | 5 | — | — | 5968260 |
| | | 14.00 | 0.5512 | | 108 | | 160 | 5 | — | — | 5968269 |
| | | 14.50 | 0.5709 | | 114 | | 169 | 1 | — | — | 5968271 |
| | | 15.00 | 0.5906 | | 114 | | 169 | 1 | — | — | 5968273 |
| | | 15.25 | 0.6004 | | 120 | | 178 | 1 | — | — | 5968279 |
| | | 15.50 | 0.6102 | | 120 | | 178 | 1 | — | — | 5968283 |
| | | 16.00 | 0.6299 | | 120 | | 178 | 1 | — | — | 5968290 |

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.



| 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 | 5997086 | 5996259 |
| 52 | 0.0635 | 7/8 | 1.7/8 | 12 | 5997021 | 5996240 |
| 51 | 0.0670 | 1" | 2" | 12 | 5997017 | 5996237 |
| 50 | 0.0700 | 1" | 2" | 12 | 5997013 | 5996405 |
| 49 | 0.0730 | 1" | 2" | 12 | 5997008 | 5996396 |
| 48 | 0.0760 | 1" | 2" | 12 | 5997005 | 5996392 |
| 5/64 | 0.0781 | 1" | 2" | 12 | 5996799 | 5996341 |
| 47 | 0.0785 | 1" | 2" | 12 | 5997002 | 5996384 |
| 46 | 0.0810 | 1.1/8 | 2.1/8 | 12 | 5996999 | 5996344 |
| 45 | 0.0820 | 1.1/8 | 2.1/8 | 12 | 5997179 | 5996311 |
| 44 | 0.0860 | 1.1/8 | 2.1/8 | 12 | 5997175 | 5996272 |
| 43 | 0.0890 | 1.1/4 | 2.1/4 | 12 | 5997170 | 5996233 |
| 42 | 0.0935 | 1.1/4 | 2.1/4 | 12 | 5997166 | 5996301 |
| 3/32 | 0.0938 | 1.1/4 | 2.1/4 | 12 | 5996944 | 5996327 |
| 41 | 0.0960 | 1.3/8 | 2.3/8 | 12 | 5997155 | 5996294 |
| 40 | 0.0980 | 1.3/8 | 2.3/8 | 12 | 5997108 | 5996291 |
| 39 | 0.0995 | 1.3/8 | 2.3/8 | 12 | 5997032 | 5996281 |
| 38 | 0.1015 | 1.7/16 | 2.1/2 | 12 | 5996993 | 5996277 |
| 37 | 0.1040 | 1.7/16 | 2.1/2 | 12 | 5997040 | 5996273 |
| 36 | 0.1065 | 1.7/16 | 2.1/2 | 12 | 5997033 | 5996268 |
| 7/64 | 0.1094 | 1.1/2 | 2.5/8 | 12 | 5996818 | 5996353 |
| 35 | 0.1100 | 1.1/2 | 2.5/8 | 12 | 5997029 | 5996264 |
| 34 | 0.1110 | 1.1/2 | 2.5/8 | 12 | 5997025 | 5996261 |
| 33 | 0.1130 | 1.1/2 | 2.5/8 | 12 | 5997020 | 5996257 |
| 32 | 0.1160 | 1.5/8 | 2.3/4 | 12 | 5997016 | 5996250 |
| 31 | 0.1200 | 1.5/8 | 2.3/4 | 12 | 5997014 | 5996246 |
| 1/8 | 0.1250 | 1.5/8 | 2.3/4 | 12 | 5997097 | 5996269 |
| 30 | 0.1285 | 1.5/8 | 2.3/4 | 12 | 5997010 | 5996243 |
| 29 | 0.1360 | 1.3/4 | 2.7/8 | 12 | 5997004 | 5996235 |
| 28 | 0.1405 | 1.3/4 | 2.7/8 | 12 | 5997000 | 5996232 |
| 9/64 | 0.1406 | 1.3/4 | 2.7/8 | 12 | 5996829 | 5996360 |
| 27 | 0.1440 | 1.7/8 | 3" | 12 | 5996995 | 5996229 |
| 26 | 0.1470 | 1.7/8 | 3" | 12 | 5996992 | 5996227 |

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 | 5996990 | 5996225 |
| 24 | 0.1520 | 2" | 3.1/8 | 12 | 5996988 | 5996223 |
| 23 | 0.1540 | 2" | 3.1/8 | 12 | 5996986 | 5996219 |
| 5/32 | 0.1563 | 2" | 3.1/8 | 12 | 5996795 | 5996338 |
| 22 | 0.1570 | 2" | 3.1/8 | 12 | 5996984 | 5996217 |
| 21 | 0.1590 | 2.1/8 | 3.1/4 | 12 | 5996982 | 5996216 |
| 20 | 0.1610 | 2.1/8 | 3.1/4 | 12 | 5996980 | 5996213 |
| 19 | 0.1660 | 2.1/8 | 3.1/4 | 12 | 5996976 | 5996210 |
| 18 | 0.1695 | 2.1/8 | 3.1/4 | 12 | 5996972 | 5996208 |
| 11/64 | 0.1719 | 2.1/8 | 3.1/4 | 12 | 5997112 | 5996279 |
| 17 | 0.1730 | 2.3/16 | 3.3/8 | 12 | 5996970 | 5996206 |
| 16 | 0.1770 | 2.3/16 | 3.3/8 | 12 | 5996968 | 5996204 |
| 15 | 0.1800 | 2.3/16 | 3.3/8 | 12 | 5996966 | 5996202 |
| 14 | 0.1820 | 2.3/16 | 3.3/8 | 12 | 5996964 | 5996198 |
| 13 | 0.1850 | 2.5/16 | 3.1/2 | 12 | 5996962 | 5996196 |
| 3/16 | 0.1875 | 2.5/16 | 3.1/2 | 12 | 5996938 | 5996325 |
| 12 | 0.1890 | 2.5/16 | 3.1/2 | 12 | 5996960 | 5996194 |
| 11 | 0.1910 | 2.5/16 | 3.1/2 | 12 | 5996958 | 5996192 |
| 10 | 0.1935 | 2.7/16 | 3.5/8 | 12 | 5996955 | 5996190 |
| 9 | 0.1960 | 2.7/16 | 3.5/8 | 12 | 5997039 | 5996255 |
| 8 | 0.1990 | 2.7/16 | 3.5/8 | 12 | 5997035 | 5996252 |
| 7 | 0.2010 | 2.7/16 | 3.5/8 | 12 | 5997028 | 5996248 |
| 13/64 | 0.2031 | 2.7/16 | 3.5/8 | 12 | 5997120 | 5996287 |
| 6 | 0.2040 | 2.1/2 | 3.3/4 | 12 | 5997024 | 5996244 |
| 5 | 0.2055 | 2.1/2 | 3.3/4 | 12 | 5997011 | 5996401 |
| 4 | 0.2090 | 2.1/2 | 3.3/4 | 12 | 5997071 | 5996285 |
| 3 | 0.2130 | 2.1/2 | 3.3/4 | 12 | 5997006 | 5996239 |
| 7/32 | 0.2188 | 2.1/2 | 3.3/4 | 12 | 5996814 | 5996351 |
| 2 | 0.2210 | 2.5/8 | 3.7/8 | 12 | 5996978 | 5996211 |
| 1 | 0.2280 | 2.5/8 | 3.7/8 | 12 | 5996952 | 5996187 |
| A | 0.2340 | 2.5/8 | 3.7/8 | 12 | 5996520 | — |
| 15/64 | 0.2344 | 2.5/8 | 3.7/8 | 12 | 5997128 | 5996293 |
| B | 0.2374 | 2.3/4 | 4" | 12 | 5996524 | — |
| C | 0.2421 | 2.3/4 | 4" | 12 | 5996531 | — |
| D | 0.2461 | 2.3/4 | 4" | 12 | 5996535 | — |
| 1/4 | 0.2500 | 2.3/4 | 4" | 12 | 5997093 | 5996265 |
| F | 0.2571 | 2.7/8 | 4.1/8 | 12 | 5996543 | — |
| G | 0.2610 | 2.7/8 | 4.1/8 | 12 | 5996547 | — |
| 17/64 | 0.2656 | 2.7/8 | 4.1/8 | 12 | 5997134 | 5996296 |
| H | 0.2661 | 2.7/8 | 4.1/8 | 12 | 5996551 | — |
| I | 0.2720 | 2.7/8 | 4.1/8 | 12 | 5996555 | — |
| J | 0.2772 | 2.7/8 | 4.1/8 | 12 | 5996559 | — |
| K | 0.2811 | 2.15/16 | 4.1/4 | 12 | 5996563 | — |
| 9/32 | 0.2813 | 2.15/16 | 4.1/4 | 12 | 5996825 | 5996357 |
| L | 0.2902 | 2.15/16 | 4.1/4 | 12 | 5996566 | — |
| M | 0.2949 | 3.1/16 | 4.3/8 | 12 | 5996571 | — |
| 19/64 | 0.2969 | 3.1/16 | 4.3/8 | 12 | 5997147 | 5996300 |
| N | 0.3020 | 3.1/16 | 4.3/8 | 12 | 5996946 | — |
| 5/16 | 0.3125 | 3.3/16 | 4.1/2 | 6 | 5996792 | 5996336 |
| O | 0.3161 | 3.3/16 | 4.1/2 | 6 | 5997043 | — |
| P | 0.3228 | 3.5/16 | 4.5/8 | 6 | 5997047 | — |
| 21/64 | 0.3281 | 3.5/16 | 4.5/8 | 6 | 5997161 | 5996304 |
| Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | 5997051 | — |
| R | 0.3390 | 3.7/16 | 4.3/4 | 6 | 5997055 | — |
| 11/32 | 0.3437 | 3.7/16 | 4.3/4 | 6 | 5997105 | 5996276 |
| S | 0.3480 | 3.1/2 | 4.7/8 | 6 | 5997059 | — |
| T | 0.3580 | 3.1/2 | 4.7/8 | 6 | 5997062 | — |
| 23/64 | 0.3594 | 3.1/2 | 4.7/8 | 6 | 5996766 | 5996308 |
| U | 0.3680 | 3.5/8 | 5" | 6 | 5997065 | — |
| 3/8 | 0.3750 | 3.5/8 | 5" | 6 | 5996947 | 5996330 |
| V | 0.3772 | 3.5/8 | 5" | 6 | 5997068 | — |
| W | 0.3858 | 3.3/4 | 5.1/8 | 6 | 5997074 | — |
| 25/64 | 0.3906 | 3.3/4 | 5.1/8 | 6 | 5996811 | 5996315 |
| X | 0.3969 | 3.3/4 | 5.1/8 | 6 | 5997077 | — |
| Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | 5997080 | — |
| 13/32 | 0.4063 | 3.7/8 | 5.1/4 | 6 | 5997116 | 5996283 |

| 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 | 5997083 | — |
| 27/64 | 0.4219 | 3.15/16 | 5.3/8 | 6 | 5996848 | 5996319 |
| 7/16 | 0.4375 | 4.1/16 | 5.1/2 | 6 | 5996806 | 5996347 |
| 29/64 | 0.4531 | 4.3/16 | 5.5/8 | 6 | 5996893 | 5996322 |
| 15/32 | 0.4687 | 4.5/16 | 5.3/4 | 6 | 5997124 | 5996289 |
| 31/64 | 0.4844 | 4.3/8 | 5.7/8 | 6 | 5996950 | 5996333 |
| 1/2 | 0.5000 | 4.1/2 | 6" | 6 | 5997090 | 5996263 |
| 33/64 | 0.5156 | 4.13/16 | 6.5/8 | 1 | 5996953 | — |
| 17/32 | 0.5313 | 4.13/16 | 6.5/8 | 1 | 5997131 | — |
| 35/64 | 0.5469 | 4.13/16 | 6.5/8 | 1 | 5996771 | — |
| 9/16 | 0.5625 | 4.13/16 | 6.5/8 | 1 | 5996822 | — |
| 37/64 | 0.5781 | 4.13/16 | 6.5/8 | 1 | 5996775 | — |
| 19/32 | 0.5937 | 5.3/16 | 7.1/8 | 1 | 5997141 | — |
| 39/64 | 0.6094 | 5.3/16 | 7.1/8 | 1 | 5996778 | — |
| 5/8 | 0.6250 | 5.3/16 | 7.1/8 | 1 | 5996802 | — |
| 41/64 | 0.6406 | 5.3/16 | 7.1/8 | 1 | 5996782 | — |
| 21/32 | 0.6563 | 5.3/16 | 7.1/8 | 1 | 5997151 | — |
| 43/64 | 0.6719 | 5.5/8 | 7.5/8 | 1 | 5996787 | — |
| 11/16 | 0.6875 | 5.5/8 | 7.5/8 | 1 | 5997101 | — |

JOBBER DRILL

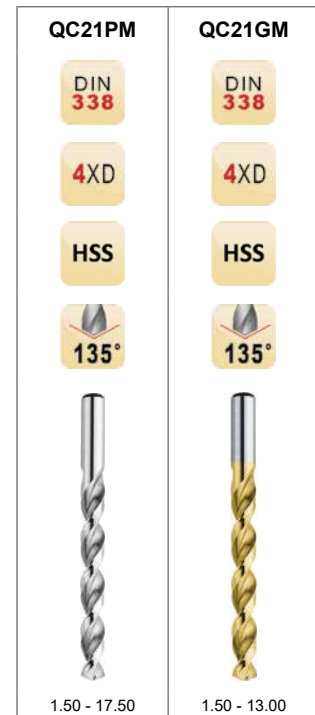
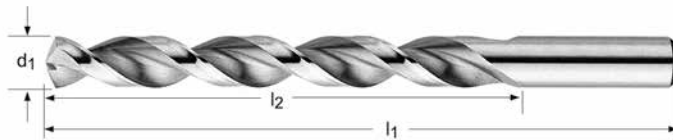


General Purpose Jobber Length Parabolic Flute, Metric

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.



| 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 | 5996576 | 5996450 |
| 2.00 | 0.0787 | 24 | 49 | 12 | 5996644 | 5996467 |
| 2.50 | 0.0984 | 30 | 57 | 12 | 5996648 | 5996469 |
| 3.00 | 0.1181 | 33 | 61 | 12 | 5996655 | 5996471 |
| 3.50 | 0.1378 | 39 | 70 | 12 | 5996908 | — |
| 4.00 | 0.1575 | 43 | 75 | 12 | 5996949 | 5996475 |
| 4.50 | 0.1772 | 47 | 80 | 12 | 5996974 | — |
| 5.00 | 0.1969 | 52 | 86 | 12 | 5996997 | 5996479 |
| 5.20 | 0.2047 | 52 | 86 | 12 | 5997036 | 5996483 |
| 5.50 | 0.2165 | 57 | 93 | 12 | 5997044 | 5996167 |
| 5.60 | 0.2205 | 57 | 93 | 12 | 5997048 | 5996200 |
| 6.00 | 0.2362 | 57 | 93 | 12 | 5997052 | 5996221 |
| 6.50 | 0.2559 | 63 | 101 | 12 | 5997056 | 5996253 |
| 6.80 | 0.2677 | 69 | 109 | 12 | 5996914 | 5996297 |
| 7.00 | 0.2756 | 69 | 109 | 12 | 5996923 | 5996305 |
| 7.50 | 0.2953 | 69 | 109 | 12 | 5996926 | 5996309 |
| 8.00 | 0.3150 | 75 | 117 | 6 | 5996929 | 5996313 |
| 8.20 | 0.3228 | 75 | 117 | 6 | 5996931 | 5996317 |
| 8.50 | 0.3346 | 75 | 117 | 6 | 5996934 | 5996171 |
| 8.60 | 0.3386 | 81 | 125 | 6 | 5996937 | 5996174 |
| 9.00 | 0.3543 | 81 | 125 | 6 | 5996940 | 5996177 |
| 9.50 | 0.3740 | 81 | 125 | 6 | 5996943 | 5996180 |
| 10.00 | 0.3937 | 87 | 133 | 6 | 5996579 | 5996452 |
| 10.50 | 0.4134 | 87 | 133 | 6 | 5996582 | 5996454 |
| 11.00 | 0.4331 | 94 | 142 | 6 | 5996585 | 5996455 |
| 11.50 | 0.4528 | 94 | 142 | 6 | 5996588 | — |
| 12.00 | 0.4724 | 101 | 151 | 6 | 5996591 | 5996461 |
| 12.50 | 0.4921 | 101 | 151 | 6 | 5996594 | 5996463 |
| 13.00 | 0.5118 | 101 | 151 | 1 | 5996597 | 5996465 |
| 13.50 | 0.5315 | 108 | 160 | 1 | 5996601 | — |
| 14.00 | 0.5512 | 108 | 160 | 1 | 5996610 | — |
| 14.50 | 0.5709 | 114 | 169 | 1 | 5996615 | — |
| 15.00 | 0.5906 | 114 | 169 | 1 | 5996619 | — |
| 15.50 | 0.6102 | 120 | 178 | 1 | 5996623 | — |
| 16.00 | 0.6299 | 120 | 178 | 1 | 5996627 | — |
| 16.50 | 0.6496 | 125 | 184 | 1 | 5996631 | — |
| 17.00 | 0.6693 | 125 | 184 | 1 | 5996635 | — |
| 17.50 | 0.6890 | 130 | 191 | 1 | 5996640 | — |

Heavy Duty Jobber Length (NAS 907 Type J)

* Sets Available on pg. 234-235

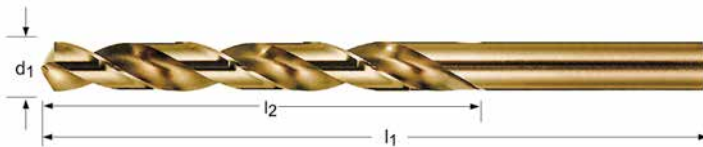
R10CO - Fractional Sizes

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 tempered for wear resistance & lubricity. For enhanced tool life in ferrous materials



| d ₁ Ø | d ₁ Ø | d ₁ Ø | d ₁ Ø | d ₁ decimal | l ₂ | l ₂ | l ₁ | l ₁ | Pack Qty | R10CO | R18CO | R15CO | 2ACO |
|------------------|------------------|------------------|------------------|------------------------|----------------|----------------|----------------|----------------|----------|---------|-----------------------|-------|---------|
| Inch | Nr. | letter | mm | Inch | Inch | mm | Inch | mm | | | | | |
| | 80 | | | 0.0135 | 1/8 | | 3/4 | | 12 | — | ¹⁾ 5997848 | — | — |
| | 79 | | | 0.0145 | 1/8 | | 3/4 | | 12 | — | ¹⁾ 5997842 | — | — |
| 1/64 | | | | 0.0156 | 3/16 | | 3/4 | | 12 | 5998146 | ¹⁾ — | — | — |
| | 78 | | | 0.0160 | 3/16 | | 7/8 | | 12 | — | ¹⁾ 5997840 | — | — |
| | 77 | | | 0.0180 | 3/16 | | 7/8 | | 12 | — | ¹⁾ 5997837 | — | — |
| | 76 | | | 0.0200 | 3/16 | | 7/8 | | 12 | — | ¹⁾ 5997831 | — | — |
| | 75 | | | 0.0210 | 1/4 | | 1" | | 12 | — | ¹⁾ 5997828 | — | — |
| | 74 | | | 0.0225 | 1/4 | | 1" | | 12 | — | ¹⁾ 5997825 | — | — |
| | 73 | | | 0.0240 | 5/16 | | 1.1/8 | | 12 | — | ¹⁾ 5997822 | — | — |
| | 72 | | | 0.0250 | 5/16 | | 1.1/8 | | 12 | — | ¹⁾ 5997819 | — | — |
| | 71 | | | 0.0260 | 3/8 | | 1.1/4 | | 12 | — | ¹⁾ 5997816 | — | — |
| | 70 | | | 0.0280 | 3/8 | | 1.1/4 | | 12 | — | ¹⁾ 5997813 | — | — |
| | 69 | | | 0.0292 | 1/2 | | 1.3/8 | | 12 | — | ¹⁾ 5997807 | — | — |
| | 68 | | | 0.0310 | 1/2 | | 1.3/8 | | 12 | — | ¹⁾ 5997804 | — | — |
| 1/32 | | | | 0.0313 | 1/2 | | 1.3/8 | | 12 | 5998139 | ¹⁾ — | — | — |
| | 67 | | | 0.0320 | 1/2 | | 1.3/8 | | 12 | — | ¹⁾ 5997798 | — | — |
| | 66 | | | 0.0330 | 1/2 | | 1.3/8 | | 12 | — | ¹⁾ 5997794 | — | — |
| | 65 | | | 0.0350 | 5/8 | | 1.1/2 | | 12 | — | ¹⁾ 5997791 | — | — |
| | 64 | | | 0.0360 | 5/8 | | 1.1/2 | | 12 | — | ¹⁾ 5997787 | — | — |
| | 63 | | | 0.0370 | 5/8 | | 1.1/2 | | 12 | — | ¹⁾ 5997783 | — | — |
| | 62 | | | 0.0380 | 5/8 | | 1.1/2 | | 12 | — | ¹⁾ 5997781 | — | — |
| | 61 | | | 0.0390 | 11/16 | | 1.5/8 | | 12 | — | ¹⁾ 5997779 | — | — |
| | | 1.00 | | 0.0394 | | 12 | | 34 | 12 | — | — | — | 5999612 |
| | 60 | | | 0.0400 | 11/16 | | 1.5/8 | | 12 | — | 5997776 | — | — |
| | 59 | | | 0.0410 | 11/16 | | 1.5/8 | | 12 | — | 5997768 | — | — |
| | | 1.05 | | 0.0413 | | 12 | | 34 | 12 | — | — | — | 5999614 |
| | 58 | | | 0.0420 | 11/16 | | 1.5/8 | | 12 | — | 5997762 | — | — |
| | 57 | | | 0.0430 | 3/4 | | 1.3/4 | | 12 | — | 5997758 | — | — |
| | | 1.10 | | 0.0433 | | 14 | | 36 | 12 | — | — | — | 5999618 |
| | | 1.15 | | 0.0453 | | 14 | | 36 | 12 | — | — | — | 5999621 |
| | 56 | | | 0.0465 | 3/4 | | 1.3/4 | | 12 | — | 5997753 | — | — |
| 3/64 | | | | 0.0469 | 3/4 | | 1.3/4 | | 12 | 5998182 | — | — | — |

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 | — | — | — | 5999625 |
| | | | 1.25 | 0.0492 | | 16 | | 38 | 12 | — | — | — | 5999629 |
| | | | 1.30 | 0.0512 | | 16 | | 38 | 12 | — | — | — | 5999635 |
| | 55 | | 0.0520 | | 7/8 | | 1.7/8 | | 12 | — | 5997752 | — | — |
| | | | 1.35 | 0.0531 | | 18 | | 40 | 12 | — | — | — | 5999639 |
| | | | 1.40 | 0.0551 | | 18 | | 40 | 12 | — | — | — | 5999643 |
| | 54 | | 0.0550 | | 7/8 | | 1.7/8 | | 12 | — | 5997749 | — | — |
| | | | 1.45 | 0.0571 | | 18 | | 40 | 12 | — | — | — | 5999648 |
| | | | 1.50 | 0.0591 | | 18 | | 40 | 12 | — | — | — | 5999652 |
| | 53 | | 0.0595 | | 7/8 | | 1.7/8 | | 12 | — | 5997745 | — | — |
| | | | 1.55 | 0.0610 | | 20 | | 43 | 12 | — | — | — | 5999656 |
| 1/16 | | | 0.0625 | | 7/8 | | 1.7/8 | | 12 | 5998132 | — | — | — |
| | | | 1.60 | 0.0630 | | 20 | | 43 | 12 | — | — | — | 5999660 |
| | 52 | | 0.0635 | | 7/8 | | 1.7/8 | | 12 | — | 5997743 | — | — |
| | | | 1.65 | 0.0650 | | 20 | | 43 | 12 | — | — | — | 5999666 |
| | | | 1.70 | 0.0669 | | 20 | | 43 | 12 | — | — | — | 5999671 |
| | 51 | | 0.0670 | | 1" | | 2" | | 12 | — | 5997740 | — | — |
| | | | 1.75 | 0.0689 | | 22 | | 46 | 12 | — | — | — | 5999674 |
| | 50 | | 0.0700 | | 1" | | 2" | | 12 | — | 5997737 | — | — |
| | | | 1.80 | 0.0709 | | 22 | | 46 | 12 | — | — | — | 5999682 |
| | | | 1.85 | 0.0728 | | 22 | | 46 | 12 | — | — | — | 5999686 |
| | 49 | | 0.0730 | | 1" | | 2" | | 12 | — | 5997888 | — | — |
| | | | 1.90 | 0.0748 | | 22 | | 46 | 12 | — | — | — | 5999689 |
| | 48 | | 0.0760 | | 1" | | 2" | | 12 | — | 5997883 | — | — |
| | | | 1.95 | 0.0768 | | 24 | | 49 | 12 | — | — | — | 5999694 |
| 5/64 | | | 0.0781 | | 1" | | 2" | | 12 | 5998215 | — | — | — |
| | 47 | | 0.0785 | | 1" | | 2" | | 12 | — | 5997879 | — | — |
| | | | 2.00 | 0.0787 | | 24 | | 49 | 12 | — | — | — | 6000762 |
| | | | 2.05 | 0.0807 | | 24 | | 49 | 12 | — | — | — | 6000766 |
| | 46 | | 0.0810 | | 1.1/8 | | 2.1/8 | | 12 | — | 5997875 | — | — |
| | 45 | | 0.0820 | | 1.1/8 | | 2.1/8 | | 12 | — | 5997868 | — | — |
| | | | 2.10 | 0.0827 | | 24 | | 49 | 12 | — | — | — | 6000771 |
| | 44 | | 0.0860 | | 1.1/8 | | 2.1/8 | | 12 | — | 5997835 | — | — |
| | | | 2.20 | 0.0866 | | 27 | | 53 | 12 | — | — | — | 6000776 |
| | 43 | | 0.0890 | | 1.1/4 | | 2.1/4 | | 12 | — | 5997802 | — | — |
| | | | 2.30 | 0.0906 | | 27 | | 53 | 12 | — | — | — | 6000622 |
| | | | 2.35 | 0.0925 | | 27 | | 53 | 12 | — | — | — | 6000627 |
| | 42 | | 0.0935 | | 1.1/4 | | 2.1/4 | | 12 | — | 5997764 | — | — |
| 3/32 | | | 0.0938 | | 1.1/4 | | 2.1/4 | | 12 | 5998179 | — | — | — |
| | | | 2.40 | 0.0945 | | 30 | | 57 | 12 | — | — | — | 6000632 |
| | 41 | | 0.0960 | | 1.3/8 | | 2.3/8 | | 12 | — | 5997730 | — | — |
| | 40 | | 0.0980 | | 1.3/8 | | 2.3/8 | | 12 | — | 5997784 | — | — |
| | | | 2.50 | 0.0984 | | 30 | | 57 | 12 | — | — | — | 6000639 |
| | 39 | | 0.0995 | | 1.3/8 | | 2.3/8 | | 12 | — | 5997772 | — | — |
| | 38 | | 0.1015 | | 1.7/16 | | 2.1/2 | | 12 | — | 5997770 | — | — |
| | | | 2.60 | 0.1024 | | 30 | | 57 | 12 | — | — | — | 6000642 |
| | 37 | | 0.1040 | | 1.7/16 | | 2.1/2 | | 12 | — | 5997767 | — | — |
| | | | 2.70 | 0.1063 | | 33 | | 61 | 12 | — | — | — | 6000646 |
| | 36 | | 0.1065 | | 1.7/16 | | 2.1/2 | | 12 | — | 5997763 | — | — |
| 7/64 | | | 0.1094 | | 1.1/2 | | 2.5/8 | | 12 | 5998225 | — | — | — |
| | 35 | | 0.1100 | | 1.1/2 | | 2.5/8 | | 12 | — | 5997759 | — | — |
| | | | 2.80 | 0.1102 | | 33 | | 61 | 12 | — | — | — | 6000650 |
| | 34 | | 0.1110 | | 1.1/2 | | 2.5/8 | | 12 | — | 5997755 | — | — |
| | 33 | | 0.1130 | | 1.1/2 | | 2.5/8 | | 12 | — | 5997751 | — | — |
| | | | 2.90 | 0.1142 | | 33 | | 61 | 12 | — | — | — | 6000654 |
| | 32 | | 0.1160 | | 1.5/8 | | 2.3/4 | | 12 | — | 5997748 | — | — |
| | | | 3.00 | 0.1181 | | 33 | | 61 | 12 | — | — | — | 6000658 |
| | 31 | | 0.1200 | | 1.5/8 | | 2.3/4 | | 12 | — | 5997746 | — | — |
| | | | 3.10 | 0.1220 | | 36 | | 65 | 12 | — | — | — | 6000662 |
| 1/8 | | | 0.1250 | | 1.5/8 | | 2.3/4 | | 12 | 5998150 | — | — | — |
| | | | 3.20 | 0.1260 | | 36 | | 65 | 12 | — | — | — | 6000669 |
| | | | 3.25 | 0.1280 | | 36 | | 65 | 12 | — | — | — | 6000673 |
| | 30 | | 0.1285 | | 1.5/8 | | 2.3/4 | | 12 | — | 5997736 | — | — |
| | | | 3.30 | 0.1299 | | 36 | | 65 | 12 | — | — | — | 6000676 |
| | | | 3.40 | 0.1339 | | 39 | | 70 | 12 | — | — | — | 6000680 |
| | 29 | | 0.1360 | | 1.3/4 | | 2.7/8 | | 12 | — | 5997731 | — | — |

| 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 | |
|-----------------------------|----------------------------|-------------------------------|---------------------------|-----------------------------------|------------------------|----------------------|------------------------|----------------------|-------------|-------|---------|---------|---------|---------|
| 9/64 | 28 | | 3.50 | 0.1378 | | 39 | | 70 | 12 | — | — | — | 6000684 | |
| | | | | | 0.1405 | 1.3/4 | | 2.7/8 | | 12 | — | 5997729 | — | — |
| | | | | | 0.1406 | 1.3/4 | | 2.7/8 | | 12 | 5998234 | — | — | — |
| | | | | 3.60 | 0.1417 | | 39 | | 70 | 12 | — | — | — | 6000688 |
| | | 27 | | | 0.1440 | 1.7/8 | | 3" | | 12 | — | 5997727 | — | — |
| | | | | | 0.1457 | | 39 | | 70 | 12 | — | — | — | 6000692 |
| | | 26 | | | 0.1470 | 1.7/8 | | 3" | | 12 | — | 5997725 | — | — |
| | | | | | 0.1476 | | 39 | | 70 | 12 | — | — | — | 6000695 |
| | | | | | 0.1496 | | 43 | | 75 | 12 | — | — | — | 6000698 |
| | | 25 | | | 0.1495 | 1.7/8 | | 3" | | 12 | — | 5997723 | — | — |
| 5/32 | 24 | | | 0.1520 | 2" | | 3.1/8 | | 12 | — | 5997721 | — | — | |
| | 23 | | | 0.1540 | 2" | | 3.1/8 | | 12 | — | 5997719 | — | — | |
| | | | | | 0.1563 | 2" | | 3.1/8 | | 12 | 5998211 | — | — | — |
| | 22 | | | | 0.1570 | 2" | | 3.1/8 | | 12 | — | 5997717 | — | — |
| | | | | 4.00 | 0.1575 | | 43 | | 75 | 12 | — | — | — | 6000701 |
| | | 21 | | | 0.1590 | 2.1/8 | | 3.1/4 | | 12 | — | 5997713 | — | — |
| | 20 | | | | 0.1610 | 2.1/8 | | 3.1/4 | | 12 | — | 5997711 | — | — |
| | | | | | 0.1614 | | 43 | | 75 | 12 | — | — | — | 6000706 |
| | | | | | 0.1654 | | 43 | | 75 | 12 | — | — | — | 6000708 |
| | 19 | | | | 0.1660 | 2.1/8 | | 3.1/4 | | 12 | — | 5997706 | — | — |
| 11/64 | | | | 0.1673 | | 43 | | 75 | 12 | — | — | — | 6000710 | |
| | | | | 0.1693 | | 47 | | 80 | 12 | — | — | — | 6000712 | |
| | 18 | | | 0.1695 | 2.1/8 | | 3.1/4 | | 12 | — | 5997703 | — | — | |
| | | | | | 0.1719 | 2.1/8 | | 3.1/4 | | 12 | 5998185 | — | — | — |
| | 17 | | | | 0.1730 | 2.3/16 | | 3.3/8 | | 12 | — | 5997700 | — | — |
| | | | | | 0.1732 | | 47 | | 80 | 12 | — | — | — | 6000714 |
| | | | | | 0.1772 | | 47 | | 80 | 12 | — | — | — | 6000717 |
| | 16 | | | | 0.1770 | 2.3/16 | | 3.3/8 | | 12 | — | 5997697 | — | — |
| | 15 | | | | 0.1800 | 2.3/16 | | 3.3/8 | | 12 | — | 5997695 | — | — |
| | 14 | | | | 0.1820 | 2.3/16 | | 3.3/8 | | 12 | — | 5997692 | — | — |
| 3/16 | | | | 0.1850 | | 47 | | 80 | 12 | — | — | — | 6000720 | |
| | 13 | | | 0.1850 | 2.5/16 | | 3.1/2 | | 12 | — | 5997689 | — | — | |
| | | | | | 0.1875 | 2.5/16 | | 3.1/2 | | 12 | 5998176 | — | — | — |
| | | | | | 0.1890 | | 52 | | 86 | 12 | — | — | — | 6000723 |
| | 12 | | | | 0.1890 | 2.5/16 | | 3.1/2 | | 12 | — | 5997683 | — | — |
| | 11 | | | | 0.1910 | 2.5/16 | | 3.1/2 | | 12 | — | 5997680 | — | — |
| | 10 | | | | 0.1935 | 2.7/16 | | 3.5/8 | | 12 | — | 5997678 | — | — |
| | 9 | | | | 0.1960 | 2.7/16 | | 3.5/8 | | 12 | — | 5997851 | — | — |
| | | | | | 0.1969 | | 52 | | 86 | 12 | — | — | — | 6000726 |
| | 8 | | | | 0.1990 | 2.7/16 | | 3.5/8 | | 12 | — | 5997845 | — | — |
| 13/64 | | | | 0.2008 | | 52 | | 86 | 12 | — | — | — | 6000729 | |
| | 7 | | | | 0.2010 | 2.7/16 | | 3.5/8 | | 12 | — | 5997810 | — | — |
| | | | | | 0.2031 | 2.7/16 | | 3.5/8 | | 12 | 5998243 | — | — | — |
| | 6 | | | | 0.2040 | 2.1/2 | | 3.3/4 | | 12 | — | 5997773 | — | — |
| | | | | | 0.2047 | | 52 | | 86 | 12 | — | — | — | 6000733 |
| | 5 | | | | 0.2055 | 2.1/2 | | 3.3/4 | | 12 | — | 5997735 | — | — |
| | | | | | 0.2067 | | 52 | | 86 | 12 | — | — | — | 6000735 |
| | | | | | 0.2087 | | 52 | | 86 | 12 | — | — | — | 6000737 |
| | 4 | | | | 0.2090 | 2.1/2 | | 3.3/4 | | 12 | — | 5997775 | — | — |
| | 3 | | | | 0.2130 | 2.1/2 | | 3.3/4 | | 12 | — | 5997733 | — | — |
| 7/32 | | | | 0.2165 | | 57 | | 93 | 12 | — | — | — | 6000739 | |
| | | | | | 0.2188 | 2.1/2 | | 3.3/4 | | 12 | 5998222 | — | — | — |
| | | | | | 0.2205 | | 57 | | 93 | 12 | — | — | — | 6000741 |
| | 2 | | | | 0.2210 | 2.5/8 | | 3.7/8 | | 12 | — | 5997709 | — | — |
| | | | | | 0.2244 | | 57 | | 93 | 12 | — | — | — | 6000743 |
| | 1 | | | | 0.2280 | 2.5/8 | | 3.7/8 | | 12 | — | 5997674 | — | — |
| | | | | | 0.2323 | | 57 | | 93 | 12 | — | — | — | 6000745 |
| | 15/64 | A | | | 0.2340 | 2.5/8 | | 3.7/8 | | 12 | — | — | 5998992 | — |
| | | | | | 0.2344 | 2.5/8 | | 3.7/8 | | 12 | 5998294 | — | — | — |
| | | | | | | 0.2362 | | 57 | | 93 | 12 | — | — | — |
| B | | | | 0.2374 | 2.3/4 | | 4" | | 12 | — | — | 5998995 | — | |
| | | | | | 0.2402 | | 63 | | 101 | 12 | — | — | — | 6000750 |
| C | | | | 0.2421 | 2.3/4 | | 4" | | 12 | — | — | 5998999 | — | |
| | | | | | 0.2441 | | 63 | | 101 | 12 | — | — | — | 6000753 |
| D | | | | 0.2461 | 2.3/4 | | 4" | | 12 | — | — | 5999003 | — | |
| | | | | 0.2480 | | 63 | | 101 | 12 | — | — | — | 6000759 | |

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 |
|-----------------------------|----------------------------|-------------------------------|---------------------------|-----------------------------------|------------------------|----------------------|------------------------|----------------------|-------------|---------|-------|---------|---------|
| 1/4 | | E | | 0.2500 | 2.3/4 | | 4" | | 12 | 5998143 | — | — | — |
| | | | 6.40 | 0.2520 | | 63 | | 101 | 12 | — | — | — | 6000538 |
| | | | 6.50 | 0.2559 | | 63 | | 101 | 12 | — | — | — | 6000570 |
| | | F | | 0.2571 | 2.7/8 | | 4.1/8 | | 12 | — | — | 5999011 | — |
| | | | 6.60 | 0.2598 | | 63 | | 101 | 12 | — | — | — | 6000601 |
| | | G | | 0.2610 | 2.7/8 | | 4.1/8 | | 12 | — | — | 5999019 | — |
| | | | 6.70 | 0.2638 | | 63 | | 101 | 12 | — | — | — | 6000643 |
| 17/64 | | | | 0.2656 | 2.7/8 | | 4.1/8 | | 12 | 5998301 | — | — | — |
| | | H | | 0.2661 | 2.7/8 | | 4.1/8 | | 12 | — | — | 5999022 | — |
| | | | 6.80 | 0.2677 | | 69 | | 109 | 12 | — | — | — | 6000685 |
| | | | 6.90 | 0.2717 | | 69 | | 109 | 12 | — | — | — | 6000693 |
| | | I | | 0.2720 | 2.7/8 | | 4.1/8 | | 12 | — | — | 5999025 | — |
| | | | 7.00 | 0.2756 | | 69 | | 109 | 12 | — | — | — | 6000696 |
| | | J | | 0.2772 | 2.7/8 | | 4.1/8 | | 12 | — | — | 5999029 | — |
| | | | 7.10 | 0.2795 | | 69 | | 109 | 12 | — | — | — | 6000699 |
| | | K | | 0.2811 | 2.15/16 | | 4.1/4 | | 12 | — | — | 5999033 | — |
| 9/32 | | | | 0.2813 | 2.15/16 | | 4.1/4 | | 12 | 5998231 | — | — | — |
| | | | 7.20 | 0.2835 | | 69 | | 109 | 12 | — | — | — | 6000702 |
| | | | 7.25 | 0.2854 | | 69 | | 109 | 12 | — | — | — | 6000542 |
| | | | 7.30 | 0.2874 | | 69 | | 109 | 12 | — | — | — | 6000545 |
| | | L | | 0.2902 | 2.15/16 | | 4.1/4 | | 12 | — | — | 5999036 | — |
| | | M | | 0.2949 | 3.1/16 | | 4.3/8 | | 12 | — | — | 5999040 | — |
| | | | 7.50 | 0.2953 | | 69 | | 109 | 12 | — | — | — | 6000548 |
| 19/64 | | | | 0.2969 | 3.1/16 | | 4.3/8 | | 12 | 5998148 | — | — | — |
| | | N | | 0.3020 | 3.1/16 | | 4.3/8 | | 12 | — | — | 5999044 | — |
| | | | 7.80 | 0.3071 | | 75 | | 117 | 12 | — | — | — | 6000551 |
| | | | 7.90 | 0.3110 | | 75 | | 117 | 12 | — | — | — | 6000553 |
| 5/16 | | | | 0.3125 | 3.3/16 | | 4.1/2 | | 6 | 5998209 | — | — | — |
| | | | 8.00 | 0.3150 | | 75 | | 117 | 6 | — | — | — | 6000556 |
| | | O | | 0.3161 | 3.3/16 | | 4.1/2 | | 6 | — | — | 5999048 | — |
| | | | 8.20 | 0.3228 | | 75 | | 117 | 6 | — | — | — | 6000559 |
| | | P | | 0.3228 | 3.5/16 | | 4.5/8 | | 6 | — | — | 5999051 | — |
| 21/64 | | | | 0.3281 | 3.5/16 | | 4.5/8 | | 6 | 5998156 | — | — | — |
| | | | 8.40 | 0.3307 | | 75 | | 117 | 6 | — | — | — | 6000562 |
| | | Q | | 0.3319 | 3.7/16 | | 4.3/4 | | 6 | — | — | 5999059 | — |
| | | | 8.50 | 0.3346 | | 75 | | 117 | 6 | — | — | — | 6000564 |
| | | R | | 0.3390 | 3.7/16 | | 4.3/4 | | 6 | — | — | 5999063 | — |
| 11/32 | | | | 0.3437 | 3.7/16 | | 4.3/4 | | 6 | 5998141 | — | — | — |
| | | | 8.80 | 0.3465 | | 81 | | 125 | 6 | — | — | — | 6000567 |
| | | S | | 0.3480 | 3.1/2 | | 4.7/8 | | 6 | — | — | 5999066 | — |
| | | | 8.90 | 0.3504 | | 81 | | 125 | 6 | — | — | — | 6000573 |
| | | | 9.00 | 0.3543 | | 81 | | 125 | 6 | — | — | — | 6000576 |
| | | T | | 0.3580 | 3.1/2 | | 4.7/8 | | 6 | — | — | 5999069 | — |
| | | | 9.10 | 0.3583 | | 81 | | 125 | 6 | — | — | — | 6000577 |
| 23/64 | | | | 0.3594 | 3.1/2 | | 4.7/8 | | 6 | 5998160 | — | — | — |
| | | | 9.20 | 0.3622 | | 81 | | 125 | 6 | — | — | — | 6000581 |
| | | | 9.30 | 0.3661 | | 81 | | 125 | 6 | — | — | — | 6000583 |
| | | U | | 0.3680 | 3.5/8 | | 5" | | 6 | — | — | 5999072 | — |
| | | | 9.40 | 0.3701 | | 81 | | 125 | 6 | — | — | — | 6000586 |
| | | | 9.50 | 0.3740 | | 81 | | 125 | 6 | — | — | — | 6000589 |
| 3/8 | | | | 0.3750 | 3.5/8 | | 5" | | 6 | 5998188 | — | — | — |
| | | V | | 0.3772 | 3.5/8 | | 5" | | 6 | — | — | 5999075 | — |
| | | | 9.60 | 0.3780 | | 87 | | 133 | 6 | — | — | — | 6000592 |
| | | | 9.70 | 0.3819 | | 87 | | 133 | 6 | — | — | — | 6000595 |
| | | | 9.80 | 0.3858 | | 87 | | 133 | 6 | — | — | — | 6000598 |
| | | W | | 0.3858 | 3.3/4 | | 5.1/8 | | 6 | — | — | 5999078 | — |
| 25/64 | | | | 0.3906 | 3.3/4 | | 5.1/8 | | 6 | 5998164 | — | — | — |
| | | | 10.00 | 0.3937 | | 87 | | 133 | 6 | — | — | — | 5999696 |
| | | X | | 0.3969 | 3.3/4 | | 5.1/8 | | 6 | — | — | 5999081 | — |
| | | | 10.20 | 0.4016 | | 87 | | 133 | 6 | — | — | — | 5999699 |
| | | Y | | 0.4039 | 3.7/8 | | 5.1/4 | | 6 | — | — | 5999084 | — |
| 13/32 | | | | 0.4063 | 3.7/8 | | 5.1/4 | | 6 | 5998213 | — | — | — |
| | | Z | | 0.4130 | 3.7/8 | | 5.1/4 | | 6 | — | — | 5999087 | — |
| | | | 10.50 | 0.4134 | | 87 | | 133 | 6 | — | — | — | 5999705 |
| 27/64 | | | | 0.4219 | 3.15/16 | | 5.3/8 | | 6 | 5998168 | — | — | — |
| | | | 10.80 | 0.4252 | | 94 | | 142 | 6 | — | — | — | 5999708 |

| 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 |
|-----------------------------|----------------------------|-------------------------------|---------------------------|-----------------------------------|------------------------|----------------------|------------------------|----------------------|-------------|---------|-------|-------|---------|
| | | | 11.00 | 0.4331 | | 94 | | 142 | 6 | — | — | — | 5999711 |
| 7/16 | | | | 0.4375 | 4.1/16 | | 5.1/2 | | 6 | 5998220 | — | — | — |
| | | | 11.20 | 0.4409 | | 94 | | 142 | 6 | — | — | — | 5999714 |
| | | | 11.50 | 0.4528 | | 94 | | 142 | 6 | — | — | — | 5999721 |
| 29/64 | | | | 0.4531 | 4.3/16 | | 5.5/8 | | 6 | 5998172 | — | — | — |
| | | | 11.80 | 0.4646 | | 94 | | 142 | 6 | — | — | — | 6000617 |
| 15/32 | | | | 0.4687 | 4.5/16 | | 5.3/4 | | 6 | 5998286 | — | — | — |
| | | | 12.00 | 0.4724 | | 101 | | 151 | 6 | — | — | — | 6000665 |
| | | | 12.20 | 0.4803 | | 101 | | 151 | 6 | — | — | — | 6000704 |
| 31/64 | | | | 0.4844 | 4.3/8 | | 5.7/8 | | 6 | 5998191 | — | — | — |
| | | | 12.50 | 0.4921 | | 101 | | 151 | 6 | — | — | — | 6000731 |
| 1/2 | | | | 0.5000 | 4.1/2 | | 6" | | 6 | 5998136 | — | — | — |
| | | | 13.00 | 0.5118 | | 101 | | 151 | 1 | — | — | — | 6000756 |
| 33/64 | | | | 0.5156 | 4.13/16 | | 6.5/8 | | 1 | 5998195 | — | — | — |
| 17/32 | | | | 0.5313 | 4.13/16 | | 6.5/8 | | 1 | 5998298 | — | — | — |
| 35/64 | | | | 0.5469 | 4.13/16 | | 6.5/8 | | 1 | 5998198 | — | — | — |
| 9/16 | | | | 0.5625 | 4.13/16 | | 6.5/8 | | 1 | 5998228 | — | — | — |
| 37/64 | | | | 0.5781 | 4.13/16 | | 6.5/8 | | 1 | 5998201 | — | — | — |
| 19/32 | | | | 0.5937 | 5.3/16 | | 7.1/8 | | 1 | 5998305 | — | — | — |
| 39/64 | | | | 0.6094 | 5.3/16 | | 7.1/8 | | 1 | 5998203 | — | — | — |
| 5/8 | | | | 0.6250 | 5.3/16 | | 7.1/8 | | 1 | 5998217 | — | — | — |
| 41/64 | | | | 0.6406 | 5.3/16 | | 7.1/8 | | 1 | 5998205 | — | — | — |
| 21/32 | | | | 0.6563 | 5.3/16 | | 7.1/8 | | 1 | 5998152 | — | — | — |
| 43/64 | | | | 0.6719 | 5.5/8 | | 7.5/8 | | 1 | 5998207 | — | — | — |
| 11/16 | | | | 0.6875 | 5.5/8 | | 7.5/8 | | 1 | 5998158 | — | — | — |

COBALT JOBBER DRILL

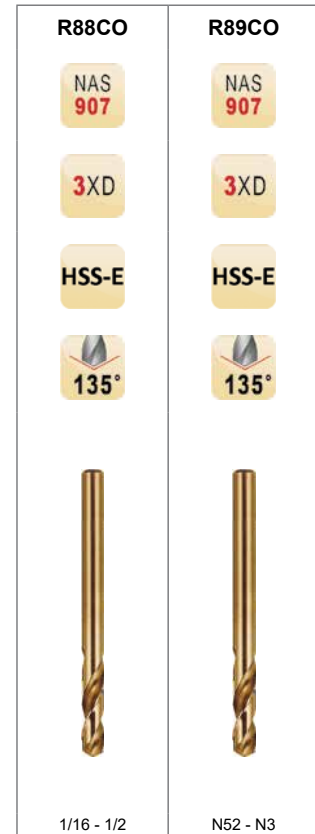
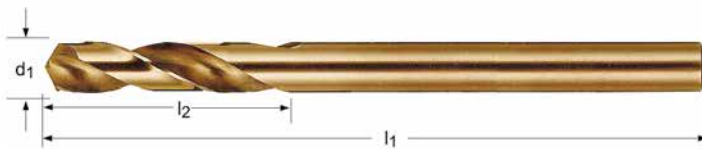


Heavy Duty Jobber Length (NAS 907 Type D)

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 tempered for wear resistance and lubricity.



| 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 | 6000151 | — |
| | 52 | 0.0635 | 7/16 | 1.7/8 | 12 | — | 6000044 |
| | 51 | 0.0670 | 1/2 | 2" | 12 | — | 6000011 |
| | 50 | 0.0700 | 1/2 | 2" | 12 | — | 5999977 |
| | 49 | 0.0730 | 1/2 | 2" | 12 | — | 5999855 |
| 5/64 | | 0.0781 | 1/2 | 2" | 12 | 5999756 | — |
| | 46 | 0.0810 | 9/16 | 2.1/8 | 12 | — | 5999850 |
| | 45 | 0.0820 | 9/16 | 2.1/8 | 12 | — | 5999846 |
| | 44 | 0.0860 | 9/16 | 2.1/8 | 12 | — | 5999844 |
| | 43 | 0.0890 | 5/8 | 2.1/4 | 12 | — | 5999839 |
| | 42 | 0.0935 | 5/8 | 2.1/4 | 12 | — | 5999836 |
| 3/32 | | 0.0938 | 5/8 | 2.1/4 | 12 | 5999740 | — |
| | 41 | 0.0960 | 5/8 | 2.3/8 | 12 | — | 5999832 |
| | 40 | 0.0980 | 13/16 | 2.3/8 | 12 | — | 5999829 |
| | 39 | 0.0995 | 13/16 | 2.3/8 | 12 | — | 5999826 |
| | 36 | 0.1065 | 13/16 | 2.1/2 | 12 | — | 5999824 |
| 7/64 | | 0.1094 | 13/16 | 2.5/8 | 12 | 5999767 | — |
| | 31 | 0.1200 | 7/8 | 2.3/4 | 12 | — | 5999818 |
| 1/8 | | 0.1250 | 7/8 | 2.3/4 | 12 | 6000163 | — |
| | 30 | 0.1285 | 15/16 | 2.3/4 | 12 | — | 5999815 |
| | 29 | 0.1360 | 15/16 | 2.7/8 | 12 | — | 5999808 |
| 9/64 | | 0.1406 | 15/16 | 2.7/8 | 12 | 5999774 | — |
| | 27 | 0.1440 | 1" | 3" | 12 | — | 5999806 |
| | 26 | 0.1470 | 1" | 3" | 12 | — | 5999803 |
| | 25 | 0.1495 | 1" | 3" | 12 | — | 5999801 |
| | 24 | 0.1520 | 1" | 3.1/8 | 12 | — | 5999799 |
| 5/32 | | 0.1563 | 1" | 3.1/8 | 12 | 5999752 | — |
| | 22 | 0.1570 | 1.1/16 | 3.1/8 | 12 | — | 5999797 |
| | 21 | 0.1590 | 1.1/16 | 3.1/4 | 12 | — | 5999795 |
| | 20 | 0.1610 | 1.1/16 | 3.1/4 | 12 | — | 5999790 |
| 11/64 | | 0.1719 | 1.1/16 | 3.1/4 | 12 | 6000176 | — |
| | 16 | 0.1770 | 1.1/8 | 3.3/8 | 12 | — | 5999788 |
| | 13 | 0.1850 | 1.1/8 | 3.1/2 | 12 | — | 5999785 |

| 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 | 5999738 | — |
| | 12 | 0.1890 | 1.1/8 | 3.1/2 | 12 | — | 5999782 |
| | 11 | 0.1910 | 1.3/16 | 3.1/2 | 12 | — | 5999779 |
| | 10 | 0.1935 | 1.3/16 | 3.5/8 | 12 | — | 5999775 |
| | 9 | 0.1960 | 1.3/16 | 3.5/8 | 12 | — | 6000120 |
| | 8 | 0.1990 | 1.3/16 | 3.5/8 | 12 | — | 6000115 |
| | 7 | 0.2010 | 1.3/16 | 3.5/8 | 12 | — | 6000109 |
| 13/64 | | 0.2031 | 1.3/16 | 3.5/8 | 12 | 5999763 | — |
| | 6 | 0.2040 | 1.1/4 | 3.3/4 | 12 | — | 6000073 |
| | 5 | 0.2055 | 1.1/4 | 3.3/4 | 12 | — | 5999863 |
| | 3 | 0.2130 | 1.1/4 | 3.3/4 | 12 | — | 5999812 |
| 7/32 | | 0.2188 | 1.1/4 | 3.3/4 | 12 | 5999765 | — |
| 15/64 | | 0.2344 | 1.5/16 | 3.7/8 | 12 | 5999821 | — |
| 1/4 | | 0.2500 | 1.3/8 | 4" | 12 | 6000159 | — |
| 17/64 | | 0.2656 | 1.7/16 | 4.1/8 | 12 | 5999859 | — |
| 9/32 | | 0.2813 | 1.1/2 | 4.1/4 | 12 | 5999771 | — |
| 19/64 | | 0.2969 | 1.9/16 | 4.3/8 | 12 | 5999867 | — |
| 5/16 | | 0.3125 | 1.5/8 | 4.1/2 | 6 | 5999749 | — |
| 21/64 | | 0.3281 | 1.11/16 | 4.5/8 | 6 | 5999874 | — |
| 11/32 | | 0.3437 | 1.11/16 | 4.3/4 | 6 | 6000167 | — |
| 23/64 | | 0.3594 | 1.3/4 | 4.7/8 | 6 | 5999879 | — |
| 3/8 | | 0.3750 | 1.13/16 | 5" | 6 | 5999744 | — |
| 25/64 | | 0.3906 | 1.7/8 | 5.1/8 | 6 | 5999883 | — |
| 13/32 | | 0.4063 | 1.15/16 | 5.1/4 | 6 | 5999720 | — |
| 27/64 | | 0.4219 | 2" | 5.3/8 | 6 | 5999727 | — |
| 7/16 | | 0.4375 | 2.1/16 | 5.1/2 | 6 | 5999762 | — |
| 29/64 | | 0.4531 | 2.1/8 | 5.5/8 | 6 | 5999731 | — |
| 15/32 | | 0.4687 | 2.1/8 | 5.3/4 | 6 | 5999792 | — |
| 31/64 | | 0.4844 | 2.3/16 | 5.7/8 | 6 | 5999746 | — |
| 1/2 | | 0.5000 | 2.1/4 | 6" | 6 | 6000155 | — |

SCREW MACHINE DRILL



General Purpose Screw Machine Length

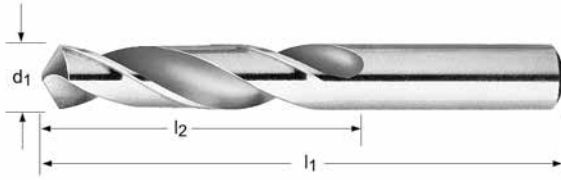
* Sets Available on pg. 236

R40 - Fractional Sizes

R41 - Wire Gauge Sizes

R42 - Letter Sizes

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



- 1) Sizes 45/64 and larger are steam tempered
- 2) 1" reduced shank
- 3) 1-1/4" reduced shank
- 4) 1-1/2" reduced shank

| 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 |

| 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 | — | 5999309 | — |
| | 59 | | 0.0410 | 1/2 | 1.3/8 | 12 | — | 5999301 | — |
| | 58 | | 0.0420 | 1/2 | 1.3/8 | 12 | — | 5999297 | — |
| | 57 | | 0.0430 | 1/2 | 1.3/8 | 12 | — | 5999293 | — |
| | 56 | | 0.0465 | 1/2 | 1.3/8 | 12 | — | 5999289 | — |
| 3/64 | | | 0.0469 | 1/2 | 1.3/8 | 12 | 5998475 | — | — |
| | 55 | | 0.0520 | 5/8 | 1.5/8 | 12 | — | 5999285 | — |
| | 54 | | 0.0550 | 5/8 | 1.5/8 | 12 | — | 5999281 | — |
| | 53 | | 0.0595 | 5/8 | 1.5/8 | 12 | — | 5999277 | — |
| 1/16 | | | 0.0625 | 5/8 | 1.5/8 | 12 | 5998567 | — | — |
| | 52 | | 0.0635 | 11/16 | 1.11/16 | 12 | — | 5999268 | — |
| | 51 | | 0.0670 | 11/16 | 1.11/16 | 12 | — | 5999264 | — |
| | 50 | | 0.0700 | 11/16 | 1.11/16 | 12 | — | 5999260 | — |
| | 49 | | 0.0730 | 11/16 | 1.11/16 | 12 | — | 5999253 | — |
| | 48 | | 0.0760 | 11/16 | 1.11/16 | 12 | — | 5999249 | — |
| 5/64 | | | 0.0781 | 11/16 | 1.11/16 | 12 | 5998532 | — | — |
| | 47 | | 0.0785 | 11/16 | 1.11/16 | 12 | — | 5999245 | — |
| | 46 | | 0.0810 | 3/4 | 1.3/4 | 12 | — | 5999241 | — |
| | 45 | | 0.0820 | 3/4 | 1.3/4 | 12 | — | 5999237 | — |
| | 44 | | 0.0860 | 3/4 | 1.3/4 | 12 | — | 5999233 | — |
| | 43 | | 0.0890 | 3/4 | 1.3/4 | 12 | — | 5999420 | — |
| | 42 | | 0.0935 | 3/4 | 1.3/4 | 12 | — | 5999417 | — |
| 3/32 | | | 0.0938 | 3/4 | 1.3/4 | 12 | 5998638 | — | — |
| | 41 | | 0.0960 | 13/16 | 1.13/16 | 12 | — | 5999414 | — |
| | 40 | | 0.0980 | 13/16 | 1.13/16 | 12 | — | 5999411 | — |
| | 39 | | 0.0995 | 13/16 | 1.13/16 | 12 | — | 5999357 | — |
| | 38 | | 0.1015 | 13/16 | 1.13/16 | 12 | — | 5999315 | — |
| | 37 | | 0.1040 | 13/16 | 1.13/16 | 12 | — | 5999273 | — |
| | 36 | | 0.1065 | 13/16 | 1.13/16 | 12 | — | 5999227 | — |
| 7/64 | | | 0.1094 | 13/16 | 1.13/16 | 12 | 5998576 | — | — |
| | 35 | | 0.1100 | 7/8 | 1.7/8 | 12 | — | 5998883 | — |
| | 34 | | 0.1110 | 7/8 | 1.7/8 | 12 | — | 5998875 | — |
| | 33 | | 0.1130 | 7/8 | 1.7/8 | 12 | — | 5998872 | — |
| | 32 | | 0.1160 | 7/8 | 1.7/8 | 12 | — | 5998868 | — |

| 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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|---------|
| 1/8 | 31 | | 0.1200 | 7/8 | 1.7/8 | 12 | — | 5998865 | — |
| | | | 0.1250 | 7/8 | 1.7/8 | 12 | 5998575 | — | — |
| | | 30 | 0.1285 | 15/16 | 1.15/16 | 12 | — | 5998862 | — |
| | | 29 | 0.1360 | 15/16 | 1.15/16 | 12 | — | 5998855 | — |
| 9/64 | 28 | | 0.1405 | 15/16 | 1.15/16 | 12 | — | 5998852 | — |
| | | | 0.1406 | 15/16 | 1.15/16 | 12 | 5998592 | — | — |
| | | 27 | 0.1440 | 1" | 2.1/16 | 12 | — | 5998849 | — |
| | | 26 | 0.1470 | 1" | 2.1/16 | 12 | — | 5998846 | — |
| | | 25 | 0.1495 | 1" | 2.1/16 | 12 | — | 5998839 | — |
| | | 24 | 0.1520 | 1" | 2.1/16 | 12 | — | 5998836 | — |
| 5/32 | 23 | | 0.1540 | 1" | 2.1/16 | 12 | — | 5998833 | — |
| | | | 0.1563 | 1" | 2.1/16 | 12 | 5998527 | — | — |
| | | 22 | 0.1570 | 1.1/16 | 2.1/8 | 12 | — | 5998830 | — |
| | | 21 | 0.1590 | 1.1/16 | 2.1/8 | 12 | — | 5998826 | — |
| | | 20 | 0.1610 | 1.1/16 | 2.1/8 | 12 | — | 5998823 | — |
| | | 19 | 0.1660 | 1.1/16 | 2.1/8 | 12 | — | 5998817 | — |
| | | 18 | 0.1695 | 1.1/16 | 2.1/8 | 12 | — | 5998813 | — |
| 11/64 | | | 0.1719 | 1.1/16 | 2.1/8 | 12 | 5998587 | — | — |
| | | 17 | 0.1730 | 1.1/8 | 2.3/16 | 12 | — | 5998807 | — |
| | | 16 | 0.1770 | 1.1/8 | 2.3/16 | 12 | — | 5998801 | — |
| | | 15 | 0.1800 | 1.1/8 | 2.3/16 | 12 | — | 5998797 | — |
| | | 14 | 0.1820 | 1.1/8 | 2.3/16 | 12 | — | 5998793 | — |
| | | 13 | 0.1850 | 1.1/8 | 2.3/16 | 12 | — | 5998789 | — |
| 3/16 | | | 0.1875 | 1.1/8 | 2.3/16 | 12 | 5998634 | — | — |
| | | 12 | 0.1890 | 1.3/16 | 2.1/4 | 12 | — | 5998785 | — |
| | | 11 | 0.1910 | 1.3/16 | 2.1/4 | 12 | — | 5998780 | — |
| | | 10 | 0.1935 | 1.3/16 | 2.1/4 | 12 | — | 5998776 | — |
| | | 9 | 0.1960 | 1.3/16 | 2.1/4 | 12 | — | 5999322 | — |
| | | 8 | 0.1990 | 1.3/16 | 2.1/4 | 12 | — | 5999319 | — |
| | | 7 | 0.2010 | 1.3/16 | 2.1/4 | 12 | — | 5999312 | — |
| 13/64 | | | 0.2031 | 1.3/16 | 2.1/4 | 12 | 5998608 | — | — |
| | | 6 | 0.2040 | 1.1/4 | 2.3/8 | 12 | — | 5999305 | — |
| | | 5 | 0.2055 | 1.1/4 | 2.3/8 | 12 | — | 5999256 | — |
| | | 4 | 0.2090 | 1.1/4 | 2.3/8 | 12 | — | 5999405 | — |
| | | 3 | 0.2130 | 1.1/4 | 2.3/8 | 12 | — | 5998858 | — |
| 7/32 | | | 0.2188 | 1.1/4 | 2.3/8 | 12 | 5998574 | — | — |
| | | 2 | 0.2210 | 1.5/16 | 2.7/16 | 12 | — | 5998820 | — |
| | | 1 | 0.2280 | 1.5/16 | 2.7/16 | 12 | — | 5998771 | — |
| 15/64 | | A | 0.2340 | 1.5/16 | 2.7/16 | 12 | — | — | 5999326 |
| | | | 0.2344 | 1.5/16 | 2.7/16 | 12 | 5998619 | — | — |
| | | B | 0.2374 | 1.3/8 | 2.1/2 | 12 | — | — | 5999330 |
| | | C | 0.2421 | 1.3/8 | 2.1/2 | 12 | — | — | 5999334 |
| | | D | 0.2461 | 1.3/8 | 2.1/2 | 12 | — | — | 5998908 |
| 1/4 | | E | 0.2500 | 1.3/8 | 2.1/2 | 12 | 5998572 | — | — |
| | | F | 0.2571 | 1.7/16 | 2.5/8 | 12 | — | — | 5998915 |
| | | G | 0.2610 | 1.7/16 | 2.5/8 | 12 | — | — | 5998919 |
| 17/64 | | | 0.2656 | 1.7/16 | 2.5/8 | 12 | 5998625 | — | — |
| | | H | 0.2661 | 1.1/2 | 2.11/16 | 12 | — | — | 5998923 |
| | | I | 0.2720 | 1.1/2 | 2.11/16 | 12 | — | — | 5998927 |
| | | J | 0.2772 | 1.1/2 | 2.11/16 | 12 | — | — | 5998932 |
| | | K | 0.2811 | 1.1/2 | 2.11/16 | 12 | — | — | 5998935 |
| | | | 0.2813 | 1.1/2 | 2.11/16 | 12 | 5998585 | — | — |
| | | L | 0.2902 | 1.9/16 | 2.3/4 | 12 | — | — | 5998938 |
| 19/64 | | M | 0.2949 | 1.9/16 | 2.3/4 | 12 | — | — | 5998944 |
| | | | 0.2969 | 1.9/16 | 2.3/4 | 12 | 5998633 | — | — |
| 5/16 | | N | 0.3020 | 1.5/8 | 2.13/16 | 12 | — | — | 5998947 |
| | | | 0.3125 | 1.5/8 | 2.13/16 | 6 | 5998523 | — | — |
| | | O | 0.3161 | 1.11/16 | 2.15/16 | 6 | — | — | 5998950 |
| 21/64 | | P | 0.3228 | 1.11/16 | 2.15/16 | 6 | — | — | 5998951 |
| | | | 0.3281 | 1.11/16 | 2.15/16 | 6 | 5998645 | — | — |
| | | Q | 0.3319 | 1.11/16 | 3" | 6 | — | — | 5998953 |
| | | R | 0.3390 | 1.11/16 | 3" | 6 | — | — | 5998955 |
| 11/32 | | | 0.3437 | 1.11/16 | 3" | 6 | 5998584 | — | — |
| | | S | 0.3480 | 1.3/4 | 3.1/16 | 6 | — | — | 5998957 |
| | | T | 0.3580 | 1.3/4 | 3.1/16 | 6 | — | — | 5998959 |

SCREW MACHINE DRILL



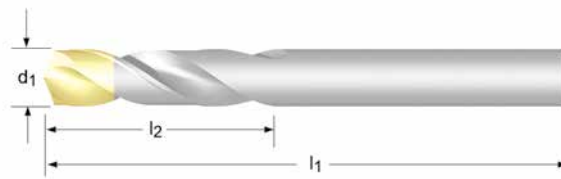
| d ₁ Ø Inch | d ₁ Ø Nr. | d ₁ Ø letter | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | R40 | R41 | R42 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|-------------------|---------|
| 23/64 | | | 0.3594 | 1.3/4 | 3.1/16 | 6 | 5998655 | — | — |
| | | U | 0.3680 | 1.13/16 | 3.1/8 | 6 | — | — | 5998961 |
| 3/8 | | | 0.3750 | 1.13/16 | 3.1/8 | 6 | 5998478 | — | — |
| | | V | 0.3772 | 1.7/8 | 3.1/4 | 6 | — | — | 5998963 |
| | | W | 0.3858 | 1.7/8 | 3.1/4 | 6 | — | — | 5998968 |
| 25/64 | | | 0.3906 | 1.7/8 | 3.1/4 | 6 | 5998507 | — | — |
| | | X | 0.3969 | 1.15/16 | 3.5/16 | 6 | — | — | 5998970 |
| | | Y | 0.4039 | 1.15/16 | 3.5/16 | 6 | — | — | 5998972 |
| 13/32 | | | 0.4063 | 1.15/16 | 3.5/16 | 6 | 5998605 | — | — |
| | | Z | 0.4130 | 2" | 3.3/8 | 6 | — | — | 5998974 |
| 27/64 | | | 0.4219 | 2" | 3.3/8 | 6 | 5998588 | — | — |
| 7/16 | | | 0.4375 | 2.1/16 | 3.7/16 | 6 | 5998571 | — | — |
| 29/64 | | | 0.4531 | 2.1/8 | 3.9/16 | 6 | 5998631 | — | — |
| 15/32 | | | 0.4687 | 2.1/8 | 3.5/8 | 6 | 5998616 | — | — |
| 31/64 | | | 0.4844 | 2.3/16 | 3.11/16 | 6 | 5998484 | — | — |
| 1/2 | | | 0.5000 | 2.1/4 | 3.3/4 | 6 | 5998570 | — | — |
| 33/64 | | | 0.5156 | 2.3/8 | 3.7/8 | 1 | 5998487 | — | — |
| 17/32 | | | 0.5313 | 2.3/8 | 3.7/8 | 1 | 5998621 | — | — |
| 35/64 | | | 0.5469 | 2.1/2 | 4" | 1 | 5998490 | — | — |
| 9/16 | | | 0.5625 | 2.1/2 | 4" | 1 | 5998582 | — | — |
| 37/64 | | | 0.5781 | 2.5/8 | 4.1/8 | 1 | 5998493 | — | — |
| 19/32 | | | 0.5937 | 2.5/8 | 4.1/8 | 1 | 5998629 | — | — |
| 39/64 | | | 0.6094 | 2.3/4 | 4.1/4 | 1 | 5998496 | — | — |
| 5/8 | | | 0.6250 | 2.3/4 | 4.1/4 | 1 | 5998538 | — | — |
| 41/64 | | | 0.6406 | 2.7/8 | 4.1/2 | 1 | 5998499 | — | — |
| 21/32 | | | 0.6563 | 2.7/8 | 4.1/2 | 1 | 5998641 | — | — |
| 43/64 | | | 0.6719 | 2.7/8 | 4.5/8 | 1 | 5998503 | — | — |
| 11/16 | | | 0.6875 | 2.7/8 | 4.5/8 | 1 | 5998578 | — | — |
| 45/64 | | | 0.7031 | 3" | 4.3/4 | 1 | 5998510 | ¹⁾ — | — |
| 23/32 | | | 0.7188 | 3" | 4.3/4 | 1 | 5998649 | ¹⁾ — | — |
| 47/64 | | | 0.7344 | 3.1/8 | 5" | 1 | 5998514 | ¹⁾ — | — |
| 3/4 | | | 0.7500 | 3.1/8 | 5" | 1 | 5998644 | ¹⁾ — | — |
| 49/64 | | | 0.7656 | 3.1/4 | 5.1/8 | 1 | 5998518 | ¹⁾ — | — |
| 25/32 | | | 0.7813 | 3.1/4 | 5.1/8 | 1 | 5998471 | ¹⁾ — | — |
| 51/64 | | | 0.7969 | 3.3/8 | 5.1/4 | 1 | 5998541 | ¹⁾ — | — |
| 13/16 | | | 0.8125 | 3.3/8 | 5.1/4 | 1 | 5998602 | ¹⁾ — | — |
| 53/64 | | | 0.8281 | 3.1/2 | 5.3/8 | 1 | 5998545 | ¹⁾ — | — |
| 27/32 | | | 0.8438 | 3.1/2 | 5.3/8 | 1 | 5998553 | ¹⁾ — | — |
| 55/64 | | | 0.8594 | 3.1/2 | 5.1/2 | 1 | 5998549 | ¹⁾ — | — |
| 7/8 | | | 0.8750 | 3.1/2 | 5.1/2 | 1 | 5998579 | ¹⁾ — | — |
| 57/64 | | | 0.8906 | 3.5/8 | 5.5/8 | 1 | 5998559 | ¹⁾ — | — |
| 29/32 | | | 0.9063 | 3.5/8 | 5.5/8 | 1 | 5998624 | ¹⁾ — | — |
| 59/64 | | | 0.9219 | 3.3/4 | 5.3/4 | 1 | 5998562 | ¹⁾ — | — |
| 15/16 | | | 0.9375 | 3.3/4 | 5.3/4 | 1 | 5998611 | ¹⁾ — | — |
| 61/64 | | | 0.9531 | 3.7/8 | 5.7/8 | 1 | 5998565 | ¹⁾ — | — |
| 31/32 | | | 0.9688 | 3.7/8 | 5.7/8 | 1 | 5998481 | ¹⁾ — | — |
| 63/64 | | | 0.9844 | 4" | 6" | 1 | 5998568 | ¹⁾ — | — |
| 1" | | | 1.0000 | 4" | 6" | 1 | 5998671 | ¹⁾ — | — |
| 1.1/16 | | | 1.0625 | 4" | 6.1/4 | 1 | 5998505 | ¹⁾²⁾ — | — |
| 1.1/8 | | | 1.1250 | 4" | 6.3/8 | 1 | 5998517 | ¹⁾²⁾ — | — |
| 1.3/16 | | | 1.1875 | 4.1/4 | 6.5/8 | 1 | 5998536 | ¹⁾²⁾ — | — |
| 1.1/4 | | | 1.2500 | 4.3/8 | 6.3/4 | 1 | 5998513 | ¹⁾²⁾ — | — |
| 1.5/16 | | | 1.3125 | 4.3/8 | 7" | 1 | 5998551 | ¹⁾³⁾ — | — |
| 1.3/8 | | | 1.3750 | 4.1/2 | 7.1/8 | 1 | 5998544 | ¹⁾³⁾ — | — |
| 1.7/16 | | | 1.4375 | 4.3/4 | 7.3/8 | 1 | 5998558 | ¹⁾³⁾ — | — |
| 1.1/2 | | | 1.5000 | 4.7/8 | 7.1/2 | 1 | 5998509 | ¹⁾³⁾ — | — |
| 1.9/16 | | | 1.5625 | 4.7/8 | 7.3/4 | 1 | 5998564 | ¹⁾⁴⁾ — | — |
| 1.5/8 | | | 1.6250 | 4.7/8 | 7.3/4 | 1 | 5998555 | ¹⁾⁴⁾ — | — |
| 1.3/4 | | | 1.7500 | 5.1/8 | 8" | 1 | 5998540 | ¹⁾⁴⁾ — | — |
| 1.13/16 | | | 1.8125 | 5.3/8 | 8.1/4 | 1 | 5998526 | ¹⁾⁴⁾ — | — |
| 1.7/8 | | | 1.8750 | 5.3/8 | 8.1/4 | 1 | 5998561 | ¹⁾⁴⁾ — | — |
| 1.15/16 | | | 1.9375 | 5.5/8 | 8.1/2 | 1 | 5998531 | ¹⁾⁴⁾ — | — |
| 2" | | | 2.0000 | 5.5/8 | 8.1/2 | 1 | 5998637 | ¹⁾⁴⁾ — | — |

General Purpose Screw Machine Length

* Sets Available on pg. 237

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 $\text{Ø}h_8$ Inch | d_1 $\text{Ø}h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A022 |
|--------------------------------|------------------------------|--------------------------|-------------|-------------|-------------|-------------|
| | 0.50 | 0.0197 | 3 | 20 | 10 | 5966728 |
| | 0.60 | 0.0236 | 3.5 | 21 | 10 | 5966732 |
| | 0.70 | 0.0276 | 4.5 | 23 | 10 | 5966736 |
| 1/32 | 0.79 | 0.0313 | 13 | 35 | 10 | 5967183 |
| | 0.80 | 0.0315 | 5 | 24 | 10 | 5966743 |
| | 0.90 | 0.0354 | 5.5 | 25 | 10 | 5967157 |
| | 1.00 | 0.0394 | 6 | 26 | 10 | 5967213 |
| | 1.10 | 0.0433 | 7 | 28 | 10 | 5967253 |
| 3/64 | 1.19 | 0.0469 | 13 | 35 | 10 | 5967112 |
| | 1.20 | 0.0472 | 8 | 30 | 10 | 5967286 |
| | 1.30 | 0.0512 | 8 | 30 | 10 | 5967324 |
| | 1.40 | 0.0551 | 9 | 32 | 10 | 5967333 |
| | 1.50 | 0.0591 | 9 | 32 | 10 | 5967335 |
| 1/16 | 1.59 | 0.0625 | 16 | 41 | 10 | 5967173 |
| | 1.60 | 0.0630 | 10 | 34 | 10 | 5967339 |
| | 1.70 | 0.0669 | 10 | 34 | 10 | 5967343 |
| | 1.80 | 0.0709 | 11 | 36 | 10 | 5967166 |
| | 1.90 | 0.0748 | 11 | 36 | 10 | 5967169 |
| 5/64 | 1.98 | 0.0781 | 17 | 43 | 10 | 5966840 |
| | 2.00 | 0.0787 | 12 | 38 | 10 | 5967096 |
| | 2.10 | 0.0827 | 12 | 38 | 10 | 5967118 |
| | 2.20 | 0.0866 | 13 | 40 | 10 | 5967140 |
| | 2.25 | 0.0886 | 13 | 40 | 10 | 5967179 |
| | 2.30 | 0.0906 | 13 | 40 | 10 | 5967189 |
| 3/32 | 2.38 | 0.0937 | 20 | 45 | 10 | 5967110 |
| | 2.40 | 0.0945 | 14 | 43 | 10 | 5967194 |
| | 2.50 | 0.0984 | 14 | 43 | 10 | 5967200 |
| | 2.60 | 0.1024 | 14 | 43 | 10 | 5967206 |
| | 2.65 | 0.1043 | 14 | 43 | 10 | 5967064 |
| | 2.70 | 0.1063 | 16 | 46 | 10 | 5967068 |
| 7/64 | 2.78 | 0.1094 | 22 | 47 | 10 | 5966875 |
| | 2.80 | 0.1102 | 16 | 46 | 10 | 5967073 |
| | 2.90 | 0.1142 | 16 | 46 | 10 | 5967076 |

SCREW MACHINE DRILL



| d_1 \varnothing_{h_8} Inch | d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A022 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 3.00 | 0.1181 | 16 | 46 | 10 | 5967079 |
| | 3.10 | 0.1220 | 18 | 49 | 10 | 5967081 |
| 1/8 | 3.18 | 0.1250 | 23 | 49 | 10 | 5967193 |
| | 3.20 | 0.1260 | 18 | 49 | 10 | 5967083 |
| | 3.25 | 0.1280 | 18 | 49 | 10 | 5967087 |
| | 3.30 | 0.1299 | 18 | 49 | 10 | 5967090 |
| | 3.40 | 0.1339 | 20 | 52 | 10 | 5967093 |
| | 3.50 | 0.1378 | 20 | 52 | 10 | 5967098 |
| 9/64 | 3.57 | 0.1406 | 25 | 50 | 10 | 5966963 |
| | 3.60 | 0.1417 | 20 | 52 | 10 | 5967100 |
| | 3.70 | 0.1457 | 20 | 52 | 10 | 5967102 |
| | 3.80 | 0.1496 | 22 | 55 | 10 | 5967104 |
| | 3.90 | 0.1535 | 22 | 55 | 10 | 5967106 |
| 5/32 | 3.97 | 0.1563 | 26 | 53 | 10 | 5967184 |
| | 4.00 | 0.1575 | 22 | 55 | 10 | 5967116 |
| | 4.10 | 0.1614 | 22 | 55 | 10 | 5967120 |
| | 4.20 | 0.1654 | 22 | 55 | 10 | 5967122 |
| | 4.30 | 0.1693 | 24 | 58 | 10 | 5967124 |
| 11/64 | 4.37 | 0.1719 | 28 | 55 | 10 | 5967277 |
| | 4.40 | 0.1732 | 24 | 58 | 10 | 5967126 |
| | 4.50 | 0.1772 | 24 | 58 | 10 | 5967128 |
| | 4.60 | 0.1811 | 24 | 58 | 10 | 5967130 |
| | 4.70 | 0.1850 | 24 | 58 | 10 | 5967132 |
| 3/16 | 4.76 | 0.1875 | 30 | 57 | 10 | 5967108 |
| | 4.80 | 0.1890 | 26 | 62 | 10 | 5967134 |
| | 4.90 | 0.1929 | 26 | 62 | 10 | 5967136 |
| | 5.00 | 0.1969 | 26 | 62 | 10 | 5967138 |
| | 5.10 | 0.2008 | 26 | 62 | 10 | 5967142 |
| 13/64 | 5.16 | 0.2031 | 31 | 58 | 10 | 5967305 |
| | 5.20 | 0.2047 | 26 | 62 | 10 | 5967144 |
| | 5.30 | 0.2087 | 26 | 62 | 10 | 5967147 |
| | 5.40 | 0.2126 | 28 | 66 | 10 | 5967149 |
| | 5.50 | 0.2165 | 28 | 66 | 10 | 5967153 |
| 7/32 | 5.56 | 0.2188 | 33 | 61 | 10 | 5966873 |
| | 5.60 | 0.2205 | 28 | 66 | 10 | 5967158 |
| | 5.70 | 0.2244 | 28 | 66 | 10 | 5967162 |
| | 5.80 | 0.2283 | 28 | 66 | 10 | 5967167 |
| | 5.90 | 0.2323 | 28 | 66 | 10 | 5967170 |
| 15/64 | 5.95 | 0.2344 | 34 | 63 | 10 | 5967329 |
| | 6.00 | 0.2362 | 28 | 66 | 10 | 5966885 |
| | 6.10 | 0.2402 | 31 | 70 | 10 | 5966921 |
| | 6.20 | 0.2441 | 31 | 70 | 10 | 5966972 |
| | 6.30 | 0.2480 | 31 | 70 | 10 | 5966981 |
| 1/4 | 6.35 | 0.2500 | 36 | 65 | 10 | 5967188 |
| | 6.40 | 0.2520 | 31 | 70 | 10 | 5966985 |
| | 6.50 | 0.2559 | 31 | 70 | 10 | 5966989 |
| | 6.60 | 0.2598 | 31 | 70 | 10 | 5966993 |
| | 6.70 | 0.2638 | 31 | 70 | 10 | 5966843 |
| | 6.80 | 0.2677 | 34 | 74 | 10 | 5966845 |
| | 6.90 | 0.2717 | 34 | 74 | 10 | 5966847 |
| | 7.00 | 0.2756 | 34 | 74 | 10 | 5966849 |
| | 7.10 | 0.2795 | 34 | 74 | 10 | 5966851 |
| 9/32 | 7.14 | 0.2813 | 40 | 70 | 10 | 5966960 |
| | 7.20 | 0.2835 | 34 | 74 | 10 | 5966853 |
| | 7.30 | 0.2874 | 34 | 74 | 10 | 5966855 |
| | 7.40 | 0.2913 | 34 | 74 | 10 | 5966857 |
| | 7.50 | 0.2953 | 34 | 74 | 10 | 5966859 |
| | 7.60 | 0.2992 | 37 | 79 | 10 | 5966861 |
| | 7.70 | 0.3031 | 37 | 79 | 10 | 5966865 |
| | 7.80 | 0.3071 | 37 | 79 | 10 | 5966867 |
| | 7.90 | 0.3110 | 37 | 79 | 10 | 5966869 |
| 5/16 | 7.94 | 0.3125 | 43 | 73 | 10 | 5967176 |
| | 8.00 | 0.3150 | 37 | 79 | 10 | 5966877 |
| | 8.10 | 0.3189 | 37 | 79 | 10 | 5966879 |
| | 8.20 | 0.3228 | 37 | 79 | 10 | 5966881 |
| | 8.30 | 0.3268 | 37 | 79 | 10 | 5966883 |

| d_1 \varnothing_{h_8} Inch | d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A022 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-------------|---------|
| | 8.40 | 0.3307 | 37 | 79 | 10 | 5966887 |
| | 8.50 | 0.3346 | 37 | 79 | 10 | 5966889 |
| | 8.60 | 0.3386 | 40 | 84 | 10 | 5966891 |
| | 8.70 | 0.3425 | 40 | 84 | 10 | 5966893 |
| 11/32 | 8.73 | 0.3438 | 45 | 78 | 10 | 5967274 |
| | 8.80 | 0.3465 | 40 | 84 | 10 | 5966896 |
| | 8.90 | 0.3504 | 40 | 84 | 10 | 5966899 |
| | 9.00 | 0.3543 | 40 | 84 | 10 | 5966902 |
| | 9.10 | 0.3583 | 40 | 84 | 10 | 5966906 |
| | 9.20 | 0.3622 | 40 | 84 | 10 | 5966911 |
| | 9.30 | 0.3661 | 40 | 84 | 10 | 5966916 |
| | 9.40 | 0.3701 | 40 | 84 | 10 | 5966926 |
| | 9.50 | 0.3740 | 40 | 84 | 10 | 5966931 |
| 3/8 | 9.52 | 0.3750 | 48 | 81 | 10 | 5967114 |
| | 9.60 | 0.3780 | 43 | 89 | 10 | 5966934 |
| | 9.70 | 0.3819 | 43 | 89 | 10 | 5966939 |
| | 9.80 | 0.3858 | 43 | 89 | 10 | 5966944 |
| | 9.90 | 0.3898 | 43 | 89 | 10 | 5966949 |
| | 10.00 | 0.3937 | 43 | 89 | 10 | 5967198 |
| | 10.10 | 0.3976 | 43 | 89 | 5 | 5967207 |
| | 10.20 | 0.4016 | 43 | 89 | 5 | 5967211 |
| | 10.30 | 0.4055 | 43 | 89 | 5 | 5967217 |
| 13/32 | 10.32 | 0.4062 | 51 | 86 | 5 | 5967302 |
| | 10.40 | 0.4094 | 43 | 89 | 5 | 5967221 |
| | 10.50 | 0.4134 | 43 | 89 | 5 | 5967224 |
| | 10.60 | 0.4173 | 43 | 89 | 5 | 5967228 |
| | 10.70 | 0.4213 | 47 | 95 | 5 | 5967233 |
| | 10.80 | 0.4252 | 47 | 95 | 5 | 5967238 |
| | 10.90 | 0.4291 | 47 | 95 | 5 | 5967241 |
| | 11.00 | 0.4331 | 47 | 95 | 5 | 5967244 |
| | 11.10 | 0.4370 | 47 | 95 | 5 | 5967248 |
| 7/16 | 11.11 | 0.4375 | 54 | 89 | 5 | 5966871 |
| | 11.20 | 0.4409 | 47 | 95 | 5 | 5967250 |
| | 11.30 | 0.4449 | 47 | 95 | 5 | 5967256 |
| | 11.50 | 0.4528 | 47 | 95 | 5 | 5967259 |
| | 11.60 | 0.4567 | 47 | 95 | 5 | 5967262 |
| | 11.70 | 0.4606 | 47 | 95 | 5 | 5967265 |
| | 11.80 | 0.4646 | 47 | 95 | 5 | 5967268 |
| | 11.90 | 0.4685 | 51 | 102 | 5 | 5967271 |
| | 12.00 | 0.4724 | 51 | 102 | 5 | 5967280 |
| | 12.10 | 0.4764 | 51 | 102 | 5 | 5967283 |
| | 12.20 | 0.4803 | 51 | 102 | 5 | 5967289 |
| | 12.50 | 0.4921 | 51 | 102 | 5 | 5967292 |
| 1/2 | 12.70 | 0.5000 | 60 | 98 | 5 | 5967178 |
| | 13.00 | 0.5118 | 51 | 102 | 5 | 5967295 |
| | 13.50 | 0.5315 | 54 | 107 | 1 | 5967298 |
| | 14.00 | 0.5512 | 54 | 107 | 1 | 5967309 |
| 9/16 | 14.29 | 0.5625 | 67 | 105 | 1 | 5966956 |
| | 14.50 | 0.5709 | 56 | 111 | 1 | 5967313 |
| | 15.00 | 0.5906 | 56 | 111 | 1 | 5967316 |
| | 15.50 | 0.6102 | 58 | 115 | 1 | 5967319 |
| 5/8 | 15.88 | 0.6250 | 73 | 111 | 1 | 5966863 |
| | 16.00 | 0.6299 | 58 | 115 | 1 | 5967059 |

SCREW MACHINE DRILL



Heavy Duty Screw Machine Length (NAS 907 Type C)

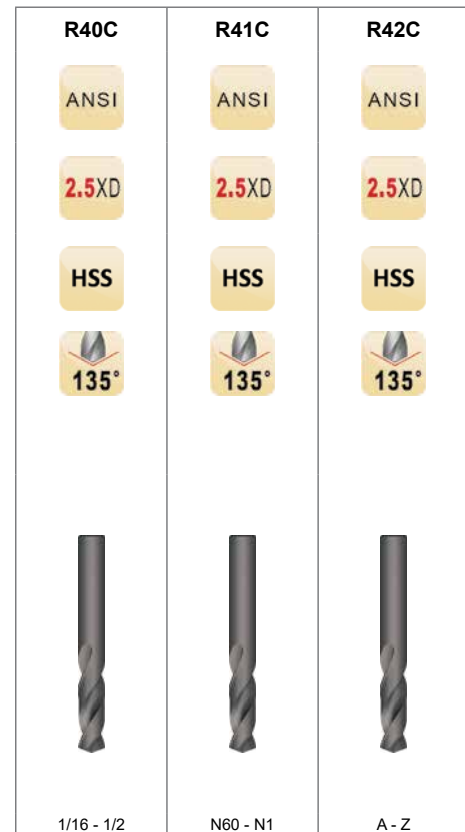
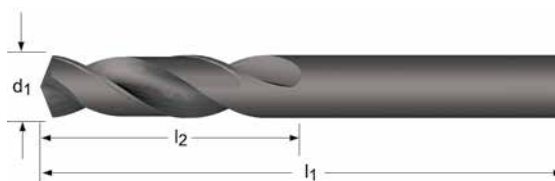
* Sets Available on pg. 238

R40C - Fractional Sizes

R41C - Wire Gauge Sizes

R42C - Letter Sizes

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



| 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 |
|--------------------|-------------------|----------------------|--------------------------|---------------|---------------|-------------|---------|-----------------------|------|
| | 60 | | 0.0400 | 1/2 | 1.3/8 | 12 | — | 5998673 ¹⁾ | — |
| | 59 | | 0.0410 | 1/2 | 1.3/8 | 12 | — | 5998665 ¹⁾ | — |
| | 58 | | 0.0420 | 1/2 | 1.3/8 | 12 | — | 5998661 ¹⁾ | — |
| | 57 | | 0.0430 | 1/2 | 1.3/8 | 12 | — | 5998657 ¹⁾ | — |
| | 56 | | 0.0465 | 1/2 | 1.3/8 | 12 | — | 5998651 ¹⁾ | — |
| | 55 | | 0.0520 | 5/8 | 1.5/8 | 12 | — | 5998647 ¹⁾ | — |
| | 54 | | 0.0550 | 5/8 | 1.5/8 | 12 | — | 5998642 ¹⁾ | — |
| | 53 | | 0.0595 | 5/8 | 1.5/8 | 12 | — | 5998635 ¹⁾ | — |
| 1/16 | | | 0.0625 | 5/8 | 1.5/8 | 12 | 5999397 | — | — |
| | 52 | | 0.0635 | 11/16 | 1.11/16 | 12 | — | 5998630 | — |
| | 51 | | 0.0670 | 11/16 | 1.11/16 | 12 | — | 5998626 | — |
| | 50 | | 0.0700 | 11/16 | 1.11/16 | 12 | — | 5998623 | — |
| | 49 | | 0.0730 | 11/16 | 1.11/16 | 12 | — | 5998615 | — |
| | 48 | | 0.0760 | 11/16 | 1.11/16 | 12 | — | 5998612 | — |
| 5/64 | | | 0.0781 | 11/16 | 1.11/16 | 12 | 5999447 | — | — |
| | 47 | | 0.0785 | 11/16 | 1.11/16 | 12 | — | 5998610 | — |
| | 46 | | 0.0810 | 3/4 | 1.3/4 | 12 | — | 5998607 | — |
| | 45 | | 0.0820 | 3/4 | 1.3/4 | 12 | — | 5998604 | — |
| | 44 | | 0.0860 | 3/4 | 1.3/4 | 12 | — | 5998598 | — |
| | 43 | | 0.0890 | 3/4 | 1.3/4 | 12 | — | 5998594 | — |
| | 42 | | 0.0935 | 3/4 | 1.3/4 | 12 | — | 5998591 | — |
| 3/32 | | | 0.0938 | 3/4 | 1.3/4 | 12 | 5999441 | — | — |
| | 41 | | 0.0960 | 13/16 | 1.13/16 | 12 | — | 5998589 | — |
| | 40 | | 0.0980 | 13/16 | 1.13/16 | 12 | — | 5998586 | — |
| | 39 | | 0.0995 | 13/16 | 1.13/16 | 12 | — | 5998580 | — |
| | 38 | | 0.1015 | 13/16 | 1.13/16 | 12 | — | 5998577 | — |
| | 37 | | 0.1040 | 13/16 | 1.13/16 | 12 | — | 5998573 | — |
| | 36 | | 0.1065 | 13/16 | 1.13/16 | 12 | — | 5998569 | — |
| 7/64 | | | 0.1094 | 13/16 | 1.13/16 | 12 | 5999450 | — | — |
| | 35 | | 0.1100 | 7/8 | 1.7/8 | 12 | — | 5998563 | — |
| | 34 | | 0.1110 | 7/8 | 1.7/8 | 12 | — | 5998560 | — |

¹⁾Not Split Point
136

| 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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|---------|
| | 33 | | 0.1130 | 7/8 | 1.7/8 | 12 | — | 5998557 | — |
| | 32 | | 0.1160 | 7/8 | 1.7/8 | 12 | — | 5998554 | — |
| | 31 | | 0.1200 | 7/8 | 1.7/8 | 12 | — | 5998550 | — |
| 1/8 | | | 0.1250 | 7/8 | 1.7/8 | 12 | 5999409 | — | — |
| | 30 | | 0.1285 | 15/16 | 1.15/16 | 12 | — | 5998547 | — |
| | 29 | | 0.1360 | 15/16 | 1.15/16 | 12 | — | 5998537 | — |
| | 28 | | 0.1405 | 15/16 | 1.15/16 | 12 | — | 5998533 | — |
| 9/64 | | | 0.1406 | 15/16 | 1.15/16 | 12 | 5999452 | — | — |
| | 27 | | 0.1440 | 1" | 2.1/16 | 12 | — | 5998528 | — |
| | 26 | | 0.1470 | 1" | 2.1/16 | 12 | — | 5998697 | — |
| | 25 | | 0.1495 | 1" | 2.1/16 | 12 | — | 5998694 | — |
| | 24 | | 0.1520 | 1" | 2.1/16 | 12 | — | 5998691 | — |
| | 23 | | 0.1540 | 1" | 2.1/16 | 12 | — | 5998688 | — |
| 5/32 | | | 0.1563 | 1" | 2.1/16 | 12 | 5999446 | — | — |
| | 22 | | 0.1570 | 1.1/16 | 2.1/8 | 12 | — | 5998682 | — |
| | 21 | | 0.1590 | 1.1/16 | 2.1/8 | 12 | — | 5998639 | — |
| | 20 | | 0.1610 | 1.1/16 | 2.1/8 | 12 | — | 5998601 | — |
| | 19 | | 0.1660 | 1.1/16 | 2.1/8 | 12 | — | 5998521 | — |
| | 18 | | 0.1695 | 1.1/16 | 2.1/8 | 12 | — | 5998628 | — |
| 11/64 | | | 0.1719 | 1.1/16 | 2.1/8 | 12 | 5999415 | — | — |
| | 17 | | 0.1730 | 1.1/8 | 2.3/16 | 12 | — | 5998620 | — |
| | 16 | | 0.1770 | 1.1/8 | 2.3/16 | 12 | — | 5998617 | — |
| | 15 | | 0.1800 | 1.1/8 | 2.3/16 | 12 | — | 5998613 | — |
| | 14 | | 0.1820 | 1.1/8 | 2.3/16 | 12 | — | 5998609 | — |
| | 13 | | 0.1850 | 1.1/8 | 2.3/16 | 12 | — | 5998606 | — |
| 3/16 | | | 0.1875 | 1.1/8 | 2.3/16 | 12 | 5999440 | — | — |
| | 12 | | 0.1890 | 1.3/16 | 2.1/4 | 12 | — | 5998603 | — |
| | 11 | | 0.1910 | 1.3/16 | 2.1/4 | 12 | — | 5998600 | — |
| | 10 | | 0.1935 | 1.3/16 | 2.1/4 | 12 | — | 5998597 | — |
| | 9 | | 0.1960 | 1.3/16 | 2.1/4 | 12 | — | 5998685 | — |
| | 8 | | 0.1990 | 1.3/16 | 2.1/4 | 12 | — | 5998679 | — |
| | 7 | | 0.2010 | 1.3/16 | 2.1/4 | 12 | — | 5998676 | — |
| 13/64 | | | 0.2031 | 1.3/16 | 2.1/4 | 12 | 5999421 | — | — |
| | 6 | | 0.2040 | 1.1/4 | 2.3/8 | 12 | — | 5998669 | — |
| | 5 | | 0.2055 | 1.1/4 | 2.3/8 | 12 | — | 5998618 | — |
| | 4 | | 0.2090 | 1.1/4 | 2.3/8 | 12 | — | 5998583 | — |
| | 3 | | 0.2130 | 1.1/4 | 2.3/8 | 12 | — | 5998543 | — |
| 7/32 | | | 0.2188 | 1.1/4 | 2.3/8 | 12 | 5999449 | — | — |
| | 2 | | 0.2210 | 1.5/16 | 2.7/16 | 12 | — | 5998566 | — |
| | 1 | | 0.2280 | 1.5/16 | 2.7/16 | 12 | — | 5998595 | — |
| | | A | 0.2340 | 1.5/16 | 2.7/16 | 12 | — | — | 5999338 |
| 15/64 | | | 0.2344 | 1.5/16 | 2.7/16 | 12 | 5999425 | — | — |
| | | B | 0.2380 | 1.3/8 | 2.1/2 | 12 | — | — | 5999342 |
| | | C | 0.2420 | 1.3/8 | 2.1/2 | 12 | — | — | 5999346 |
| | | D | 0.2460 | 1.3/8 | 2.1/2 | 12 | — | — | 5999350 |
| 1/4 | | | 0.2500 | 1.3/8 | 2.1/2 | 12 | 5999406 | — | — |
| | | E | 0.2500 | 1.3/8 | 2.1/2 | 12 | — | — | — |
| | | F | 0.2570 | 1.7/16 | 2.5/8 | 12 | — | — | 5999362 |
| | | G | 0.2610 | 1.7/16 | 2.5/8 | 12 | — | — | 5999367 |
| 17/64 | | | 0.2656 | 1.7/16 | 2.5/8 | 12 | 5999427 | — | — |
| | | H | 0.2660 | 1.1/2 | 2.11/16 | 12 | — | — | 5999373 |
| | | I | 0.2720 | 1.1/2 | 2.11/16 | 12 | — | — | 5999377 |
| | | J | 0.2770 | 1.1/2 | 2.11/16 | 12 | — | — | 5999381 |
| | | K | 0.2810 | 1.1/2 | 2.11/16 | 12 | — | — | 5999386 |
| 9/32 | | | 0.2813 | 1.1/2 | 2.11/16 | 12 | 5999451 | — | — |
| | | L | 0.2900 | 1.9/16 | 2.3/4 | 12 | — | — | 5999390 |
| | | M | 0.2950 | 1.9/16 | 2.3/4 | 12 | — | — | 5999395 |
| 19/64 | | | 0.2969 | 1.9/16 | 2.3/4 | 12 | 5999429 | — | — |
| | | N | 0.3020 | 1.5/8 | 2.13/16 | 12 | — | — | 5999398 |
| 5/16 | | | 0.3125 | 1.5/8 | 2.13/16 | 6 | 5999444 | — | — |
| | | O | 0.3160 | 1.11/16 | 2.15/16 | 6 | — | — | 5999402 |
| | | P | 0.3230 | 1.11/16 | 2.15/16 | 6 | — | — | 5999408 |
| 21/64 | | | 0.3281 | 1.11/16 | 2.15/16 | 6 | 5999433 | — | — |
| | | Q | 0.3320 | 1.11/16 | 3" | 6 | — | — | 5998896 |
| | | R | 0.3390 | 1.11/16 | 3" | 6 | — | — | 5998941 |
| 11/32 | | | 0.3437 | 1.11/16 | 3" | 6 | 5999412 | — | — |
| | | S | 0.3480 | 1.3/4 | 3.1/16 | 6 | — | — | 5998965 |

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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|------|---------|
| | | T | 0.3580 | 1.3/4 | 3.1/16 | 6 | — | — | 5998994 |
| 23/64 | | | 0.3594 | 1.3/4 | 3.1/16 | 6 | 5999435 | — | — |
| | | U | 0.3680 | 1.13/16 | 3.1/8 | 6 | — | — | 5999038 |
| 3/8 | | | 0.3750 | 1.13/16 | 3.1/8 | 6 | 5999442 | — | — |
| | | V | 0.3770 | 1.7/8 | 3.1/4 | 6 | — | — | 5999047 |
| | | W | 0.3860 | 1.7/8 | 3.1/4 | 6 | — | — | 5999052 |
| 25/64 | | | 0.3906 | 1.7/8 | 3.1/4 | 6 | 5999437 | — | — |
| | | X | 0.3970 | 1.15/16 | 3.5/16 | 6 | — | — | 5999056 |
| | | Y | 0.4040 | 1.15/16 | 3.5/16 | 6 | — | — | 5999060 |
| 13/32 | | | 0.4063 | 1.15/16 | 3.5/16 | 6 | 5999418 | — | — |
| | | Z | 0.4130 | 2" | 3.3/8 | 6 | — | — | 5998903 |
| 27/64 | | | 0.4219 | 2" | 3.3/8 | 6 | 5999438 | — | — |
| 7/16 | | | 0.4375 | 2.1/16 | 3.7/16 | 6 | 5999448 | — | — |
| 29/64 | | | 0.4531 | 2.1/8 | 3.9/16 | 6 | 5999439 | — | — |
| 15/32 | | | 0.4687 | 2.1/8 | 3.5/8 | 6 | 5999423 | — | — |
| 31/64 | | | 0.4844 | 2.3/16 | 3.11/16 | 6 | 5999443 | — | — |
| 1/2 | | | 0.5000 | 2.1/4 | 3.3/4 | 6 | 5999400 | — | — |

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

4ASM

DIN
1897

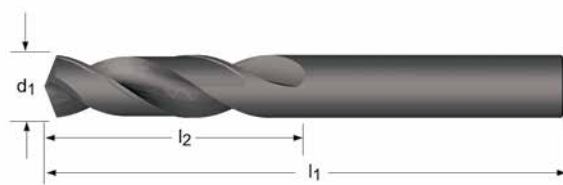
2.5XD

HSS

135°



1.00 - 12.50



| d₁ Ø mm | d₁ decimal Inch | l₂ mm | l₁ mm | Pack Qty | 4ASM |
|---|---|-----------------------------------|-----------------------------------|---------------------------|-----------------------|
| 1.00 | 0.0394 | 6 | 22 | 12 | 6000967 ¹⁾ |
| 1.25 | 0.0492 | 8 | 30 | 12 | 6000969 ¹⁾ |
| 1.30 | 0.0512 | 8 | 30 | 12 | 6000971 ¹⁾ |
| 1.65 | 0.0650 | 11 | 34 | 12 | 6000973 |
| 2.00 | 0.0787 | 12 | 38 | 12 | 6001002 |
| 2.30 | 0.0906 | 13 | 40 | 12 | 6001010 |
| 2.40 | 0.0945 | 14 | 43 | 12 | 6000362 |
| 2.50 | 0.0984 | 14 | 43 | 12 | 6000414 |
| 3.00 | 0.1181 | 16 | 46 | 12 | 6000456 |
| 3.10 | 0.1220 | 18 | 49 | 12 | 6000483 |
| 3.20 | 0.1260 | 18 | 49 | 12 | 6000514 |
| 3.30 | 0.1299 | 18 | 49 | 12 | 6000521 |
| 3.40 | 0.1339 | 20 | 52 | 12 | 6000524 |
| 3.50 | 0.1378 | 20 | 52 | 12 | 6000527 |
| 3.70 | 0.1457 | 20 | 52 | 12 | 6000531 |
| 4.00 | 0.1575 | 22 | 55 | 12 | 6000368 |
| 4.20 | 0.1654 | 22 | 55 | 12 | 6000373 |
| 4.50 | 0.1772 | 24 | 58 | 12 | 6000379 |
| 5.00 | 0.1969 | 26 | 62 | 12 | 6000384 |
| 5.50 | 0.2165 | 28 | 66 | 12 | 6000388 |
| 5.70 | 0.2244 | 28 | 66 | 12 | 6000392 |
| 5.80 | 0.2283 | 28 | 66 | 12 | 6000396 |
| 6.00 | 0.2362 | 28 | 66 | 12 | 6000400 |
| 6.20 | 0.2441 | 31 | 70 | 12 | 6000406 |
| 6.40 | 0.2520 | 31 | 70 | 12 | 6000410 |
| 6.50 | 0.2559 | 31 | 70 | 12 | 6000418 |
| 6.60 | 0.2598 | 31 | 70 | 12 | 6000422 |
| 6.80 | 0.2677 | 34 | 74 | 12 | 6000426 |
| 6.90 | 0.2717 | 34 | 74 | 12 | 6000431 |
| 7.00 | 0.2756 | 34 | 74 | 12 | 6000437 |
| 7.20 | 0.2835 | 34 | 74 | 12 | 6000441 |
| 7.50 | 0.2953 | 37 | 79 | 12 | 6000444 |

¹⁾ Not Split Point

SCREW MACHINE DRILL



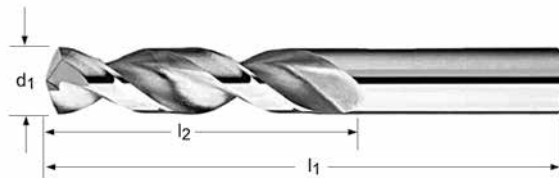
| d_1 Ø mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | 4ASM |
|------------------|--------------------------|-------------|-------------|-------------|---------|
| 8.00 | 0.3150 | 37 | 79 | 6 | 6000447 |
| 8.10 | 0.3189 | 37 | 79 | 6 | 6000450 |
| 8.40 | 0.3307 | 37 | 79 | 6 | 6000453 |
| 8.50 | 0.3346 | 37 | 79 | 6 | 6000460 |
| 8.70 | 0.3425 | 40 | 84 | 6 | 6000462 |
| 9.00 | 0.3543 | 40 | 84 | 6 | 6000464 |
| 9.10 | 0.3583 | 40 | 84 | 6 | 6000466 |
| 9.20 | 0.3622 | 40 | 84 | 6 | 6000468 |
| 9.30 | 0.3661 | 40 | 84 | 6 | 6000470 |
| 9.50 | 0.3740 | 40 | 84 | 6 | 6000472 |
| 9.70 | 0.3819 | 43 | 89 | 6 | 6000474 |
| 10.00 | 0.3937 | 43 | 89 | 6 | 6000975 |
| 10.20 | 0.4016 | 43 | 89 | 6 | 6000977 |
| 10.50 | 0.4134 | 43 | 89 | 6 | 6000981 |
| 10.80 | 0.4252 | 47 | 95 | 6 | 6000982 |
| 11.00 | 0.4331 | 47 | 95 | 6 | 6000984 |
| 11.20 | 0.4409 | 47 | 95 | 6 | 6000986 |
| 11.50 | 0.4528 | 47 | 95 | 6 | 6000988 |
| 11.80 | 0.4646 | 47 | 95 | 6 | 6000990 |
| 12.00 | 0.4724 | 51 | 102 | 6 | 6000993 |
| 12.20 | 0.4803 | 51 | 102 | 6 | 6000995 |
| 12.50 | 0.4921 | 51 | 102 | 6 | 6000997 |

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 easier 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 |
|--------------|------------|
| | |
| | |
| | |
| | |
| | |
| 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 | 5997255 | 5996945 |
| 5/64 | 0.0781 | 11/16 | 1.11/16 | 12 | 5997589 | 5997492 |
| 3/32 | 0.0938 | 3/4 | 1.3/4 | 12 | 5997553 | 5997338 |
| 40 | 0.0980 | 13/16 | 1.13/16 | 12 | 5997238 | 5996924 |
| 39 | 0.0995 | 13/16 | 1.13/16 | 12 | 5997234 | 5996917 |
| 38 | 0.1015 | 13/16 | 1.13/16 | 12 | 5997231 | 5996912 |
| 37 | 0.1040 | 13/16 | 1.13/16 | 12 | 5997228 | 5996909 |
| 36 | 0.1065 | 13/16 | 1.13/16 | 12 | 5997226 | 5996904 |
| 7/64 | 0.1094 | 13/16 | 1.13/16 | 12 | 5997602 | 5997502 |
| 35 | 0.1100 | 7/8 | 1.7/8 | 12 | 5997224 | 5996900 |
| 34 | 0.1110 | 7/8 | 1.7/8 | 12 | 5997220 | 5996896 |
| 33 | 0.1130 | 7/8 | 1.7/8 | 12 | 5997218 | 5996889 |
| 32 | 0.1160 | 7/8 | 1.7/8 | 12 | 5997216 | 5996886 |
| 31 | 0.1200 | 7/8 | 1.7/8 | 12 | 5997214 | 5996882 |
| 1/8 | 0.1250 | 7/8 | 1.7/8 | 12 | 5997265 | 5996954 |
| 30 | 0.1285 | 15/16 | 1.15/16 | 12 | 5997212 | 5996874 |
| 29 | 0.1360 | 15/16 | 1.15/16 | 12 | 5997208 | 5996869 |
| 28 | 0.1405 | 15/16 | 1.15/16 | 12 | 5997206 | 5996865 |
| 9/64 | 0.1406 | 15/16 | 1.15/16 | 12 | 5997618 | 5997349 |
| 27 | 0.1440 | 1" | 2.1/16 | 12 | 5997203 | 5996861 |
| 26 | 0.1470 | 1" | 2.1/16 | 12 | 5997200 | 5996857 |
| 25 | 0.1495 | 1" | 2.1/16 | 12 | 5997194 | 5996853 |
| 24 | 0.1520 | 1" | 2.1/16 | 12 | 5997191 | 5996996 |
| 23 | 0.1540 | 1" | 2.1/16 | 12 | 5997188 | 5996991 |
| 5/32 | 0.1563 | 1" | 2.1/16 | 12 | 5997586 | 5997487 |
| 22 | 0.1570 | 1.1/16 | 2.1/8 | 12 | 5997185 | 5996989 |
| 21 | 0.1590 | 1.1/16 | 2.1/8 | 12 | 5997182 | 5996987 |
| 20 | 0.1610 | 1.1/16 | 2.1/8 | 12 | 5997178 | 5996983 |
| 19 | 0.1660 | 1.1/16 | 2.1/8 | 12 | 5997168 | 5996933 |
| 18 | 0.1695 | 1.1/16 | 2.1/8 | 12 | 5997163 | 5996892 |
| 11/64 | 0.1719 | 1.1/16 | 2.1/8 | 12 | 5997274 | 5996957 |
| 17 | 0.1730 | 1.1/8 | 2.3/16 | 12 | 5997158 | 5996846 |
| 16 | 0.1770 | 1.1/8 | 2.3/16 | 12 | 5997304 | 5997410 |

SCREW MACHINE DRILL



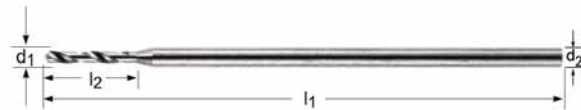
| d ₁ Ø "/Nr. | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | QC41P | QC41G |
|------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|
| 15 | 0.1800 | 1.1/8 | 2.3/16 | 12 | 5997300 | 5997402 |
| 14 | 0.1820 | 1.1/8 | 2.3/16 | 12 | 5997296 | 5997394 |
| 13 | 0.1850 | 1.1/8 | 2.3/16 | 12 | 5997292 | 5997390 |
| 3/16 | 0.1875 | 1.1/8 | 2.3/16 | 12 | 5997550 | 5996985 |
| 12 | 0.1890 | 1.3/16 | 2.1/4 | 12 | 5997282 | 5997386 |
| 11 | 0.1910 | 1.3/16 | 2.1/4 | 12 | 5997247 | 5997382 |
| 10 | 0.1935 | 1.3/16 | 2.1/4 | 12 | 5997222 | 5997378 |
| 9 | 0.1960 | 1.3/16 | 2.1/4 | 12 | 5997252 | 5996942 |
| 8 | 0.1990 | 1.3/16 | 2.1/4 | 12 | 5997249 | 5996939 |
| 7 | 0.2010 | 1.3/16 | 2.1/4 | 12 | 5997245 | 5996936 |
| 13/64 | 0.2031 | 1.3/16 | 2.1/4 | 12 | 5997286 | 5996963 |
| 6 | 0.2040 | 1.1/4 | 2.3/8 | 12 | 5997243 | 5996930 |
| 5 | 0.2055 | 1.1/4 | 2.3/8 | 12 | 5997241 | 5996927 |
| 4 | 0.2090 | 1.1/4 | 2.3/8 | 12 | 5997236 | 5996922 |
| 3 | 0.2130 | 1.1/4 | 2.3/8 | 12 | 5997210 | 5996871 |
| 7/32 | 0.2188 | 1.1/4 | 2.3/8 | 12 | 5997599 | 5997498 |
| 2 | 0.2210 | 1.5/16 | 2.7/16 | 12 | 5997173 | 5996961 |
| 1 | 0.2280 | 1.5/16 | 2.7/16 | 12 | 5997197 | 5997375 |
| 15/64 | 0.2344 | 1.5/16 | 2.7/16 | 12 | 5997570 | 5996967 |
| 1/4 | 0.2500 | 1.3/8 | 2.1/2 | 12 | 5997262 | 5996951 |
| 17/64 | 0.2656 | 1.7/16 | 2.5/8 | 12 | 5997651 | 5996969 |
| 9/32 | 0.2812 | 1.1/2 | 2.11/16 | 12 | 5997615 | 5997345 |
| 19/64 | 0.2969 | 1.9/16 | 2.3/4 | 12 | 5997699 | 5996971 |
| 5/16 | 0.3125 | 1.5/8 | 2.13/16 | 6 | 5997583 | 5997463 |
| 21/64 | 0.3281 | 1.11/16 | 2.15/16 | 6 | 5997705 | 5996973 |
| 11/32 | 0.3437 | 1.11/16 | 3" | 6 | 5997271 | 5996956 |
| 23/64 | 0.3594 | 1.3/4 | 3.1/16 | 6 | 5997707 | 5996975 |
| 3/8 | 0.3750 | 1.13/16 | 3.1/8 | 6 | 5997556 | 5997383 |
| 25/64 | 0.3906 | 1.7/8 | 3.1/4 | 6 | 5997539 | 5996977 |
| 13/32 | 0.4063 | 1.15/16 | 3.5/16 | 6 | 5997278 | 5996959 |
| 27/64 | 0.4219 | 2" | 3.3/8 | 6 | 5997543 | 5996979 |
| 7/16 | 0.4375 | 2.1/16 | 3.7/16 | 6 | 5997595 | 5997495 |
| 29/64 | 0.4531 | 2.1/8 | 3.9/16 | 6 | 5997546 | 5996981 |
| 15/32 | 0.4687 | 2.1/8 | 3.5/8 | 6 | 5997535 | 5996965 |
| 31/64 | 0.4844 | 2.3/16 | 3.3/4 | 6 | 5997559 | 5997431 |
| 1/2 | 0.5000 | 2.1/4 | 3.3/4 | 6 | 5997259 | 5996948 |
| 33/64 | 0.5156 | 2.3/8 | 3.7/8 | 1 | 5997562 | — |
| 17/32 | 0.5313 | 2.3/8 | 3.7/8 | 1 | 5997606 | — |
| 35/64 | 0.5469 | 2.1/2 | 4" | 1 | 5997564 | — |
| 9/16 | 0.5625 | 2.1/2 | 4" | 1 | 5997610 | — |
| 37/64 | 0.5781 | 2.5/8 | 4.1/8 | 1 | 5997567 | — |
| 19/32 | 0.5937 | 2.5/8 | 4.1/8 | 1 | 5997694 | — |
| 5/8 | 0.6250 | 2.3/4 | 4.1/4 | 1 | 5997592 | — |
| 11/16 | 0.6875 | 2.7/8 | 4.5/8 | 1 | 5997268 | — |

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 | 5971007 |
| 0.16 | 0.0063 | 1.4 | 25 | 1 | 10 | 5971119 |
| 0.17 | 0.0067 | 1.4 | 25 | 1 | 10 | 5971157 |
| 0.18 | 0.0070 | 1.4 | 25 | 1 | 10 | 5971205 |
| 0.20 | 0.0078 | 1.8 | 25 | 1 | 10 | 5971249 |
| 0.22 | 0.0087 | 1.8 | 25 | 1 | 10 | 5971292 |
| 0.25 | 0.0098 | 2.2 | 25 | 1 | 10 | 5971298 |
| 0.27 | 0.0106 | 2.2 | 25 | 1 | 10 | 5971301 |
| 0.28 | 0.0110 | 2.2 | 25 | 1 | 10 | 5971303 |
| 0.30 | 0.0118 | 2.2 | 25 | 1 | 10 | 5971306 |
| 0.35 | 0.0138 | 2.8 | 25 | 1 | 10 | 5971122 |
| 0.38 | 0.0150 | 2.8 | 25 | 1 | 10 | 5971125 |
| 0.39 | 0.0154 | 3.6 | 25 | 1 | 10 | 5971128 |
| 0.40 | 0.0157 | 3.6 | 25 | 1 | 10 | 5971131 |
| 0.45 | 0.0177 | 3.6 | 25 | 1 | 10 | 5971135 |
| 0.50 | 0.0197 | 4.0 | 25 | 1 | 10 | 5971139 |
| 0.55 | 0.0217 | 4.5 | 25 | 1 | 10 | 5971143 |
| 0.60 | 0.0236 | 4.5 | 25 | 1 | 10 | 5971148 |
| 0.62 | 0.0244 | 5.0 | 25 | 1 | 10 | 5971150 |
| 0.65 | 0.0256 | 5.0 | 25 | 1 | 10 | 5971154 |
| 0.70 | 0.0276 | 5.6 | 25 | 1 | 10 | 5971160 |
| 0.75 | 0.0295 | 5.6 | 25 | 1 | 10 | 5971163 |
| 0.80 | 0.0315 | 6.3 | 25 | 1.5 | 10 | 5971167 |
| 0.85 | 0.0335 | 6.3 | 25 | 1.5 | 10 | 5971171 |
| 0.90 | 0.0354 | 7.1 | 25 | 1.5 | 10 | 5971176 |
| 0.95 | 0.0374 | 7.1 | 25 | 1.5 | 10 | 5971181 |
| 1.00 | 0.0394 | 8.0 | 25 | 1.5 | 10 | 5971186 |
| 1.05 | 0.0413 | 8.0 | 25 | 1.5 | 10 | 5971191 |
| 1.10 | 0.0433 | 9.0 | 25 | 1.5 | 10 | 5971195 |
| 1.20 | 0.0472 | 10.0 | 25 | 1.5 | 10 | 5971200 |
| 1.30 | 0.0512 | 10.0 | 25 | 1.5 | 10 | 5971210 |
| 1.40 | 0.0551 | 11.2 | 25 | 1.5 | 10 | 5971214 |

Heavy Duty Screw Machine Length

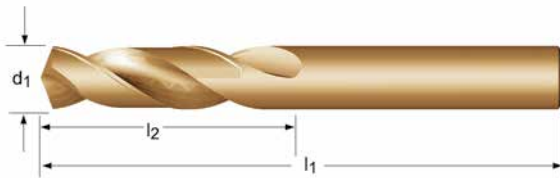
* Sets Available on pg. 239

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 tempered for wear resistance and lubricity.



| 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 | — | 5996169 ¹⁾ | — |
| | 59 | | 0.0410 | 1/2 | 1.3/8 | 12 | — | 5996164 ¹⁾ | — |
| | 58 | | 0.0420 | 1/2 | 1.3/8 | 12 | — | 5996162 ¹⁾ | — |
| | 57 | | 0.0430 | 1/2 | 1.3/8 | 12 | — | 5996158 ¹⁾ | — |
| | 56 | | 0.0465 | 1/2 | 1.3/8 | 12 | — | 5996154 ¹⁾ | — |
| | 55 | | 0.0520 | 5/8 | 1.5/8 | 12 | — | 5996150 ¹⁾ | — |
| | 54 | | 0.0550 | 5/8 | 1.5/8 | 12 | — | 5996146 ¹⁾ | — |
| | 53 | | 0.0595 | 5/8 | 1.5/8 | 12 | — | 5996142 ¹⁾ | — |
| 1/16 | | | 0.0625 | 5/8 | 1.5/8 | 12 | 5996129 | — | — |
| | 52 | | 0.0635 | 11/16 | 1.11/16 | 12 | — | 5996134 | — |
| | 51 | | 0.0670 | 11/16 | 1.11/16 | 12 | — | 5996130 | — |
| | 50 | | 0.0700 | 11/16 | 1.11/16 | 12 | — | 5996126 | — |
| | 49 | | 0.0730 | 11/16 | 1.11/16 | 12 | — | 5996118 | — |
| | 48 | | 0.0760 | 11/16 | 1.11/16 | 12 | — | 5996114 | — |
| 5/64 | | | 0.0781 | 11/16 | 1.11/16 | 12 | 5995991 | — | — |
| | 47 | | 0.0785 | 11/16 | 1.11/16 | 12 | — | 5996109 | — |
| | 46 | | 0.0810 | 3/4 | 1.3/4 | 12 | — | 5996106 | — |
| | 45 | | 0.0820 | 3/4 | 1.3/4 | 12 | — | 5996103 | — |
| | 44 | | 0.0860 | 3/4 | 1.3/4 | 12 | — | 5996101 | — |
| | 43 | | 0.0890 | 3/4 | 1.3/4 | 12 | — | 5996095 | — |
| | 42 | | 0.0935 | 3/4 | 1.3/4 | 12 | — | 5996091 | — |
| 3/32 | | | 0.0938 | 3/4 | 1.3/4 | 12 | 5995958 | — | — |
| | 41 | | 0.0960 | 13/16 | 1.13/16 | 12 | — | 5996089 | — |
| | 40 | | 0.0980 | 13/16 | 1.13/16 | 12 | — | 5996085 | — |
| | 39 | | 0.0995 | 13/16 | 1.13/16 | 12 | — | 5996079 | — |
| | 38 | | 0.1015 | 13/16 | 1.13/16 | 12 | — | 5996076 | — |
| | 37 | | 0.1040 | 13/16 | 1.13/16 | 12 | — | 5996073 | — |
| | 36 | | 0.1065 | 13/16 | 1.13/16 | 12 | — | 5996069 | — |
| 7/64 | | | 0.1094 | 13/16 | 1.13/16 | 12 | 5996005 | — | — |
| | 35 | | 0.1100 | 7/8 | 1.7/8 | 12 | — | 5996065 | — |
| | 34 | | 0.1110 | 7/8 | 1.7/8 | 12 | — | 5996057 | — |
| | 33 | | 0.1130 | 7/8 | 1.7/8 | 12 | — | 5996052 | — |

¹⁾Not Split Point

| 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 | — | 5996049 | — |
| | 31 | | 0.1200 | 7/8 | 1.7/8 | 12 | — | 5996045 | — |
| 1/8 | | | 0.1250 | 7/8 | 1.7/8 | 12 | 5996145 | — | — |
| | 30 | | 0.1285 | 15/16 | 1.15/16 | 12 | — | 5996041 | — |
| | 29 | | 0.1360 | 15/16 | 1.15/16 | 12 | — | 5996031 | — |
| | 28 | | 0.1405 | 15/16 | 1.15/16 | 12 | — | 5996027 | — |
| 9/64 | | | 0.1406 | 15/16 | 1.15/16 | 12 | 5996019 | — | — |
| | 27 | | 0.1440 | 1" | 2.1/16 | 12 | — | 5996021 | — |
| | 26 | | 0.1470 | 1" | 2.1/16 | 12 | — | 5996017 | — |
| | 25 | | 0.1495 | 1" | 2.1/16 | 12 | — | 5996188 | — |
| | 24 | | 0.1520 | 1" | 2.1/16 | 12 | — | 5996185 | — |
| | 23 | | 0.1540 | 1" | 2.1/16 | 12 | — | 5996183 | — |
| 5/32 | | | 0.1563 | 1" | 2.1/16 | 12 | 5995987 | — | — |
| | 22 | | 0.1570 | 1.1/16 | 2.1/8 | 12 | — | 5996181 | — |
| | 21 | | 0.1590 | 1.1/16 | 2.1/8 | 12 | — | 5996175 | — |
| | 20 | | 0.1610 | 1.1/16 | 2.1/8 | 12 | — | 5996138 | — |
| | 19 | | 0.1660 | 1.1/16 | 2.1/8 | 12 | — | 5996061 | — |
| | 18 | | 0.1695 | 1.1/16 | 2.1/8 | 12 | — | 5996012 | — |
| 11/64 | | | 0.1719 | 1.1/16 | 2.1/8 | 12 | 5995976 | — | — |
| | 17 | | 0.1730 | 1.1/8 | 2.3/16 | 12 | — | 5996058 | — |
| | 16 | | 0.1770 | 1.1/8 | 2.3/16 | 12 | — | 5996050 | — |
| | 15 | | 0.1800 | 1.1/8 | 2.3/16 | 12 | — | 5996046 | — |
| | 14 | | 0.1820 | 1.1/8 | 2.3/16 | 12 | — | 5996042 | — |
| | 13 | | 0.1850 | 1.1/8 | 2.3/16 | 12 | — | 5996038 | — |
| 3/16 | | | 0.1875 | 1.1/8 | 2.3/16 | 12 | 5995954 | — | — |
| | 12 | | 0.1890 | 1.3/16 | 2.1/4 | 12 | — | 5996034 | — |
| | 11 | | 0.1910 | 1.3/16 | 2.1/4 | 12 | — | 5996030 | — |
| | 10 | | 0.1935 | 1.3/16 | 2.1/4 | 12 | — | 5996026 | — |
| | 9 | | 0.1960 | 1.3/16 | 2.1/4 | 12 | — | 5996489 | — |
| | 8 | | 0.1990 | 1.3/16 | 2.1/4 | 12 | — | 5996178 | — |
| | 7 | | 0.2010 | 1.3/16 | 2.1/4 | 12 | — | 5996172 | — |
| 13/64 | | | 0.2031 | 1.3/16 | 2.1/4 | 12 | 5996054 | — | — |
| | 6 | | 0.2040 | 1.1/4 | 2.3/8 | 12 | — | 5996166 | — |
| | 5 | | 0.2055 | 1.1/4 | 2.3/8 | 12 | — | 5996122 | — |
| | 4 | | 0.2090 | 1.1/4 | 2.3/8 | 12 | — | 5996081 | — |
| | 3 | | 0.2130 | 1.1/4 | 2.3/8 | 12 | — | 5996035 | — |
| 7/32 | | | 0.2188 | 1.1/4 | 2.3/8 | 12 | 5996002 | — | — |
| | 2 | | 0.2210 | 1.5/16 | 2.7/16 | 12 | — | 5996098 | — |
| | 1 | | 0.2280 | 1.5/16 | 2.7/16 | 12 | — | 5996023 | — |
| | | A | 0.2340 | 1.5/16 | 2.7/16 | 12 | — | — | 5996525 |
| 15/64 | | | 0.2344 | 1.5/16 | 2.7/16 | 12 | 5996068 | — | — |
| | | B | 0.2380 | 1.3/8 | 2.1/2 | 12 | — | — | 5996569 |
| | | C | 0.2420 | 1.3/8 | 2.1/2 | 12 | — | — | 5996603 |
| | | D | 0.2460 | 1.3/8 | 2.1/2 | 12 | — | — | 5996646 |
| 1/4 | | | 0.2500 | 1.3/8 | 2.1/2 | 12 | 5996137 | — | — |
| | | F | 0.2570 | 1.7/16 | 2.5/8 | 12 | — | — | 5996657 |
| | | G | 0.2610 | 1.7/16 | 2.5/8 | 12 | — | — | 5996661 |
| 17/64 | | | 0.2656 | 1.7/16 | 2.5/8 | 12 | 5996075 | — | — |
| | | H | 0.2660 | 1.1/2 | 2.11/16 | 12 | — | — | 5996664 |
| | | I | 0.2720 | 1.1/2 | 2.11/16 | 12 | — | — | 5996493 |
| | | J | 0.2770 | 1.1/2 | 2.11/16 | 12 | — | — | 5996497 |
| | | K | 0.2810 | 1.1/2 | 2.11/16 | 12 | — | — | 5996500 |
| 9/32 | | | 0.2813 | 1.1/2 | 2.11/16 | 12 | 5996015 | — | — |
| | | L | 0.2900 | 1.9/16 | 2.3/4 | 12 | — | — | 5996503 |
| | | M | 0.2950 | 1.9/16 | 2.3/4 | 12 | — | — | 5996506 |
| 19/64 | | | 0.2969 | 1.9/16 | 2.3/4 | 12 | 5995938 | — | — |
| | | N | 0.3020 | 1.5/8 | 2.13/16 | 12 | — | — | 5996509 |
| 5/16 | | | 0.3125 | 1.5/8 | 2.13/16 | 6 | 5995983 | — | — |
| | | O | 0.3160 | 1.11/16 | 2.15/16 | 6 | — | — | 5996512 |
| | | P | 0.3230 | 1.11/16 | 2.15/16 | 6 | — | — | 5996515 |
| 21/64 | | | 0.3281 | 1.11/16 | 2.15/16 | 6 | 5995942 | — | — |
| | | Q | 0.3320 | 1.11/16 | 3" | 6 | — | — | 5996518 |
| | | R | 0.3390 | 1.11/16 | 3" | 6 | — | — | 5996521 |
| 11/32 | | | 0.3437 | 1.11/16 | 3" | 6 | 5995956 | — | — |
| | | S | 0.3480 | 1.3/4 | 3.1/16 | 6 | — | — | 5996529 |
| | | T | 0.3580 | 1.3/4 | 3.1/16 | 6 | — | — | 5996532 |

COBALT SCREW MACHINE DRILL

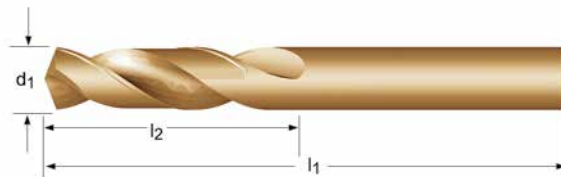


| d ₁ Ø Inch | d ₁ Ø Nr. | d ₁ Ø letter | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | M40CO | M41CO | M42CO |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|-------|---------|
| 23/64 | | | 0.3594 | 1.3/4 | 3.1/16 | 6 | 5995946 | — | — |
| | | U | 0.3680 | 1.13/16 | 3.1/8 | 6 | — | — | 5996536 |
| 3/8 | | | 0.3750 | 1.13/16 | 3.1/8 | 6 | 5995962 | — | — |
| | | V | 0.3770 | 1.7/8 | 3.1/4 | 6 | — | — | 5996540 |
| | | W | 0.3860 | 1.7/8 | 3.1/4 | 6 | — | — | 5996544 |
| 25/64 | | | 0.3906 | 1.7/8 | 3.1/4 | 6 | 5995948 | — | — |
| | | X | 0.3970 | 1.15/16 | 3.5/16 | 6 | — | — | 5996548 |
| | | Y | 0.4040 | 1.15/16 | 3.5/16 | 6 | — | — | 5996553 |
| 13/32 | | | 0.4063 | 1.15/16 | 3.5/16 | 6 | 5996011 | — | — |
| | | Z | 0.4130 | 2" | 3.3/8 | 6 | — | — | 5996557 |
| 27/64 | | | 0.4219 | 2" | 3.3/8 | 6 | 5995950 | — | — |
| 7/16 | | | 0.4375 | 2.1/16 | 3.7/16 | 6 | 5995998 | — | — |
| 29/64 | | | 0.4531 | 2.1/8 | 3.9/16 | 6 | 5995952 | — | — |
| 15/32 | | | 0.4687 | 2.1/8 | 3.5/8 | 6 | 5996063 | — | — |
| 31/64 | | | 0.4844 | 2.3/16 | 3.11/16 | 6 | 5995964 | — | — |
| 1/2 | | | 0.5000 | 2.1/4 | 3.3/4 | 6 | 5996133 | — | — |
| 33/64 | | | 0.5156 | 2.3/8 | 3.7/8 | 1 | 5995966 | — | — |
| 17/32 | | | 0.5313 | 2.3/8 | 3.7/8 | 1 | 5996071 | — | — |
| 35/64 | | | 0.5469 | 2.1/2 | 4" | 1 | 5995968 | — | — |
| 9/16 | | | 0.5625 | 2.1/2 | 4" | 1 | 5996008 | — | — |
| 37/64 | | | 0.5781 | 2.5/8 | 4.1/8 | 1 | 5995969 | — | — |
| 19/32 | | | 0.5937 | 2.5/8 | 4.1/8 | 1 | 5995936 | — | — |
| 39/64 | | | 0.6094 | 2.3/4 | 4.1/4 | 1 | 5995970 | — | — |
| 5/8 | | | 0.6250 | 2.3/4 | 4.1/4 | 1 | 5995994 | — | — |
| 41/64 | | | 0.6406 | 2.7/8 | 4.1/2 | 1 | 5995972 | — | — |
| 21/32 | | | 0.6563 | 2.7/8 | 4.1/2 | 1 | 5995940 | — | — |
| 43/64 | | | 0.6719 | 2.7/8 | 4.5/8 | 1 | 5995974 | — | — |
| 11/16 | | | 0.6875 | 2.7/8 | 4.5/8 | 1 | 5995934 | — | — |
| 45/64 | | | 0.7031 | 3" | 4.3/4 | 1 | 5995978 | — | — |
| 23/32 | | | 0.7188 | 3" | 4.3/4 | 1 | 5995944 | — | — |
| 47/64 | | | 0.7344 | 3.1/8 | 5" | 1 | 5995981 | — | — |
| 3/4 | | | 0.7500 | 3.1/8 | 5" | 1 | 5995960 | — | — |

Heavy Duty Screw Machine Length, Metric

4ASMCO

Low thrust design self centering Split Point for easier penetration.
Cobalt base material with Bronze tempered 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 | 6001006 |
| 2.50 | 0.0984 | 14 | 43 | 12 | 6001014 |
| 3.00 | 0.1181 | 16 | 46 | 12 | 6001019 |
| 3.10 | 0.1220 | 18 | 49 | 12 | 6001024 |
| 3.20 | 0.1260 | 18 | 49 | 12 | 6001030 |
| 3.30 | 0.1299 | 18 | 49 | 12 | 6000870 |
| 3.40 | 0.1339 | 20 | 52 | 12 | 6000875 |
| 3.50 | 0.1378 | 20 | 52 | 12 | 6000884 |
| 3.60 | 0.1417 | 20 | 52 | 12 | 6000888 |
| 3.70 | 0.1457 | 20 | 52 | 12 | 6000893 |
| 4.00 | 0.1575 | 22 | 55 | 12 | 6000899 |
| 4.10 | 0.1614 | 22 | 55 | 12 | 6000904 |
| 4.20 | 0.1654 | 22 | 55 | 12 | 6000909 |
| 4.70 | 0.1850 | 24 | 58 | 12 | 6000914 |
| 4.80 | 0.1890 | 26 | 62 | 12 | 6000920 |
| 4.90 | 0.1929 | 26 | 62 | 12 | 6000930 |
| 5.00 | 0.1969 | 26 | 62 | 12 | 6000935 |
| 5.10 | 0.2008 | 26 | 62 | 12 | 6000940 |
| 5.50 | 0.2165 | 28 | 66 | 12 | 6000944 |
| 5.70 | 0.2244 | 28 | 66 | 12 | 6000946 |
| 6.00 | 0.2362 | 28 | 66 | 12 | 6000947 |
| 6.40 | 0.2520 | 31 | 70 | 12 | 6000950 |
| 6.50 | 0.2559 | 31 | 70 | 12 | 6000953 |
| 6.80 | 0.2677 | 34 | 74 | 12 | 6000955 |
| 7.00 | 0.2756 | 34 | 74 | 12 | 6000957 |
| 8.00 | 0.3150 | 37 | 79 | 6 | 6000960 |
| 8.50 | 0.3346 | 37 | 79 | 6 | 6000962 |
| 9.50 | 0.3740 | 40 | 84 | 6 | 6000964 |
| 9.80 | 0.3858 | 43 | 89 | 6 | 6000966 |
| 10.00 | 0.3937 | 43 | 89 | 6 | 6001166 |
| 10.20 | 0.4016 | 43 | 89 | 6 | 6001170 |
| 10.50 | 0.4134 | 43 | 89 | 6 | 6001182 |
| 11.00 | 0.4331 | 47 | 95 | 6 | 6000863 |
| 11.20 | 0.4409 | 47 | 95 | 6 | 6000925 |
| 11.50 | 0.4528 | 47 | 95 | 6 | 6000959 |
| 12.00 | 0.4724 | 51 | 102 | 6 | 6000979 |

TAPER LENGTH DRILL



General Purpose Taper Length

* Sets Available on pg. 240

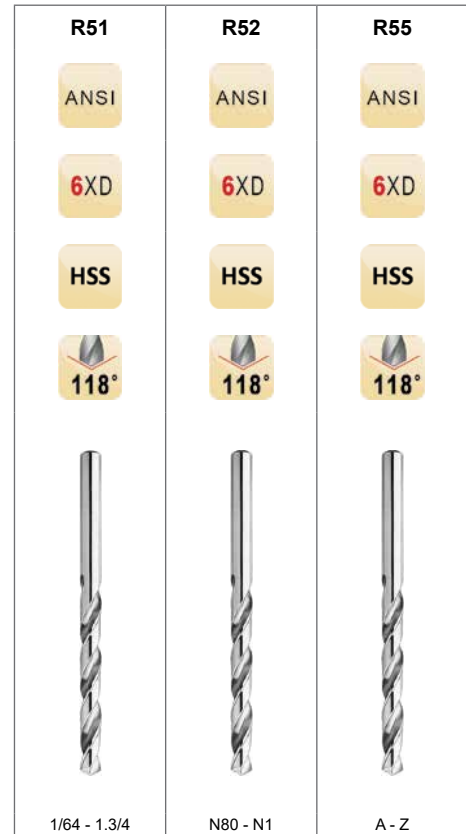
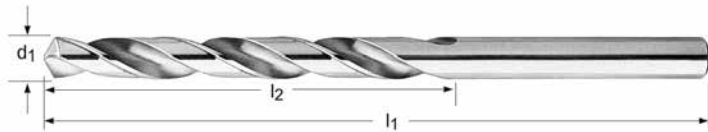
R51 - Fractional Sizes

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 tempered



| 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 | — | 5999626 | — |
| | 79 | | 0.0145 | 5/16 | 1.1/2 | 12 | — | 5999617 | — |
| 1/64 | | | 0.0156 | 5/16 | 1.1/2 | 12 | 5999668 | — | — |
| | 78 | | 0.0160 | 5/16 | 1.1/2 | 12 | — | 5999613 | — |
| | 77 | | 0.0180 | 5/16 | 1.1/2 | 12 | — | 5999607 | — |
| | 76 | | 0.0200 | 5/16 | 1.1/2 | 12 | — | 5999567 | — |
| | 75 | | 0.0210 | 5/16 | 1.1/2 | 12 | — | 5999541 | — |
| | 74 | | 0.0225 | 5/16 | 1.1/2 | 12 | — | 5999519 | — |
| | 73 | | 0.0240 | 5/16 | 1.1/2 | 12 | — | 5999496 | — |
| | 72 | | 0.0250 | 5/16 | 1.1/2 | 12 | — | 6000270 | — |
| | 71 | | 0.0260 | 3/4 | 2" | 12 | — | 6000264 | — |
| | 70 | | 0.0280 | 3/4 | 2" | 12 | — | 6000262 | — |
| | 69 | | 0.0292 | 3/4 | 2" | 12 | — | 6000257 | — |
| | 68 | | 0.0310 | 3/4 | 2" | 12 | — | 6000254 | — |
| 1/32 | | | 0.0313 | 3/4 | 2" | 12 | 5999661 | — | — |
| | 67 | | 0.0320 | 3/4 | 2" | 12 | — | 6000250 | — |
| | 66 | | 0.0330 | 3/4 | 2" | 12 | — | 6000248 | — |
| | 65 | | 0.0350 | 3/4 | 2" | 12 | — | 6000245 | — |
| | 64 | | 0.0360 | 3/4 | 2" | 12 | — | 6000242 | — |
| | 63 | | 0.0370 | 3/4 | 2" | 12 | — | 6000239 | — |
| | 62 | | 0.0380 | 3/4 | 2" | 12 | — | 6000232 | — |
| | 61 | | 0.0390 | 1.1/8 | 2.1/4 | 12 | — | 6000229 | — |
| | 60 | | 0.0400 | 1.1/8 | 2.1/4 | 12 | — | 6000226 | — |
| | 59 | | 0.0410 | 1.1/8 | 2.1/4 | 12 | — | 6000221 | — |
| | 58 | | 0.0420 | 1.1/8 | 2.1/4 | 12 | — | 6000218 | — |
| | 57 | | 0.0430 | 1.1/8 | 2.1/4 | 12 | — | 6000215 | — |
| | 56 | | 0.0465 | 1.1/8 | 2.1/4 | 12 | — | 6000212 | — |
| 3/64 | | | 0.0469 | 1.1/8 | 2.1/4 | 12 | 5999764 | — | — |
| | 55 | | 0.0520 | 1.3/4 | 3" | 12 | — | 6000209 | — |
| | 54 | | 0.0550 | 1.3/4 | 3" | 12 | — | 6000206 | — |
| | 53 | | 0.0595 | 1.3/4 | 3" | 12 | — | 6000200 | — |
| 1/16 | | | 0.0625 | 1.3/4 | 3" | 12 | 5999654 | — | — |

| 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 | — | 6000197 | — |
| | 51 | | 0.0670 | 2" | 3.3/4 | 12 | — | 6000194 | — |
| | 50 | | 0.0700 | 2" | 3.3/4 | 12 | — | 6000191 | — |
| | 49 | | 0.0730 | 2" | 3.3/4 | 12 | — | 6000183 | — |
| | 48 | | 0.0760 | 2" | 3.3/4 | 12 | — | 6000179 | — |
| 5/64 | | | 0.0781 | 2" | 3.3/4 | 12 | 6000231 | — | — |
| | 47 | | 0.0785 | 2.1/4 | 4.1/4 | 12 | — | 6000177 | — |
| | 46 | | 0.0810 | 2.1/4 | 4.1/4 | 12 | — | 6000173 | — |
| | 45 | | 0.0820 | 2.1/4 | 4.1/4 | 12 | — | 6000170 | — |
| | 44 | | 0.0860 | 2.1/4 | 4.1/4 | 12 | — | 6000164 | — |
| | 43 | | 0.0890 | 2.1/4 | 4.1/4 | 12 | — | 6000160 | — |
| | 42 | | 0.0935 | 2.1/4 | 4.1/4 | 12 | — | 6000157 | — |
| 3/32 | | | 0.0938 | 2.1/4 | 4.1/4 | 12 | 5999759 | — | — |
| | 41 | | 0.0960 | 2.1/2 | 4.5/8 | 12 | — | 6000153 | — |
| | 40 | | 0.0980 | 2.1/2 | 4.5/8 | 12 | — | 6000149 | — |
| | 39 | | 0.0995 | 2.1/2 | 4.5/8 | 12 | — | 6000141 | — |
| | 38 | | 0.1015 | 2.1/2 | 4.5/8 | 12 | — | 6000136 | — |
| | 37 | | 0.1040 | 2.1/2 | 4.5/8 | 12 | — | 6000132 | — |
| | 36 | | 0.1065 | 2.1/2 | 4.5/8 | 12 | — | 6000128 | — |
| 7/64 | | | 0.1094 | 2.1/2 | 4.5/8 | 12 | 6000266 | — | — |
| | 35 | | 0.1100 | 2.3/4 | 5.1/8 | 12 | — | 6000283 | — |
| | 34 | | 0.1110 | 2.3/4 | 5.1/8 | 12 | — | 6000280 | — |
| | 33 | | 0.1130 | 2.3/4 | 5.1/8 | 12 | — | 6000277 | — |
| | 32 | | 0.1160 | 2.3/4 | 5.1/8 | 12 | — | 6000273 | — |
| | 31 | | 0.1200 | 2.3/4 | 5.1/8 | 12 | — | 6000267 | — |
| 1/8 | | | 0.1250 | 2.3/4 | 5.1/8 | 12 | 5999672 | — | — |
| | 30 | | 0.1285 | 3" | 5.3/8 | 12 | — | 6000235 | — |
| | 29 | | 0.1360 | 3" | 5.3/8 | 12 | — | 6000168 | — |
| | 28 | | 0.1405 | 3" | 5.3/8 | 12 | — | 6000121 | — |
| 9/64 | | | 0.1406 | 3" | 5.3/8 | 12 | 6000279 | — | — |
| | 27 | | 0.1440 | 3" | 5.3/8 | 12 | — | 5999750 | — |
| | 26 | | 0.1470 | 3" | 5.3/8 | 12 | — | 5999743 | — |
| | 25 | | 0.1495 | 3" | 5.3/8 | 12 | — | 5999741 | — |
| | 24 | | 0.1520 | 3" | 5.3/8 | 12 | — | 5999737 | — |
| | 23 | | 0.1540 | 3" | 5.3/8 | 12 | — | 5999734 | — |
| 5/32 | | | 0.1563 | 3" | 5.3/8 | 12 | 6000228 | — | — |
| | 22 | | 0.1570 | 3.3/8 | 5.3/4 | 12 | — | 5999730 | — |
| | 21 | | 0.1590 | 3.3/8 | 5.3/4 | 12 | — | 5999726 | — |
| | 20 | | 0.1610 | 3.3/8 | 5.3/4 | 12 | — | 5999723 | — |
| | 19 | | 0.1660 | 3.3/8 | 5.3/4 | 12 | — | 5999716 | — |
| | 18 | | 0.1695 | 3.3/8 | 5.3/4 | 12 | — | 5999712 | — |
| 11/64 | | | 0.1719 | 3.3/8 | 5.3/4 | 12 | 5999688 | — | — |
| | 17 | | 0.1730 | 3.3/8 | 5.3/4 | 12 | — | 5999706 | — |
| | 16 | | 0.1770 | 3.3/8 | 5.3/4 | 12 | — | 5999703 | — |
| | 15 | | 0.1800 | 3.3/8 | 5.3/4 | 12 | — | 5999701 | — |
| | 14 | | 0.1820 | 3.3/8 | 5.3/4 | 12 | — | 5999697 | — |
| | 13 | | 0.1850 | 3.3/8 | 5.3/4 | 12 | — | 5999693 | — |
| 3/16 | | | 0.1875 | 3.3/8 | 5.3/4 | 12 | 5999757 | — | — |
| | 12 | | 0.1890 | 3.5/8 | 6" | 12 | — | 5999691 | — |
| | 11 | | 0.1910 | 3.5/8 | 6" | 12 | — | 5999687 | — |
| | 10 | | 0.1935 | 3.5/8 | 6" | 12 | — | 5999683 | — |
| | 9 | | 0.1960 | 3.5/8 | 6" | 12 | — | 5999499 | — |
| | 8 | | 0.1990 | 3.5/8 | 6" | 12 | — | 5999622 | — |
| | 7 | | 0.2010 | 3.5/8 | 6" | 12 | — | 6000259 | — |
| 13/64 | | | 0.2031 | 3.5/8 | 6" | 12 | 5999698 | — | — |
| | 6 | | 0.2040 | 3.5/8 | 6" | 12 | — | 6000223 | — |
| | 5 | | 0.2055 | 3.5/8 | 6" | 12 | — | 6000187 | — |
| | 4 | | 0.2090 | 3.5/8 | 6" | 12 | — | 6000145 | — |
| | 3 | | 0.2130 | 3.5/8 | 6" | 12 | — | 6000203 | — |
| 7/32 | | | 0.2188 | 3.5/8 | 6" | 12 | 6000263 | — | — |
| | 2 | | 0.2210 | 3.3/4 | 6.1/8 | 12 | — | 5999719 | — |
| | 1 | | 0.2280 | 3.3/4 | 6.1/8 | 12 | — | 5999679 | — |
| | | A | 0.2340 | 3.3/4 | 6.1/8 | 12 | — | — | 5999547 |
| 15/64 | | | 0.2344 | 3.3/4 | 6.1/8 | 12 | 5999704 | — | — |
| | | B | 0.2380 | 3.3/4 | 6.1/8 | 12 | — | — | 5999549 |
| | | C | 0.2420 | 3.3/4 | 6.1/8 | 12 | — | — | 5999551 |

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 | — | — | 5999553 |
| 1/4 | | E | 0.2500 | 3.3/4 | 6.1/8 | 12 | 5999664 | — | — |
| | | F | 0.2570 | 3.7/8 | 6.1/4 | 12 | — | — | 5999558 |
| | | G | 0.2610 | 3.7/8 | 6.1/4 | 6 | — | — | 6000451 |
| 17/64 | | | 0.2656 | 3.7/8 | 6.1/4 | 6 | 5999713 | — | — |
| | | H | 0.2660 | 3.7/8 | 6.1/4 | 6 | — | — | 6000454 |
| | | I | 0.2720 | 3.7/8 | 6.1/4 | 6 | — | — | 6000457 |
| | | J | 0.2770 | 3.7/8 | 6.1/4 | 6 | — | — | 6000459 |
| | | K | 0.2810 | 3.7/8 | 6.1/4 | 6 | — | — | 6000298 |
| 9/32 | | | 0.2813 | 3.7/8 | 6.1/4 | 6 | 6000276 | — | — |
| | | L | 0.2900 | 4" | 6.3/8 | 6 | — | — | 6000301 |
| | | M | 0.2950 | 4" | 6.3/8 | 6 | — | — | 6000304 |
| 19/64 | | | 0.2969 | 4" | 6.3/8 | 6 | 5999718 | — | — |
| | | N | 0.3020 | 4" | 6.3/8 | 6 | — | — | 6000307 |
| 5/16 | | | 0.3125 | 4" | 6.3/8 | 6 | 6000381 | — | — |
| | | O | 0.3161 | 4.1/8 | 6.1/2 | 6 | — | — | 6000310 |
| | | P | 0.3230 | 4.1/8 | 6.1/2 | 6 | — | — | 6000313 |
| 21/64 | | | 0.3281 | 4.1/8 | 6.1/2 | 6 | 5999725 | — | — |
| | | Q | 0.3320 | 4.1/8 | 6.1/2 | 6 | — | — | 6000316 |
| | | R | 0.3390 | 4.1/8 | 6.1/2 | 6 | — | — | 6000319 |
| 11/32 | | | 0.3437 | 4.1/8 | 6.1/2 | 6 | 5999684 | — | — |
| | | S | 0.3480 | 4.1/4 | 6.3/4 | 6 | — | — | 6000322 |
| | | T | 0.3580 | 4.1/4 | 6.3/4 | 6 | — | — | 6000325 |
| 23/64 | | | 0.3594 | 4.1/4 | 6.3/4 | 6 | 5999733 | — | — |
| | | U | 0.3680 | 4.1/4 | 6.3/4 | 6 | — | — | 6000331 |
| 3/8 | | | 0.3750 | 4.1/4 | 6.3/4 | 6 | 5999766 | — | — |
| | | V | 0.3770 | 4.3/8 | 7" | 6 | — | — | 6000333 |
| | | W | 0.3860 | 4.3/8 | 7" | 6 | — | — | 6000336 |
| 25/64 | | | 0.3906 | 4.3/8 | 7" | 6 | 5999739 | — | — |
| | | X | 0.3970 | 4.3/8 | 7" | 6 | — | — | 6000338 |
| | | Y | 0.4040 | 4.3/8 | 7" | 6 | — | — | 6000341 |
| 13/32 | | | 0.4063 | 4.3/8 | 7" | 6 | 5999695 | — | — |
| | | Z | 0.4130 | 4.5/8 | 7.1/4 | 6 | — | — | 6000344 |
| 27/64 | | | 0.4219 | 4.5/8 | 7.1/4 | 6 | 5999748 | — | — |
| 7/16 | | | 0.4375 | 4.5/8 | 7.1/4 | 6 | 6000261 | — | — |
| 29/64 | | | 0.4531 | 4.3/4 | 7.1/2 | 6 | 5999754 | — | — |
| 15/32 | | | 0.4687 | 4.3/4 | 7.1/2 | 6 | 5999702 | — | — |
| 31/64 | | | 0.4844 | 4.3/4 | 7.3/4 | 6 | 5999770 | — | — |
| 1/2 | | | 0.5000 | 4.3/4 | 7.3/4 | 6 | 5999657 | — | — |
| 33/64 | | | 0.5156 | 4.3/4 | 8" | 1 | 5999776 | — | — |
| 17/32 | | | 0.5313 | 4.3/4 | 8" | 1 | 5999707 | — | — |
| 35/64 | | | 0.5469 | 4.7/8 | 8.1/4 | 1 | 6000225 | — | — |
| 9/16 | | | 0.5625 | 4.7/8 | 8.1/4 | 1 | 6000272 | — | — |
| 37/64 | | | 0.5781 | 4.7/8 | 8.3/4 | 1 | 6000258 | — | — |
| 19/32 | | | 0.5937 | 4.7/8 | 8.3/4 | 1 | 5999715 | — | — |
| 39/64 | | | 0.6094 | 4.7/8 | 8.3/4 | 1 | 6000289 | — | — |
| 5/8 | | | 0.6250 | 4.7/8 | 8.3/4 | 1 | 6000234 | — | — |
| 41/64 | | | 0.6406 | 5.1/8 | 9" | 1 | 6000321 | — | — |
| 21/32 | | | 0.6563 | 5.1/8 | 9" | 1 | 5999722 | — | — |
| 43/64 | | | 0.6719 | 5.3/8 | 9.1/4 | 1 | 6000358 | — | — |
| 11/16 | | | 0.6875 | 5.3/8 | 9.1/4 | 1 | 5999680 | — | — |
| 45/64 | | | 0.7031 | 5.5/8 | 9.1/2 | 1 | 6000366 | ¹⁾ — | — |
| 23/32 | | | 0.7188 | 5.5/8 | 9.1/2 | 1 | 5999729 | ¹⁾ — | — |
| 47/64 | | | 0.7344 | 5.7/8 | 9.3/4 | 1 | 6000371 | ¹⁾ — | — |
| 3/4 | | | 0.7500 | 5.7/8 | 9.3/4 | 1 | 5999761 | ¹⁾ — | — |
| 49/64 | | | 0.7656 | 6" | 9.7/8 | 1 | 6000376 | ¹⁾ — | — |
| 25/32 | | | 0.7813 | 6" | 9.7/8 | 1 | 5999736 | ¹⁾ — | — |
| 51/64 | | | 0.7969 | 6.1/8 | 10" | 1 | 6000237 | ¹⁾ — | — |
| 13/16 | | | 0.8125 | 6.1/8 | 10" | 1 | 5999692 | ¹⁾ — | — |
| 53/64 | | | 0.8281 | 6.1/8 | 10" | 1 | 6000240 | ¹⁾ — | — |
| 27/32 | | | 0.8438 | 6.1/8 | 10" | 1 | 5999742 | ¹⁾ — | — |
| 55/64 | | | 0.8594 | 6.1/8 | 10" | 1 | 6000243 | ¹⁾ — | — |
| 7/8 | | | 0.8750 | 6.1/8 | 10" | 1 | 6000269 | ¹⁾ — | — |
| 57/64 | | | 0.8906 | 6.1/8 | 10" | 1 | 6000246 | ¹⁾ — | — |
| 29/32 | | | 0.9063 | 6.1/8 | 10" | 1 | 5999751 | ¹⁾ — | — |

¹⁾ steam tempered

| 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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|-----------------------|-----|-----|
| 59/64 | | | 0.9219 | 6.1/8 | 10.3/4 | 1 | 6000251 ¹⁾ | — | — |
| 15/16 | | | 0.9375 | 6.1/8 | 10.3/4 | 1 | 5999700 ¹⁾ | — | — |
| 61/64 | | | 0.9531 | 6.3/8 | 11" | 1 | 6000253 ¹⁾ | — | — |
| 31/32 | | | 0.9688 | 6.3/8 | 11" | 1 | 5999768 ¹⁾ | — | — |
| 63/64 | | | 0.9844 | 6.3/8 | 11" | 1 | 6000255 ¹⁾ | — | — |
| 1" | | | 1.0000 | 6.3/8 | 11" | 1 | 5998971 ¹⁾ | — | — |
| 1.1/64 | | | 1.0156 | 6.1/2 | 11.1/8 | 1 | 5998984 ¹⁾ | — | — |
| 1.1/32 | | | 1.0312 | 6.1/2 | 11.1/8 | 1 | 5998978 ¹⁾ | — | — |
| 1.3/64 | | | 1.0469 | 6.5/8 | 11.1/4 | 1 | 5999710 ¹⁾ | — | — |
| 1.1/16 | | | 1.0625 | 6.5/8 | 11.1/4 | 1 | 5998973 ¹⁾ | — | — |
| 1.5/64 | | | 1.0781 | 6.7/8 | 11.1/2 | 1 | 5999781 ¹⁾ | — | — |
| 1.3/32 | | | 1.0937 | 6.7/8 | 11.1/2 | 1 | 5999633 ¹⁾ | — | — |
| 1.7/64 | | | 1.1094 | 7.1/8 | 11.3/4 | 1 | 5999641 ¹⁾ | — | — |
| 1.1/8 | | | 1.1250 | 7.1/8 | 11.3/4 | 1 | 5998987 ¹⁾ | — | — |
| 1.9/64 | | | 1.1406 | 7.1/4 | 11.7/8 | 1 | 5999649 ¹⁾ | — | — |
| 1.5/32 | | | 1.1563 | 7.1/4 | 11.7/8 | 1 | 5999778 ¹⁾ | — | — |
| 1.11/64 | | | 1.1719 | 7.3/8 | 12" | 1 | 5998990 ¹⁾ | — | — |
| 1.3/16 | | | 1.1875 | 7.3/8 | 12" | 1 | 5999004 ¹⁾ | — | — |
| 1.13/64 | | | 1.2031 | 7.1/2 | 12.1/8 | 1 | 5998993 ¹⁾ | — | — |
| 1.7/32 | | | 1.2187 | 7.1/2 | 12.1/8 | 1 | 5999637 ¹⁾ | — | — |
| 1.15/64 | | | 1.2344 | 7.7/8 | 12.1/2 | 1 | 5998997 ¹⁾ | — | — |
| 1.1/4 | | | 1.2500 | 7.7/8 | 12.1/2 | 1 | 5998981 ¹⁾ | — | — |
| 1.5/16 | | | 1.3125 | 8.5/8 | 14.1/4 | 1 | 5999773 ¹⁾ | — | — |
| 1.3/8 | | | 1.3750 | 8.7/8 | 14.1/2 | 1 | 5999745 ¹⁾ | — | — |
| 1.7/16 | | | 1.4375 | 9.1/8 | 14.3/4 | 1 | 5999787 ¹⁾ | — | — |
| 1.1/2 | | | 1.5000 | 9.3/8 | 15" | 1 | 5998976 ¹⁾ | — | — |
| 1.9/16 | | | 1.5625 | 9.5/8 | 15.1/4 | 1 | 5999645 ¹⁾ | — | — |
| 1.5/8 | | | 1.6250 | 9.7/8 | 15.5/8 | 1 | 5999784 ¹⁾ | — | — |
| 1.3/4 | | | 1.7500 | 10.1/2 | 16.1/4 | 1 | 5999676 ¹⁾ | — | — |

¹⁾ steam tempered

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 tempered



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 | 6000480 |
| 1.20 | 0.0472 | 41 | 65 | 12 | 6000486 |
| 1.25 | 0.0492 | 41 | 65 | 12 | 6000489 |
| 1.30 | 0.0512 | 41 | 65 | 12 | 6000492 |
| 1.40 | 0.0551 | 45 | 70 | 12 | 6000494 |
| 1.50 | 0.0591 | 45 | 70 | 12 | 6000496 |
| 1.60 | 0.0630 | 50 | 76 | 12 | 6000499 |
| 1.70 | 0.0669 | 50 | 76 | 12 | 6000502 |
| 1.80 | 0.0709 | 53 | 80 | 12 | 6000505 |
| 1.90 | 0.0748 | 53 | 80 | 12 | 6000508 |
| 2.00 | 0.0787 | 56 | 85 | 12 | 6000810 |
| 2.10 | 0.0827 | 56 | 85 | 12 | 6000813 |
| 2.15 | 0.0846 | 59 | 90 | 12 | 6000816 |
| 2.20 | 0.0866 | 59 | 90 | 12 | 6000819 |
| 2.30 | 0.0906 | 59 | 90 | 12 | 6000822 |
| 2.40 | 0.0945 | 62 | 95 | 12 | 6000825 |
| 2.50 | 0.0984 | 62 | 95 | 12 | 6000828 |
| 3.00 | 0.1181 | 66 | 100 | 12 | 6000912 |
| 3.10 | 0.1220 | 69 | 106 | 12 | 6000917 |
| 3.20 | 0.1260 | 69 | 106 | 12 | 6000926 |
| 3.30 | 0.1299 | 69 | 106 | 12 | 6001365 |
| 3.40 | 0.1339 | 73 | 112 | 12 | 6001416 |
| 3.50 | 0.1378 | 73 | 112 | 12 | 6001458 |
| 3.60 | 0.1417 | 73 | 112 | 12 | 6001480 |
| 3.70 | 0.1457 | 73 | 112 | 12 | 6001504 |
| 3.80 | 0.1496 | 78 | 119 | 12 | 6001508 |
| 4.00 | 0.1575 | 78 | 119 | 12 | 6001370 |
| 4.20 | 0.1654 | 78 | 119 | 12 | 6001374 |
| 4.30 | 0.1693 | 82 | 126 | 12 | 6001379 |
| 4.50 | 0.1772 | 82 | 126 | 12 | 6001384 |
| 4.60 | 0.1811 | 82 | 126 | 12 | 6001389 |
| 4.80 | 0.1890 | 87 | 132 | 12 | 6001392 |

| d ₁ Ø mm | d ₁ decimal Inch | l ₂ mm | l ₁ mm | Pack Qty | 5ATL |
|---------------------------|-----------------------------------|----------------------|----------------------|-------------|-----------------------|
| 5.00 | 0.1969 | 87 | 132 | 12 | 6001399 |
| 5.50 | 0.2165 | 91 | 139 | 12 | 6001404 |
| 5.60 | 0.2205 | 91 | 139 | 12 | 6001407 |
| 5.70 | 0.2244 | 91 | 139 | 12 | 6001411 |
| 6.00 | 0.2362 | 91 | 139 | 12 | 6001421 |
| 6.40 | 0.2520 | 97 | 148 | 6 | 6001426 |
| 6.50 | 0.2559 | 97 | 148 | 6 | 6001431 |
| 6.80 | 0.2677 | 102 | 156 | 6 | 6001435 |
| 7.00 | 0.2756 | 102 | 156 | 6 | 6001440 |
| 7.20 | 0.2835 | 102 | 156 | 6 | 6001444 |
| 7.50 | 0.2953 | 102 | 156 | 6 | 6001450 |
| 7.80 | 0.3071 | 109 | 165 | 6 | 6001452 |
| 8.00 | 0.3150 | 109 | 165 | 6 | 6001454 |
| 8.20 | 0.3228 | 109 | 165 | 6 | 6001456 |
| 8.50 | 0.3346 | 109 | 165 | 6 | 6001460 |
| 9.00 | 0.3543 | 115 | 175 | 6 | 6001462 |
| 9.20 | 0.3622 | 115 | 175 | 6 | 6001464 |
| 9.50 | 0.3740 | 115 | 175 | 6 | 6001466 |
| 9.80 | 0.3858 | 121 | 184 | 6 | 6001468 |
| 10.00 | 0.3937 | 121 | 184 | 6 | 6000511 |
| 10.20 | 0.4016 | 121 | 184 | 6 | 6000518 |
| 10.50 | 0.4134 | 121 | 184 | 6 | 6000763 |
| 11.00 | 0.4331 | 128 | 195 | 6 | 6000802 |
| 11.20 | 0.4409 | 128 | 195 | 6 | 6000834 |
| 11.50 | 0.4528 | 128 | 195 | 6 | 6000871 |
| 12.00 | 0.4724 | 134 | 205 | 6 | 6000921 |
| 12.50 | 0.4921 | 134 | 205 | 6 | 6000931 |
| 13.00 | 0.5118 | 134 | 205 | 1 | 6000939 |
| 13.50 | 0.5315 | 140 | 214 | 1 | 6000943 |
| 13.80 | 0.5433 | 140 | 214 | 1 | 6000945 |
| 14.00 | 0.5512 | 140 | 214 | 1 | 6000769 |
| 14.50 | 0.5709 | 144 | 220 | 1 | 6000773 |
| 15.00 | 0.5906 | 144 | 220 | 1 | 6000777 |
| 15.50 | 0.6102 | 149 | 227 | 1 | 6000781 |
| 16.00 | 0.6299 | 149 | 227 | 1 | 6000785 |
| 16.50 | 0.6496 | 154 | 235 | 1 | 6000788 |
| 17.00 | 0.6693 | 154 | 235 | 1 | 6000791 |
| 17.50 | 0.6890 | 158 | 241 | 1 | 6000794 |
| 18.00 | 0.7087 | 158 | 241 | 1 | 6000797 ¹⁾ |
| 18.50 | 0.7283 | 162 | 247 | 1 | 6000799 ¹⁾ |
| 19.00 | 0.7480 | 162 | 247 | 1 | 6000805 ¹⁾ |
| 19.50 | 0.7677 | 166 | 254 | 1 | 6000808 ¹⁾ |
| 20.00 | 0.7874 | 166 | 254 | 1 | 6000830 ¹⁾ |
| 20.50 | 0.8071 | 171 | 261 | 1 | 6000837 ¹⁾ |
| 21.00 | 0.8268 | 171 | 261 | 1 | 6000840 ¹⁾ |
| 21.50 | 0.8465 | 176 | 268 | 1 | 6000844 ¹⁾ |
| 22.00 | 0.8661 | 176 | 268 | 1 | 6000845 ¹⁾ |
| 22.50 | 0.8858 | 180 | 275 | 1 | 6000848 ¹⁾ |
| 23.00 | 0.9055 | 180 | 275 | 1 | 6000852 ¹⁾ |
| 23.50 | 0.9252 | 180 | 275 | 1 | 6000855 ¹⁾ |
| 24.00 | 0.9449 | 185 | 282 | 1 | 6000858 ¹⁾ |
| 24.50 | 0.9646 | 185 | 282 | 1 | 6000860 ¹⁾ |
| 25.00 | 0.9843 | 185 | 282 | 1 | 6000866 ¹⁾ |
| 25.50 | 1.0039 | 190 | 290 | 1 | 6000876 ¹⁾ |
| 26.00 | 1.0236 | 190 | 290 | 1 | 6000880 ¹⁾ |
| 26.50 | 1.0433 | 190 | 290 | 1 | 6000885 ¹⁾ |
| 27.00 | 1.0630 | 195 | 298 | 1 | 6000889 ¹⁾ |
| 28.00 | 1.1024 | 195 | 298 | 1 | 6000894 ¹⁾ |
| 28.50 | 1.1220 | 201 | 307 | 1 | 6000898 ¹⁾ |
| 29.00 | 1.1417 | 201 | 307 | 1 | 6000902 ¹⁾ |
| 29.50 | 1.1614 | 201 | 307 | 1 | 6000907 ¹⁾ |
| 30.00 | 1.1811 | 201 | 307 | 1 | 6001510 ¹⁾ |
| 30.50 | 1.2008 | 207 | 316 | 1 | 6001512 ¹⁾ |
| 31.00 | 1.2205 | 207 | 316 | 1 | 6001514 ¹⁾ |

¹⁾ steam tempered

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



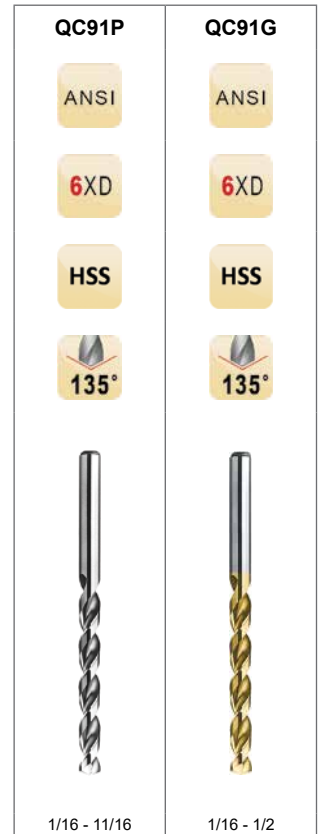
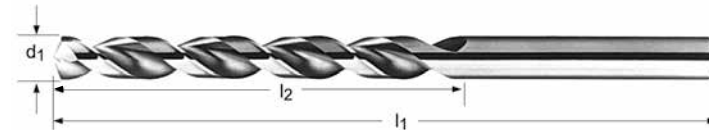
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | Pack Qty | R51FS |
|--------------------|--------------------------|---------------|---------------|-------------|---------|
| 1/16 | 0.0625 | 1.3/4 | 3" | 12 | 5998977 |
| 5/64 | 0.0781 | 2" | 3.3/4 | 12 | 5998917 |
| 3/32 | 0.0938 | 2.1/4 | 4.1/4 | 12 | 5998788 |
| 7/64 | 0.1094 | 2.1/2 | 4.5/8 | 12 | 5998747 |
| 1/8 | 0.1250 | 2.3/4 | 5.1/8 | 12 | 5998985 |
| 9/64 | 0.1406 | 3" | 5.3/8 | 12 | 5998755 |
| 5/32 | 0.1563 | 3" | 5.3/8 | 12 | 5998913 |
| 11/64 | 0.1719 | 3.3/8 | 5.3/4 | 12 | 5998991 |
| 3/16 | 0.1875 | 3.3/8 | 5.3/4 | 12 | 5998743 |
| 13/64 | 0.2031 | 3.5/8 | 6" | 12 | 5999002 |
| 7/32 | 0.2188 | 3.5/8 | 6" | 12 | 5998924 |
| 15/64 | 0.2344 | 3.3/4 | 6.1/8 | 12 | 5999009 |
| 1/4 | 0.2500 | 3.3/4 | 6.1/8 | 12 | 5998982 |
| 17/64 | 0.2656 | 3.7/8 | 6.1/4 | 6 | 5999013 |
| 9/32 | 0.2813 | 3.7/8 | 6.1/4 | 6 | 5998751 |
| 19/64 | 0.2969 | 4" | 6.3/8 | 6 | 5999017 |
| 5/16 | 0.3125 | 4" | 6.3/8 | 6 | 5998905 |
| 21/64 | 0.3281 | 4.1/8 | 6.1/2 | 6 | 5999023 |
| 11/32 | 0.3437 | 4.1/8 | 6.1/2 | 6 | 5998989 |
| 23/64 | 0.3594 | 4.1/4 | 6.3/4 | 6 | 5999027 |
| 3/8 | 0.3750 | 4.1/4 | 6.3/4 | 6 | 5998829 |
| 25/64 | 0.3906 | 4.3/8 | 7" | 6 | 5999030 |
| 13/32 | 0.4063 | 4.3/8 | 7" | 6 | 5998998 |
| 27/64 | 0.4219 | 4.5/8 | 7.1/4 | 6 | 5999034 |
| 7/16 | 0.4375 | 4.5/8 | 7.1/4 | 6 | 5998920 |
| 29/64 | 0.4531 | 4.3/4 | 7.1/2 | 6 | 5999043 |
| 15/32 | 0.4687 | 4.3/4 | 7.1/2 | 6 | 5999006 |
| 31/64 | 0.4844 | 4.3/4 | 7.3/4 | 6 | 5998861 |
| 1/2 | 0.5000 | 4.3/4 | 7.3/4 | 6 | 5998980 |

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.



| 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 | 5997190 | 5996826 |
| 52 | 0.0635 | 2" | 3.3/4 | 12 | 5997169 | 5996809 |
| 51 | 0.0670 | 2" | 3.3/4 | 12 | 5997164 | 5996805 |
| 50 | 0.0700 | 2" | 3.3/4 | 12 | 5997159 | 5996801 |
| 49 | 0.0730 | 2" | 3.3/4 | 12 | 5997149 | 5996794 |
| 48 | 0.0760 | 2" | 3.3/4 | 12 | 5997145 | — |
| 5/64 | 0.0781 | 2" | 3.3/4 | 12 | 5997426 | 5997143 |
| 47 | 0.0785 | 2.1/4 | 4.1/4 | 12 | 5997142 | 5996788 |
| 46 | 0.0810 | 2.1/4 | 4.1/4 | 12 | 5997135 | 5996780 |
| 45 | 0.0820 | 2.1/4 | 4.1/4 | 12 | 5997132 | 5996777 |
| 44 | 0.0860 | 2.1/4 | 4.1/4 | 12 | 5997126 | 5996773 |
| 43 | 0.0890 | 2.1/4 | 4.1/4 | 12 | 5997122 | 5996769 |
| 42 | 0.0935 | 2.1/4 | 4.1/4 | 12 | 5997118 | 5996765 |
| 3/32 | 0.0938 | 2.1/4 | 4.1/4 | 12 | 5997472 | 5996895 |
| 41 | 0.0960 | 2.1/2 | 4.5/8 | 12 | 5997114 | 5996762 |
| 40 | 0.0980 | 2.1/2 | 4.5/8 | 12 | 5997109 | 5996759 |
| 39 | 0.0995 | 2.1/2 | 4.5/8 | 12 | 5997099 | 5996753 |
| 38 | 0.1015 | 2.1/2 | 4.5/8 | 12 | 5997095 | 5996750 |
| 37 | 0.1040 | 2.1/2 | 4.5/8 | 12 | 5997242 | 5996920 |
| 36 | 0.1065 | 2.1/2 | 4.5/8 | 12 | 5997240 | 5996916 |
| 7/64 | 0.1094 | 2.1/2 | 4.5/8 | 12 | 5997439 | 5997198 |
| 35 | 0.1100 | 2.3/4 | 5.1/8 | 12 | 5997239 | 5996911 |
| 34 | 0.1110 | 2.3/4 | 5.1/8 | 12 | 5997237 | 5996907 |
| 33 | 0.1130 | 2.3/4 | 5.1/8 | 12 | 5997233 | — |
| 32 | 0.1160 | 2.3/4 | 5.1/8 | 12 | 5997213 | 5996855 |
| 31 | 0.1200 | 2.3/4 | 5.1/8 | 12 | 5997184 | 5996820 |
| 1/8 | 0.1250 | 2.3/4 | 5.1/8 | 12 | 5997199 | 5996834 |
| 30 | 0.1285 | 3" | 5.3/8 | 12 | 5997138 | 5996784 |
| 29 | 0.1360 | 3" | 5.3/8 | 12 | 5998036 | 5996793 |
| 28 | 0.1405 | 3" | 5.3/8 | 12 | 5998029 | 5996785 |
| 9/64 | 0.1406 | 3" | 5.3/8 | 12 | 5997451 | 5997204 |
| 27 | 0.1440 | 3" | 5.3/8 | 12 | 5998026 | — |
| 26 | 0.1470 | 3" | 5.3/8 | 12 | 5998021 | 5996774 |

TAPER LENGTH DRILL



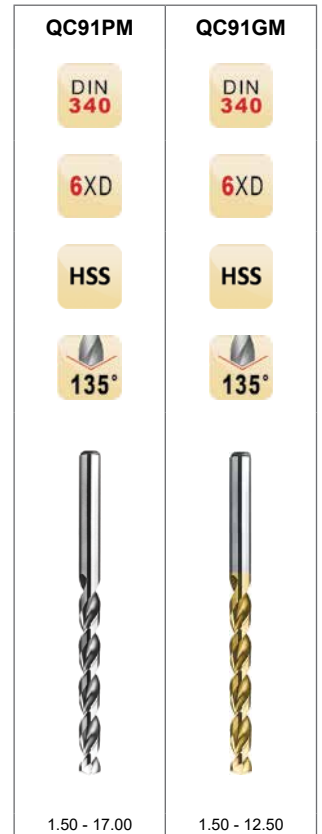
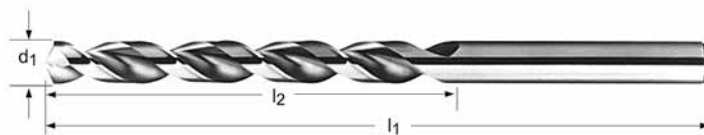
| d ₁ Ø "/Nr. | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | QC91P | QC91G |
|------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|
| 25 | 0.1495 | 3" | 5.3/8 | 12 | 5998017 | 5996770 |
| 24 | 0.1520 | 3" | 5.3/8 | 12 | 5998013 | 5996767 |
| 23 | 0.1540 | 3" | 5.3/8 | 12 | 5998009 | — |
| 5/32 | 0.1563 | 3" | 5.3/8 | 12 | 5997421 | 5997098 |
| 22 | 0.1570 | 3.3/8 | 5.3/4 | 12 | 5998006 | — |
| 21 | 0.1590 | 3.3/8 | 5.3/4 | 12 | 5998002 | 5996757 |
| 20 | 0.1610 | 3.3/8 | 5.3/4 | 12 | 5997998 | 5996754 |
| 19 | 0.1660 | 3.3/8 | 5.3/4 | 12 | 5997989 | 5996745 |
| 18 | 0.1695 | 3.3/8 | 5.3/4 | 12 | 5997986 | 5996743 |
| 11/64 | 0.1719 | 3.3/8 | 5.3/4 | 12 | 5997207 | 5996840 |
| 17 | 0.1730 | 3.3/8 | 5.3/4 | 12 | 5997983 | 5996741 |
| 16 | 0.1770 | 3.3/8 | 5.3/4 | 12 | 5997979 | 5996739 |
| 15 | 0.1800 | 3.3/8 | 5.3/4 | 12 | 5997976 | 5996737 |
| 14 | 0.1820 | 3.3/8 | 5.3/4 | 12 | 5997973 | 5996735 |
| 13 | 0.1850 | 3.3/8 | 5.3/4 | 12 | 5997971 | 5996733 |
| 3/16 | 0.1875 | 3.3/8 | 5.3/4 | 12 | 5997445 | 5996891 |
| 12 | 0.1890 | 3.5/8 | 6" | 12 | 5997968 | — |
| 11 | 0.1910 | 3.5/8 | 6" | 12 | 5997966 | 5996729 |
| 10 | 0.1935 | 3.5/8 | 6" | 12 | 5997964 | — |
| 9 | 0.1960 | 3.5/8 | 6" | 12 | 5997187 | 5996823 |
| 8 | 0.1990 | 3.5/8 | 6" | 12 | 5997181 | 5996817 |
| 7 | 0.2010 | 3.5/8 | 6" | 12 | 5997177 | 5996815 |
| 13/64 | 0.2031 | 3.5/8 | 6" | 12 | 5997211 | 5996847 |
| 6 | 0.2040 | 3.5/8 | 6" | 12 | 5997174 | 5996812 |
| 5 | 0.2055 | 3.5/8 | 6" | 12 | 5997154 | 5996798 |
| 4 | 0.2090 | 3.5/8 | 6" | 12 | 5997103 | 5996756 |
| 3 | 0.2130 | 3.5/8 | 6" | 12 | 5997089 | 5996746 |
| 7/32 | 0.2188 | 3.5/8 | 6" | 12 | 5997435 | 5997195 |
| 2 | 0.2210 | 3.3/4 | 6.1/8 | 12 | 5997995 | 5996751 |
| 1 | 0.2280 | 3.3/4 | 6.1/8 | 12 | 5997960 | — |
| 15/64 | 0.2344 | 3.3/4 | 6.1/8 | 12 | 5997217 | 5996859 |
| 1/4 | 0.2500 | 3.3/4 | 6.1/8 | 12 | 5997196 | 5996831 |
| 17/64 | 0.2656 | 3.7/8 | 6.1/4 | 6 | 5997221 | 5996863 |
| 9/32 | 0.2813 | 3.7/8 | 6.1/4 | 6 | 5997448 | 5997201 |
| 19/64 | 0.2969 | 4" | 6.3/8 | 6 | 5997225 | 5996867 |
| 5/16 | 0.3125 | 4" | 6.3/8 | 6 | 5997416 | 5997063 |
| 21/64 | 0.3281 | 4.1/8 | 6.1/2 | 6 | 5997229 | 5996870 |
| 11/32 | 0.3437 | 4.1/8 | 6.1/2 | 6 | 5997205 | 5996837 |
| 23/64 | 0.3594 | 4.1/4 | 6.3/4 | 6 | 5997230 | — |
| 3/8 | 0.3750 | 4.1/4 | 6.3/4 | 6 | 5997497 | 5996903 |
| 25/64 | 0.3906 | 4.3/8 | 7" | 6 | 5997232 | 5996878 |
| 13/32 | 0.4063 | 4.3/8 | 7" | 6 | 5997209 | 5996844 |
| 27/64 | 0.4219 | 4.5/8 | 7.1/4 | 6 | 5997235 | 5996881 |
| 7/16 | 0.4375 | 4.5/8 | 7.1/4 | 6 | 5997432 | 5997189 |
| 29/64 | 0.4531 | 4.3/4 | 7.1/2 | 6 | 5997398 | 5996884 |
| 15/32 | 0.4687 | 4.3/4 | 7.1/2 | 6 | 5997215 | — |
| 31/64 | 0.4844 | 4.3/4 | 7.3/4 | 6 | 5997531 | — |
| 1/2 | 0.5000 | 4.3/4 | 7.3/4 | 6 | 5997193 | 5996828 |
| 33/64 | 0.5156 | 4.3/4 | 8" | 1 | 5997538 | — |
| 17/32 | 0.5313 | 4.3/4 | 8" | 1 | 5997219 | — |
| 35/64 | 0.5469 | 4.7/8 | 8.1/4 | 1 | 5997541 | — |
| 9/16 | 0.5625 | 4.7/8 | 8.1/4 | 1 | 5997442 | — |
| 37/64 | 0.5781 | 4.7/8 | 8.3/4 | 1 | 5997545 | — |
| 19/32 | 0.5937 | 4.7/8 | 8.3/4 | 1 | 5997223 | — |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 1 | 5997429 | — |
| 21/32 | 0.6563 | 5.1/8 | 9" | 1 | 5997227 | — |
| 11/16 | 0.6875 | 5.3/8 | 9.1/4 | 1 | 5997202 | — |

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.



| 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 | 5997412 | 5996902 |
| 2.00 | 0.0787 | 56 | 85 | 12 | 5998048 | 5996804 |
| 2.50 | 0.0984 | 62 | 95 | 12 | 5998052 | 5996808 |
| 3.00 | 0.1181 | 66 | 100 | 12 | 5997892 | 5996673 |
| 3.50 | 0.1378 | 73 | 112 | 12 | 5997896 | 5996675 |
| 4.00 | 0.1575 | 78 | 119 | 12 | 5997899 | 5996679 |
| 4.50 | 0.1772 | 82 | 126 | 12 | 5997904 | 5996681 |
| 5.00 | 0.1969 | 87 | 132 | 12 | 5997907 | 5996685 |
| 5.20 | 0.2047 | 87 | 132 | 12 | 5997911 | 5996687 |
| 5.50 | 0.2165 | 91 | 139 | 12 | 5997915 | 5996690 |
| 6.00 | 0.2362 | 91 | 139 | 12 | 5997921 | 5996696 |
| 6.50 | 0.2559 | 97 | 148 | 6 | 5997926 | 5996700 |
| 6.80 | 0.2677 | 102 | 156 | 6 | 5997933 | — |
| 7.00 | 0.2756 | 102 | 156 | 6 | 5997936 | 5996706 |
| 8.00 | 0.3150 | 109 | 165 | 6 | 5997941 | 5996710 |
| 8.20 | 0.3228 | 109 | 165 | 6 | 5997944 | — |
| 8.50 | 0.3346 | 109 | 165 | 6 | 5997948 | 5996714 |
| 8.60 | 0.3386 | 115 | 175 | 6 | 5997952 | 5996716 |
| 9.00 | 0.3543 | 115 | 175 | 6 | 5997955 | 5996718 |
| 9.50 | 0.3740 | 115 | 175 | 6 | 5997958 | — |
| 10.00 | 0.3937 | 121 | 184 | 6 | 5997417 | 5996668 |
| 10.50 | 0.4134 | 121 | 184 | 6 | 5997422 | 5996702 |
| 11.00 | 0.4331 | 128 | 195 | 6 | 5997425 | — |
| 12.00 | 0.4724 | 134 | 205 | 6 | 5997433 | 5996789 |
| 12.50 | 0.4921 | 134 | 205 | 6 | 5997436 | 5996796 |
| 13.00 | 0.5118 | 134 | 205 | 1 | 5997438 | — |
| 13.50 | 0.5315 | 140 | 214 | 1 | 5997441 | — |
| 14.00 | 0.5512 | 140 | 214 | 1 | 5997447 | — |
| 15.00 | 0.5906 | 144 | 220 | 1 | 5997929 | — |
| 15.50 | 0.6102 | 149 | 227 | 1 | 5997962 | — |
| 16.00 | 0.6299 | 149 | 227 | 1 | 5997992 | — |
| 17.00 | 0.6693 | 154 | 235 | 1 | 5998040 | — |

COBALT TAPER LENGTH DRILL

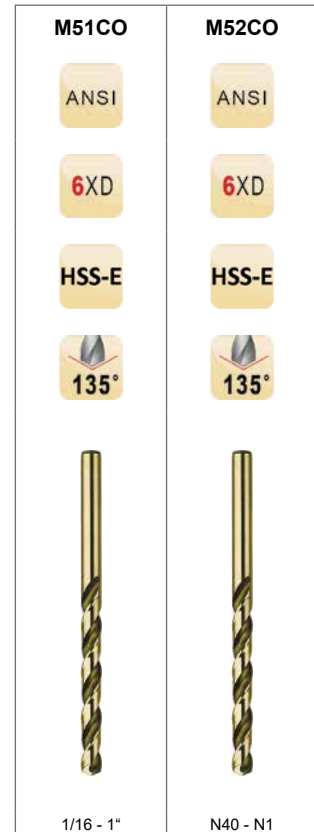
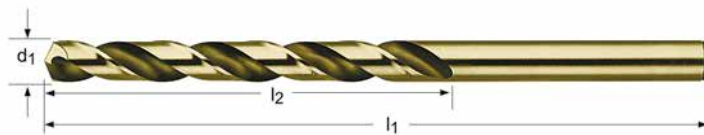


Heavy Duty Taper Length

M51CO - Fractional Sizes

M52CO - Wire Gauge Sizes

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



| 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 | 5996565 | — |
| 5/64 | | 0.0781 | 2" | 3.3/4 | 12 | 5996328 | — |
| 3/32 | | 0.0938 | 2.1/4 | 4.1/4 | 12 | 5996444 | — |
| | 40 | 0.0980 | 2.1/2 | 4.5/8 | 12 | — | 5995712 |
| | 39 | 0.0995 | 2.1/2 | 4.5/8 | 12 | — | 5995706 |
| | 36 | 0.1065 | 2.1/2 | 4.5/8 | 12 | — | 5995704 |
| 7/64 | | 0.1094 | 2.1/2 | 4.5/8 | 12 | 5996373 | — |
| | 35 | 0.1100 | 2.3/4 | 5.1/8 | 12 | — | 5995702 |
| | 34 | 0.1110 | 2.3/4 | 5.1/8 | 12 | — | 5995701 |
| | 33 | 0.1130 | 2.3/4 | 5.1/8 | 12 | — | 5995699 |
| | 32 | 0.1160 | 2.3/4 | 5.1/8 | 12 | — | 5995697 |
| | 31 | 0.1200 | 2.3/4 | 5.1/8 | 12 | — | 5995695 |
| 1/8 | | 0.1250 | 2.3/4 | 5.1/8 | 12 | 5996577 | — |
| | 30 | 0.1285 | 3" | 5.3/8 | 12 | — | 5995693 |
| | 29 | 0.1360 | 3" | 5.3/8 | 12 | — | 5995838 |
| | 28 | 0.1405 | 3" | 5.3/8 | 12 | — | 5995834 |
| 9/64 | | 0.1406 | 3" | 5.3/8 | 12 | 5996391 | — |
| | 27 | 0.1440 | 3" | 5.3/8 | 12 | — | 5995830 |
| | 26 | 0.1470 | 3" | 5.3/8 | 12 | — | 5995827 |
| | 25 | 0.1495 | 3" | 5.3/8 | 12 | — | 5995817 |
| | 24 | 0.1520 | 3" | 5.3/8 | 12 | — | 5995774 |
| 5/32 | | 0.1563 | 3" | 5.3/8 | 12 | 5996324 | — |
| | 22 | 0.1570 | 3.3/8 | 5.3/4 | 12 | — | 5995737 |
| | 21 | 0.1590 | 3.3/8 | 5.3/4 | 12 | — | 5995710 |
| | 20 | 0.1610 | 3.3/8 | 5.3/4 | 12 | — | 5995688 |
| | 19 | 0.1660 | 3.3/8 | 5.3/4 | 12 | — | 5996431 |
| | 18 | 0.1695 | 3.3/8 | 5.3/4 | 12 | — | 5996427 |
| 11/64 | | 0.1719 | 3.3/8 | 5.3/4 | 12 | 5996586 | — |
| | 17 | 0.1730 | 3.3/8 | 5.3/4 | 12 | — | 5996425 |
| | 16 | 0.1770 | 3.3/8 | 5.3/4 | 12 | — | 5996421 |
| | 15 | 0.1800 | 3.3/8 | 5.3/4 | 12 | — | 5996419 |
| | 14 | 0.1820 | 3.3/8 | 5.3/4 | 12 | — | 5996416 |

| d ₁ Ø Inch | d ₁ Ø Nr. | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | M51CO | M52CO | |
|-----------------------------|----------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|-----------------|---------|
| 3/16 | 13 | 0.1850 | 3.3/8 | 5.3/4 | 12 | — | 5996414 | |
| | | | 0.1875 | 3.3/8 | 5.3/4 | 12 | 5996440 | — |
| | | 12 | 0.1890 | 3.5/8 | 6" | 12 | — | 5996411 |
| | | 11 | 0.1910 | 3.5/8 | 6" | 12 | — | 5996408 |
| | | 10 | 0.1935 | 3.5/8 | 6" | 12 | — | 5996404 |
| | | 9 | 0.1960 | 3.5/8 | 6" | 12 | — | 5995720 |
| | | 8 | 0.1990 | 3.5/8 | 6" | 12 | — | 5995718 |
| 13/64 | 7 | 0.2010 | 3.5/8 | 6" | 12 | — | 5995716 | |
| | | 0.2031 | 3.5/8 | 6" | 12 | 5996596 | — | |
| | | 5 | 0.2055 | 3.5/8 | 6" | 12 | — | 5995714 |
| | | 4 | 0.2090 | 3.5/8 | 6" | 12 | — | 5995708 |
| 7/32 | 3 | 0.2130 | 3.5/8 | 6" | 12 | — | 5995691 | |
| | | 0.2188 | 3.5/8 | 6" | 12 | 5996369 | — | |
| | | 2 | 0.2210 | 3.3/4 | 6.1/8 | 12 | — | 5996437 |
| | 1 | 0.2280 | 3.3/4 | 6.1/8 | 12 | — | 5996395 | |
| 15/64 | | 0.2344 | 3.3/4 | 6.1/8 | 12 | 5996609 | — | |
| 1/4 | | 0.2500 | 3.3/4 | 6.1/8 | 12 | 5996574 | — | |
| 17/64 | | 0.2656 | 3.7/8 | 6.1/4 | 6 | 5996618 | — | |
| 9/32 | | 0.2813 | 3.7/8 | 6.1/4 | 6 | 5996387 | — | |
| 19/64 | | 0.2969 | 4" | 6.3/8 | 6 | 5996626 | — | |
| 5/16 | | 0.3125 | 4" | 6.3/8 | 6 | 5996323 | — | |
| 21/64 | | 0.3281 | 4.1/8 | 6.1/2 | 6 | 5996634 | — | |
| 11/32 | | 0.3437 | 4.1/8 | 6.1/2 | 6 | 5996583 | — | |
| 23/64 | | 0.3594 | 4.1/4 | 6.3/4 | 6 | 5996642 | — | |
| 3/8 | | 0.3750 | 4.1/4 | 6.3/4 | 6 | 5996449 | — | |
| 25/64 | | 0.3906 | 4.3/8 | 7" | 6 | 5996266 | — | |
| 13/32 | | 0.4063 | 4.3/8 | 7" | 6 | 5996592 | — | |
| 27/64 | | 0.4219 | 4.5/8 | 7.1/4 | 6 | 5996354 | — | |
| 7/16 | | 0.4375 | 4.5/8 | 7.1/4 | 6 | 5996365 | — | |
| 29/64 | | 0.4531 | 4.3/4 | 7.1/2 | 6 | 5996434 | — | |
| 15/32 | | 0.4687 | 4.3/4 | 7.1/2 | 6 | 5996607 | — | |
| 31/64 | | 0.4844 | 4.3/4 | 7.3/4 | 6 | 5996275 | — | |
| 1/2 | | 0.5000 | 4.3/4 | 7.3/4 | 6 | 5996572 | — | |
| 33/64 | | 0.5156 | 4.3/4 | 8" | 1 | 5996280 | ¹⁾ — | |
| 17/32 | | 0.5313 | 4.3/4 | 8" | 1 | 5996613 | ¹⁾ — | |
| 35/64 | | 0.5469 | 4.7/8 | 8.1/4 | 1 | 5996284 | ¹⁾ — | |
| 9/16 | | 0.5625 | 4.7/8 | 8.1/4 | 1 | 5996383 | ¹⁾ — | |
| 37/64 | | 0.5781 | 4.7/8 | 8.3/4 | 1 | 5996288 | ¹⁾ — | |
| 19/32 | | 0.5937 | 4.7/8 | 8.3/4 | 1 | 5996621 | ¹⁾ — | |
| 39/64 | | 0.6094 | 4.7/8 | 8.3/4 | 1 | 5996292 | ¹⁾ — | |
| 5/8 | | 0.6250 | 4.7/8 | 8.3/4 | 1 | 5996331 | ¹⁾ — | |
| 41/64 | | 0.6406 | 5.1/8 | 9" | 1 | 5996299 | ¹⁾ — | |
| 21/32 | | 0.6563 | 5.1/8 | 9" | 1 | 5996630 | ¹⁾ — | |
| 43/64 | | 0.6719 | 5.3/8 | 9.1/4 | 1 | 5996302 | ¹⁾ — | |
| 11/16 | | 0.6875 | 5.3/8 | 9.1/4 | 1 | 5996580 | ¹⁾ — | |
| 45/64 | | 0.7031 | 5.5/8 | 9.1/2 | 1 | 5996306 | ¹⁾ — | |
| 23/32 | | 0.7188 | 5.5/8 | 9.1/2 | 1 | 5996638 | ¹⁾ — | |
| 47/64 | | 0.7344 | 5.7/8 | 9.3/4 | 1 | 5996312 | ¹⁾ — | |
| 3/4 | | 0.7500 | 5.7/8 | 9.3/4 | 1 | 5996446 | ¹⁾ — | |
| 49/64 | | 0.7656 | 6" | 9.7/8 | 1 | 5996321 | ¹⁾ — | |
| 25/32 | | 0.7813 | 6" | 9.7/8 | 1 | 5996650 | ¹⁾ — | |
| 51/64 | | 0.7969 | 6.1/8 | 10" | 1 | 5996335 | ¹⁾ — | |
| 13/16 | | 0.8125 | 6.1/8 | 10" | 1 | 5996589 | ¹⁾ — | |
| 53/64 | | 0.8281 | 6.1/8 | 10" | 1 | 5996339 | ¹⁾ — | |
| 27/32 | | 0.8438 | 6.1/8 | 10" | 1 | 5996316 | ¹⁾ — | |
| 55/64 | | 0.8594 | 6.1/8 | 10" | 1 | 5996343 | ¹⁾ — | |
| 7/8 | | 0.8750 | 6.1/8 | 10" | 1 | 5996377 | ¹⁾ — | |
| 57/64 | | 0.8906 | 6.1/8 | 10" | 1 | 5996348 | ¹⁾ — | |
| 29/32 | | 0.9063 | 6.1/8 | 10" | 1 | 5996400 | ¹⁾ — | |
| 59/64 | | 0.9219 | 6.1/8 | 10.3/4 | 1 | 5996350 | ¹⁾ — | |
| 15/16 | | 0.9375 | 6.1/8 | 10.3/4 | 1 | 5996599 | ¹⁾ — | |
| 61/64 | | 0.9531 | 6.3/8 | 11" | 1 | 5996358 | ¹⁾ — | |
| 31/32 | | 0.9688 | 6.3/8 | 11" | 1 | 5996271 | ¹⁾ — | |
| 63/64 | | 0.9844 | 6.3/8 | 11" | 1 | 5996361 | ¹⁾ — | |
| 1" | | 1.0000 | 6.3/8 | 11" | 1 | 5996560 | ¹⁾ — | |

¹⁾ Notched Point

EXTRA LENGTH DRILL

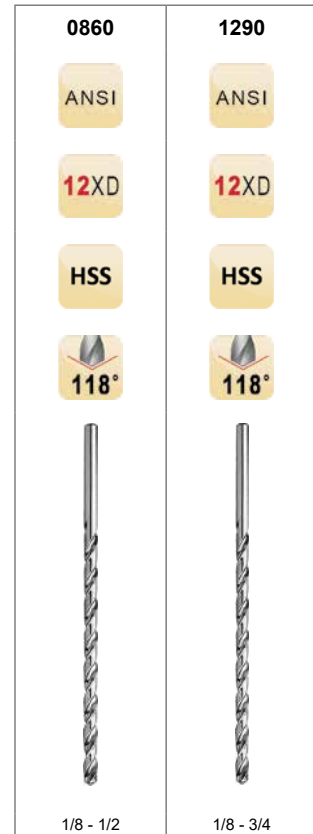


General Purpose Extra Length

0860 8" Overall length

1290 12" Overall length

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



| 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 | 6000278 | — |
| 1/8 | 0.1250 | 9" | 12" | 1 | — | 6000178 |
| 9/64 | 0.1406 | 9" | 12" | 1 | — | 5999809 |
| 5/32 | 0.1563 | 6" | 8" | 1 | 6000129 | — |
| 5/32 | 0.1563 | 9" | 12" | 1 | — | 5999924 |
| 11/64 | 0.1719 | 9" | 12" | 1 | — | 6000189 |
| 3/16 | 0.1875 | 6" | 8" | 1 | 6000117 | — |
| 3/16 | 0.1875 | 9" | 12" | 1 | — | 6000244 |
| 13/64 | 0.2031 | 9" | 12" | 1 | — | 6000199 |
| 7/32 | 0.2188 | 6" | 8" | 1 | 6000137 | — |
| 7/32 | 0.2188 | 9" | 12" | 1 | — | 5999971 |
| 15/64 | 0.2344 | 9" | 12" | 1 | — | 6000205 |
| 1/4 | 0.2500 | 6" | 8" | 1 | 6000274 | — |
| 1/4 | 0.2500 | 9" | 12" | 1 | — | 6000174 |
| 17/64 | 0.2656 | 9" | 12" | 1 | — | 6000211 |
| 9/32 | 0.2813 | 6" | 8" | 1 | 6000140 | — |
| 9/32 | 0.2813 | 9" | 12" | 1 | — | 5999978 |
| 19/64 | 0.2969 | 9" | 12" | 1 | — | 6000217 |
| 5/16 | 0.3125 | 6" | 8" | 1 | 6000124 | — |
| 5/16 | 0.3125 | 9" | 12" | 1 | — | 5999880 |
| 21/64 | 0.3281 | 9" | 12" | 1 | — | 6000224 |
| 11/32 | 0.3437 | 6" | 8" | 1 | 6000099 | — |
| 11/32 | 0.3437 | 9" | 12" | 1 | — | 6000186 |
| 23/64 | 0.3594 | 9" | 12" | 1 | — | 6000233 |
| 3/8 | 0.3750 | 6" | 8" | 1 | 6000119 | — |
| 3/8 | 0.3750 | 9" | 12" | 1 | — | 6000249 |
| 25/64 | 0.3906 | 9" | 12" | 1 | — | 6000236 |
| 13/32 | 0.4063 | 6" | 8" | 1 | 6000103 | — |
| 13/32 | 0.4063 | 9" | 12" | 1 | — | 6000196 |
| 27/64 | 0.4219 | 9" | 12" | 1 | — | 6000238 |
| 7/16 | 0.4375 | 6" | 8" | 1 | 6000134 | — |
| 7/16 | 0.4375 | 9" | 12" | 1 | — | 5999969 |

| d_1 Ø | d_1 decimal | l_2 | l_1 | Pack Qty | 0860 | 1290 |
|------------|------------------|-------|-------|-------------|---------|-----------------------|
| Inch | Inch | Inch | Inch | | | |
| 29/64 | 0.4531 | 9" | 12" | 1 | — | 6000241 |
| 15/32 | 0.4687 | 6" | 8" | 1 | 6000106 | — |
| 15/32 | 0.4687 | 9" | 12" | 1 | — | 6000202 |
| 31/64 | 0.4844 | 9" | 12" | 1 | — | 6000252 |
| 1/2 | 0.5000 | 6" | 8" | 1 | 6000271 | — |
| 1/2 | 0.5000 | 9" | 12" | 1 | — | 6000165 |
| 33/64 | 0.5156 | 9" | 12" | 1 | — | 6000256 ¹⁾ |
| 17/32 | 0.5313 | 9" | 12" | 1 | — | 6000208 ¹⁾ |
| 35/64 | 0.5469 | 9" | 12" | 1 | — | 6000265 ¹⁾ |
| 9/16 | 0.5625 | 9" | 12" | 1 | — | 5999974 ¹⁾ |
| 37/64 | 0.5781 | 9" | 12" | 1 | — | 5999804 ¹⁾ |
| 19/32 | 0.5937 | 9" | 12" | 1 | — | 6000214 ¹⁾ |
| 39/64 | 0.6094 | 9" | 12" | 1 | — | 5999840 ¹⁾ |
| 5/8 | 0.6250 | 9" | 12" | 1 | — | 5999964 ¹⁾ |
| 21/32 | 0.6563 | 9" | 12" | 1 | — | 6000220 ¹⁾ |
| 11/16 | 0.6875 | 9" | 12" | 1 | — | 6000181 ¹⁾ |
| 23/32 | 0.7188 | 9" | 12" | 1 | — | 6000230 ¹⁾ |
| 3/4 | 0.7500 | 9" | 12" | 1 | — | 6000247 ¹⁾ |

1) 33/64 and larger are steam tempered

General Purpose Extra Length

1511 Bright Finish improves chip flow in soft or
1813 non-ferrous materials

A125 Steam tempered for increased wear
 resistance & lubricity.



1813 Series - 33/64 and larger are steam tempered
 1511 Series - 17/32 and larger are steam tempered
 A125 Series - under 3/32 are bright



| d_1 Ø Inch | d_1 decimal Inch | d_1 Ø _{h8} 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 | — | — | 5968821 |
| | 0.0591 | 1.50 | | | 100 | 160 | 1 | — | — | 5968831 |
| | 0.0591 | 1.50 | | | 80 | 125 | 1 | — | — | 5968826 |
| 1/16 | 0.0625 | 1.59 | | | 100 | 160 | 1 | — | — | 5968847 |
| 1/16 | 0.0625 | 1.59 | | | 80 | 125 | 1 | — | — | 5968843 |
| | 0.0709 | 1.80 | | | 100 | 160 | 1 | — | — | 5968837 |
| 5/64 | 0.0781 | 1.98 | | | 100 | 160 | 1 | — | — | 5968859 |
| 5/64 | 0.0781 | 1.98 | | | 80 | 125 | 1 | — | — | 5968854 |
| | 0.0787 | 2.00 | | | 100 | 160 | 1 | — | — | 5968519 |
| | 0.0787 | 2.00 | | | 80 | 125 | 1 | — | — | 5968514 |
| | 0.0866 | 2.20 | | | 100 | 160 | 1 | — | — | 5968523 |
| 3/32 | 0.0938 | 2.38 | | | 100 | 160 | 1 | — | — | 5968651 |
| 3/32 | 0.0938 | 2.38 | | | 80 | 125 | 1 | — | — | 5968649 |
| | 0.0984 | 2.50 | | | 100 | 160 | 1 | — | — | 5968533 |
| | 0.0984 | 2.50 | | | 80 | 125 | 1 | — | — | 5968528 |
| 7/64 | 0.1094 | 2.78 | | | 100 | 160 | 1 | — | — | 5968960 |
| 7/64 | 0.1094 | 2.78 | | | 80 | 125 | 1 | — | — | 5969172 |
| | 0.1181 | 3.00 | | | 100 | 160 | 1 | — | — | 5968611 |
| | 0.1181 | 3.00 | | | 150 | 200 | 1 | — | — | 5968616 |
| | 0.1181 | 3.00 | | | 200 | 250 | 1 | — | — | 5968620 |
| 1/8 | 0.1250 | 3.18 | | | 100 | 160 | 1 | — | — | 5968186 |
| 1/8 | 0.1250 | 3.18 | | | 150 | 200 | 1 | — | — | 5968038 |
| 1/8 | 0.1250 | 3.18 | | | 200 | 250 | 1 | — | — | 5968043 |
| 1/8 | 0.1250 | 3.18 | | | 250 | 310 | 1 | — | — | 5968048 |
| | 0.1299 | 3.30 | | | 100 | 160 | 1 | — | — | 5968624 |
| | 0.1378 | 3.50 | | | 100 | 160 | 1 | — | — | 5968627 |
| | 0.1378 | 3.50 | | | 150 | 200 | 1 | — | — | 5968630 |
| | 0.1378 | 3.50 | | | 200 | 250 | 1 | — | — | 5968633 |
| 9/64 | 0.1406 | 3.57 | | | 100 | 160 | 1 | — | — | 5969048 |
| 9/64 | 0.1406 | 3.57 | | | 150 | 200 | 1 | — | — | 5969052 |
| 9/64 | 0.1406 | 3.57 | | | 250 | 310 | 1 | — | — | 5969063 |
| 5/32 | 0.1563 | 3.97 | | | 100 | 160 | 1 | — | — | 5968834 |

| 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 | — | — | 5968839 |
| 5/32 | 0.1563 | 3.97 | | | 200 | 250 | 1 | — | — | 5968844 |
| 5/32 | 0.1563 | 3.97 | | | 250 | 310 | 1 | — | — | 5968849 |
| | 0.1575 | 4.00 | | | 100 | 160 | 1 | — | — | 5968727 |
| | 0.1575 | 4.00 | | | 150 | 200 | 1 | — | — | 5968731 |
| | 0.1575 | 4.00 | | | 200 | 250 | 1 | — | — | 5968737 |
| | 0.1575 | 4.00 | | | 250 | 310 | 1 | — | — | 5968740 |
| 11/64 | 0.1719 | 4.37 | | | 100 | 160 | 1 | — | — | 5968123 |
| 11/64 | 0.1719 | 4.37 | | | 150 | 200 | 1 | — | — | 5968127 |
| 11/64 | 0.1719 | 4.37 | | | 250 | 310 | 1 | — | — | 5968129 |
| | 0.1772 | 4.50 | | | 100 | 160 | 1 | — | — | 5968743 |
| | 0.1772 | 4.50 | | | 150 | 200 | 1 | — | — | 5968747 |
| | 0.1772 | 4.50 | | | 200 | 250 | 1 | — | — | 5968751 |
| | 0.1772 | 4.50 | | | 250 | 310 | 1 | — | — | 5968756 |
| 3/16 | 0.1875 | 4.76 | | | 100 | 160 | 1 | — | — | 5968636 |
| 3/16 | 0.1875 | 4.76 | | | 150 | 200 | 1 | — | — | 5968638 |
| 3/16 | 0.1875 | 4.76 | | | 200 | 250 | 1 | — | — | 5968643 |
| 3/16 | 0.1875 | 4.76 | | | 250 | 310 | 1 | — | — | 5968645 |
| 3/16 | 0.1875 | 4.76 | | | 300 | 400 | 1 | — | — | 5968647 |
| 3/16 | 0.1875 | | 11" | 15" | | | 1 | 5999851 | — | — |
| | 0.1969 | 5.00 | | | 100 | 160 | 1 | — | — | 5968762 |
| | 0.1969 | 5.00 | | | 150 | 200 | 1 | — | — | 5968767 |
| | 0.1969 | 5.00 | | | 200 | 250 | 1 | — | — | 5968777 |
| | 0.1969 | 5.00 | | | 250 | 310 | 1 | — | — | 5968781 |
| | 0.1969 | 5.00 | | | 300 | 400 | 1 | — | — | 5968786 |
| 13/64 | 0.2031 | 5.16 | | | 150 | 200 | 1 | — | — | 5968151 |
| 13/64 | 0.2031 | 5.16 | | | 200 | 250 | 1 | — | — | 5968153 |
| 13/64 | 0.2031 | 5.16 | | | 250 | 310 | 1 | — | — | 5968154 |
| | 0.2165 | 5.50 | | | 150 | 200 | 1 | — | — | 5968791 |
| | 0.2165 | 5.50 | | | 200 | 250 | 1 | — | — | 5968797 |
| | 0.2165 | 5.50 | | | 250 | 310 | 1 | — | — | 5968802 |
| 7/32 | 0.2188 | 5.56 | | | 150 | 200 | 1 | — | — | 5969164 |
| 7/32 | 0.2188 | 5.56 | | | 200 | 250 | 1 | — | — | 5969167 |
| 7/32 | 0.2188 | 5.56 | | | 250 | 310 | 1 | — | — | 5969170 |
| 15/64 | 0.2344 | 5.95 | | | 150 | 200 | 1 | — | — | 5968170 |
| 15/64 | 0.2344 | 5.95 | | | 200 | 250 | 1 | — | — | 5968500 |
| 15/64 | 0.2344 | 5.95 | | | 250 | 310 | 1 | — | — | 5968546 |
| | 0.2362 | 6.00 | | | 150 | 200 | 1 | — | — | 5968874 |
| | 0.2362 | 6.00 | | | 200 | 250 | 1 | — | — | 5968883 |
| | 0.2362 | 6.00 | | | 250 | 310 | 1 | — | — | 5968886 |
| | 0.2362 | 6.00 | | | 300 | 400 | 1 | — | — | 5968890 |
| 1/4 | 0.2500 | 6.35 | | | 150 | 200 | 1 | — | — | 5968146 |
| 1/4 | 0.2500 | 6.35 | | | 200 | 250 | 1 | — | — | 5968169 |
| 1/4 | 0.2500 | 6.35 | | | 250 | 310 | 1 | — | — | 5968174 |
| 1/4 | 0.2500 | 6.35 | | | 300 | 400 | 1 | — | — | 5968178 |
| 1/4 | 0.2500 | 6.35 | | | 400 | 460 | 1 | — | — | 5968181 |
| 1/4 | 0.2500 | | 11" | 15" | | | 1 | 5999817 | — | — |
| 1/4 | 0.2500 | | 13" | 18" | | | 1 | — | 5999892 | — |
| | 0.2559 | 6.50 | | | 150 | 200 | 1 | — | — | 5968894 |
| | 0.2559 | 6.50 | | | 200 | 250 | 1 | — | — | 5968897 |
| | 0.2559 | 6.50 | | | 250 | 310 | 1 | — | — | 5968899 |
| 17/64 | 0.2656 | 6.75 | | | 150 | 200 | 1 | — | — | 5968660 |
| 17/64 | 0.2656 | 6.75 | | | 200 | 250 | 1 | — | — | 5968665 |
| 17/64 | 0.2656 | 6.75 | | | 400 | 460 | 1 | — | — | 5968667 |
| 17/64 | 0.2656 | | 13" | 18" | | | 1 | — | 5999928 | — |
| | 0.2756 | 7.00 | | | 150 | 200 | 1 | — | — | 5968902 |
| | 0.2756 | 7.00 | | | 200 | 250 | 1 | — | — | 5968904 |
| | 0.2756 | 7.00 | | | 250 | 310 | 1 | — | — | 5968906 |
| 9/32 | 0.2813 | 7.14 | | | 150 | 200 | 1 | — | — | 5969030 |
| 9/32 | 0.2813 | 7.14 | | | 200 | 250 | 1 | — | — | 5969034 |
| 9/32 | 0.2813 | 7.14 | | | 250 | 310 | 1 | — | — | 5969039 |
| 9/32 | 0.2813 | 7.14 | | | 400 | 460 | 1 | — | — | 5969043 |
| 9/32 | 0.2813 | | 13" | 18" | | | 1 | — | 6000288 | — |
| | 0.2953 | 7.50 | | | 150 | 200 | 1 | — | — | 5968908 |
| | 0.2953 | 7.50 | | | 200 | 250 | 1 | — | — | 5968912 |
| | 0.2953 | 7.50 | | | 250 | 310 | 1 | — | — | 5968954 |

| 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 | — | — | 5968507 |
| 19/64 | 0.2969 | 7.54 | | | 400 | 460 | 1 | — | — | 5968510 |
| 19/64 | 0.2969 | 7.54 | 13" | 18" | | | 1 | — | 5999937 | — |
| 5/16 | 0.3125 | 7.94 | | | 150 | 200 | 1 | — | — | 5968807 |
| 5/16 | 0.3125 | 7.94 | | | 200 | 250 | 1 | — | — | 5968811 |
| 5/16 | 0.3125 | 7.94 | | | 250 | 310 | 1 | — | — | 5968815 |
| 5/16 | 0.3125 | 7.94 | | | 300 | 400 | 1 | — | — | 5968820 |
| 5/16 | 0.3125 | 7.94 | | | 400 | 460 | 1 | — | — | 5968829 |
| 5/16 | 0.3125 | 7.94 | 11" | 15" | | | 1 | 5999862 | — | — |
| 5/16 | 0.3125 | 7.94 | 13" | 18" | | | 1 | — | 6000434 | — |
| | 0.3150 | 8.00 | | | 200 | 250 | 1 | — | — | 5968970 |
| | 0.3150 | 8.00 | | | 250 | 310 | 1 | — | — | 5968974 |
| | 0.3150 | 8.00 | | | 300 | 400 | 1 | — | — | 5968977 |
| 21/64 | 0.3281 | 8.33 | | | 250 | 310 | 1 | — | — | 5968542 |
| 21/64 | 0.3281 | 8.33 | | | 400 | 460 | 1 | — | — | 5968551 |
| 21/64 | 0.3281 | 8.33 | 13" | 18" | | | 1 | — | 5999945 | — |
| | 0.3346 | 8.50 | | | 200 | 250 | 1 | — | — | 5968981 |
| | 0.3346 | 8.50 | | | 250 | 310 | 1 | — | — | 5968985 |
| 11/32 | 0.3437 | 8.73 | | | 200 | 250 | 1 | — | — | 5968113 |
| 11/32 | 0.3437 | 8.73 | | | 250 | 310 | 1 | — | — | 5968116 |
| 11/32 | 0.3437 | 8.73 | | | 300 | 400 | 1 | — | — | 5968119 |
| 11/32 | 0.3437 | 8.73 | | | 400 | 460 | 1 | — | — | 5968122 |
| 11/32 | 0.3437 | 8.73 | 11" | 15" | | | 1 | 5999823 | — | — |
| 11/32 | 0.3437 | 8.73 | 13" | 18" | | | 1 | — | 5999900 | — |
| | 0.3543 | 9.00 | | | 200 | 250 | 1 | — | — | 5968990 |
| | 0.3543 | 9.00 | | | 250 | 310 | 1 | — | — | 5968995 |
| | 0.3543 | 9.00 | | | 300 | 400 | 1 | — | — | 5969000 |
| 23/64 | 0.3594 | 9.13 | | | 250 | 310 | 1 | — | — | 5968569 |
| 23/64 | 0.3594 | 9.13 | | | 400 | 460 | 1 | — | — | 5968574 |
| 23/64 | 0.3594 | 9.13 | 13" | 18" | | | 1 | — | 5999951 | — |
| | 0.3740 | 9.50 | | | 200 | 250 | 1 | — | — | 5969010 |
| | 0.3740 | 9.50 | | | 250 | 310 | 1 | — | — | 5969015 |
| 3/8 | 0.3750 | 9.52 | | | 200 | 250 | 1 | — | — | 5968657 |
| 3/8 | 0.3750 | 9.52 | | | 250 | 310 | 1 | — | — | 5968658 |
| 3/8 | 0.3750 | 9.52 | | | 300 | 400 | 1 | — | — | 5968659 |
| 3/8 | 0.3750 | 9.52 | | | 400 | 460 | 1 | — | — | 5968662 |
| 3/8 | 0.3750 | 9.52 | 11" | 15" | | | 1 | 5999858 | — | — |
| 3/8 | 0.3750 | 9.52 | 13" | 18" | | | 1 | — | 6000306 | — |
| 25/64 | 0.3906 | 9.92 | | | 250 | 310 | 1 | — | — | 5968584 |
| 25/64 | 0.3906 | 9.92 | | | 400 | 460 | 1 | — | — | 5968589 |
| 25/64 | 0.3906 | 9.92 | 13" | 18" | | | 1 | — | 5999957 | — |
| | 0.3937 | 10.00 | | | 200 | 250 | 1 | — | — | 5968061 |
| | 0.3937 | 10.00 | | | 250 | 310 | 1 | — | — | 5968066 |
| | 0.3937 | 10.00 | | | 300 | 400 | 1 | — | — | 5968071 |
| 13/32 | 0.4063 | 10.32 | | | 200 | 250 | 1 | — | — | 5968142 |
| 13/32 | 0.4063 | 10.32 | | | 250 | 310 | 1 | — | — | 5968144 |
| 13/32 | 0.4063 | 10.32 | | | 400 | 460 | 1 | — | — | 5968148 |
| 13/32 | 0.4063 | 10.32 | 13" | 18" | | | 1 | — | 5999909 | — |
| | 0.4134 | 10.50 | | | 200 | 250 | 1 | — | — | 5968076 |
| | 0.4134 | 10.50 | | | 250 | 310 | 1 | — | — | 5968080 |
| | 0.4134 | 10.50 | | | 300 | 400 | 1 | — | — | 5968085 |
| 27/64 | 0.4219 | 10.72 | | | 250 | 310 | 1 | — | — | 5968594 |
| 27/64 | 0.4219 | 10.72 | 13" | 18" | | | 1 | — | 5999960 | — |
| | 0.4331 | 11.00 | | | 200 | 250 | 1 | — | — | 5968094 |
| | 0.4331 | 11.00 | | | 250 | 310 | 1 | — | — | 5968099 |
| | 0.4331 | 11.00 | | | 300 | 400 | 1 | — | — | 5968102 |
| 7/16 | 0.4375 | 11.11 | | | 200 | 250 | 1 | — | — | 5969004 |
| 7/16 | 0.4375 | 11.11 | | | 250 | 310 | 1 | — | — | 5969057 |
| 7/16 | 0.4375 | 11.11 | | | 300 | 400 | 1 | — | — | 5969113 |
| 7/16 | 0.4375 | 11.11 | | | 400 | 460 | 1 | — | — | 5969158 |
| 7/16 | 0.4375 | 11.11 | 11" | 15" | | | 1 | 5999869 | — | — |
| 7/16 | 0.4375 | 11.11 | 13" | 18" | | | 1 | — | 6000281 | — |
| 29/64 | 0.4531 | 11.51 | | | 250 | 310 | 1 | — | — | 5968597 |
| 29/64 | 0.4531 | 11.51 | | | 400 | 460 | 1 | — | — | 5968606 |
| 29/64 | 0.4531 | 11.51 | 13" | 18" | | | 1 | — | 5999967 | — |
| 15/32 | 0.4688 | 11.91 | | | 200 | 250 | 1 | — | — | 5968162 |

| 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 | — | — | 5968164 |
| 15/32 | 0.4687 | 11.91 | | | 400 | 460 | 1 | — | — | 5968166 |
| 15/32 | 0.4687 | | 13" | 18" | | | 1 | — | 5999917 | — |
| | 0.4724 | 12.00 | | | 200 | 250 | 1 | — | — | 5968130 |
| | 0.4724 | 12.00 | | | 250 | 310 | 1 | — | — | 5968132 |
| | 0.4724 | 12.00 | | | 300 | 400 | 1 | — | — | 5968134 |
| 31/64 | 0.4844 | 12.30 | | | 250 | 310 | 1 | — | — | 5968720 |
| 31/64 | 0.4844 | 12.30 | | | 400 | 460 | 1 | — | — | 5968772 |
| 31/64 | 0.4844 | | 13" | 18" | | | 1 | — | 6000337 | — |
| 1/2 | 0.5000 | 12.70 | | | 200 | 250 | 1 | — | — | 5968857 |
| 1/2 | 0.5000 | 12.70 | | | 250 | 310 | 1 | — | — | 5968030 |
| 1/2 | 0.5000 | 12.70 | | | 300 | 400 | 1 | — | — | 5968089 |
| 1/2 | 0.5000 | 12.70 | | | 400 | 460 | 1 | — | — | 5968125 |
| 1/2 | 0.5000 | | 11" | 15" | | | 1 | 5999814 | — | — |
| 1/2 | 0.5000 | | 13" | 18" | | | 1 | — | 5999888 | — |
| | 0.5118 | 13.00 | | | 250 | 310 | 1 | — | — | 5968136 |
| | 0.5118 | 13.00 | | | 300 | 400 | 1 | — | — | 5968138 |
| 33/64 | 0.5156 | 13.10 | | | 250 | 310 | 1 | — | — | 5968825 |
| 33/64 | 0.5156 | 13.10 | | | 400 | 460 | 1 | — | — | 5968879 |
| 33/64 | 0.5156 | | 13" | 18" | | | 1 | — | 6000375 | — |
| 17/32 | 0.5313 | 13.49 | | | 250 | 310 | 1 | — | — | 5968603 |
| 17/32 | 0.5313 | 13.49 | | | 400 | 460 | 1 | — | — | 5968641 |
| 17/32 | 0.5313 | | 11" | 15" | | | 1 | 5999833 | — | — |
| 17/32 | 0.5313 | | 13" | 18" | | | 1 | — | 5999920 | — |
| 35/64 | 0.5469 | 13.89 | | | 250 | 310 | 1 | — | — | 5968910 |
| 35/64 | 0.5469 | 13.89 | | | 400 | 460 | 1 | — | — | 5968914 |
| 35/64 | 0.5469 | | 13" | 18" | | | 1 | — | 6000419 | — |
| | 0.5512 | 14.00 | | | 250 | 310 | 1 | — | — | 5968156 |
| | 0.5512 | 14.00 | | | 300 | 400 | 1 | — | — | 5968158 |
| 9/16 | 0.5625 | 14.29 | | | 250 | 310 | 1 | — | — | 5969020 |
| 9/16 | 0.5625 | 14.29 | | | 400 | 460 | 1 | — | — | 5969025 |
| 9/16 | 0.5625 | | 11" | 15" | | | 1 | 5999875 | — | — |
| 9/16 | 0.5625 | | 13" | 18" | | | 1 | — | 6000286 | — |
| 37/64 | 0.5781 | 14.68 | | | 250 | 310 | 1 | — | — | 5968916 |
| 37/64 | 0.5781 | | 13" | 18" | | | 1 | — | 6000427 | — |
| 19/32 | 0.5937 | 15.08 | | | 250 | 310 | 1 | — | — | 5968669 |
| 19/32 | 0.5937 | 15.08 | | | 400 | 460 | 1 | — | — | 5968671 |
| 19/32 | 0.5937 | | 13" | 18" | | | 1 | — | 5999933 | — |
| 39/64 | 0.6094 | 15.48 | | | 250 | 310 | 1 | — | — | 5968918 |
| 39/64 | 0.6094 | 15.48 | | | 400 | 460 | 1 | — | — | 5968920 |
| 39/64 | 0.6094 | | 13" | 18" | | | 1 | — | 6000430 | — |
| 5/8 | 0.6250 | 15.88 | | | 250 | 310 | 1 | — | — | 5968864 |
| 5/8 | 0.6250 | 15.88 | | | 400 | 460 | 1 | — | — | 5968869 |
| 5/8 | 0.6250 | | 11" | 15" | | | 1 | 5999865 | — | — |
| 5/8 | 0.6250 | | 13" | 18" | | | 1 | — | 6000438 | — |
| 21/32 | 0.6563 | 16.67 | | | 250 | 310 | 1 | — | — | 5968536 |
| 21/32 | 0.6563 | 16.67 | | | 400 | 460 | 1 | — | — | 5968540 |
| 21/32 | 0.6563 | | 11" | 15" | | | 1 | 5999835 | — | — |
| 21/32 | 0.6563 | | 13" | 18" | | | 1 | — | 5999940 | — |
| 11/16 | 0.6875 | 17.46 | | | 250 | 310 | 1 | — | — | 5968107 |
| 11/16 | 0.6875 | 17.46 | | | 400 | 460 | 1 | — | — | 5968110 |
| 11/16 | 0.6875 | | 11" | 15" | | | 1 | 5999820 | — | — |
| 11/16 | 0.6875 | | 13" | 18" | | | 1 | — | 5999896 | — |
| 23/32 | 0.7188 | 18.26 | | | 250 | 310 | 1 | — | — | 5968556 |
| 23/32 | 0.7188 | 18.26 | | | 400 | 460 | 1 | — | — | 5968562 |
| 23/32 | 0.7188 | | 11" | 15" | | | 1 | 5999843 | — | — |
| 23/32 | 0.7188 | | 13" | 18" | | | 1 | — | 5999948 | — |
| 3/4 | 0.7500 | 19.05 | | | 250 | 310 | 1 | — | — | 5968653 |
| 3/4 | 0.7500 | 19.05 | | | 400 | 460 | 1 | — | — | 5968655 |
| 3/4 | 0.7500 | | 11" | 15" | | | 1 | 5999854 | — | — |
| 3/4 | 0.7500 | | 13" | 18" | | | 1 | — | 6000275 | — |
| 25/32 | 0.7813 | 19.84 | | | 400 | 460 | 1 | — | — | 5968579 |
| 25/32 | 0.7813 | | 11" | 15" | | | 1 | 5999848 | — | — |
| 25/32 | 0.7813 | | 13" | 18" | | | 1 | — | 5999954 | — |
| 13/16 | 0.8125 | 20.64 | | | 400 | 460 | 1 | — | — | 5968140 |
| 13/16 | 0.8125 | | 11" | 15" | | | 1 | 5999827 | — | — |

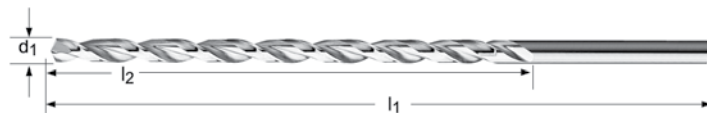
| d_1 Ø Inch | d_1 decimal Inch | d_1 Ø _{h8} mm | l_2 Inch | l_1 Inch | l_2 mm | l_1 mm | Pack Qty | 1511 | 1813 | A125 |
|--------------------|--------------------------|--------------------------------|---------------|---------------|-------------|-------------|-------------|---------|---------|---------|
| 13/16 | 0.8125 | | 13" | 18" | | | 1 | — | 5999904 | — |
| 7/8 | 0.8750 | 22.22 | | | 400 | 460 | 1 | — | — | 5968965 |
| 7/8 | 0.8750 | | 11" | 15" | | | 1 | 5999872 | — | — |
| 7/8 | 0.8750 | | 13" | 18" | | | 1 | — | 6000284 | — |
| 15/16 | 0.9375 | 23.81 | | | 400 | 460 | 1 | — | — | 5968160 |
| 15/16 | 0.9375 | | 11" | 15" | | | 1 | 5999830 | — | — |
| 15/16 | 0.9375 | | 13" | 18" | | | 1 | — | 5999912 | — |
| 1" | 1.0000 | 25.40 | | | 400 | 460 | 1 | — | — | 5968053 |
| 1" | 1.0000 | | 11" | 15" | | | 1 | 5999811 | — | — |
| 1" | 1.0000 | | 13" | 18" | | | 1 | — | 5999885 | — |

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 |
|-----------|-----------|
| | |
| | |
| | |
| | |
| | |
| 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 | 5995727 | — |
| 1/8 | 0.1250 | 9" | 12" | 1 | — | 5996453 |
| 9/64 | 0.1406 | 6" | 8" | 1 | 5995814 | — |
| 9/64 | 0.1406 | 9" | 12" | 1 | — | 5996464 |
| 5/32 | 0.1563 | 6" | 8" | 1 | 5995797 | — |
| 5/32 | 0.1563 | 9" | 12" | 1 | — | 5996456 |
| 11/64 | 0.1719 | 6" | 8" | 1 | 5995734 | — |
| 11/64 | 0.1719 | 9" | 12" | 1 | — | 5996504 |
| 3/16 | 0.1875 | 6" | 8" | 1 | 5995781 | — |
| 3/16 | 0.1875 | 9" | 12" | 1 | — | 5996441 |
| 13/64 | 0.2031 | 6" | 8" | 1 | 5995744 | — |
| 13/64 | 0.2031 | 9" | 12" | 1 | — | 5996550 |
| 7/32 | 0.2188 | 6" | 8" | 1 | 5995806 | — |
| 7/32 | 0.2188 | 9" | 12" | 1 | — | 5996460 |
| 15/64 | 0.2344 | 6" | 8" | 1 | 5995748 | — |
| 15/64 | 0.2344 | 9" | 12" | 1 | — | 5996558 |
| 1/4 | 0.2500 | 6" | 8" | 1 | 5995725 | — |
| 1/4 | 0.2500 | 9" | 12" | 1 | — | 5996417 |
| 17/64 | 0.2656 | 6" | 8" | 1 | 5995752 | — |
| 17/64 | 0.2656 | 9" | 12" | 1 | — | 5996562 |
| 9/32 | 0.2813 | 6" | 8" | 1 | 5995810 | — |
| 9/32 | 0.2813 | 9" | 12" | 1 | — | 5996462 |
| 19/64 | 0.2969 | 6" | 8" | 1 | 5995754 | — |
| 19/64 | 0.2969 | 9" | 12" | 1 | — | 5996422 |
| 5/16 | 0.3125 | 6" | 8" | 1 | 5995794 | — |
| 5/16 | 0.3125 | 9" | 12" | 1 | — | 5996451 |
| 21/64 | 0.3281 | 6" | 8" | 1 | 5995758 | — |
| 21/64 | 0.3281 | 9" | 12" | 1 | — | 5996426 |
| 11/32 | 0.3437 | 6" | 8" | 1 | 5995730 | — |
| 11/32 | 0.3437 | 9" | 12" | 1 | — | 5996476 |
| 23/64 | 0.3594 | 6" | 8" | 1 | 5995762 | — |
| 23/64 | 0.3594 | 9" | 12" | 1 | — | 5996429 |
| 3/8 | 0.3750 | 6" | 8" | 1 | 5995786 | — |

EXTRA LENGTH DRILL

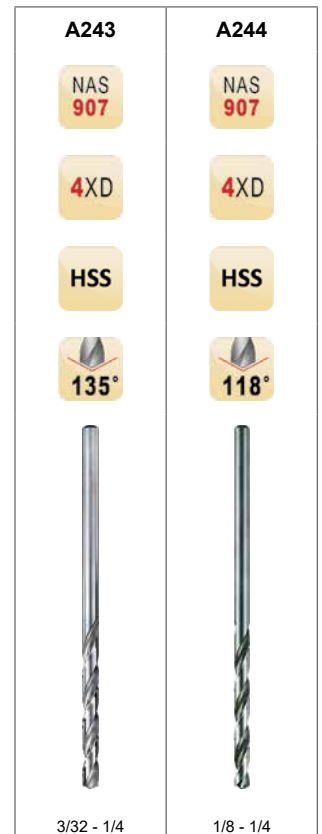
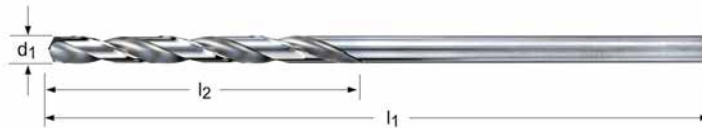


| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | Pack Qty | QC0860P | QC1290P |
|--------------------|--------------------------|---------------|---------------|-------------|---------|---------|
| 3/8 | 0.3750 | 9" | 12" | 1 | — | 5996445 |
| 25/64 | 0.3906 | 6" | 8" | 1 | 5995766 | — |
| 25/64 | 0.3906 | 9" | 12" | 1 | — | 5996430 |
| 13/32 | 0.4063 | 6" | 8" | 1 | 5995740 | — |
| 13/32 | 0.4063 | 9" | 12" | 1 | — | 5996542 |
| 27/64 | 0.4219 | 6" | 8" | 1 | 5995770 | — |
| 27/64 | 0.4219 | 9" | 12" | 1 | — | 5996433 |
| 7/16 | 0.4375 | 6" | 8" | 1 | 5995803 | — |
| 7/16 | 0.4375 | 9" | 12" | 1 | — | 5996458 |
| 29/64 | 0.4531 | 6" | 8" | 1 | 5995778 | — |
| 15/32 | 0.4687 | 6" | 8" | 1 | 5995746 | — |
| 15/32 | 0.4687 | 9" | 12" | 1 | — | 5996554 |
| 31/64 | 0.4844 | 6" | 8" | 1 | 5995790 | — |
| 1/2 | 0.5000 | 6" | 8" | 1 | 5995722 | — |
| 1/2 | 0.5000 | 9" | 12" | 1 | — | 5995821 |

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.



| 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 | 5968855 | — |
| 40 | 0.0980 | 1.3/8 | 6" | 10 | 5968835 | — |
| 1/8 | 0.1250 | 1.5/8 | 6" | 10 | 5968845 | 5968875 |
| 30 | 0.1285 | 1.5/8 | 6" | 10 | 5968830 | — |
| 5/32 | 0.1563 | 2" | 6" | 10 | 5968861 | 5968884 |
| 21 | 0.1590 | 2.1/8 | 6" | 10 | 5968822 | — |
| 20 | 0.1610 | 2.1/8 | 6" | 10 | 5968818 | — |
| 3/16 | 0.1875 | 2.5/16 | 6" | 10 | 5968850 | 5968880 |
| 11 | 0.1910 | 2.5/16 | 6" | 10 | 5968813 | — |
| 10 | 0.1935 | 2.7/16 | 6" | 10 | 5968803 | — |
| 1/4 | 0.2500 | 2.3/4 | 6" | 10 | 5968840 | 5968870 |

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 tempered for increased wear resistance & lubricity.

6" overall length.



| 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 | — | 6001340 ¹⁾ | — |
| | 59 | | 0.0410 | 11/16 | 6" | 12 | — | 6001332 ¹⁾ | — |
| | 58 | | 0.0420 | 11/16 | 6" | 12 | — | 6001329 ¹⁾ | — |
| | 57 | | 0.0430 | 3/4 | 6" | 12 | — | 6001326 ¹⁾ | — |
| | 56 | | 0.0465 | 3/4 | 6" | 12 | — | 6001323 ¹⁾ | — |
| 3/64 | | | 0.0469 | 3/4 | 6" | 12 | 6001203 | — | — |
| | 55 | | 0.0520 | 7/8 | 6" | 12 | — | 6001320 ¹⁾ | — |
| | 54 | | 0.0550 | 7/8 | 6" | 12 | — | 6001317 ¹⁾ | — |
| | 53 | | 0.0595 | 7/8 | 6" | 12 | — | 6001314 ¹⁾ | — |
| 1/16 | | | 0.0625 | 7/8 | 6" | 12 | 6001270 | — | — |
| | 52 | | 0.0635 | 7/8 | 6" | 12 | — | 6001311 | — |
| | 51 | | 0.0670 | 1" | 6" | 12 | — | 6001309 | — |
| | 50 | | 0.0700 | 1" | 6" | 12 | — | 6001302 | — |
| | 49 | | 0.0730 | 1" | 6" | 12 | — | 6001296 | — |
| | 48 | | 0.0760 | 1" | 6" | 12 | — | 6001293 | — |
| 5/64 | | | 0.0781 | 1" | 6" | 12 | 6001212 | — | — |
| | 47 | | 0.0785 | 1" | 6" | 12 | — | 6001289 | — |
| | 46 | | 0.0810 | 1.1/8 | 6" | 12 | — | 6001285 | — |
| | 45 | | 0.0820 | 1.1/8 | 6" | 12 | — | 6001282 | — |
| | 44 | | 0.0860 | 1.1/8 | 6" | 12 | — | 6001276 | — |
| | 43 | | 0.0890 | 1.1/4 | 6" | 12 | — | 6001271 | — |
| | 42 | | 0.0935 | 1.1/4 | 6" | 12 | — | 6001268 | — |
| 3/32 | | | 0.0938 | 1.1/4 | 6" | 12 | 6001201 | — | — |
| | 41 | | 0.0960 | 1.3/8 | 6" | 12 | — | 6001448 | — |
| | 40 | | 0.0980 | 1.3/8 | 6" | 12 | — | 6001446 | — |
| | 39 | | 0.0995 | 1.3/8 | 6" | 12 | — | 6001439 | — |
| | 38 | | 0.1015 | 1.7/16 | 6" | 12 | — | 6001427 | — |
| | 37 | | 0.1040 | 1.7/16 | 6" | 12 | — | 6001371 | — |
| | 36 | | 0.1065 | 1.7/16 | 6" | 12 | — | 6001337 | — |
| 7/64 | | | 0.1094 | 1.1/2 | 6" | 12 | 6001220 | — | — |
| | 35 | | 0.1100 | 1.1/2 | 6" | 12 | — | 6001305 | — |

¹⁾Not Split Point
170

| 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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|---------|
| | 34 | | 0.1110 | 1.1/2 | 6" | 12 | — | 6001261 | — |
| | 33 | | 0.1130 | 1.1/2 | 6" | 12 | — | 6001507 | — |
| | 32 | | 0.1160 | 1.5/8 | 6" | 12 | — | 6001503 | — |
| | 31 | | 0.1200 | 1.5/8 | 6" | 12 | — | 6001502 | — |
| 1/8 | | | 0.1250 | 1.5/8 | 6" | 12 | 6001288 | — | — |
| | 30 | | 0.1285 | 1.5/8 | 6" | 12 | — | 6001500 | — |
| | 29 | | 0.1360 | 1.3/4 | 6" | 12 | — | 6001496 | — |
| | 28 | | 0.1405 | 1.3/4 | 6" | 12 | — | 6001494 | — |
| 9/64 | | | 0.1406 | 1.3/4 | 6" | 12 | 6001224 | — | — |
| | 27 | | 0.1440 | 1.7/8 | 6" | 12 | — | 6001492 | — |
| | 26 | | 0.1470 | 1.7/8 | 6" | 12 | — | 6001490 | — |
| | 25 | | 0.1495 | 1.7/8 | 6" | 12 | — | 6001489 | — |
| | 24 | | 0.1520 | 2" | 6" | 12 | — | 6001487 | — |
| | 23 | | 0.1540 | 2" | 6" | 12 | — | 6001483 | — |
| 5/32 | | | 0.1563 | 2" | 6" | 12 | 6001211 | — | — |
| | 22 | | 0.1570 | 2" | 6" | 12 | — | 6001481 | — |
| | 21 | | 0.1590 | 2.1/8 | 6" | 12 | — | 6001479 | — |
| | 20 | | 0.1610 | 2.1/8 | 6" | 12 | — | 6001477 | — |
| | 19 | | 0.1660 | 2.1/8 | 6" | 12 | — | 6001473 | — |
| | 18 | | 0.1695 | 2.1/8 | 6" | 12 | — | 6001471 | — |
| 11/64 | | | 0.1719 | 2.1/8 | 6" | 12 | 6001142 | — | — |
| | 17 | | 0.1730 | 2.3/16 | 6" | 12 | — | 6001469 | — |
| | 16 | | 0.1770 | 2.3/16 | 6" | 12 | — | 6001467 | — |
| | 15 | | 0.1800 | 2.3/16 | 6" | 12 | — | 6001465 | — |
| | 14 | | 0.1820 | 2.3/16 | 6" | 12 | — | 6001461 | — |
| | 13 | | 0.1850 | 2.5/16 | 6" | 12 | — | 6001459 | — |
| 3/16 | | | 0.1875 | 2.5/16 | 6" | 12 | 6001199 | — | — |
| | 12 | | 0.1890 | 2.5/16 | 6" | 12 | — | 6001457 | — |
| | 11 | | 0.1910 | 2.5/16 | 6" | 12 | — | 6001455 | — |
| | 10 | | 0.1935 | 2.7/16 | 6" | 12 | — | 6001453 | — |
| | 9 | | 0.1960 | 2.7/16 | 6" | 12 | — | 6001349 | — |
| | 8 | | 0.1990 | 2.7/16 | 6" | 12 | — | 6001346 | — |
| | 7 | | 0.2010 | 2.7/16 | 6" | 12 | — | 6001343 | — |
| 13/64 | | | 0.2031 | 2.7/16 | 6" | 12 | 6001150 | — | — |
| | 6 | | 0.2040 | 2.1/2 | 6" | 12 | — | 6001334 | — |
| | 5 | | 0.2055 | 2.1/2 | 6" | 12 | — | 6001299 | — |
| | 4 | | 0.2090 | 2.1/2 | 6" | 12 | — | 6001443 | — |
| | 3 | | 0.2130 | 2.1/2 | 6" | 12 | — | 6001498 | — |
| 7/32 | | | 0.2188 | 2.1/2 | 6" | 12 | 6001218 | — | — |
| | 2 | | 0.2210 | 2.5/8 | 6" | 12 | — | 6001475 | — |
| | 1 | | 0.2280 | 2.5/8 | 6" | 12 | — | 6001451 | — |
| 15/64 | | A | 0.2340 | 2.5/8 | 6" | 12 | — | — | 6001257 |
| | | | 0.2344 | 2.5/8 | 6" | 12 | 6001160 | — | — |
| | | B | 0.2380 | 2.3/4 | 6" | 12 | — | — | 6001260 |
| | | C | 0.2420 | 2.3/4 | 6" | 12 | — | — | 6001265 |
| | | D | 0.2460 | 2.3/4 | 6" | 12 | — | — | 6001272 |
| 1/4 | | E | 0.2500 | 2.3/4 | 6" | 12 | 6001284 | — | — |
| | | F | 0.2570 | 2.7/8 | 6" | 12 | — | — | 6001281 |
| | | G | 0.2610 | 2.7/8 | 6" | 6 | — | — | 6001286 |
| 17/64 | | | 0.2656 | 2.7/8 | 6" | 6 | 6001167 | — | — |
| | | H | 0.2660 | 2.7/8 | 6" | 6 | — | — | 6001290 |
| | | I | 0.2720 | 2.7/8 | 6" | 6 | — | — | 6001294 |
| | | J | 0.2770 | 2.7/8 | 6" | 6 | — | — | 6001297 |
| | | K | 0.2810 | 2.15/16 | 6" | 6 | — | — | 6001303 |
| 9/32 | | | 0.2813 | 2.15/16 | 6" | 6 | 6001222 | — | — |
| | | L | 0.2900 | 2.15/16 | 6" | 6 | — | — | 6001306 |
| | | M | 0.2950 | 3.1/16 | 6" | 6 | — | — | 6001308 |
| 19/64 | | | 0.2969 | 3.1/16 | 6" | 6 | 6001172 | — | — |
| | | N | 0.3020 | 3.1/16 | 6" | 6 | — | — | 6001310 |
| 5/16 | | | 0.3125 | 3.3/16 | 6" | 6 | 6001209 | — | — |
| | | O | 0.3160 | 3.3/16 | 6" | 6 | — | — | 6001313 |
| | | P | 0.3230 | 3.5/16 | 6" | 6 | — | — | 6001316 |
| 21/64 | | | 0.3281 | 3.5/16 | 6" | 6 | 6001177 | — | — |
| | | Q | 0.3320 | 3.7/16 | 6" | 6 | — | — | 6001319 |
| | | R | 0.3390 | 3.7/16 | 6" | 6 | — | — | 6001322 |
| 11/32 | | | 0.3437 | 3.7/16 | 6" | 6 | 6001292 | — | — |

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 | — | — | 6001325 |
| | | T | 0.3580 | 3.1/2 | 6" | 6 | — | — | 6001328 |
| 23/64 | | | 0.3594 | 3.1/2 | 6" | 6 | 6001180 | — | — |
| | | U | 0.3680 | 3.5/8 | 6" | 6 | — | — | 6001336 |
| 3/8 | | | 0.3750 | 3.5/8 | 6" | 6 | 6001204 | — | — |
| | | V | 0.3770 | 3.5/8 | 6" | 6 | — | — | 6001339 |
| | | W | 0.3860 | 3.3/4 | 6" | 6 | — | — | 6001342 |
| 25/64 | | | 0.3906 | 3.3/4 | 6" | 6 | 6001185 | — | — |
| | | X | 0.3970 | 3.3/4 | 6" | 6 | — | — | 6001345 |
| | | Y | 0.4040 | 3.7/8 | 6" | 6 | — | — | 6001348 |
| 13/32 | | | 0.4063 | 3.7/8 | 6" | 6 | 6001146 | — | — |
| | | Z | 0.4130 | 3.7/8 | 6" | 6 | — | — | 6001351 |
| 27/64 | | | 0.4219 | 3.15/16 | 6" | 6 | 6001192 | — | — |
| 7/16 | | | 0.4375 | 4.1/16 | 6" | 6 | 6001216 | — | — |
| 29/64 | | | 0.4531 | 4.3/16 | 6" | 6 | 6001195 | — | — |
| 15/32 | | | 0.4687 | 4.5/16 | 6" | 6 | 6001155 | — | — |
| 31/64 | | | 0.4844 | 4.3/8 | 6" | 6 | 6001207 | — | — |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 6001280 | — | — |

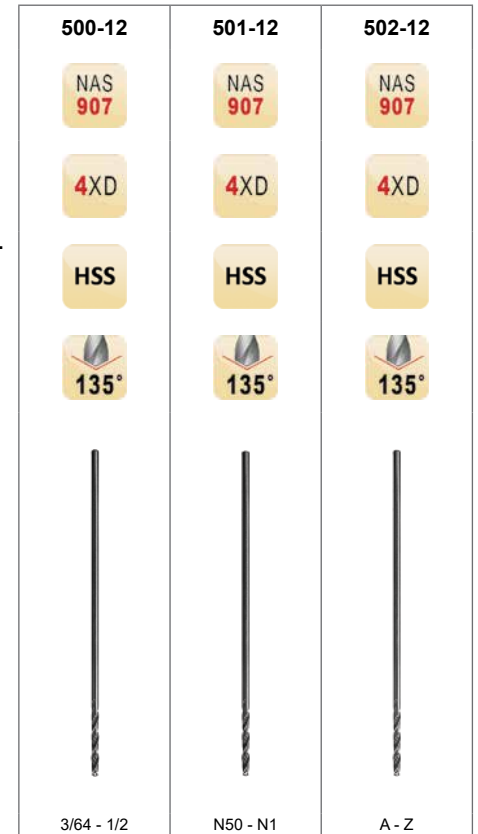
Aircraft Extension (NAS 907 Type B)

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 tempered for increased wear resistance & lubricity.
 12" Over All Length



| 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 | 6001382 ¹⁾ | — | — |
| 1/16 | | | 0.0625 | 7/8 | 12" | 12 | 6001315 | — | — |
| | 50 | | 0.0700 | 1" | 12" | 12 | — | 6001441 | — |
| | 49 | | 0.0730 | 1" | 12" | 12 | — | 6001425 | — |
| | 48 | | 0.0760 | 1" | 12" | 12 | — | 6001420 | — |
| 5/64 | | | 0.0781 | 1" | 12" | 12 | 6001408 | — | — |
| | 47 | | 0.0785 | 1" | 12" | 12 | — | 6001415 | — |
| | 46 | | 0.0810 | 1.1/8 | 12" | 12 | — | 6001410 | — |
| | 45 | | 0.0820 | 1.1/8 | 12" | 12 | — | 6001406 | — |
| | 44 | | 0.0860 | 1.1/8 | 12" | 12 | — | 6001401 | — |
| | 43 | | 0.0890 | 1.1/4 | 12" | 12 | — | 6001396 | — |
| | 42 | | 0.0935 | 1.1/4 | 12" | 12 | — | 6001394 | — |
| 3/32 | | | 0.0938 | 1.1/4 | 12" | 12 | 6001377 | — | — |
| | 41 | | 0.0960 | 1.3/8 | 12" | 12 | — | 6001386 | — |
| | 40 | | 0.0980 | 1.3/8 | 12" | 12 | — | 6001381 | — |
| | 37 | | 0.1040 | 1.7/16 | 12" | 12 | — | 6001509 | — |
| | 36 | | 0.1065 | 1.7/16 | 12" | 12 | — | 6001506 | — |
| 7/64 | | | 0.1094 | 1.1/2 | 12" | 12 | 6001189 | — | — |
| | 31 | | 0.1200 | 1.5/8 | 12" | 12 | — | 6001485 | — |
| 1/8 | | | 0.1250 | 1.5/8 | 12" | 12 | 6001324 | — | — |
| | 30 | | 0.1285 | 1.5/8 | 12" | 12 | — | 6001463 | — |
| | 29 | | 0.1360 | 1.3/4 | 12" | 12 | — | 6001375 | — |
| 9/64 | | | 0.1406 | 1.3/4 | 12" | 12 | 6001236 | — | — |
| | 27 | | 0.1440 | 1.7/8 | 12" | 12 | — | 6001275 | — |
| | 26 | | 0.1470 | 1.7/8 | 12" | 12 | — | 6001266 | — |
| | 25 | | 0.1495 | 1.7/8 | 12" | 12 | — | 6001262 | — |
| | 23 | | 0.1540 | 2" | 12" | 12 | — | 6001258 | — |
| 5/32 | | | 0.1563 | 2" | 12" | 12 | 6001402 | — | — |
| | 22 | | 0.1570 | 2" | 12" | 12 | — | 6001254 | — |
| | 21 | | 0.1590 | 2.1/8 | 12" | 12 | — | 6001250 | — |
| | 20 | | 0.1610 | 2.1/8 | 12" | 12 | — | 6001247 | — |
| | 19 | | 0.1660 | 2.1/8 | 12" | 12 | — | 6001245 | — |

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 | — | 6001242 | — |
| 11/64 | | | 0.1719 | 2.1/8 | 12" | 12 | 6001333 | — | — |
| | 17 | | 0.1730 | 2.3/16 | 12" | 12 | — | 6001240 | — |
| | 16 | | 0.1770 | 2.3/16 | 12" | 12 | — | 6001238 | — |
| 3/16 | | | 0.1850 | 2.5/16 | 12" | 12 | — | 6001234 | — |
| | 13 | | 0.1875 | 2.5/16 | 12" | 6 | 6001372 | — | — |
| | 12 | | 0.1890 | 2.5/16 | 12" | 6 | — | 6001232 | — |
| | 11 | | 0.1910 | 2.5/16 | 12" | 6 | — | 6001231 | — |
| | 10 | | 0.1935 | 2.7/16 | 12" | 6 | — | 6001229 | — |
| | 9 | | 0.1960 | 2.7/16 | 12" | 6 | — | 6001449 | — |
| 13/64 | | | 0.2010 | 2.7/16 | 12" | 6 | — | 6001445 | — |
| | 7 | | 0.2031 | 2.7/16 | 12" | 6 | 6001338 | — | — |
| | 5 | | 0.2055 | 2.1/2 | 12" | 6 | — | 6001436 | — |
| | 4 | | 0.2090 | 2.1/2 | 12" | 6 | — | 6001515 | — |
| | 3 | | 0.2130 | 2.1/2 | 12" | 6 | — | 6001430 | — |
| 7/32 | | | 0.2188 | 2.1/2 | 12" | 6 | 6001134 | — | — |
| | 1 | | 0.2280 | 2.5/8 | 12" | 6 | — | 6001226 | — |
| 15/64 | | A | 0.2340 | 2.5/8 | 12" | 6 | — | — | 6001352 |
| | | | 0.2344 | 2.5/8 | 12" | 6 | 6001344 | — | — |
| | | B | 0.2380 | 2.3/4 | 12" | 6 | — | — | 6001355 |
| | | C | 0.2420 | 2.3/4 | 12" | 6 | — | — | 6001358 |
| | | D | 0.2460 | 2.3/4 | 12" | 6 | — | — | 6001361 |
| 1/4 | | E | 0.2500 | 2.3/4 | 12" | 6 | 6001321 | — | — |
| | | F | 0.2570 | 2.7/8 | 12" | 6 | — | — | 6001368 |
| | | G | 0.2610 | 2.7/8 | 12" | 6 | — | — | 6001376 |
| 17/64 | | | 0.2656 | 2.7/8 | 12" | 6 | 6001347 | — | — |
| | | H | 0.2660 | 2.7/8 | 12" | 6 | — | — | 6001380 |
| | | I | 0.2720 | 2.7/8 | 12" | 6 | — | — | 6001385 |
| | | J | 0.2770 | 2.7/8 | 12" | 6 | — | — | 6001390 |
| | | K | 0.2810 | 2.15/16 | 12" | 6 | — | — | 6001395 |
| 9/32 | | | 0.2813 | 2.15/16 | 12" | 6 | 6001214 | — | — |
| | | L | 0.2900 | 2.15/16 | 12" | 6 | — | — | 6001400 |
| | | M | 0.2950 | 3.1/16 | 12" | 6 | — | — | 6001405 |
| 19/64 | | | 0.2969 | 3.1/16 | 12" | 6 | 6001350 | — | — |
| | | N | 0.3020 | 3.1/16 | 12" | 6 | — | — | 6001414 |
| 5/16 | | | 0.3125 | 3.3/16 | 12" | 6 | 6001397 | — | — |
| | | O | 0.3160 | 3.3/16 | 12" | 6 | — | — | 6001419 |
| | | P | 0.3230 | 3.5/16 | 12" | 6 | — | — | 6001424 |
| 21/64 | | | 0.3281 | 3.5/16 | 12" | 6 | 6001353 | — | — |
| | | Q | 0.3320 | 3.7/16 | 12" | 6 | — | — | 6001434 |
| | | R | 0.3390 | 3.7/16 | 12" | 6 | — | — | 6001251 |
| 11/32 | | | 0.3437 | 3.7/16 | 12" | 6 | 6001327 | — | — |
| | | S | 0.3480 | 3.1/2 | 12" | 3 | — | — | 6001300 |
| | | T | 0.3580 | 3.1/2 | 12" | 3 | — | — | 6001331 |
| 23/64 | | | 0.3594 | 3.1/2 | 12" | 3 | 6001356 | — | — |
| | | U | 0.3680 | 3.5/8 | 12" | 3 | — | — | 6001367 |
| 3/8 | | | 0.3750 | 3.5/8 | 12" | 3 | 6001388 | — | — |
| | | V | 0.3770 | 3.5/8 | 12" | 3 | — | — | 6001423 |
| | | W | 0.3860 | 3.3/4 | 12" | 3 | — | — | 6001432 |
| 25/64 | | | 0.3906 | 3.3/4 | 12" | 3 | 6001359 | — | — |
| | | X | 0.3970 | 3.3/4 | 12" | 3 | — | — | 6001438 |
| | | Y | 0.4040 | 3.7/8 | 12" | 3 | — | — | 6001442 |
| 13/32 | | | 0.4063 | 3.7/8 | 12" | 3 | 6001335 | — | — |
| | | Z | 0.4130 | 3.7/8 | 12" | 3 | — | — | 6001447 |
| 27/64 | | | 0.4219 | 3.15/16 | 12" | 3 | 6001366 | — | — |
| 7/16 | | | 0.4375 | 4.1/16 | 12" | 3 | 6001417 | — | — |
| 29/64 | | | 0.4531 | 4.3/16 | 12" | 3 | 6001369 | — | — |
| 15/32 | | | 0.4687 | 4.5/16 | 12" | 3 | 6001341 | — | — |
| 31/64 | | | 0.4844 | 4.3/8 | 12" | 3 | 6001393 | — | — |
| 1/2 | | | 0.5000 | 4.1/2 | 12" | 3 | 6001318 | — | — |

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 tempered 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 | — | — | 5995755 | — |
| 1/16 | | 0.0625 | 7/8 | 6" | 12 | 5995809 | — | — | — |
| | 52 | 0.0635 | 7/8 | 6" | 12 | — | 5996131 | — | — |
| | 51 | 0.0670 | 1" | 6" | 12 | — | 5996127 | — | — |
| | 50 | 0.0700 | 1" | 6" | 12 | — | 5996123 | — | — |
| | 49 | 0.0730 | 1" | 6" | 12 | — | 5996116 | — | — |
| | 48 | 0.0760 | 1" | 6" | 12 | — | 5996113 | — | — |
| 5/64 | | 0.0781 | 1" | 12" | 12 | — | — | 5995796 | — |
| 5/64 | | 0.0781 | 1" | 6" | 12 | 5995848 | — | — | — |
| | 47 | 0.0785 | 1" | 6" | 12 | — | 5996110 | — | — |
| | 46 | 0.0810 | 1.1/8 | 6" | 12 | — | 5996107 | — | — |
| | 45 | 0.0820 | 1.1/8 | 6" | 12 | — | 5996104 | — | — |
| | 44 | 0.0860 | 1.1/8 | 6" | 12 | — | 5996097 | — | — |
| | 43 | 0.0890 | 1.1/4 | 6" | 12 | — | 5996094 | — | — |
| | 42 | 0.0935 | 1.1/4 | 6" | 12 | — | 5996092 | — | — |
| 3/32 | | 0.0938 | 1.1/4 | 12" | 12 | — | — | 5995787 | — |
| 3/32 | | 0.0938 | 1.1/4 | 6" | 12 | 5995842 | — | — | — |
| | 41 | 0.0960 | 1.3/8 | 6" | 12 | — | 5996088 | — | — |
| | 40 | 0.0980 | 1.3/8 | 12" | 12 | — | — | — | 5995909 |
| | 40 | 0.0980 | 1.3/8 | 6" | 12 | — | 5996086 | — | — |
| | 39 | 0.0995 | 1.3/8 | 6" | 12 | — | 5996080 | — | — |
| | 38 | 0.1015 | 1.7/16 | 6" | 12 | — | 5996077 | — | — |
| | 37 | 0.1040 | 1.7/16 | 6" | 12 | — | 5996072 | — | — |
| | 36 | 0.1065 | 1.7/16 | 6" | 12 | — | 5996067 | — | — |
| 7/64 | | 0.1094 | 1.1/2 | 12" | 12 | — | — | 5995802 | — |
| 7/64 | | 0.1094 | 1.1/2 | 6" | 12 | 5995854 | — | — | — |
| | 35 | 0.1100 | 1.1/2 | 6" | 12 | — | 5996060 | — | — |
| | 34 | 0.1110 | 1.1/2 | 6" | 12 | — | 5996056 | — | — |
| | 33 | 0.1130 | 1.1/2 | 6" | 12 | — | 5996053 | — | — |
| | 32 | 0.1160 | 1.5/8 | 6" | 12 | — | 5996047 | — | — |
| | 31 | 0.1200 | 1.5/8 | 6" | 12 | — | 5996044 | — | — |
| 1/8 | | 0.1250 | 1.5/8 | 12" | 12 | — | — | 5995763 | — |
| 1/8 | | 0.1250 | 1.5/8 | 6" | 12 | 5995818 | — | — | — |

AIRCRAFT EXTENSION DRILL



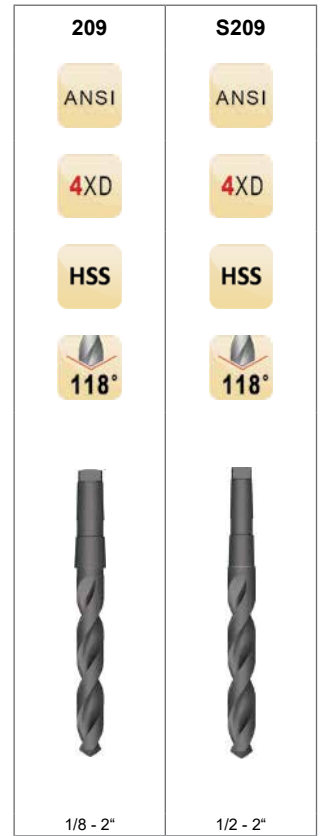
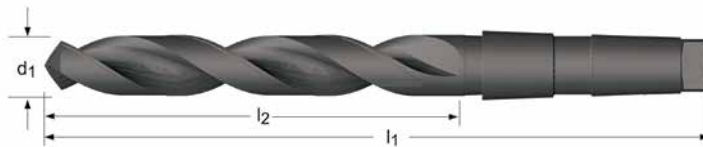
| d ₁ ∅ Inch | d ₁ | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | CO500-6 | CO501-6 | CO500-12 | CO501-12 |
|-----------------------------|----------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|----------|----------|
| | 30 | 0.1285 | 1.5/8 | 12" | 12 | — | — | — | 5995899 |
| | 30 | 0.1285 | 1.5/8 | 6" | 12 | — | 5996040 | — | — |
| | 29 | 0.1360 | 1.3/4 | 12" | 12 | — | — | — | 5995895 |
| | 29 | 0.1360 | 1.3/4 | 6" | 12 | — | 5996033 | — | — |
| | 28 | 0.1405 | 1.3/4 | 6" | 12 | — | 5996029 | — | — |
| 9/64 | | 0.1406 | 1.3/4 | 12" | 12 | — | — | 5995805 | — |
| 9/64 | | 0.1406 | 1.3/4 | 6" | 12 | 5995858 | — | — | — |
| | 27 | 0.1440 | 1.7/8 | 12" | 12 | — | — | — | 5995891 |
| | 27 | 0.1440 | 1.7/8 | 6" | 12 | — | 5996024 | — | — |
| | 26 | 0.1470 | 1.7/8 | 6" | 12 | — | 5996018 | — | — |
| | 25 | 0.1495 | 1.7/8 | 6" | 12 | — | 5996014 | — | — |
| | 24 | 0.1520 | 2" | 6" | 12 | — | 5996010 | — | — |
| | 23 | 0.1540 | 2" | 6" | 12 | — | 5996007 | — | — |
| 5/32 | | 0.1563 | 2" | 12" | 12 | — | — | 5995792 | — |
| 5/32 | | 0.1563 | 2" | 6" | 12 | 5995845 | — | — | — |
| | 22 | 0.1570 | 2" | 6" | 12 | — | 5996004 | — | — |
| | 21 | 0.1590 | 2.1/8 | 12" | 12 | — | — | — | 5995887 |
| | 21 | 0.1590 | 2.1/8 | 6" | 12 | — | 5996000 | — | — |
| | 20 | 0.1610 | 2.1/8 | 12" | 12 | — | — | — | 5995883 |
| | 20 | 0.1610 | 2.1/8 | 6" | 12 | — | 5995996 | — | — |
| | 19 | 0.1660 | 2.1/8 | 12" | 12 | — | — | — | 5995877 |
| | 19 | 0.1660 | 2.1/8 | 6" | 12 | — | 5995988 | — | — |
| | 18 | 0.1695 | 2.1/8 | 6" | 12 | — | 5995984 | — | — |
| 11/64 | | 0.1719 | 2.1/8 | 12" | 12 | — | — | 5995767 | — |
| 11/64 | | 0.1719 | 2.1/8 | 6" | 12 | 5995822 | — | — | — |
| | 17 | 0.1730 | 2.3/16 | 6" | 12 | — | 5996159 | — | — |
| | 16 | 0.1770 | 2.3/16 | 12" | 12 | — | — | — | 5995873 |
| | 16 | 0.1770 | 2.3/16 | 6" | 12 | — | 5996155 | — | — |
| | 15 | 0.1800 | 2.3/16 | 6" | 12 | — | 5996151 | — | — |
| | 14 | 0.1820 | 2.3/16 | 6" | 12 | — | 5996147 | — | — |
| | 13 | 0.1850 | 2.5/16 | 6" | 12 | — | 5996139 | — | — |
| 3/16 | | 0.1875 | 2.5/16 | 12" | 6 | — | — | 5995779 | — |
| 3/16 | | 0.1875 | 2.5/16 | 6" | 12 | 5995839 | — | — | — |
| | 12 | 0.1890 | 2.5/16 | 6" | 12 | — | 5996100 | — | — |
| | 11 | 0.1910 | 2.5/16 | 12" | 12 | — | — | — | 5995869 |
| | 11 | 0.1910 | 2.5/16 | 6" | 12 | — | 5996064 | — | — |
| | 10 | 0.1935 | 2.7/16 | 12" | 6 | — | — | — | 5995861 |
| | 10 | 0.1935 | 2.7/16 | 6" | 12 | — | 5996022 | — | — |
| | 9 | 0.1960 | 2.7/16 | 6" | 12 | — | 5995556 | — | — |
| | 8 | 0.1990 | 2.7/16 | 6" | 12 | — | 5995507 | — | — |
| | 7 | 0.2010 | 2.7/16 | 6" | 12 | — | 5996143 | — | — |
| 13/64 | | 0.2031 | 2.7/16 | 12" | 6 | — | — | 5995771 | — |
| 13/64 | | 0.2031 | 2.7/16 | 6" | 12 | 5995831 | — | — | — |
| | 6 | 0.2040 | 2.1/2 | 6" | 12 | — | 5996135 | — | — |
| | 5 | 0.2055 | 2.1/2 | 6" | 12 | — | 5996119 | — | — |
| | 4 | 0.2090 | 2.1/2 | 6" | 12 | — | 5996083 | — | — |
| | 3 | 0.2130 | 2.1/2 | 6" | 12 | — | 5996037 | — | — |
| 7/32 | | 0.2188 | 2.1/2 | 12" | 6 | — | — | 5995799 | — |
| 7/32 | | 0.2188 | 2.1/2 | 6" | 12 | 5995851 | — | — | — |
| | 2 | 0.2210 | 2.5/8 | 12" | 6 | — | — | — | 5995880 |
| | 2 | 0.2210 | 2.5/8 | 6" | 12 | — | 5995992 | — | — |
| | 1 | 0.2280 | 2.5/8 | 6" | 12 | — | 5995980 | — | — |
| 15/64 | | 0.2344 | 2.5/8 | 12" | 6 | — | — | 5995775 | — |
| 15/64 | | 0.2344 | 2.5/8 | 6" | 12 | 5995835 | — | — | — |
| 1/4 | | 0.2500 | 2.3/4 | 12" | 6 | — | — | 5995759 | — |
| 1/4 | | 0.2500 | 2.3/4 | 6" | 12 | 5995813 | — | — | — |

General Purpose Taper Shank

209 Standard Taper Type

S209 Small Taper Type

Steam tempered for increased tool life & lubricity.



| 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 | 6001003 | — |
| 9/64 | 0.1406 | 2.1/8 | 5.3/8 | 1 | 1 | 6001068 | — |
| 5/32 | 0.1563 | 2.1/8 | 5.3/8 | 1 | 1 | 6001011 | — |
| 11/64 | 0.1719 | 2.1/2 | 5.3/4 | 1 | 1 | 6001018 | — |
| 3/16 | 0.1875 | 2.1/2 | 5.3/4 | 1 | 1 | 6001135 | — |
| 13/64 | 0.2031 | 2.3/4 | 6" | 1 | 1 | 6001032 | — |
| 7/32 | 0.2188 | 2.3/4 | 6" | 1 | 1 | 6001056 | — |
| 15/64 | 0.2344 | 2.7/8 | 6.1/8 | 1 | 1 | 6001048 | — |
| 1/4 | 0.2500 | 2.7/8 | 6.1/8 | 1 | 1 | 6001000 | — |
| 17/64 | 0.2656 | 3" | 6.1/4 | 1 | 1 | 6001054 | — |
| 9/32 | 0.2813 | 3" | 6.1/4 | 1 | 1 | 6001065 | — |
| 19/64 | 0.2969 | 3.1/8 | 6.3/8 | 1 | 1 | 6001060 | — |
| 5/16 | 0.3125 | 3.1/8 | 6.3/8 | 1 | 1 | 6001196 | — |
| 21/64 | 0.3281 | 3.1/4 | 6.1/2 | 1 | 1 | 6001095 | — |
| 11/32 | 0.3437 | 3.1/4 | 6.1/2 | 1 | 1 | 6001012 | — |
| 23/64 | 0.3594 | 3.1/2 | 6.3/4 | 1 | 1 | 6001101 | — |
| 3/8 | 0.3750 | 3.1/2 | 6.3/4 | 1 | 1 | 6001144 | — |
| 25/64 | 0.3906 | 3.5/8 | 7" | 1 | 1 | 6001112 | — |
| 13/32 | 0.4063 | 3.5/8 | 7" | 1 | 1 | 6001027 | — |
| 27/64 | 0.4219 | 3.7/8 | 7.1/4 | 1 | 1 | 6001118 | — |
| 7/16 | 0.4375 | 3.7/8 | 7.1/4 | 1 | 1 | 6001050 | — |
| 29/64 | 0.4531 | 4.1/8 | 7.1/2 | 1 | 1 | 6001125 | — |
| 15/32 | 0.4687 | 4.1/8 | 7.1/2 | 1 | 1 | 6001046 | — |
| 31/64 | 0.4844 | 4.3/8 | 8.1/4 | 2 | 1 | 6001152 | — |
| 1/2 | 0.5000 | 4.3/8 | 7.3/4 | 1 | 1 | — | 5999934 |
| 1/2 | 0.5000 | 4.3/8 | 8.1/4 | 2 | 1 | 6000998 | — |
| 33/64 | 0.5156 | 4.5/8 | 8" | 1 | 1 | — | 5999791 |
| 33/64 | 0.5156 | 4.5/8 | 8.1/2 | 2 | 1 | 6001161 | — |
| 17/32 | 0.5313 | 4.5/8 | 8" | 1 | 1 | — | 5999777 |
| 17/32 | 0.5313 | 4.5/8 | 8.1/2 | 2 | 1 | 6001051 | — |
| 35/64 | 0.5469 | 4.7/8 | 8.1/4 | 1 | 1 | — | 5999793 |
| 35/64 | 0.5469 | 4.7/8 | 8.3/4 | 2 | 1 | 6001005 | — |
| 9/16 | 0.5625 | 4.7/8 | 8.1/4 | 1 | 1 | — | 5999807 |

TAPER SHANK DRILL



| d ₁ Ø | d ₁ decimal | l ₂ | l ₁ | MTS | Pack Qty | 209 | S209 |
|---------------------|---------------------------|----------------|----------------|-----|-------------|---------|---------|
| Inch | Inch | Inch | Inch | | | | |
| 9/16 | 0.5625 | 4.7/8 | 8.3/4 | 2 | 1 | 6001062 | — |
| 37/64 | 0.5781 | 4.7/8 | 8.3/4 | 2 | 1 | 6001053 | — |
| 19/32 | 0.5937 | 4.7/8 | 8.3/4 | 2 | 1 | 6001057 | — |
| 39/64 | 0.6094 | 4.7/8 | 8.3/4 | 2 | 1 | 6001086 | — |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 2 | 1 | 6001015 | — |
| 41/64 | 0.6406 | 5.1/8 | 9" | 2 | 1 | 6001120 | — |
| 21/32 | 0.6563 | 5.1/8 | 9" | 2 | 1 | 6001093 | — |
| 43/64 | 0.6719 | 5.3/8 | 9.1/4 | 2 | 1 | 6001175 | — |
| 11/16 | 0.6875 | 5.3/8 | 9.1/4 | 2 | 1 | 6001008 | — |
| 45/64 | 0.7031 | 5.5/8 | 9.1/2 | 2 | 1 | 6001186 | — |
| 23/32 | 0.7188 | 5.5/8 | 9.1/2 | 2 | 1 | 6001098 | — |
| 47/64 | 0.7344 | 5.7/8 | 9.3/4 | 2 | 1 | 6001190 | — |
| 3/4 | 0.7500 | 5.7/8 | 9.3/4 | 2 | 1 | 6001139 | — |
| 49/64 | 0.7656 | 6" | 9.7/8 | 2 | 1 | 6001193 | — |
| 25/32 | 0.7813 | 6" | 9.7/8 | 2 | 1 | 6001104 | — |
| 51/64 | 0.7969 | 6.1/8 | 10" | 2 | 1 | — | 5999794 |
| 51/64 | 0.7969 | 6.1/8 | 10.3/4 | 3 | 1 | 6001021 | — |
| 13/16 | 0.8125 | 6.1/8 | 10" | 2 | 1 | — | 5999772 |
| 13/16 | 0.8125 | 6.1/8 | 10.3/4 | 3 | 1 | 6001023 | — |
| 53/64 | 0.8281 | 6.1/8 | 10" | 2 | 1 | — | 5999796 |
| 53/64 | 0.8281 | 6.1/8 | 10.3/4 | 3 | 1 | 6001025 | — |
| 27/32 | 0.8438 | 6.1/8 | 10" | 2 | 1 | — | 5999783 |
| 27/32 | 0.8438 | 6.1/8 | 10.3/4 | 3 | 1 | 6001115 | — |
| 55/64 | 0.8594 | 6.1/8 | 10.3/4 | 3 | 1 | 6001031 | — |
| 7/8 | 0.8750 | 6.1/8 | 10" | 2 | 1 | — | 5999805 |
| 7/8 | 0.8750 | 6.1/8 | 10.3/4 | 3 | 1 | 6001059 | — |
| 57/64 | 0.8906 | 6.1/8 | 10.3/4 | 3 | 1 | 6001035 | — |
| 29/32 | 0.9063 | 6.1/8 | 10" | 2 | 1 | — | 5999786 |
| 29/32 | 0.9063 | 6.1/8 | 10.3/4 | 3 | 1 | 6001122 | — |
| 59/64 | 0.9219 | 6.1/8 | 10.3/4 | 3 | 1 | 6001039 | — |
| 15/16 | 0.9375 | 6.1/8 | 10.3/4 | 3 | 1 | 6001037 | — |
| 61/64 | 0.9531 | 6.3/8 | 11" | 3 | 1 | 6001043 | — |
| 31/32 | 0.9688 | 6.3/8 | 11" | 3 | 1 | 6001148 | — |
| 63/64 | 0.9844 | 6.3/8 | 11" | 3 | 1 | 6001047 | — |
| 1" | 1.0000 | 6.3/8 | 11" | 3 | 1 | 5999465 | — |
| 1.1/64 | 1.0156 | 6.1/2 | 11.1/8 | 3 | 1 | 5999470 | — |
| 1.1/32 | 1.0312 | 6.1/2 | 11.1/8 | 3 | 1 | 5999468 | — |
| 1.3/64 | 1.0469 | 6.5/8 | 11.1/4 | 3 | 1 | 5999506 | — |
| 1.1/16 | 1.0625 | 6.5/8 | 11.1/4 | 3 | 1 | 5999466 | — |
| 1.5/64 | 1.0781 | 6.7/8 | 12.1/2 | 4 | 1 | 6000992 | — |
| 1.3/32 | 1.0937 | 6.7/8 | 11.1/2 | 3 | 1 | — | 6000482 |
| 1.3/32 | 1.0937 | 6.7/8 | 12.1/2 | 4 | 1 | 5999502 | — |
| 1.7/64 | 1.1094 | 7.1/8 | 11.3/4 | 3 | 1 | — | 5999914 |
| 1.7/64 | 1.1094 | 7.1/8 | 12.3/4 | 4 | 1 | 6001157 | — |
| 1.1/8 | 1.1250 | 7.1/8 | 11.3/4 | 3 | 1 | — | 6000436 |
| 1.1/8 | 1.1250 | 7.1/8 | 12.3/4 | 4 | 1 | 5999471 | — |
| 1.9/64 | 1.1406 | 7.1/4 | 11.7/8 | 3 | 1 | — | 5999930 |
| 1.9/64 | 1.1406 | 7.1/4 | 12.7/8 | 4 | 1 | 6001181 | — |
| 1.5/32 | 1.1563 | 7.1/4 | 11.7/8 | 3 | 1 | — | 5999769 |
| 1.5/32 | 1.1563 | 7.1/4 | 12.7/8 | 4 | 1 | 5999518 | — |
| 1.11/64 | 1.1719 | 7.3/8 | 12" | 3 | 1 | — | 6000443 |
| 1.11/64 | 1.1719 | 7.3/8 | 13" | 4 | 1 | 5999475 | — |
| 1.3/16 | 1.1875 | 7.3/8 | 12" | 3 | 1 | — | 6000476 |
| 1.3/16 | 1.1875 | 7.3/8 | 13" | 4 | 1 | 5999500 | — |
| 1.13/64 | 1.2031 | 7.1/2 | 12.1/8 | 3 | 1 | — | 6000449 |
| 1.7/32 | 1.2187 | 7.1/2 | 12.1/8 | 3 | 1 | — | 5999870 |
| 1.7/32 | 1.2187 | 7.1/2 | 13.1/8 | 4 | 1 | 6001109 | — |
| 1.15/64 | 1.2344 | 7.7/8 | 13.1/2 | 4 | 1 | 5999481 | — |
| 1.1/4 | 1.2500 | 7.7/8 | 12.1/2 | 3 | 1 | — | 6000433 |
| 1.1/4 | 1.2500 | 7.7/8 | 13.1/2 | 4 | 1 | 5999469 | — |
| 1.17/64 | 1.2656 | 8.1/2 | 14.1/8 | 4 | 1 | 5999483 | — |
| 1.9/32 | 1.2813 | 8.1/2 | 14.1/8 | 4 | 1 | 6001178 | — |
| 1.19/64 | 1.2969 | 8.5/8 | 14.1/4 | 4 | 1 | 5999486 | — |
| 1.5/16 | 1.3125 | 8.5/8 | 14.1/4 | 4 | 1 | 5999514 | — |
| 1.21/64 | 1.3281 | 8.3/4 | 14.3/8 | 4 | 1 | 5999488 | — |
| 1.11/32 | 1.3437 | 8.3/4 | 14.3/8 | 4 | 1 | 5999474 | — |

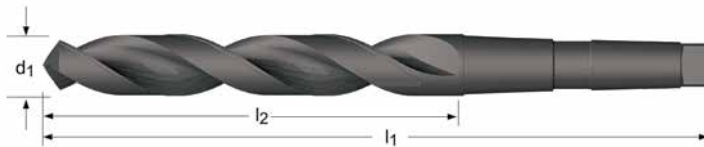
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | MTS | Pack Qty | 209 | S209 |
|--------------------|--------------------------|---------------|---------------|-----|-------------|---------|---------|
| 1.3/8 | 1.3750 | 8.7/8 | 14.1/2 | 4 | 1 | 5999508 | — |
| 1.13/32 | 1.4063 | 9" | 14.5/8 | 4 | 1 | 5999477 | — |
| 1.27/64 | 1.4219 | 9.1/8 | 14.3/4 | 4 | 1 | 5999494 | — |
| 1.7/16 | 1.4375 | 9.1/8 | 14.3/4 | 4 | 1 | 6001075 | — |
| 1.15/32 | 1.4687 | 9.1/4 | 14.7/8 | 4 | 1 | 5999480 | — |
| 1.31/64 | 1.4844 | 9.3/8 | 15" | 4 | 1 | 5999512 | — |
| 1.1/2 | 1.5000 | 9.3/8 | 15" | 4 | 1 | 5999467 | — |
| 1.33/64 | 1.5156 | 9.3/8 | 15" | 4 | 1 | — | 6000491 |
| 1.17/32 | 1.5313 | 9.3/8 | 15" | 4 | 1 | — | 6000461 |
| 1.17/32 | 1.5313 | 9.3/8 | 16.3/8 | 5 | 1 | 5999482 | — |
| 1.35/64 | 1.5469 | 9.5/8 | 15.1/4 | 4 | 1 | — | 6000497 |
| 1.9/16 | 1.5625 | 9.5/8 | 15.1/4 | 4 | 1 | — | 5999926 |
| 1.9/16 | 1.5625 | 9.5/8 | 16.5/8 | 5 | 1 | 6001173 | — |
| 1.19/32 | 1.5937 | 9.7/8 | 15.1/2 | 4 | 1 | — | 6000463 |
| 1.39/64 | 1.6094 | 10" | 15.5/8 | 4 | 1 | — | 6000504 |
| 1.5/8 | 1.6250 | 10" | 15.5/8 | 4 | 1 | — | 5999828 |
| 1.5/8 | 1.6250 | 10" | 17" | 5 | 1 | 6001042 | — |
| 1.21/32 | 1.6563 | 10.1/8 | 15.3/4 | 4 | 1 | — | 6000465 |
| 1.11/16 | 1.6875 | 10.1/8 | 15.3/4 | 4 | 1 | — | 6000440 |
| 1.11/16 | 1.6875 | 10.1/8 | 17.1/8 | 5 | 1 | 5999472 | — |
| 1.47/64 | 1.7344 | 10.3/8 | 16.1/4 | 4 | 1 | — | 6000520 |
| 1.3/4 | 1.7500 | 10.1/8 | 17.1/8 | 5 | 1 | 5999504 | — |
| 1.3/4 | 1.7500 | 10.3/8 | 16.1/4 | 4 | 1 | — | 6000484 |
| 1.25/32 | 1.7813 | 10.3/8 | 16.1/4 | 4 | 1 | — | 6000469 |
| 1.13/16 | 1.8125 | 10.1/8 | 17.1/8 | 5 | 1 | 5999476 | — |
| 1.13/16 | 1.8125 | 10.3/8 | 16.1/4 | 4 | 1 | — | 6000446 |
| 1.7/8 | 1.8750 | 10.1/2 | 16.1/2 | 4 | 1 | — | 5999922 |
| 1.7/8 | 1.8750 | 10.3/8 | 17.3/8 | 5 | 1 | 6001164 | — |
| 1.15/16 | 1.9375 | 10.3/8 | 17.3/8 | 5 | 1 | 5999479 | — |
| 1.15/16 | 1.9375 | 10.5/8 | 16.5/8 | 4 | 1 | — | 6000455 |
| 1.31/32 | 1.9687 | 10.5/8 | 16.5/8 | 4 | 1 | — | 6000488 |
| 2" | 2.0000 | 10.3/8 | 17.3/8 | 5 | 1 | 6001063 | — |
| 2" | 2.0000 | 10.5/8 | 16.5/8 | 4 | 1 | — | 5999780 |

General Purpose Taper Shank, Metric

5ATS Steam tempered for increased wear resistance & lubricity.

A350 Long series. Steam tempered 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 |
|--------------|--------------|--------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| 5.00 - 50.00 | 5.00 - 50.00 | 8.50 - 40.00 |

| d ₁ Ø _{h₈} 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 | — | 5969914 | — |
| 5.00 | 0.1969 | 52 | 133 | 1 | 1 | 6001263 | — | — |
| 5.50 | 0.2165 | 80 | 161 | 1 | 1 | — | 5969918 | — |
| 5.50 | 0.2165 | 57 | 138 | 1 | 1 | 6001267 | — | — |
| 6.00 | 0.2362 | 80 | 161 | 1 | 1 | — | 5970237 | — |
| 6.00 | 0.2362 | 57 | 138 | 1 | 1 | 6001278 | — | — |
| 6.50 | 0.2559 | 63 | 144 | 1 | 1 | 6001283 | — | — |
| 6.70 | 0.2638 | 86 | 167 | 1 | 1 | — | 5970279 | — |
| 6.80 | 0.2677 | 93 | 174 | 1 | 1 | — | 5970322 | — |
| 6.80 | 0.2677 | 69 | 150 | 1 | 1 | 6001287 | — | — |
| 7.00 | 0.2756 | 93 | 174 | 1 | 1 | — | 5970363 | — |
| 7.00 | 0.2756 | 69 | 150 | 1 | 1 | 6001291 | — | — |
| 7.50 | 0.2953 | 93 | 174 | 1 | 1 | — | 5970371 | — |
| 7.50 | 0.2953 | 69 | 150 | 1 | 1 | 6001298 | — | — |
| 8.00 | 0.3150 | 100 | 181 | 1 | 1 | — | 5970375 | — |
| 8.00 | 0.3150 | 75 | 156 | 1 | 1 | 6001301 | — | — |
| 8.40 | 0.3307 | 100 | 181 | 1 | 1 | — | 5970378 | — |
| 8.50 | 0.3346 | 100 | 181 | 1 | 1 | — | 5970382 | — |
| 8.50 | 0.3346 | 75 | 156 | 1 | 1 | 6001304 | — | 5970277 |
| 8.75 | 0.3445 | 107 | 188 | 1 | 1 | — | 5970207 | — |
| 9.00 | 0.3543 | 107 | 188 | 1 | 1 | — | 5970209 | — |
| 9.00 | 0.3543 | 81 | 162 | 1 | 1 | 6001307 | — | 5970281 |
| 9.50 | 0.3740 | 107 | 188 | 1 | 1 | — | 5970211 | — |
| 9.50 | 0.3740 | 81 | 162 | 1 | 1 | 6001312 | — | — |
| 9.80 | 0.3858 | 116 | 197 | 1 | 1 | — | 5970215 | — |
| 10.00 | 0.3937 | 116 | 197 | 1 | 1 | — | 5969555 | — |
| 10.00 | 0.3937 | 87 | 168 | 1 | 1 | 6001470 | — | 5970037 |
| 10.20 | 0.4016 | 116 | 197 | 1 | 1 | — | 5969559 | — |
| 10.20 | 0.4016 | 87 | 168 | 1 | 1 | 6001472 | — | 5970047 |
| 10.50 | 0.4134 | 116 | 197 | 1 | 1 | — | 5969564 | — |
| 10.50 | 0.4134 | 87 | 168 | 1 | 1 | 6001474 | — | 5970052 |
| 10.70 | 0.4213 | 125 | 206 | 1 | 1 | — | 5969571 | — |
| 11.00 | 0.4331 | 125 | 206 | 1 | 1 | — | 5969575 | — |

| d ₁ Øh 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 | 6001476 | — | 5970057 |
| 11.50 | 0.4528 | 125 | 206 | 1 | 1 | — | 5969581 | — |
| 11.50 | 0.4528 | 94 | 175 | 1 | 1 | 6001478 | — | 5970062 |
| 11.75 | 0.4626 | 125 | 206 | 1 | 1 | — | 5969585 | — |
| 11.75 | 0.4626 | 94 | 175 | 1 | 1 | — | — | 5970067 |
| 11.80 | 0.4646 | 125 | 206 | 1 | 1 | — | 5969590 | — |
| 12.00 | 0.4724 | 134 | 215 | 1 | 1 | — | 5969595 | — |
| 12.00 | 0.4724 | 101 | 182 | 1 | 1 | 6001482 | — | 5970071 |
| 12.20 | 0.4803 | 101 | 182 | 1 | 1 | 6001484 | — | — |
| 12.50 | 0.4921 | 134 | 215 | 1 | 1 | — | 5969600 | — |
| 12.50 | 0.4921 | 101 | 182 | 1 | 1 | 6001486 | — | 5970075 |
| 12.80 | 0.5039 | 101 | 182 | 1 | 1 | 6001488 | — | — |
| 13.00 | 0.5118 | 134 | 215 | 1 | 1 | — | 5969605 | — |
| 13.00 | 0.5118 | 101 | 182 | 1 | 1 | 6001491 | — | 5970079 |
| 13.50 | 0.5315 | 142 | 223 | 1 | 1 | — | 5969609 | — |
| 13.50 | 0.5315 | 108 | 189 | 1 | 1 | 6001493 | — | 5970084 |
| 13.80 | 0.5433 | 108 | 189 | 1 | 1 | 6001495 | — | — |
| 14.00 | 0.5512 | 142 | 223 | 1 | 1 | — | 5969613 | — |
| 14.00 | 0.5512 | 108 | 189 | 1 | 1 | 6001497 | — | 5970087 |
| 14.25 | 0.5610 | 147 | 245 | 2 | 1 | — | 5969621 | — |
| 14.25 | 0.5610 | 114 | 212 | 2 | 1 | 6001499 | — | — |
| 14.50 | 0.5709 | 147 | 245 | 2 | 1 | — | 5969625 | — |
| 14.50 | 0.5709 | 114 | 212 | 2 | 1 | 6001501 | — | 5970095 |
| 14.75 | 0.5807 | 147 | 245 | 2 | 1 | — | 5969630 | — |
| 14.75 | 0.5807 | 114 | 212 | 2 | 1 | 6001505 | — | — |
| 15.00 | 0.5906 | 147 | 245 | 2 | 1 | — | 5969635 | — |
| 15.00 | 0.5906 | 114 | 212 | 2 | 1 | 6001009 | — | 5970098 |
| 15.25 | 0.6004 | 120 | 218 | 2 | 1 | — | — | 5970101 |
| 15.25 | 0.6004 | 153 | 251 | 2 | 1 | — | 5969638 | — |
| 15.50 | 0.6102 | 153 | 251 | 2 | 1 | — | 5969642 | — |
| 15.50 | 0.6102 | 120 | 218 | 2 | 1 | 6001088 | — | 5970105 |
| 15.75 | 0.6201 | 153 | 251 | 2 | 1 | — | 5969647 | — |
| 15.75 | 0.6201 | 120 | 218 | 2 | 1 | 6001119 | — | — |
| 16.00 | 0.6299 | 153 | 251 | 2 | 1 | — | 5969651 | — |
| 16.00 | 0.6299 | 120 | 218 | 2 | 1 | 6001165 | — | 5970108 |
| 16.25 | 0.6398 | 159 | 257 | 2 | 1 | — | 5969655 | — |
| 16.50 | 0.6496 | 159 | 257 | 2 | 1 | — | 5969657 | — |
| 16.50 | 0.6496 | 125 | 223 | 2 | 1 | 6001179 | — | 5970114 |
| 16.75 | 0.6594 | 159 | 257 | 2 | 1 | — | 5969663 | — |
| 17.00 | 0.6693 | 159 | 257 | 2 | 1 | — | 5969717 | — |
| 17.00 | 0.6693 | 125 | 223 | 2 | 1 | 6001187 | — | 5970117 |
| 17.25 | 0.6791 | 165 | 263 | 2 | 1 | — | 5969775 | — |
| 17.50 | 0.6890 | 165 | 263 | 2 | 1 | — | 5969834 | — |
| 17.50 | 0.6890 | 130 | 228 | 2 | 1 | 6001020 | — | 5970121 |
| 18.00 | 0.7087 | 165 | 263 | 2 | 1 | — | 5969878 | — |
| 18.00 | 0.7087 | 130 | 228 | 2 | 1 | 6001026 | — | 5970125 |
| 18.50 | 0.7283 | 171 | 269 | 2 | 1 | — | 5969916 | — |
| 18.50 | 0.7283 | 135 | 233 | 2 | 1 | 6001029 | — | 5970129 |
| 19.00 | 0.7480 | 171 | 269 | 2 | 1 | — | 5969920 | — |
| 19.00 | 0.7480 | 135 | 233 | 2 | 1 | 6001034 | — | 5970135 |
| 19.50 | 0.7677 | 177 | 275 | 2 | 1 | — | 5969922 | — |
| 19.50 | 0.7677 | 140 | 238 | 2 | 1 | 6001038 | — | 5970206 |
| 19.75 | 0.7776 | 177 | 275 | 2 | 1 | — | 5969924 | — |
| 20.00 | 0.7874 | 177 | 275 | 2 | 1 | — | 5969927 | — |
| 20.00 | 0.7874 | 140 | 238 | 2 | 1 | 6001041 | — | 5970243 |
| 20.25 | 0.7972 | 184 | 282 | 2 | 1 | — | 5969723 | — |
| 20.50 | 0.8071 | 184 | 282 | 2 | 1 | — | 5969727 | — |
| 20.50 | 0.8071 | 145 | 243 | 2 | 1 | 6001045 | — | 5970284 |
| 21.00 | 0.8268 | 184 | 282 | 2 | 1 | — | 5969731 | — |
| 21.00 | 0.8268 | 145 | 243 | 2 | 1 | 6001049 | — | 5970327 |
| 21.50 | 0.8465 | 191 | 289 | 2 | 1 | — | 5969737 | — |
| 21.50 | 0.8465 | 150 | 248 | 2 | 1 | 6001052 | — | 5970368 |
| 22.00 | 0.8661 | 191 | 289 | 2 | 1 | — | 5969742 | — |
| 22.00 | 0.8661 | 150 | 248 | 2 | 1 | 6001058 | — | 5970377 |
| 22.50 | 0.8858 | 198 | 296 | 2 | 1 | — | 5969746 | — |
| 22.50 | 0.8858 | 155 | 253 | 2 | 1 | 6001061 | — | 5970381 |

| d_1 $\varnothing h_8$ 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 | — | 5969751 | — |
| 23.00 | 0.9055 | 155 | 253 | 2 | 1 | 6001064 | — | 5970384 |
| 23.50 | 0.9252 | 198 | 319 | 3 | 1 | — | 5969756 | — |
| 23.50 | 0.9252 | 155 | 276 | 3 | 1 | 6001067 | — | 5970387 |
| 24.00 | 0.9449 | 206 | 327 | 3 | 1 | — | 5969764 | — |
| 24.00 | 0.9449 | 160 | 281 | 3 | 1 | 6001070 | — | 5970212 |
| 24.50 | 0.9646 | 206 | 327 | 3 | 1 | — | 5969770 | — |
| 24.50 | 0.9646 | 160 | 281 | 3 | 1 | 6001073 | — | 5970214 |
| 25.00 | 0.9843 | 206 | 327 | 3 | 1 | — | 5969780 | — |
| 25.00 | 0.9843 | 160 | 281 | 3 | 1 | 6001076 | — | 5970217 |
| 25.50 | 1.0039 | 165 | 286 | 3 | 1 | — | — | 5970220 |
| 25.50 | 1.0039 | 214 | 335 | 3 | 1 | — | 5969786 | — |
| 26.00 | 1.0236 | 214 | 335 | 3 | 1 | — | 5969791 | — |
| 26.00 | 1.0236 | 165 | 286 | 3 | 1 | 6001082 | — | 5970223 |
| 26.50 | 1.0433 | 214 | 335 | 3 | 1 | — | 5969796 | — |
| 26.50 | 1.0433 | 165 | 286 | 3 | 1 | 6001085 | — | 5970226 |
| 27.00 | 1.0630 | 222 | 343 | 3 | 1 | — | 5969802 | — |
| 27.00 | 1.0630 | 170 | 291 | 3 | 1 | 6001091 | — | 5970229 |
| 27.50 | 1.0827 | 170 | 291 | 3 | 1 | — | — | 5970231 |
| 27.50 | 1.0827 | 222 | 343 | 3 | 1 | — | 5969805 | — |
| 28.00 | 1.1024 | 222 | 343 | 3 | 1 | — | 5969808 | — |
| 28.00 | 1.1024 | 170 | 291 | 3 | 1 | 6001099 | — | 5970235 |
| 28.50 | 1.1220 | 175 | 296 | 3 | 1 | — | — | 5970238 |
| 29.00 | 1.1417 | 230 | 351 | 3 | 1 | — | 5969813 | — |
| 29.00 | 1.1417 | 175 | 296 | 3 | 1 | 6001105 | — | 5970246 |
| 29.50 | 1.1614 | 175 | 296 | 3 | 1 | — | — | 5970250 |
| 30.00 | 1.1811 | 230 | 351 | 3 | 1 | — | 5969817 | — |
| 30.00 | 1.1811 | 175 | 296 | 3 | 1 | 6001107 | — | 5970253 |
| 30.50 | 1.2008 | 239 | 360 | 3 | 1 | — | 5969826 | — |
| 31.00 | 1.2205 | 239 | 360 | 3 | 1 | — | 5969838 | — |
| 31.00 | 1.2205 | 180 | 301 | 3 | 1 | 6001113 | — | 5970257 |
| 31.50 | 1.2402 | 239 | 360 | 3 | 1 | — | 5969844 | — |
| 32.00 | 1.2598 | 248 | 397 | 4 | 1 | — | 5969848 | — |
| 32.00 | 1.2598 | 185 | 334 | 4 | 1 | 6001123 | — | 5970262 |
| 33.00 | 1.2992 | 185 | 334 | 4 | 1 | — | — | 5970266 |
| 33.00 | 1.2992 | 248 | 397 | 4 | 1 | — | 5969852 | — |
| 34.00 | 1.3386 | 257 | 406 | 4 | 1 | — | 5969855 | — |
| 34.00 | 1.3386 | 190 | 339 | 4 | 1 | 6001137 | — | — |
| 35.00 | 1.3780 | 257 | 406 | 4 | 1 | — | 5969859 | — |
| 35.00 | 1.3780 | 190 | 339 | 4 | 1 | 6001147 | — | 5970270 |
| 36.00 | 1.4173 | 267 | 416 | 4 | 1 | — | 5969863 | — |
| 36.00 | 1.4173 | 195 | 344 | 4 | 1 | 6001156 | — | — |
| 37.00 | 1.4567 | 267 | 416 | 4 | 1 | — | 5969867 | — |
| 37.00 | 1.4567 | 195 | 344 | 4 | 1 | 6001169 | — | — |
| 38.00 | 1.4961 | 277 | 426 | 4 | 1 | — | 5969871 | — |
| 38.00 | 1.4961 | 200 | 349 | 4 | 1 | 6001295 | — | — |
| 39.00 | 1.5354 | 277 | 426 | 4 | 1 | — | 5969874 | — |
| 40.00 | 1.5748 | 277 | 426 | 4 | 1 | — | 5969882 | — |
| 40.00 | 1.5748 | 200 | 349 | 4 | 1 | 6001362 | — | 5970275 |
| 41.00 | 1.6142 | 287 | 436 | 4 | 1 | — | 5969886 | — |
| 42.00 | 1.6535 | 287 | 436 | 4 | 1 | — | 5969889 | — |
| 42.00 | 1.6535 | 205 | 354 | 4 | 1 | 6001422 | — | — |
| 43.00 | 1.6929 | 298 | 447 | 4 | 1 | — | 5969893 | — |
| 44.00 | 1.7323 | 298 | 447 | 4 | 1 | — | 5969897 | — |
| 44.00 | 1.7323 | 210 | 359 | 4 | 1 | 6001433 | — | — |
| 45.00 | 1.7717 | 298 | 447 | 4 | 1 | — | 5969902 | — |
| 46.00 | 1.8110 | 310 | 459 | 4 | 1 | — | 5969905 | — |
| 47.00 | 1.8504 | 310 | 459 | 4 | 1 | — | 5969909 | — |
| 48.00 | 1.8898 | 321 | 470 | 4 | 1 | — | 5969912 | — |
| 50.00 | 1.9685 | 321 | 470 | 4 | 1 | — | 5970204 | — |
| 50.00 | 1.9685 | 220 | 369 | 4 | 1 | 6001273 | — | — |

General Purpose Taper Shank - Extra Length

A345 Steam tempered for increase wear resistance & lubricity.

A345

DIN
1870/1

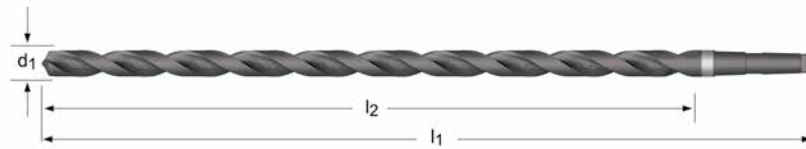
10XD

HSS

118°



8.00 - 40.00



| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | MTS | Pack Qty | A345 |
|------------------------------------|----------------------------------|--------------------------|-------------|-------------|-----|-------------|-------------|
| | 8.00 | 0.3150 | 165 | 265 | 1 | 1 | 5969532 |
| | 8.50 | 0.3346 | 165 | 265 | 1 | 1 | 5969538 |
| | 9.00 | 0.3543 | 175 | 275 | 1 | 1 | 5969541 |
| | 9.50 | 0.3740 | 175 | 275 | 1 | 1 | 5969546 |
| 3/8 | 9.52 | 0.3750 | 185 | 285 | 1 | 1 | 5969149 |
| | 10.00 | 0.3937 | 185 | 285 | 1 | 1 | 5969159 |
| 13/32 | 10.32 | 0.4063 | 185 | 285 | 1 | 1 | 5968967 |
| | 10.50 | 0.4134 | 185 | 285 | 1 | 1 | 5969162 |
| | 11.00 | 0.4331 | 195 | 300 | 1 | 1 | 5969165 |
| 7/16 | 11.11 | 0.4375 | 195 | 300 | 1 | 1 | 5969520 |
| | 11.50 | 0.4528 | 195 | 300 | 1 | 1 | 5969168 |
| 29/64 | 11.51 | 0.4531 | 205 | 310 | 1 | 1 | 5969141 |
| | 12.00 | 0.4724 | 205 | 310 | 1 | 1 | 5968952 |
| | 12.50 | 0.4921 | 205 | 310 | 1 | 1 | 5968956 |
| 1/2 | 12.70 | 0.5000 | 205 | 310 | 1 | 1 | 5969153 |
| | 13.00 | 0.5118 | 205 | 310 | 1 | 1 | 5968959 |
| 17/32 | 13.49 | 0.5313 | 220 | 325 | 1 | 1 | 5969012 |
| | 13.50 | 0.5315 | 220 | 325 | 1 | 1 | 5968963 |
| | 14.00 | 0.5512 | 220 | 325 | 1 | 1 | 5968971 |
| 9/16 | 14.29 | 0.5625 | 220 | 340 | 2 | 1 | 5969550 |
| 37/64 | 14.68 | 0.5781 | 220 | 340 | 2 | 1 | 5969669 |
| | 15.00 | 0.5906 | 220 | 340 | 2 | 1 | 5968979 |
| 39/64 | 15.48 | 0.6094 | 230 | 355 | 2 | 1 | 5969479 |
| | 15.50 | 0.6102 | 230 | 355 | 2 | 1 | 5968983 |
| 5/8 | 15.88 | 0.6250 | 230 | 355 | 2 | 1 | 5969505 |
| | 16.00 | 0.6299 | 230 | 355 | 2 | 1 | 5968992 |
| 41/64 | 16.27 | 0.6406 | 230 | 355 | 2 | 1 | 5969489 |
| | 16.50 | 0.6496 | 230 | 355 | 2 | 1 | 5968997 |
| 21/32 | 16.67 | 0.6563 | 230 | 355 | 2 | 1 | 5969062 |
| | 17.00 | 0.6693 | 230 | 355 | 2 | 1 | 5969002 |
| 11/16 | 17.46 | 0.6875 | 245 | 370 | 2 | 1 | 5968949 |
| | 17.50 | 0.6890 | 245 | 370 | 2 | 1 | 5969007 |

TAPER SHANK DRILL



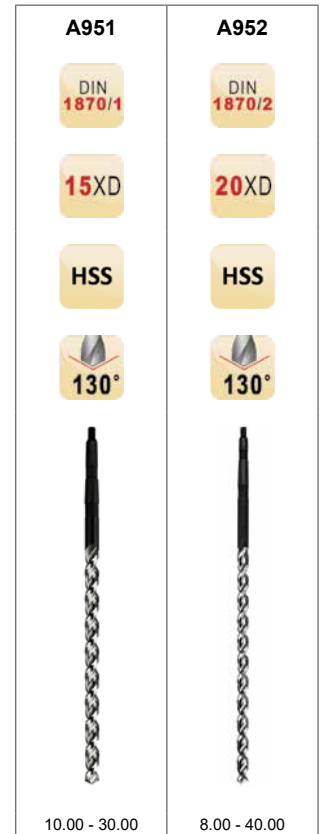
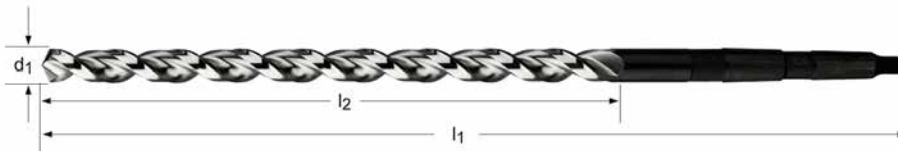
| d_1 \varnothing_{h_8} Inch | d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | MTS | Pack Qty | A345 |
|--------------------------------------|------------------------------------|--------------------------|-------------|-------------|-----|-------------|-----------------------|
| | 18.00 | 0.7087 | 245 | 370 | 2 | 1 | 5969018 |
| | 18.50 | 0.7283 | 245 | 370 | 2 | 1 | 5969023 |
| | 19.00 | 0.7480 | 245 | 370 | 2 | 1 | 5969028 |
| 3/4 | 19.05 | 0.7500 | 260 | 385 | 2 | 1 | 5969145 |
| | 19.50 | 0.7677 | 260 | 385 | 2 | 1 | 5969033 |
| | 20.00 | 0.7874 | 260 | 385 | 2 | 1 | 5969038 |
| | 20.50 | 0.8071 | 260 | 385 | 2 | 1 | 5969046 |
| | 21.00 | 0.8268 | 260 | 385 | 2 | 1 | 5969051 |
| | 21.50 | 0.8465 | 270 | 405 | 2 | 1 | 5969056 |
| | 22.00 | 0.8661 | 270 | 405 | 2 | 1 | 5969067 |
| 7/8 | 22.22 | 0.8750 | 270 | 405 | 2 | 1 | 5969525 |
| | 22.50 | 0.8858 | 270 | 405 | 2 | 1 | 5969074 |
| | 23.00 | 0.9055 | 270 | 405 | 2 | 1 | 5969076 |
| | 23.50 | 0.9252 | 270 | 425 | 3 | 1 | 5969082 |
| | 24.00 | 0.9449 | 290 | 440 | 3 | 1 | 5969090 |
| | 24.50 | 0.9646 | 290 | 440 | 3 | 1 | 5969095 |
| | 25.00 | 0.9843 | 290 | 440 | 3 | 1 | 5969105 |
| 1" | 25.40 | 1.0000 | 290 | 440 | 3 | 1 | 5968945 ¹⁾ |
| | 25.50 | 1.0039 | 290 | 440 | 3 | 1 | 5969110 ¹⁾ |
| | 26.00 | 1.0236 | 290 | 440 | 3 | 1 | 5969114 ¹⁾ |
| | 26.50 | 1.0433 | 290 | 440 | 3 | 1 | 5969119 ¹⁾ |
| | 27.00 | 1.0630 | 305 | 460 | 3 | 1 | 5969125 ¹⁾ |
| | 28.00 | 1.1024 | 305 | 460 | 3 | 1 | 5969133 ¹⁾ |
| | 29.00 | 1.1417 | 305 | 460 | 3 | 1 | 5969138 ¹⁾ |
| | 30.00 | 1.1811 | 305 | 460 | 3 | 1 | 5969156 ¹⁾ |
| 1.1/4 | 31.75 | 1.2500 | 320 | 480 | 3 | 1 | 5969042 ¹⁾ |
| | 31.00 | 1.2205 | 320 | 480 | 3 | 1 | 5969468 ¹⁾ |
| | 32.00 | 1.2598 | 320 | 505 | 4 | 1 | 5969515 ¹⁾ |
| | 33.00 | 1.2992 | 320 | 505 | 4 | 1 | 5969567 ¹⁾ |
| | 34.00 | 1.3386 | 340 | 530 | 4 | 1 | 5969617 ¹⁾ |
| | 35.00 | 1.3780 | 340 | 530 | 4 | 1 | 5969661 ¹⁾ |
| | 36.00 | 1.4173 | 340 | 530 | 4 | 1 | 5969665 ¹⁾ |
| | 37.00 | 1.4567 | 340 | 530 | 4 | 1 | 5969667 ¹⁾ |
| | 38.00 | 1.4961 | 360 | 555 | 4 | 1 | 5969671 ¹⁾ |
| 1.1/2 | 38.10 | 1.5000 | 360 | 555 | 4 | 1 | 5968988 ¹⁾ |
| | 39.00 | 1.5354 | 360 | 555 | 4 | 1 | 5969475 ¹⁾ |
| | 40.00 | 1.5748 | 360 | 555 | 4 | 1 | 5969483 ¹⁾ |

¹⁾ < 10xD

General Purpose Parabolic Flute Taper Shank - Extra Length, Metric

- A951** 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.
- 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 tempered for increased wear resistance & lubricity.



| 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 | — | 5972581 |
| 8.50 | 0.3346 | 210 | 330 | 1 | 1 | — | 5972585 |
| 9.00 | 0.3543 | 220 | 345 | 1 | 1 | — | 5972587 |
| 10.00 | 0.3937 | 185 | 285 | 1 | 1 | 5972410 | — |
| 10.00 | 0.3937 | 235 | 360 | 1 | 1 | — | 5972462 |
| 10.50 | 0.4134 | 235 | 360 | 1 | 1 | — | 5972466 |
| 11.00 | 0.4331 | 195 | 300 | 1 | 1 | 5972452 | — |
| 11.00 | 0.4331 | 250 | 375 | 1 | 1 | — | 5972470 |
| 11.50 | 0.4528 | 250 | 375 | 1 | 1 | — | 5972473 |
| 12.00 | 0.4724 | 205 | 310 | 1 | 1 | 5972499 | — |
| 12.00 | 0.4724 | 260 | 395 | 1 | 1 | — | 5972478 |
| 12.50 | 0.4921 | 205 | 310 | 1 | 1 | 5972542 | — |
| 12.50 | 0.4921 | 260 | 395 | 1 | 1 | — | 5972484 |
| 13.00 | 0.5118 | 205 | 310 | 1 | 1 | 5972549 | — |
| 13.00 | 0.5118 | 260 | 395 | 1 | 1 | — | 5972488 |
| 13.50 | 0.5315 | 220 | 325 | 1 | 1 | 5972550 | — |
| 13.50 | 0.5315 | 275 | 410 | 1 | 1 | — | 5972491 |
| 14.00 | 0.5512 | 220 | 325 | 1 | 1 | 5972552 | — |
| 14.00 | 0.5512 | 275 | 410 | 1 | 1 | — | 5972495 |
| 14.50 | 0.5709 | 220 | 340 | 2 | 1 | 5972555 ¹⁾ | — |
| 14.50 | 0.5709 | 275 | 425 | 2 | 1 | — | 5972503 ²⁾ |
| 15.00 | 0.5906 | 220 | 340 | 2 | 1 | 5972372 ¹⁾ | — |
| 15.00 | 0.5906 | 275 | 425 | 2 | 1 | — | 5972507 ²⁾ |
| 15.50 | 0.6102 | 230 | 355 | 2 | 1 | 5972376 ¹⁾ | — |
| 15.50 | 0.6102 | 295 | 445 | 2 | 1 | — | 5972511 ²⁾ |
| 16.00 | 0.6299 | 230 | 355 | 2 | 1 | 5972380 ¹⁾ | — |
| 16.00 | 0.6299 | 295 | 445 | 2 | 1 | — | 5972515 ²⁾ |
| 16.50 | 0.6496 | 230 | 355 | 2 | 1 | 5972384 ¹⁾ | — |
| 16.50 | 0.6496 | 295 | 445 | 2 | 1 | — | 5972518 ²⁾ |
| 17.00 | 0.6693 | 230 | 355 | 2 | 1 | 5972387 ¹⁾ | — |
| 17.00 | 0.6693 | 295 | 445 | 2 | 1 | — | 5972522 ²⁾ |

¹⁾ < 15xD

²⁾ < 20xD

TAPER SHANK DRILL



| d_1 $\varnothing h_8$ mm | d_1 decimal Inch | l_2 mm | l_1 mm | MTS | Pack Qty | A951 | A952 |
|----------------------------------|--------------------------|-------------|-------------|-----|-------------|-----------------------|-----------------------|
| 17.50 | 0.6890 | 245 | 370 | 2 | 1 | 5972390 ¹⁾ | — |
| 17.50 | 0.6890 | 310 | 465 | 2 | 1 | — | 5972526 ²⁾ |
| 18.00 | 0.7087 | 245 | 370 | 2 | 1 | 5972394 ¹⁾ | — |
| 18.00 | 0.7087 | 310 | 465 | 2 | 1 | — | 5972530 ²⁾ |
| 18.50 | 0.7283 | 245 | 370 | 2 | 1 | 5972398 ¹⁾ | — |
| 18.50 | 0.7283 | 310 | 465 | 2 | 1 | — | 5972534 ²⁾ |
| 19.00 | 0.7480 | 245 | 370 | 2 | 1 | 5972402 ¹⁾ | — |
| 19.00 | 0.7480 | 310 | 465 | 2 | 1 | — | 5972538 ²⁾ |
| 19.50 | 0.7677 | 260 | 385 | 2 | 1 | 5972406 ¹⁾ | — |
| 19.50 | 0.7677 | 325 | 490 | 2 | 1 | — | 5972545 ²⁾ |
| 20.00 | 0.7874 | 260 | 385 | 2 | 1 | 5972414 ¹⁾ | — |
| 20.00 | 0.7874 | 325 | 490 | 2 | 1 | — | 5972560 ²⁾ |
| 21.00 | 0.8268 | 260 | 385 | 2 | 1 | 5972416 ¹⁾ | — |
| 21.00 | 0.8268 | 325 | 490 | 2 | 1 | — | 5972583 ²⁾ |
| 22.00 | 0.8661 | 270 | 405 | 2 | 1 | 5972420 ¹⁾ | — |
| 22.00 | 0.8661 | 345 | 515 | 2 | 1 | — | 5972604 ²⁾ |
| 23.00 | 0.9055 | 270 | 405 | 2 | 1 | 5972424 ¹⁾ | — |
| 23.00 | 0.9055 | 345 | 515 | 2 | 1 | — | 5972638 ²⁾ |
| 24.00 | 0.9449 | 290 | 440 | 3 | 1 | 5972428 ¹⁾ | — |
| 24.00 | 0.9449 | 365 | 555 | 3 | 1 | — | 5972681 ²⁾ |
| 25.00 | 0.9843 | 290 | 440 | 3 | 1 | 5972432 ¹⁾ | — |
| 25.00 | 0.9843 | 365 | 555 | 3 | 1 | — | 5972690 ²⁾ |
| 26.00 | 1.0236 | 290 | 440 | 3 | 1 | 5972435 ¹⁾ | — |
| 26.00 | 1.0236 | 365 | 555 | 3 | 1 | — | 5972695 ²⁾ |
| 27.00 | 1.0630 | 305 | 460 | 3 | 1 | 5972439 ¹⁾ | — |
| 27.00 | 1.0630 | 385 | 580 | 3 | 1 | — | 5972699 ²⁾ |
| 28.00 | 1.1024 | 305 | 460 | 3 | 1 | 5972443 ¹⁾ | — |
| 28.00 | 1.1024 | 385 | 580 | 3 | 1 | — | 5972705 ²⁾ |
| 29.00 | 1.1417 | 305 | 460 | 3 | 1 | 5972447 ¹⁾ | — |
| 29.00 | 1.1417 | 385 | 580 | 3 | 1 | — | 5972563 ²⁾ |
| 30.00 | 1.1811 | 305 | 460 | 3 | 1 | 5972457 ¹⁾ | — |
| 30.00 | 1.1811 | 385 | 580 | 3 | 1 | — | 5972565 ²⁾ |
| 31.00 | 1.2205 | 410 | 610 | 3 | 1 | — | 5972567 ²⁾ |
| 32.00 | 1.2598 | 410 | 635 | 4 | 1 | — | 5972569 ²⁾ |
| 33.00 | 1.2992 | 410 | 635 | 4 | 1 | — | 5972571 ²⁾ |
| 34.00 | 1.3386 | 430 | 665 | 4 | 1 | — | 5972573 ²⁾ |
| 35.00 | 1.3780 | 430 | 665 | 4 | 1 | — | 5972575 ²⁾ |
| 38.00 | 1.4961 | 460 | 695 | 4 | 1 | — | 5972577 ²⁾ |
| 40.00 | 1.5748 | 460 | 695 | 4 | 1 | — | 5972579 ²⁾ |

¹⁾ < 15xD

²⁾ < 20xD

Cobalt Heavy Duty Taper Shank

209CO Notched Point reduces thrust. Cobalt base material with Bronze tempered 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 | 6000767 |
| 9/32 | 0.2813 | 3" | 6.1/4 | 1 | 1 | 6000887 |
| 5/16 | 0.3125 | 3.1/8 | 6.3/8 | 1 | 1 | 6000843 |
| 11/32 | 0.3437 | 3.1/4 | 6.1/2 | 1 | 1 | 6000841 |
| 3/8 | 0.3750 | 3.1/2 | 7.3/8 | 2 | 1 | 6000800 |
| 13/32 | 0.4063 | 3.5/8 | 7.1/2 | 2 | 1 | 6000929 |
| 27/64 | 0.4219 | 3.7/8 | 7.3/4 | 2 | 1 | 6000789 |
| 7/16 | 0.4375 | 3.7/8 | 7.3/4 | 2 | 1 | 6000869 |
| 29/64 | 0.4531 | 4.1/8 | 8" | 2 | 1 | 6000795 |
| 15/32 | 0.4687 | 4.1/8 | 8" | 2 | 1 | 6000942 |
| 31/64 | 0.4844 | 4.3/8 | 8.1/4 | 2 | 1 | 6000811 |
| 1/2 | 0.5000 | 4.3/8 | 8.1/4 | 2 | 1 | 6001028 |
| 33/64 | 0.5156 | 4.5/8 | 8.1/2 | 2 | 1 | 6000814 |
| 17/32 | 0.5313 | 4.5/8 | 8.1/2 | 2 | 1 | 6000948 |
| 35/64 | 0.5469 | 4.7/8 | 8.3/4 | 2 | 1 | 6000817 |
| 9/16 | 0.5625 | 4.7/8 | 8.3/4 | 2 | 1 | 6000882 |
| 37/64 | 0.5781 | 4.7/8 | 8.3/4 | 2 | 1 | 6000820 |
| 19/32 | 0.5937 | 4.7/8 | 8.3/4 | 2 | 1 | 6000951 |
| 39/64 | 0.6094 | 4.7/8 | 8.3/4 | 2 | 1 | 6000823 |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 2 | 1 | 6000847 |
| 41/64 | 0.6406 | 5.1/8 | 9" | 2 | 1 | 6000826 |
| 21/32 | 0.6563 | 5.1/8 | 9.3/4 | 3 | 1 | 6000774 |
| 43/64 | 0.6719 | 5.3/8 | 10" | 3 | 1 | 6000829 |
| 11/16 | 0.6875 | 5.3/8 | 10" | 3 | 1 | 6000806 |
| 45/64 | 0.7031 | 5.5/8 | 10.1/4 | 3 | 1 | 6000832 |
| 23/32 | 0.7188 | 5.5/8 | 10.1/4 | 3 | 1 | 6000779 |
| 47/64 | 0.7344 | 5.7/8 | 10.1/2 | 3 | 1 | 6000835 |
| 3/4 | 0.7500 | 5.7/8 | 10.1/2 | 3 | 1 | 6000798 |
| 49/64 | 0.7656 | 6" | 10.5/8 | 3 | 1 | 6000838 |
| 25/32 | 0.7813 | 6" | 10.5/8 | 3 | 1 | 6000783 |
| 51/64 | 0.7969 | 6.1/8 | 10.3/4 | 3 | 1 | 6000849 |
| 13/16 | 0.8125 | 6.1/8 | 10.3/4 | 3 | 1 | 6000873 |
| 53/64 | 0.8281 | 6.1/8 | 10.3/4 | 3 | 1 | 6000851 |

COBALT TAPER SHANK DRILL



| d_1 Ø | d_1 decimal | l_2 | l_1 | MTS | Pack Qty | 209CO |
|------------|------------------|-------|--------|-----|-------------|---------|
| Inch | Inch | Inch | Inch | | | |
| 27/32 | 0.8438 | 6.1/8 | 10.3/4 | 3 | 1 | 6000786 |
| 55/64 | 0.8594 | 6.1/8 | 10.3/4 | 3 | 1 | 6000854 |
| 7/8 | 0.8750 | 6.1/8 | 10.3/4 | 3 | 1 | 6000878 |
| 57/64 | 0.8906 | 6.1/8 | 10.3/4 | 3 | 1 | 6000856 |
| 29/32 | 0.9062 | 6.1/8 | 10.3/4 | 3 | 1 | 6000792 |
| 59/64 | 0.9219 | 6.1/8 | 10.3/4 | 3 | 1 | 6000859 |
| 15/16 | 0.9375 | 6.1/8 | 10.3/4 | 3 | 1 | 6000938 |
| 61/64 | 0.9531 | 6.3/8 | 11" | 3 | 1 | 6000862 |
| 31/32 | 0.9688 | 6.3/8 | 11" | 3 | 1 | 6000803 |
| 63/64 | 0.9844 | 6.3/8 | 11" | 3 | 1 | 6000865 |
| 1" | 1.0000 | 6.3/8 | 11" | 3 | 1 | 6000952 |
| 1.1/64 | 1.0156 | 6.1/2 | 12.1/8 | 4 | 1 | 6000965 |
| 1.1/32 | 1.0312 | 6.1/2 | 12.1/8 | 4 | 1 | 6000958 |
| 1.1/16 | 1.0625 | 6.5/8 | 12.1/4 | 4 | 1 | 6000954 |
| 1.3/32 | 1.0937 | 6.7/8 | 12.1/2 | 4 | 1 | 6000989 |
| 1.7/64 | 1.1094 | 7.1/8 | 12.3/4 | 4 | 1 | 6001007 |
| 1.1/8 | 1.1250 | 7.1/8 | 12.3/4 | 4 | 1 | 6000968 |
| 1.11/64 | 1.1719 | 7.3/8 | 13" | 4 | 1 | 6000972 |
| 1.3/16 | 1.1875 | 7.3/8 | 13" | 4 | 1 | 6000985 |
| 1.7/32 | 1.2188 | 7.1/2 | 13.1/8 | 4 | 1 | 6001004 |
| 1.1/4 | 1.2500 | 7.7/8 | 13.1/2 | 4 | 1 | 6000961 |
| 1.9/32 | 1.2813 | 8.1/2 | 14.1/8 | 4 | 1 | 6001013 |
| 1.11/32 | 1.3437 | 8.3/4 | 14.3/8 | 4 | 1 | 6000970 |
| 1.3/8 | 1.3750 | 8.7/8 | 14.1/2 | 4 | 1 | 6000991 |
| 1.7/16 | 1.4375 | 9.1/8 | 14.3/4 | 4 | 1 | 6001001 |
| 1.1/2 | 1.5000 | 9.3/8 | 15" | 4 | 1 | 6000956 |

Metric Cobalt Heavy Duty Taper Shank

A730 Notched Point reduces thrust. Cobalt base material with Bronze tempered for wear resistance and lubricity. Suitable for ferrous materials.



A730

DIN
345

4XD

HSS-E

118°



1/4 - 1 1/2

| d ₁ Ø mm | d ₁ decimal mm | l ₂ mm | l ₁ mm | MTS | Pack Qty | A730 |
|---------------------------|---------------------------------|----------------------|----------------------|-----|-------------|---------|
| 10.00 | 0.3937 | 87 | 168 | 1 | 1 | 5971219 |
| 10.20 | 0.4016 | 87 | 168 | 1 | 1 | 5971222 |
| 10.50 | 0.4134 | 87 | 168 | 1 | 1 | 5971226 |
| 10.80 | 0.4252 | 94 | 175 | 1 | 1 | 5971230 |
| 11.00 | 0.4331 | 94 | 175 | 1 | 1 | 5971235 |
| 11.50 | 0.4528 | 94 | 175 | 1 | 1 | 5971237 |
| 11.80 | 0.4646 | 94 | 175 | 1 | 1 | 5971242 |
| 12.00 | 0.4724 | 101 | 182 | 1 | 1 | 5971246 |
| 12.20 | 0.4803 | 101 | 182 | 1 | 1 | 5971252 |
| 12.50 | 0.4921 | 101 | 182 | 1 | 1 | 5971257 |
| 12.80 | 0.5039 | 101 | 182 | 1 | 1 | 5971262 |
| 13.00 | 0.5118 | 101 | 182 | 1 | 1 | 5971266 |
| 13.50 | 0.5315 | 108 | 189 | 1 | 1 | 5971269 |
| 13.80 | 0.5433 | 108 | 189 | 1 | 1 | 5971272 |
| 14.00 | 0.5512 | 108 | 189 | 1 | 1 | 5971276 |
| 14.25 | 0.5610 | 114 | 212 | 2 | 1 | 5971280 |
| 14.50 | 0.5709 | 114 | 212 | 2 | 1 | 5971284 |
| 14.75 | 0.5807 | 114 | 212 | 2 | 1 | 5971288 |
| 15.00 | 0.5906 | 114 | 212 | 2 | 1 | 5971296 |
| 15.25 | 0.6004 | 120 | 218 | 2 | 1 | 5971165 |
| 15.50 | 0.6102 | 120 | 218 | 2 | 1 | 5971221 |
| 15.75 | 0.6201 | 120 | 218 | 2 | 1 | 5971265 |
| 16.00 | 0.6299 | 120 | 218 | 2 | 1 | 5971305 |
| 16.25 | 0.6398 | 120 | 218 | 2 | 1 | 5971331 |
| 16.50 | 0.6496 | 125 | 223 | 2 | 1 | 5971335 |
| 17.00 | 0.6693 | 125 | 223 | 2 | 1 | 5971337 |
| 17.25 | 0.6791 | 130 | 228 | 2 | 1 | 5971339 |
| 17.50 | 0.6890 | 130 | 228 | 2 | 1 | 5971341 |
| 17.75 | 0.6988 | 130 | 228 | 2 | 1 | 5971174 |
| 18.00 | 0.7087 | 130 | 228 | 2 | 1 | 5971179 |
| 18.25 | 0.7185 | 135 | 233 | 2 | 1 | 5971184 |
| 18.50 | 0.7283 | 135 | 233 | 2 | 1 | 5971190 |
| 18.75 | 0.7382 | 135 | 233 | 2 | 1 | 5971194 |

COBALT TAPER SHANK DRILL



| d_1 Ø mm | d_1 decimal mm | l_2 mm | l_1 mm | MTS | Pack Qty | A730 |
|------------------|------------------------|-------------|-------------|-----|-------------|---------|
| 19.00 | 0.7480 | 135 | 233 | 2 | 1 | 5971199 |
| 19.25 | 0.7579 | 140 | 238 | 2 | 1 | 5971203 |
| 19.50 | 0.7677 | 140 | 238 | 2 | 1 | 5971208 |
| 19.75 | 0.7776 | 140 | 238 | 2 | 1 | 5971213 |
| 20.00 | 0.7874 | 140 | 238 | 2 | 1 | 5971217 |
| 20.25 | 0.7972 | 145 | 243 | 2 | 1 | 5971225 |
| 20.50 | 0.8071 | 145 | 243 | 2 | 1 | 5971229 |
| 20.75 | 0.8169 | 145 | 243 | 2 | 1 | 5971233 |
| 21.00 | 0.8268 | 145 | 243 | 2 | 1 | 5971238 |
| 21.50 | 0.8465 | 150 | 248 | 2 | 1 | 5971241 |
| 22.00 | 0.8661 | 150 | 248 | 2 | 1 | 5971245 |
| 22.50 | 0.8858 | 155 | 253 | 2 | 1 | 5971250 |
| 23.00 | 0.9055 | 155 | 253 | 2 | 1 | 5971254 |
| 23.50 | 0.9252 | 155 | 276 | 3 | 1 | 5971258 |
| 24.00 | 0.9449 | 160 | 281 | 3 | 1 | 5971261 |
| 24.50 | 0.9646 | 160 | 281 | 3 | 1 | 5971268 |
| 25.00 | 0.9843 | 160 | 281 | 3 | 1 | 5971271 |
| 25.50 | 1.0039 | 165 | 286 | 3 | 1 | 5971275 |
| 26.00 | 1.0236 | 165 | 286 | 3 | 1 | 5971279 |
| 26.50 | 1.0433 | 165 | 286 | 3 | 1 | 5971283 |
| 27.00 | 1.0630 | 170 | 291 | 3 | 1 | 5971286 |
| 27.50 | 1.0827 | 170 | 291 | 3 | 1 | 5971290 |
| 28.00 | 1.1024 | 170 | 291 | 3 | 1 | 5971294 |
| 28.50 | 1.1220 | 175 | 296 | 3 | 1 | 5971299 |
| 29.00 | 1.1417 | 175 | 296 | 3 | 1 | 5971302 |
| 30.00 | 1.1811 | 175 | 296 | 3 | 1 | 5971310 |
| 31.00 | 1.2205 | 180 | 301 | 3 | 1 | 5971314 |
| 32.00 | 1.2598 | 185 | 334 | 4 | 1 | 5971319 |

Taper Shank - 4-Flute

T400 Core drill with taper shank for enlarging pre-drilled or cast holes in a wide range of materials.



T400

HSS

ST

ANSI

1/2 - 1.5/8

| d_1 Ø | 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 | 5999981 |
| 17/32 | 0.5312 | 4.5/8 | 8.1/2 | 2 | 1 | 5999997 |
| 9/16 | 0.5625 | 4.7/8 | 8.3/4 | 2 | 1 | 6000268 |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 2 | 1 | 6000227 |
| 21/32 | 0.6562 | 5.1/8 | 9" | 2 | 1 | 6000018 |
| 3/4 | 0.7500 | 5.7/8 | 9.3/4 | 2 | 1 | 6000144 |
| 25/32 | 0.7812 | 6" | 9.7/8 | 2 | 1 | 6000024 |
| 7/8 | 0.8750 | 6.1/8 | 10.3/4 | 3 | 1 | 6000260 |
| 1" | 1.0000 | 6.3/8 | 11" | 3 | 1 | 5999994 |
| 1.1/32 | 1.0312 | 6.1/2 | 11.1/8 | 3 | 1 | 6000036 |
| 1.1/16 | 1.0625 | 6.5/8 | 11.1/4 | 3 | 1 | 6000027 |
| 1.1/8 | 1.1250 | 7.1/8 | 12.3/4 | 4 | 1 | 6000042 |
| 1.5/32 | 1.1562 | 7.1/4 | 12.7/8 | 4 | 1 | 5999955 |
| 1.1/4 | 1.2500 | 7.7/8 | 13.1/2 | 4 | 1 | 6000039 |
| 1.5/16 | 1.3125 | 8.5/8 | 14.1/4 | 4 | 1 | 5999952 |
| 1.11/32 | 1.3438 | 8.3/4 | 14.3/8 | 4 | 1 | 5999889 |
| 1.3/8 | 1.3750 | 8.7/8 | 14.1/2 | 4 | 1 | 5999946 |
| 1.1/2 | 1.5000 | 9.3/8 | 15" | 4 | 1 | 6000033 |
| 1.9/16 | 1.5625 | 9.5/8 | 16.5/8 | 5 | 1 | 5999975 |
| 1.5/8 | 1.6250 | 10" | 17" | 5 | 1 | 5999961 |

REDUCED SHANK DRILL



General Purpose Reduced Shank - 1/2" Shank

A170 Silver & Deming Drills. Steam tempered 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 | | | | | 1 | 5968873 |
| 33/64 | 13.10 | 0.5157 | 3.1/8 | 6" | | | 1 | 5968798 |
| 17/32 | 13.49 | 0.5313 | 3.1/8 | 6" | | | 1 | 5968708 |
| | 13.50 | 0.5315 | | | 83 | 156 | 1 | 5968882 |
| 35/64 | 13.89 | 0.5469 | 3.1/8 | 6" | | | 1 | 5968804 |
| | 14.00 | 0.5512 | | | 83 | 156 | 1 | 5968889 |
| 9/16 | 14.29 | 0.5625 | 3.1/8 | 6" | | | 1 | 5969849 |
| | 14.50 | 0.5709 | | | 83 | 156 | 1 | 5968893 |
| 37/64 | 14.68 | 0.5781 | 3.1/8 | 6" | | | 1 | 5968809 |
| | 15.00 | 0.5906 | | | 83 | 156 | 1 | 5968688 |
| 19/32 | 15.08 | 0.5937 | 3.1/8 | 6" | | | 1 | 5968725 |
| 39/64 | 15.48 | 0.6094 | 3.1/8 | 6" | | | 1 | 5968814 |
| | 15.50 | 0.6102 | | | 83 | 156 | 1 | 5968690 |
| 5/8 | 15.88 | 0.6250 | 3.1/8 | 6" | | | 1 | 5968848 |
| | 16.00 | 0.6299 | | | 84 | 157 | 1 | 5968695 |
| 41/64 | 16.27 | 0.6406 | 3.1/8 | 6" | | | 1 | 5968823 |
| | 16.50 | 0.6496 | | | 84 | 157 | 1 | 5968699 |
| 21/32 | 16.67 | 0.6563 | 3.1/8 | 6" | | | 1 | 5968738 |
| | 17.00 | 0.6693 | | | 84 | 157 | 1 | 5968702 |
| 43/64 | 17.07 | 0.6719 | 3.1/8 | 6" | | | 1 | 5968828 |
| 11/16 | 17.46 | 0.6875 | 3.1/8 | 6" | | | 1 | 5968819 |
| | 17.50 | 0.6890 | | | 84 | 157 | 1 | 5968705 |
| 45/64 | 17.86 | 0.7031 | 3.1/8 | 6" | | | 1 | 5968833 |
| | 18.00 | 0.7087 | | | 84 | 157 | 1 | 5968711 |
| 23/32 | 18.26 | 0.7188 | 3.1/8 | 6" | | | 1 | 5968754 |
| | 18.50 | 0.7283 | | | 84 | 157 | 1 | 5968713 |
| 47/64 | 18.65 | 0.7344 | 3.1/8 | 6" | | | 1 | 5968838 |
| | 19.00 | 0.7480 | | | 84 | 157 | 1 | 5968719 |
| 3/4 | 19.05 | 0.7500 | 3.1/8 | 6" | | | 1 | 5968788 |
| 49/64 | 19.45 | 0.7656 | 3" | 6" | | | 1 | 5968842 |
| | 19.50 | 0.7677 | | | 81 | 158 | 1 | 5968722 |
| 25/32 | 19.84 | 0.7812 | 3" | 6" | | | 1 | 5968771 |
| | 20.00 | 0.7874 | | | 81 | 158 | 1 | 5968729 |

| d_1 $\varnothing h_8$ Inch | d_1 $\varnothing h_8$ 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 | 5968853 |
| 13/16 | 20.64 | 0.8125 | 3" | 6" | | | 1 | 5968885 |
| | 21.00 | 0.8268 | | | 82 | 158 | 1 | 5968733 |
| 53/64 | 21.03 | 0.8281 | 3" | 6" | | | 1 | 5968858 |
| 27/32 | 21.43 | 0.8437 | 3" | 6" | | | 1 | 5968776 |
| 55/64 | 21.83 | 0.8594 | 3" | 6" | | | 1 | 5968862 |
| | 22.00 | 0.8661 | | | 82 | 158 | 1 | 5968745 |
| 7/8 | 22.22 | 0.8750 | 3" | 6" | | | 1 | 5969793 |
| 57/64 | 22.62 | 0.8906 | 3" | 6" | | | 1 | 5968868 |
| | 23.00 | 0.9055 | | | 82 | 158 | 1 | 5968749 |
| 29/32 | 23.02 | 0.9062 | 3" | 6" | | | 1 | 5968783 |
| 59/64 | 23.42 | 0.9220 | 3" | 6" | | | 1 | 5968878 |
| 15/16 | 23.81 | 0.9375 | 3" | 6" | | | 1 | 5968692 |
| | 24.00 | 0.9449 | | | 83 | 159 | 1 | 5968758 |
| 61/64 | 24.21 | 0.9531 | 3" | 6" | | | 1 | 5969699 |
| 31/32 | 24.61 | 0.9688 | 3" | 6" | | | 1 | 5968793 |
| | 25.00 | 0.9843 | | | 83 | 159 | 1 | 5968766 |
| 63/64 | 25.00 | 0.9844 | 3" | 6" | | | 1 | 5969741 |
| 1" | 25.40 | 1.0000 | 3" | 6" | | | 1 | 5969709 |
| 1.1/32 | 26.19 | 1.0312 | 3" | 6" | | | 1 | 5969721 |
| 1.1/16 | 26.99 | 1.0625 | 3" | 6" | | | 1 | 5969714 |
| 1.7/64 | 28.18 | 1.1094 | 3" | 6" | | | 1 | 5968685 |
| 1.1/8 | 28.58 | 1.1250 | 3" | 6" | | | 1 | 5969733 |
| 1.9/64 | 28.97 | 1.1406 | 3" | 6" | | | 1 | 5968761 |
| 1.5/32 | 29.37 | 1.1563 | 3" | 6" | | | 1 | 5969794 |
| 1.3/16 | 30.16 | 1.1875 | 3" | 6" | | | 1 | 5969769 |
| 1.7/32 | 30.96 | 1.2188 | 3" | 6" | | | 1 | 5969818 |
| 1.1/4 | 31.75 | 1.2500 | 3" | 6" | | | 1 | 5969725 |
| 1.5/16 | 33.34 | 1.3125 | 3" | 6" | | | 1 | 5969789 |
| 1.3/8 | 34.93 | 1.3750 | 3" | 6" | | | 1 | 5969784 |
| 1.7/16 | 36.51 | 1.4375 | 3" | 6" | | | 1 | 5969809 |
| 1.1/2 | 38.10 | 1.5000 | 3" | 6" | | | 1 | 5969718 |

REDUCED SHANK DRILL



General Purpose Reduced Shank - 1/2" Shank

* Sets Available on pg. 241

R56 Silver & Deming Drills. Steam tempered 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 | 5999983 |
| 17/32 | 0.5313 | 3" | 6" | 1/2 | 1 | 5999953 |
| 35/64 | 0.5469 | 3" | 6" | 1/2 | 1 | 5999986 |
| 9/16 | 0.5625 | 3" | 6" | 1/2 | 1 | 5999536 |
| 37/64 | 0.5781 | 3" | 6" | 1/2 | 1 | 5999989 |
| 19/32 | 0.5937 | 3" | 6" | 1/2 | 1 | 5999956 |
| 39/64 | 0.6094 | 3" | 6" | 1/2 | 1 | 5999992 |
| 5/8 | 0.6250 | 3" | 6" | 1/2 | 1 | 5999628 |
| 41/64 | 0.6406 | 3" | 6" | 1/2 | 1 | 5999995 |
| 21/32 | 0.6563 | 3" | 6" | 1/2 | 1 | 5999959 |
| 43/64 | 0.6719 | 3" | 6" | 1/2 | 1 | 6000001 |
| 11/16 | 0.6875 | 3" | 6" | 1/2 | 1 | 5999944 |
| 45/64 | 0.7031 | 3" | 6" | 1/2 | 1 | 5999527 |
| 23/32 | 0.7188 | 3" | 6" | 1/2 | 1 | 5999962 |
| 47/64 | 0.7344 | 3" | 6" | 1/2 | 1 | 5999550 |
| 3/4 | 0.7500 | 3" | 6" | 1/2 | 1 | 5999976 |
| 49/64 | 0.7656 | 3" | 6" | 1/2 | 1 | 5999584 |
| 25/32 | 0.7813 | 3" | 6" | 1/2 | 1 | 5999968 |
| 51/64 | 0.7969 | 3" | 6" | 1/2 | 1 | 5999670 |
| 13/16 | 0.8125 | 3" | 6" | 1/2 | 1 | 5999947 |
| 53/64 | 0.8281 | 3" | 6" | 1/2 | 1 | 5999677 |
| 27/32 | 0.8438 | 3" | 6" | 1/2 | 1 | 5999970 |
| 55/64 | 0.8594 | 3" | 6" | 1/2 | 1 | 5999681 |
| 7/8 | 0.8750 | 3" | 6" | 1/2 | 1 | 5999534 |
| 57/64 | 0.8906 | 3" | 6" | 1/2 | 1 | 5999685 |
| 29/32 | 0.9063 | 3" | 6" | 1/2 | 1 | 5999973 |
| 59/64 | 0.9219 | 3" | 6" | 1/2 | 1 | 5999690 |
| 15/16 | 0.9375 | 3" | 6" | 1/2 | 1 | 5999950 |
| 61/64 | 0.9531 | 3" | 6" | 1/2 | 1 | 5999530 |
| 31/32 | 0.9688 | 3" | 6" | 1/2 | 1 | 5999980 |
| 63/64 | 0.9844 | 3" | 6" | 1/2 | 1 | 5999532 |
| 1" | 1.0000 | 3" | 6" | 1/2 | 1 | 6000010 |
| 1.1/64 | 1.0156 | 3" | 6" | 1/2 | 1 | 5999856 |

| 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 | 5999847 |
| 1.3/64 | 1.0469 | 3" | 6" | 1/2 | 1 | 5999903 |
| 1.1/16 | 1.0625 | 3" | 6" | 1/2 | 1 | 6000013 |
| 1.5/64 | 1.0781 | 3" | 6" | 1/2 | 1 | 5999919 |
| 1.3/32 | 1.0937 | 3" | 6" | 1/2 | 1 | 5999899 |
| 1.7/64 | 1.1094 | 3" | 6" | 1/2 | 1 | 5999935 |
| 1.1/8 | 1.1250 | 3" | 6" | 1/2 | 1 | 5999860 |
| 1.9/64 | 1.1406 | 3" | 6" | 1/2 | 1 | 5999941 |
| 1.5/32 | 1.1563 | 3" | 6" | 1/2 | 1 | 5999915 |
| 1.11/64 | 1.1719 | 3" | 6" | 1/2 | 1 | 5999868 |
| 1.3/16 | 1.1875 | 3" | 6" | 1/2 | 1 | 5999895 |
| 1.13/64 | 1.2031 | 3" | 6" | 1/2 | 1 | 5999876 |
| 1.7/32 | 1.2187 | 3" | 6" | 1/2 | 1 | 5999927 |
| 1.15/64 | 1.2344 | 3" | 6" | 1/2 | 1 | 5999891 |
| 1.1/4 | 1.2500 | 3" | 6" | 1/2 | 1 | 5999852 |
| 1.9/32 | 1.2813 | 3" | 6" | 1/2 | 1 | 5999938 |
| 1.5/16 | 1.3125 | 3" | 6" | 1/2 | 1 | 5999911 |
| 1.11/32 | 1.3437 | 3" | 6" | 1/2 | 1 | 5999864 |
| 1.3/8 | 1.3750 | 3" | 6" | 1/2 | 1 | 5999908 |
| 1.13/32 | 1.4063 | 3" | 6" | 1/2 | 1 | 5999871 |
| 1.7/16 | 1.4375 | 3" | 6" | 1/2 | 1 | 5999923 |
| 1.15/32 | 1.4687 | 3" | 6" | 1/2 | 1 | 5999881 |
| 1.1/2 | 1.5000 | 3" | 6" | 1/2 | 1 | 5999842 |

REDUCED SHANK DRILL



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

* Sets Available on pg. 241

R57 Silver & Deming Drills with 3-Flat Shank. Steam tempered 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 | 6000017 |
| 17/32 | 0.5313 | 3" | 6" | 1/2 | 1 | 5999640 |
| 35/64 | 0.5469 | 3" | 6" | 1/2 | 1 | 6000047 |
| 9/16 | 0.5625 | 3" | 6" | 1/2 | 1 | 6000045 |
| 37/64 | 0.5781 | 3" | 6" | 1/2 | 1 | 6000080 |
| 19/32 | 0.5937 | 3" | 6" | 1/2 | 1 | 5999644 |
| 39/64 | 0.6094 | 3" | 6" | 1/2 | 1 | 6000123 |
| 5/8 | 0.6250 | 3" | 6" | 1/2 | 1 | 6000021 |
| 41/64 | 0.6406 | 3" | 6" | 1/2 | 1 | 6000171 |
| 21/32 | 0.6563 | 3" | 6" | 1/2 | 1 | 5999647 |
| 43/64 | 0.6719 | 3" | 6" | 1/2 | 1 | 6000180 |
| 11/16 | 0.6875 | 3" | 6" | 1/2 | 1 | 5999624 |
| 45/64 | 0.7031 | 3" | 6" | 1/2 | 1 | 6000184 |
| 23/32 | 0.7188 | 3" | 6" | 1/2 | 1 | 5999651 |
| 47/64 | 0.7344 | 3" | 6" | 1/2 | 1 | 6000188 |
| 3/4 | 0.7500 | 3" | 6" | 1/2 | 1 | 5999667 |
| 49/64 | 0.7656 | 3" | 6" | 1/2 | 1 | 6000192 |
| 25/32 | 0.7813 | 3" | 6" | 1/2 | 1 | 5999655 |
| 51/64 | 0.7969 | 3" | 6" | 1/2 | 1 | 6000023 |
| 13/16 | 0.8125 | 3" | 6" | 1/2 | 1 | 5999631 |
| 53/64 | 0.8281 | 3" | 6" | 1/2 | 1 | 6000026 |
| 27/32 | 0.8438 | 3" | 6" | 1/2 | 1 | 5999659 |
| 55/64 | 0.8594 | 3" | 6" | 1/2 | 1 | 6000029 |
| 7/8 | 0.8750 | 3" | 6" | 1/2 | 1 | 6000043 |
| 57/64 | 0.8906 | 3" | 6" | 1/2 | 1 | 6000032 |
| 29/32 | 0.9063 | 3" | 6" | 1/2 | 1 | 5999663 |
| 59/64 | 0.9219 | 3" | 6" | 1/2 | 1 | 6000035 |
| 15/16 | 0.9375 | 3" | 6" | 1/2 | 1 | 5999636 |
| 61/64 | 0.9531 | 3" | 6" | 1/2 | 1 | 6000038 |
| 31/32 | 0.9688 | 3" | 6" | 1/2 | 1 | 5999675 |
| 63/64 | 0.9844 | 3" | 6" | 1/2 | 1 | 6000041 |
| 1" | 1.0000 | 3" | 6" | 1/2 | 1 | 5999538 |
| 1.1/64 | 1.0156 | 3" | 6" | 1/2 | 1 | 5999548 |

| 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 | 5999545 |
| 1.3/64 | 1.0469 | 3" | 6" | 1/2 | 1 | 5999580 |
| 1.1/16 | 1.0625 | 3" | 6" | 1/2 | 1 | 5999540 |
| 1.5/64 | 1.0781 | 3" | 6" | 1/2 | 1 | 5999598 |
| 1.3/32 | 1.0937 | 3" | 6" | 1/2 | 1 | 5999577 |
| 1.7/64 | 1.1094 | 3" | 6" | 1/2 | 1 | 5999610 |
| 1.1/8 | 1.1250 | 3" | 6" | 1/2 | 1 | 5999552 |
| 1.9/64 | 1.1406 | 3" | 6" | 1/2 | 1 | 5999620 |
| 1.5/32 | 1.1563 | 3" | 6" | 1/2 | 1 | 5999594 |
| 1.11/64 | 1.1719 | 3" | 6" | 1/2 | 1 | 5999557 |
| 1.3/16 | 1.1875 | 3" | 6" | 1/2 | 1 | 5999573 |
| 1.13/64 | 1.2031 | 3" | 6" | 1/2 | 1 | 5999562 |
| 1.7/32 | 1.2187 | 3" | 6" | 1/2 | 1 | 5999606 |
| 1.15/64 | 1.2344 | 3" | 6" | 1/2 | 1 | 5999570 |
| 1.1/4 | 1.2500 | 3" | 6" | 1/2 | 1 | 5999546 |
| 1.9/32 | 1.2813 | 3" | 6" | 1/2 | 1 | 5999616 |
| 1.5/16 | 1.3125 | 3" | 6" | 1/2 | 1 | 5999590 |
| 1.11/32 | 1.3437 | 3" | 6" | 1/2 | 1 | 5999554 |
| 1.3/8 | 1.3750 | 3" | 6" | 1/2 | 1 | 5999588 |
| 1.13/32 | 1.4063 | 3" | 6" | 1/2 | 1 | 5999559 |
| 1.7/16 | 1.4375 | 3" | 6" | 1/2 | 1 | 5999602 |
| 1.15/32 | 1.4687 | 3" | 6" | 1/2 | 1 | 5999566 |
| 1.1/2 | 1.5000 | 3" | 6" | 1/2 | 1 | 5999543 |

REDUCED SHANK DRILL



General Purpose Reduced Shank - 3/4" Shank

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

R58

ANSI

1.5XD

HSS

118°



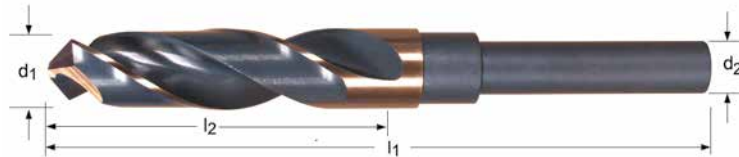
1" - 2"

| 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 | 6000049 |
| 1.1/32 | 1.0312 | 3" | 6" | 3/4" | 1 | 6000058 |
| 1.1/16 | 1.0625 | 3" | 6" | 3/4" | 1 | 6000052 |
| 1.3/32 | 1.0937 | 3" | 6" | 3/4" | 1 | 6000092 |
| 1.1/8 | 1.1250 | 3" | 6" | 3/4" | 1 | 6000064 |
| 1.5/32 | 1.1563 | 3" | 6" | 3/4" | 1 | 6000111 |
| 1.3/16 | 1.1875 | 3" | 6" | 3/4" | 1 | 6000089 |
| 1.7/32 | 1.2187 | 3" | 6" | 3/4" | 1 | 6000126 |
| 1.1/4 | 1.2500 | 3" | 6" | 3/4" | 1 | 6000061 |
| 1.9/32 | 1.2813 | 3" | 6" | 3/4" | 1 | 6000143 |
| 1.5/16 | 1.3125 | 3" | 6" | 3/4" | 1 | 6000107 |
| 1.11/32 | 1.3437 | 3" | 6" | 3/4" | 1 | 6000070 |
| 1.3/8 | 1.3750 | 3" | 6" | 3/4" | 1 | 6000102 |
| 1.13/32 | 1.4063 | 3" | 6" | 3/4" | 1 | 6000077 |
| 1.7/16 | 1.4375 | 3" | 6" | 3/4" | 1 | 6000118 |
| 1.15/32 | 1.4687 | 3" | 6" | 3/4" | 1 | 6000086 |
| 1.1/2 | 1.5000 | 3" | 6" | 3/4" | 1 | 6000054 |
| 1.9/16 | 1.5625 | 3" | 6" | 3/4" | 1 | 6000138 |
| 1.5/8 | 1.6250 | 3" | 6" | 3/4" | 1 | 6000114 |
| 1.11/16 | 1.6875 | 3" | 6" | 3/4" | 1 | 6000067 |
| 1.3/4 | 1.7500 | 3" | 6" | 3/4" | 1 | 6000096 |
| 1.13/16 | 1.8125 | 3" | 6" | 3/4" | 1 | 6000074 |
| 1.7/8 | 1.8750 | 3" | 6" | 3/4" | 1 | 6000131 |
| 1.15/16 | 1.9375 | 3" | 6" | 3/4" | 1 | 6000083 |
| 2" | 2.0000 | 3" | 6" | 3/4" | 1 | 6000147 |

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

* Sets Available on pg. 241

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



R56CO

ANSI

4XD

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118°



33/64 - 1"

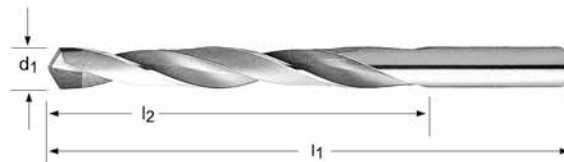
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | Pack Qty | R56CO |
|--------------------|--------------------------|---------------|---------------|--------------------|-------------|---------|
| 33/64 | 0.5156 | 3" | 6" | 1/2 | 1 | 6000402 |
| 17/32 | 0.5313 | 3" | 6" | 1/2 | 1 | 6000364 |
| 35/64 | 0.5469 | 3" | 6" | 1/2 | 1 | 6000409 |
| 9/16 | 0.5625 | 3" | 6" | 1/2 | 1 | 6000007 |
| 37/64 | 0.5781 | 3" | 6" | 1/2 | 1 | 6000413 |
| 19/32 | 0.5937 | 3" | 6" | 1/2 | 1 | 6000367 |
| 39/64 | 0.6094 | 3" | 6" | 1/2 | 1 | 6000417 |
| 5/8 | 0.6250 | 3" | 6" | 1/2 | 1 | 6000439 |
| 41/64 | 0.6406 | 3" | 6" | 1/2 | 1 | 6000420 |
| 21/32 | 0.6563 | 3" | 6" | 1/2 | 1 | 6000372 |
| 43/64 | 0.6719 | 3" | 6" | 1/2 | 1 | 6000424 |
| 11/16 | 0.6875 | 3" | 6" | 1/2 | 1 | 6000350 |
| 45/64 | 0.7031 | 3" | 6" | 1/2 | 1 | 6000428 |
| 23/32 | 0.7188 | 3" | 6" | 1/2 | 1 | 6000377 |
| 47/64 | 0.7344 | 3" | 6" | 1/2 | 1 | 6000432 |
| 3/4 | 0.7500 | 3" | 6" | 1/2 | 1 | 6000394 |
| 49/64 | 0.7656 | 3" | 6" | 1/2 | 1 | 6000435 |
| 25/32 | 0.7813 | 3" | 6" | 1/2 | 1 | 6000382 |
| 51/64 | 0.7969 | 3" | 6" | 1/2 | 1 | 6000442 |
| 13/16 | 0.8125 | 3" | 6" | 1/2 | 1 | 6000353 |
| 53/64 | 0.8281 | 3" | 6" | 1/2 | 1 | 6000448 |
| 27/32 | 0.8438 | 3" | 6" | 1/2 | 1 | 6000386 |
| 55/64 | 0.8594 | 3" | 6" | 1/2 | 1 | 5999837 |
| 7/8 | 0.8750 | 3" | 6" | 1/2 | 1 | 6000004 |
| 57/64 | 0.8906 | 3" | 6" | 1/2 | 1 | 5999886 |
| 29/32 | 0.9063 | 3" | 6" | 1/2 | 1 | 6000390 |
| 59/64 | 0.9219 | 3" | 6" | 1/2 | 1 | 5999931 |
| 15/16 | 0.9375 | 3" | 6" | 1/2 | 1 | 6000356 |
| 61/64 | 0.9531 | 3" | 6" | 1/2 | 1 | 5999965 |
| 31/32 | 0.9688 | 3" | 6" | 1/2 | 1 | 6000398 |
| 63/64 | 0.9844 | 3" | 6" | 1/2 | 1 | 5999998 |
| 1" | 1.0000 | 3" | 6" | 1/2 | 1 | 6000347 |

SPECIAL PURPOSE DRILL



Jobber Length Carbide Tipped

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



D444

ANSI

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 | 6001915 |
| 1/8 | 0.1250 | 1.5/8 | 2.3/4 | 1 | 6001948 |
| 30 | 0.1285 | 1.5/8 | 2.3/4 | 1 | 6001912 |
| 29 | 0.1360 | 1.3/4 | 2.7/8 | 1 | 6001904 |
| 9/64 | 0.1406 | 1.3/4 | 2.7/8 | 1 | 6001721 |
| 25 | 0.1495 | 1.7/8 | 3" | 1 | 6001901 |
| 5/32 | 0.1563 | 2" | 3.1/8 | 1 | 6001707 |
| 21 | 0.1590 | 2.1/8 | 3.1/4 | 1 | 6001898 |
| 20 | 0.1610 | 2.1/8 | 3.1/4 | 1 | 6001895 |
| 19 | 0.1660 | 2.1/8 | 3.1/4 | 1 | 6001892 |
| 18 | 0.1695 | 2.1/8 | 3.1/4 | 1 | 6001886 |
| 11/64 | 0.1719 | 2.1/8 | 3.1/4 | 1 | 6001953 |
| 17 | 0.1730 | 2.3/16 | 3.3/8 | 1 | 6001882 |
| 15 | 0.1800 | 2.3/16 | 3.3/8 | 1 | 6001879 |
| 14 | 0.1820 | 2.3/16 | 3.3/8 | 1 | 6001875 |
| 13 | 0.1850 | 2.5/16 | 3.1/2 | 1 | 6001865 |
| 3/16 | 0.1875 | 2.5/16 | 3.1/2 | 1 | 6001853 |
| 11 | 0.1910 | 2.5/16 | 3.1/2 | 1 | 6001861 |
| 10 | 0.1935 | 2.7/16 | 3.5/8 | 1 | 6001856 |
| 9 | 0.1960 | 2.7/16 | 3.5/8 | 1 | 6001920 |
| 7 | 0.2010 | 2.7/16 | 3.5/8 | 1 | 6001918 |
| 13/64 | 0.2031 | 2.7/16 | 3.5/8 | 1 | 6001959 |
| 3 | 0.2130 | 2.1/2 | 3.3/4 | 1 | 6001907 |
| 7/32 | 0.2188 | 2.1/2 | 3.3/4 | 1 | 6001714 |
| 1 | 0.2280 | 2.5/8 | 3.7/8 | 1 | 6001851 |
| 15/64 | 0.2344 | 2.5/8 | 3.7/8 | 1 | 6001969 |
| B | 0.2380 | 2.3/4 | 4" | 1 | 6001966 |
| C | 0.2420 | 2.3/4 | 4" | 1 | 6001972 |
| 1/4 (E) | 0.2500 | 2.3/4 | 4" | 1 | 6001945 |
| F | 0.2570 | 2.7/8 | 4.1/8 | 1 | 6001978 |
| G | 0.2610 | 2.7/8 | 4.1/8 | 1 | 6001981 |
| 17/64 | 0.2656 | 2.7/8 | 4.1/8 | 1 | 6001697 |
| H | 0.2660 | 2.7/8 | 4.1/8 | 1 | 6001821 |

| d_1 Ø "Nr./letter | d_1 decimal Inch | l_2 Inch | l_1 Inch | Pack Qty | D444 |
|---------------------------|--------------------------|---------------|---------------|-------------|---------|
| I | 0.2720 | 2.7/8 | 4.1/8 | 1 | 6001826 |
| J | 0.2770 | 2.7/8 | 4.1/8 | 1 | 6001831 |
| K | 0.2810 | 2.15/16 | 4.1/4 | 1 | 6001838 |
| 9/32 | 0.2813 | 2.15/16 | 4.1/4 | 1 | 6001718 |
| L | 0.2900 | 2.15/16 | 4.1/4 | 1 | 6001842 |
| 19/64 | 0.2969 | 3.1/16 | 4.3/8 | 1 | 6001732 |
| N | 0.3020 | 3.1/16 | 4.3/8 | 1 | 6001847 |
| 5/16 | 0.3125 | 3.3/16 | 4.1/2 | 1 | 6001703 |
| O | 0.3160 | 3.3/16 | 4.1/2 | 1 | 6001924 |
| P | 0.3230 | 3.5/16 | 4.5/8 | 1 | 6001926 |
| 21/64 | 0.3281 | 3.5/16 | 4.5/8 | 1 | 6001756 |
| Q | 0.3320 | 3.7/16 | 4.3/4 | 1 | 6001928 |
| R | 0.3390 | 3.7/16 | 4.3/4 | 1 | 6001930 |
| 11/32 | 0.3437 | 3.7/16 | 4.3/4 | 1 | 6001950 |
| S | 0.3480 | 3.1/2 | 4.7/8 | 1 | 6001932 |
| T | 0.3580 | 3.1/2 | 4.7/8 | 1 | 6001934 |
| 23/64 | 0.3594 | 3.1/2 | 4.7/8 | 1 | 6001789 |
| U | 0.3680 | 3.5/8 | 5" | 1 | 6001938 |
| 3/8 | 0.3750 | 3.5/8 | 5" | 1 | 6001859 |
| 25/64 | 0.3906 | 3.3/4 | 5.1/8 | 1 | 6001834 |
| 13/32 | 0.4063 | 3.7/8 | 5.1/4 | 1 | 6001956 |
| Z | 0.4130 | 3.7/8 | 5.1/4 | 1 | 6001940 |
| 27/64 | 0.4219 | 3.15/16 | 5.3/8 | 1 | 6001843 |
| 7/16 | 0.4375 | 4.1/16 | 5.1/2 | 1 | 6001711 |
| 29/64 | 0.4531 | 4.3/16 | 5.5/8 | 1 | 6001849 |
| 15/32 | 0.4687 | 4.5/16 | 5.3/4 | 1 | 6001962 |
| 31/64 | 0.4844 | 4.3/8 | 5.7/8 | 1 | 6001700 |
| 1/2 | 0.5000 | 4.1/2 | 6" | 1 | 6001942 |

SPECIAL PURPOSE DRILL



Jobber Length Carbide Tipped

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

A160

DIN
338

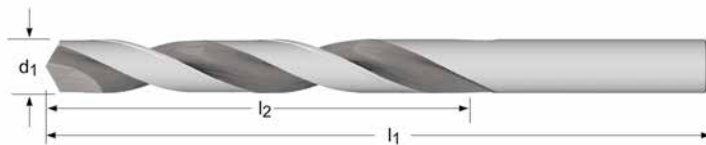
4XD

**HSS
HM**

118°



4.00 - 16.00



| d_1 \varnothing_{h_8} mm | d_1 decimal Inch | l_2 mm | l_1 mm | Pack Qty | A160 |
|------------------------------------|--------------------------|-------------|-------------|-------------|-------------|
| 4.00 | 0.1575 | 43 | 75 | 1 | 5969608 |
| 4.50 | 0.1772 | 47 | 80 | 1 | 5969616 |
| 5.00 | 0.1969 | 52 | 86 | 1 | 5969620 |
| 5.50 | 0.2165 | 57 | 93 | 1 | 5969624 |
| 6.00 | 0.2362 | 57 | 93 | 1 | 5969628 |
| 6.50 | 0.2559 | 63 | 101 | 1 | 5969632 |
| 6.80 | 0.2677 | 69 | 109 | 1 | 5969636 |
| 7.00 | 0.2756 | 69 | 109 | 1 | 5969639 |
| 7.50 | 0.2953 | 69 | 109 | 1 | 5969643 |
| 8.00 | 0.3150 | 75 | 117 | 1 | 5969646 |
| 8.50 | 0.3346 | 75 | 117 | 1 | 5969650 |
| 9.00 | 0.3543 | 81 | 125 | 1 | 5969658 |
| 9.50 | 0.3740 | 81 | 125 | 1 | 5969659 |
| 10.00 | 0.3937 | 87 | 133 | 1 | 5969553 |
| 10.20 | 0.4016 | 87 | 133 | 1 | 5969561 |
| 10.50 | 0.4134 | 87 | 133 | 1 | 5969566 |
| 11.00 | 0.4331 | 94 | 142 | 1 | 5969572 |
| 11.50 | 0.4528 | 94 | 142 | 1 | 5969578 |
| 12.00 | 0.4724 | 101 | 151 | 1 | 5969582 |
| 13.00 | 0.5118 | 101 | 151 | 1 | 5969586 |
| 14.00 | 0.5512 | 108 | 160 | 1 | 5969594 |
| 15.00 | 0.5906 | 114 | 169 | 1 | 5969599 |
| 16.00 | 0.6299 | 120 | 178 | 1 | 5969604 |

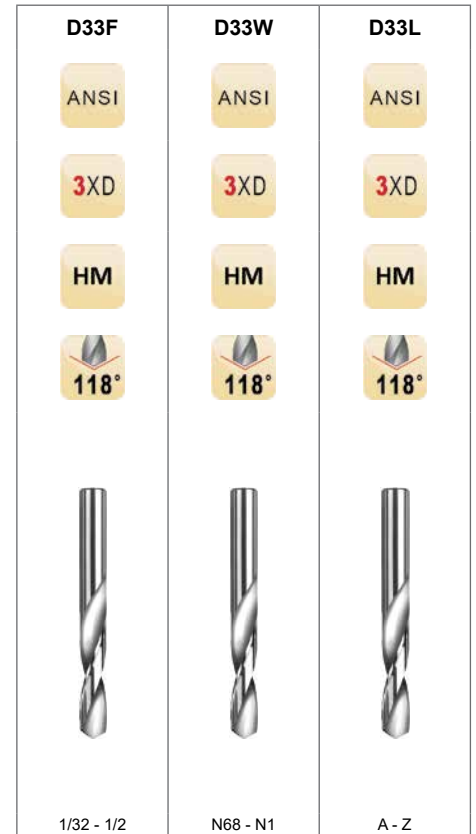
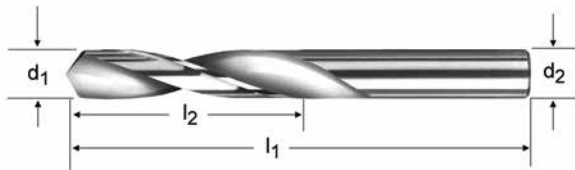
General Purpose Solid Carbide Jobber Length

D33F - Fractional Sizes

D33W - Wire Gauge Sizes

D33L - Letter Sizes

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



| 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 |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|---------|------|
| 1/32 | 68 | | 0.0310 | 5/16 | 1.1/4 | 1 | — | 6001815 | — |
| | | | 0.0313 | 5/16 | 1.1/4 | 1 | 6002760 | — | — |
| | 67 | | 0.0320 | 5/16 | 1.1/4 | 1 | — | 6002214 | — |
| | 66 | | 0.0330 | 5/16 | 1.1/4 | 1 | — | 6002208 | — |
| | 65 | | 0.0350 | 5/8 | 1.3/8 | 1 | — | 6002205 | — |
| | 64 | | 0.0360 | 5/8 | 1.3/8 | 1 | — | 6002202 | — |
| | 63 | | 0.0370 | 5/8 | 1.3/8 | 1 | — | 6002199 | — |
| | 62 | | 0.0380 | 5/8 | 1.3/8 | 1 | — | 6002197 | — |
| | 61 | | 0.0390 | 5/8 | 1.3/8 | 1 | — | 6002194 | — |
| | 60 | | 0.0400 | 3/4 | 1.1/2 | 1 | — | 6002192 | — |
| | 59 | | 0.0410 | 3/4 | 1.1/2 | 1 | — | 6002188 | — |
| | 58 | | 0.0420 | 3/4 | 1.1/2 | 1 | — | 6002186 | — |
| | 57 | | 0.0430 | 3/4 | 1.1/2 | 1 | — | 6002182 | — |
| | 56 | | 0.0465 | 3/4 | 1.1/2 | 1 | — | 6002180 | — |
| 3/64 | | | 0.0469 | 3/4 | 1.1/2 | 1 | 6002731 | — | — |
| | 55 | | 0.0520 | 3/4 | 1.1/2 | 1 | — | 6002178 | — |
| | 54 | | 0.0550 | 3/4 | 1.1/2 | 1 | — | 6002175 | — |
| | 53 | | 0.0595 | 3/4 | 1.1/2 | 1 | — | 6002172 | — |
| 1/16 | | | 0.0625 | 3/4 | 1.1/2 | 1 | 6002738 | — | — |
| | 52 | | 0.0635 | 3/4 | 1.1/2 | 1 | — | 6002169 | — |
| | 51 | | 0.0670 | 3/4 | 1.1/2 | 1 | — | 6002166 | — |
| | 50 | | 0.0700 | 7/8 | 1.3/4 | 1 | — | 6002163 | — |
| | 49 | | 0.0730 | 7/8 | 1.3/4 | 1 | — | 6002157 | — |
| | 48 | | 0.0760 | 7/8 | 1.3/4 | 1 | — | 6002151 | — |
| 5/64 | | | 0.0781 | 7/8 | 1.3/4 | 1 | 6002736 | — | — |
| | 47 | | 0.0785 | 7/8 | 1.3/4 | 1 | — | 6002147 | — |
| | 46 | | 0.0810 | 7/8 | 1.3/4 | 1 | — | 6002145 | — |
| | 45 | | 0.0820 | 7/8 | 1.3/4 | 1 | — | 6002140 | — |
| | 44 | | 0.0860 | 1" | 2" | 1 | — | 6002136 | — |
| | 43 | | 0.0890 | 1" | 2" | 1 | — | 6002132 | — |
| | 42 | | 0.0935 | 1" | 2" | 1 | — | 6002128 | — |
| 3/32 | | | 0.0938 | 1" | 2" | 1 | 6002730 | — | — |
| | 41 | | 0.0960 | 1" | 2" | 1 | — | 6002124 | — |

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 | — | 6002120 | — |
| | 39 | | 0.0995 | 1.1/4 | 2.1/4 | 1 | — | 6002106 | — |
| | 38 | | 0.1015 | 1.1/4 | 2.1/4 | 1 | — | 6002103 | — |
| | 37 | | 0.1040 | 1.1/4 | 2.1/4 | 1 | — | 6002098 | — |
| | 36 | | 0.1065 | 1.1/4 | 2.1/4 | 1 | — | 6002091 | — |
| 7/64 | | | 0.1094 | 1.1/4 | 2.1/4 | 1 | 6002740 | — | — |
| | 35 | | 0.1100 | 1.1/4 | 2.1/4 | 1 | — | 6002086 | — |
| | 34 | | 0.1110 | 1.1/4 | 2.1/4 | 1 | — | 6002082 | — |
| | 33 | | 0.1130 | 1.1/4 | 2.1/4 | 1 | — | 6002077 | — |
| | 32 | | 0.1160 | 1.1/4 | 2.1/4 | 1 | — | 6002073 | — |
| | 31 | | 0.1200 | 1.1/4 | 2.1/4 | 1 | — | 6002069 | — |
| 1/8 | | | 0.1250 | 1.1/4 | 2.1/4 | 1 | 6002763 | — | — |
| | 30 | | 0.1285 | 1.3/8 | 2.1/2 | 1 | — | 6002064 | — |
| | 29 | | 0.1360 | 1.3/8 | 2.1/2 | 1 | — | 6002224 | — |
| | 28 | | 0.1405 | 1.3/8 | 2.1/2 | 1 | — | 6002221 | — |
| 9/64 | | | 0.1406 | 1.3/8 | 2.1/2 | 1 | 6002742 | — | — |
| | 27 | | 0.1440 | 1.3/8 | 2.1/2 | 1 | — | 6002217 | — |
| | 26 | | 0.1470 | 1.3/8 | 2.1/2 | 1 | — | 6002211 | — |
| | 25 | | 0.1495 | 1.3/8 | 2.1/2 | 1 | — | 6002184 | — |
| | 24 | | 0.1520 | 1.3/8 | 2.1/2 | 1 | — | 6002154 | — |
| | 23 | | 0.1540 | 1.3/8 | 2.1/2 | 1 | — | 6002112 | — |
| 5/32 | | | 0.1563 | 1.3/8 | 2.1/2 | 1 | 6002735 | — | — |
| | 22 | | 0.1570 | 1.3/8 | 2.1/2 | 1 | — | 6002055 | — |
| | 21 | | 0.1590 | 1.3/8 | 2.1/2 | 1 | — | 6002473 | — |
| | 20 | | 0.1610 | 1.3/8 | 2.1/2 | 1 | — | 6002468 | — |
| | 19 | | 0.1660 | 1.5/8 | 2.3/4 | 1 | — | 6002460 | — |
| | 18 | | 0.1695 | 1.5/8 | 2.3/4 | 1 | — | 6002457 | — |
| 11/64 | | | 0.1719 | 1.5/8 | 2.3/4 | 1 | 6002765 | — | — |
| | 17 | | 0.1730 | 1.5/8 | 2.3/4 | 1 | — | 6002454 | — |
| | 16 | | 0.1770 | 1.5/8 | 2.3/4 | 1 | — | 6002451 | — |
| | 15 | | 0.1800 | 1.5/8 | 2.3/4 | 1 | — | 6002448 | — |
| | 14 | | 0.1820 | 1.5/8 | 2.3/4 | 1 | — | 6002444 | — |
| | 13 | | 0.1850 | 1.5/8 | 2.3/4 | 1 | — | 6002441 | — |
| 3/16 | | | 0.1875 | 1.5/8 | 2.3/4 | 1 | 6002729 | — | — |
| | 12 | | 0.1890 | 1.5/8 | 2.3/4 | 1 | — | 6002438 | — |
| | 11 | | 0.1910 | 1.5/8 | 2.3/4 | 1 | — | 6002432 | — |
| | 10 | | 0.1935 | 1.5/8 | 2.3/4 | 1 | — | 6002429 | — |
| | 9 | | 0.1960 | 1.3/4 | 3" | 1 | — | 6001936 | — |
| | 8 | | 0.1990 | 1.3/4 | 3" | 1 | — | 6001909 | — |
| | 7 | | 0.2010 | 1.3/4 | 3" | 1 | — | 6001872 | — |
| 13/64 | | | 0.2031 | 1.3/4 | 3" | 1 | 6002704 | — | — |
| | 6 | | 0.2040 | 1.3/4 | 3" | 1 | — | 6002190 | — |
| | 5 | | 0.2055 | 1.3/4 | 3" | 1 | — | 6002160 | — |
| | 4 | | 0.2090 | 1.3/4 | 3" | 1 | — | 6002117 | — |
| | 3 | | 0.2130 | 1.3/4 | 3" | 1 | — | 6002227 | — |
| 7/32 | | | 0.2188 | 1.3/4 | 3" | 1 | 6002739 | — | — |
| | 2 | | 0.2210 | 1.3/4 | 3" | 1 | — | 6002463 | — |
| | 1 | | 0.2280 | 1.3/4 | 3" | 1 | — | 6002426 | — |
| | | A | 0.2340 | 2" | 3.1/4 | 1 | — | — | 6002743 |
| 15/64 | | | 0.2344 | 2" | 3.1/4 | 1 | 6002711 | — | — |
| | | B | 0.2380 | 2" | 3.1/4 | 1 | — | — | 6002744 |
| | | C | 0.2420 | 2" | 3.1/4 | 1 | — | — | 6002745 |
| | | D | 0.2460 | 2" | 3.1/4 | 1 | — | — | 6002746 |
| 1/4 | | | 0.2500 | 2" | 3.1/4 | 1 | 6002762 | — | — |
| | | F | 0.2570 | 2" | 3.1/4 | 1 | — | — | 6002747 |
| | | G | 0.2610 | 2.1/8 | 3.1/2 | 1 | — | — | 6002748 |
| 17/64 | | | 0.2656 | 2.1/8 | 3.1/2 | 1 | 6002714 | — | — |
| | | H | 0.2660 | 2.1/8 | 3.1/2 | 1 | — | — | 6002750 |
| | | I | 0.2720 | 2.1/8 | 3.1/2 | 1 | — | — | 6002751 |
| | | J | 0.2770 | 2.1/8 | 3.1/2 | 1 | — | — | 6002752 |
| | | K | 0.2810 | 2.1/8 | 3.1/2 | 1 | — | — | 6002753 |
| 9/32 | | | 0.2813 | 2.1/8 | 3.1/2 | 1 | 6002741 | — | — |
| | | L | 0.2900 | 2.1/8 | 3.1/2 | 1 | — | — | 6002754 |
| | | M | 0.2950 | 2.3/8 | 4" | 1 | — | — | 6002755 |
| 19/64 | | | 0.2969 | 2.3/8 | 4" | 1 | 6002718 | — | — |
| | | N | 0.3020 | 2.3/8 | 4" | 1 | — | — | 6002756 |

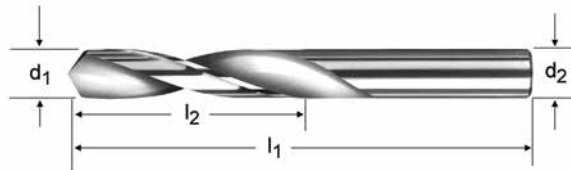
| d ₁ Ø Inch | d ₁ Ø Nr. | d ₁ Ø letter | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | Pack Qty | D33F | D33W | D33L |
|-----------------------------|----------------------------|-------------------------------|-----------------------------------|------------------------|------------------------|-------------|---------|------|---------|
| 5/16 | | | 0.3125 | 2.3/8 | 4" | 1 | 6002734 | — | — |
| | | O | 0.3160 | 2.3/8 | 4" | 1 | — | — | 6002757 |
| | | P | 0.3230 | 2.3/8 | 4" | 1 | — | — | 6002758 |
| 21/64 | | | 0.3281 | 2.3/8 | 4" | 1 | 6002723 | — | — |
| | | Q | 0.3320 | 2.3/8 | 4" | 1 | — | — | 6002759 |
| | | R | 0.3390 | 2.3/8 | 4" | 1 | — | — | 6002761 |
| 11/32 | | | 0.3437 | 2.3/8 | 4" | 1 | 6002764 | — | — |
| | | S | 0.3480 | 2.3/8 | 4" | 1 | — | — | 6002301 |
| | | T | 0.3580 | 2.3/4 | 4.1/4 | 1 | — | — | 6002360 |
| 23/64 | | | 0.3594 | 2.3/4 | 4.1/4 | 1 | 6002724 | — | — |
| | | U | 0.3680 | 2.3/4 | 4.1/4 | 1 | — | — | 6002403 |
| 3/8 | | | 0.3750 | 2.3/4 | 4.1/4 | 1 | 6002732 | — | — |
| | | V | 0.3770 | 2.3/4 | 4.1/4 | 1 | — | — | 6002435 |
| | | W | 0.3860 | 2.7/8 | 4.1/2 | 1 | — | — | 6002470 |
| 25/64 | | | 0.3906 | 2.7/8 | 4.1/2 | 1 | 6002725 | — | — |
| | | X | 0.3970 | 2.7/8 | 4.1/2 | 1 | — | — | 6002477 |
| | | Y | 0.4040 | 2.7/8 | 4.1/2 | 1 | — | — | 6002480 |
| 13/32 | | | 0.4063 | 2.7/8 | 4.1/2 | 1 | 6002702 | — | — |
| | | Z | 0.4130 | 2.7/8 | 4.1/2 | 1 | — | — | 6002483 |
| 27/64 | | | 0.4219 | 2.7/8 | 4.1/2 | 1 | 6002726 | — | — |
| 7/16 | | | 0.4375 | 2.7/8 | 4.1/2 | 1 | 6002737 | — | — |
| 29/64 | | | 0.4531 | 3" | 4.3/4 | 1 | 6002728 | — | — |
| 15/32 | | | 0.4687 | 3" | 4.3/4 | 1 | 6002707 | — | — |
| 31/64 | | | 0.4844 | 3" | 4.3/4 | 1 | 6002733 | — | — |
| 1/2 | | | 0.5000 | 3" | 4.3/4 | 1 | 6002749 | — | — |

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°

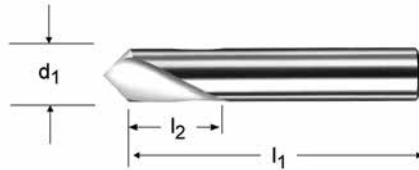


1.00 - 12.00

| d_1 Ø | d_1 decimal | l_2 | l_1 | Pack Qty | D33M |
|------------|------------------|-------|-------|-------------|---------|
| mm | Inch | inch | inch | | |
| 1.00 | 0.0394 | 5/8 | 1.1/2 | 1 | 6002316 |
| 1.50 | 0.0591 | 3/4 | 1.1/2 | 1 | 6002320 |
| 2.00 | 0.0787 | 7/8 | 1.3/4 | 1 | 6002353 |
| 2.05 | 0.0807 | 7/8 | 1.3/4 | 1 | 6002364 |
| 2.50 | 0.0984 | 1" | 2" | 1 | 6002368 |
| 3.00 | 0.1181 | 1.1/4 | 2.1/4 | 1 | 6002373 |
| 3.30 | 0.1299 | 1.3/8 | 2.1/2 | 1 | 6002378 |
| 3.50 | 0.1378 | 1.3/8 | 2.1/2 | 1 | 6002382 |
| 4.00 | 0.1575 | 1.3/8 | 2.1/2 | 1 | 6002386 |
| 4.50 | 0.1772 | 1.5/8 | 2.3/4 | 1 | 6002390 |
| 5.00 | 0.1969 | 1.3/4 | 3" | 1 | 6002394 |
| 5.50 | 0.2165 | 1.3/4 | 3" | 1 | 6002397 |
| 6.00 | 0.2362 | 2" | 3.1/4 | 1 | 6002400 |
| 6.50 | 0.2559 | 2" | 3.1/4 | 1 | 6002406 |
| 7.00 | 0.2756 | 2.1/8 | 3.1/2 | 1 | 6002409 |
| 7.50 | 0.2953 | 2.3/8 | 4" | 1 | 6002412 |
| 8.00 | 0.3150 | 2.3/8 | 4" | 1 | 6002415 |
| 8.50 | 0.3346 | 2.3/8 | 4" | 1 | 6002418 |
| 9.00 | 0.3543 | 2.3/4 | 4.1/4 | 1 | 6002420 |
| 9.50 | 0.3740 | 2.3/4 | 4.1/4 | 1 | 6002423 |
| 10.00 | 0.3937 | 2.7/8 | 4.1/2 | 1 | 6002324 |
| 10.50 | 0.4134 | 2.7/8 | 4.1/2 | 1 | 6002328 |
| 10.75 | 0.4232 | 2.7/8 | 4.1/2 | 1 | 6002333 |
| 11.00 | 0.4331 | 2.7/8 | 4.1/2 | 1 | 6002338 |
| 11.50 | 0.4528 | 3" | 4.3/4 | 1 | 6002342 |
| 12.00 | 0.4724 | 3" | 4.3/4 | 1 | 6002347 |

General Purpose Solid Carbide Standard Length - Spotting Drill

DS-90 Provides 90°, 120° or 142° included angle spot locations or chamfers for follow-up drilling & tapping operations.
DS-120
DS-142



| DS-90 | DS-120 | DS-142 |
|-----------|-----------|-----------|
| ANSI | ANSI | ANSI |
| 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 | 6002225 | 7378063 | 7378069 |
| 3/16 | 0.1875 | 3/4 | 3" | 1 | 6002228 | 7378064 | 7378970 |
| 1/4 | 0.2500 | 3/4 | 3" | 1 | 6002392 | 7378068 | 7378974 |
| 5/16 | 0.3125 | 1" | 2.1/2 | 1 | 6002232 | 7378066 | 7378972 |
| 3/8 | 0.3750 | 1" | 3" | 1 | 6002230 | 7378065 | 7378971 |
| 1/2 | 0.5000 | 1" | 4" | 1 | 6002389 | 7378067 | 7378973 |

SPECIAL PURPOSE DRILL



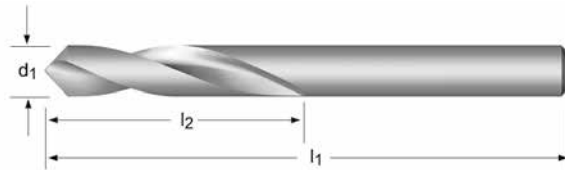
Spotting Drill - Short Length

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 |
|----------|----------|----------|----------|
| ANSI | ANSI | ANSI | ANSI |
| 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 | 6000094 | 6000142 | 6000072 | 6000113 |
| 3/8 | 0.3750 | 1.1/8 | 3.1/8 | 1 | 6000100 | 6000150 | 6000078 | 6000127 |
| 1/2 | 0.5000 | 1.3/8 | 3.3/4 | 1 | 6000090 | 6000139 | 6000069 | 6000110 |
| 5/8 | 0.6250 | 1.5/8 | 4.3/8 | 1 | 6000104 | 6000154 | 6000081 | 6000133 |
| 3/4 | 0.7500 | 1.7/8 | 5" | 1 | 6000097 | 6000146 | 6000075 | 6000116 |
| 1" | 1.0000 | 2.1/4 | 6" | 1 | 6000087 | 6000135 | 6000066 | 6000108 |

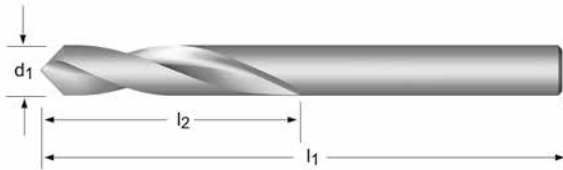
Spotting Drill - Regular Length

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 |
|----------|----------|----------|------------|
| ANSI | ANSI | ANSI | ANSI |
| 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 | 6000101 | 6000055 | 6000082 | 6000166 |
| 3/8 | 0.3750 | 1.1/8 | 5" | 1 | 6000112 | 6000060 | 6000088 | 6000213 |
| 1/2 | 0.5000 | 1.3/8 | 6" | 1 | 6000098 | 6000222 | 6000079 | 6000122 |
| 5/8 | 0.6250 | 1.5/8 | 7" | 1 | 6000050 | 6000063 | 6000091 | — |
| 3/4 | 0.7500 | 1.7/8 | 8" | 1 | 6000105 | 6000057 | 6000085 | — |
| 1" | 1.0000 | 2.1/4 | 8" | 1 | 6000095 | 6000219 | 6000076 | — |

SPECIAL PURPOSE DRILL



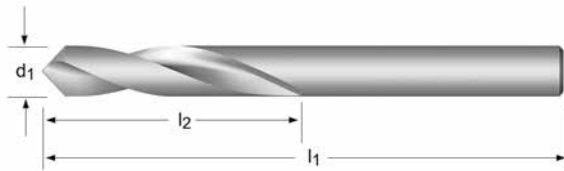
Spotting Drill - Long Length

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.

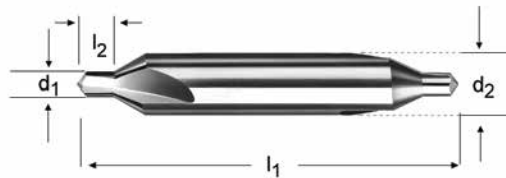


| SPL-90 | SPLG-90 | SPL-120 | SPLG-120 |
|----------|----------|-----------|-----------|
| ANSI | ANSI | ANSI | ANSI |
| 1XD | 1XD | 1XD | 1XD |
| HSS | HSS | HSS | HSS |
| 90° | 90° | 120° | 120° |
| | | | |
| 1/4 - 1" | 1/4 - 1" | 1/4 - 5/8 | 1/4 - 1/2 |

| 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 | 6000025 | 6000062 | 6000005 | 6000046 |
| 3/8 | 0.3750 | 1.1/8 | 7" | 1 | 6000031 | 6000068 | 6000014 | 6000051 |
| 1/2 | 0.5000 | 1.3/8 | 8" | 1 | 6000022 | 6000059 | 6000002 | 6000040 |
| 5/8 | 0.6250 | 1.5/8 | 9" | 1 | 6000034 | — | 6000016 | — |
| 3/4 | 0.7500 | 1.7/8 | 10" | 1 | 6000028 | 6000065 | — | — |
| 1" | 1.0000 | 2.1/4 | 10" | 1 | 6000019 | 6000056 | — | — |

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

ANSI

1XD

HM

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 | 6002219 |
| 1 | 3/64 | 3/64 | 1.1/2 | 1/8 | 1 | 6002246 |
| 2 | 5/64 | 5/64 | 2" | 3/16 | 1 | 6002278 |
| 3 | 7/64 | 7/64 | 2" | 1/4 | 1 | 6002325 |
| 4 | 1/8 | 1/8 | 2.1/8 | 5/16 | 1 | 6002372 |
| 5 | 3/16 | 3/16 | 2.3/4 | 7/16 | 1 | 6002380 |
| 6 | 7/32 | 7/32 | 3" | 1/2 | 1 | 6002384 |

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 | 6001210 |
| 00 | 0.0250 | 0.0300 | 1.1/8 | 1/8 | 12 | 6001208 |
| 0 | 1/32 | 0.0380 | 1.1/8 | 1/8 | 12 | 6001205 |
| 1 | 3/64 | 3/64 | 1.1/4 | 1/8 | 12 | 6001213 |
| 2 | 5/64 | 5/64 | 1.7/8 | 3/16 | 12 | 6001215 |
| 3 | 7/64 | 7/64 | 2" | 1/4 | 12 | 6001217 |
| 4 | 1/8 | 1/8 | 2.1/8 | 5/16 | 12 | 6001219 |
| 5 | 3/16 | 3/16 | 2.3/4 | 7/16 | 6 | 6001221 |
| 6 | 7/32 | 7/32 | 3" | 1/2 | 6 | 6001223 |
| 7 | 1/4 | 1/4 | 3.1/4 | 5/8 | 1 | 6001225 |
| 8 | 5/16 | 5/16 | 3.1/2 | 3/4 | 1 | 6001227 |

General Purpose Combined Drill and Countersink (Center Drill)

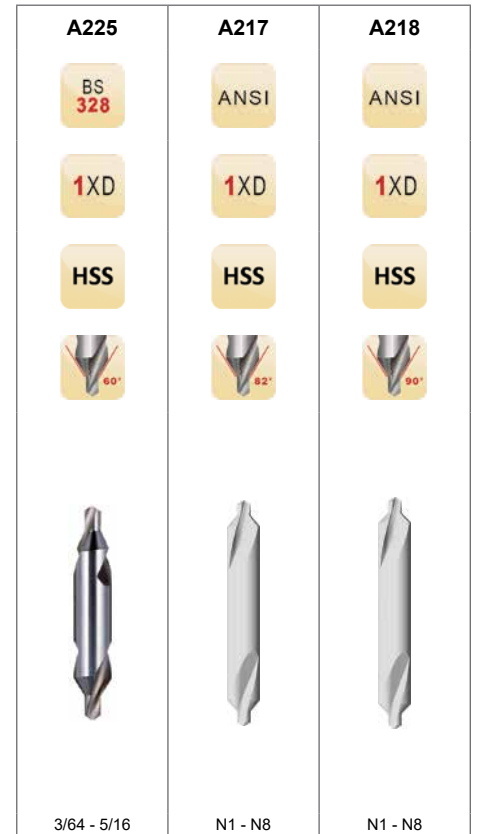
A225 60° C'sink. Bright Finish improves chip flow in soft or non-ferrous materials

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



| 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 | 5969157 | — | — |
| BS2 | 1/16 | 0.0625 | 3/32 - 5/64 | 1.3/4 | 3/16 | 1 | 5969160 | — | — |
| BS3 | 3/32 | 0.0938 | 5/32 - 1/8 | 2" | 1/4 | 1 | 5969163 | — | — |
| BS4 | 1/8 | 0.1250 | 3/16 - 5/32 | 2.1/4 | 5/16 | 1 | 5969166 | — | — |
| BS5 | 3/16 | 0.1875 | 9/32 - 1/4 | 2.1/2 | 7/16 | 1 | 5969169 | — | — |
| BS5A | 7/32 | 0.2188 | 5/16 - 9/32 | 2.3/4 | 1/2 | 1 | 5969171 | — | — |
| BS6 | 1/4 | 0.2500 | 3/8 - 5/16 | 3" | 5/8 | 1 | 5969173 | — | — |
| BS7 | 5/16 | 0.3125 | 15/32 - 13/32 | 3.1/2 | 3/4 | 1 | 5969174 | — | — |
| 1 | | 0.0469 | .055-.067 | 1.1/4 | 1/8 | 1 | — | 5969408 | — |
| 1 | | 0.0469 | .055-.067 | 1.1/4 | 1/8 | 1 | — | — | 5968986 |
| 2 | | 0.0781 | .094-.106 | 1.7/8 | 3/16 | 1 | — | 5969412 | — |
| 2 | | 0.0781 | .094-.106 | 1.7/8 | 3/16 | 1 | — | — | 5969045 |
| 3 | | 0.1094 | .130-.154 | 2" | 1/4 | 1 | — | 5969415 | — |
| 3 | | 0.1094 | .130-.154 | 2" | 1/4 | 1 | — | — | 5969099 |
| 4 | | 0.1250 | .150-.173 | 2.1/8 | 5/16 | 1 | — | 5969418 | — |
| 4 | | 0.1250 | .150-.173 | 2.1/8 | 5/16 | 1 | — | — | 5969147 |
| 5 | | 0.1875 | .232-.256 | 2.3/4 | 7/16 | 1 | — | 5969420 | — |
| 5 | | 0.1875 | .232-.256 | 2.3/4 | 7/16 | 1 | — | — | 5969175 |
| 6 | | 0.2188 | .272-.295 | 3" | 1/2 | 1 | — | 5969422 | — |
| 6 | | 0.2188 | .272-.295 | 3" | 1/2 | 1 | — | — | 5969177 |
| 7 | | 0.2500 | .315-.339 | 3.1/4 | 5/8 | 1 | — | 5969423 | — |
| 7 | | 0.2500 | .315-.339 | 3.1/4 | 5/8 | 1 | — | — | 5969178 |
| 8 | | 0.3125 | .394-.417 | 3.1/2 | 3/4 | 1 | — | 5969424 | — |
| 8 | | 0.3125 | .394-.417 | 3.1/2 | 3/4 | 1 | — | — | 5969179 |

| Set | Style | Pieces per set | Contents of set | Pack Qty | A217 set | A218 set |
|---------|-------|----------------|--------------------|----------|----------|----------|
| A217SET | A217 | 5 | N1, N2, N3, N4, N5 | 1 | 5969426 | — |
| A218SET | A218 | 5 | N1, N2, N3, N4, N5 | 1 | — | 5969180 |

SPECIAL PURPOSE DRILL

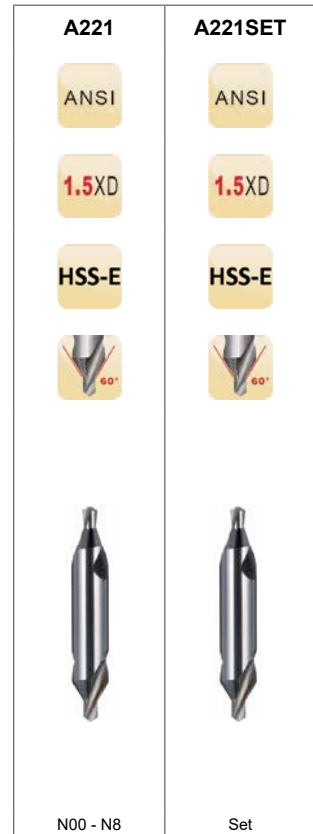


Cobalt Combined Drill and Countersink (Center Drill)

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



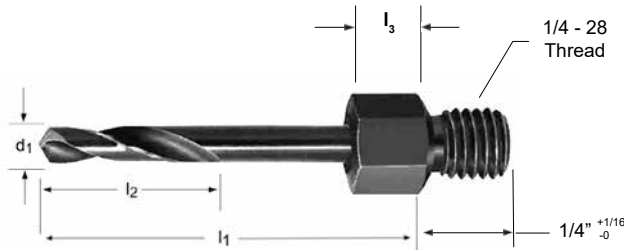
| Nr. | Set | d ₁ Ø Inch | Style | d ₁ decimal Inch | Pieces per Set | l ₂ Inch | Contents of set | l ₁ Inch | d ₂ Ø Inch | Pack Qty | A221 | A221SET |
|-----|---------|-----------------------------|-------|-----------------------------------|----------------------|------------------------|--------------------|------------------------|-----------------------------|-------------|---------|-----------------|
| 00 | | 0.025 | | 0.0250 | | 1/32 | | 1.1/8 | 1/8 | 1 | 5969071 | ¹⁾ — |
| 0 | | 1/32 | | 0.0313 | | 1/32 | | 1.1/8 | 1/8 | 1 | 5969065 | ¹⁾ — |
| 1 | | 3/64 | | 0.0469 | | 3/64 | | 1.1/4 | 1/8 | 1 | 5969075 | — |
| 2 | | 5/64 | | 0.0781 | | 5/64 | | 1.7/8 | 3/16 | 1 | 5969079 | — |
| 3 | | 7/64 | | 0.1094 | | 7/64 | | 2" | 1/4 | 1 | 5969085 | — |
| 4 | | 1/8 | | 0.1250 | | 1/8 | | 2.1/8 | 5/16 | 1 | 5969089 | — |
| 5 | | 3/16 | | 0.1875 | | 3/16 | | 2.3/4 | 7/16 | 1 | 5969094 | — |
| 6 | | 7/32 | | 0.2188 | | 7/32 | | 3" | 1/2 | 1 | 5969104 | — |
| 7 | | 1/4 | | 0.2500 | | 1/4 | | 3.1/4 | 5/8 | 1 | 5969109 | — |
| 8 | | 5/16 | | 0.3125 | | 5/16 | | 3.1/2 | 3/4 | 1 | 5969115 | — |
| | A221SET | | A221 | | 5 | | N1, N2, N3, N4, N5 | | | 1 | — | 5969120 |

¹⁾ single ended only

HSS, Threaded Hex Shank Drills

- TS41HS** - Stub, Wire Gauge Sizes
- TS40HS** - Stub, Fractional Sizes
- TS42HS** - Stub, Letter Sizes
- TS18HS** - Short, Wire Gauge Sizes
- TS10HS** - Short, Fractional Sizes
- TS15HS** - Short, Letter Sizes
- TS52HS** - Long, Wire Gauge Sizes
- TS51HS** - Long, Fractional Sizes
- TS55HS** - Long, Letter Sizes

NAS-965 Type B Steam tempered 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



| TS41HS TS40HS TS42HS | TS18HS TS10HS TS15HS | TS52HS TS51HS TS55HS |
|---|---|---|
| HSS | HSS | HSS |
| 135° | 135° | 135° |
|  |  |  |
| N50 - N1 3/32 - 3/8 A - G | N50 - N1 3/32 - 3/8 A - G | N50 - N1 3/32 - 3/8 A - G |

| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41HS TS40HS TS42HS | TS18HS TS10HS TS15HS | TS52HS TS51HS TS55HS |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N50 | 5/16 | 1/2 | 1/8 | 1 | 7877827 | — | — |
| N50 | 9/16 | 1" | 1/4 | 1 | — | 7877968 | — |
| N50 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878029 |
| 3/32 | 5/16 | 1/2 | 1/8 | 1 | 7877828 | — | — |
| 3/32 | 9/16 | 1" | 1/4 | 1 | — | 7877969 | — |
| 3/32 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878030 |
| N40 | 5/16 | 1/2 | 1/8 | 1 | 7877829 | — | — |
| N40 | 9/16 | 1" | 1/4 | 1 | — | 7877970 | — |
| N40 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878031 |
| N39 | 5/16 | 1/2 | 1/8 | 1 | 7877910 | — | — |
| N39 | 9/16 | 1" | 1/4 | 1 | — | 7877971 | — |
| N39 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878032 |
| N38 | 5/16 | 1/2 | 1/8 | 1 | 7877911 | — | — |
| N38 | 9/16 | 1" | 1/4 | 1 | — | 7877972 | — |
| N38 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878033 |
| N37 | 5/16 | 1/2 | 1/8 | 1 | 7877912 | — | — |
| N37 | 9/16 | 1" | 1/4 | 1 | — | 7877973 | — |
| N37 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878034 |
| N36 | 5/16 | 1/2 | 1/8 | 1 | 7877913 | — | — |
| N36 | 9/16 | 1" | 1/4 | 1 | — | 7877974 | — |
| N36 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878035 |
| 7/64 | 5/16 | 1/2 | 1/8 | 1 | 7877914 | — | — |
| 7/64 | 9/16 | 1" | 1/4 | 1 | — | 7877975 | — |
| 7/64 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878036 |
| N35 | 5/16 | 1/2 | 1/8 | 1 | 7877915 | — | — |
| N35 | 9/16 | 1" | 1/4 | 1 | — | 7877976 | — |
| N35 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878037 |
| N34 | 5/16 | 1/2 | 1/8 | 1 | 7877916 | — | — |
| N34 | 9/16 | 1" | 1/4 | 1 | — | 7877977 | — |
| N34 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878038 |
| N33 | 5/16 | 1/2 | 1/8 | 1 | 7877917 | — | — |

SPECIAL PURPOSE DRILL



| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41HS TS40HS TS42HS | TS18HS TS10HS TS15HS | TS52HS TS51HS TS55HS |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N33 | 9/16 | 1" | 1/4 | 1 | — | 7877978 | — |
| N33 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878039 |
| N32 | 5/16 | 1/2 | 1/8 | 1 | 7877918 | — | — |
| N32 | 9/16 | 1" | 1/4 | 1 | — | 7877979 | — |
| N32 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878040 |
| N31 | 5/16 | 1/2 | 1/8 | 1 | 7877919 | — | — |
| N31 | 9/16 | 1" | 1/4 | 1 | — | 7877980 | — |
| N31 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878041 |
| 1/8 | 5/16 | 1/2 | 1/8 | 1 | 7877920 | — | — |
| 1/8 | 9/16 | 1" | 1/4 | 1 | — | 7877981 | — |
| 1/8 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878042 |
| N30 | 5/16 | 9/16 | 1/8 | 1 | 7877921 | — | — |
| N30 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877982 | — |
| N30 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878043 |
| N29 | 5/16 | 9/16 | 1/8 | 1 | 7877922 | — | — |
| N29 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877983 | — |
| N29 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878044 |
| N28 | 5/16 | 9/16 | 1/8 | 1 | 7877923 | — | — |
| N28 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877984 | — |
| N28 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878045 |
| 9/64 | 5/16 | 9/16 | 1/8 | 1 | 7877924 | — | — |
| 9/64 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877985 | — |
| 9/64 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878046 |
| N27 | 5/16 | 9/16 | 1/8 | 1 | 7877925 | — | — |
| N27 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877986 | — |
| N27 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878047 |
| N26 | 5/16 | 9/16 | 1/8 | 1 | 7877926 | — | — |
| N26 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877987 | — |
| N26 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878048 |
| N25 | 5/16 | 9/16 | 1/8 | 1 | 7877927 | — | — |
| N25 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877988 | — |
| N25 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878049 |
| N24 | 5/16 | 9/16 | 1/8 | 1 | 7877928 | — | — |
| N24 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877989 | — |
| N24 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878050 |
| N23 | 5/16 | 9/16 | 1/8 | 1 | 7877929 | — | — |
| N23 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877990 | — |
| N23 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878051 |
| 5/32 | 5/16 | 9/16 | 1/8 | 1 | 7877930 | — | — |
| 5/32 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877991 | — |
| 5/32 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878052 |
| N22 | 5/16 | 9/16 | 1/8 | 1 | 7877931 | — | — |
| N22 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877992 | — |
| N22 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878053 |
| N21 | 5/16 | 9/16 | 1/8 | 1 | 7877932 | — | — |
| N21 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877993 | — |
| N21 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878054 |
| N20 | 5/16 | 9/16 | 1/8 | 1 | 7877933 | — | — |
| N20 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877994 | — |
| N20 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878055 |
| N19 | 5/16 | 9/16 | 1/8 | 1 | 7877934 | — | — |
| N19 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877995 | — |
| N19 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878056 |
| N18 | 5/16 | 9/16 | 1/8 | 1 | 7877935 | — | — |
| N18 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877996 | — |
| N18 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878057 |
| 11/64 | 5/16 | 9/16 | 1/8 | 1 | 7877936 | — | — |
| 11/64 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877997 | — |
| 11/64 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878357 |
| N17 | 5/16 | 9/16 | 1/8 | 1 | 7877937 | — | — |
| N17 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877998 | — |
| N17 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878059 |

| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41HS TS40HS TS42HS | TS18HS TS10HS TS15HS | TS52HS TS51HS TS55HS |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N16 | 5/16 | 9/16 | 1/8 | 1 | 7877938 | — | — |
| N16 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7877999 | — |
| N16 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878060 |
| N15 | 5/16 | 9/16 | 1/8 | 1 | 7877939 | — | — |
| N15 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878000 | — |
| N15 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878061 |
| N14 | 5/16 | 9/16 | 1/8 | 1 | 7877940 | — | — |
| N14 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878001 | — |
| N14 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878062 |
| N13 | 5/16 | 9/16 | 1/8 | 1 | 7877941 | — | — |
| N13 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878002 | — |
| N13 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878063 |
| 3/16 | 5/16 | 9/16 | 1/8 | 1 | 7877942 | — | — |
| 3/16 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878003 | — |
| 3/16 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878064 |
| N12 | 5/16 | 9/16 | 1/8 | 1 | 7877943 | — | — |
| N12 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878004 | — |
| N12 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878065 |
| N11 | 5/16 | 9/16 | 1/8 | 1 | 7877944 | — | — |
| N11 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878005 | — |
| N11 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878066 |
| N10 | 5/16 | 9/16 | 1/8 | 1 | 7877945 | — | — |
| N10 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878006 | — |
| N10 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878067 |
| N9 | 5/16 | 5/8 | 1/4 | 1 | 7877946 | — | — |
| N9 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878007 | — |
| N9 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878068 |
| N8 | 5/16 | 5/8 | 1/4 | 1 | 7877947 | — | — |
| N8 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878008 | — |
| N8 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878069 |
| N7 | 5/16 | 5/8 | 1/4 | 1 | 7877948 | — | — |
| N7 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878009 | — |
| N7 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878070 |
| 13/64 | 5/16 | 5/8 | 1/4 | 1 | 7877949 | — | — |
| 13/64 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878010 | — |
| 13/64 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878071 |
| N6 | 5/16 | 5/8 | 1/4 | 1 | 7877950 | — | — |
| N6 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878011 | — |
| N6 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878072 |
| N5 | 5/16 | 5/8 | 1/4 | 1 | 7877951 | — | — |
| N5 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878012 | — |
| N5 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878073 |
| N4 | 5/16 | 5/8 | 1/4 | 1 | 7877952 | — | — |
| N4 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878013 | — |
| N4 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878074 |
| N3 | 5/16 | 5/8 | 1/4 | 1 | 7877953 | — | — |
| N3 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878014 | — |
| N3 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878075 |
| 7/32 | 5/16 | 5/8 | 1/4 | 1 | 7877954 | — | — |
| 7/32 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878015 | — |
| 7/32 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878076 |
| N2 | 5/16 | 5/8 | 1/4 | 1 | 7877955 | — | — |
| N2 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878016 | — |
| N2 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878077 |
| N1 | 5/16 | 5/8 | 1/4 | 1 | 7877956 | — | — |
| N1 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878017 | — |
| N1 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878078 |
| A | 5/16 | 5/8 | 1/4 | 1 | 7877957 | — | — |
| A | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878018 | — |
| A | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878079 |
| 15/64 | 5/16 | 5/8 | 1/4 | 1 | 7877958 | — | — |
| 15/64 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878019 | — |
| 15/64 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878080 |
| B | 5/16 | 5/8 | 1/4 | 1 | 7877959 | — | — |

SPECIAL PURPOSE DRILL

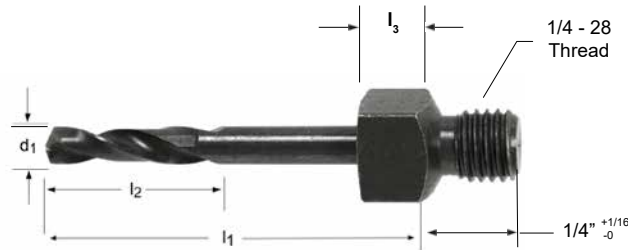


| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41HS | TS18HS | TS52HS |
|----------------------------|------------------------|------------------------|------------------------|-------------|---------|---------|---------|
| | | | | | TS40HS | TS10HS | TS51HS |
| | | | | | TS42HS | TS15HS | TS55HS |
| B | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878020 | — |
| B | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878081 |
| C | 5/16 | 5/8 | 1/4 | 1 | 7877960 | — | — |
| C | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878021 | — |
| C | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878082 |
| D | 5/16 | 5/8 | 1/4 | 1 | 7877961 | — | — |
| D | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878022 | — |
| D | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878083 |
| 1/4 | 5/16 | 5/8 | 1/4 | 1 | 7877962 | — | — |
| 1/4 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878023 | — |
| 1/4 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878084 |
| F | 5/16 | 5/8 | 1/4 | 1 | 7877963 | — | — |
| F | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878024 | — |
| F | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878085 |
| G | 5/16 | 5/8 | 1/4 | 1 | 7877964 | — | — |
| G | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878025 | — |
| G | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878086 |
| 9/32 | 5/16 | 5/8 | 1/4 | 1 | 7877965 | — | — |
| 9/32 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878026 | — |
| 9/32 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878087 |
| 5/16 | 5/16 | 5/8 | 1/4 | 1 | 7877966 | — | — |
| 5/16 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878027 | — |
| 5/16 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878088 |
| 3/8 | 5/16 | 5/8 | 1/4 | 1 | 7877967 | — | — |
| 3/8 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878028 | — |
| 3/8 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878089 |

Cobalt, Threaded Square Shank Drills

- TS41CO** - Stub, Wire Gauge Sizes
- TS40CO** - Stub, Fractional Sizes
- TS42CO** - Stub, Letter Sizes
- TS18CO** - Short, Wire Gauge Sizes
- TS10CO** - Short, Fractional Sizes
- TS15CO** - Short, Letter Sizes
- TS52CO** - Long, Wire Gauge Sizes
- TS51CO** - Long, Fractional Sizes
- TS55CO** - Long, Wire Gauge Sizes

NAS-965 Type D Steam tempered 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



| | | |
|---|---|---|
| TS41CO TS40CO TS42CO | TS18CO TS10CO TS15CO | TS52CO TS51CO TS55CO |
| HSS-E | HSS-E | HSS-E |
| | | |
| | | |
| N50 - N1 3/32 - 3/8 A - G | N50 - N1 3/32 - 3/8 A - G | N50 - N1 3/32 - 3/8 A - G |

| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41CO TS40CO TS42CO | TS18CO TS10CO TS15CO | TS52CO TS51CO TS55CO |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N50 | 5/16 | 1/2 | 1/8 | 1 | 7878110 | — | — |
| N50 | 9/16 | 1" | 1/4 | 1 | — | 7878171 | — |
| N50 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878232 |
| 3/32 | 5/16 | 1/2 | 1/8 | 1 | 7878111 | — | — |
| 3/32 | 9/16 | 1" | 1/4 | 1 | — | 7878172 | — |
| 3/32 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878233 |
| N40 | 5/16 | 1/2 | 1/8 | 1 | 7878112 | — | — |
| N40 | 9/16 | 1" | 1/4 | 1 | — | 7878173 | — |
| N40 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878234 |
| N39 | 5/16 | 1/2 | 1/8 | 1 | 7878113 | — | — |
| N39 | 9/16 | 1" | 1/4 | 1 | — | 7878174 | — |
| N39 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878235 |
| N38 | 5/16 | 1/2 | 1/8 | 1 | 7878114 | — | — |
| N38 | 9/16 | 1" | 1/4 | 1 | — | 7878175 | — |
| N38 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878236 |
| N37 | 5/16 | 1/2 | 1/8 | 1 | 7878115 | — | — |
| N37 | 9/16 | 1" | 1/4 | 1 | — | 7878176 | — |
| N37 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878237 |
| N36 | 5/16 | 1/2 | 1/8 | 1 | 7878116 | — | — |
| N36 | 9/16 | 1" | 1/4 | 1 | — | 7878177 | — |
| N36 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878238 |
| 7/64 | 5/16 | 1/2 | 1/8 | 1 | 7878117 | — | — |
| 7/64 | 9/16 | 1" | 1/4 | 1 | — | 7878178 | — |
| 7/64 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878239 |
| N35 | 5/16 | 1/2 | 1/8 | 1 | 7878118 | — | — |
| N35 | 9/16 | 1" | 1/4 | 1 | — | 7878179 | — |
| N35 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878240 |
| N34 | 5/16 | 1/2 | 1/8 | 1 | 7878119 | — | — |
| N34 | 9/16 | 1" | 1/4 | 1 | — | 7878180 | — |
| N34 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878241 |
| N33 | 5/16 | 1/2 | 1/8 | 1 | 7878120 | — | — |

SPECIAL PURPOSE DRILL



| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41CO TS40CO TS42CO | TS18CO TS10CO TS15CO | TS52CO TS51CO TS55CO |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N33 | 9/16 | 1" | 1/4 | 1 | — | 7878181 | — |
| N33 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878242 |
| N32 | 5/16 | 1/2 | 1/8 | 1 | 7878121 | — | — |
| N32 | 9/16 | 1" | 1/4 | 1 | — | 7878182 | — |
| N32 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878243 |
| N31 | 5/16 | 1/2 | 1/8 | 1 | 7878122 | — | — |
| N31 | 9/16 | 1" | 1/4 | 1 | — | 7878183 | — |
| N31 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878244 |
| 1/8 | 5/16 | 1/2 | 1/8 | 1 | 7878123 | — | — |
| 1/8 | 9/16 | 1" | 1/4 | 1 | — | 7878184 | — |
| 1/8 | 7/8 | 2 1/8 | 1/4 | 1 | — | — | 7878245 |
| N30 | 5/16 | 9/16 | 1/8 | 1 | 7878124 | — | — |
| N30 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878185 | — |
| N30 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878246 |
| N29 | 5/16 | 9/16 | 1/8 | 1 | 7878125 | — | — |
| N29 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878186 | — |
| N29 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878247 |
| N28 | 5/16 | 9/16 | 1/8 | 1 | 7878126 | — | — |
| N28 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878187 | — |
| N28 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878248 |
| 9/64 | 5/16 | 9/16 | 1/8 | 1 | 7878127 | — | — |
| 9/64 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878188 | — |
| 9/64 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878249 |
| N27 | 5/16 | 9/16 | 1/8 | 1 | 7878128 | — | — |
| N27 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878189 | — |
| N27 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878250 |
| N26 | 5/16 | 9/16 | 1/8 | 1 | 7878129 | — | — |
| N26 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878190 | — |
| N26 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878251 |
| N25 | 5/16 | 9/16 | 1/8 | 1 | 7878130 | — | — |
| N25 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878191 | — |
| N25 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878252 |
| N24 | 5/16 | 9/16 | 1/8 | 1 | 7878131 | — | — |
| N24 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878192 | — |
| N24 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878253 |
| N23 | 5/16 | 9/16 | 1/8 | 1 | 7878132 | — | — |
| N23 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878193 | — |
| N23 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878254 |
| 5/32 | 5/16 | 9/16 | 1/8 | 1 | 7878133 | — | — |
| 5/32 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878194 | — |
| 5/32 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878255 |
| N22 | 5/16 | 9/16 | 1/8 | 1 | 7878134 | — | — |
| N22 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878195 | — |
| N22 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878256 |
| N21 | 5/16 | 9/16 | 1/8 | 1 | 7878135 | — | — |
| N21 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878196 | — |
| N21 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878257 |
| N20 | 5/16 | 9/16 | 1/8 | 1 | 7878136 | — | — |
| N20 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878197 | — |
| N20 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878258 |
| N19 | 5/16 | 9/16 | 1/8 | 1 | 7878137 | — | — |
| N19 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878198 | — |
| N19 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878259 |
| N18 | 5/16 | 9/16 | 1/8 | 1 | 7878138 | — | — |
| N18 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878199 | — |
| N18 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878260 |
| 11/64 | 5/16 | 9/16 | 1/8 | 1 | 7878139 | — | — |
| 11/64 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878200 | — |
| 11/64 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878261 |
| N17 | 5/16 | 9/16 | 1/8 | 1 | 7878140 | — | — |
| N17 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878201 | — |
| N17 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878262 |

| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41CO TS40CO TS42CO | TS18CO TS10CO TS15CO | TS52CO TS51CO TS55CO |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| N16 | 5/16 | 9/16 | 1/8 | 1 | 7878141 | — | — |
| N16 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878202 | — |
| N16 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878263 |
| N15 | 5/16 | 9/16 | 1/8 | 1 | 7878142 | — | — |
| N15 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878203 | — |
| N15 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878264 |
| N14 | 5/16 | 9/16 | 1/8 | 1 | 7878143 | — | — |
| N14 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878204 | — |
| N14 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878265 |
| N13 | 5/16 | 9/16 | 1/8 | 1 | 7878144 | — | — |
| N13 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878205 | — |
| N13 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878266 |
| 3/16 | 5/16 | 9/16 | 1/8 | 1 | 7878145 | — | — |
| 3/16 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878206 | — |
| 3/16 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878267 |
| N12 | 5/16 | 9/16 | 1/8 | 1 | 7878146 | — | — |
| N12 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878207 | — |
| N12 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878268 |
| N11 | 5/16 | 9/16 | 1/8 | 1 | 7878147 | — | — |
| N11 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878208 | — |
| N11 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878269 |
| N10 | 5/16 | 9/16 | 1/8 | 1 | 7878148 | — | — |
| N10 | 9/16 | 1 1/4 | 1/4 | 1 | — | 7878209 | — |
| N10 | 1 1/8 | 2 1/8 | 1/4 | 1 | — | — | 7878270 |
| N9 | 5/16 | 5/8 | 1/4 | 1 | 7878149 | — | — |
| N9 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878210 | — |
| N9 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878271 |
| N8 | 5/16 | 5/8 | 1/4 | 1 | 7878150 | — | — |
| N8 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878211 | — |
| N8 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878272 |
| N7 | 5/16 | 5/8 | 1/4 | 1 | 7878151 | — | — |
| N7 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878212 | — |
| N7 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878273 |
| 13/64 | 5/16 | 5/8 | 1/4 | 1 | 7878152 | — | — |
| 13/64 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878213 | — |
| 13/64 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878274 |
| N6 | 5/16 | 5/8 | 1/4 | 1 | 7878153 | — | — |
| N6 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878214 | — |
| N6 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878275 |
| N5 | 5/16 | 5/8 | 1/4 | 1 | 7878154 | — | — |
| N5 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878215 | — |
| N5 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878276 |
| N4 | 5/16 | 5/8 | 1/4 | 1 | 7878155 | — | — |
| N4 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878216 | — |
| N4 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878277 |
| N3 | 5/16 | 5/8 | 1/4 | 1 | 7878156 | — | — |
| N3 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878217 | — |
| N3 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878278 |
| 7/32 | 5/16 | 5/8 | 1/4 | 1 | 7878157 | — | — |
| 7/32 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878218 | — |
| 7/32 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878279 |
| N2 | 5/16 | 5/8 | 1/4 | 1 | 7878158 | — | — |
| N2 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878219 | — |
| N2 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878280 |
| N1 | 5/16 | 5/8 | 1/4 | 1 | 7878159 | — | — |
| N1 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878220 | — |
| N1 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878281 |
| A | 5/16 | 5/8 | 1/4 | 1 | 7878160 | — | — |
| A | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878221 | — |
| A | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878079 |
| 15/64 | 5/16 | 5/8 | 1/4 | 1 | 7878161 | — | — |
| 15/64 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878222 | — |
| 15/64 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878283 |
| B | 5/16 | 5/8 | 1/4 | 1 | 7878162 | — | — |

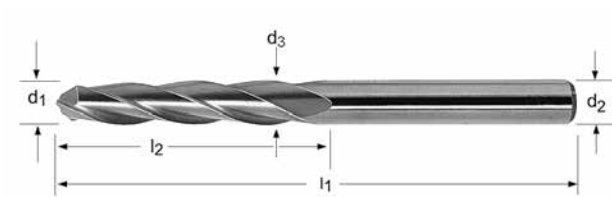
SPECIAL PURPOSE DRILL



| d ₁ Ø Nr. | l ₂ Inch | l ₁ Inch | l ₃ Inch | Pack Qty | TS41CO TS40CO TS42CO | TS18CO TS10CO TS15CO | TS52CO TS51CO TS55CO |
|----------------------------|------------------------|------------------------|------------------------|-------------|----------------------------|----------------------------|----------------------------|
| B | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878223 | — |
| B | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878081 |
| C | 5/16 | 5/8 | 1/4 | 1 | 7878163 | — | — |
| C | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878224 | — |
| C | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878082 |
| D | 5/16 | 5/8 | 1/4 | 1 | 7878164 | — | — |
| D | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878225 | — |
| D | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878083 |
| 1/4 | 5/16 | 5/8 | 1/4 | 1 | 7878165 | — | — |
| 1/4 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878226 | — |
| 1/4 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878287 |
| F | 5/16 | 5/8 | 1/4 | 1 | 7878166 | — | — |
| F | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878227 | — |
| F | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878085 |
| G | 5/16 | 5/8 | 1/4 | 1 | 7878167 | — | — |
| G | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878228 | — |
| G | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878086 |
| 9/32 | 5/16 | 5/8 | 1/4 | 1 | 7878168 | — | — |
| 9/32 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878229 | — |
| 9/32 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878290 |
| 5/16 | 5/16 | 5/8 | 1/4 | 1 | 7878169 | — | — |
| 5/16 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878230 | — |
| 5/16 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878291 |
| 3/8 | 5/16 | 5/8 | 1/4 | 1 | 7878170 | — | — |
| 3/8 | 9/16 | 1 1/4 | 5/16 | 1 | — | 7878231 | — |
| 3/8 | 1 1/8 | 2 1/8 | 5/16 | 1 | — | — | 7878292 |

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 | 5989076 |
| 2 | 0.1100 | 0.1280 | 7/8 | 2.1/4 | 0.1280 | 3 | 12 | 5995742 |
| 3 | 0.1650 | 0.1875 | 1.1/16 | 2.1/2 | 0.1875 | 3 | 12 | 5995783 |
| 4 | 0.2240 | 0.2500 | 1.1/4 | 2.3/4 | 0.2500 | 4 | 12 | 5995826 |

JOBBER DRILL SETS



General Purpose Jobber Length Sets

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



C15R10 Steam tempered reduces wear
C29R10 and chip 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 | — | 5995533 |
| C29R10 | R10 | 29 | 1/16 - 1/2 x 64ths | 1 | — | 5995628 |
| C15R10P | R10P | 15 | 1/16-1/2 x 32nds | 1 | 5995528 | — |
| C29R10P | R10P | 29 | 1/16 - 1/2 x 64ths | 1 | 5995624 | — |

General Purpose Jobber Length Sets

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



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



C20R18 Steam tempered for increased
C60R18 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 | 5967709 | — | — |
| 14 | A012 | 26 | A - Z | 1 | 5967714 | — | — |
| 18 | A012 | 29 | 1/16 - 1/2 x 1/64 | 1 | 5967571 | — | — |
| 20 | A012 | 15 | 1/16 - 1/2 x 1/32 | 1 | 5967576 | — | — |
| 30 | A012 | 115 | 1/16 - 1/2 x 1/64, Nr.1 - Nr.60, A-Z | 1 | 5967581 | — | — |
| 60 | A012 | 13 | 1/16 - 1/4 x 1/64 | 1 | 5967586 | — | — |
| C20R18 | R18 | 20 | N61 - N80 | 1 | — | 5995552 | — |
| C60R18 | R18 | 60 | N1 - N60 | 1 | — | 5995674 | — |
| C20R18P | R18P | 20 | N61 - N80 | 1 | — | — | 5995547 |
| C60R18P | R18P | 60 | N1 - N60 | 1 | — | — | 5995672 |

JOBBER DRILL SETS



General Purpose Jobber Length and Combination Sets

C26R15P

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



C26R15

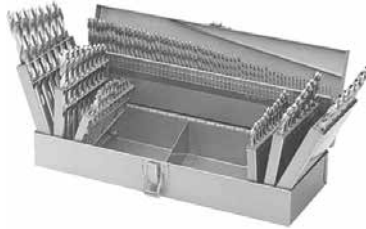
Steam tempered for increased wear resistance & lubricity.



C114COMBP

C115COMBP

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

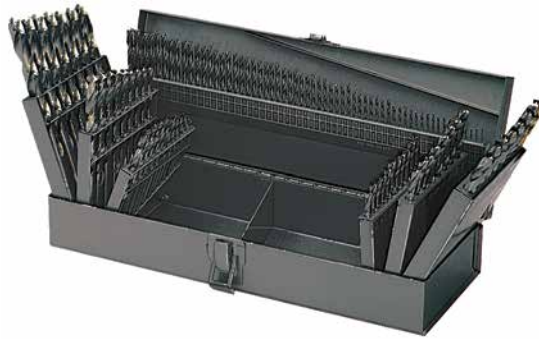


| C26R15P | C26R15 | C115COMBP | C114COMBP |
|---------|--------|-----------|-----------|
| ANSI | ANSI | ANSI | ANSI |
| 4XD | 4XD | 4XD | 4XD |
| HSS | HSS | HSS | HSS |
| 118° | 118° | 118° | 118° |
| | | | |
| Set | Set | Set | Set |

| Set | Style | Pieces per Set | Sizes | Pack Qty | C26R15P | C26R15 | C115COMBP | C114COMBP |
|-----------|------------------|----------------|---|----------|---------|---------|-----------|-----------|
| C114COMBP | R10P, R18P, 2A | 114 | 1/16-1/2 x 64ths, N1-N60, 1-13mm x 5 mm | 1 | — | — | — | 5995643 |
| C115COMBP | R10P, R18P, R15P | 115 | 1/16-1/2 x 64ths, N1-6N0, A-Z | 1 | — | — | 5995681 | — |
| C26R15 | R15 | 26 | A - Z | 1 | — | 5995597 | — | — |
| C26R15P | R15P | 26 | A - Z | 1 | 5995593 | — | — | — |

General Purpose Jobber Length Combination Sets

C114COMB Steam tempered for increased wear resistance & lubricity.
C115COMB



| 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 | 5995676 | — |
| C115COMB | R10, R18, R15 | 115 | 1/16-1/2 x 64ths, N1-N60, A-Z | 1 | — | 5995683 |

General Purpose Jobber Length Metric Sets

A191 Steam tempered for increased wear resistance & lubricity.
A190



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



C252AB Steam tempered for increased wear resistance & lubricity.
C502AB



| A191 | A190 | C252A | C252AB C502AB |
|------|------|-------|------------------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 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 | — | 5969705 | — | — |
| 18 | A100 | 29 | 1/16 inch - 1/2 inch x 1/64 inch | 1 | — | 5969712 | — | — |
| 20 | A100 | 15 | 1/16 inch - 1/2 inch x 1/32 inch | 1 | — | 5969715 | — | — |
| 201 | A100 | 19 | 1.0 mm - 10.0 mm x 0.5 mm | 1 | — | 5969724 | — | — |
| 202 | A100 | 51 | 1.0 mm - 6.0 mm x 0.1 mm | 1 | — | 5969728 | — | — |
| 203 | A100 | 41 | 6.0 mm - 10.0 mm x 0.1 mm | 1 | — | 5969732 | — | — |
| 204 | A100 | 25 | 1.0 mm - 13.0 mm x 0.5 mm | 1 | — | 5969738 | — | — |
| 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 | — | 5969747 | — | — |
| 209 | A100 | 91 | 1.0 mm - 10.0 mm x 0.1 mm | 1 | — | 5969752 | — | — |
| 3 | A100 | 21 | 1/16 inch - 3/8 inch x 1/64 inch | 1 | — | 5969754 | — | — |
| 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 | 5969762 | — | — | — |
| 413 | A100 | 13 | 1.5 mm - 6.5 mm x 0.5 mm + 3.3 mm, 4.2 mm | 1 | 5969772 | — | — | — |
| 419 | A100 | 19 | 1.0 mm - 10.0 mm x 0.5 mm | 1 | 5969777 | — | — | — |
| 61-80 | A100 | 20 | No.61 - No. 80 | 1 | 5969782 | — | — | — |
| C252A | 2A | 25 | 1.0mm - 13mm x .5mm | 1 | — | — | 5995581 | — |
| C252AB | 2AB | 25 | 1.0mm - 13mm x .5mm | 1 | — | — | — | 5995577 |
| C502AB | 2AB | 50 | 1.0mm - 5.9mm x .1mm | 1 | — | — | — | 5995661 |

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 | 6610302 |
| 419 | A002 | 19 | 1.0 mm - 10.0 mm x 0.5 mm | 1 | 6610303 |

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 | 5967564 |
| 20 | A002 | 15 | 1/16 inch - 1/2 inch x 1/32 inch | 1 | 6610305 |
| 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 | 6610306 |
| 201 | A002 | 19 | 1.0 mm - 10.0 mm x 0.5 mm | 1 | 5967607 |
| 202 | A002 | 51 | 1.0 mm - 6.0 mm x 0.1 mm | 1 | 5967627 |
| 203 | A002 | 41 | 6.0 mm - 10.0 mm x 0.1 mm | 1 | 5967649 |
| 204 | A002 | 25 | 1.0 mm - 13.0 mm x 0.5 mm | 1 | 5967689 |
| 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 | 5967699 |
| 209 | A002 | 91 | 1.0 mm - 10.0 mm x 0.1 mm | 1 | 5967704 |

General Purpose Jobber Length Left Hand Sets

C15L10 Bright Finish improves chip flow in soft or non-ferrous materials
C29L10



| 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 | 5995520 | — |
| C29L10 | L10 | 29 | 1/16 - 1/2 x 64ths, Left Hand | 1 | — | 5995612 |

High Helix Jobber Length Set

A287 Low thrust design self centering Split Point for easier penetration. Steam tempered 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 | 5969853 |

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 | 5995609 |

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 tempered 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 | 1/16-1/4 x 64ths | 1 | 5995685 | — | — |
| C15R10CO | R10CO | 15 | 1/16-1/2 x 32nds | 1 | 5995524 | — | — |
| C21R10CO | R10CO | 21 | 1/16-3/8 x 64ths | 1 | 5995560 | — | — |
| C26R15CO | R15CO | 26 | A - Z | 1 | — | 5995589 | — |
| C29R10CO | R10CO | 29 | 1/16 - 1/2 x 64ths | 1 | 5995620 | — | — |
| C60R18CO | R18CO | 60 | N1 - N60 | 1 | — | — | 5995670 |

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

C115COMBC Low thrust design self centering 135° Split Point for easier penetration. Cobalt base material with Bronze tempered for wear resistance and lubricity. Suitable for ferrous materials.

C114COMBC



| 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 | — | 5995600 |
| C115COMBC | R10CO, R18CO, R15CO | 115 | 1/16-1/2 x 64ths, N1-N60, A-Z | 1 | 5995679 | — |

SCREW MACHINE DRILL SETS



General Purpose Screw Machine Drill Sets

C29R40

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

C60R41

C26R42



| C29R40 | C60R41 | C26R42 |
|--------|--------|--------|
| | | |
| | | |
| | | |
| | | |
| | | |
| Set | Set | Set |

| Set | Style | Pieces per Set | Sizes | Pack Qty | C29R40 | C60R41 | C26R42 |
|--------|-------|----------------|------------------|----------|---------|---------|---------|
| C26R42 | R42 | 26 | A - Z | 1 | — | — | 5995604 |
| C29R40 | R40 | 29 | 1/16-1/2 x 64ths | 1 | 5995635 | — | — |
| C60R41 | R41 | 60 | N1 - N60 | 1 | — | 5995608 | — |

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 | 5966976 |

SCREW MACHINE DRILL SETS



Heavy Duty Screw Machine Drill Set

C29R40C

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

C60R41C



| 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 | 5995632 | — |
| C60R41C | R41C | 60 | N1 - N60 | 1 | — | 5995677 |

Cobalt Heavy Duty Screw Machine Drill Sets

C29M40CO Low thrust design self centering Split Point for easier penetration. Cobalt base material with Bronze tempered for wear resistance and lubricity. Suitable for ferrous materials.

C60M41CO

C26M42CO



| 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 | — | — | 5995585 |
| C29M40CO | M40CO | 29 | 1/16 - 1/2 x 64ths | 1 | 5995616 | — | — |
| C60M41CO | M41CO | 60 | N1 - N60 | 1 | — | 5995667 | — |

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 | 5995639 |

Reduced Shank Drill Sets

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

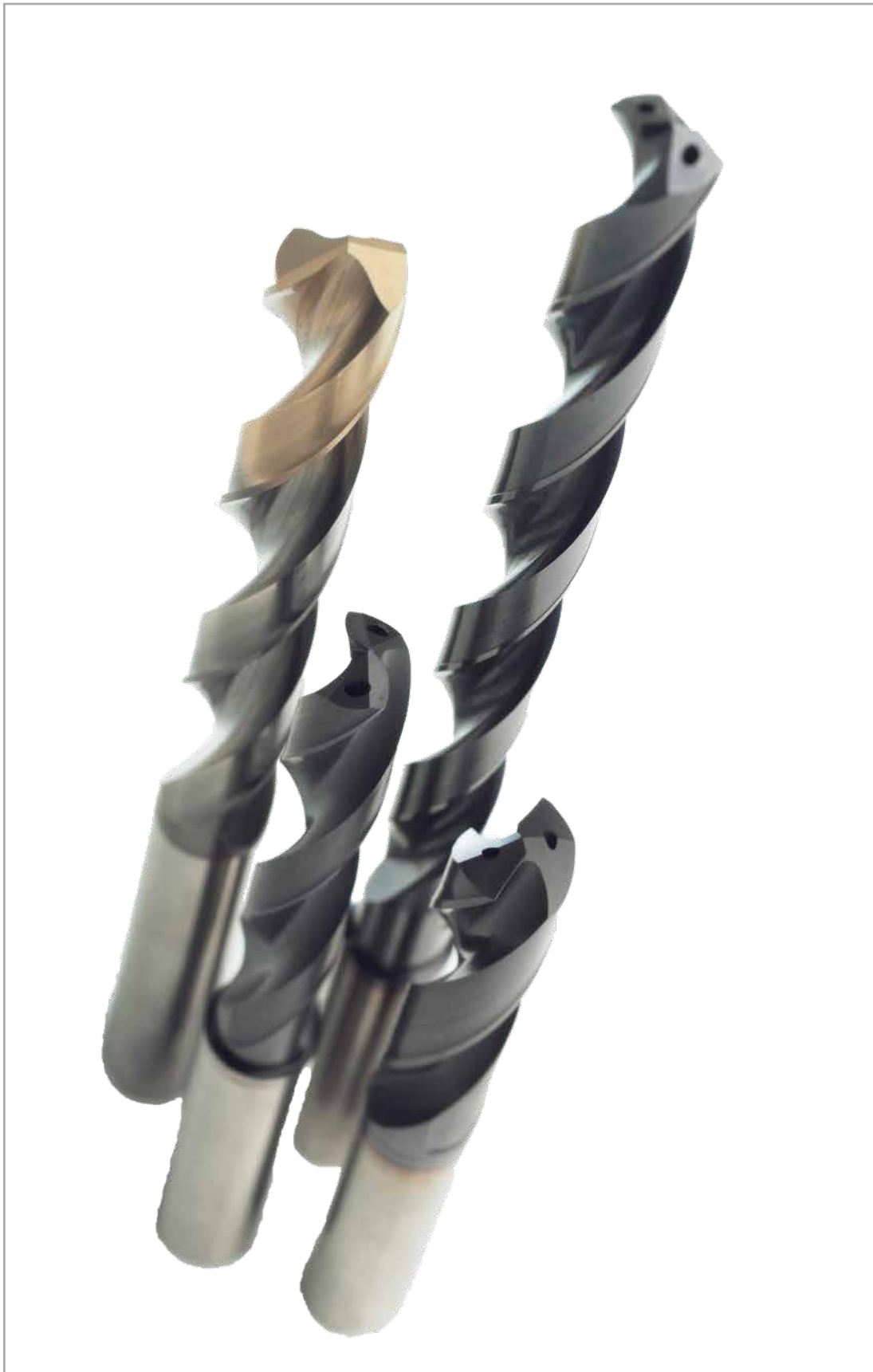
C8R57 Silver & Deming Drills with **Tri-Flat** Shank. Steam tempered for increased wear resistance & lubricity.

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



| 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 | 5995647 | — | — |
| C8R56 | R56 | 8 | 1/2" Reduced Shank, 9/16 - 1" x 16ths, S&D | 1 | 5995703 | — | — |
| C8R56CO | R56CO | 8 | 1/2" Reduced Shank, 9/16 - 1" x 16ths, S&D | 1 | — | — | 5995682 |
| C8R57 | R57 | 8 | 1/2" Reduced Shank, 9/16 - 1" x 16ths, S&D | 1 | — | 5995726 | — |

*1/2" R56 drill is a straight shank, not a reduced shank



Visual Index - Taps

How to Use This Chart:


























































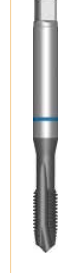
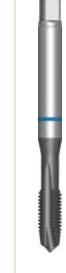













- 1) Determine your Workpiece Material from the Application Material Groups (AMG) below.
- 2) Use the icons to find Product Features.
- 3) Find the Surface Feet Per Minute (SFM)
example: 361 = SFM

| 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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 | S 3 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB | N 3 |
| | 6.2 β-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 | Ultradid, 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 - Taps

| Thread Form: | UNC | UNC | UNF | UNF | M | M | MF | MF | UNC | UNF | UNC | UNF | UNC | UNF | UNC | |
|-------------------|-----------|------------|-------------|------------|-----------|------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-----|
| 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 | 2BX | |
| 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: | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | TiAIN Top | Super B | Super B | TiAIN Top | TiAIN Top | TiAIN Top | |
| Coolant Through: | | | | | | | | | | | | | | | | |
| Style: | E814 | E815 | E914 | E915 | E630 | E631 | E770 | E771 | E809 | E909 | E813 | E913 | E811 | E911 | E816 | |
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| | HSS-E | HSS-E PM | HSS-E PM | HSS | 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 |
| | B 3.5-5 | C 2-3 | C 2-3 | | | 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 |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| | TIN | ST | ST | ST | ST | TICN | TICN | TICN | TICN | | | ST | ST | | | ST | ST |
| |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| | E000TIN | E201 | E252 | 1985 (UNC) | 1985 (UNF) | 1676AP (UNC) | 1676AP (UNF) | 1678 (UNC) | 1678 (UNF) | E027 | E037 | E028 | E038 | EX20 | EX30 | EX21 | EX31 |
| | M3 - M20 | M3 - M10 | M8 - M24 | No.4 - 1" | 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" |
| | 288 | 290 | 290 | 291 | 291 | 292 | 292 | 292 | 292 | 293 | 293 | 293 | 293 | 294 | 294 | 294 | 294 |
| 1.1 | 131 | | | 75 | 75 | 100 | 100 | 110 | 110 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 |
| 1.2 | 131 | | | 69 | 69 | 80 | 80 | 90 | 90 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 |
| 1.3 | 105 | | | 49 | 49 | 50 | 50 | 55 | 55 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 |
| 1.4 | 89 | | | 49 | 49 | 50 | 50 | 55 | 55 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 |
| 1.5 | 43 | | | 30 | 30 | 40 | 40 | 45 | 45 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| 1.6 | 36 | | | 16 | 16 | | | | | | 16 | | 16 | | | | |
| 1.7 | | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | | |
| 2.1 | 26 | | | 36 | 36 | 45 | 45 | 50 | 50 | | | 23 | 23 | | | 23 | 23 |
| 2.2 | 23 | | | 20 | 20 | 30 | 30 | 35 | 35 | | | 20 | 20 | | | 20 | 20 |
| 2.3 | 16 | | | | | 35 | 35 | 40 | 40 | | | 13 | 13 | | | 13 | 13 |
| 2.4 | | | | | | | | | | | | | | | | | |
| 3.1 | 72 | 49 | 49 | | | | | | | | | | | | | | |
| 3.2 | 59 | 26 | 26 | | | | | | | | | | | | | | |
| 3.3 | 82 | 49 | 49 | | | | | | | | | | | | | | |
| 3.4 | 59 | 26 | 26 | | | | | | | | | | | | | | |
| 4.1 | 49 | | | 20 | 20 | 30 | 30 | 35 | 35 | 33 | 33 | | | 33 | 33 | | |
| 4.2 | 23 | | | 16 | 16 | 20 | 20 | 25 | 25 | 16 | 16 | | | 16 | 16 | | |
| 4.3 | | | | 7 | 7 | | | | | | | | | | | | |
| 5.1 | 59 | | | 30 | 30 | 30 | 30 | 35 | 35 | 39 | 39 | | | 39 | 39 | | |
| 5.2 | 26 | | | 16 | 16 | 15 | 15 | 20 | 20 | 16 | 16 | | | 16 | 16 | | |
| 5.3 | | | | 10 | 10 | | | | | | | | | | | | |
| 6.1 | 59 | | | | | 40 | 40 | 45 | 45 | 39 | | | | | | | |
| 6.2 | 148 | 66 | 66 | | | 100 | 100 | 120 | 120 | 98 | | | | | | | |
| 6.3 | 115 | | | | | 90 | 90 | 100 | 100 | 66 | | | | | | | |
| 6.4 | | 16 | 16 | | | | | | | | | | | | | | |
| 7.1 | | | | | | 80 | 80 | 90 | 90 | 52 | 52 | | | 52 | 52 | | |
| 7.2 | | | | | | 95 | 95 | 115 | 115 | 115 | 115 | | | 115 | 115 | | |
| 7.3 | 98 | | | | | 80 | 80 | 90 | 90 | 66 | 66 | | | 66 | 66 | | |
| 7.4 | 72 | 49 | 49 | | | 30 | 30 | 35 | 35 | 49 | 49 | | | 49 | 49 | | |
| 8.1 | | | | | | | | | | 98 | 98 | | | | | | |
| 8.2 | 148 | 33 | 33 | | | | | | | | | | | | | | |
| 8.3 | | | | | | | | | | | | | | | | | |
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| | ISO 529 | ISO 529 | DIN ANSI | DIN ANSI | DIN ANSI | ANSI | ANSI | ANSI | DIN 374x10 376x12 | DIN 374x10 376x12 | DIN 374 | DIN 374 | ISO 529 | ISO 529 | ISO 529 | ANSI | ANSI |
| | 2B | 2B | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 6H | 2B 3B | 2B 3B |
| | | | | | | | | | | | | | | | | | |
| | 2.5XD | 2.5XD | 3XD | 3XD | 3XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | 2.5XD | | |
| | HSS-E | HSS-E | 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 |
| | C 2-3 | C 2-3 | 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 | E 1.5-2 | E 1.5-2 |
| | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 50^\circ$ | $\lambda 50^\circ$ | $\lambda 50^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 45^\circ$ | | |
| | | | | | | | | | | | | | | | | | |
| | ST | ST | TiCN | TiCN | TiCN | | ST | ST | | ST | | ST | | ST | ST | TiN | TiN |
| | | | | | | | | | | | | | | | | | |
| | E023 | E033 | 1677AP (M) | 1677AP (MF) | 1679 (M)(MF) | E007 | E008 | E018 | EX006H | EX016H | EX10 | EX11 | E002 | E003 | E013 | 1641 (UNC) | 1641 (UNF) |
| | No.2 - 1" | No.8 - 1" | M4 - M24 | M8 - M24 | M6 - M24 | M4 - M16 | M4 - M20 | M8 - M14 | M2 - M64 | M2 - M64 | M4 - M30 | M4 - M30 | M2 - M24 | M2 - M24 | M4 - M22 | No.4 - 1/2 | No.10 - 3/8 |
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| | 295 | 295 | 296 | 296 | 296 | 297 | 297 | 297 | 298 | 298 | 299 | 299 | 300 | 300 | 300 | 301 | 301 |
| 1.1 | 82 | 82 | 100 | 100 | 110 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 82 | 150 | 150 |
| 1.2 | 72 | 72 | 80 | 80 | 90 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 72 | 125 | 125 |
| 1.3 | 59 | 59 | 50 | 50 | 55 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 59 | 90 | 90 |
| 1.4 | 52 | 52 | 50 | 50 | 55 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 52 | 90 | 90 |
| 1.5 | 33 | 33 | 40 | 40 | 45 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | | |
| 1.6 | | 16 | | | | | | | | | | | | | | | |
| 1.7 | | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | | |
| 2.1 | 23 | 23 | 45 | 45 | 50 | | 23 | 23 | | 23 | | 23 | | 23 | 23 | 70 | 70 |
| 2.2 | 20 | 20 | 30 | 30 | 35 | | 20 | 20 | | 20 | | 20 | | 20 | 20 | 60 | 60 |
| 2.3 | 13 | 13 | 35 | 35 | 40 | | 13 | 13 | | 13 | | 13 | | 13 | 13 | 50 | 50 |
| 2.4 | | | | | | | | | | | | | | | | | |
| 3.1 | | | | | | | | | | | | | | | | | |
| 3.2 | | | | | | | | | | | | | | | | | |
| 3.3 | | | | | | | | | | | | | | | | | |
| 3.4 | | | | | | | | | | | | | | | | | |
| 4.1 | | | 30 | 30 | 35 | 33 | | | 33 | | 33 | | 33 | | | 60 | 60 |
| 4.2 | | | 20 | 20 | 25 | 16 | | | 16 | | 16 | | 16 | | | | |
| 4.3 | | | | | | | | | | | | | | | | | |
| 5.1 | | | 30 | 30 | 35 | 39 | | | 39 | | 39 | | 39 | | | 45 | 45 |
| 5.2 | | | 15 | 15 | 20 | 16 | | | 16 | | 16 | | 16 | | | | |
| 5.3 | | | | | | | | | | | | | | | | | |
| 6.1 | | | 40 | 40 | 45 | | | | | | | | | | | 55 | 55 |
| 6.2 | | | 100 | 100 | 120 | | | | | | | | | | | 180 | 180 |
| 6.3 | | | 90 | 90 | 100 | | | | | | | | | | | 130 | 130 |
| 6.4 | | | | | | | | | | | | | | | | | |
| 7.1 | | | 80 | 80 | 89 | 52 | | | 52 | | 52 | | 52 | | | 180 | 180 |
| 7.2 | | | 95 | 95 | 115 | 115 | | | 115 | | 115 | | 115 | | | 200 | 200 |
| 7.3 | | | 80 | 80 | 90 | 66 | | | 66 | | 66 | | 66 | | | 230 | 230 |
| 7.4 | | | 30 | 30 | 35 | 49 | | | 49 | | 49 | | 49 | | | | |
| 8.1 | | | | | | | | | | | | | | | | | |
| 8.2 | | | | | | | | | | | | | | | | | |
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| | ANSI | 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 | |
| | 6H | 2B | 2B | 2B | 2B | 6H | 6H | 6H | Normal | Normal | Normal | Normal | Normal | 2B 3B | 2B 3B | 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 | |
| | HSS PM | 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-E | HSS | HSS | HSS |
| | E 1.5-2 | 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 | | | | |
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| | TIN | TIN Top | TIN Top | TIN Top | TIN Top | TIN Top | TIN Top | TIN Top | | ST | ST | | | | | | | |
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| | ANSI | ISO 529 | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ISO 529 | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | |
| | 6H | 6H | | 2B | 3B | 3B | 2B | 2B | 6H | 6H | 6H | 2B 3B | 2B 3B | 2B | 2B | 3B | 3B | |
| | | | | | | | | | | | | | | | | | | |
| | 1.5XD | 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 | |
| | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | |
| | | | P | | | | | | | | | | | | | | | |
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| | | | | N | N | N/ST | N/ST | N | N | TIN | | | TIN | TIN | | | | |
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| | 1700 (M) | 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) | |
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| 1.2 | 36 | 20 | 36 | 36 | | | | | | | 39 | 66 | 66 | 75 | 75 | 66 | 66 | |
| 1.3 | 26 | 16 | 26 | 26 | | | | | | | 33 | 39 | 39 | 49 | 49 | 39 | 39 | |
| 1.4 | 26 | 13 | 26 | 26 | | | | | | | 26 | 39 | 39 | 49 | 49 | 39 | 39 | |
| 1.5 | 16 | 10 | 16 | 16 | | | | | | | 20 | 26 | 26 | 30 | 30 | 26 | 26 | |
| 1.6 | 7 | | 7 | 7 | | | | | | | | 16 | 16 | 20 | 20 | 16 | 16 | |
| 1.7 | | | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | | | |
| 2.1 | 20 | | 20 | 20 | | | | | | | | 30 | 30 | 39 | 39 | 30 | 30 | |
| 2.2 | 13 | | 13 | 13 | | | | | | | | 20 | 20 | 26 | 26 | 20 | 20 | |
| 2.3 | 13 | | 13 | 13 | | | | | | | | 20 | 20 | 26 | 26 | 20 | 20 | |
| 2.4 | | | | | | | | | | | | | | | | | | |
| 3.1 | 39 | 39 | 39 | 39 | 49 | 49 | 49 | 49 | 49 | 59 | 46 | 46 | 49 | 49 | 46 | 46 | | |
| 3.2 | 26 | 23 | 26 | 26 | 36 | 36 | 36 | 36 | 36 | 39 | 26 | 26 | 30 | 30 | 26 | 26 | | |
| 3.3 | 26 | 33 | 26 | 26 | 36 | 36 | 36 | 36 | 36 | 72 | 26 | 26 | 30 | 30 | 26 | 26 | | |
| 3.4 | 13 | 16 | 13 | 13 | 20 | 20 | 20 | 20 | 20 | 39 | 16 | 16 | 20 | 20 | 16 | 16 | | |
| 4.1 | 16 | | 16 | 16 | | | | | | | | 20 | 20 | | | 20 | 20 | |
| 4.2 | 13 | | 13 | 13 | | | | | | | | 16 | 16 | | | 16 | 16 | |
| 4.3 | | | | | | | | | | | | 7 | 7 | | | 7 | 7 | |
| 5.1 | 16 | | 16 | 16 | | | | | | | | 26 | 26 | 30 | 30 | 26 | 26 | |
| 5.2 | 7 | | 7 | 7 | | | | | | | | 10 | 10 | 13 | 13 | 10 | 10 | |
| 5.3 | | | | | | | | | | | | | | | | | | |
| 6.1 | 20 | 13 | 20 | 20 | | | | | | | | 30 | 30 | 39 | 39 | 30 | 30 | |
| 6.2 | 66 | 33 | 66 | 66 | | | | | | | 66 | 89 | 89 | 115 | 115 | 89 | 89 | |
| 6.3 | 49 | 23 | 49 | 49 | | | | | | | 46 | 69 | 69 | 89 | 89 | 69 | 69 | |
| 6.4 | 7 | 7 | 7 | 7 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 10 | 10 | 13 | 13 | 10 | 10 | |
| 7.1 | 39 | | 39 | 39 | | | | | | | | 49 | 49 | 66 | 66 | 49 | 49 | |
| 7.2 | 79 | 39 | 79 | 79 | | | | | | | | 79 | 98 | 98 | 125 | 125 | 98 | 98 |
| 7.3 | 59 | 23 | 59 | 59 | | | | | | | | 46 | 66 | 66 | 79 | 79 | 66 | 66 |
| 7.4 | 16 | 16 | 16 | 16 | | | | | | | | 33 | 20 | 20 | 26 | 26 | 20 | 20 |
| 8.1 | 26 | | 26 | 26 | | | | | | | | 98 | 98 | 121 | 121 | 98 | 98 | |
| 8.2 | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 33 | 26 | 26 | 30 | 30 | 26 | 26 | |
| 8.3 | | 10 | | | | | | | | | | 20 | | | | | | |
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| | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI |
| | 2B 3B | 2B 3B | 2B 3B | 3B | 3B | 3B | 6H | 6H | 2B 3B | 2B 3B | 3B | 2B 3B | 2B 3B | 6H | 3B | 2B 3B | 2B 3B |
| | | | | | | | | | | | | | | | | | |
| | 2.5XD | 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 |
| | HSS | HSS | HSS | HSS | HSS-E | HSS-E | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS |
| | | | | | P | P | | | | | | | | | P | P | |
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| | ST | ST | TIN | TIN | | | | TIN | | | | | | | | | |
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| | 1585A (UNC) | 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) |
| | 1/4 - 3/4 | 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 |
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| 1.7 | | | | | | | | | | | | | | | | | |
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| 2.2 | 20 | 20 | 26 | 26 | 20 | 20 | 20 | 26 | 20 | 20 | 20 | 13 | 13 | 13 | 20 | 20 | 20 |
| 2.3 | 20 | 20 | 26 | 26 | 20 | 20 | 20 | 26 | 20 | 20 | 20 | 10 | 10 | 10 | 20 | 20 | 20 |
| 2.4 | | | | | | | | | | | | | | | | | |
| 3.1 | 46 | 46 | 49 | 49 | 46 | 46 | 46 | 49 | 46 | 46 | 46 | | | 46 | 46 | 46 | 46 |
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| 3.3 | 26 | 26 | 30 | 30 | 26 | 26 | 26 | 30 | 26 | 26 | 26 | | | 26 | 26 | 26 | 26 |
| 3.4 | 16 | 16 | 20 | 20 | 16 | 16 | 16 | 20 | 16 | 16 | 16 | | | 16 | 16 | 16 | 16 |
| 4.1 | 20 | 20 | | | 20 | 20 | 20 | | 20 | 20 | 20 | | | 20 | 20 | 20 | 20 |
| 4.2 | 16 | 16 | | | 16 | 16 | 16 | | 16 | 16 | 16 | | | 16 | 16 | 16 | 16 |
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| 5.1 | 26 | 26 | 30 | 30 | 26 | 26 | 26 | 30 | 26 | 26 | 26 | 33 | 33 | 33 | 26 | 26 | 26 |
| 5.2 | 10 | 10 | 13 | 13 | 10 | 10 | 10 | 13 | 10 | 10 | 10 | 13 | 13 | 13 | 10 | 10 | 10 |
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| 8.2 | 26 | 26 | 30 | 30 | 26 | 26 | 26 | 30 | 26 | 26 | 26 | | | 26 | 26 | 26 | 26 |
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| | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI | ANSI B94.9 | ANSI B94.9 | ANSI B94.9 | ANSI B94.9 | ANSI | ANSI | |
| | 6H | 2B 3B | 2B 3B | 6H | 2B | 2B | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | |
| | | | | | | | | | | | | | | | |
| | 2.5XD | 3XD | 3XD | 3XD | 2.5XD | 2.5XD | 2XD | 1.5XD | 1.5XD | 1.5XD | 1.5XD | 1.5XD | 1.5XD | 1.5XD | |
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| 3.2 | | | | | | | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 3.3 | | | | | | | 20 | 23 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 3.4 | | | | | | | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
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| 7.4 | | | | | | | 23 | 26 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 8.1 | | | | | | | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 8.2 | | | | | | | | | | | | | | | |
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| | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | 3B | 3B | |
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| | 2XD | 2XD | 1.5XD | 2XD | 1.5XD | 2XD | 2XD | 1.5XD | 2XD | 2XD | 1.5XD | 1.5XD | 1.5XD | 1.5XD | |
| | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | HSS | |
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| 1.4 | 16 | 16 | 16 | 16 | 20 | 16 | 16 | 16 | 16 | 16 | 39 | 13 | 26 | 26 | |
| 1.5 | 10 | 10 | 10 | 10 | 13 | 10 | 10 | 10 | 10 | 10 | 23 | 10 | | | |
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| 3.2 | 13 | 13 | 13 | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 23 | 23 | | | |
| 3.3 | 20 | 20 | 20 | 20 | 23 | 20 | 20 | 20 | 20 | 20 | 33 | 33 | | | |
| 3.4 | 13 | 13 | 13 | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 16 | 16 | | | |
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| 7.3 | 36 | 36 | 36 | 36 | 39 | 36 | 36 | 36 | 36 | 36 | 66 | 23 | 59 | 59 | |
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| | ANSI | ANSI | DORMER ISO | DORMER ISO | ANSI | ANSI | ANSI | DORMER DIN | DORMER DIN | DORMER ISO | ANSI |
| | 2B 3B | 2B 3B | 6H | 6H | 3B | 2B | 2B | 2B | Medium | 6H | Normal |
| | | | | | | | | | | | |
| | 1.5XD | 1.5XD | 1.5XD | 2XD | 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 |
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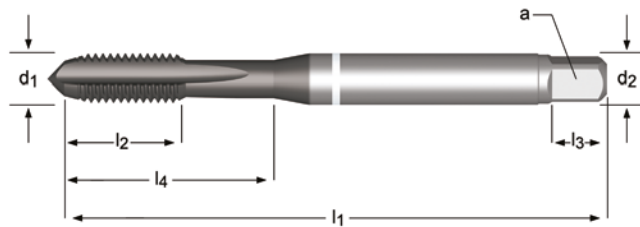
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DIN ANSI Machine Tap, White Shark for Cast Iron

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

| E814 | E815 | E914 | E915 |
|----------|----------|-------------|----------|
| UNC | UNC | UNF | UNF |
| DIN ANSI | DIN ANSI | DIN ANSI | DIN ANSI |
| 2BX | 2BX | 2BX | 2BX |
| | | | |
| 2XD | 2.5XD | 2XD | 2.5XD |
| HSS-E PM | HSS-E PM | HSS-E PM | HSS-E PM |
| C 2-3 | E 1.5-2 | C 2-3 | E 1.5-2 |
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| | | | |
| | | | |
| 1/4 - 1" | 1/4 - 1" | No.10 - 7/8 | 1/4 - 1" |

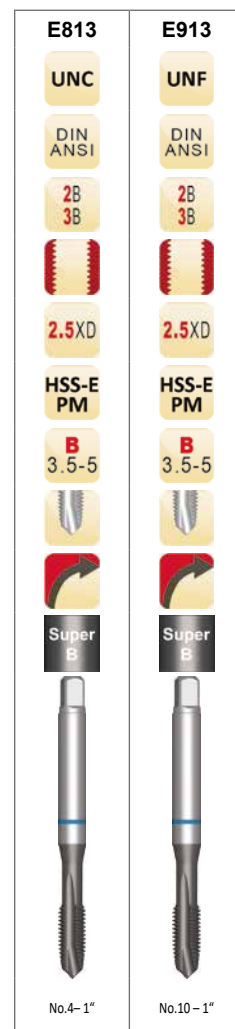
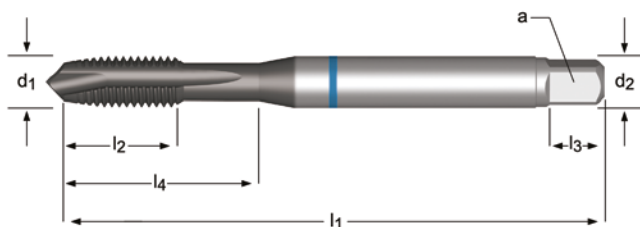
| UNC | UNF | TPI | l_1 Inch | l_2 Inch | l_4 Inch | d_2 Ø Inch | \square a Inch | l_3 Inch | No. of flutes | | | Limits | E814 | E815 | E914 | E915 |
|------|------|-------|---------------|---------------|---------------|--------------------|------------------------|---------------|---------------------|-------|-------|---------|---------|------|---------|---------|
| | 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 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E813 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 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

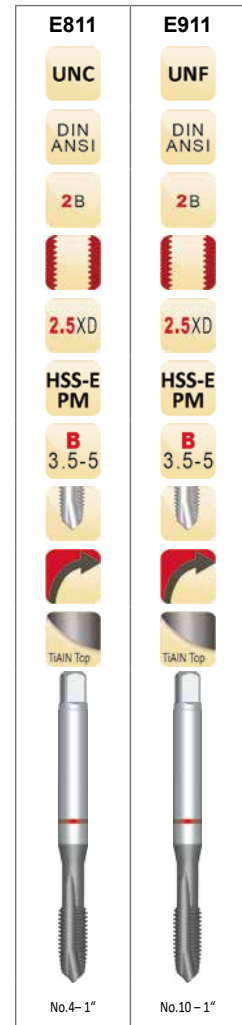
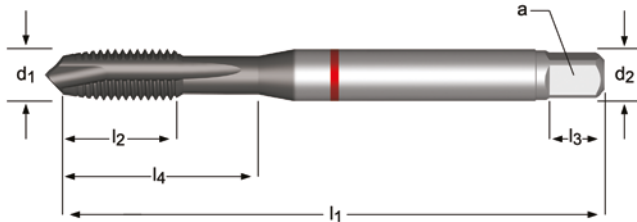
| UNC | UNF | TPI | l_1 Inch | l_2 Inch | l_4 Inch | d_2 Ø Inch | a Inch | l_3 Inch | No. of flutes |  |  | Limits | E813 | E913 |
|-----|-----|-----|---------------|---------------|---------------|--------------------|-------------|---------------|---------------------|---|---|--------|---------|---------|
| | 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 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

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 | — |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E816 Designed for high performance through hole tapping in high strength and heat resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry that significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

E916

- 1.6 4.3 5.3
- 1.5 1.7 4.2 5.2



| | |
|------------------|------------------|
| E816 | E916 |
| UNC | UNF |
| DIN ANSI | DIN ANSI |
| 2BX | 2BX |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| B 3.5-5 | B 3.5-5 |
| | |
| | |
| TiAlN Top | TiAlN Top |
| | |
| No.4-3/4 | No.10-3/4 |

Pack Qty = 1 pc

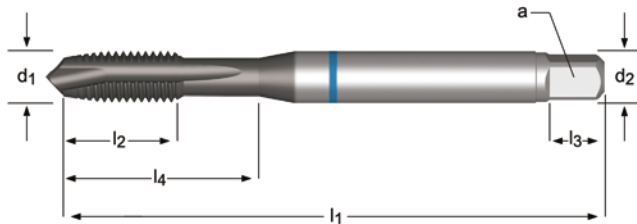
| UNC | UNF | TPI | l_1 Inch | l_2 Inch | l_4 Inch | d_2 Ø Inch | \square a Inch | l_3 Inch | No. of flutes | | | Limits | E816 | E916 |
|------|------|-----|---------------|---------------|---------------|--------------------|------------------------|---------------|------------------|-------|-------|--------|---------|---------|
| 4 | | 40 | 2.205 | 0.472 | 0.827 | 0.141 | 0.108 | 0.190 | 3 | 2.35 | N43 | H2 | 7812046 | — |
| 6 | | 32 | 2.480 | 0.551 | 0.866 | 0.168 | 0.129 | 0.250 | 3 | 2.85 | N36 | H3 | 7812047 | — |
| 8 | | 32 | 2.756 | 0.610 | 1.102 | 0.194 | 0.150 | 0.250 | 3 | 3.50 | N29 | H3 | 7812048 | — |
| 10 | | 24 | 3.150 | 0.669 | 1.024 | 0.255 | 0.189 | 0.310 | 3 | 3.90 | N25 | H3 | 7812049 | — |
| | 10 | 32 | 3.150 | 0.669 | 1.024 | 0.255 | 0.189 | 0.310 | 3 | 4.10 | N21 | H3 | — | 7812107 |
| 1/4 | | 20 | 3.543 | 0.807 | 1.378 | 0.318 | 0.236 | 0.380 | 3 | 5.10 | N7 | H5 | 7812100 | — |
| | 1/4 | 28 | 3.543 | 0.807 | 1.339 | 0.318 | 0.236 | 0.380 | 3 | 5.50 | N3 | H4 | — | 7812108 |
| 5/16 | | 18 | 3.937 | 0.906 | 1.535 | 0.381 | 0.236 | 0.440 | 3 | 6.60 | F | H5 | 7812101 | — |
| | 5/16 | 24 | 3.937 | 0.906 | 1.535 | 0.381 | 0.284 | 0.440 | 3 | 6.90 | I | H4 | — | 7812109 |
| 3/8 | | 16 | 3.937 | 0.787 | 1.535 | 0.381 | 0.236 | 0.440 | 3 | 8.00 | 5/16 | H5 | 7812102 | — |
| | 3/8 | 24 | 3.937 | 0.787 | 1.535 | 0.381 | 0.284 | 0.440 | 3 | 8.50 | Q | H4 | — | 7812110 |
| 7/16 | | 14 | 3.937 | 0.787 | — | 0.323 | 0.240 | 0.410 | 4 | 9.40 | U | H5 | 7812103 | — |
| | 7/16 | 20 | 3.937 | 0.787 | — | 0.323 | 0.240 | 0.440 | 4 | 9.90 | 25/64 | H5 | — | 7812111 |
| 1/2 | | 13 | 4.331 | 0.906 | — | 0.367 | 0.273 | 0.440 | 4 | 10.80 | 27/64 | H5 | 7812104 | — |
| | 1/2 | 20 | 4.331 | 0.906 | — | 0.367 | 0.273 | 0.440 | 4 | 11.50 | 29/64 | H5 | — | 7812112 |
| 5/8 | | 11 | 4.331 | 0.906 | — | 0.480 | 0.358 | 0.560 | 4 | 13.50 | 17/32 | H5 | 7812105 | — |
| | 5/8 | 18 | 4.331 | 0.906 | — | 0.480 | 0.358 | 0.560 | 4 | 14.50 | 37/64 | H5 | — | 7812113 |
| 3/4 | | 10 | 4.921 | 1.181 | — | 0.590 | 0.440 | 0.690 | 4 | 16.50 | 21/32 | H5 | 7812106 | — |
| | 3/4 | 16 | 4.921 | 1.181 | — | 0.590 | 0.440 | 0.690 | 4 | 17.50 | 11/16 | H5 | — | 7812114 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

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



| | |
|-------------|-------------|
| E629 | E769 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| B 3.5-5 | B 3.5-5 |
| | |
| | |
| Super B | Super B |
| | |
| M4 - M24 | M8 - M18 |

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 | — |

Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E817 **E917** Designed for high performance through hole tapping in high strength and heat resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry that significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

- 1.6 4.3 5.3
- 1.5 1.7 4.2 5.2



| | |
|-------------|-------------|
| E816 | E916 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| B 3.5-5 | B 3.5-5 |
| | |
| | |
| TiAlN Top | TiAlN Top |
| | |
| M3-M12 | M8-M12 |

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 | E817 | E917 |
|----|----|------|-------------------|-------------------|-------------------|-----------------------|----------|-------------------|---------------|-------|-------|--------|---------|---------|
| 3 | | 0.50 | 63 | 15 | 22 | 0.168 | 0.129 | 6 | 3 | 2.50 | N40 | D3 | 7812115 | — |
| 4 | | 0.70 | 70 | 16 | 28 | 0.194 | 0.150 | 6 | 3 | 3.30 | N30 | D4 | 7812116 | — |
| 5 | | 0.80 | 80 | 17 | 26 | 0.255 | 0.189 | 8 | 3 | 4.20 | N19 | D4 | 7812117 | — |
| 6 | | 1.00 | 90 | 21 | 35 | 0.318 | 0.236 | 10 | 3 | 5.00 | N9 | D5 | 7812118 | — |
| 8 | | 1.25 | 100 | 23 | 39 | 0.381 | 0.284 | 11 | 3 | 6.80 | H | D5 | 7812119 | — |
| | 8 | 1.00 | 100 | 23 | 39 | 0.381 | 0.284 | 11 | 3 | 7.00 | J | D5 | — | 7812122 |
| 10 | | 1.50 | 100 | 20 | 38 | 0.381 | 0.284 | 11 | 3 | 8.50 | Q | D6 | 7812120 | — |
| | 10 | 1.25 | 100 | 20 | 38 | 0.381 | 0.284 | 11 | 3 | 8.80 | 11/32 | D5 | — | 7812123 |
| 12 | | 1.75 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.30 | Y | D6 | 7812121 | — |
| | 12 | 1.25 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.80 | 27/64 | D5 | — | 7812124 |
| | 12 | 1.50 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.50 | Z | D5 | — | 7812125 |

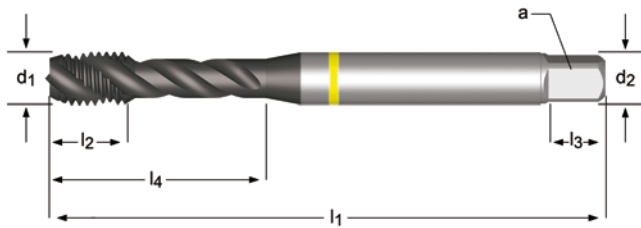
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E808 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.

E908

- 1.1 1.2 1.3 6.1 6.3
- 1.4 1.5 6.2



| | |
|-------------|-------------|
| E808 | E908 |
| UNC | UNF |
| DIN ANSI | DIN ANSI |
| 2B | 2B |
| | |
| 2XD | 2XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| | |
| | |
| | |
| No.4 - 1" | No.10 - 1" |

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 | — |
| | 1" | 12 | 5.512 | 1.063 | — | 0.800 | 0.597 | 0.810 | 4 | 23.25 | 59/64 | H6 | — | 7350532 |

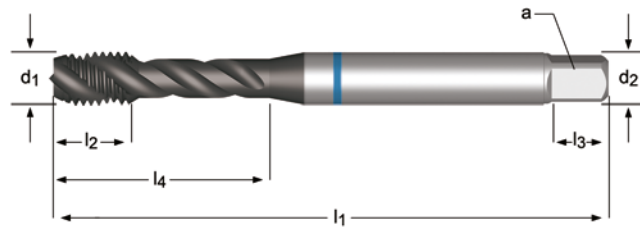
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN ANSI Machine Tap, Blue Shark for Stainless Steel

E812 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.

E912

- 2.1 2.2 2.3
- 1.2 1.3 1.4 1.5



| | |
|-------------|-------------|
| E812 | E912 |
| UNC | UNF |
| DIN ANSI | DIN ANSI |
| 2B 3B | 2B 3B |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| | |
| | |
| No.4-1" | No.10-1" |

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 |

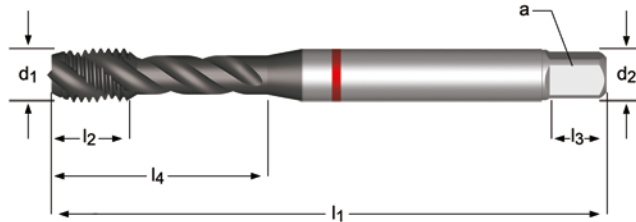
| UNC | UNF | TPI | l_1 Inch | l_2 Inch | l_4 Inch | d_2 \varnothing Inch | a Inch | l_3 Inch | No. of flutes | | | Limits | E812 | E912 |
|-----|-----|-----|---------------|---------------|---------------|--------------------------------|-------------|---------------|---------------------|-------|-------|--------|---------|---------|
| 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 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN ANSI Machine Tap, Red Shark for Alloy Steels

E810 Designed for high performance blind hole tapping in most medium Alloy Steels.
E910 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



| | |
|-------------|-------------|
| E810 | E910 |
| UNC | UNF |
| DIN ANSI | DIN ANSI |
| 2B | 2B |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| λ45° | λ45° |
| | |
| TiAlN Top | TiAlN Top |
| | |
| No.4-1" | No.10-1" |

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 |

Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN-ANSI Machine Tap Black Shark for Hard Alloys, Spiral Flute

E805 Designed for high performance blind hole tapping in high strength and heat-resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry what significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

- 1.6 4.3 5.3
- 1.5 1.7 4.2 5.2



| | |
|--------------------|--------------------|
| E805 | E905 |
| UNC | UNF |
| DIN ANSI | DIN ANSI |
| 2BX | 2BX |
| | |
| 1.5XD | 1.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| $\lambda 15^\circ$ | $\lambda 15^\circ$ |
| | |
| TiAlN Top | TiAlN Top |
| | |
| No.4-3/4 | No.10-3/4 |

Pack Qty = 1 pc

| UNC | UNF | TPI | l_1 Inch | l_2 Inch | l_4 Inch | d_2 Ø Inch | \square a Inch | l_3 Inch | No. of flutes | | | Limits | E805 | E905 |
|------|------|-----|---------------|---------------|---------------|--------------------|------------------------|---------------|------------------|-------|-------|--------|---------|---------|
| 4 | | 40 | 2.205 | 0.472 | 0.827 | 0.141 | 0.108 | 0.190 | 3 | 2.35 | N43 | H2 | 7812126 | — |
| 6 | | 32 | 2.480 | 0.551 | 0.866 | 0.168 | 0.129 | 0.250 | 3 | 2.85 | N36 | H2 | 7812127 | — |
| 8 | | 32 | 2.756 | 0.610 | 1.102 | 0.194 | 0.150 | 0.250 | 3 | 3.50 | N29 | H3 | 7812128 | — |
| 10 | | 24 | 3.150 | 0.669 | 1.024 | 0.255 | 0.189 | 0.310 | 3 | 3.90 | N25 | H3 | 7812129 | — |
| | 10 | 32 | 3.150 | 0.669 | 1.024 | 0.255 | 0.189 | 0.310 | 3 | 4.10 | N21 | H3 | — | 7812137 |
| 1/4 | | 20 | 3.543 | 0.807 | 1.378 | 0.318 | 0.236 | 0.380 | 3 | 5.10 | N7 | H5 | 7812130 | — |
| | 1/4 | 28 | 3.543 | 0.807 | 1.339 | 0.318 | 0.236 | 0.380 | 3 | 5.50 | N3 | H4 | — | 7812138 |
| 5/16 | | 18 | 3.937 | 0.906 | 1.535 | 0.381 | 0.236 | 0.440 | 3 | 6.60 | F | H5 | 7812131 | — |
| | 5/16 | 24 | 3.937 | 0.906 | 1.535 | 0.381 | 0.284 | 0.440 | 3 | 6.90 | I | H4 | — | 7812139 |
| 3/8 | | 16 | 3.937 | 0.787 | 1.535 | 0.381 | 0.236 | 0.440 | 3 | 8.00 | 5/16 | H5 | 7812132 | — |
| | 3/8 | 24 | 3.937 | 0.787 | 1.535 | 0.381 | 0.284 | 0.440 | 3 | 8.50 | Q | H4 | — | 7812140 |
| 7/16 | | 14 | 3.937 | 0.787 | - | 0.323 | 0.240 | 0.410 | 4 | 9.40 | U | H5 | 7812133 | — |
| | 7/16 | 20 | 3.937 | 0.787 | - | 0.325 | 0.240 | 0.440 | 4 | 9.90 | 25/64 | H5 | — | 7812141 |
| 1/2 | | 13 | 4.331 | 0.906 | - | 0.367 | 0.273 | 0.440 | 4 | 10.80 | 27/64 | H5 | 7812134 | — |
| | 1/2 | 20 | 4.331 | 0.906 | - | 0.367 | 0.273 | 0.440 | 4 | 11.50 | 29/64 | H5 | — | 7812142 |
| 5/8 | | 11 | 4.331 | 0.906 | - | 0.480 | 0.358 | 0.560 | 4 | 13.50 | 17/32 | H5 | 7812135 | — |
| | 5/8 | 18 | 4.331 | 0.906 | - | 0.480 | 0.358 | 0.560 | 4 | 14.50 | 37/64 | H5 | — | 7812143 |
| 3/4 | | 10 | 4.921 | 1.181 | - | 0.590 | 0.440 | 0.690 | 4 | 16.50 | 21/32 | H5 | 7812136 | — |
| | 3/4 | 16 | 4.921 | 1.181 | - | 0.590 | 0.440 | 0.690 | 4 | 17.50 | 11/16 | H5 | — | 7812144 |

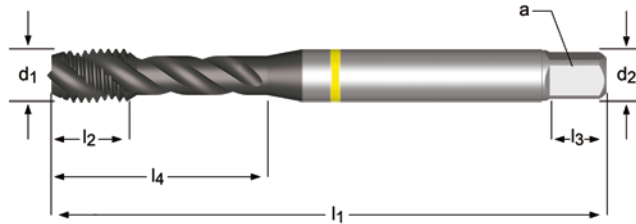
Note: Sizes up to 3/8" have male centers on both ends • Sizes over 3/8" have female centers on both ends.

DIN ANSI Machine Tap, Yellow for Low Alloy Steels

E624 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.

E764

- 1.1 1.2 1.3 6.1 6.3
- 1.4 1.5 6.2



| | |
|-------------|-------------|
| E624 | E764 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 2XD | 2XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| λ 40° | λ 40° |
| | |
| | |
| M4 - M24 | M8 - M18 |

Pack Qty = 1 pc

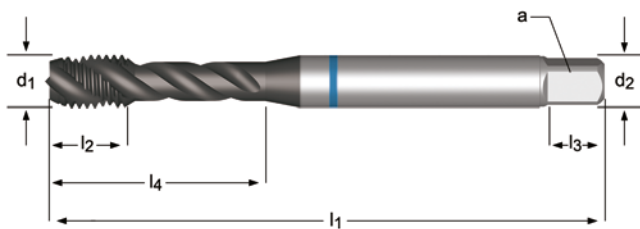
| M | MF | P mm | l ₁ mm | l ₂ mm | l ₄ mm | d ₂ Ø Inch | a Inch | l ₃ mm | No. of flutes | | | Limits | E624 | E764 |
|----|----|------|-------------------|-------------------|-------------------|-----------------------|--------|-------------------|---------------|-------|-------|--------|---------|---------|
| 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 | — |

Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

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



| | |
|-------------|-------------|
| E628 | E768 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| | |
| | |
| M4 - M24 | M8 - M18 |

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 | — |

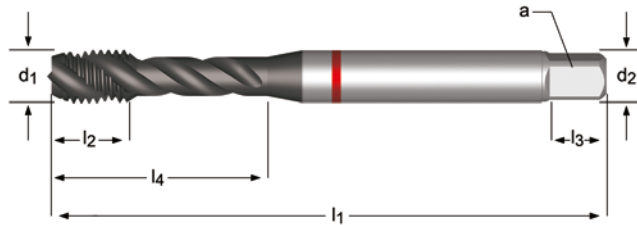
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

DIN ANSI Machine Tap, Red Shark for Alloy Steels

E626 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.

E766

- 1.4 1.5
- 1.6 4.2 5.2



| | |
|-------------|-------------|
| E626 | E766 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 2.5XD | 2.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| | |
| | |
| | |
| M3 - M24 | M8 - M14 |

Pack Qty = 1 pc

| M | MF | P mm | l ₁ mm | l ₂ mm | l ₄ mm | d ₂ ∅ 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 | — |

Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

DIN-ANSI Machine Tap Black Shark for Hard Alloys, Plug Style

E806 Designed for high performance blind hole tapping in high strength and heat-resistant work-materials with hardness up to 45HRC. The TiAlN-Top coating combined with geometry what significantly increases cutting edge strength, provides excellent performance and consistency in hard and difficult to machine materials.

E906

- 1.6 4.3 5.3
- 1.5 1.7 4.2 5.2



| | |
|--------------------|--------------------|
| E806 | E906 |
| M | MF |
| DIN ANSI | DIN ANSI |
| 6H | 6H |
| | |
| 1.5XD | 1.5XD |
| HSS-E PM | HSS-E PM |
| C 2-3 | C 2-3 |
| | |
| $\lambda 15^\circ$ | $\lambda 15^\circ$ |
| | |
| | |
| | |
| M3-M12 | M8-M12 |

Pack Qty = 1 pc

| M | MF | P mm | l_1 mm | l_2 mm | l_4 mm | d_2 \emptyset Inch | \square a Inch | l_3 mm | No. of flutes | | | Limits | E806 | E906 |
|----|----|------|----------|----------|----------|------------------------|------------------|----------|---------------|-------|-------|--------|---------|---------|
| 3 | | 0.50 | 63 | 15 | 22 | 0.168 | 0.129 | 6 | 3 | 2.50 | N40 | D3 | 7812145 | — |
| 4 | | 0.70 | 70 | 16 | 28 | 0.194 | 0.150 | 6 | 3 | 3.30 | N30 | D4 | 7812146 | — |
| 5 | | 0.80 | 80 | 17 | 26 | 0.255 | 0.189 | 8 | 3 | 4.20 | N19 | D4 | 7812147 | — |
| 6 | | 1.00 | 90 | 21 | 35 | 0.318 | 0.236 | 10 | 3 | 5.00 | N9 | D5 | 7812148 | — |
| 8 | | 1.25 | 100 | 23 | 39 | 0.381 | 0.284 | 11 | 3 | 6.80 | H | D5 | 7812149 | — |
| | 8 | 1.00 | 100 | 23 | 39 | 0.381 | 0.284 | 11 | 3 | 7.00 | J | D5 | — | 7812152 |
| 10 | | 1.50 | 100 | 20 | 38 | 0.381 | 0.284 | 11 | 3 | 8.50 | Q | D6 | 7812150 | — |
| 12 | | 1.75 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.30 | Y | D6 | 7812151 | — |
| | 10 | 1.25 | 100 | 20 | 38 | 0.381 | 0.284 | 11 | 3 | 8.80 | 11/32 | D5 | — | 7812153 |
| | 12 | 1.25 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.80 | 27/64 | D5 | — | 7812155 |
| | 12 | 1.50 | 110 | 23 | - | 0.367 | 0.273 | 11 | 4 | 10.50 | Z | D5 | — | 7812154 |

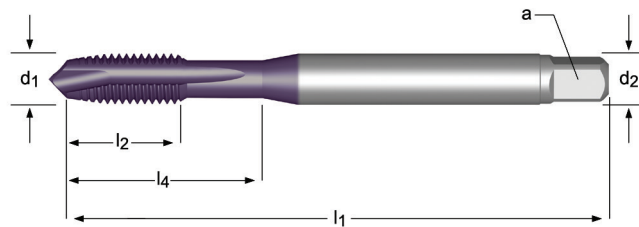
Note: Sizes up to M10 have male centers on both ends • Sizes over M10 have female centers on both ends.

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 | 6204859 | ¹⁾ — |
| 6 | | 32 | 2.205 | 0.472 | 0.787 | 0.141 | 0.110 | 2 | H3 | 1 | 6204864 | ¹⁾ — |
| 8 | | 32 | 2.480 | 0.512 | 0.827 | 0.168 | 0.131 | 3 | H3 | 1 | 6204869 | ¹⁾ — |
| | 10 | 32 | 2.756 | 0.512 | 0.984 | 0.194 | 0.152 | 3 | H3 | 1 | 6204852 | ¹⁾ — |
| 10 | | 24 | 2.756 | 0.591 | 0.984 | 0.194 | 0.152 | 3 | H3 | 1 | 6204851 | ¹⁾ — |
| | 1/4 | 28 | 3.150 | 0.669 | 1.181 | 0.255 | 0.191 | 3 | H4 | 1 | 6204850 | ¹⁾ 6007893 ¹⁾ |
| 1/4 | | 20 | 3.150 | 0.669 | 1.181 | 0.255 | 0.191 | 3 | H5 | 1 | 6204849 | ¹⁾ 6007890 ¹⁾ |
| | 5/16 | 24 | 3.543 | 0.669 | 1.378 | 0.318 | 0.238 | 3 | H4 | 1 | 6204861 | ¹⁾ — |
| 5/16 | | 18 | 3.543 | 0.787 | 1.378 | 0.318 | 0.238 | 3 | H5 | 1 | 6204860 | ¹⁾ 6007922 ¹⁾ |
| | 3/8 | 24 | 3.937 | 0.709 | 1.535 | 0.381 | 0.286 | 3 | H4 | 1 | 6204858 | ¹⁾ — |
| 3/8 | | 16 | 3.937 | 0.866 | 1.535 | 0.381 | 0.286 | 3 | H5 | 1 | 6204857 | ¹⁾ 6007914 ¹⁾ |
| | 7/16 | 20 | 3.937 | 0.866 | | 0.323 | 0.242 | 3 | H5 | 1 | 6204866 | ²⁾ — |
| 7/16 | | 14 | 3.937 | 0.866 | | 0.323 | 0.242 | 3 | H5 | 1 | 6204865 | 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 | 6204848 | ²⁾ — |
| 1/2 | | 13 | 4.331 | 0.984 | | 0.367 | 0.275 | 3 | H5 | 1 | 6204847 | ²⁾ 6008101 ²⁾ |
| | 5/8 | 18 | 3.937 | 0.866 | | 0.480 | 0.360 | 4 | H5 | 1 | 6204863 | ²⁾ — |
| 5/8 | | 11 | 4.331 | 1.063 | | 0.480 | 0.360 | 4 | H5 | 1 | 6204862 | ²⁾ 6007931 ²⁾ |
| | 3/4 | 16 | 4.331 | 0.984 | | 0.590 | 0.442 | 4 | H5 | 1 | 6204856 | ²⁾ — |
| 3/4 | | 10 | 4.921 | 1.181 | | 0.590 | 0.442 | 4 | H5 | 1 | 6204855 | ²⁾ — |
| 3/4 | | 10 | 4.921 | 1.181 | | 0.590 | 0.442 | 4 | H5 | 1 | — | ²⁾ 6007905 ²⁾ |
| 7/8 | | 9 | 5.512 | 1.260 | | 0.697 | 0.523 | 4 | H6 | 1 | 6204868 | ²⁾ — |
| 1" | | 8 | 6.299 | 1.417 | | 0.800 | 0.600 | 4 | H6 | 1 | 6204854 | ²⁾ — ²⁾ |

¹⁾ Reinforced Shanks
²⁾ Reduced Shanks

SPIRAL POINT TAPS



Multi-Application, Plug Chamfer

E025 Premium substrate for through hole tapping in tough or abrasive materials. Bronze tempered body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft or non-ferrous materials.

E035

E025 = UNC Sizes, E035 = UNF Sizes

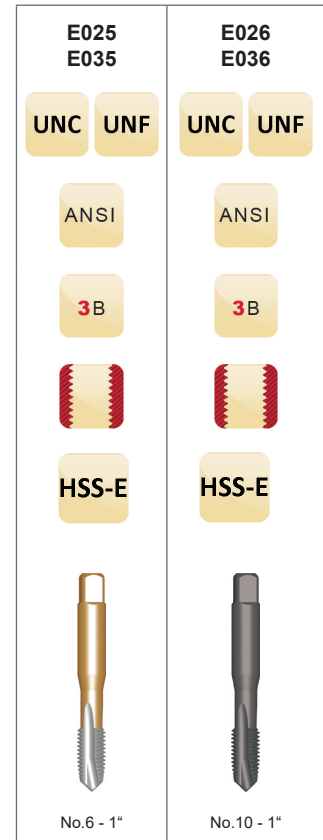
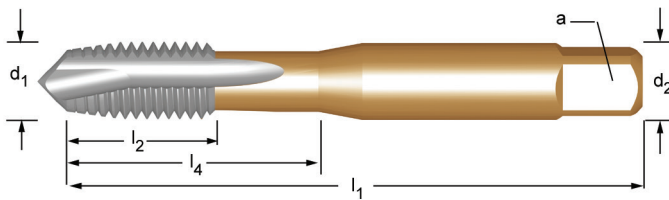
1.1 1.2 1.3 1.4 1.5 1.6 3.1 3.2 3.3 3.4 4.1 4.2 5.1 5.2 6.1
6.2 6.3 7.1 7.2 7.3 7.4 8.1

E026 Premium substrate with steam tempered surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E036

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



| UNC | | UNF | | TPI | l_1 | l_2 | d_2 | a | # of Flutes | Limits | l_4 | Pack Qty | E025 E035 | E026 E036 |
|------|------|------|---------|--------|--------|--------|-------|------|-------------|--------|--------|----------|-----------------------|-------------------------|
| Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | | | Inch | | | |
| 2 | | 56 | 1.3/4 | 0.3140 | 0.1410 | 0.1100 | 2 | H2 | N50 | 1.80 | 0.3140 | 1 | — | 5974126 ¹⁾ |
| 4 | | 40 | 1.7/8 | 0.6091 | 0.1410 | 0.1100 | 2 | H2 | N43 | 2.35 | 0.6091 | 1 | — | 5974153 ¹⁾ |
| 5 | | 40 | 1.15/16 | 0.7404 | 0.1410 | 0.1100 | 2 | H2 | N38 | 2.65 | 0.7404 | 1 | — | 5974159 ¹⁾ |
| | 6 | 40 | 2" | 0.2610 | 0.1410 | 0.1100 | 2 | H2 | N33 | 2.95 | 0.5938 | 1 | 5974546 ¹⁾ | — |
| 6 | | 32 | 2" | 0.2610 | 0.1410 | 0.1100 | 2 | H2 | N36 | 2.85 | 0.5938 | 1 | 5974057 ¹⁾ | 5974184 ¹⁾ |
| | 8 | 36 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 2 | H2 | N29 | 3.50 | 0.6526 | 1 | 5974557 | — |
| 8 | | 32 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 2 | H2 | N29 | 3.50 | 0.6526 | 1 | 5974068 ¹⁾ | 5974203 ¹⁾ |
| | 10 | 32 | 2.3/8 | 0.4303 | 0.1940 | 0.1520 | 2 | H2 | N21 | 4.10 | 0.8434 | 1 | 5974585 ¹⁾ | 5974592 ¹⁾ |
| 10 | | 24 | 2.3/8 | 0.4303 | 0.1940 | 0.1520 | 2 | H3 | N25 | 3.90 | 0.8434 | 1 | 5974031 ¹⁾ | 5974116 ¹⁾ |
| | 12 | 28 | 2.3/8 | 0.4173 | 0.2200 | 0.1650 | 2 | H3 | N14 | 4.70 | 0.8848 | 1 | — ¹⁾ | 5974596 ¹⁾ |
| 12 | | 24 | 2.3/8 | 0.4173 | 0.2200 | 0.1650 | 2 | H3 | N16 | 4.50 | 0.8848 | 1 | 5974034 ¹⁾ | 5974121 ¹⁾ |
| | 1/4 | 28 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 2 | H3 | N3 | 5.50 | 1.0073 | 1 | 5973974 ¹⁾ | 5974581 ¹⁾ |
| | 1/4 | 28 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 3 | H3 | N3 | 5.50 | 1.0073 | 1 | 5974542 ¹⁾ | 5974589 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 2 | H3 | N7 | 5.10 | 1.0073 | 1 | 5974027 ¹⁾ | 5974097 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 3 | H3 | N7 | 5.10 | 1.0073 | 1 | 5974029 ¹⁾ | 5974110 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 3 | H11 | N7 | 5.10 | 1.0073 | 1 | — | 5974106 ¹⁾³⁾ |
| | 5/16 | 24 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 2 | H3 | I | 6.90 | 1.1891 | 1 | 5974736 ¹⁾ | 5974618 ¹⁾ |
| | 5/16 | 24 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 3 | H3 | I | 6.90 | 1.1891 | 1 | 5974740 ¹⁾ | 5974624 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 2 | H3 | F | 6.60 | 1.1891 | 1 | 5974044 ¹⁾ | 5974164 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 3 | H3 | F | 6.60 | 1.1891 | 1 | 5974047 ¹⁾ | 5974173 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 3 | H11 | F | 6.60 | 1.1891 | 1 | — | 5974169 ¹⁾³⁾ |
| | 3/8 | 24 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 2 | H3 | Q | 8.50 | 1.2915 | 1 | 5974725 ¹⁾ | 5974608 ¹⁾ |
| | 3/8 | 24 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 3 | H3 | Q | 8.50 | 1.2915 | 1 | 5974732 ¹⁾ | 5974613 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 2 | H3 | 5/16 | 8.00 | 1.2915 | 1 | 5974039 ¹⁾ | 5974135 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 3 | H3 | 5/16 | 8.00 | 1.2915 | 1 | 5974041 ¹⁾ | 5974145 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 3 | H11 | 5/16 | 8.00 | 1.2915 | 1 | — | 5974140 ¹⁾³⁾ |
| | 7/16 | 20 | 3.5/32 | 0.9055 | 0.3230 | 0.2420 | 3 | H3 | 25/64 | 9.90 | — | 1 | 5974549 ²⁾ | 5974633 ²⁾ |
| 7/16 | | 14 | 3.5/32 | 0.9055 | 0.3230 | 0.2420 | 3 | H3 | U | 9.40 | — | 1 | 5974060 ²⁾ | 5974188 ²⁾ |
| | 1/2 | 20 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 2 | H3 | 29/64 | 11.50 | — | 1 | 5973965 ²⁾ | 5974573 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

³⁾ Oversize +.005", not 3B

| UNC | UNF | TPI | l ₁ Inch | l ₂ Inch | d ₂ ∅ 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 | 5973968 ²⁾ | 5974577 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 2 | H3 | 27/64 | 10.80 | — | 1 | 5974219 ²⁾ | 5974081 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 3 | H3 | 27/64 | 10.80 | — | 1 | 5974025 ²⁾ | 5974090 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 3 | H11 | 27/64 | 10.80 | — | 1 | — | 5974085 ²⁾³⁾ |
| | 9/16 | 18 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 3 | H3 | 33/64 | 12.90 | — | 1 | 5974561 ²⁾ | 5974648 ²⁾ |
| 9/16 | | 12 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 3 | H3 | 31/64 | 12.20 | — | 1 | 5974072 ²⁾ | 5974009 ²⁾ |
| | 5/8 | 18 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 3 | H3 | 37/64 | 14.50 | — | 1 | 5974743 ²⁾ | 5974628 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 3 | H3 | 17/32 | 13.50 | — | 1 | 5974053 ²⁾ | 5974177 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 3 | H11 | 17/32 | 13.50 | — | 1 | — | 5974181 ²⁾³⁾ |
| | 3/4 | 16 | 4.1/4 | 1.1614 | 0.5900 | 0.4420 | 3 | H3 | 11/16 | 17.50 | — | 1 | 5974686 ²⁾ | 5974605 ²⁾ |
| 3/4 | | 10 | 4.1/4 | 1.1614 | 0.5900 | 0.4420 | 3 | H4 | 21/32 | 16.50 | — | 1 | 5974036 ²⁾ | 5974130 ²⁾ |
| | 7/8 | 14 | 4.11/16 | 1.1614 | 0.6970 | 0.5230 | 3 | H4 | 13/16 | 20.40 | — | 1 | 5974553 ²⁾ | 5974643 ²⁾ |
| 7/8 | | 9 | 4.11/16 | 1.1614 | 0.6970 | 0.5230 | 3 | H4 | 49/64 | 19.50 | — | 1 | 5974064 ²⁾ | 5974192 ²⁾ |
| | 1" | 12 | 5.1/8 | 1.3976 | 0.8000 | 0.6000 | 3 | H4 | 59/64 | 23.25 | — | 1 | — | 5974565 ²⁾ |
| | 1" | 14 | 5.1/8 | 1.3976 | 0.8000 | 0.6000 | 3 | H4 | 59/64 | 23.50 | — | 1 | 5973962 ²⁾ | 5974569 ²⁾ |
| 1" | | 8 | 5.1/8 | 1.3976 | 0.8000 | 0.6000 | 3 | H4 | 7/8 | 22.25 | — | 1 | 5974215 ²⁾ | 5974078 ²⁾ |

¹⁾ Reinforced Shanks
²⁾ Reduced Shanks
³⁾ Oversize +.005", not 3B

SPIRAL POINT TAPS



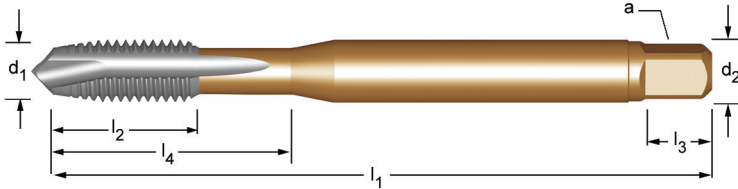
Multi-Application, Plug Chamfer

EP20/EP30 Premium substrate for through hole tapping in tough or abrasive materials. Bronze tempered 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 tempered 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 | Flute Profile | 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 | 5973735 | ¹⁾ 5973914 |
| 5 | | 40 | 3.175 | 56 | 10 | 3.5 | 2.7 | 6 | 3 | 2.65 | 18 | H2 | 1 | 5973737 | ¹⁾ 5973957 |
| 6 | | 32 | 3.505 | 56 | 11 | 4.0 | 3.0 | 6 | 3 | 2.85 | 20 | H2 | 1 | 5973745 | ¹⁾ 5973995 |
| | 8 | 36 | 4.166 | 63 | 12 | 4.5 | 3.4 | 8 | 3 | 3.5 | 21 | H3 | 1 | 5973871 | ¹⁾ 5973927 |
| 8 | | 32 | 4.166 | 63 | 12 | 4.5 | 3.4 | 8 | 3 | 3.5 | 21 | H3 | 1 | 5973752 | ¹⁾ 5973818 |
| | 10 | 32 | 4.826 | 70 | 13 | 6.0 | 4.9 | 8 | 3 | 4.1 | 25 | H3 | 1 | 5973834 | ¹⁾ 5973889 |
| 10 | | 24 | 4.826 | 70 | 13 | 6.0 | 4.9 | 8 | 3 | 3.9 | 25 | H3 | 1 | 5973723 | ¹⁾ 5973760 |
| 12 | | 24 | 5.486 | 80 | 15 | 6.0 | 4.9 | 8 | 3 | 4.5 | 30 | H3 | 1 | 5973725 | ¹⁾ 5973764 |
| | 1/4 | 28 | 6.350 | 80 | 15 | 7.0 | 5.5 | 8 | 3 | 5.5 | 30 | H4 | 1 | 5973829 | ¹⁾ 5973884 |
| 1/4 | | 20 | 6.350 | 80 | 15 | 7.0 | 5.5 | 8 | 3 | 5.1 | 30 | H5 | 1 | 5973720 | ¹⁾ 5973758 |
| | 5/16 | 24 | 7.938 | 90 | 18 | 8.0 | 6.2 | 9 | 3 | 6.9 | 35 | H4 | 1 | 5973844 | ¹⁾ 5973904 |
| 5/16 | | 18 | 7.938 | 90 | 18 | 8.0 | 6.2 | 9 | 3 | 6.6 | 35 | H5 | 1 | 5973741 | ¹⁾ 5973989 |
| | 3/8 | 24 | 9.525 | 100 | 20 | 10.0 | 8.0 | 11 | 3 | 8.5 | 39 | H4 | 1 | 5973841 | ¹⁾ 5973899 |
| 3/8 | | 16 | 9.525 | 100 | 20 | 10.0 | 8.0 | 11 | 3 | 8 | 39 | H5 | 1 | 5973732 | ¹⁾ 5973858 |
| | 7/16 | 20 | 11.112 | 100 | 20 | 8.0 | 6.2 | 9 | 3 | 9.9 | - | H5 | 1 | 5973853 | ²⁾ 5973919 |
| 7/16 | | 14 | 11.112 | 100 | 20 | 8.0 | 6.2 | 9 | 3 | 9.4 | - | H5 | 1 | 5973747 | ²⁾ 5973997 |
| | 1/2 | 20 | 12.700 | 110 | 23 | 9.0 | 7.0 | 10 | 3 | 11.5 | - | H5 | 1 | 5973826 | ²⁾ 5973879 |
| 1/2 | | 13 | 12.700 | 110 | 23 | 9.0 | 7.0 | 10 | 3 | 10.8 | - | H5 | 1 | 5973716 | ²⁾ 5973756 |
| | 5/8 | 18 | 15.875 | 110 | 25 | 12.0 | 9.0 | 12 | 3 | 14.5 | - | H5 | 1 | 5973848 | ²⁾ 5973909 |
| 5/8 | | 11 | 15.875 | 110 | 25 | 12.0 | 9.0 | 12 | 3 | 13.5 | - | H5 | 1 | 5973743 | ²⁾ 5973993 |
| | 3/4 | 16 | 19.050 | 125 | 30 | 14.0 | 11.0 | 14 | 4 | 17.5 | - | H5 | 1 | 5973837 | ²⁾ 5973894 |
| 3/4 | | 10 | 19.050 | 125 | 30 | 14.0 | 11.0 | 14 | 4 | 16.5 | - | H5 | 1 | 5973729 | ²⁾ 5973810 |
| | 7/8 | 14 | 22.225 | 140 | 34 | 18.0 | 14.5 | 17 | 4 | 20.4 | - | H6 | 1 | 5973866 | ²⁾ 5973923 |
| 7/8 | | 9 | 22.225 | 140 | 34 | 18.0 | 14.5 | 17 | 4 | 19.5 | - | H6 | 1 | 5973749 | ²⁾ 5973999 |
| | 1" | 12 | 25.400 | 160 | 38 | 18.0 | 14.5 | 17 | 4 | 23.25 | - | H6 | 1 | 5973822 | ²⁾ 5973874 |
| 1" | | 8 | 25.400 | 160 | 38 | 18.0 | 14.5 | 17 | 4 | 22.25 | - | H6 | 1 | 5973714 | ²⁾ 5973754 |

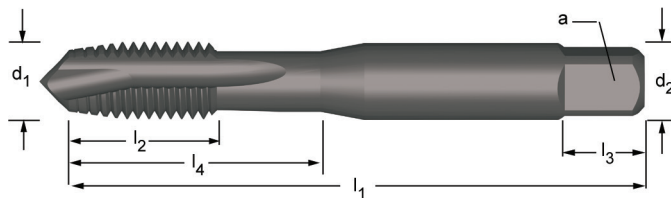
Note: DIN shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks
²⁾ Reduced Shanks

Multi-Application, PLUG CHAMFER

E021 Premium substrate with steam tempered 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



| | |
|-------------|-------------|
| E021 | E031 |
| UNC | UNF |
| ISO 529 | ISO 529 |
| 2B | 2B |
| | |
| HSS-E | HSS-E |
| | |
| No.2 - 1" | No.8 - 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 | E021 | E031 |
|------|------|-----|-----------------------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|-------|----------------------|--------|-------------|-----------------------|-----------------------|
| 2 | | 56 | 2.184 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 2 | 1.85 | 9.5 | H2 | 1 | 5974319 ¹⁾ | — |
| 4 | | 40 | 2.845 | 48 | 14 | 3.15 | 2.50 | 5 | 3 | 2.35 | 14 | H2 | 1 | 5974331 ¹⁾ | — |
| 5 | | 40 | 3.175 | 48 | 12.5 | 3.15 | 2.50 | 5 | 3 | 2.65 | 12.5 | H2 | 1 | 5974336 ¹⁾ | — |
| 6 | | 32 | 3.505 | 50 | 16 | 3.55 | 2.80 | 5 | 3 | 2.85 | 16 | H3 | 1 | 5974354 ¹⁾ | — |
| | 8 | 36 | 4.166 | 53 | 9.5 | 4.5 | 3.55 | 6 | 3 | 3.50 | 17 | H3 | 1 | — | 5973839 ¹⁾ |
| 8 | | 32 | 4.166 | 53 | 9.5 | 4.50 | 3.55 | 6 | 3 | 3.50 | 17 | H3 | 1 | 5974369 ¹⁾ | — |
| | 10 | 32 | 4.826 | 58 | 11 | 5.0 | 4.00 | 7 | 3 | 4.10 | 20 | H3 | 1 | — | 5973806 ¹⁾ |
| 10 | | 24 | 4.826 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 3.90 | 20 | H3 | 1 | 5974311 ¹⁾ | — |
| 12 | | 24 | 5.486 | 62 | 12 | 5.60 | 4.50 | 7 | 3 | 4.50 | 21 | H3 | 1 | 5974315 ¹⁾ | — |
| | 1/4 | 28 | 6.350 | 66 | 13 | 6.3 | 5.00 | 8 | 3 | 5.50 | 26 | H4 | 1 | — | 5973803 ¹⁾ |
| 1/4 | | 20 | 6.350 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5.10 | 26 | H5 | 1 | 5974305 ¹⁾ | — |
| | 5/16 | 24 | 7.938 | 72 | 16 | 8.0 | 6.30 | 9 | 3 | 6.90 | 29 | H4 | 1 | — | 5973819 ¹⁾ |
| 5/16 | | 18 | 7.938 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.60 | 29 | H5 | 1 | 5974346 ¹⁾ | — |
| | 3/8 | 24 | 9.525 | 80 | 18 | 10.0 | 8.00 | 11 | 3 | 8.50 | 32 | H4 | 1 | — | 5973815 ¹⁾ |
| 3/8 | | 16 | 9.525 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.00 | 32 | H5 | 1 | 5974327 ¹⁾ | — |
| | 7/16 | 20 | 11.112 | 85 | 19 | 8.0 | 6.30 | 9 | 3 | 9.90 | - | H5 | 1 | — | 5973827 ²⁾ |
| 7/16 | | 14 | 11.112 | 85 | 19 | 8.00 | 6.30 | 9 | 3 | 9.40 | - | H5 | 1 | 5974359 ²⁾ | — |
| | 1/2 | 20 | 12.700 | 89 | 22 | 9.0 | 7.10 | 10 | 3 | 11.50 | - | H5 | 1 | — | 5973800 ²⁾ |
| 1/2 | | 13 | 12.700 | 89 | 22 | 9.00 | 7.10 | 10 | 3 | 10.80 | - | H5 | 1 | 5974301 ²⁾ | — |
| | 9/16 | 18 | 14.288 | 95 | 24 | 11.2 | 9.00 | 12 | 3 | 12.90 | - | H5 | 1 | — | 5973842 ²⁾ |
| | 5/8 | 18 | 15.875 | 102 | 24 | 12.5 | 10.00 | 13 | 3 | 14.50 | - | H5 | 1 | — | 5973823 ²⁾ |
| 5/8 | | 11 | 15.875 | 102 | 24 | 12.50 | 10.00 | 13 | 3 | 13.50 | - | H5 | 1 | 5974350 ²⁾ | — |
| | 3/4 | 16 | 19.050 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 17.50 | - | H5 | 1 | — | 5973813 ²⁾ |
| 3/4 | | 10 | 19.050 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 16.50 | - | H5 | 1 | 5974323 ²⁾ | — |
| | 7/8 | 14 | 22.225 | 118 | 29 | 16.0 | 12.50 | 16 | 4 | 20.40 | - | H6 | 1 | — | 5973831 ²⁾ |
| 7/8 | | 9 | 22.225 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | 19.50 | - | H6 | 1 | 5974364 ²⁾ | — |
| | 1" | 12 | 25.400 | 130 | 35 | 18.0 | 14.00 | 18 | 4 | 23.25 | - | H6 | 1 | — | 5973798 ²⁾ |
| 1" | | 8 | 25.400 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | 22.25 | - | H6 | 1 | 5974297 ²⁾ | — |

Note: ISO shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks
²⁾ Reduced Shanks

SPIRAL POINT TAPS



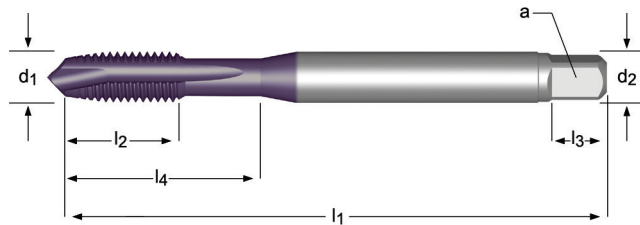
MXP Multi-Application, Plug Chamfer, Metric

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.

APPLIX®

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 | |
| 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 | 6204884 | ¹⁾ — |
| 5 | | 0.80 | 70 | 15 | 25 | 0.194 | 0.152 | 3 | D4 | 1 | 6204885 | ¹⁾ — |
| 6 | | 1.00 | 80 | 17 | 30 | 0.255 | 0.191 | 3 | D5 | 1 | 6204886 | ¹⁾ — |
| | 8 | 1.00 | 90 | 17 | 35 | 0.318 | 0.238 | 3 | D5 | 1 | 6205008 | ¹⁾ — |
| 8 | | 1.25 | 90 | 20 | 35 | 0.318 | 0.238 | 3 | D5 | 1 | 6204887 | ¹⁾ — |
| | 10 | 1.25 | 100 | 16 | 39 | 0.381 | 0.286 | 3 | D6 | 1 | 6204870 | ¹⁾ — |
| 10 | | 1.50 | 100 | 22 | 39 | 0.381 | 0.286 | 3 | D6 | 1 | 6204871 | ¹⁾ — |
| | 12 | 1.25 | 100 | 21 | | 0.367 | 0.275 | 3 | D6 | 1 | 6205009 | ²⁾ — |
| | 12 | 1.50 | 100 | 22 | | 0.367 | 0.275 | 3 | D6 | 1 | 6204872 | ²⁾ — |
| 12 | | 1.75 | 110 | 24 | | 0.367 | 0.275 | 3 | D6 | 1 | 6204873 | ²⁾ 6007959 ²⁾ |
| | 14 | 1.50 | 100 | 22 | | 0.429 | 0.322 | 4 | D7 | 1 | 6204874 | ²⁾ — |
| 14 | | 2.00 | 110 | 26 | | 0.429 | 0.322 | 4 | D7 | 1 | 6204875 | ²⁾ — |
| | 16 | 1.50 | 100 | 22 | | 0.480 | 0.360 | 4 | D7 | 1 | 6204876 | ²⁾ — |
| 16 | | 2.00 | 110 | 27 | | 0.480 | 0.360 | 4 | D7 | 1 | 6204877 | ²⁾ 6007991 ²⁾ |
| | 18 | 1.50 | 110 | 25 | | 0.542 | 0.406 | 4 | D7 | 1 | 6204878 | ²⁾ — |
| 20 | | 2.50 | 140 | 32 | | 0.652 | 0.489 | 4 | D7 | 1 | 6204881 | ²⁾ 6008013 ²⁾ |
| | 24 | 2.00 | 140 | 27 | | 0.760 | 0.570 | 4 | D8 | 1 | 6204882 | ²⁾ — |
| 24 | | 3.00 | 160 | 34 | | 0.760 | 0.570 | 4 | D8 | 1 | 6204883 | ²⁾ — |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

Multi-Application, Plug Chamfer

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

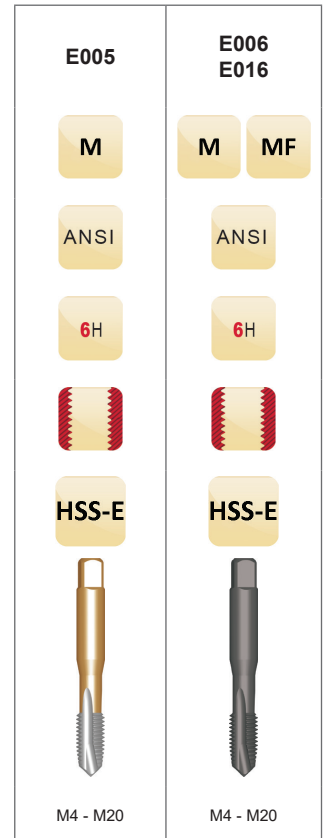
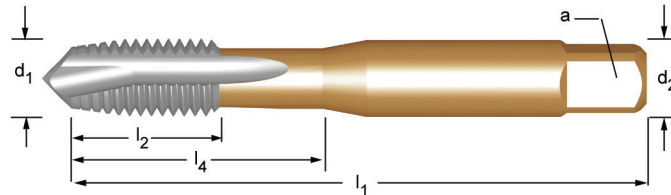
E005 = Metric Coarse

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 tempered 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 | l ₁ | l ₂ | d ₂ | a | # of Flutes | ↔ | ↔ | l ₄ | Limits | Pack Qty | E005 | E006 E016 |
|----|----|------|----------------|----------------|----------------|--------|-------------|-------|-------|----------------|--------|----------|-----------------------|-----------------------|
| | | mm | Inch | Inch | Inch | Inch | | | | Inch | | | | |
| 4 | | 0.70 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 2 | 3.30 | N30 | 0.6526 | D4 | 1 | 5974453 ¹⁾ | 5973941 ¹⁾ |
| 4 | | 0.70 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 3 | 3.30 | N30 | 0.6526 | D4 | 1 | 5974457 ¹⁾ | 5973945 ¹⁾ |
| 5 | | 0.80 | 2.3/8 | 0.4303 | 0.1940 | 0.1520 | 2 | 4.20 | N19 | 0.8434 | D4 | 1 | 5974461 ¹⁾ | 5973949 ¹⁾ |
| 5 | | 0.80 | 2.3/8 | 0.4303 | 0.1940 | 0.1520 | 3 | 4.20 | N19 | 0.8434 | D4 | 1 | 5974465 ¹⁾ | 5973777 ¹⁾ |
| 6 | | 1.00 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 2 | 5.00 | N9 | 1.0073 | D5 | 1 | 5974469 ¹⁾ | 5973778 ¹⁾ |
| 6 | | 1.00 | 2.1/2 | 0.5075 | 0.2550 | 0.1910 | 3 | 5.00 | N9 | 1.0073 | D5 | 1 | 5974473 ¹⁾ | 5973780 ¹⁾ |
| | 8 | 1.00 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 3 | 7.00 | J | 1.1891 | D5 | 1 | — | 5973568 ¹⁾ |
| 8 | | 1.25 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 2 | 6.80 | H | 1.1891 | D5 | 1 | 5974476 ¹⁾ | 5973782 ¹⁾ |
| 8 | | 1.25 | 2.23/32 | 0.5939 | 0.3180 | 0.2380 | 3 | 6.80 | H | 1.1891 | D5 | 1 | 5974479 ¹⁾ | 5973784 ¹⁾ |
| | 10 | 1.00 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 3 | 9.00 | T | 1.2915 | D6 | 1 | — | 5973557 ¹⁾ |
| 10 | | 1.50 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 2 | 8.50 | Q | 1.2915 | D6 | 1 | 5974418 ¹⁾ | 5974482 ¹⁾ |
| 10 | | 1.50 | 2.15/16 | 0.6020 | 0.3810 | 0.2860 | 3 | 8.50 | Q | 1.2915 | D6 | 1 | 5974422 ¹⁾ | 5974488 ¹⁾ |
| 12 | | 1.75 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 2 | 10.30 | Y | | D6 | 1 | 5974426 ²⁾ | 5973774 ²⁾ |
| 12 | | 1.75 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 3 | 10.30 | Y | | D6 | 1 | 5974430 ²⁾ | 5973796 ²⁾ |
| | 14 | 1.50 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 3 | 12.50 | 31/64 | | D7 | 1 | — | 5973561 ²⁾ |
| 14 | | 2.00 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 3 | 12.00 | 15/32 | | D7 | 1 | 5974434 ²⁾ | 5973832 ²⁾ |
| 16 | | 2.00 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 3 | 14.00 | 35/64 | | D7 | 1 | 5974438 ²⁾ | 5973878 ²⁾ |
| 18 | | 2.50 | 4.1/32 | 1.1614 | 0.5420 | 0.4060 | 3 | 15.50 | 39/64 | | D7 | 1 | 5974442 ²⁾ | 5973929 ²⁾ |
| 20 | | 2.50 | 4.15/32 | 1.1614 | 0.6520 | 0.4890 | 3 | 17.50 | 11/16 | | D7 | 1 | 5974450 ²⁾ | 5973937 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

SPIRAL POINT TAPS



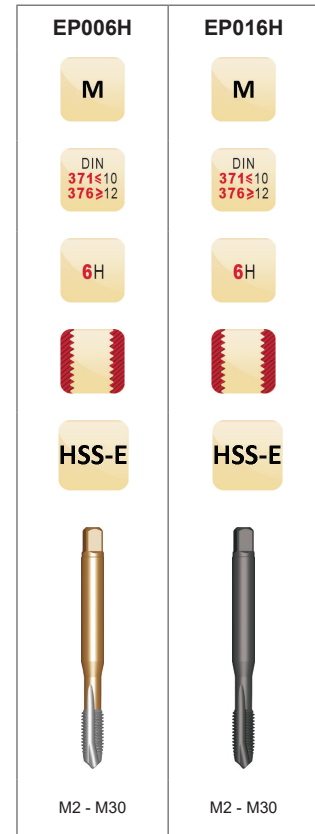
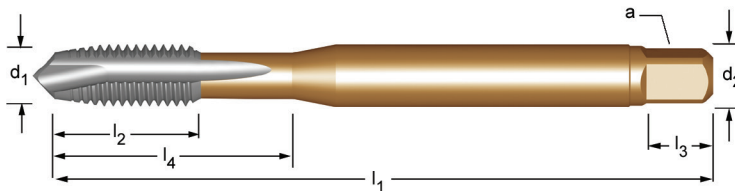
Multi-Application, Plug Chamfer

EP006H Premium substrate for through hole tapping in tough or abrasive materials. Bronze tempered 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 tempered 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



| 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 | 5973413 | 5973473 |
| 2.5 | 0.45 | 50 | 8 | 2.8 | 2.1 | 5 | 2 | 2.1 | 12.5 | D3 | 1 | 5973414 | 5973475 |
| 3 | 0.50 | 56 | 10 | 2.2 | 1.8 | 4 | 3 | 2.5 | 18 | D3 | 1 | 5973422 | 5973495 |
| 3 | 0.50 | 56 | 9 | 3.5 | 2.7 | 6 | 3 | 2.5 | 18 | D3 | 1 | 5973420 | 5973452 |
| 3.5 | 0.60 | 56 | 11 | 4.0 | 3.0 | 6 | 3 | 2.9 | 20 | D4 | 1 | 5973421 | 5973474 |
| 4 | 0.70 | 63 | 12 | 2.8 | 2.1 | 5 | 3 | 3.3 | 21 | D4 | 1 | 5973428 | 5973515 |
| 4 | 0.70 | 63 | 12 | 4.5 | 3.4 | 6 | 3 | 3.3 | 21 | D4 | 1 | 5973426 | 5973511 |
| 4.5 | 0.75 | 70 | 13 | 6.0 | 4.9 | 8 | 3 | 3.8 | 25 | D4 | 1 | 5973427 | 5973513 |
| 5 | 0.80 | 70 | 13 | 3.5 | 2.7 | 6 | 3 | 4.2 | 25 | D4 | 1 | 5973433 | 5973436 |
| 5 | 0.80 | 70 | 13 | 6.0 | 4.9 | 8 | 3 | 4.2 | 25 | D4 | 1 | 5973431 | 5973434 |
| 6 | 1.00 | 80 | 15 | 4.5 | 3.4 | 6 | 3 | 5 | 30 | D5 | 1 | 5973441 | 5973442 |
| 6 | 1.00 | 80 | 15 | 6.0 | 4.9 | 8 | 3 | 5 | 30 | D5 | 1 | 5973437 | 5973440 |
| 7 | 1.00 | 80 | 15 | 7.0 | 5.5 | 8 | 3 | 6 | 30 | D5 | 1 | 5973445 | 5973446 |
| 8 | 1.25 | 90 | 18 | 6.0 | 4.9 | 8 | 3 | 6.8 | 35 | D5 | 1 | 5973449 | 5973450 |
| 8 | 1.25 | 90 | 18 | 8.0 | 6.2 | 9 | 3 | 6.8 | 35 | D5 | 1 | 5973447 | 5973448 |
| 10 | 1.50 | 100 | 20 | 7.0 | 5.5 | 8 | 3 | 8.5 | - | D6 | 1 | 5973423 | 5973455 |
| 10 | 1.50 | 100 | 20 | 10.0 | 8.0 | 11 | 3 | 8.5 | 39 | D6 | 1 | 5973412 | 5973453 |
| 12 | 1.75 | 110 | 23 | 9.0 | 7.0 | 10 | 3 | 10.3 | - | D6 | 1 | 5973461 | 5973459 |
| 14 | 2.00 | 110 | 25 | 11.0 | 9.0 | 12 | 3 | 12 | - | D7 | 1 | 5973486 | 5973465 |
| 16 | 2.00 | 110 | 25 | 12.0 | 9.0 | 12 | 3 | 14 | - | D7 | 1 | 5973489 | 5973467 |
| 18 | 2.50 | 125 | 30 | 14.0 | 11.0 | 14 | 4 | 15.5 | - | D7 | 1 | 5973493 | 5973471 |
| 20 | 2.50 | 140 | 30 | 16.0 | 12.0 | 15 | 4 | 17.5 | - | D7 | 1 | 5973415 | 5973477 |
| 22 | 2.50 | 140 | 34 | 18.0 | 14.5 | 17 | 4 | 19.5 | - | D8 | 1 | 5973417 | 5973480 |
| 24 | 3.00 | 160 | 38 | 18.0 | 14.5 | 17 | 4 | 21 | - | D8 | 1 | 5973418 | 5973484 |
| 27 | 3.00 | 160 | 38 | 20.0 | 16.0 | 19 | 4 | 24 | - | D8 | 1 | 5973419 | 5973429 |
| 30 | 3.50 | 180 | 45 | 22.0 | 18.0 | 21 | 4 | 26.5 | - | D9 | 1 | 5973424 | 5973506 |

Note: DIN shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks (DIN 371)

²⁾ Reduced Shanks (DIN 376)

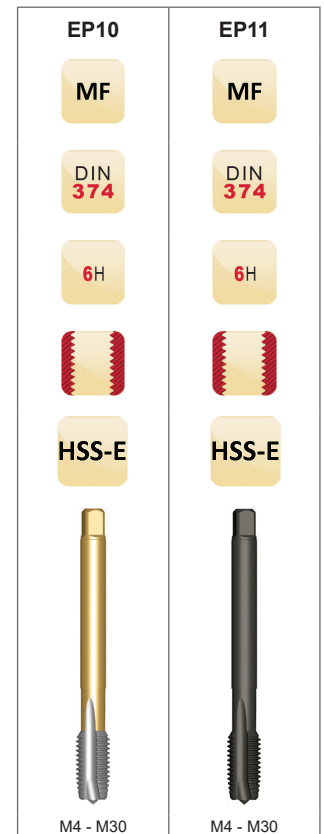
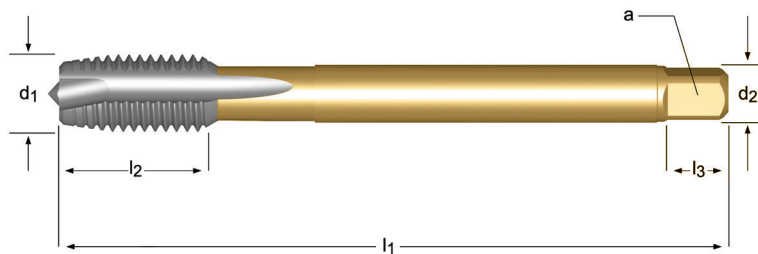
Multi-Application, Plug Chamfer

EP10 Premium substrate for through hole tapping in tough or abrasive materials. Bronze tempered 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 tempered 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



| MF | P mm | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | l ₃ mm | # of Flutes | Flute Width | Limits | Pack Qty | EP10 | EP11 |
|----|------|-------------------|-------------------|---------------------|--------|-------------------|-------------|-------------|--------|----------|---------|---------|
| 4 | 0.50 | 63 | 12 | 2.8 | 2.1 | 5 | 3 | 3.5 | D4 | 1 | 5973502 | 5973691 |
| 5 | 0.50 | 70 | 13 | 3.5 | 2.7 | 6 | 3 | 4.5 | D4 | 1 | 5973503 | 5973695 |
| 6 | 0.75 | 80 | 15 | 4.5 | 3.4 | 6 | 3 | 5.3 | D5 | 1 | 5973504 | 5973699 |
| 8 | 0.75 | 80 | 15 | 6.0 | 4.9 | 8 | 3 | 7.3 | D5 | 1 | 5973505 | 5973703 |
| 8 | 1.00 | 90 | 18 | 6.0 | 4.9 | 8 | 3 | 7 | D5 | 1 | 5973507 | 5973711 |
| 10 | 0.75 | 90 | 18 | 7.0 | 5.5 | 8 | 3 | 9.3 | D6 | 1 | 5973456 | 5973600 |
| 10 | 1.00 | 90 | 18 | 7.0 | 5.5 | 8 | 3 | 9 | D6 | 1 | 5973458 | 5973663 |
| 10 | 1.25 | 100 | 20 | 7.0 | 5.5 | 8 | 3 | 8.8 | D6 | 1 | 5973460 | 5973707 |
| 12 | 1.00 | 100 | 21 | 9.0 | 7.0 | 10 | 3 | 11 | D6 | 1 | 5973462 | 5973738 |
| 12 | 1.25 | 100 | 21 | 9.0 | 7.0 | 10 | 3 | 10.8 | D6 | 1 | 5973464 | 5973762 |
| 12 | 1.50 | 100 | 21 | 9.0 | 7.0 | 10 | 3 | 10.5 | D6 | 1 | 5973466 | 5973766 |
| 14 | 1.00 | 100 | 21 | 11.0 | 9.0 | 12 | 3 | 13 | D7 | 1 | 5973468 | 5973768 |
| 14 | 1.25 | 100 | 21 | 11.0 | 9.0 | 12 | 3 | 13 | D7 | 1 | 5973470 | 5973770 |
| 14 | 1.50 | 100 | 21 | 11.0 | 9.0 | 12 | 3 | 12.5 | D7 | 1 | 5973472 | 5973772 |
| 16 | 1.00 | 100 | 21 | 12.0 | 9.0 | 12 | 3 | 15 | D7 | 1 | 5973476 | 5973606 |
| 16 | 1.50 | 100 | 21 | 12.0 | 9.0 | 12 | 3 | 14.5 | D7 | 1 | 5973478 | 5973610 |
| 18 | 1.00 | 110 | 24 | 14.0 | 11.0 | 14 | 4 | 17 | D7 | 1 | 5973481 | 5973615 |
| 18 | 1.50 | 110 | 24 | 14.0 | 11.0 | 14 | 4 | 16.5 | D7 | 1 | 5973483 | 5973623 |
| 20 | 1.00 | 125 | 24 | 16.0 | 12.0 | 15 | 4 | 19 | D7 | 1 | 5973485 | 5973628 |
| 20 | 1.50 | 125 | 24 | 16.0 | 12.0 | 15 | 4 | 18.5 | D7 | 1 | 5973487 | 5973632 |
| 22 | 1.50 | 125 | 25 | 18.0 | 14.5 | 17 | 4 | 20.5 | D8 | 1 | 5973488 | 5973637 |
| 24 | 1.50 | 140 | 28 | 18.0 | 14.5 | 17 | 4 | 22.5 | D8 | 1 | 5973490 | 5973642 |
| 24 | 2.00 | 140 | 28 | 18.0 | 14.5 | 17 | 4 | 22 | D8 | 1 | 5973492 | 5973654 |
| 25 | 1.50 | 140 | 28 | 18.0 | 14.5 | 17 | 4 | 23.5 | D8 | 1 | 5973494 | 5973659 |
| 26 | 1.50 | 140 | 28 | 18.0 | 14.5 | 17 | 4 | 24.5 | D8 | 1 | 5973496 | 5973668 |
| 27 | 1.50 | 140 | 28 | 20.0 | 16.0 | 19 | 4 | 25.5 | D8 | 1 | 5973497 | 5973672 |
| 27 | 2.00 | 140 | 28 | 20.0 | 16.0 | 19 | 4 | 25 | D8 | 1 | 5973498 | 5973676 |
| 28 | 1.50 | 140 | 28 | 20.0 | 16.0 | 19 | 4 | 26.5 | D9 | 1 | 5973499 | 5973679 |
| 30 | 1.50 | 150 | 28 | 22.0 | 18.0 | 21 | 4 | 28.5 | D9 | 1 | 5973500 | 5973683 |
| 30 | 2.00 | 150 | 28 | 22.0 | 18.0 | 21 | 4 | 28 | D9 | 1 | 5973501 | 5973687 |

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 tempered 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

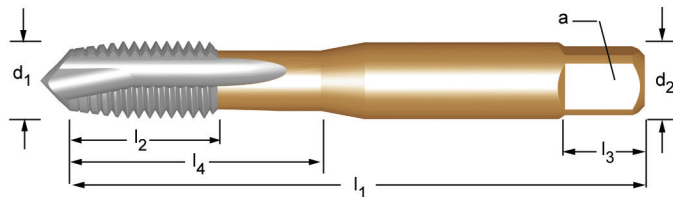
1.1 1.2 1.3 1.4 1.5 1.6 2.1 2.2 2.3 3.1 3.2 3.3 3.4 4.1 4.2
5.1 5.2 6.1 6.2 6.3 7.3 7.4 8.2

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

E011

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




| E000 | E001 E011 | E000TIN |
|------------|--------------|----------|
| M | MF | M |
| ISO 529 | ISO 529 | ISO 529 |
| 6H | 6H | 6H |
| | | |
| HSS-E | HSS-E | HSS-E |
| | | |
| M1.6 - M24 | M1.6 - M24 | M3 - M20 |

| M | MF | P | l_1 | l_2 | d_2 | \square | l_3 | # of Flutes | l_4 | Limits | Pack Qty | E000 | E001 E011 | E000TIN |
|-----|----|------|-------|-------|-------|-----------|-------|-------------|-------|--------|----------|---------|--------------|---------|
| 1.6 | | 0.35 | 41 | 7 | 2.50 | 2.00 | 4 | 2 | 1.25 | 7 | D3 | 5973759 | 5973804 | — |
| 2 | | 0.40 | 41 | 8 | 2.50 | 2.00 | 4 | 2 | 1.6 | 8 | D3 | 5973771 | 5973825 | — |
| 2.5 | | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 2 | 2.05 | 9.5 | D3 | 5973775 | 5973830 | — |
| 3 | | 0.50 | 48 | 15 | 3.15 | 2.50 | 5 | 3 | 2.5 | 15 | D3 | 5973783 | 5973852 | 6196635 |
| 3.5 | | 0.60 | 50 | 16 | 3.55 | 2.80 | 5 | 3 | 2.9 | 16 | D4 | 5973785 | 5973857 | — |
| 4 | | 0.50 | 53 | 17 | 4.0 | 3.15 | 6 | 3 | 3.5 | 17 | D4 | — | 5974474 | — |
| 4 | | 0.70 | 53 | 17 | 4.00 | 3.15 | 6 | 3 | 3.3 | 17 | D4 | 5973788 | 5973861 | 6196636 |
| 5 | | 0.50 | 58 | 11 | 5.0 | 4.00 | 7 | 3 | 4.5 | 22 | D4 | — | 5974477 | — |
| 5 | | 0.80 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.2 | 22 | D4 | 5973790 | 5973865 | 6196637 |
| 6 | | 0.50 | 66 | 13 | 6.3 | 5.00 | 8 | 3 | 5.5 | 26 | D5 | — | 5974483 | — |
| 6 | | 0.75 | 66 | 13 | 6.3 | 5.00 | 8 | 3 | 5.3 | 26 | D5 | — | 5974486 | — |
| 6 | | 1.00 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5.0 | 26 | D5 | 5973792 | 5973870 | 6196638 |
| 8 | | 0.75 | 72 | 16 | 8.0 | 6.30 | 9 | 3 | 7.3 | 29 | D5 | — | 5974489 | — |
| 8 | | 1.00 | 72 | 16 | 8.0 | 6.30 | 9 | 3 | 7.0 | 29 | D5 | — | 5974492 | — |
| 8 | | 1.25 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.8 | 29 | D5 | 5973802 | 5973880 | 6196693 |
| 10 | | 1.00 | 80 | 18 | 10.0 | 8.00 | 11 | 3 | 9.0 | 34 | D6 | — | 5974395 | — |
| 10 | | 1.25 | 80 | 18 | 10.0 | 8.00 | 11 | 3 | 8.8 | 34 | D6 | — | 5974400 | — |
| 10 | | 1.50 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.5 | 34 | D6 | 5973761 | 5973807 | 6196690 |
| 12 | | 1.00 | 89 | 22 | 9.0 | 7.10 | 10 | 3 | 11.0 | - | D6 | — | 5974405 | — |
| 12 | | 1.25 | 89 | 22 | 9.0 | 7.10 | 10 | 3 | 10.8 | - | D6 | — | 5974410 | — |
| 12 | | 1.50 | 89 | 22 | 9.0 | 7.10 | 10 | 3 | 10.5 | - | D6 | — | 5974415 | — |
| 12 | | 1.75 | 89 | 22 | 9.00 | 7.10 | 10 | 3 | 10.3 | - | D6 | 5973763 | 5973809 | 6196691 |
| 14 | | 1.00 | 95 | 24 | 11.2 | 9.00 | 12 | 3 | 13.0 | - | D7 | — | 5974419 | — |
| 14 | | 1.25 | 95 | 24 | 11.2 | 9.00 | 12 | 3 | 12.8 | - | D7 | — | 5974423 | — |
| 14 | | 1.50 | 95 | 24 | 11.2 | 9.00 | 12 | 3 | 12.5 | - | D7 | — | 5974427 | — |
| 14 | | 2.00 | 95 | 24 | 11.20 | 9.00 | 12 | 3 | 12.0 | - | D7 | 5973765 | 5973812 | — |
| 16 | | 1.00 | 102 | 24 | 12.5 | 10.00 | 13 | 3 | 15.0 | - | D7 | — | 5974431 | — |
| 16 | | 1.50 | 102 | 24 | 12.5 | 10.00 | 13 | 3 | 14.5 | - | D7 | — | 5974435 | — |
| 16 | | 2.00 | 102 | 24 | 12.50 | 10.00 | 13 | 3 | 14.0 | - | D7 | 5973767 | 5973817 | 6196692 |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

| M | MF | P mm | l ₁ mm | l ₂ mm | d ₂ ∅ 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 | — | 5974443 ²⁾ | — |
| | 18 | 1.50 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 16.5 | - | D7 | 1 | — | 5974447 ²⁾ | — |
| 18 | | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 15.5 | - | D7 | 1 | 5973769 ²⁾ | 5973821 ²⁾ | — |
| | 20 | 1.00 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 19.0 | - | D7 | 1 | — | 5974452 ²⁾ | — |
| | 20 | 1.50 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 18.5 | - | D7 | 1 | — | 5974456 ²⁾ | — |
| | 20 | 2.00 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 18.0 | - | D7 | 1 | — | 5974459 ²⁾ | — |
| 20 | | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 17.5 | - | D7 | 1 | 5973776 ²⁾ | 5973833 ²⁾ | 6196639 ²⁾ |
| | 22 | 1.50 | 118 | 29 | 16.0 | 12.50 | 16 | 4 | 20.5 | - | D8 | 1 | — | 5974463 ²⁾ | — |
| 22 | | 2.50 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | 19.5 | - | D8 | 1 | 5973779 ²⁾ | 5973845 ²⁾ | — |
| | 24 | 1.50 | 130 | 35 | 18.0 | 14.00 | 18 | 4 | 22.5 | - | D8 | 1 | — | 5974467 ²⁾ | — |
| | 24 | 2.00 | 130 | 35 | 18.0 | 14.00 | 18 | 4 | 22.0 | - | D8 | 1 | — | 5974470 ²⁾ | — |
| 24 | | 3.00 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | 21.0 | - | D8 | 1 | 5973781 ²⁾ | 5973849 ²⁾ | — |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

STRAIGHT FLUTE TAPS

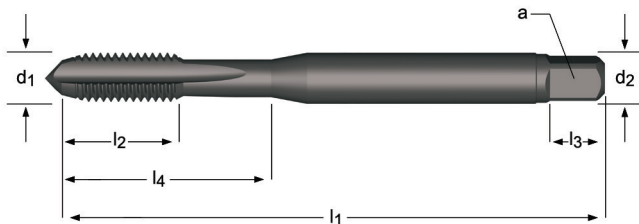


For Cast Iron, Plug Chamfer

E201 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 tempered coating reduces wear and chip welding in abrasive materials.

E252

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 | 5975842 ¹⁾ | — |
| 4 | 0.70 | 63 | 12 | 4.5 | 3.4 | 6 | 4 | 3.3 | 21 | D4 | 1 | 5975692 ¹⁾ | — |
| 5 | 0.80 | 70 | 13 | 6.0 | 4.9 | 8 | 4 | 4.2 | 25 | D4 | 1 | 5975694 ¹⁾ | — |
| 6 | 1.00 | 80 | 15 | 6.0 | 4.9 | 8 | 4 | 5.0 | 30 | D5 | 1 | 5975696 ¹⁾ | — |
| 8 | 1.25 | 90 | 18 | 6.0 | 4.9 | 8 | 4 | 6.8 | | D5 | 1 | — | 5975463 ¹⁾ |
| 8 | 1.25 | 90 | 18 | 8.0 | 6.2 | 9 | 4 | 6.8 | 35 | D5 | 1 | 5975698 ¹⁾ | — |
| 10 | 1.50 | 100 | 20 | 10.0 | 8.0 | 11 | 4 | 8.5 | 39 | D6 | 1 | 5975838 ¹⁾ | — |
| 10 | 1.50 | 100 | 20 | 7.0 | 5.5 | 8 | 4 | 8.5 | | D6 | 1 | — | 5975917 ²⁾ |
| 12 | 1.75 | 110 | 23 | 9.0 | 7.0 | 10 | 4 | 10.3 | | D6 | 1 | — | 5975921 ²⁾ |
| 14 | 2.00 | 110 | 25 | 11.0 | 9.0 | 12 | 4 | 12.0 | | D7 | 1 | — | 5975929 ²⁾ |
| 16 | 2.00 | 110 | 25 | 12.0 | 9.0 | 12 | 4 | 14.0 | | D7 | 1 | — | 5975258 ²⁾ |
| 18 | 2.50 | 125 | 30 | 14.0 | 11.0 | 14 | 4 | 15.5 | | D7 | 1 | — | 5975304 ²⁾ |
| 20 | 2.50 | 140 | 30 | 16.0 | 12.0 | 15 | 4 | 17.5 | | D7 | 1 | — | 5975347 ²⁾ |
| 22 | 2.50 | 140 | 34 | 18.0 | 14.5 | 17 | 4 | 19.5 | | D8 | 1 | — | 5975394 ²⁾ |
| 24 | 3.00 | 160 | 38 | 18.0 | 14.5 | 17 | 4 | 21.0 | | D8 | 1 | — | 5975449 ²⁾ |

Note: DIN shank and square dimensions will necessitate metric holders

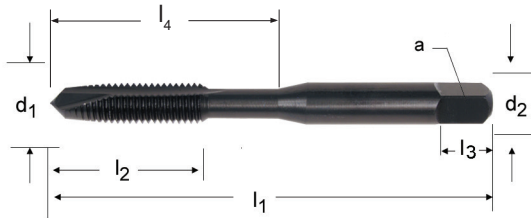
¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

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 tempered 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 | l ₄ Inch | Pack Qty | 1985 |
|------|------|-----|------------------------|------------------------|-----------------------------|----------------|------------------------|----------------|------------------------|-------------|-----------------------|
| 4 | 4 | 48 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | 0.69 | 1 | 6008789 ¹⁾ |
| 4 | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | 0.69 | 1 | 6008784 ¹⁾ |
| | 5 | 44 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | 0.75 | 1 | 6008797 ¹⁾ |
| 5 | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | 0.75 | 1 | 6008793 ¹⁾ |
| | 6 | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | 0.78 | 1 | 6008939 ¹⁾ |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | 0.78 | 1 | 6008889 ¹⁾ |
| | 8 | 36 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | 0.81 | 1 | 6009104 ¹⁾ |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | 0.81 | 1 | 6009102 ¹⁾ |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | 0.94 | 1 | 6008748 ¹⁾ |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | 0.94 | 1 | 6008744 ¹⁾ |
| | 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | 1.19 | 1 | 6008734 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | 1.19 | 1 | 6008729 ¹⁾ |
| | 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | 1.31 | 1 | 6008807 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | 1.31 | 1 | 6008802 ¹⁾ |
| | 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | 1.44 | 1 | 6008780 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | 1.44 | 1 | 6008774 ¹⁾ |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | — | 1 | 6009058 ²⁾ |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | — | 1 | 6009000 ²⁾ |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | — | 1 | 6008724 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | — | 1 | 6008719 ²⁾ |
| | 9/16 | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | — | 1 | 6008894 ²⁾ |
| 9/16 | | 12 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | — | 1 | 6009106 ²⁾ |
| | 5/8 | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | — | 1 | 6008824 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | — | 1 | 6008811 ²⁾ |
| | 3/4 | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | — | 1 | 6008770 ²⁾ |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | — | 1 | 6008760 ²⁾ |
| | 7/8 | 14 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | — | 1 | 6009096 ²⁾ |
| 7/8 | | 9 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | — | 1 | 6009100 ²⁾ |
| 1" | | 8 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | — | 1 | 6008739 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

APPLIX SPIRAL FLUTE TAP (48°-52°)



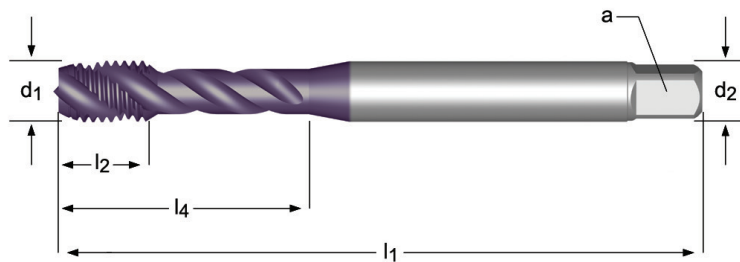
APPLIX®

MXL Multi-Application, Semi-Bottoming

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 | \square a Inch | # of Flutes | Limits | Pack Qty | 1676AP | 1678 |
|------|------|-----|---------------|---------------|--------------------------------|--------------------|------------------------|----------------|--------|-------------|---------|-------------------------------------|
| 4 | | 40 | 2.205 | 0.236 | 0.709 | 0.141 | 0.110 | 3 | H2 | 1 | 6204902 | ¹⁾ — |
| 6 | | 32 | 2.205 | 0.236 | 0.787 | 0.141 | 0.110 | 3 | H2 | 1 | 6204907 | ¹⁾ — |
| 8 | | 32 | 2.480 | 0.236 | 0.827 | 0.168 | 0.131 | 3 | H3 | 1 | 6204912 | ¹⁾ — |
| | 10 | 32 | 2.756 | 0.354 | 0.984 | 0.194 | 0.152 | 3 | H3 | 1 | 6204895 | ¹⁾ — |
| 10 | | 24 | 2.756 | 0.354 | 0.984 | 0.194 | 0.152 | 3 | H3 | 1 | 6204894 | ¹⁾ — |
| | 1/4 | 28 | 3.150 | 0.433 | 1.181 | 0.255 | 0.191 | 3 | H4 | 1 | 6204893 | ¹⁾ 6008758 ¹⁾ |
| 1/4 | | 20 | 3.150 | 0.433 | 1.181 | 0.255 | 0.191 | 3 | H5 | 1 | 6204892 | ¹⁾ 6008750 ¹⁾ |
| | 5/16 | 24 | 3.543 | 0.472 | 1.378 | 0.318 | 0.238 | 3 | H4 | 1 | 6204904 | ¹⁾ — |
| 5/16 | | 18 | 3.543 | 0.472 | 1.378 | 0.318 | 0.238 | 3 | H5 | 1 | 6204903 | ¹⁾ 6008795 ¹⁾ |
| | 3/8 | 24 | 3.937 | 0.551 | 1.535 | 0.381 | 0.286 | 3 | H4 | 1 | 6204901 | ¹⁾ — |
| 3/8 | | 16 | 3.937 | 0.551 | 1.535 | 0.381 | 0.286 | 3 | H5 | 1 | 6204900 | ¹⁾ 6008781 ¹⁾ |
| | 7/16 | 20 | 3.937 | 0.591 | | 0.323 | 0.242 | 3 | H5 | 1 | 6204909 | ²⁾ 6008825 ²⁾ |
| 7/16 | | 14 | 3.937 | 0.591 | | 0.323 | 0.242 | 3 | H5 | 1 | 6204908 | ²⁾ 6008820 ²⁾ |
| | 1/2 | 20 | 3.937 | 0.630 | | 0.367 | 0.275 | 3 | H5 | 1 | 6204891 | ²⁾ — |
| 1/2 | | 13 | 4.331 | 0.630 | | 0.367 | 0.275 | 3 | H5 | 1 | 6204890 | ²⁾ 6008735 ²⁾ |
| | 5/8 | 18 | 3.937 | 0.745 | | 0.480 | 0.360 | 3 | H5 | 1 | 6204906 | ²⁾ — |
| 5/8 | | 11 | 4.331 | 0.745 | | 0.480 | 0.360 | 3 | H5 | 1 | 6204905 | ²⁾ 6008812 ²⁾ |
| | 3/4 | 16 | 4.331 | 0.820 | | 0.590 | 0.442 | 3 | H5 | 1 | 6204899 | ²⁾ — |
| 3/4 | | 10 | 4.921 | 0.820 | | 0.590 | 0.442 | 3 | H5 | 1 | 6204898 | ²⁾ 6008771 ²⁾ |
| | 7/8 | 14 | 4.921 | 0.910 | | 0.697 | 0.523 | 4 | H6 | 1 | 6204910 | ²⁾ — |
| 7/8 | | 9 | 5.512 | 0.910 | | 0.697 | 0.523 | 4 | H6 | 1 | 6204911 | ²⁾ 6204932 ²⁾ |
| 1" | | 8 | 6.299 | 1.025 | | 0.800 | 0.600 | 4 | H6 | 1 | 6204897 | ²⁾ 6008767 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

Multi-Application, Semi-Bottoming

**E027
E037**

Premium substrate for blind hole tapping in tough or abrasive materials. Bronze tempered 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

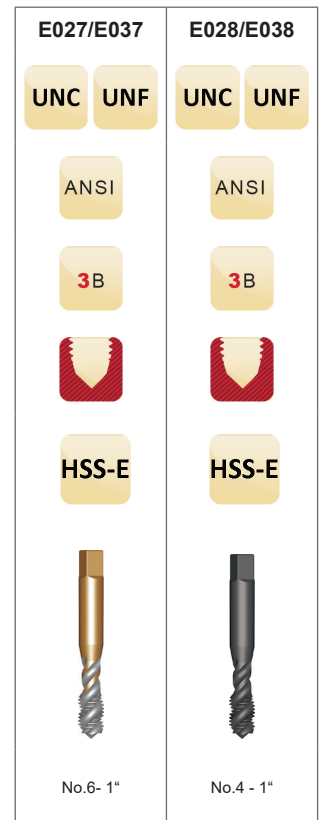
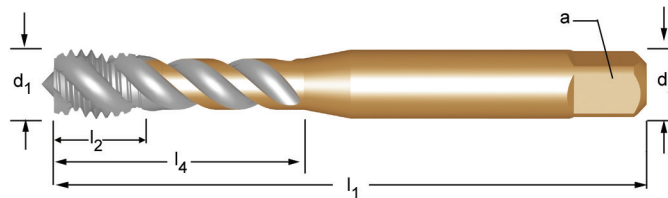
7.4 8.1

**E028
E038**

Premium substrate with Steam tempered 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



| UNC | UNF | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | — | 5974035 ¹⁾ |
| 5 | | 40 | 1.15/16 | 0.7404 | 0.1410 | 0.1100 | 3 | H2 | N38 | 2.65 | 0.7404 | 1 | — | 5974037 ¹⁾ |
| 6 | | 32 | 2" | 0.2610 | 0.1410 | 0.1100 | 3 | H2 | N36 | 2.85 | 0.5938 | 1 | 5974013 | 5974046 ¹⁾ |
| 8 | | 32 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 3 | H2 | N29 | 3.50 | 0.6526 | 1 | 5974017 | 5974058 ¹⁾ |
| | 10 | 32 | 2.3/8 | 0.2650 | 0.1940 | 0.1520 | 3 | H2 | N21 | 4.10 | 0.8434 | 1 | 5974670 | 5974718 ¹⁾ |
| 10 | | 24 | 2.3/8 | 0.2650 | 0.1940 | 0.1520 | 3 | H3 | N25 | 3.90 | 0.8434 | 1 | 5974150 | 5974023 ¹⁾ |
| 12 | | 24 | 2.3/8 | 0.2520 | 0.2200 | 0.1650 | 3 | H3 | N16 | 4.50 | 0.8848 | 1 | 5974158 | 5974026 ¹⁾ |
| | 1/4 | 28 | 2.1/2 | 0.3937 | 0.2550 | 0.1910 | 3 | H3 | N3 | 5.50 | 1.0993 | 1 | 5974666 | 5974715 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 0.3937 | 0.2550 | 0.1910 | 3 | H3 | N7 | 5.10 | 1.0993 | 1 | 5974095 | 5974021 ¹⁾ |
| | 5/16 | 24 | 2.23/32 | 0.4567 | 0.3180 | 0.2380 | 3 | H3 | I | 6.90 | 1.3094 | 1 | 5974682 | 5973856 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 0.4567 | 0.3180 | 0.2380 | 3 | H3 | F | 6.60 | 1.3094 | 1 | 5974171 | 5974040 ¹⁾ |
| | 3/8 | 24 | 2.15/16 | 0.5315 | 0.3810 | 0.2860 | 3 | H3 | Q | 8.50 | 1.4415 | 1 | 5974677 | 5974729 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 0.5315 | 0.3810 | 0.2860 | 3 | H3 | 5/16 | 8.00 | 1.4415 | 1 | 5974168 | 5974030 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 0.5315 | 0.3810 | 0.2860 | 3 | H5 | 5/16 | 8.00 | 1.4415 | 1 | — | 5974032 ¹⁾³⁾ |
| | 7/16 | 20 | 3.5/32 | 0.6299 | 0.3230 | 0.2420 | 3 | H3 | 25/64 | 9.90 | - | 1 | 5974693 | 5973958 ²⁾ |
| 7/16 | | 14 | 3.5/32 | 0.6299 | 0.3230 | 0.2420 | 3 | H3 | U | 9.40 | - | 1 | 5974015 | 5974049 ²⁾ |
| | 1/2 | 20 | 3.3/8 | 0.6890 | 0.3670 | 0.2750 | 3 | H3 | 29/64 | 11.50 | - | 1 | 5974662 | 5974712 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 0.6890 | 0.3670 | 0.2750 | 3 | H3 | 27/64 | 10.80 | - | 1 | 5974052 | 5974020 ²⁾ |
| | 9/16 | 18 | 3.19/32 | 0.7087 | 0.4290 | 0.3220 | 3 | H3 | 33/64 | 12.90 | - | 1 | 5974700 | 5974006 ²⁾ |
| 9/16 | | 12 | 3.19/32 | 0.7087 | 0.4290 | 0.3220 | 3 | H3 | 31/64 | 12.20 | - | 1 | 5974018 | 5974061 ²⁾ |
| | 5/8 | 18 | 3.13/16 | 0.7087 | 0.4800 | 0.3600 | 3 | H3 | 37/64 | 14.50 | - | 1 | 5974690 | 5973916 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 0.7087 | 0.4800 | 0.3600 | 3 | H3 | 17/32 | 13.50 | - | 1 | 5974011 | 5974043 ²⁾ |
| | 3/4 | 16 | 4.1/4 | 0.8858 | 0.5900 | 0.4420 | 3 | H3 | 11/16 | 17.50 | - | 1 | 5974673 | 5974721 ²⁾ |
| 3/4 | | 10 | 4.1/4 | 0.8858 | 0.5900 | 0.4420 | 3 | H4 | 21/32 | 16.50 | - | 1 | 5974163 | 5974028 ²⁾ |
| | 7/8 | 14 | 4.11/16 | 0.9843 | 0.6970 | 0.5230 | 3 | H4 | 13/16 | 20.40 | - | 1 | 5974697 | 5973990 ²⁾ |
| 7/8 | | 9 | 4.11/16 | 0.9843 | 0.6970 | 0.5230 | 3 | H4 | 49/64 | 19.50 | - | 1 | 5974016 | 5974055 ²⁾ |
| | 1" | 14 | 5.1/8 | 1.1811 | 0.8000 | 0.6000 | 3 | H4 | 59/64 | 23.50 | - | 1 | 5974658 | 5974707 ²⁾ |
| 1" | | 8 | 5.1/8 | 1.1811 | 0.8000 | 0.6000 | 3 | H4 | 7/8 | 22.25 | - | 1 | 5974024 | 5974019 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

³⁾ Class of fit: 2B

SPIRAL FLUTE TAPS (45°)



Multi-Application, Semi-Bottoming

EX20 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze tempered body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

EX30

EX20 = UNC Sizes, EX30 = UNF Sizes

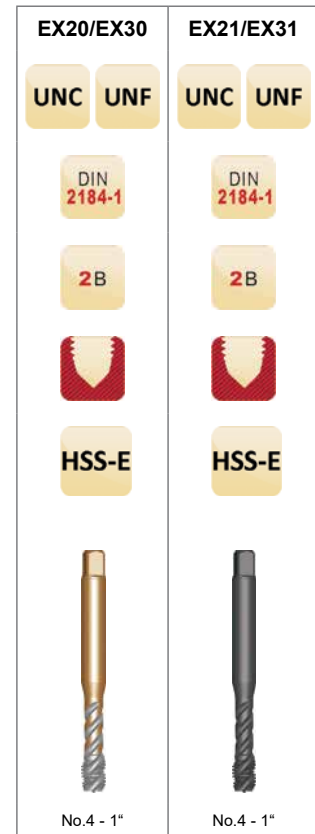
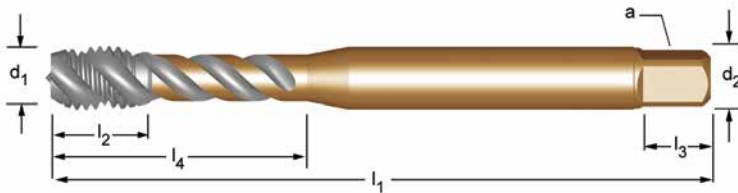
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

EX21 Premium substrate with Steam tempered surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

EX31

EX21 = UNC Sizes, EX31 = UNF Sizes

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



| 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 | 5973704 | ¹⁾ 5974042 |
| 5 | | 40 | 3.175 | 56 | 6 | 3.5 | 2.7 | 6 | 3 | 2.65 | H2 | 18 | 1 | 5973708 | ¹⁾ 5974045 |
| 6 | | 32 | 3.505 | 56 | 7 | 4.0 | 3.0 | 6 | 3 | 2.85 | H2 | 20 | 1 | 5973724 | ¹⁾ 5974054 |
| | 8 | 36 | 4.166 | 63 | 7 | 4.5 | 3.4 | 8 | 3 | 3.5 | H3 | 21 | 1 | 5974125 | ¹⁾ 5974191 |
| 8 | | 32 | 4.166 | 63 | 7 | 4.5 | 3.4 | 8 | 3 | 3.5 | H3 | 21 | 1 | 5974132 | ¹⁾ 5974066 |
| | 10 | 32 | 4.826 | 70 | 8 | 6.0 | 4.9 | 8 | 3 | 4.1 | H3 | 25 | 1 | 5974087 | ¹⁾ 5974151 |
| 10 | | 24 | 4.826 | 70 | 8 | 6.0 | 4.9 | 8 | 3 | 3.9 | H3 | 25 | 1 | 5973688 | ¹⁾ 5974238 |
| 12 | | 24 | 5.486 | 80 | 10 | 6.0 | 4.9 | 8 | 3 | 4.5 | H3 | 30 | 1 | 5973692 | ¹⁾ 5974242 |
| | 1/4 | 28 | 6.350 | 80 | 10 | 7.0 | 5.5 | 8 | 3 | 5.5 | H4 | 30 | 1 | 5974083 | ¹⁾ 5974146 |
| 1/4 | | 20 | 6.350 | 80 | 10 | 7.0 | 5.5 | 8 | 3 | 5.1 | H5 | 30 | 1 | 5973684 | ¹⁾ 5974234 |
| | 5/16 | 24 | 7.938 | 90 | 12 | 8.0 | 6.2 | 9 | 3 | 6.9 | H4 | 35 | 1 | 5974103 | ¹⁾ 5974167 |
| 5/16 | | 18 | 7.938 | 90 | 12 | 8.0 | 6.2 | 9 | 3 | 6.6 | H5 | 35 | 1 | 5973713 | ¹⁾ 5974048 |
| | 3/8 | 24 | 9.525 | 100 | 15 | 10.0 | 8.0 | 11 | 3 | 8.5 | H4 | 39 | 1 | 5974098 | ¹⁾ 5974160 |
| 3/8 | | 16 | 9.525 | 100 | 15 | 10.0 | 8.0 | 11 | 3 | 8 | H5 | 39 | 1 | 5973700 | ¹⁾ 5974038 |
| | 7/16 | 20 | 11.112 | 100 | 15 | 8.0 | 6.2 | 9 | 3 | 9.9 | H5 | - | 1 | 5974115 | ²⁾ 5974176 |
| 7/16 | | 14 | 11.112 | 100 | 15 | 8.0 | 6.2 | 9 | 3 | 9.4 | H5 | - | 1 | 5974033 | ²⁾ 5974056 |
| | 1/2 | 20 | 12.700 | 110 | 18 | 9.0 | 7.0 | 10 | 3 | 11.5 | H5 | - | 1 | 5974076 | ²⁾ 5974141 |
| 1/2 | | 13 | 12.700 | 110 | 18 | 9.0 | 7.0 | 10 | 3 | 10.8 | H5 | - | 1 | 5973680 | ²⁾ 5974228 |
| | 5/8 | 18 | 15.875 | 110 | 20 | 12.0 | 9.0 | 12 | 4 | 14.5 | H5 | - | 1 | 5974111 | ²⁾ 5974172 |
| 5/8 | | 11 | 15.875 | 110 | 20 | 12.0 | 9.0 | 12 | 4 | 13.5 | H5 | - | 1 | 5973718 | ²⁾ 5974051 |
| | 3/4 | 16 | 19.050 | 125 | 25 | 14.0 | 11.0 | 14 | 4 | 17.5 | H5 | - | 1 | 5974092 | ²⁾ 5974155 |
| 3/4 | | 10 | 19.050 | 125 | 25 | 14.0 | 11.0 | 14 | 4 | 16.5 | H5 | - | 1 | 5973696 | ²⁾ 5974245 |
| | 7/8 | 14 | 22.225 | 140 | 25 | 18.0 | 14.5 | 17 | 4 | 20.4 | H6 | - | 1 | 5974120 | ²⁾ 5974180 |
| 7/8 | | 9 | 22.225 | 140 | 25 | 18.0 | 14.5 | 17 | 4 | 19.5 | H6 | - | 1 | 5974074 | ²⁾ 5974062 |
| | 1" | 12 | 25.400 | 160 | 30 | 18.0 | 14.5 | 17 | 4 | 23.25 | H6 | - | 1 | 5974070 | ²⁾ 5974137 |
| 1" | | 8 | 25.400 | 160 | 30 | 18.0 | 14.5 | 17 | 4 | 22.25 | H6 | - | 1 | 5973671 | ²⁾ 5974187 |

Note: DIN shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks

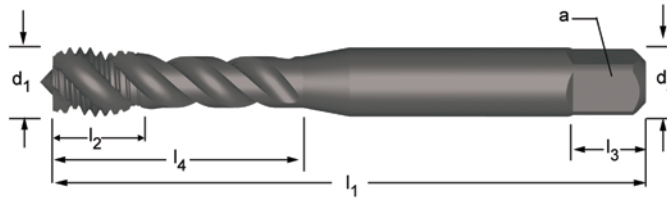
²⁾ Reduced Shanks

Multi-Application, Semi-Bottoming

E023 Premium substrate with Steam tempered 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 | 5974478 ¹⁾ |
| 4 | | 40 | 2.845 | 48 | 6 | 3.15 | 2.50 | 5 | 3 | 2.35 | 14 | H2 | 1 | 5974490 ¹⁾ |
| 5 | | 40 | 3.175 | 48 | 6 | 3.15 | 2.50 | 5 | 3 | 2.65 | 12.5 | H2 | 1 | 5974022 ¹⁾ |
| 6 | | 32 | 3.505 | 50 | 6 | 3.55 | 2.80 | 5 | 3 | 2.85 | 16 | H2 | 1 | 5974149 ¹⁾ |
| | 8 | 36 | 4.166 | 53 | 7 | 4.5 | 3.55 | 6 | 3 | 3.50 | 17 | H3 | 1 | 5973953 ¹⁾ |
| 8 | | 32 | 4.166 | 53 | 7 | 4.50 | 3.55 | 6 | 3 | 3.50 | 17 | H3 | 1 | 5974211 ¹⁾ |
| | 10 | 32 | 4.826 | 58 | 8 | 5.0 | 4.00 | 7 | 3 | 4.10 | 20 | H3 | 1 | 5973922 ¹⁾ |
| 10 | | 24 | 4.826 | 58 | 8 | 5.00 | 4.00 | 7 | 3 | 3.90 | 20 | HH3 | 1 | 5974471 ¹⁾ |
| 12 | | 24 | 5.486 | 62 | 12 | 5.60 | 4.50 | 7 | 3 | 4.50 | 21 | H3 | 1 | 5974475 ¹⁾ |
| | 1/4 | 28 | 6.350 | 66 | 10 | 6.3 | 5.00 | 8 | 3 | 5.50 | 28 | H4 | 1 | 5973918 ¹⁾ |
| 1/4 | | 20 | 6.350 | 66 | 10 | 6.30 | 5.00 | 8 | 3 | 5.10 | 28 | H5 | 1 | 5974466 ¹⁾ |
| | 5/16 | 24 | 7.938 | 72 | 12 | 8.0 | 6.30 | 9 | 3 | 6.90 | 31 | H4 | 1 | 5973938 ¹⁾ |
| 5/16 | | 18 | 7.938 | 72 | 12 | 8.00 | 6.30 | 9 | 3 | 6.60 | 31 | H5 | 1 | 5974050 ¹⁾ |
| | 3/8 | 24 | 9.525 | 80 | 15 | 10.0 | 8.00 | 11 | 3 | 8.50 | 34 | H4 | 1 | 5973930 ¹⁾ |
| 3/8 | | 16 | 9.525 | 80 | 15 | 10.00 | 8.00 | 11 | 3 | 8.00 | 34 | H5 | 1 | 5974484 ¹⁾ |
| | 7/16 | 20 | 11.112 | 85 | 19 | 8.0 | 6.30 | 9 | 3 | 9.90 | - | H5 | 1 | 5973946 ²⁾ |
| 7/16 | | 14 | 11.112 | 85 | 19 | 8.00 | 6.30 | 9 | 3 | 9.40 | - | H5 | 1 | 5974196 ²⁾ |
| | 1/2 | 20 | 12.700 | 89 | 22 | 9.0 | 7.10 | 10 | 3 | 11.50 | - | H5 | 1 | 5973913 ²⁾ |
| 1/2 | | 13 | 12.700 | 89 | 19 | 9.00 | 7.10 | 10 | 3 | 10.80 | - | H5 | 1 | 5974462 ²⁾ |
| | 9/16 | 18 | 14.288 | 95 | 24 | 11.2 | 9.00 | 12 | 3 | 12.90 | - | H5 | 1 | 5973956 ²⁾ |
| | 5/8 | 18 | 15.875 | 102 | 24 | 12.5 | 10.00 | 13 | 4 | 14.50 | - | H5 | 1 | 5973942 ²⁾ |
| 5/8 | | 11 | 15.875 | 102 | 24 | 12.50 | 10.00 | 13 | 4 | 13.50 | - | H5 | 1 | 5974093 ²⁾ |
| | 3/4 | 16 | 19.050 | 112 | 29 | 14.0 | 11.20 | 14 | 4 | 17.50 | - | H5 | 1 | 5973926 ²⁾ |
| 3/4 | | 10 | 19.050 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 16.50 | - | H5 | 1 | 5974481 ²⁾ |
| | 7/8 | 14 | 22.225 | 118 | 29 | 16.0 | 12.50 | 16 | 4 | 20.40 | - | H6 | 1 | 5973950 ²⁾ |
| 7/8 | | 9 | 22.225 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | 19.50 | - | H6 | 1 | 5974207 ²⁾ |
| | 1" | 12 | 25.400 | 130 | 35 | 18.0 | 14.00 | 18 | 4 | 23.25 | - | H6 | 1 | 5973908 ²⁾ |
| 1" | | 8 | 25.400 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | 22.25 | - | H6 | 1 | 5974458 ²⁾ |

Note: ISO shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

SPIRAL FLUTE TAP (48°-52°)



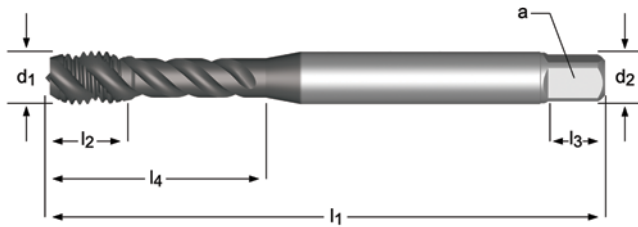
MXL Multi-Application, Semi-Bottoming

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.

APPLIX

- 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 | 6204927 | ¹⁾ — |
| 5 | | 0.80 | 70 | 9 | 25 | D4 | 0.194 | 0.152 | 3 | 1 | 6204928 | ¹⁾ — |
| 6 | | 1.00 | 80 | 11 | 30 | D5 | 0.255 | 0.191 | 3 | 1 | 6204929 | ¹⁾ 6008613 ¹⁾ |
| | 8 | 1.00 | 90 | 12 | 35 | D5 | 0.318 | 0.238 | 3 | 1 | 6205010 | ¹⁾ — |
| 8 | | 1.25 | 90 | 12 | 35 | D5 | 0.318 | 0.238 | 3 | 1 | 6204930 | ¹⁾ 6008380 ¹⁾ |
| | 10 | 1.25 | 100 | 14 | 39 | D6 | 0.381 | 0.286 | 3 | 1 | 6204913 | ¹⁾ 6008830 |
| 10 | | 1.50 | 100 | 14 | 39 | D6 | 0.381 | 0.286 | 3 | 1 | 6204914 | ¹⁾ 6008835 ¹⁾ |
| | 12 | 1.50 | 100 | 16 | | D6 | 0.367 | 0.275 | 3 | 1 | 6204915 | ²⁾ — |
| 12 | | 1.75 | 110 | 16 | | D6 | 0.367 | 0.275 | 3 | 1 | 6204916 | ²⁾ 6008845 ²⁾ |
| | 14 | 1.50 | 100 | 18 | | D7 | 0.429 | 0.322 | 3 | 1 | 6204917 | ²⁾ — |
| 14 | | 2.00 | 110 | 18 | | D7 | 0.429 | 0.322 | 3 | 1 | 6204918 | ²⁾ 6008856 ²⁾ |
| 16 | | 2.00 | 110 | 19 | | D7 | 0.480 | 0.360 | 3 | 1 | 6204920 | ²⁾ 6008422 ²⁾ |
| | 18 | 1.50 | 110 | 21 | | D7 | 0.542 | 0.406 | 3 | 1 | 6204921 | ²⁾ — |
| 18 | | 2.50 | 125 | 21 | | D7 | 0.542 | 0.406 | 3 | 1 | 6204922 | ²⁾ 6008537 ²⁾ |
| | 20 | 1.50 | 125 | 21 | | D7 | 0.652 | 0.489 | 3 | 1 | 6204923 | ²⁾ — |
| 20 | | 2.50 | 140 | 21 | | D7 | 0.652 | 0.489 | 3 | 1 | 6204924 | ²⁾ 6008606 ²⁾ |
| 24 | | 3.00 | 160 | 26 | | D8 | 0.760 | 0.570 | 4 | 1 | 6204926 | ²⁾ 6008611 ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

Multi-Application, Semi-Bottoming

E007 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze tempered 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

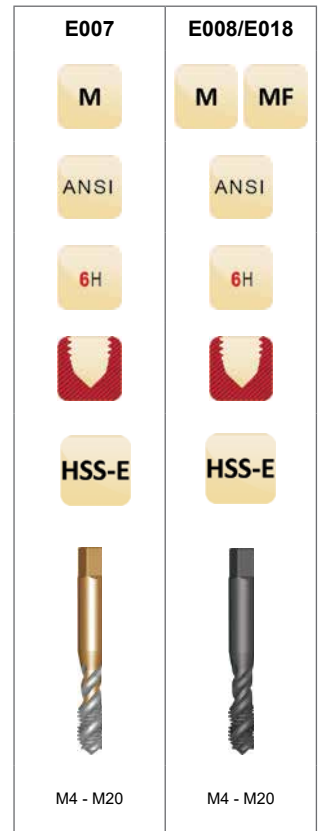
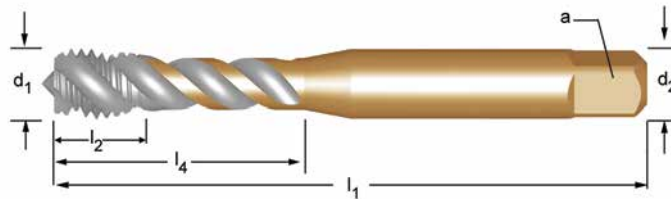
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

E008 Premium substrate with Steam tempered surface treatment reduces wear and prevents chip welding in abrasive or harder ferrous materials.

E018

E008 = Metric Coarse, E018 = Metric Fine

1.1 1.2 1.3 1.4 1.5 2.1 2.2 2.3



| M | MF | P mm | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch | a Inch | # of flutes | Limits | Flute Profile | l ₄ Inch | Pack Qty | Material | |
|----|----|---------|------------------------|------------------------|-----------------------------|-----------|----------------|--------|---------------|------------------------|-------------|----------|--------------|
| | | | | | | | | | | | | E007 | E008 E018 |
| 4 | | 0.70 | 2.1/8 | 0.2484 | 0.1680 | 0.1310 | 3 | D4 | 3.30 N30 | 0.6526 | 1 | 5973801 | 5973840 |
| 5 | | 0.80 | 2.3/8 | 0.2650 | 0.1940 | 0.1520 | 3 | D4 | 4.20 N19 | 0.8434 | 1 | 5973805 | 5973843 |
| 6 | | 1.00 | 2.1/2 | 0.3937 | 0.2550 | 0.1910 | 3 | D5 | 5.00 N9 | 1.0993 | 1 | 5973808 | 5973846 |
| | 8 | 1.00 | 2.23/32 | 0.4567 | 0.3180 | 0.2380 | 3 | D5 | 7.00 J | 1.3094 | 1 | — | 5973601 |
| 8 | | 1.25 | 2.23/32 | 0.4567 | 0.3180 | 0.2380 | 3 | D5 | 6.80 H | 1.3094 | 1 | 5973811 | 5973850 |
| | 10 | 1.00 | 2.15/16 | 0.5315 | 0.3810 | 0.2860 | 3 | D6 | 9.00 T | 1.4415 | 1 | — | 5973589 |
| 10 | | 1.50 | 2.15/16 | 0.5315 | 0.3810 | 0.2860 | 3 | D6 | 8.50 Q | 1.4415 | 1 | 5973786 | 5973814 |
| 12 | | 1.75 | 3.3/8 | 0.6890 | 0.3670 | 0.2750 | 3 | D6 | 10.30 Y | — | 1 | 5973787 | 5973816 |
| | 14 | 1.50 | 3.19/32 | 0.7087 | 0.4290 | 0.3220 | 3 | D7 | 12.50 31/64 | — | 1 | — | 5973593 |
| 14 | | 2.00 | 3.19/32 | 0.7087 | 0.4290 | 0.3220 | 3 | D7 | 12.00 15/32 | — | 1 | — | 5973820 |
| 16 | | 2.00 | 3.13/16 | 0.7087 | 0.4800 | 0.3600 | 3 | D7 | 14.00 35/64 | — | 1 | 5973791 | 5973824 |
| 20 | | 2.50 | 4.15/32 | 0.8858 | 0.6520 | 0.4890 | 3 | D7 | 17.50 11/16 | — | 1 | — | 5973836 |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

SPIRAL FLUTE TAPS (45°)



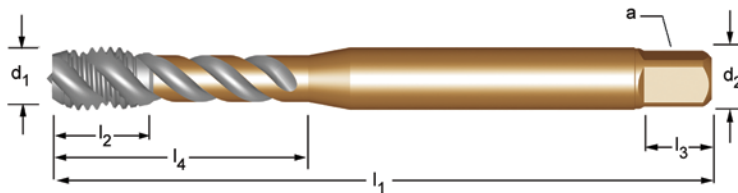
Multi-Application, Semi-Bottoming

EX006H Premium substrate for blind hole tapping in tough or abrasive materials. Bronze tempered 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 tempered 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



| 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 | 5973751 ¹⁾ 5973739 ¹⁾ |
| 2.5 | 0.45 | 50 | 4 | 2.8 | 2.1 | 5 | 3 | 2.05 | 12.5 | D3 | 1 | 5973567 ¹⁾ 5973742 ¹⁾ |
| 3 | 0.50 | 56 | 6 | 3.5 | 2.7 | 6 | 3 | 2.5 | 18 | D3 | 1 | 5973590 ¹⁾ 5973698 ¹⁾ |
| 3.5 | 0.60 | 56 | 7 | 4.0 | 3.0 | 6 | 3 | 2.9 | 20 | D4 | 1 | 5973595 ¹⁾ 5973702 ¹⁾ |
| 4 | 0.70 | 63 | 7 | 4.5 | 3.4 | 6 | 3 | 3.3 | 21 | D4 | 1 | 5973630 ¹⁾ 5973532 ¹⁾ |
| 5 | 0.80 | 70 | 8 | 6.0 | 4.9 | 8 | 3 | 4.2 | 25 | D4 | 1 | 5973649 ¹⁾ 5973544 ¹⁾ |
| 6 | 1.00 | 80 | 10 | 4.5 | 3.4 | 6 | 3 | 5 | 31 | D5 | 1 | 5973677 ²⁾ 5973562 ²⁾ |
| 6 | 1.00 | 80 | 10 | 6.0 | 4.9 | 8 | 3 | 5 | 31 | D5 | 1 | 5973673 ¹⁾ 5973559 ¹⁾ |
| 7 | 1.00 | 80 | 10 | 7.0 | 5.5 | 8 | 3 | 6 | 31 | D5 | 1 | 5973690 ¹⁾ 5973576 ¹⁾ |
| 8 | 1.25 | 90 | 13 | 6.0 | 4.9 | 8 | 3 | 6.8 | 35 | D5 | 1 | 5973697 ²⁾ 5973584 ²⁾ |
| 8 | 1.25 | 90 | 12 | 8.0 | 6.2 | 9 | 3 | 6.8 | 35 | D5 | 1 | 5973694 ¹⁾ 5973580 ¹⁾ |
| 10 | 1.50 | 100 | 15 | 7.0 | 5.5 | 8 | 3 | 8.5 | 39 | D6 | 1 | 5973991 ²⁾ 5973712 ²⁾ |
| 10 | 1.50 | 100 | 15 | 10.0 | 8.0 | 11 | 3 | 8.5 | 39 | D6 | 1 | 5973986 ¹⁾ 5973705 ¹⁾ |
| 12 | 1.75 | 110 | 16 | 9.0 | 7.0 | 10 | 3 | 10.3 | - | D6 | 1 | 5973611 ²⁾ 5973717 ²⁾ |
| 14 | 2.00 | 110 | 20 | 11.0 | 9.0 | 12 | 3 | 12 | - | D7 | 1 | 5973709 ²⁾ 5973722 ²⁾ |
| 16 | 2.00 | 110 | 20 | 12.0 | 9.0 | 12 | 4 | 14 | - | D7 | 1 | 5973744 ²⁾ 5973730 ²⁾ |
| 18 | 2.50 | 125 | 25 | 14.0 | 11.0 | 14 | 4 | 15.5 | - | D7 | 1 | 5973748 ²⁾ 5973736 ²⁾ |
| 20 | 2.50 | 140 | 25 | 16.0 | 12.0 | 15 | 4 | 17.5 | - | D7 | 1 | 5973571 ²⁾ 5973524 ²⁾ |
| 22 | 2.50 | 140 | 25 | 18.0 | 14.5 | 17 | 4 | 19.5 | - | D8 | 1 | 5973578 ²⁾ 5973594 ²⁾ |
| 24 | 3.00 | 160 | 30 | 18.0 | 14.5 | 17 | 4 | 21 | - | D8 | 1 | 5973583 ²⁾ 5973644 ²⁾ |
| 27 | 3.00 | 160 | 30 | 20.0 | 16.0 | 19 | 4 | 24 | - | D8 | 1 | 5973586 ²⁾ 5973689 ²⁾ |
| 30 | 3.50 | 180 | 36 | 22.0 | 18.0 | 21 | 4 | 26.5 | - | D9 | 1 | 5973599 ²⁾ 5973706 ²⁾ |
| 33 | 3.50 | 180 | 36 | 25.0 | 20.0 | 23 | 4 | 29.5 | - | D9 | 1 | 5973604 ²⁾ 5973710 ²⁾ |
| 36 | 4.00 | 200 | 40 | 28.0 | 22.0 | 25 | 4 | 32 | - | D9 | 1 | 5973616 ²⁾ 5973526 ²⁾ |
| 39 | 4.00 | 200 | 40 | 32.0 | 24.0 | 27 | 4 | 35 | - | D9 | 1 | 5973624 ²⁾ 5973530 ²⁾ |
| 42 | 4.50 | 200 | 45 | 32.0 | 24.0 | 27 | 4 | 37.5 | - | D10 | 1 | 5973634 ²⁾ 5973534 ²⁾ |
| 48 | 5.00 | 250 | 50 | 36.0 | 29.0 | 32 | 4 | 43 | - | D11 | 1 | 5973646 ²⁾ 5973539 ²⁾ |
| 52 | 5.00 | 250 | 50 | 40.0 | 32.0 | 35 | 5 | 47 | - | D11 | 1 | 5973653 ²⁾ 5973547 ²⁾ |
| 56 | 5.50 | 250 | 55 | 40.0 | 32.0 | 35 | 5 | 50.5 | - | D11 | 1 | 5973658 ²⁾ 5973550 ²⁾ |
| 64 | 6.00 | 315 | 60 | 50.0 | 39.0 | 42 | 6 | 58 | - | D12 | 1 | 5973682 ²⁾ 5973565 ²⁾ |

Note: DIN shank and square dimensions will necessitate metric holders

¹⁾ Reinforced Shanks (DIN 371)

²⁾ Reduced Shanks (DIN 376)

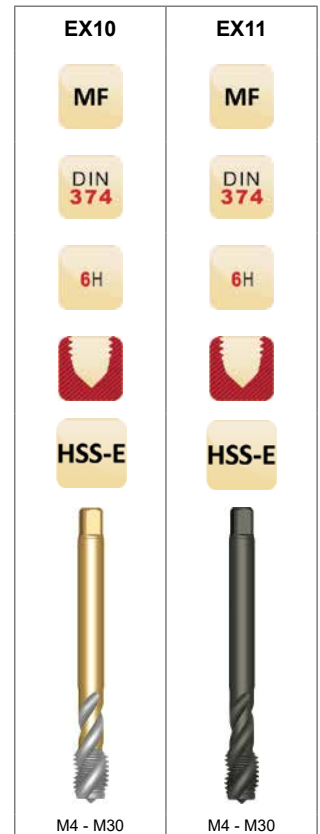
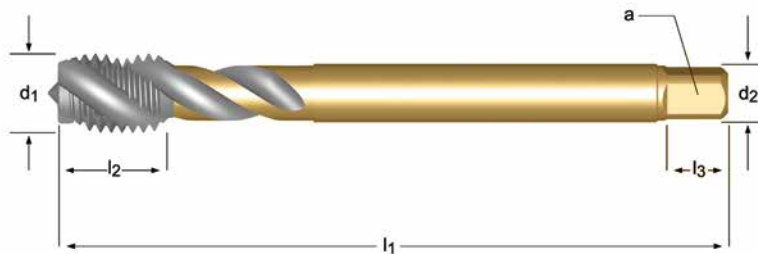
Multi-Application, Semi-Bottoming

EX10 Premium substrate for blind hole tapping in tough or abrasive materials. Bronze tempered 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 tempered 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



| 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 | 5973675 | 5973648 |
| 5 | 0.50 | 70 | 8 | 3.5 | 2.7 | 6 | 3 | 4.5 | D4 | 1 | 5973721 | 5973652 |
| 6 | 0.75 | 80 | 10 | 4.5 | 3.4 | 6 | 3 | 5.3 | D5 | 1 | 5973726 | 5973656 |
| 8 | 0.75 | 80 | 13 | 6.0 | 4.9 | 8 | 3 | 7.3 | D5 | 1 | 5973728 | 5973662 |
| 8 | 1.00 | 90 | 13 | 6.0 | 4.9 | 8 | 3 | 7 | D5 | 1 | 5973731 | 5973667 |
| 10 | 0.75 | 90 | 13 | 7.0 | 5.5 | 8 | 3 | 9.3 | D6 | 1 | 5973591 | 5973733 |
| 10 | 1.00 | 90 | 13 | 7.0 | 5.5 | 8 | 3 | 9 | D6 | 1 | 5973598 | 5973540 |
| 10 | 1.25 | 100 | 15 | 7.0 | 5.5 | 8 | 3 | 8.8 | D6 | 1 | 5973603 | 5973543 |
| 12 | 1.00 | 100 | 15 | 9.0 | 7.0 | 10 | 3 | 11 | D6 | 1 | 5973608 | 5973546 |
| 12 | 1.25 | 100 | 15 | 9.0 | 7.0 | 10 | 3 | 10.8 | D6 | 1 | 5973613 | 5973549 |
| 12 | 1.50 | 100 | 15 | 9.0 | 7.0 | 10 | 3 | 10.5 | D6 | 1 | 5973618 | 5973552 |
| 14 | 1.00 | 100 | 15 | 11.0 | 9.0 | 12 | 3 | 13 | D7 | 1 | 5973621 | 5973555 |
| 14 | 1.25 | 100 | 15 | 11.0 | 9.0 | 12 | 3 | 12.8 | D7 | 1 | 5973626 | 5973558 |
| 14 | 1.50 | 100 | 15 | 11.0 | 9.0 | 12 | 3 | 12.5 | D7 | 1 | 5973631 | 5973563 |
| 16 | 1.00 | 100 | 15 | 12.0 | 9.0 | 12 | 4 | 15 | D7 | 1 | 5973635 | 5973566 |
| 16 | 1.50 | 100 | 15 | 12.0 | 9.0 | 12 | 4 | 14.5 | D7 | 1 | 5973639 | 5973570 |
| 18 | 1.00 | 110 | 17 | 14.0 | 11.0 | 14 | 4 | 17 | D7 | 1 | 5973647 | 5973577 |
| 18 | 1.50 | 110 | 17 | 14.0 | 11.0 | 14 | 4 | 16.5 | D7 | 1 | 5973651 | 5973582 |
| 20 | 1.00 | 125 | 17 | 16.0 | 12.0 | 15 | 4 | 19 | D7 | 1 | 5973657 | 5973588 |
| 20 | 1.50 | 125 | 17 | 16.0 | 12.0 | 15 | 4 | 18.5 | D7 | 1 | 5973661 | 5973592 |
| 22 | 1.50 | 125 | 17 | 18.0 | 14.5 | 17 | 4 | 20.5 | D8 | 1 | 5973665 | 5973597 |
| 24 | 1.50 | 140 | 20 | 18.0 | 14.5 | 17 | 4 | 22.5 | D8 | 1 | 5973670 | 5973602 |
| 24 | 2.00 | 140 | 20 | 18.0 | 14.5 | 17 | 4 | 22 | D8 | 1 | 5973674 | 5973605 |
| 25 | 1.50 | 140 | 20 | 18.0 | 14.5 | 17 | 4 | 23.5 | D8 | 1 | 5973678 | 5973609 |
| 26 | 1.50 | 140 | 20 | 18.0 | 14.5 | 17 | 4 | 24.5 | D8 | 1 | 5973681 | 5973614 |
| 27 | 1.50 | 140 | 20 | 20.0 | 16.0 | 19 | 4 | 25.5 | D8 | 1 | 5973685 | 5973619 |
| 27 | 2.00 | 140 | 20 | 20.0 | 16.0 | 19 | 4 | 25 | D8 | 1 | 5973693 | 5973627 |
| 28 | 1.50 | 140 | 20 | 20.0 | 16.0 | 19 | 4 | 26.5 | D9 | 1 | 5973535 | 5973636 |
| 30 | 1.50 | 150 | 20 | 22.0 | 18.0 | 21 | 4 | 28.5 | D9 | 1 | 5973573 | 5973640 |
| 30 | 2.00 | 150 | 20 | 22.0 | 18.0 | 21 | 4 | 28 | D9 | 1 | 5973622 | 5973645 |

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 tempered body and shank reduces rust and corrosion. Bright finish flutes improve chip flow in soft and non-ferrous materials.

E002 = Metric Coarse

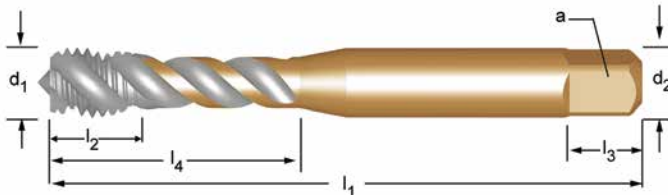
1.1 1.2 1.3 1.4 1.5 4.1 4.2 5.1 5.2 7.1 7.2 7.3 7.4

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

E013

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 ∅ 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 | 5974446 ¹⁾ | 5974357 ¹⁾ |
| 2.5 | | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 2 | D3 | 2.05 | 9.5 | 1 | 5974485 ¹⁾ | 5974361 ¹⁾ |
| 3 | | 0.50 | 48 | 6 | 3.15 | 2.50 | 5 | 3 | D3 | 2.5 | 12.5 | 1 | 5974500 ¹⁾ | 5974380 ¹⁾ |
| | 4 | 0.50 | 53 | 7 | 4.0 | 3.15 | 6 | 3 | D4 | 3.5 | 19 | 1 | — | 5973529 ¹⁾ |
| 4 | | 0.70 | 53 | 7 | 4.00 | 3.15 | 6 | 3 | D4 | 3.3 | 19 | 1 | 5974312 ¹⁾ | 5974390 ¹⁾ |
| | 5 | 0.50 | 58 | 8 | 5.0 | 4.0 | 7 | 3 | D4 | 4.5 | 22 | 1 | — | 5973531 ¹⁾ |
| 5 | | 0.80 | 58 | 8 | 5.00 | 4.00 | 7 | 3 | D4 | 4.2 | 22 | 1 | 5974316 ¹⁾ | 5974394 ¹⁾ |
| | 6 | 0.50 | 66 | 10 | 6.3 | 5.0 | 8 | 3 | D5 | 5.5 | 27 | 1 | — | 5973533 ¹⁾ |
| | 6 | 0.75 | 66 | 10 | 6.3 | 5.0 | 8 | 3 | D5 | 5.3 | 27 | 1 | — | 5973536 ¹⁾ |
| 6 | | 1.00 | 66 | 10 | 6.30 | 5.00 | 8 | 3 | D5 | 5.0 | 27 | 1 | 5974320 ¹⁾ | 5974404 ¹⁾ |
| | 8 | 0.75 | 72 | 12 | 8.0 | 6.3 | 9 | 3 | D5 | 7.3 | 31 | 1 | — | 5973538 ¹⁾ |
| | 8 | 1.00 | 72 | 12 | 8.0 | 6.3 | 9 | 3 | D5 | 7.0 | 31 | 1 | — | 5973541 ¹⁾ |
| 8 | | 1.25 | 72 | 12 | 8.00 | 6.30 | 9 | 3 | D5 | 6.8 | 31 | 1 | 5974325 ¹⁾ | 5974414 ¹⁾ |
| | 10 | 1.00 | 80 | 15 | 10.0 | 8.0 | 11 | 3 | D6 | 9.0 | 35 | 1 | — | 5973512 ¹⁾ |
| | 10 | 1.25 | 80 | 15 | 10.0 | 8.0 | 11 | 3 | D6 | 8.8 | 35 | 1 | — | 5973514 ¹⁾ |
| 10 | | 1.50 | 80 | 15 | 10.00 | 8.00 | 11 | 3 | D6 | 8.5 | 35 | 1 | 5973886 ¹⁾ | 5974329 ¹⁾ |
| | 12 | 1.00 | 89 | 16 | 9.0 | 7.1 | 10 | 3 | D6 | 11.0 | - | 1 | — | 5973516 ²⁾ |
| | 12 | 1.25 | 89 | 16 | 9.0 | 7.1 | 10 | 3 | D6 | 10.8 | - | 1 | — | 5973517 ²⁾ |
| | 12 | 1.50 | 89 | 16 | 9.0 | 7.1 | 10 | 3 | D6 | 10.5 | - | 1 | — | 5973518 ²⁾ |
| 12 | | 1.75 | 89 | 16 | 9.00 | 7.10 | 10 | 3 | D6 | 10.3 | - | 1 | 5973895 ²⁾ | 5974334 ²⁾ |
| | 14 | 1.50 | 95 | 18 | 11.2 | 9.0 | 12 | 3 | D7 | 12.5 | - | 1 | — | 5973519 ²⁾ |
| 14 | | 2.00 | 95 | 18 | 11.20 | 9.00 | 12 | 3 | D7 | 12.0 | - | 1 | 5974304 ²⁾ | 5974339 ²⁾ |
| | 16 | 1.00 | 102 | 18 | 12.5 | 10.0 | 13 | 4 | D7 | 15.0 | - | 1 | — | 5973520 ²⁾ |
| | 16 | 1.50 | 102 | 18 | 12.5 | 10.0 | 13 | 4 | D7 | 14.5 | - | 1 | — | 5973521 ²⁾ |
| 16 | | 2.00 | 102 | 18 | 12.50 | 10.00 | 13 | 4 | D7 | 14.0 | - | 1 | 5974349 ²⁾ | 5974344 ²⁾ |
| | 18 | 1.50 | 112 | 29 | 14.0 | 11.2 | 14 | 4 | D7 | 16.5 | - | 1 | — | 5973522 ²⁾ |
| 18 | | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | D7 | 15.5 | - | 1 | 5974399 ²⁾ | 5974352 ²⁾ |
| | 20 | 1.50 | 112 | 29 | 14.0 | 11.2 | 14 | 4 | D7 | 18.5 | - | 1 | — | 5973525 ²⁾ |
| 20 | | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | D7 | 17.5 | - | 1 | 5974491 ²⁾ | 5974366 ²⁾ |
| | 22 | 1.50 | 118 | 29 | 16.0 | 12.5 | 16 | 4 | D8 | 20.5 | - | 1 | — | 5973527 ²⁾ |
| 22 | | 2.50 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | D8 | 19.5 | - | 1 | 5974494 ²⁾ | 5974371 ²⁾ |
| 24 | | 3.00 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | D8 | 21.0 | - | 1 | 5974497 ²⁾ | 5974376 ²⁾ |

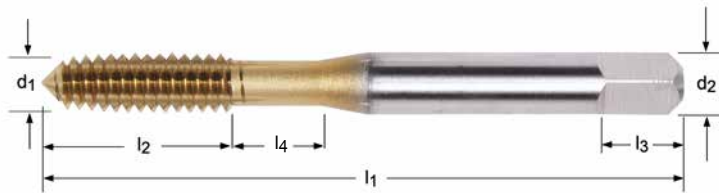
¹⁾ Reinforced Shanks, ²⁾ Reduced Shanks

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 | \square a Inch | Limits | Pack Qty | 1641(UNC) | 1641(UNF) |
|------|------|-----|---------------|---------------|--------------------------------|---------------|--------------------|------------------------|--------|-------------|-----------|-----------|
| 4 | | 40 | 1.7/8 | 5/16 | 9/16 | 3/16 | 0.141 | 0.110 | H3 | 1 | 6008526 | — |
| 4 | | 40 | 1.7/8 | 5/16 | 9/16 | 3/16 | 0.141 | 0.110 | H5 | 1 | 6008585 | — |
| 6 | | 32 | 2" | 3/8 | 11/16 | 3/16 | 0.141 | 0.110 | H3 | 1 | 6008387 | — |
| 6 | | 32 | 2" | 3/8 | 11/16 | 3/16 | 0.141 | 0.110 | H5 | 1 | 6008391 | — |
| 8 | | 32 | 2.1/8 | 3/8 | 3/4 | 1/4 | 0.141 | 0.110 | H3 | 1 | 6008411 | — |
| 8 | | 32 | 2.1/8 | 3/8 | 3/4 | 1/4 | 0.141 | 0.110 | H5 | 1 | 6008416 | — |
| | 10 | 32 | 2.3/8 | 1/2 | 7/8 | 1/4 | 0.194 | 0.152 | H4 | 1 | — | 6008114 |
| | 10 | 32 | 2.3/8 | 1/2 | 7/8 | 1/4 | 0.194 | 0.152 | H6 | 1 | — | 6008115 |
| 10 | | 24 | 2.3/8 | 1/2 | 7/8 | 1/4 | 0.194 | 0.152 | H6 | 1 | 6008113 | — |
| | 1/4 | 28 | 2.1/2 | 5/8 | 1" | 5/16 | 0.255 | 0.191 | H4 | 1 | — | 6008110 |
| | 1/4 | 28 | 2.1/2 | 5/8 | 1" | 5/16 | 0.255 | 0.191 | H6 | 1 | — | 6008111 |
| 1/4 | | 20 | 2.1/2 | 5/8 | 1" | 5/16 | 0.255 | 0.191 | H4 | 1 | 6008108 | — |
| 1/4 | | 20 | 2.1/2 | 5/8 | 1" | 5/16 | 0.255 | 0.191 | H6 | 1 | 6008109 | — |
| | 5/16 | 24 | 2.23/32 | 11/16 | 1.1/8 | 3/8 | 0.318 | 0.238 | H7 | 1 | — | 6008383 |
| 5/16 | | 18 | 2.23/32 | 11/16 | 1.1/8 | 3/8 | 0.318 | 0.238 | H5 | 1 | 6008605 | — |
| 5/16 | | 18 | 2.23/32 | 11/16 | 1.1/8 | 3/8 | 0.318 | 0.238 | H7 | 1 | 6008608 | — |
| | 3/8 | 24 | 2.15/16 | 3/4 | 1.1/4 | 7/16 | 0.381 | 0.286 | H7 | 1 | — | 6008476 |
| 3/8 | | 16 | 2.15/16 | 3/4 | 1.1/4 | 7/16 | 0.381 | 0.286 | H5 | 1 | 6008117 | — |
| 3/8 | | 16 | 2.15/16 | 3/4 | 1.1/4 | 7/16 | 0.381 | 0.286 | H7 | 1 | 6008374 | — |
| 1/2 | | 13 | 3.3/8 | 15/16 | 1.21/32 | 7/16 | 0.367 | 0.275 | H5 | 1 | 6008102 | — |
| 1/2 | | 13 | 3.3/8 | 15/16 | 1.21/32 | 7/16 | 0.367 | 0.275 | H8 | 1 | 6008104 | — |

THREAD FORMING TAPS

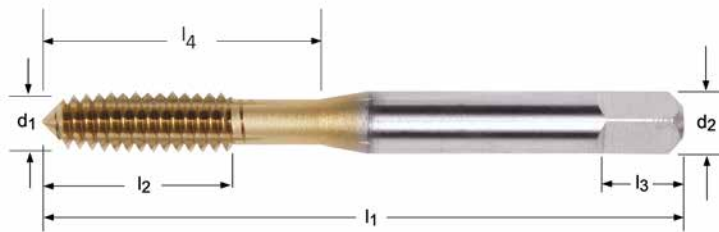


Multi-Application / Lube Grooves, Full-Bottoming

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



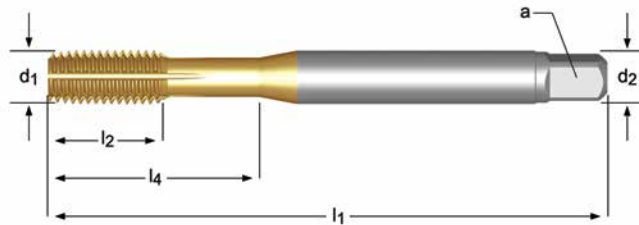
M3 - M10

| M | P mm | l_1 Inch | l_2 Inch | l_4 Inch (Neck Length) | l_3 Inch | d_2 Ø Inch | \square a Inch | Limits | Pack Qty | 1671(M) |
|----|---------|---------------|---------------|--------------------------------|---------------|--------------------|------------------------|--------|-------------|---------|
| 3 | 0.50 | 1.15/16 | 5/16 | 1/2 | 3/16 | 0.141 | 0.110 | D5 | 1 | 6008385 |
| 4 | 0.70 | 2.1/8 | 3/8 | 3/4 | 1/4 | 0.168 | 0.131 | D6 | 1 | 6008389 |
| 5 | 0.80 | 2.3/8 | 1/2 | 7/8 | 1/4 | 0.194 | 0.152 | D7 | 1 | 6008393 |
| 6 | 1.00 | 2.1/2 | 5/8 | 1" | 5/16 | 0.255 | 0.191 | D8 | 1 | 6008397 |
| 8 | 1.00 | 2.23/32 | 11/16 | 1.1/8 | 3/8 | 0.318 | 0.238 | D9 | 1 | 6008401 |
| 8 | 1.25 | 2.23/32 | 11/16 | 1.1/8 | 3/8 | 0.318 | 0.238 | D9 | 1 | 6008405 |
| 10 | 1.50 | 2.15/16 | 3/4 | 1.1/4 | 7/16 | 0.381 | 0.286 | D10 | 1 | 6008375 |

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



APPLIX

| 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 | 6204945 | ¹⁾ — |
| 6 | | 32 | 2.205 | 0.472 | 0.787 | H5 | 0.141 | 0.110 | 1 | 6204950 | ¹⁾ — |
| 8 | | 32 | 2.480 | 0.512 | 0.827 | H5 | 0.168 | 0.131 | 1 | 6204955 | ¹⁾ — |
| | 10 | 32 | 2.756 | 0.512 | 0.984 | H6 | 0.194 | 0.152 | 1 | — | 6204938 ¹⁾ |
| 10 | | 24 | 2.756 | 0.591 | 0.984 | H6 | 0.194 | 0.152 | 1 | 6204937 | ¹⁾ — |
| 12 | | 24 | 3.150 | 0.630 | 1.142 | H6 | 0.220 | 0.165 | 1 | 6371643 | ¹⁾ — |
| | 1/4 | 28 | 3.150 | 0.669 | 1.181 | H6 | 0.255 | 0.191 | 1 | — | 6204936 ¹⁾ |
| 1/4 | | 20 | 3.150 | 0.669 | 1.181 | H6 | 0.255 | 0.191 | 1 | 6204935 | ¹⁾ — |
| | 5/16 | 24 | 3.543 | 0.669 | 1.378 | H7 | 0.318 | 0.238 | 1 | — | 6204947 ¹⁾ |
| 5/16 | | 18 | 3.546 | 0.787 | 1.378 | H7 | 0.318 | 0.238 | 1 | 6204946 | ¹⁾ — |
| | 3/8 | 24 | 3.937 | 0.709 | 1.535 | H7 | 0.381 | 0.286 | 1 | — | 6204944 ¹⁾ |
| 3/8 | | 16 | 3.937 | 0.866 | 1.535 | H7 | 0.381 | 0.286 | 1 | 6204943 | ¹⁾ — |
| | 7/16 | 20 | 3.937 | 0.866 | — | H8 | 0.323 | 0.242 | 1 | — | 6204952 ²⁾ |
| 7/16 | | 14 | 3.937 | 0.866 | — | H8 | 0.323 | 0.242 | 1 | 6204951 | ²⁾ — |
| | 1/2 | 20 | 3.937 | 0.866 | — | H8 | 0.397 | 0.275 | 1 | — | 6204934 ²⁾ |
| 1/2 | | 13 | 4.331 | 0.984 | — | H8 | 0.367 | 0.275 | 1 | 6204933 | ²⁾ — |
| 5/8 | | 11 | 4.331 | 1.063 | — | H8 | 0.480 | 0.360 | 1 | 6204948 | ²⁾ — |
| | 3/4 | 16 | 4.331 | 0.984 | — | H8 | 0.590 | 0.442 | 1 | — | 6204942 ²⁾ |
| 3/4 | | 10 | 4.921 | 1.181 | — | H8 | 0.590 | 0.442 | 1 | 6204941 | ²⁾ — |
| | 7/8 | 14 | 4.921 | 1.024 | — | H9 | 0.697 | 0.523 | 1 | — | 6204953 ²⁾ |
| 7/8 | | 9 | 5.512 | 1.260 | — | H9 | 0.697 | 0.523 | 1 | 6204954 | ²⁾ — |
| 1" | | 8 | 6.299 | 1.417 | — | H9 | 0.800 | 0.600 | 1 | 6204940 | ²⁾ — |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

THREAD FORMING TAPS

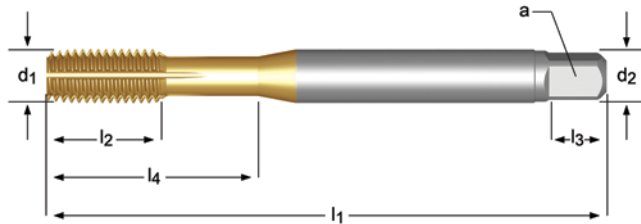


APPLIX

MXR Multi-Application / Lube Grooves, Semi-Bottoming

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 \varnothing Inch | a Inch | Pack Qty | 1691AP (UNC) | 1691AP (UNF) |
|------|------|-----|---------------|---------------|--------------------------------|--------|--------------------------------|-------------|----------|-----------------------|-----------------------|
| 1/4 | | 20 | 3.150 | 0.669 | 1.181 | H6 | 0.255 | 0.191 | 1 | 6204976 ¹⁾ | — |
| | 5/16 | 24 | 3.543 | 0.669 | 1.378 | H7 | 0.318 | 0.238 | 1 | — | 6204985 ¹⁾ |
| 5/16 | | 18 | 3.546 | 0.787 | 1.378 | H7 | 0.318 | 0.238 | 1 | 6204984 ¹⁾ | — |
| | 3/8 | 24 | 3.937 | 0.709 | 1.535 | H7 | 0.381 | 0.286 | 1 | — | 6204983 ¹⁾ |
| 3/8 | | 16 | 3.937 | 0.866 | 1.535 | H7 | 0.381 | 0.286 | 1 | 6204982 ¹⁾ | — |
| | 7/16 | 20 | 3.937 | 0.866 | — | H8 | 0.323 | 0.242 | 1 | — | 6204989 ²⁾ |
| | 1/2 | 20 | 3.937 | 0.866 | — | H8 | 0.397 | 0.275 | 1 | — | 6204975 ²⁾ |
| 1/2 | | 13 | 4.331 | 0.984 | — | H8 | 0.367 | 0.275 | 1 | 6204974 ²⁾ | — |
| 5/8 | | 11 | 4.331 | 1.063 | — | H8 | 0.480 | 0.360 | 1 | 6204986 ²⁾ | — |
| 3/4 | | 10 | 4.921 | 1.181 | — | H8 | 0.590 | 0.442 | 1 | 6204980 ²⁾ | — |
| 1" | | 8 | 6.299 | 1.417 | — | H9 | 0.800 | 0.600 | 1 | 6204979 ²⁾ | — |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

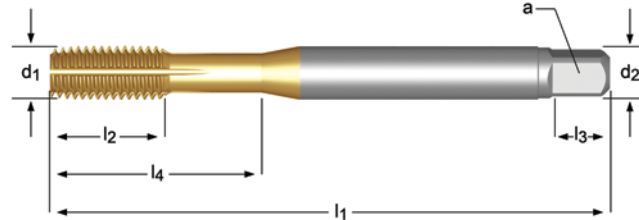
MXR Multi-Application / Lube Grooves, Semi-Bottoming



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 Inch | \square a Inch | Pack Qty | 1687AP | 1697AP |
|----|----|------|----------|----------|------------|--------------------------|--------|------------|------------------|----------|---------|-------------------------------------|
| 4 | | 0.70 | 63 | 13 | | 21 | D6 | 0.168 | 0.131 | 1 | 6204970 | ¹⁾ — |
| 5 | | 0.80 | 70 | 15 | | 25 | D7 | 0.194 | 0.152 | 1 | 6204971 | ¹⁾ — |
| 6 | | 1.00 | 80 | 17 | | 30 | D8 | 0.255 | 0.191 | 1 | 6204972 | ¹⁾ 6205004 ¹⁾ |
| 8 | | 1.25 | 90 | 20 | | 25 | D9 | 0.318 | 0.238 | 1 | 6204973 | ¹⁾ — |
| 8 | | 1.25 | 90 | 20 | | 35 | D9 | 0.318 | 0.238 | 1 | — | 6205005 ¹⁾ |
| | 10 | 1.25 | 100 | 16 | | 39 | D10 | 0.381 | 0.286 | 1 | 6204956 | ¹⁾ — |
| 10 | | 1.50 | 100 | 22 | | 39 | D10 | 0.381 | 0.286 | 1 | 6204957 | ¹⁾ 6204991 ¹⁾ |
| | 12 | 1.50 | 100 | 22 | | | D11 | 0.367 | 0.275 | 1 | 6204958 | ²⁾ — |
| 12 | | 1.75 | 110 | 24 | | | D11 | 0.367 | 0.275 | 1 | 6204959 | ²⁾ 6204993 ²⁾ |
| | 14 | 1.50 | 100 | 22 | | | D10 | 0.429 | 0.322 | 1 | 6204960 | ²⁾ — |
| 14 | | 2.00 | 110 | 26 | | | D11 | 0.429 | 0.322 | 1 | 6204961 | ²⁾ — ²⁾ |
| | 16 | 1.50 | 100 | 22 | | | D10 | 0.480 | 0.360 | 1 | 6204962 | ²⁾ — |
| 16 | | 2.00 | 110 | 27 | | | D11 | 0.480 | 0.360 | 1 | 6204963 | ²⁾ 6204997 ²⁾ |
| | 20 | 1.50 | 125 | | 25 | | D11 | 0.652 | 0.489 | 1 | — | 6205000 ²⁾ |
| 20 | | 2.50 | 140 | 32 | | | D12 | 0.652 | 0.489 | 1 | 6204967 | ²⁾ — ²⁾ |

¹⁾ Reinforced Shanks

²⁾ Reduced Shanks

PIPE TAPS, STRAIGHT FLUTE



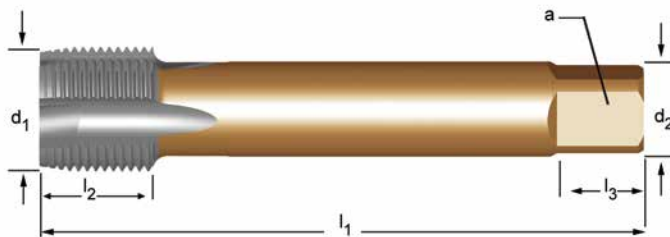
Parallel Thread, G (BSP), Plug Style

EP40 Bronze tempered 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 tempered 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



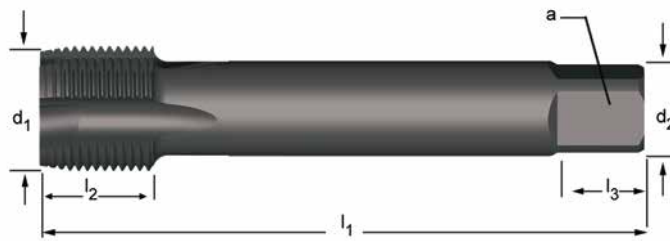
| G(BSP) | TPI | d ₁ nom mm | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | l ₃ mm | # of flutes | | Pack Qty | EP40 | EP41 |
|--------|-----|-----------------------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|-------|-------------|---------|---------|
| 1/8 | 28 | 9.728 | 90 | 18 | 7.0 | 5.5 | 8 | 3 | 8.8 | 1 | 5973943 | 5973972 |
| 1/4 | 19 | 13.157 | 100 | 21 | 11.0 | 9.0 | 12 | 3 | 11.8 | 1 | 5973939 | 5973969 |
| 3/8 | 19 | 16.662 | 100 | 21 | 12.0 | 9.0 | 12 | 4 | 15.25 | 1 | 5973951 | 5973978 |
| 1/2 | 14 | 20.955 | 125 | 24 | 16.0 | 12.0 | 15 | 4 | 19 | 1 | 5973935 | 5973966 |
| 5/8 | 14 | 22.911 | 125 | 24 | 18.0 | 14.5 | 17 | 4 | 21 | 1 | 5973954 | 5973981 |
| 3/4 | 14 | 26.441 | 140 | 28 | 20.0 | 16.0 | 19 | 4 | 24.5 | 1 | 5973947 | 5973975 |
| 7/8 | 14 | 30.201 | 150 | 28 | 22.0 | 18.0 | 21 | 4 | 28.25 | 1 | 5973960 | 5973984 |
| 1" | 11 | 33.249 | 160 | 30 | 25.0 | 20.0 | 23 | 4 | 30.75 | 1 | 5973931 | 5973963 |

Note: DIN shank and square dimensions will necessitate metric holders

Parallel Thread, G(BSP), Plug Style

E041 Steam tempered 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 ∅ 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 | 5973928 |
| 1/4 | 19 | 13.157 | 100 | 19 | 10.0 | 8.0 | 11 | 3 | 11.80 | 1 | 5973924 |
| 3/8 | 19 | 16.662 | 100 | 21 | 12.5 | 10.0 | 13 | 3 | 15.25 | 1 | 5973936 |
| 1/2 | 14 | 20.955 | 125 | 26 | 16.0 | 12.5 | 16 | 4 | 19.00 | 1 | 5973920 |
| 3/4 | 14 | 26.441 | 140 | 28 | 20.0 | 16.0 | 20 | 4 | 24.50 | 1 | 5973932 |

Note: ISO shank and square dimensions will necessitate metric holders

PIPE TAPS, SPIRAL FLUTE



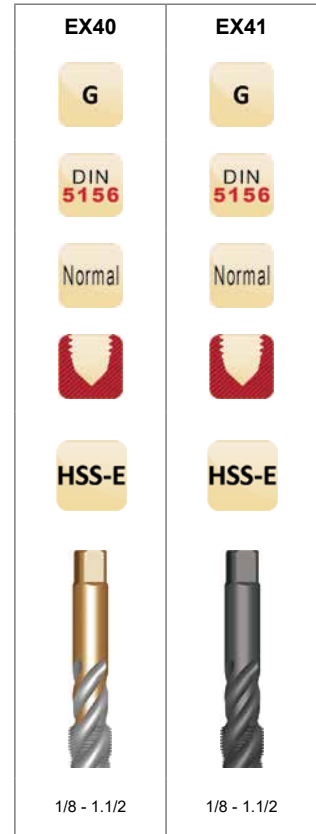
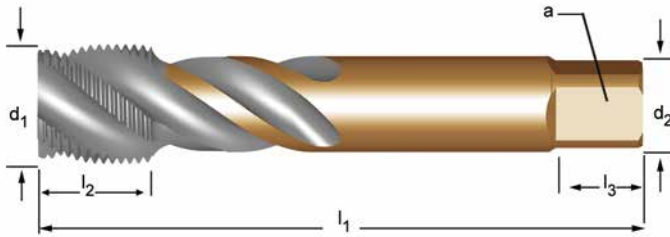
Parallel Thread, G(BSP), Semi- Bottoming

EX40 Bronze tempered 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 tempered 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



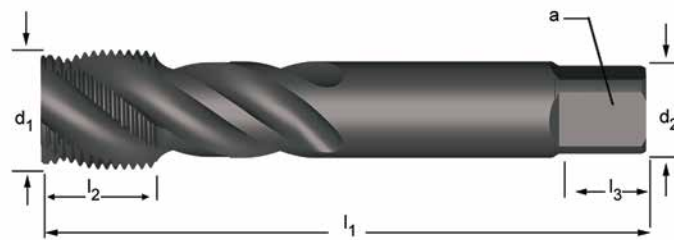
| G(BSP) | TPI | d ₁ nom mm | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | l ₃ mm | # of flutes | | Pack Qty | EX40 | EX41 |
|--------|-----|-----------------------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|-------|-------------|---------|---------|
| 1/8 | 28 | 9.728 | 90 | 13 | 7.0 | 5.5 | 8 | 3 | 8.8 | 1 | 5974218 | 5973910 |
| 1/4 | 19 | 13.157 | 100 | 15 | 11.0 | 9.0 | 12 | 3 | 11.8 | 1 | 5974214 | 5973905 |
| 3/8 | 19 | 16.662 | 100 | 15 | 12.0 | 9.0 | 12 | 4 | 15.25 | 1 | 5974225 | 5973753 |
| 1/2 | 14 | 20.955 | 125 | 18 | 16.0 | 12.0 | 15 | 4 | 19 | 1 | 5974210 | 5973900 |
| 5/8 | 14 | 22.911 | 125 | 18 | 18.0 | 14.5 | 17 | 4 | 21 | 1 | 5974232 | 5973755 |
| 3/4 | 14 | 26.441 | 140 | 20 | 20.0 | 16.0 | 19 | 4 | 24.5 | 1 | 5974222 | 5973915 |
| 7/8 | 14 | 30.201 | 150 | 20 | 22.0 | 18.0 | 21 | 4 | 28.25 | 1 | 5973750 | 5973757 |
| 1" | 11 | 33.249 | 160 | 22 | 25.0 | 20.0 | 23 | 4 | 30.75 | 1 | 5974195 | 5973773 |
| 1.1/8 | 11 | 37.897 | 170 | 22 | 28.0 | 22.0 | 25 | 4 | 35 | 1 | 5974206 | 5973890 |
| 1.1/4 | 11 | 41.910 | 170 | 22 | 32.0 | 24.0 | 27 | 4 | 39.5 | 1 | 5974202 | 5973838 |
| 1.1/2 | 11 | 47.803 | 190 | 23 | 36.0 | 29.0 | 32 | 4 | 45 | 1 | 5974199 | 5973797 |

Note: DIN shank and square dimensions will necessitate metric holders

Parallel Thread, G(BSP), Semi-Bottoming

E043 Steam tempered 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 ∅ 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 | 5973967 |
| 1/4 | 19 | 13.157 | 100 | 19 | 10.0 | 8.0 | 11 | 3 | 11.80 | 1 | 5973964 |
| 3/8 | 19 | 16.662 | 100 | 21 | 12.5 | 10.0 | 13 | 4 | 15.25 | 1 | 5973973 |
| 1/2 | 14 | 20.955 | 125 | 26 | 16.0 | 12.5 | 16 | 4 | 19.00 | 1 | 5973961 |
| 3/4 | 14 | 26.441 | 140 | 28 | 20.0 | 16.0 | 20 | 4 | 24.50 | 1 | 5973970 |

Note: ISO shank and square dimensions will necessitate metric holders

HAND TAPS



General Purpose

1500
1500S
1528
1528S

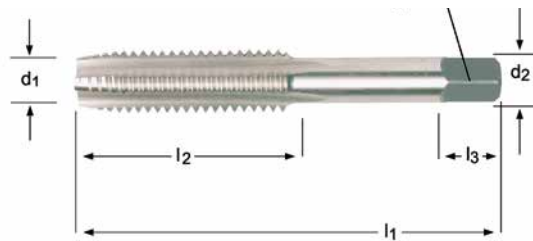
The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

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

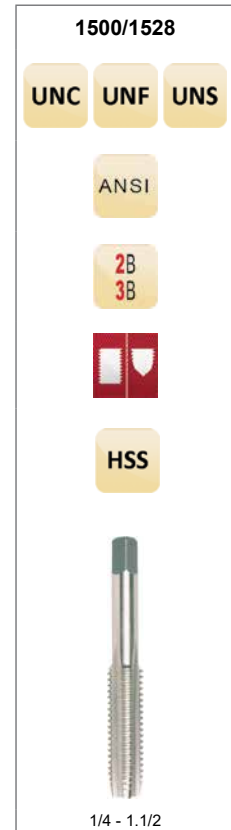
1500 - Fractional sizes

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 | 6007279 | 6007342 | 6007366 | 6006774 |
| 0 | | 80 | | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 6007368 | 6007369 | — |
| 1 | 64 | | | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | 1 | 6007370 | 6007371 | 6007167 | 6006781 |
| 1 | | 72 | | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | 1 | 6007181 | 6007184 | 6007189 | 6006785 |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 6007357 | 6007359 | — |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 6007341 | 6007350 | 6007354 | — |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007143 | 6007148 | 6007151 | 6006808 |
| 2 | | 64 | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | — | — | — | 6006811 |
| 3 | 48 | | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 6007174 | — | — |
| 3 | 48 | | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007178 | 6007180 | 6007190 | 6006817 |
| 3 | | 56 | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007195 | 6007200 | 6007205 | 6006820 |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 6007250 | 6007255 | — |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 6007229 | 6007235 | 6007245 | — |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007260 | 6007265 | 6007270 | 6006826 |
| 4 | | 48 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007275 | 6007277 | 6007284 | 6006829 |
| 5 | 40 | | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007298 | 6007303 | 6007307 | 6006832 |
| 5 | | 44 | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007315 | 6007318 | 6007322 | 6006838 |
| 6 | 32 | | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 6006942 | 6007002 | — |
| 6 | 32 | | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | — | 6007109 | 6007112 | — |
| 6 | 32 | | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 6007331 | 6007336 | 6007346 | — |
| 6 | 32 | | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6007042 | 6007074 | 6007104 | 6006844 |
| 6 | 32 | | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H3 | 1 | 6007114 | 6007116 | 6006947 | 6006848 |
| 6 | | 40 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6006965 | 6006970 | 6006974 | 6006852 |

| 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 | — | 6006984 | 6006988 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | — | 6007018 | 6007022 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H2 | 1 | — | 6006991 | 6006999 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H3 | 1 | — | 6007026 | 6007031 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H1 | 1 | — | 6006980 | — | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H2 | 1 | 6007006 | 6007010 | 6007014 | 6006860 |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H3 | 1 | 6007034 | 6007037 | 6007039 | 6007159 |
| 8 | | 36 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H2 | 1 | 6007045 | 6007048 | 6007051 | 6007221 |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | 1 | — | 6007216 | 6007225 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | — | 6007253 | 6007259 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H2 | 1 | — | 6007233 | — | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | — | 6007263 | 6007267 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H1 | 1 | — | 6007209 | — | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H2 | 1 | 6007238 | 6007243 | 6007247 | 6006789 |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H3 | 1 | 6007273 | 6007285 | 6007294 | 6006792 |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | 1 | — | 6007309 | 6007313 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | — | 6007351 | 6007355 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H2 | 1 | — | 6007324 | 6007328 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | — | 6007358 | 6007360 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H2 | 1 | 6007333 | 6007338 | 6007347 | 6006796 |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H3 | 1 | 6007361 | 6007362 | 6007363 | 6006799 |
| 12 | 24 | | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 4 | H3 | 1 | 6007364 | 6007365 | 6007367 | 6006802 |
| 12 | | 28 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 4 | H3 | 1 | 6007136 | 6007186 | 6007240 | 6006805 |
| 1/4 | 20 | | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H1 | 1 | 6006971 | 6006976 | 6006987 | — |
| 1/4 | 20 | | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H2 | 1 | 6006993 | 6006995 | 6006997 | — |
| 1/4 | 20 | | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H3 | 1 | 6007003 | 6007007 | 6007011 | 6006718 |
| 1/4 | 20 | | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H5 | 1 | — | 6007015 | 6007019 | — |
| 1/4 | | 28 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H2 | 1 | — | 6007035 | 6007038 | — |
| 1/4 | | 28 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H3 | 1 | 6007041 | 6007044 | 6007047 | 6006949 |
| 1/4 | | 28 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H4 | 1 | — | 6007050 | 6007054 | — |
| 5/16 | 18 | | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H2 | 1 | 6007244 | 6007248 | 6007254 | — |
| 5/16 | 18 | | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | 6007257 | 6007262 | 6007274 | 6006960 |
| 5/16 | | 24 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | 6007301 | 6007306 | 6007317 | 6006964 |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H2 | 1 | 6007156 | 6007166 | 6007172 | — |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 6007176 | 6007182 | 6007185 | 6007121 |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H5 | 1 | — | 6007193 | 6007198 | — |
| 3/8 | | 24 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 6007212 | 6007222 | 6007227 | 6006957 |
| 7/16 | 14 | | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | 1 | 6007402 | 6007406 | 6007410 | 6006979 |
| 7/16 | | 20 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | 1 | 6007431 | 6007436 | 6007441 | 6006990 |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H2 | 1 | — | 6007063 | 6007095 | — |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 6007100 | 6007103 | 6007107 | 6006703 |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H5 | 1 | — | 6007110 | 6006941 | — |
| 1/2 | | 20 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 6006948 | 6006953 | 6006956 | 6006707 |
| 9/16 | 12 | | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | 6007512 | 6007517 | 6007522 | 6007000 |
| 9/16 | | 18 | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | 6007541 | 6007546 | 6007550 | 6007008 |
| 5/8 | 11 | | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | 1 | 6007476 | 6007532 | 6007584 | 6006966 |
| 5/8 | | 18 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | 1 | 6007607 | 6007380 | 6007384 | 6006975 |
| 3/4 | 10 | | | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | 6007344 | 6007349 | 6007353 | 6007119 |
| 3/4 | | 16 | | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | 6007133 | 6007138 | 6007141 | 6007120 |
| 7/8 | 9 | | | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | 1 | 6007492 | 6007497 | 6007502 | 6006996 |
| 7/8 | | 14 | | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | 1 | 6007468 | 6007473 | 6007481 | 6006994 |

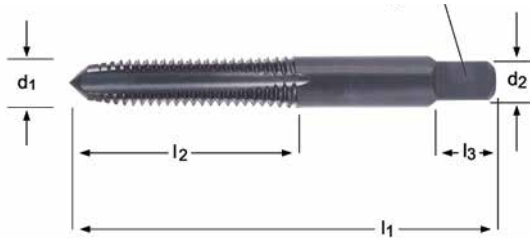
HAND TAPS



| 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 | 6007084 | 1010170 | 6007087 | 6007079 |
| 1" | | 12 | | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | 1 | 6007057 | 1010174 | 6007060 | 6007004 |
| 1" | | | 14 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | 1 | 6007072 | 1010178 | 6007075 | — |
| 1.1/8 | 7 | | | 5.7/16 | 2.9/16 | 0.8960 | 0.6720 | 7/8 | 4 | H4 | 1 | 6007086 | 1010183 | 6007089 | 6006691 |
| 1.1/8 | | 12 | | 5.7/16 | 2.9/16 | 0.8960 | 0.6720 | 7/8 | 4 | H4 | 1 | 6007070 | 1010186 | 6007073 | 6006687 |
| 1.1/4 | 7 | | | 5.3/4 | 2.9/16 | 1.0210 | 0.7660 | 1" | 4 | H4 | 1 | 6007058 | 1010189 | 6007061 | 6006683 |
| 1.1/4 | | 12 | | 5.3/4 | 2.9/16 | 1.0210 | 0.7660 | 1" | 6 | H4 | 1 | 6007043 | 1010192 | 6007049 | 6006680 |
| 1.3/8 | 6 | | | 6.1/16 | 3" | 1.1000 | 0.8310 | 1.1/16 | 4 | H4 | 1 | 6007117 | 1010195 | 6006937 | 6006699 |
| 1.3/8 | | 12 | | 6.1/16 | 3" | 1.1000 | 0.8310 | 1.1/16 | 6 | H4 | 1 | 6007102 | 1010198 | 6007105 | 6006695 |
| 1.1/2 | 6 | | | 6.3/8 | 3" | 1.2300 | 0.9250 | 1.1/8 | 4 | H4 | 1 | 6007033 | 1010201 | 6007036 | 6006677 |
| 1.1/2 | | 12 | | 6.3/8 | 3" | 1.2300 | 0.9250 | 1.1/8 | 6 | H4 | 1 | 6007012 | 1010204 | 6007016 | 6006675 |

General Purpose

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



¹⁾ Male centers on thread end

²⁾ Female centers / flat ends

1500A

UNC
UNF

ANSI

3B

HSS

1/4 - 1"

| UNC | UNF | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | 6006633 ¹⁾ |
| | 1/4 | 28 | 2.1/2 | 1.000 | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Bottoming | 1 | 6006651 ¹⁾ |
| | 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006623 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006738 ¹⁾ |
| | 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006733 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006728 ¹⁾ |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006627 ²⁾ |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006626 ²⁾ |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6006622 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6007592 ²⁾ |
| | 9/16 | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 6006631 ²⁾ |
| 9/16 | | 12 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 6006630 ²⁾ |
| | 5/8 | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 6006625 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 6006624 ²⁾ |
| | 3/4 | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 6006723 ²⁾ |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 6006713 ²⁾ |
| | 7/8 | 14 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 6006628 ²⁾ |
| 7/8 | | 9 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 6006629 ²⁾ |
| 1" | | 8 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 6006673 ²⁾ |

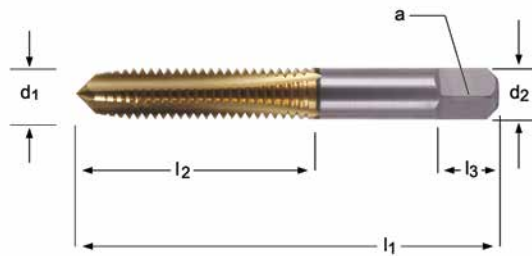
HAND TAPS



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.



¹⁾ Male centers on thread end

²⁾ Female centers / flat ends

TN1500

UNC

UNF

ANSI

3B

HSS

1/4 - 7/8

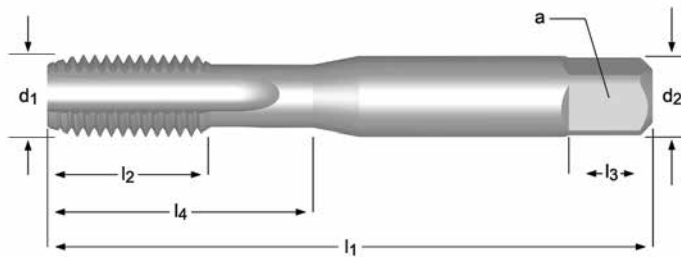
| UNC | UNF | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square a Inch | l_3 Inch | # of Flutes | Limits | Chamfer | Pack Qty | TN1500 |
|------|------|-----|---------------|---------------|--------------------|------------------------|---------------|----------------|--------|-----------|-------------|-----------------------|
| | 1/4 | 28 | 2.1/2 | 1.0000 | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006700 ¹⁾ |
| 1/4 | | 20 | 2.1/2 | 1.0000 | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006696 ¹⁾ |
| | 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006731 ¹⁾ |
| 5/16 | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006722 ¹⁾ |
| | 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006717 ¹⁾ |
| 3/8 | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006712 ¹⁾ |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006752 ²⁾ |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006748 ²⁾ |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6006692 ²⁾ |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6006686 ²⁾ |
| | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Bottoming | 1 | 6006688 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 6006736 ²⁾ |
| | 5/8 | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Bottoming | 1 | 6006745 ²⁾ |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Bottoming | 1 | 6006741 ²⁾ |
| | 3/4 | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Bottoming | 1 | 6006708 ²⁾ |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Bottoming | 1 | 6006704 ²⁾ |
| 7/8 | | 9 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 6006756 ²⁾ |

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 semi-bottoming.

- Taper - 7-10 pitch chamfer length
- Plug - 3-5 pitch chamfer length
- Semi-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 | Semi - Bottoming | Sets | |
|---------------------------|------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|----------------------|-------------|-------|---------|---------------------|---------|---------|
| 1 | 0.25 | 38 | 4.5 | 2.50 | 2.00 | 4 | 2 | 0.75 | 4.5 | 1 | 5977027 | 5977031 | 5977035 | — |
| 1.2 | 0.25 | 38 | 4.5 | 2.50 | 2.00 | 4 | 2 | 0.95 | 4.5 | 1 | 5976974 | 5976976 | 5976978 | — |
| 1.4 | 0.30 | 40 | 6 | 2.50 | 2.00 | 4 | 2 | 0.95 | 6 | 1 | 5976982 | 5976983 | 5976985 | — |
| 1.6 | 0.35 | 41 | 8 | 2.50 | 2.00 | 4 | 2 | 1.25 | 8 | 1 | 5976987 | 5976988 | 5976989 | 5976990 |
| 1.7 | 0.35 | 41 | 8 | 2.50 | 2.00 | 4 | 2 | 1.35 | 8 | 1 | 5976993 | 5976994 | 5976995 | 5977001 |
| 1.8 | 0.35 | 41 | 8 | 2.50 | 2.00 | 4 | 2 | 1.45 | 8 | 1 | 5977007 | 5977011 | 5977015 | — |
| 2 | 0.40 | 41 | 8 | 2.50 | 2.00 | 4 | 3 | 1.6 | 8 | 1 | 5975724 | 5975728 | 5975730 | 5975732 |
| 2 | 0.45 | 41 | 8 | 2.50 | 2.00 | 4 | 3 | 1.55 | 8 | 1 | 5975593 | 5975597 | 5975603 | — |
| 2.2 | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 3 | 1.75 | 9.5 | 1 | 5975398 | 5975404 | 5975410 | — |
| 2.3 | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 3 | 1.85 | 9.5 | 1 | 5975432 | 5975437 | 5975442 | — |
| 2.5 | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 3 | 2.05 | 9.5 | 1 | 5975452 | 5975456 | 5975461 | 5975466 |
| 2.6 | 0.45 | 44.5 | 9.5 | 2.80 | 2.24 | 5 | 3 | 2.15 | 9.5 | 1 | 5975584 | 5975631 | 5975674 | — |
| 3 | 0.50 | 48 | 12.5 | 3.15 | 2.50 | 5 | 3 | 2.5 | 12.5 | 1 | 5975703 | 5975705 | 5975707 | 5975709 |
| 3 | 0.60 | 48 | 12.5 | 3.15 | 2.50 | 5 | 3 | 2.4 | 12.5 | 1 | 5975715 | 5975717 | 5975720 | — |
| 3.5 | 0.60 | 50 | 14 | 3.55 | 2.80 | 5 | 3 | 2.9 | 14 | 1 | 5975690 | 5975691 | 5975693 | 5975695 |
| 4 | 0.70 | 53 | 14 | 4.00 | 3.15 | 6 | 3 | 3.3 | 14 | 1 | 5976765 | 5976770 | 5976774 | 5976783 |
| 4 | 0.75 | 53 | 14 | 4.00 | 3.15 | 6 | 3 | 3.25 | 14 | 1 | 5976795 | 5976798 | 5976802 | — |
| 4.5 | 0.75 | 53 | 9.5 | 4.50 | 3.55 | 6 | 3 | 3.8 | 18 | 1 | 5976749 | 5976752 | 5976754 | 5976757 |
| 5 | 0.80 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.2 | 22 | 1 | 5976871 | 5976878 | 5976886 | 5976890 |
| 5 | 0.90 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.1 | 22 | 1 | 5976902 | 5976907 | 5976910 | — |
| 5.5 | 0.90 | 62 | 12 | 5.60 | 4.50 | 7 | 3 | 4.6 | 21 | 1 | 5976854 | 5976858 | 5976862 | — |
| 6 | 1.00 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5 | 26 | 1 | 5977074 | 5977116 | 5977162 | 5977173 |
| 7 | 1.00 | 66 | 13 | 7.10 | 5.60 | 8 | 3 | 6 | 26 | 1 | 5977183 | 5976997 | 5976999 | 5977002 |
| 8 | 1.25 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.8 | 29 | 1 | 5977012 | 5977016 | 5977020 | 5977024 |
| 9 | 1.25 | 72 | 16 | 9.00 | 7.10 | 10 | 3 | 7.8 | 29 | 1 | 5977040 | 5977043 | 5977047 | 5977051 |
| 10 | 1.50 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.5 | 34 | 1 | 5975273 | 5975320 | 5975367 | 5975419 |
| 11 | 1.50 | 85 | 19 | 8.00 | 6.30 | 9 | 3 | 9.5 | | 1 | 5975482 | 5975484 | 5975486 | 5975281 |
| 12 | 1.75 | 89 | 22 | 9.00 | 7.10 | 10 | 3 | 10.3 | | 1 | 5975288 | 5975293 | 5975296 | 5975302 |
| 14 | 2.00 | 95 | 24 | 11.20 | 9.00 | 12 | 4 | 12 | | 1 | 5975313 | 5975317 | 5975324 | 5975328 |
| 16 | 2.00 | 102 | 24 | 12.50 | 10.00 | 13 | 4 | 14 | | 1 | 5975340 | 5975344 | 5975349 | 5975355 |
| 18 | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 15.5 | | 1 | 5975371 | 5975375 | 5975380 | 5975385 |
| 20 | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 17.5 | | 1 | 5975607 | 5975610 | 5975614 | 5975619 |

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 | Semi - Bottoming | Sets |
|---------------------------|------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|---|----------------------|-------------|---------|---------|---------------------|---------|
| 22 | 2.50 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | 19.5 | | 1 | 5975634 | 5975639 | 5975645 | 5975648 |
| 24 | 3.00 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | 21 | | 1 | 5975656 | 5975659 | 5975663 | 5975667 |
| 27 | 3.00 | 135 | 35 | 20.00 | 16.00 | 20 | 4 | 24 | | 1 | 5975684 | 5975687 | 5975688 | — |
| 30 | 3.50 | 138 | 41 | 20.00 | 16.00 | 20 | 4 | 26.5 | | 1 | 5975722 | 5975727 | 5976741 | — |
| 33 | 3.50 | 151 | 41 | 22.40 | 18.00 | 22 | 4 | 29.5 | | 1 | 5976778 | 5976831 | 5976875 | — |
| 36 | 4.00 | 162 | 47 | 25.00 | 20.00 | 24 | 4 | 32 | | 1 | 5976923 | 5976933 | 5976938 | — |
| 39 | 4.00 | 170 | 47 | 28.00 | 22.40 | 26 | 4 | 35 | | 1 | 5976941 | 5976944 | 5976746 | — |
| 42 | 4.50 | 170 | 53 | 28.00 | 22.40 | 26 | 6 | 37.5 | | 1 | 5976807 | 5976812 | 5976815 | — |
| 45 | 4.50 | 187 | 54 | 31.50 | 25.00 | 28 | 6 | 40.5 | | 1 | 5976826 | 5976837 | 5976841 | — |
| 48 | 5.00 | 187 | 60 | 31.50 | 25.00 | 28 | 6 | 43 | | 1 | 5976844 | 5976847 | 5976850 | — |
| 52 | 5.00 | 200 | 60 | 35.50 | 28.00 | 31 | 6 | 47 | | 1 | — | — | 5976992 | — |
| 56 | 5.50 | 200 | 60 | 35.50 | 28.00 | 31 | 6 | 50.5 | | 1 | — | — | 5977032 | — |

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 semi-bottoming.

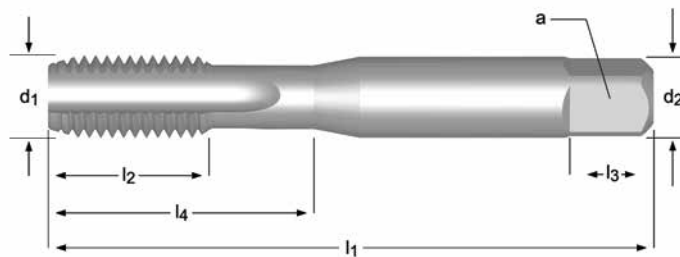
Taper - 7-10 pitch chamfer length

Plug - 3-5 pitch chamfer length

Semi-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)



E513

MF

ISO
529

6H



HSS




M3 - M50

Note: ISO shank and square dimensions will necessitate metric holders

| 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 | Semi - Bottoming | 2 Pc Sets | 3 Pc Sets |
|---------------------------|-------------|----------------------|----------------------|---------------------------|--------------|----------------|----------------------|------|----------------------|-------------|---------|---------|---------------------|--------------|--------------|
| 3 | 0.35 | 48 | 12.5 | 3.15 | 2.50 | 3 | 5 | 2.65 | 12.5 | 1 | 5977029 | 5977033 | 5977041 | — | — |
| 3.5 | 0.35 | 48 | 12.5 | 3.15 | 2.50 | 3 | 5 | 3.2 | 12.5 | 1 | — | — | 5977025 | — | — |
| 4 | 0.50 | 53 | 14 | 4.00 | 3.15 | 3 | 6 | 3.5 | 14 | 1 | 5977117 | 5977125 | 5977128 | 5977133 | — |
| 5 | 0.50 | 58 | 11 | 5.00 | 4.00 | 3 | 7 | 4.5 | 22 | 1 | 5977153 | 5977196 | 5977223 | 5977227 | — |
| 5 | 0.75 | 58 | 11 | 5.00 | 4.00 | 3 | 7 | 4.3 | 22 | 1 | 5977229 | 5977231 | 5977233 | — | — |
| 6 | 0.50 | 66 | 13 | 6.30 | 5.00 | 3 | 8 | 5.5 | 26 | 1 | 5977076 | 5977080 | 5977083 | — | — |
| 6 | 0.75 | 66 | 13 | 6.30 | 5.00 | 3 | 8 | 5.3 | 26 | 1 | 5977087 | 5977094 | 5977098 | 5977102 | — |
| 7 | 0.75 | 66 | 13 | 7.10 | 5.60 | 3 | 8 | 6.3 | 26 | 1 | 5977106 | 5977114 | 5977118 | — | — |
| 8 | 0.50 | 72 | 16 | 8.00 | 6.30 | 3 | 9 | 7.5 | 29 | 1 | 5977122 | 5977126 | 5977130 | — | — |
| 8 | 0.75 | 72 | 16 | 8.00 | 6.30 | 3 | 9 | 7.3 | 29 | 1 | 5977134 | 5977136 | 5977141 | 5977145 | — |
| 8 | 1.00 | 72 | 16 | 8.00 | 6.30 | 3 | 9 | 7 | 29 | 1 | 5977149 | 5977155 | 5977161 | 5977163 | — |
| 9 | 0.75 | 72 | 16 | 9.00 | 7.10 | 3 | 10 | 8.3 | 29 | 1 | — | — | 5977168 | — | — |
| 9 | 1.00 | 72 | 16 | 9.00 | 7.10 | 3 | 10 | 8 | 29 | 1 | 5977172 | 5977177 | 5977182 | — | — |
| 10 | 0.50 | 80 | 18 | 10.00 | 8.00 | 3 | 11 | 9.5 | 34 | 1 | — | — | 5977390 | — | — |
| 10 | 0.75 | 80 | 18 | 10.00 | 8.00 | 3 | 11 | 9.3 | 34 | 1 | 5977393 | 5977396 | 5977398 | — | — |
| 10 | 1.00 | 80 | 18 | 10.00 | 8.00 | 3 | 11 | 9 | 34 | 1 | 5977402 | 5977404 | 5977407 | 5976716 | 5976682 |
| 10 | 1.25 | 80 | 18 | 10.00 | 8.00 | 3 | 11 | 8.8 | 34 | 1 | 5976737 | 5976768 | 5976817 | 5976833 | 5976828 |
| 11 | 0.75 | 85 | 19 | 8.00 | 6.30 | 3 | 9 | 10.3 | — | 1 | 5976838 | 5976843 | 5976686 | — | — |
| 11 | 1.00 | 85 | 19 | 8.00 | 6.30 | 3 | 9 | 10 | — | 1 | 5976690 | 5976693 | 5976696 | — | — |
| 11 | 1.25 | 85 | 19 | 8.00 | 6.30 | 3 | 9 | 9.8 | — | 1 | — | — | 5976699 | — | — |
| 12 | 0.75 | 89 | 22 | 9.00 | 7.10 | 3 | 10 | 11.3 | — | 1 | — | — | 5976702 | — | — |
| 12 | 1.00 | 89 | 22 | 9.00 | 7.10 | 3 | 10 | 11 | — | 1 | 5976704 | 5976707 | 5976710 | 5976713 | — |
| 12 | 1.25 | 89 | 22 | 9.00 | 7.10 | 3 | 10 | 10.8 | — | 1 | 5976718 | 5976719 | 5976721 | 5976725 | 5976723 |
| 12 | 1.50 | 89 | 22 | 9.00 | 7.10 | 3 | 10 | 10.5 | — | 1 | 5976727 | 5976729 | 5976731 | 5976735 | 5976733 |
| 13 | 1.50 | 89 | 22 | 9.00 | 7.10 | 3 | 10 | 11.5 | — | 1 | — | — | 5976739 | — | — |
| 14 | 1.00 | 95 | 24 | 11.20 | 9.00 | 4 | 12 | 13 | — | 1 | 5976742 | 5976744 | 5976747 | 5976751 | — |
| 14 | 1.25 | 95 | 24 | 11.20 | 9.00 | 4 | 12 | 12.8 | — | 1 | 5976755 | 5976758 | 5976760 | — | 5976763 |
| 14 | 1.50 | 95 | 24 | 11.20 | 9.00 | 4 | 12 | 12.5 | — | 1 | 5976773 | 5976777 | 5976780 | 5976788 | 5976784 |
| 15 | 1.50 | 95 | 24 | 11.20 | 9.00 | 4 | 12 | 13.5 | — | 1 | — | 5976793 | 5976797 | — | — |
| 16 | 1.00 | 102 | 24 | 12.50 | 10.00 | 4 | 13 | 15 | — | 1 | 5976806 | 5976813 | 5976823 | 5977250 | — |
| 16 | 1.25 | 102 | 24 | 12.50 | 10.00 | 4 | 13 | 14.8 | — | 1 | — | — | 5977291 | — | — |
| 16 | 1.50 | 102 | 24 | 12.50 | 10.00 | 4 | 13 | 14.5 | — | 1 | 5977327 | 5977362 | 5977395 | 5977401 | 5977400 |

HAND TAPS

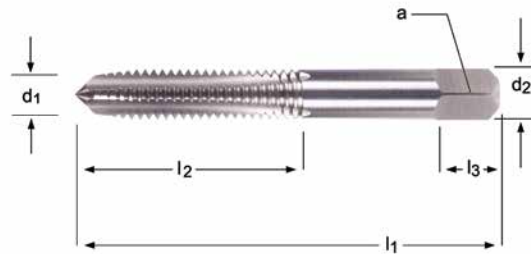


| Nominal d ₁ | Pitch MF | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | # of Flutes | l ₃ mm |  | l ₄ mm | Pack Qty | Taper | Plug | Semi - Bottoming | 2 Pc Sets | 3 Pc Sets |
|---------------------------|-------------|----------------------|----------------------|---------------------------|--------------|----------------|----------------------|---|----------------------|-------------|---------|---------|---------------------|--------------|--------------|
| 18 | 1.00 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 17 | | 1 | 5977403 | 5977405 | 5977255 | 5977258 | — |
| 18 | 1.50 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 16.5 | | 1 | 5977261 | 5977264 | 5977267 | 5977275 | 5977271 |
| 18 | 2.00 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 16 | | 1 | 5977279 | 5977283 | 5977287 | 5977295 | — |
| 20 | 1.00 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 19 | | 1 | 5977299 | 5977302 | 5977305 | 5977308 | — |
| 20 | 1.50 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 18.5 | | 1 | 5977311 | 5977314 | 5977318 | 5977324 | 5977322 |
| 20 | 2.00 | 112 | 29 | 14.00 | 11.20 | 4 | 14 | 18 | | 1 | 5977330 | 5977333 | 5977336 | 5977341 | — |
| 22 | 1.00 | 118 | 29 | 16.00 | 12.50 | 4 | 16 | 21 | | 1 | — | 5977344 | 5977347 | 5977350 | — |
| 22 | 1.50 | 118 | 29 | 16.00 | 12.50 | 4 | 16 | 20.5 | | 1 | 5977353 | 5977356 | 5977359 | 5977365 | — |
| 22 | 2.00 | 118 | 29 | 16.00 | 12.50 | 4 | 16 | 20 | | 1 | 5977369 | 5977372 | 5977375 | 5977378 | — |
| 24 | 1.00 | 130 | 35 | 18.00 | 14.00 | 4 | 18 | 23 | | 1 | — | 5977381 | 5977383 | — | — |
| 24 | 1.50 | 130 | 35 | 18.00 | 14.00 | 4 | 18 | 22.5 | | 1 | 5977386 | 5977389 | 5977392 | 5977399 | — |
| 24 | 2.00 | 130 | 35 | 18.00 | 14.00 | 4 | 18 | 22 | | 1 | 5976996 | 5977038 | 5977079 | 5977121 | — |
| 25 | 1.50 | 130 | 35 | 18.00 | 14.00 | 4 | 18 | 23.5 | | 1 | 5977166 | 5977175 | 5977179 | 5977193 | 5977187 |
| 26 | 1.50 | 130 | 35 | 18.00 | 14.00 | 4 | 18 | 24.5 | | 1 | — | 5977000 | 5977003 | — | — |
| 27 | 1.50 | 135 | 35 | 20.00 | 16.00 | 4 | 20 | 25.5 | | 1 | — | 5977006 | 5977010 | — | — |
| 27 | 2.00 | 135 | 35 | 20.00 | 16.00 | 4 | 20 | 25 | | 1 | — | — | 5977013 | — | — |
| 28 | 1.50 | 138 | 35 | 20.00 | 16.00 | 4 | 20 | 26.5 | | 1 | — | 5977017 | 5977021 | — | — |
| 30 | 1.50 | 138 | 41 | 20.00 | 16.00 | 4 | 20 | 28.5 | | 1 | — | 5977045 | 5977049 | — | — |
| 30 | 2.00 | 138 | 41 | 20.00 | 16.00 | 4 | 20 | 28 | | 1 | — | 5977053 | 5977057 | — | — |
| 32 | 1.50 | 151 | 41 | 22.40 | 18.00 | 4 | 22 | 30.5 | | 1 | 5977062 | 5977065 | 5977068 | — | — |
| 33 | 2.00 | 151 | 41 | 22.40 | 18.00 | 4 | 22 | 31 | | 1 | — | 5977071 | 5977075 | — | — |
| 35 | 1.50 | 162 | 47 | 25.00 | 20.00 | 4 | 24 | 33.5 | | 1 | — | 5977082 | 5977086 | — | — |
| 36 | 1.50 | 162 | 47 | 25.00 | 20.00 | 4 | 24 | 34.5 | | 1 | — | — | 5977090 | — | — |
| 36 | 2.00 | 162 | 47 | 25.00 | 20.00 | 4 | 24 | 34 | | 1 | — | 5977093 | 5977097 | — | — |
| 36 | 3.00 | 162 | 47 | 25.00 | 20.00 | 4 | 24 | 33 | | 1 | — | 5977101 | 5977105 | — | — |
| 39 | 3.00 | 170 | 47 | 28.00 | 22.40 | 4 | 26 | 36 | | 1 | — | 5977109 | 5977113 | — | — |
| 40 | 1.50 | 170 | 53 | 28.00 | 22.40 | 6 | 26 | 38.5 | | 1 | — | 5977137 | 5977140 | — | — |
| 42 | 1.50 | 170 | 53 | 28.00 | 22.40 | 6 | 26 | 40.5 | | 1 | — | 5977144 | 5977151 | — | — |
| 42 | 3.00 | 170 | 53 | 28.00 | 22.40 | 6 | 26 | 39 | | 1 | — | — | 5977156 | — | — |
| 45 | 1.50 | 187 | 54 | 31.50 | 25.00 | 6 | 28 | 43.5 | | 1 | — | 5977160 | 5977164 | — | — |
| 48 | 1.50 | 187 | 60 | 31.50 | 25.00 | 6 | 28 | 46.5 | | 1 | — | — | 5977170 | — | — |
| 48 | 2.00 | 187 | 60 | 31.50 | 25.00 | 6 | 28 | 46 | | 1 | — | — | 5977058 | — | — |
| 48 | 3.00 | 187 | 60 | 31.50 | 25.00 | 6 | 28 | 45 | | 1 | — | — | 5977110 | — | — |
| 50 | 1.50 | 187 | 60 | 31.50 | 25.00 | 6 | 28 | 48.5 | | 1 | — | 5977067 | 5977072 | — | — |

Note: ISO shank and square dimensions will necessitate metric holders

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"

| | | | l_1 | l_2 | d_2 | \square | l_3 | | | | Pack Qty | 1500L | |
|------|------|-----|---------|---------|--------|-----------|-------|------|-------------|--------|----------|---------|--|
| UNC | UNF | UNS | TPI | Inch | Inch | Inch | Inch | Inch | # of Flutes | Limits | Chamfer | | |
| | 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006636 | |
| 1/4 | | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006635 | |
| | 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006655 | |
| 5/16 | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006653 | |
| | 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006649 | |
| 3/8 | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006647 | |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006663 | |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 6006661 | |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6006634 | |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 6006632 | |
| | 9/16 | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 6006671 | |
| 9/16 | | 12 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 6006669 | |
| | 5/8 | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 6006659 | |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 6006657 | |
| | 3/4 | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 6006645 | |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 6006643 | |
| | 7/8 | 14 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 6006665 | |
| 7/8 | | 9 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 6006667 | |
| | 1" | 12 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 6006637 | |
| 1" | | 8 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 6006641 | |

HAND TAPS



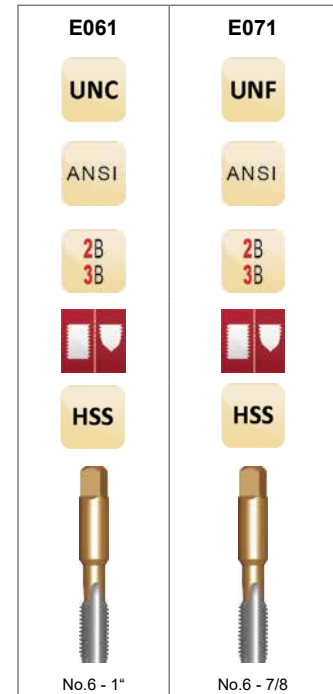
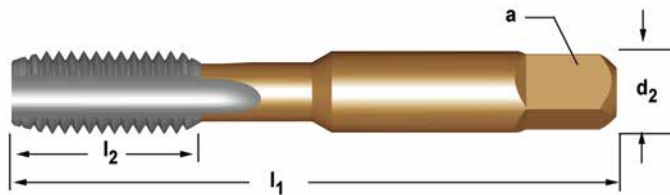
General Purpose

E061 The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications.
E071 Available in 3 chamfer lengths - taper, plug, and semi-bottoming.

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

Premium substrate with bronze tempered 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 UNF | TPI UNF | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch / | a Inch | # of Flutes | Limits | Flute | | l ₄ Inch | Pack Qty | Taper | Plug | Semi - Bottoming | Sets |
|---------------------------|---------------|------------|------------------------|------------------------|-------------------------------|-----------|----------------|--------|-------|--------|------------------------|-----------------------|---------|---------|---------------------|------|
| | | | | | | | | | ↔ | ↔ | | | | | | |
| 6 | 32 | 2" | 0.5800 | 0.1410 | 0.1100 | 3 | H3 | 36 | 2.85 | 0.5800 | 1 | 5974286 | 5974288 | 5974290 | 5974295 | |
| 6 | 40 | 2" | 0.5800 | 0.1410 | 0.1100 | 3 | H2 | 33 | 2.90 | 0.5800 | 1 | 5974142 | 5974147 | 5974152 | 5974162 | |
| 8 | 32 | 2.1/8 | 0.6500 | 0.1680 | 0.1310 | 4 | H3 | 29 | 3.50 | 0.6500 | 1 | 5974326 | 5974335 | 5974337 | 5974342 | |
| 8 | 36 | 2.1/8 | 0.6500 | 0.1680 | 0.1310 | 4 | H2 | 29 | 3.50 | 0.6500 | 1 | 5974198 | 5974205 | 5974209 | 5974213 | |
| 10 | 24 | 2.3/8 | 0.7600 | 0.1940 | 0.1520 | 4 | H3 | 25 | 3.90 | 0.7600 | 1 | 5974292 | 5974330 | 5974387 | 5974396 | |
| 10 | 32 | 2.3/8 | 0.7600 | 0.1940 | 0.1520 | 4 | H3 | 21 | 4.10 | 0.7600 | 1 | 5974157 | 5974201 | 5974239 | 5974244 | |
| 12 | 24 | 2.3/8 | 0.8100 | 0.2200 | 0.1650 | 4 | H3 | 16 | 4.50 | 0.8100 | 1 | 5974402 | 5974406 | 5974412 | 5974257 | |
| 12 | 28 | 2.3/8 | 0.8100 | 0.2200 | 0.1650 | 4 | H3 | 15 | 4.70 | 0.8100 | 1 | 5974247 | 5974249 | 5974250 | 5974063 | |
| 1/4 | 20 | 2.1/2 | 0.6500 | 0.2550 | 0.1910 | 4 | H3 | 7 | 5.10 | 1.0630 | 1 | 5974924 | 5974927 | 5974930 | 5974933 | |
| 1/4 | 28 | 2.1/2 | 0.6500 | 0.2550 | 0.1910 | 4 | H3 | 3 | 5.50 | 1.0630 | 1 | 5974681 | 5974685 | 5974689 | 5974694 | |
| 5/16 | 18 | 2.23/32 | 0.7700 | 0.3180 | 0.2380 | 4 | H3 | F | 6.60 | 1.2598 | 1 | 5974272 | 5974274 | 5974275 | 5974277 | |
| 5/16 | 24 | 2.23/32 | 0.7700 | 0.3180 | 0.2380 | 4 | H3 | I | 6.90 | 1.2598 | 1 | 5974100 | 5974108 | 5974114 | 5974118 | |
| 3/8 | 16 | 2.15/16 | 0.8100 | 0.3810 | 0.2860 | 4 | H3 | 5/16 | 8.00 | 1.3780 | 1 | 5974267 | 5974269 | 5974270 | 5974271 | |
| 3/8 | 24 | 2.15/16 | 0.8100 | 0.3810 | 0.2860 | 4 | H3 | Q | 8.50 | 1.3780 | 1 | 5974082 | 5974086 | 5974091 | 5974094 | |
| 7/16 | 14 | 3.5/32 | 0.9055 | 0.3230 | 0.2420 | 4 | H3 | U | 9.40 | | 1 | 5974298 | 5974300 | 5974303 | 5974307 | |
| 7/16 | 20 | 3.5/32 | 0.9055 | 0.3230 | 0.2420 | 4 | H3 | 25/64 | 9.90 | | 1 | 5974166 | 5974170 | 5974175 | 5974179 | |
| 1/2 | 13 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 4 | H3 | 27/64 | 10.80 | | 1 | 5974912 | 5974915 | 5974918 | 5974921 | |
| 1/2 | 20 | 3.3/8 | 0.9055 | 0.3670 | 0.2750 | 4 | H3 | 29/64 | 11.50 | | 1 | 5974659 | 5974664 | 5974668 | 5974679 | |
| 9/16 | 12 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 4 | H3 | 27/64 | 12.20 | | 1 | 5974347 | 5974355 | 5974363 | 5974368 | |
| 9/16 | 18 | 3.19/32 | 0.9843 | 0.4290 | 0.3220 | 4 | H3 | 33/64 | 12.90 | | 1 | 5974217 | 5974221 | 5974224 | 5974227 | |
| 5/8 | 11 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 4 | H3 | 17/32 | 13.50 | | 1 | 5974278 | 5974280 | 5974282 | 5974284 | |
| 5/8 | 18 | 3.13/16 | 0.9843 | 0.4800 | 0.3600 | 4 | H3 | 37/64 | 14.50 | | 1 | 5974123 | 5974128 | 5974133 | 5974138 | |
| 3/4 | 10 | 4.1/4 | 1.1811 | 0.5900 | 0.4420 | 4 | H3 | 21/32 | 16.50 | | 1 | 5974259 | 5974261 | 5974263 | 5974265 | |
| 3/4 | 16 | 4.1/4 | 1.1811 | 0.5900 | 0.4420 | 4 | H3 | 11/16 | 17.50 | | 1 | 5974067 | 5974071 | 5974075 | 5974079 | |
| 7/8 | 9 | 4.11/16 | 1.1811 | 0.6970 | 0.5230 | 4 | H4 | 49/64 | 19.50 | | 1 | 5974310 | 5974314 | 5974318 | — | |
| 7/8 | 14 | 4.11/16 | 1.1811 | 0.6970 | 0.5230 | 4 | H4 | 13/16 | 20.40 | | 1 | 5974182 | 5974185 | 5974190 | 5974194 | |
| 1" | 8 | 5.1/8 | 1.4173 | 0.8000 | 0.6000 | 4 | H4 | 7/8 | 22.25 | | 1 | 5974936 ¹⁾ | — | — | — | |

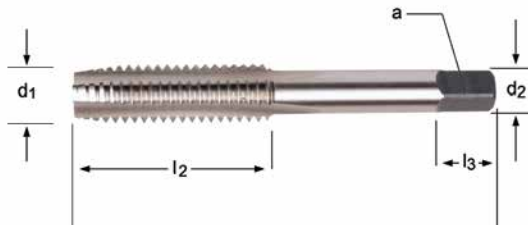
¹⁾ Bright Finish

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.



| | | l_1 | l_2 | d_2 | \square | l_3 | # of | | Pack | 1508(UNC) | 1508(UNF) | 1595 |
|------|---------|---------|---------|--------|-----------|-------|--------|--------|------|-----------|-----------|---------|
| UNC | UNF TPI | Inch | Inch | Inch | Inch | Inch | Flutes | Limits | Qty | | | |
| | 1/4 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | — | 6007576 | — |
| | 1/4 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | — | — | 6007668 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007567 | — | — |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | — | — | 6007870 |
| | 1/4 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | — | — | — |
| | 1/4 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | — | — | 6007672 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007572 | — | — |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | — | — | 6007871 |
| | 5/16 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | — | 6006862 | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6006814 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | — | — | 6007677 |
| | 5/16 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | — | 6006866 | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6006856 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | — | — | 6007682 |
| | 3/8 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | — | 6006730 | — |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007591 | — | — |
| | 3/8 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | — | 6006777 | — |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6006681 | — | — |
| | 7/16 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | — | 6006874 | — |
| 7/16 | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6006870 | — | — |
| | 1/2 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | — | 6007562 | — |
| 1/2 | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007553 | — | — |
| 1/2 | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007558 | — | — |

HAND TAPS



General Purpose

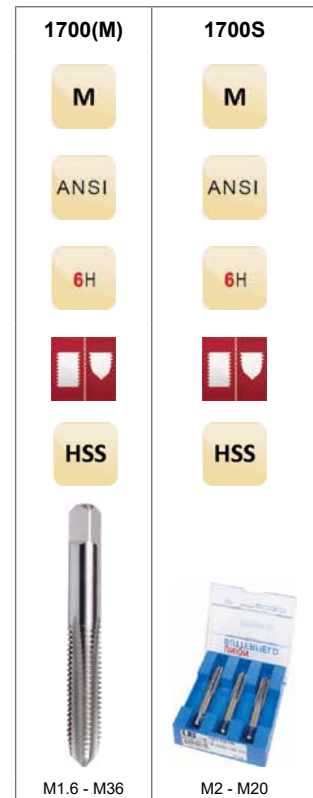
1700(M) The most versatile taps for hand use or machine tapping in a wide variety of materials in through or blind hole applications. Available in 3 chamfer lengths - taper, plug, and bottoming.

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).

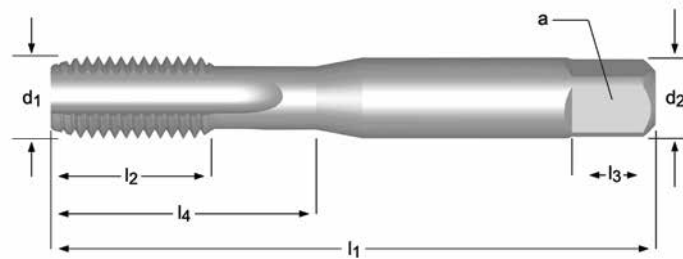


| Nominal d ₁ | Pitch M | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch / | l ₃ Inch | ∠ a Inch | # of Flutes | Limits | Pack Qty | Taper | Plug | Bottoming | Sets |
|---------------------------|------------|------------------------|------------------------|-------------------------------|------------------------|----------------|----------------|--------|-------------|---------|---------|-----------|---------|
| M1.6 | 0.35 | 1.5/8 | 5/16 | 0.1410 | 3/16 | 0.1100 | 2 | D3 | 1 | 6008954 | 6009005 | 6009064 | — |
| M1.8 | 0.35 | 1.11/16 | 3/8 | 0.1410 | 3/16 | 0.1100 | 2 | D3 | 1 | 6009078 | 6009080 | — | — |
| M2 | 0.40 | 1.3/4 | 7/16 | 0.1410 | 3/16 | 0.1100 | 3 | D3 | 1 | 6009056 | 6009071 | 6008657 | 6008649 |
| M2.3 | 0.40 | 1.3/4 | 7/16 | 0.1410 | 3/16 | 0.1100 | 3 | D3 | 1 | — | 6009014 | 6009024 | — |
| M2.5 | 0.45 | 1.13/16 | 1/2 | 0.1410 | 3/16 | 0.1100 | 3 | D3 | 1 | 6009028 | 6009033 | 6009038 | 6008642 |
| M2.6 | 0.45 | 1.13/16 | 1/2 | 0.1410 | 3/16 | 0.1100 | 3 | D3 | 1 | 6009042 | 6009047 | — | — |
| M3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 3/16 | 0.1100 | 3 | D3 | 1 | 6008727 | 6008732 | 6008737 | 6008660 |
| M3.5 | 0.60 | 2" | 11/16 | 0.1410 | 3/16 | 0.1100 | 3 | D4 | 1 | 6008712 | 6008717 | 6008723 | 6008655 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 1/4 | 0.1310 | 4 | D4 | 1 | 6008787 | 6008790 | 6008794 | 6008666 |
| M4.5 | 0.75 | 2.3/8 | 7/8 | 0.1940 | 1/4 | 0.1520 | 4 | D4 | 1 | 6008772 | 6008777 | — | — |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 1/4 | 0.1520 | 4 | D4 | 1 | 6008798 | 6008801 | 6008814 | 6008673 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 4 | D5 | 1 | 6008818 | 6008822 | 6008828 | 6008687 |
| M7 | 1.00 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 4 | D5 | 1 | 6008833 | 6008837 | 6008842 | 6008696 |
| M8 | 1.00 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 4 | D5 | 1 | 6008847 | 6008851 | 6008854 | 6008700 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 4 | D5 | 1 | 6008861 | 6008630 | 6008678 | 6008708 |
| M9 | 1.25 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 4 | D5 | 1 | — | 6008743 | 6008800 | — |
| M10 | 1.25 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 4 | D5 | 1 | 6009088 | 6008877 | 6008879 | 6008855 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 4 | D6 | 1 | 6008880 | 6008882 | 6008884 | 6008860 |
| M11 | 1.50 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 4 | D6 | 1 | — | 6008886 | 6008888 | — |
| M12 | 1.25 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 4 | D5 | 1 | 6008891 | 6008895 | 6008899 | 6008864 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 4 | D6 | 1 | 6008907 | 6008911 | 6008919 | 6008867 |
| M14 | 1.50 | 3.19/32 | 1.21/32 | 0.4290 | 1/2 | 0.3220 | 4 | D6 | 1 | 6008922 | 6008926 | 6008930 | — |
| M14 | 2.00 | 3.19/32 | 1.21/32 | 0.4290 | 1/2 | 0.3220 | 4 | D7 | 1 | 6008935 | 6008938 | 6008943 | 6008870 |
| M16 | 1.50 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 4 | D6 | 1 | 6008947 | 6008959 | 6008964 | — |
| M16 | 2.00 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 4 | D7 | 1 | 6008967 | 6008971 | 6008976 | 6008633 |
| M18 | 1.50 | 4.1/32 | 1.13/16 | 0.5420 | 5/8 | 0.4060 | 4 | D6 | 1 | 6008981 | 6008985 | 6008990 | — |
| M18 | 2.50 | 4.1/32 | 1.13/16 | 0.5420 | 5/8 | 0.4060 | 4 | D7 | 1 | 6008995 | 6008999 | 6009009 | 6008636 |
| M20 | 1.50 | 4.15/32 | 2" | 0.6520 | 11/16 | 0.4890 | 4 | D6 | 1 | 6008707 | 6008759 | 6008806 | — |
| M20 | 2.50 | 4.15/32 | 2" | 0.6520 | 11/16 | 0.4890 | 4 | D7 | 1 | 6008858 | 6008863 | 6008866 | 6008652 |
| M22 | 1.50 | 4.11/16 | 2.7/32 | 0.6970 | 3/4 | 0.5230 | 4 | D6 | 1 | 6008869 | 6008871 | 6008663 | — |
| M22 | 2.50 | 4.11/16 | 2.7/32 | 0.6970 | 3/4 | 0.5230 | 4 | D7 | 1 | 6008668 | 6008672 | 6008676 | — |
| M24 | 2.00 | 4.29/32 | 2.7/32 | 0.7600 | 3/4 | 0.5700 | 4 | D7 | 1 | 6008681 | 6008685 | 6008691 | — |
| M24 | 3.00 | 4.29/32 | 2.7/32 | 0.7600 | 3/4 | 0.5700 | 4 | D8 | 1 | 6008695 | 6008698 | 6008703 | — |
| M30 | 3.50 | 5.7/16 | 2.9/16 | 1.0210 | 1" | 0.7660 | 4 | D9 | 1 | 6008742 | 6008746 | 6008751 | — |
| M36 | 4.00 | 6.1/16 | 3" | 1.2330 | 1.1/8 | 0.9250 | 4 | D9 | 1 | — | 6008763 | 6008768 | — |

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 semi-bottoming chamfer. For through or blind hole applications.



E501

M

ISO
529

6H



HSS



M3 - M24

| 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 | Semi - Bottoming | |
|------------------|------------|-------------|-------------|------------------|-----------|-------------|----------------|-------------|--------|-------------|-------|---------|---------------------|---------|
| 3 | 0.50 | 48 | 12.5 | 3.15 | 2.50 | 5 | 3 | 2.5 | 12.5 | D3 | 1 | 5977154 | 5977158 | 5977169 |
| 4 | 0.70 | 53 | 14 | 4.00 | 3.15 | 6 | 3 | 3.3 | 14 | D4 | 1 | 5976769 | 5976814 | 5976856 |
| 5 | 0.80 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.2 | 22 | D4 | 1 | — | 5976942 | 5976949 |
| 6 | 1.00 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5 | 26 | D5 | 1 | 5976952 | 5976955 | 5976958 |
| 8 | 1.25 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.8 | 29 | D5 | 1 | 5976771 | 5976775 | 5976779 |
| 10 | 1.50 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.5 | 34 | D6 | 1 | 5977063 | 5977066 | 5977070 |
| 12 | 1.75 | 89 | 22 | 9.00 | 7.10 | 10 | 3 | 10.3 | | D6 | 1 | 5977078 | 5977081 | 5977085 |
| 14 | 2.00 | 95 | 24 | 11.20 | 9.00 | 12 | 4 | 12 | | D7 | 1 | 5977089 | 5977092 | 5977096 |
| 16 | 2.00 | 102 | 24 | 12.50 | 10.00 | 13 | 4 | 14 | | D7 | 1 | 5977100 | 5977104 | 5977108 |
| 18 | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 15.5 | | D7 | 1 | — | — | 5977120 |
| 20 | 2.50 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 17.5 | | D7 | 1 | 5977124 | 5977129 | 5977132 |
| 22 | 2.50 | 118 | 29 | 16.00 | 12.50 | 16 | 4 | 19.5 | | D7 | 1 | — | — | 5977142 |
| 24 | 3.00 | 130 | 35 | 18.00 | 14.00 | 18 | 4 | 21 | | D8 | 1 | — | 5977147 | 5977150 |

Note: ISO shank and square dimensions will necessitate metric holders

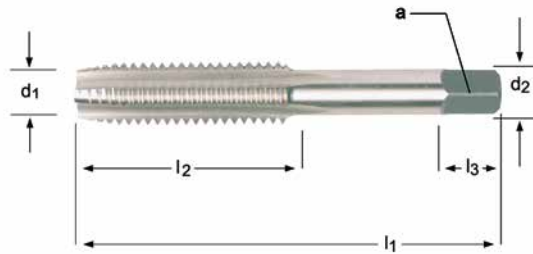
HAND TAPS



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

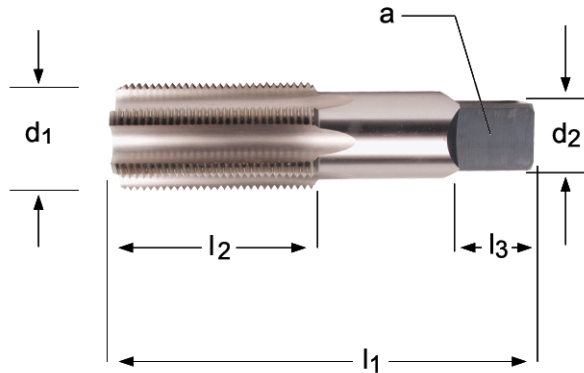


1/4 - 5/8

| UNC | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | 6006967 |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H11 | Plug | 1 | 6007239 |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H11 | Plug | 1 | 6007152 |
| 1/2 | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H11 | Plug | 1 | 6007027 |
| 5/8 | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H11 | Plug | 1 | 6007375 |

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 \varnothing Inch / | \square 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 | 6007424 | 6007478 | 6007534 |
| 1.1/4 | 8 | 5.3/4 | 2.9/16 | 1.0210 | 0.7660 | 1" | 4 | H5 | 1 | 6007579 | 6007589 | 6007378 |
| 1.3/8 | 8 | 6.1/16 | 3" | 1.1080 | 0.8310 | 1.1/16 | 4 | H5 | 1 | 6007605 | 6007610 | 6007383 |
| 1.1/2 | 8 | 6.3/8 | 3" | 1.2330 | 0.9250 | 1.1/8 | 6 | H5 | 1 | 6007565 | 6007570 | 6007575 |
| 1.5/8 | 8 | 6.11/16 | 3.3/16 | 1.3050 | 0.9780 | 1.1/8 | 6 | H6 | 1 | 6007387 | 6007391 | 6007396 |
| 1.3/4 | 8 | 7" | 3.3/16 | 1.4300 | 1.0720 | 1.1/4 | 6 | H6 | 1 | 6007586 | 6007596 | 6007601 |
| 1.7/8 | 8 | 7.5/16 | 3.9/16 | 1.5190 | 1.1390 | 1.1/4 | 6 | H6 | 1 | 6007400 | 6007403 | 6007407 |
| 2" | 8 | 7.5/8 | 3.9/16 | 1.6440 | 1.2330 | 1.3/8 | 6 | H6 | 1 | 6009511 | 6007524 | 6007529 |

HAND TAPS



For Cast Iron

1599 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 tempered coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.

1600

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 | 6007787 | 6007791 | — | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H5 | 1 | — | — | 6008145 | 6008149 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | H5 | 1 | — | — | 6008153 | 6008158 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | 6007853 | 6007856 | — | — |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H5 | 1 | — | — | — | 6008209 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | — | 6007861 | — | — |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H5 | 1 | — | — | 6008212 | 6008217 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 6007835 | 6007840 | — | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H5 | 1 | — | — | 6008182 | 6008187 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 6007845 | 6007849 | — | — |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H5 | 1 | — | — | 6008191 | 6008199 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H5 | 1 | — | — | 6008245 | 6008254 |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | 1 | — | 6008330 | — | — |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H5 | 1 | — | — | 6008260 | 6008266 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 6007763 | 6007767 | — | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H5 | 1 | — | — | — | 6008136 |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 6007776 | 6007782 | — | — |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H5 | 1 | — | — | 6008138 | 6008141 |
| 9/16 | 12 | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H5 | 1 | — | — | 6008268 | 6008270 |
| 9/16 | | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | — | 6008354 | — | — |
| 9/16 | | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H5 | 1 | — | — | — | 6008285 |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | 1 | 6007863 | 6007865 | — | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H5 | 1 | — | — | 6008226 | 6008231 |
| 3/4 | 10 | | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | — | 6007814 | — | — |
| 3/4 | 10 | | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H5 | 1 | — | — | — | 6008165 |
| 3/4 | | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | 6007819 | 6007824 | — | — |
| 3/4 | | 16 | 4.1/4 | 2" | 0.5900 | 0.4420 | 11/16 | 4 | H5 | 1 | — | — | — | 6008178 |

For Cast Iron

1599(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 tempered coating reduces wear and chip welding in abrasive materials. For through or blind hole applications.

1599SB(M)



1599(M)

M

ANSI

6H



HSS



M6 - M14

| Nominal d_1 | Pitch M | l_1 Inch | l_2 Inch | d_2 \varnothing Inch / | \square a Inch | l_3 Inch | # of Flutes | Limits | Pack Qty | 1599M Plug | 1599M Bottoming |
|------------------|------------|---------------|---------------|----------------------------------|------------------------|---------------|----------------|--------|-------------|---------------|--------------------|
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 4 | D5 | 1 | 6007738 | 6007742 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | D5 | 1 | 6007754 | 6007759 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | D6 | 1 | 6007695 | 6007699 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | D6 | 1 | 6007708 | 6007712 |
| M14 | 1.25 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | D4 | 1 | 6007722 | — |

HAND TAPS



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

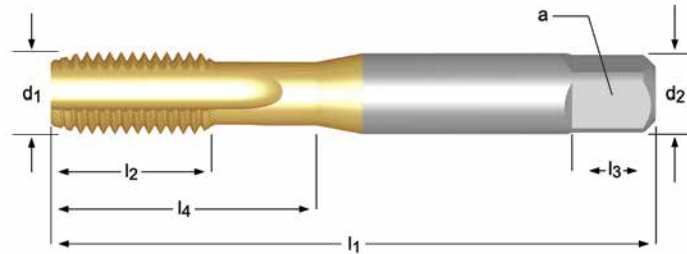
6H



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 | 5976834 |
| 4 | 0.70 | 53 | 14 | 4.00 | 3.15 | 6 | 3 | 3.3 | 14 | D4 | 1 | 5976842 |
| 5 | 0.80 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.2 | 22 | D4 | 1 | 5976848 |
| 6 | 1.00 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5 | 26 | D5 | 1 | 5976860 |
| 8 | 1.25 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.8 | 29 | D5 | 1 | 5976868 |
| 10 | 1.50 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.5 | 34 | D6 | 1 | 5976786 |

Note: ISO shank and square dimensions will necessitate metric holders

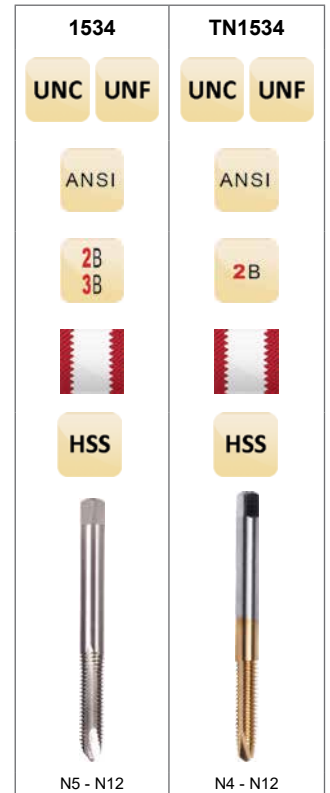
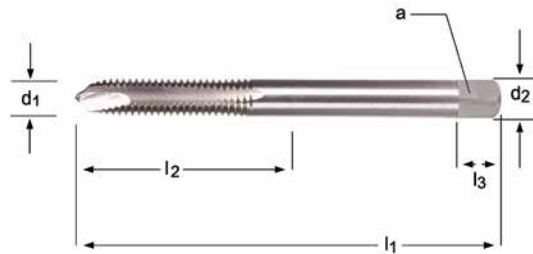
Relieved Style, Machine Screw Sizes

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 | l_2 | d_2 | \square | l_3 | # of Flutes | Limits | Chamfer | Pack Qty | 1534 | TN1534 |
|------|------|------|---------|-------|--------|--------|-------|-------|-----------|-----------|-------------|---------|---------|----------|------|--------|
| Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | | | | | | |
| 4 | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | — | 6006760 | — | | |
| | 5 | 44 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6006753 | — | | | |
| 5 | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6006757 | — | | | |
| | 6 | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6006790 | — | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6006764 | — | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6006768 | — | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Plug | 1 | 6006778 | 6007377 | | | |
| | 6 | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6006794 | — | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6006772 | — | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Bottoming | 1 | 6006786 | — | | | |
| | 8 | 36 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 6006812 | — | | | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H1 | Plug | 1 | 6006798 | — | | | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 6006801 | — | | | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Plug | 1 | 6006806 | 6007420 | | | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Bottoming | 1 | 6006803 | — | | | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Bottoming | 1 | 6006809 | — | | | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H1 | Plug | 1 | 6006706 | — | | | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 6006711 | — | | | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 6006719 | 6006763 | | | |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 6006690 | — | | | |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 6006698 | 6006759 | | | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 6006714 | — | | | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 6006724 | — | | | |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 6006694 | — | | | |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 6006702 | — | | | |
| | 12 | 28 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 6006743 | — | | | |
| 12 | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 6006729 | 6006767 | | | |
| 12 | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Bottoming | 1 | 6006739 | — | | | |

SPIRAL POINT TAPS



Relieved Style, Fractional Sizes

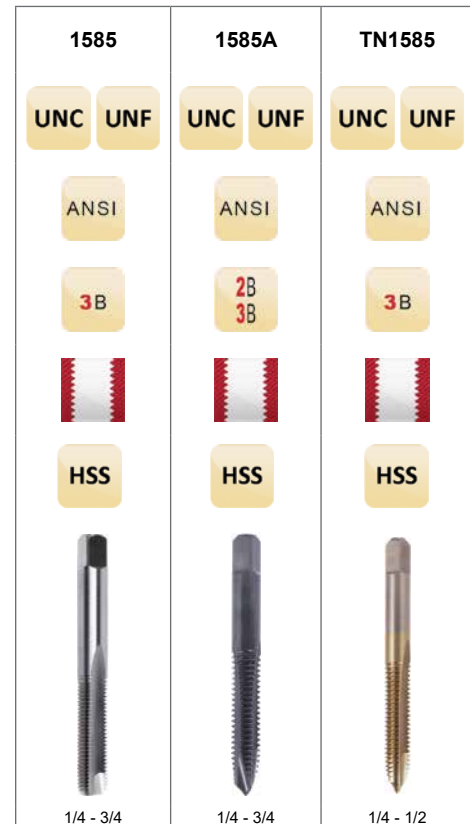
- 1585** Spiral point taps are designed to solve the problem of tap breakage in through hole applications in a variety of materials.
- 1585A** The angular flutes in the cutting face propel the chips ahead of the cutting zone, thus reducing loading and clogging in the flutes.
- TN1585**

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 tempered - reduces wear and prevents chip welding in harder ferrous materials.

TiN Coating - increases surface hardness and improves tool life.



| | | l_1 | l_2 | d_2 | l_3 | \square | | | | Pack Qty | 1585 | 1585A | TN1585 |
|------|-----|---------|-------|--------|-------|-----------|-------------|--------|-----------|----------|---------|---------|---------|
| UNC | UNF | TPI | Inch | Inch | Inch | Inch | # of Flutes | Limits | Chamfer | | | | |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H1 | Plug | 1 | 6007168 | — | — |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H2 | Plug | 1 | 6007226 | — | — |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H3 | Plug | 1 | 6007283 | 6007698 | 6007401 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 3 | H3 | Plug | 1 | 6007343 | — | 6007405 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 3 | H5 | Plug | 1 | 6007352 | — | 6007413 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H5 | Plug | 1 | 6007348 | — | 6007409 |
| 1/4 | 20 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H3 | Bottoming | 1 | 6007332 | — | — |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H2 | Plug | 1 | 6007129 | — | — |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 3 | H2 | Plug | 1 | 6007132 | — | — |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H3 | Plug | 1 | 6007135 | 6007702 | 6007416 |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H4 | Plug | 1 | 6007142 | — | — |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 3 | H4 | Plug | 1 | 6007146 | — | — |
| 1/4 | 28 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | H3 | Bottoming | 1 | 6007139 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H1 | Plug | 1 | 6007220 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H2 | Plug | 1 | 6007230 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H3 | Plug | 1 | 6007234 | 6007727 | 6007443 |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 3 | H3 | Plug | 1 | 6007249 | — | 6007446 |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 3 | H5 | Plug | 1 | 6007258 | — | 6007448 |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H5 | Plug | 1 | 6007252 | — | — |
| 5/16 | 18 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H3 | Bottoming | 1 | 6007242 | — | — |
| 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 3 | H2 | Plug | 1 | 6007272 | — | — |
| 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H3 | Plug | 1 | 6007280 | 6007731 | 6007453 |
| 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 3 | H4 | Plug | 1 | 6007297 | — | — |
| 5/16 | 24 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | H3 | Bottoming | 1 | 6007288 | — | — |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H1 | Plug | 1 | 6007173 | — | — |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H3 | Plug | 1 | 6007188 | 6007715 | 6007425 |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H2 | Plug | 1 | 6007177 | — | — |
| 3/8 | 16 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H5 | Plug | 1 | 6007192 | — | 6007432 |
| 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H3 | Plug | 1 | 6007206 | 6007719 | 6007438 |
| 3/8 | 24 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | H4 | Plug | 1 | 6007211 | — | — |

SPIRAL POINT TAPS

| UNC | UNF | TPI | l_1 Inch | l_2 Inch | d_2 \emptyset Inch | l_3 Inch | \square 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 | 6007323 | — | — |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 3 | H3 | Plug | 1 | 6007327 | 6007748 | 6007457 |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 3 | H5 | Plug | 1 | 6007337 | — | — |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 3 | H2 | Plug | 1 | 6007622 | — | — |
| | 7/16 | 20 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 3 | H3 | Plug | 1 | 6007651 | 6007752 | 6007461 |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H1 | Plug | 1 | 6007817 | — | — |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H2 | Plug | 1 | 6007821 | — | — |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H3 | Plug | 1 | 6007826 | 6007685 | 6007393 |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H5 | Plug | 1 | 6007832 | — | — |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H1 | Plug | 1 | 6007837 | — | — |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H2 | Plug | 1 | 6007843 | — | — |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H3 | Plug | 1 | 6007846 | 6007690 | 6007397 |
| | 1/2 | 20 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | H5 | Plug | 1 | 6007854 | — | — |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 3 | H3 | Plug | 1 | 6007308 | 6007737 | — |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 3 | H5 | Plug | 1 | 6007312 | — | — |
| | 5/8 | 18 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 3 | H3 | Plug | 1 | 6007316 | — | — |
| 3/4 | | 10 | 4.1/2 | 2" | 0.5900 | 11/16 | 0.4420 | 3 | H3 | Plug | 1 | — | 6007706 | — |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 11/16 | 0.4420 | 3 | H3 | Plug | 1 | 6007150 | — | — |
| 3/4 | | 10 | 4.1/4 | 2" | 0.5900 | 11/16 | 0.4420 | 3 | H5 | Plug | 1 | 6007154 | — | — |
| | 3/4 | 16 | 4.1/2 | 2" | 0.5900 | 11/16 | 0.4420 | 3 | H3 | Plug | 1 | — | 6007709 | — |
| | 3/4 | 16 | 4.1/4 | 2" | 0.5900 | 11/16 | 0.4420 | 3 | H3 | Plug | 1 | 6007158 | — | — |

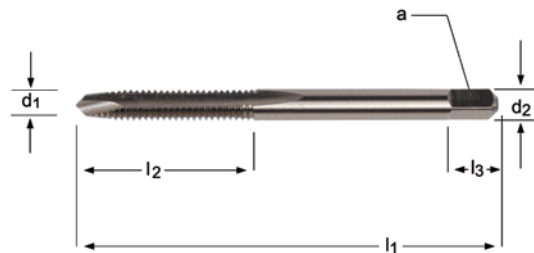
SPIRAL POINT TAPS



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 | \square 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 | 6008081 |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6008001 |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 6008058 |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 6008074 |

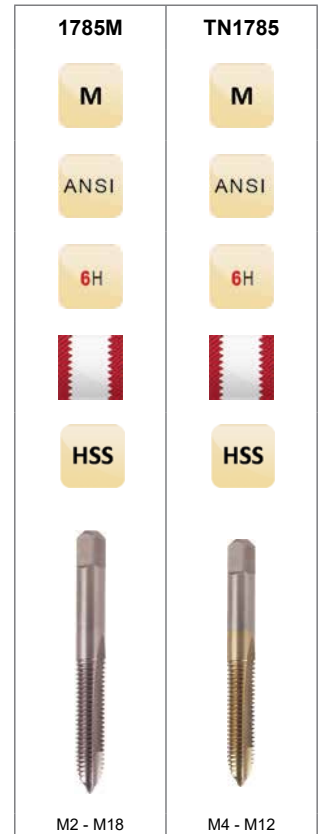
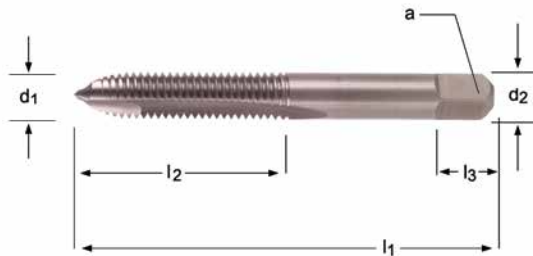
Relieved Style, Metric

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.



| M | P mm | l_1 Inch | l_2 Inch | d_2 Ø Inch | l_3 Inch | \square 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 | 6008747 | — |
| M2.5 | 0.45 | 1.13/16 | 1/2 | 0.1410 | 3/16 | 0.1100 | 2 | D3 | Plug | 1 | 6008764 | — |
| M3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 3/16 | 0.1100 | 2 | D3 | Plug | 1 | 6008773 | — |
| M3.5 | 0.60 | 2" | 11/16 | 0.1410 | 3/16 | 0.1100 | 2 | D4 | Plug | 1 | 6008778 | — |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 1/4 | 0.1310 | 2 | D4 | Plug | 1 | — | 6007488 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 1/4 | 0.1310 | 2 | D4 | Plug | 1 | 6008782 | — |
| M4.5 | 0.75 | 2.3/8 | 7/8 | 0.1940 | 1/4 | 0.1520 | 2 | D4 | Plug | 1 | 6008786 | — |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 1/4 | 0.1520 | 2 | D4 | Plug | 1 | — | 6007491 |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 1/4 | 0.1520 | 2 | D4 | Plug | 1 | 6008791 | — |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | D5 | Plug | 1 | — | 6007496 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 5/16 | 0.1910 | 2 | D5 | Plug | 1 | 6008796 | — |
| M7 | 1.00 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | D5 | Plug | 1 | 6008805 | — |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | D5 | Plug | 1 | — | 6007501 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 3/8 | 0.2380 | 2 | D5 | Plug | 1 | 6008810 | — |
| M9 | 1.25 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | D5 | Plug | 1 | 6008819 | — |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | D6 | Plug | 1 | — | 6007466 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 7/16 | 0.2860 | 3 | D6 | Plug | 1 | 6008714 | — |
| M11 | 1.50 | 3.5/32 | 1.7/16 | 0.3230 | 13/32 | 0.2420 | 3 | D6 | Plug | 1 | 6008718 | — |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | D6 | Plug | 1 | — | 6007480 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 7/16 | 0.2750 | 3 | D6 | Plug | 1 | 6008722 | — |
| M14 | 2.00 | 3.19/32 | 1.21/32 | 0.4290 | 1/2 | 0.3220 | 3 | D7 | Plug | 1 | 6008728 | — |
| M16 | 2.00 | 3.13/16 | 1.13/16 | 0.4800 | 9/16 | 0.3600 | 3 | D7 | Plug | 1 | 6008733 | — |
| M18 | 2.50 | 4.1/32 | 1.13/16 | 0.5420 | 5/8 | 0.4060 | 3 | D7 | Plug | 1 | 6008738 | — |

SPIRAL POINT TAPS

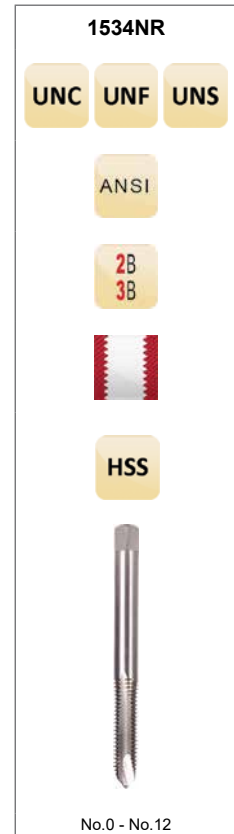
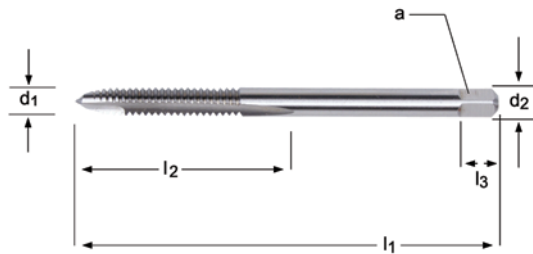


Non-Relieved Style, Machine Screw Sizes

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.



| UNC | UNF | UNS | TPI | <i>l₁</i> | <i>l₂</i> | <i>d₂</i> | <i>a</i> | <i>l₃</i> | # of Flutes | Limits | Chamfer | Pack Qty | 1534NR |
|----------|-----|-----|-----|-----------------------------|-----------------------------|-----------------------------|-----------------|-----------------------------|-------------|--------|-----------|----------|---------|
| | | | | Inch | Inch | Ø Inch | Inch | Inch | | | | | |
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007593 |
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007598 |
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007373 |
| | 1 | | 72 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007379 |
| | 1 | | 72 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007382 |
| 1 | | | 64 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007374 |
| 1 | | | 64 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007376 |
| | 2 | | 64 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007472 |
| | 2 | | 64 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007477 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007451 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007459 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007467 |
| | 3 | | 56 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007490 |
| | 3 | | 56 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007495 |
| 3 | | | 48 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007482 |
| 3 | | | 48 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007486 |
| | 4 | | 48 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007526 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007505 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007510 |
| | 4 | | 48 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007531 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007521 |
| | 5 | | 44 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007547 |
| 5 | | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007537 |
| 5 | | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007542 |
| | 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6006685 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 6007554 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 6007559 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Plug | 1 | 6007569 |
| | 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6006734 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 6007564 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Bottoming | 1 | 6007578 |
| | 8 | | 36 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 6006877 |

SPIRAL POINT TAPS

| | | | | l_1 | l_2 | d_2 \emptyset | \square a | l_3 | # of Flutes | Limits | Chamfer | Pack Qty | 1534NR |
|-----|-----|-----|-----|-------|-------|----------------------|----------------|-------|----------------|--------|-----------|-------------|---------|
| UNC | UNF | UNS | TPI | Inch | Inch | Inch | Inch | Inch | | | | | |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H1 | Plug | 1 | 6006782 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 6006818 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Plug | 1 | 6006867 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Bottoming | 1 | 6006859 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Bottoming | 1 | 6006871 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H1 | Plug | 1 | 6007412 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 6007417 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 6007426 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 6007421 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 6007430 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H1 | Plug | 1 | 6007386 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 6007390 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 6007399 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 6007394 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 6007404 |
| | 12 | | 28 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 6007445 |
| 12 | | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 6007435 |
| 12 | | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Bottoming | 1 | 6007440 |

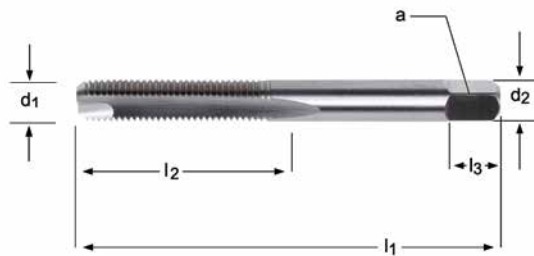
SPIRAL POINT TAPS



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



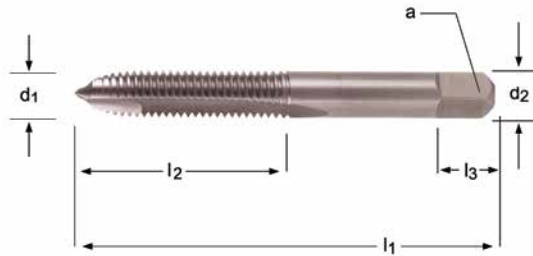
1/4 - 3/4

| 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 | 6007801 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H2 | 1 | 6007806 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 6007811 | 6007815 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H5 | 1 | 6007825 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007820 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H1 | 1 | 6007635 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H2 | 1 | 6007687 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 6007799 | 6007850 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H2 | 1 | 6007692 | — |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | 6007696 | 7197820 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H5 | 1 | 6007716 | — |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007703 | — |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | 6007741 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H2 | 1 | 6007648 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007652 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H5 | 1 | 6007659 | — |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007673 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H2 | 1 | 6007777 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007781 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H5 | 1 | 6007786 | — |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007802 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H2 | 1 | 6007762 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007768 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H5 | 1 | 6007773 | — |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007792 | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H3 | 1 | 6007761 | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H5 | 1 | 6007766 | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H5 | 1 | 6007771 | — |
| 5/8 | | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H3 | 1 | 6007771 | — |
| 3/4 | 10 | | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H3 | 1 | 6007862 | — |
| 3/4 | 10 | | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H5 | 1 | 6007864 | — |
| 3/4 | | 16 | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H3 | 1 | 6007639 | — |

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

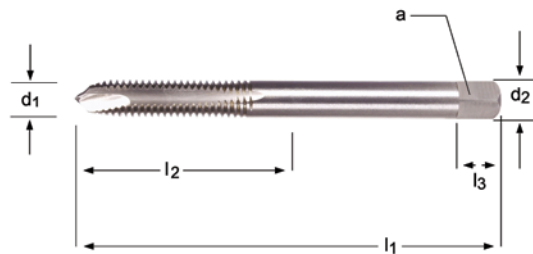
| M | P mm | l_1 Inch | l_2 Inch | l_3 Inch | d_2 Ø Inch | \square a Inch | # of Flutes | Limits | Chamfer | Pack Qty | 1785NR |
|-----|---------|---------------|---------------|---------------|--------------------|------------------------|----------------|--------|---------|-------------|---------|
| 1.6 | 0.35 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 6008823 |
| 2 | 0.40 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 6008852 |
| 2.5 | 0.45 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 6008622 |
| 3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 6008765 |
| 3.5 | 0.60 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | D4 | Plug | 1 | 6008815 |
| 4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | D4 | Plug | 1 | 6008829 |
| 4.5 | 0.75 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | D4 | Plug | 1 | 6008834 |
| 5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | D4 | Plug | 1 | 6008839 |
| 6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | D5 | Plug | 1 | 6008844 |
| 7 | 1.00 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | D5 | Plug | 1 | 6008623 |
| 8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | D5 | Plug | 1 | 6008625 |
| 10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | D6 | Plug | 1 | 6008827 |
| 12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | D6 | Plug | 1 | 6008832 |
| 14 | 2.00 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 3 | D7 | Plug | 1 | 6008838 |
| 16 | 2.00 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | D7 | Plug | 1 | 6008843 |
| 20 | 2.50 | 4.15/32 | 2" | 0.6520 | 0.4890 | 11/16 | 3 | D7 | Plug | 1 | 6008713 |

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

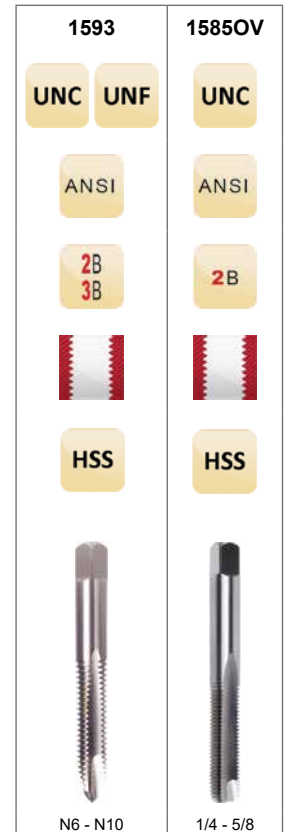
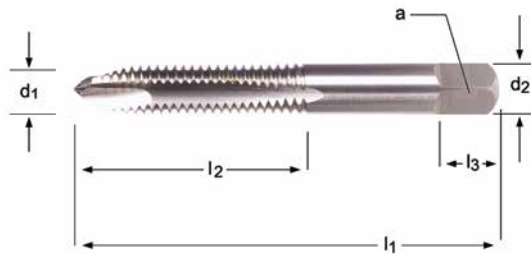
| UNC | UNF | TPI | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch | a Inch | l ₃ Inch | # of Flutes | Limits | Pack Qty | Chamfer | 1534NE |
|------|------|-----|------------------------|------------------------|-----------------------------|-----------|------------------------|----------------|--------|-------------|---------|---------|
| 4 | | 40 | 4" | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | Plug | 6007097 |
| 6 | | 32 | 4" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | Plug | 6007408 |
| 6 | | 32 | 6" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | Plug | 6007462 |
| 8 | | 32 | 4" | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | Plug | 6007583 |
| 8 | | 32 | 6" | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | Plug | 6007588 |
| | 10 | 32 | 4" | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 6007080 |
| | 10 | 32 | 6" | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 6007083 |
| 10 | | 24 | 4" | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 6007071 |
| 10 | | 24 | 6" | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 6007077 |
| | 1/4 | 28 | 4" | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 6007065 |
| | 1/4 | 28 | 6" | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 6007068 |
| 1/4 | | 20 | 4" | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 6007059 |
| 1/4 | | 20 | 6" | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 6007062 |
| 5/16 | | 18 | 4" | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 6007099 |
| 5/16 | | 18 | 6" | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 6007101 |
| | 3/8 | 24 | 6" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 6007094 |
| 3/8 | | 16 | 4" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 6007085 |
| 3/8 | | 16 | 6" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 6007088 |
| | 7/16 | 20 | 6" | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | Plug | 6007574 |
| 7/16 | | 14 | 6" | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | Plug | 6007515 |
| | 1/2 | 20 | 6" | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | Plug | 6007056 |
| 1/2 | | 13 | 6" | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | Plug | 6007053 |

OverSize / Relieved Style

1593 Similar in design to the standard 1534/1585 series
1585OV 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



| UNC | | UNF | TPI | l_1 | l_2 | d_2 | a | l_3 | # of Flutes | Limits | Chamfer | Pack Qty | 1593 | 1585OV |
|------|------|------|---------|---------|--------|--------|-------|-------|-------------|--------|---------|----------|---------|--------|
| Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | Inch | | | | | | |
| 6 | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H7 | Plug | 1 | 6007868 | — | |
| 8 | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H7 | Plug | 1 | 6007869 | — | |
| | 10 | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H7 | Plug | 1 | 6007866 | — | |
| 10 | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H7 | Plug | 1 | 6007830 | — | |
| 1/4 | | 20 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H11 | Plug | 1 | — | 6007124 | |
| 5/16 | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H11 | Plug | 1 | — | 6007215 | |
| 3/8 | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H11 | Plug | 1 | — | 6007163 | |
| 7/16 | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H11 | Plug | 1 | — | 6007319 | |
| 1/2 | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H11 | Plug | 1 | — | 6007812 | |
| 5/8 | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H11 | Plug | 1 | — | 6007304 | |

SPIRAL FLUTE TAPS

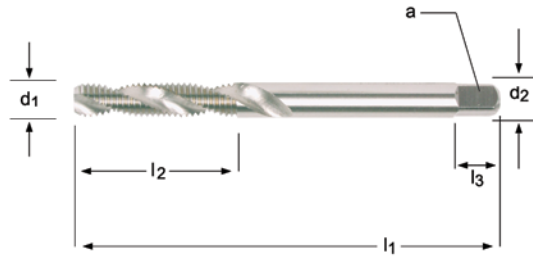


Regular Spiral 30°

1582 - Machine Screw Sizes

1586 - Fractional Sizes

Generally used where chip disposal is a problem. The spiral flute design effectively 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 \varnothing Inch / | \square 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 | 6007645 | 6007650 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | 6007661 | 6007665 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | 6007675 | 6007680 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | 6007630 | 6007633 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | 6007637 | 6007641 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 6007836 | 6007841 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007623 | 6007624 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 6007625 | 6007627 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007629 | 6007632 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007655 | 6007662 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007666 | 6007671 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007636 | 6007640 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007644 | 6007647 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007676 | 6007681 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007760 | 6007816 |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007827 | 6007831 |

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-ferrous 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 | 6007730 | 6007735 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | 6007750 | 6007755 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H3 | 1 | 6007765 | 6007770 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 6007686 | 6007691 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 6007694 | 6007700 |
| 1/4 | 20 | | 2.1/2 | 1.000 | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007796 | 6007800 |
| 1/4 | | 28 | 2.1/2 | 1.000 | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007805 | 6007810 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007784 | 6007838 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007847 | 6007851 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007822 | 6007628 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007669 | 6007721 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007855 | 6007858 |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007631 | 6007634 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007775 | 6007780 |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007785 | 6007790 |

SPIRAL FLUTE TAPS

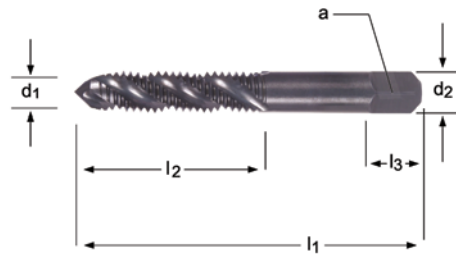


Heavy Duty Spiral 40°

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 tempered finish makes this tap ideal for use in ferrous materials and higher strength alloys.



1590 / 1591

UNC UNF

ANSI

3B



HSS

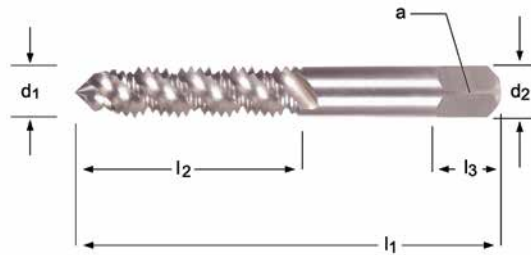


N6 - 1/2

| Nominal d_1 | TPI UNC | TPI UNF | l_1 Inch | l_2 Inch | d_2 Ø Inch / | \square 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 | 6007674 | 6007679 |
| 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | — | 6007689 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 6007638 | 6007642 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 6007646 | 6007649 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007736 | 6007746 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6007751 | 6007756 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6007789 | 6007793 |
| 3/8 | 16 | | 2.5/16 | 1.1.4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 6007764 | 6007769 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 6007808 | 6007813 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 6007713 | 6007718 |

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 / | \square 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 | 6008645 | 6008650 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | D4 | 1 | 6008669 | 6008674 |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | D4 | 1 | 6008679 | 6008683 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | D5 | 1 | 6008688 | 6008692 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | D5 | 1 | 6008704 | 6008709 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | D6 | 1 | 6008626 | 6008628 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | D6 | 1 | 6008631 | 6008634 |

THREAD FORMING TAPS



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

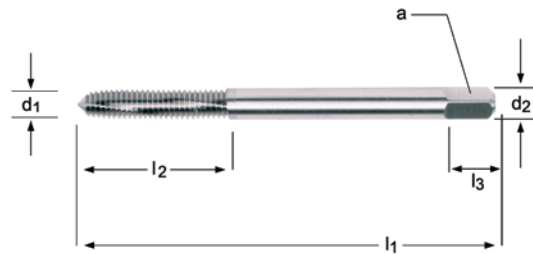


N2 - 3/8

| Nominal d_1 | TPI UNC | TPI UNF | l_1 Inch | l_2 Inch | d_2 \varnothing Inch / | \square 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 | — | 6006727 |
| 2 | 56 | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | — | 6006732 |
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | 6006780 | 6006784 |
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | H5 | 1 | — | 6006791 |
| 5 | 40 | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | — | 6006807 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | 6006843 | 6006847 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | H5 | 1 | 6006849 | — |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | H3 | 1 | 6007778 | 6007829 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | H5 | 1 | 6007839 | 6007844 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H4 | 1 | 6007005 | 6007009 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H4 | 1 | — | 6006800 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H6 | 1 | 6006834 | 6006873 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H4 | 1 | 6006982 | 6006985 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H6 | 1 | 6006989 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H4 | 1 | 6006998 | 6007001 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 7/16 | H5 | 1 | 6006822 | 6006825 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 7/16 | H7 | 1 | — | 6006828 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 7/16 | H5 | 1 | 6006831 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 1/2 | H5 | 1 | 6006765 | 6006769 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 1/2 | H5 | 1 | — | 6006776 |

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

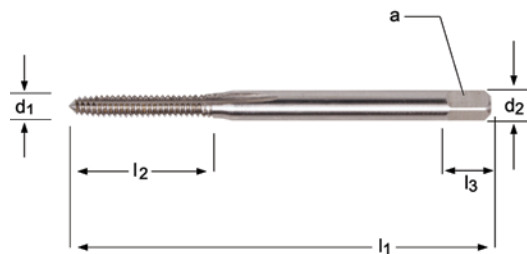
| Nominal d_1 | Pitch M | l_1 Inch | l_2 Inch | d_2 \varnothing Inch / | \square a Inch | l_3 Inch | Limits | Pack Qty | Plug | Bottoming |
|------------------|------------|---------------|---------------|----------------------------------|------------------------|---------------|--------|-------------|---------|-----------|
| M3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | D5 | 1 | 6006922 | 6006924 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | D6 | 1 | 6006926 | 6006928 |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | D7 | 1 | 6006930 | 6006933 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | D8 | 1 | 6006935 | 6006938 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | D9 | 1 | 6006939 | 6006943 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | D10 | 1 | 6006913 | 6006915 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | D11 | 1 | 6006917 | 6006919 |

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



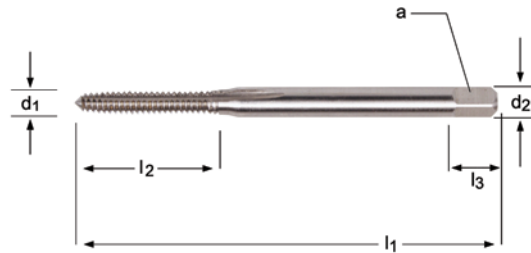
NO - 1/2

| 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 | — | 6009413 |
| 1 | 64 | | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | H2 | 1 | — | 6009416 |
| 1 | | 72 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | H2 | 1 | — | 6009419 |
| 2 | 56 | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | H2 | 1 | — | 6009492 |
| 2 | 56 | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | — | 6009496 |
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | 6009383 | 6009386 |
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | H5 | 1 | 6009389 | — |
| 5 | 40 | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | — | 6009409 |
| 5 | 40 | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | H5 | 1 | — | 6009415 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | H3 | 1 | 6009454 | 6009457 |
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | H5 | 1 | 6009459 | 6009462 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | H3 | 1 | 6009491 | 6009493 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | H5 | 1 | 6009495 | 6009497 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H4 | 1 | 6009453 | 6009455 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H6 | 1 | 6009458 | 6009460 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H4 | 1 | 6009468 | 6009471 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | H6 | 1 | 6009474 | 6009476 |
| 12 | 24 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | H4 | 1 | 6009480 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H4 | 1 | 6009435 | 6009438 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H6 | 1 | 6009441 | 6009444 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | H4 | 1 | 6009447 | 6009450 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 7/16 | H5 | 1 | 6009424 | 6009427 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 7/16 | H7 | 1 | 6009432 | 6009437 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 1/2 | H5 | 1 | 6009502 | 6009506 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 1/2 | H7 | 1 | 6009507 | 6009508 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 1/2 | H7 | 1 | 6009378 | 6009381 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 23/32 | H5 | 1 | 6009422 | — |

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 \emptyset Inch / | \square 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 | 6009382 | 6009384 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | D6 | 1 | 1 | 6009387 | 6009390 |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | D7 | 1 | 1 | 6009393 | 6009396 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | D8 | 2 | 1 | 6009399 | 6009404 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | D9 | 2 | 1 | 6009407 | 6009410 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | D10 | 2 | 1 | 6009505 | 6009373 |

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 | \square a Inch | l_3 Inch | Limits | Chamfer | Pack Qty | 3306E |
|------|-----|-----|---------------|---------------|--------------------|------------------------|---------------|--------|-----------|----------|---------|
| 4 | | 40 | 4" | 9/16 | 0.1410 | 0.1100 | 3/16 | H3 | Bottoming | 1 | 6009250 |
| 4 | | 40 | 4" | 9/16 | 0.1410 | 0.1100 | 3/16 | H5 | Bottoming | 1 | 6009255 |
| 6 | | 32 | 4" | 11/16 | 0.1410 | 0.1100 | 3/16 | H3 | Bottoming | 1 | 6009326 |
| 8 | | 32 | 4" | 3/4 | 0.1680 | 0.1310 | 1/4 | H3 | Bottoming | 1 | 6009339 |
| 10 | | 24 | 4" | 7/8 | 0.1940 | 0.1520 | 1/4 | H4 | Bottoming | 1 | 6009175 |
| 1/4 | | 20 | 4" | 1" | 0.2550 | 0.1910 | 5/16 | H4 | Bottoming | 1 | 6009504 |
| 5/16 | | 18 | 4" | 1.1/8 | 0.3180 | 0.2380 | 3/8 | H5 | Bottoming | 1 | 6009260 |

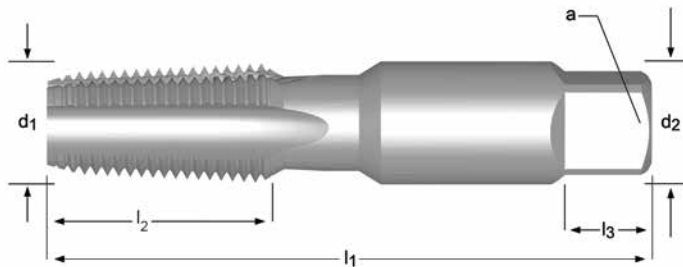
General Purpose, Medium Hook, NPT

1541 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.

TN1541

TiN coating increases surface hardness and improves tool life.

Made to Metal Cutting Tool Institute Standards, table 311



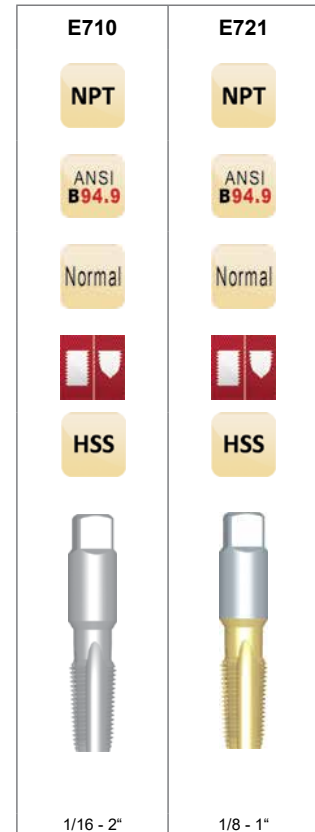
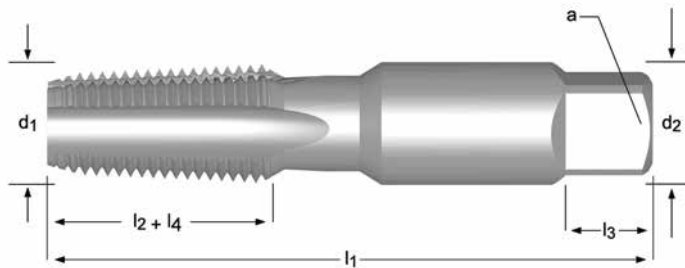
| 1541(NPT) | TN1541 |
|-----------|-----------|
| | |
| | |
| | |
| | |
| | |
| | |
| 1/16 - 2" | 1/8 - 3/4 |

| Nominal d ₁ | TPI | l ₁ | | d ₂ Ø Inch / | a Inch | l ₃ Inch | # of Flutes | Pack Qty | 1541 | TN1541 |
|---------------------------|------|----------------|--------|-------------------------------|-----------|------------------------|----------------|-------------|---------|---------|
| | | Inch | Inch | | | | | | | |
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006824 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006837 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6006833 | 6007587 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6006830 | 6007530 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6006855 | 6007602 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6006827 | 6007471 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6006851 | 6007597 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6006841 | — |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 6006821 | — |
| 1.1/2 | 11.5 | 4.1/4 | 1.3/4 | 1.5000 | 1.1250 | 1" | 7 | 1 | 6006815 | — |
| 2" | 11.5 | 4.1/2 | 1.3/4 | 1.8750 | 1.4060 | 1.1/8 | 7 | 1 | 6006846 | — |

General Purpose, Medium Hook, NPT

- E710** Straight Flute. Medium hook for multi-material tapping.
- E721** 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.

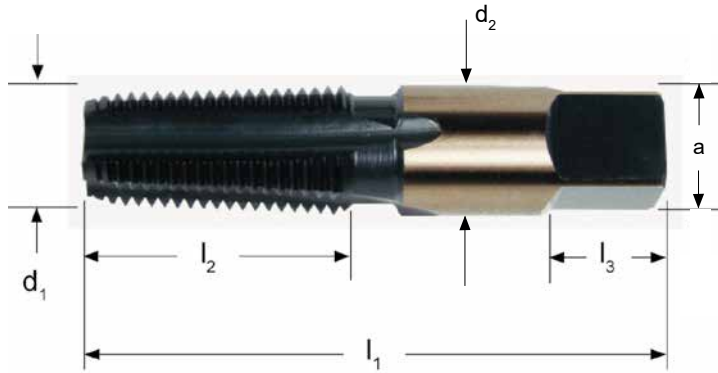


| Nominal d ₁ | TPI | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | l ₃ mm | | # of Flutes | l ₄ mm | Pack Qty | E710 | E721 |
|---------------------------|------|----------------------|----------------------|---------------------------|--------------|----------------------|------|----------------|----------------------|-------------|-----------------------|---------|
| 1/16 | 27 | 65 | 17 | 7.9 | 5.9 | 8 | 6.3 | 4 | 11.7 | 1 | 5977618 | — |
| 1/8 | 27 | 70 | 19 | 11.1 | 8.3 | 10 | 8.5 | 4 | 11.9 | 1 | 5977634 | 5977601 |
| 1/8 | 27 | 70 | 19 | 11.1 | 8.3 | 10 | 8.5 | 4 | 11.9 | Set of 2 | 5977637 ¹⁾ | — |
| 1/4 | 18 | 75 | 27 | 14.3 | 10.7 | 11 | 11 | 4 | 17.6 | 1 | 5977628 | 5977598 |
| 1/4 | 18 | 75 | 27 | 14.3 | 10.7 | 11 | 11 | 4 | 17.6 | Set of 2 | 5977631 ¹⁾ | — |
| 3/8 | 18 | 80 | 27 | 17.8 | 13.5 | 13 | 14.5 | 4 | 19.5 | 1 | 5977652 | 5977607 |
| 3/8 | 18 | 80 | 27 | 17.8 | 13.5 | 13 | 14.5 | 4 | 19.5 | Set of 2 | 5977653 ¹⁾ | — |
| 1/2 | 14 | 100 | 35 | 17.5 | 13.1 | 16 | 18 | 4 | 22.7 | 1 | 5977622 | 5977595 |
| 1/2 | 14 | 100 | 35 | 17.5 | 13.1 | 16 | 18 | 4 | 22.7 | Set of 2 | 5977625 ¹⁾ | — |
| 3/4 | 14 | 105 | 35 | 23.0 | 17.2 | 17 | 23 | 5 | 24.4 | 1 | 5977646 | 5977604 |
| 3/4 | 14 | 105 | 35 | 23.0 | 17.2 | 17 | 23 | 5 | 24.4 | Set of 2 | 5977649 ¹⁾ | — |
| 1" | 11.5 | 115 | 43 | 28.6 | 21.4 | 21 | 29 | 5 | 29.4 | 1 | 5977609 | 5977592 |
| 1.1/4 | 11.5 | 125 | 43 | 33.3 | 25.0 | 24 | 38 | 5 | 27.7 | 1 | 5977615 | — |
| 1.1/2 | 11.5 | 135 | 43 | 38.1 | 28.6 | 25 | 44 | 7 | 28.9 | 1 | 5977612 | — |
| 2" | 11.5 | 145 | 43 | 47.6 | 35.7 | 29 | 56 | 7 | 26.6 | 1 | 5977643 | — |

¹⁾ Sets (No.7) include: 1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)

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"

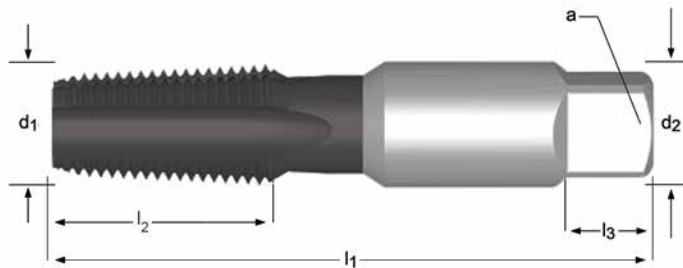
| NPT | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square a Inch | l_3 Inch | # of Flutes | Pack Qty | 6541 |
|-------|------|---------------|---------------|--------------------|------------------------|---------------|----------------|-------------|-------------|
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6008958 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6008949 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6008970 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6008944 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6008965 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6008928 |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 6008941 |
| 1.1/2 | 11.5 | 4.1/4 | 1.3/4 | 1.5000 | 1.1250 | 1 | 7 | 1 | 6008932 |
| 2" | 11.5 | 4.1/2 | 1.3/4 | 1.8750 | 1.4060 | 1.1/8 | 7 | 1 | 6008963 |

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



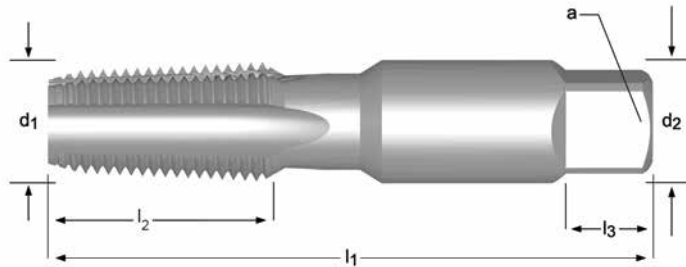
1/16 - 1.1/4

| | | l_1 | l_2 | d_2 | \square | l_3 | # of Flutes | Pack Qty | 1544 |
|-------|------|--------|--------|--------|-----------|-------|-------------|----------|---------|
| NPT | TPI | Inch | Inch | Ø Inch | a Inch | Inch | | | |
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6007157 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6007175 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6007170 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6007197 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6007165 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6007191 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6007183 |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 6007153 |

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 tempered 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 | \square 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 | — | 6007202 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6007271 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6007261 | 6007223 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6007256 | 6007218 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6007290 | 6007232 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6007251 | 6007207 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6007286 | 6007228 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6007276 | — |

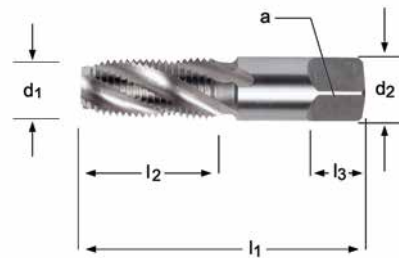
PIPE TAPS



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



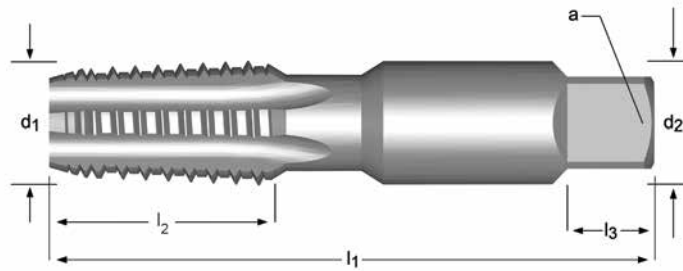
1/16 - 1"

| | | l_1 | l_2 | d_2 | \square | l_3 | # of Flutes | Pack Qty | 1548 |
|------|------|--------|--------|--------|-----------|-------|-------------|----------|---------|
| NPT | TPI | Inch | Inch | Ø Inch | a Inch | Inch | | | |
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006902 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006978 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6006973 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6006961 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6006839 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6006923 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6006986 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6006983 |

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

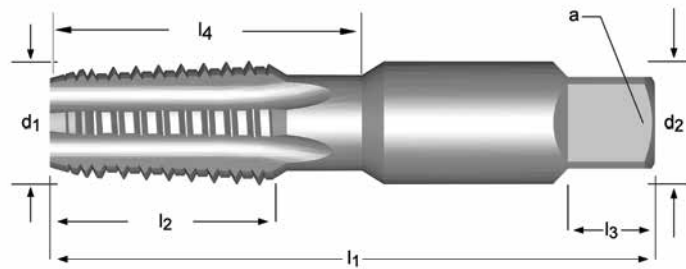


1/8 - 1.1/2

| NPT | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | 6006908 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 5 | 1 | 6006906 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 5 | 1 | 6006904 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 5 | 1 | 6006916 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 5 | 1 | 6006900 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6006914 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6006910 |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 6006898 |
| 1.1/2 | 11.5 | 4.1/4 | 1.3/4 | 1.5000 | 1.1250 | 1" | 7 | 1 | 6006896 |

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



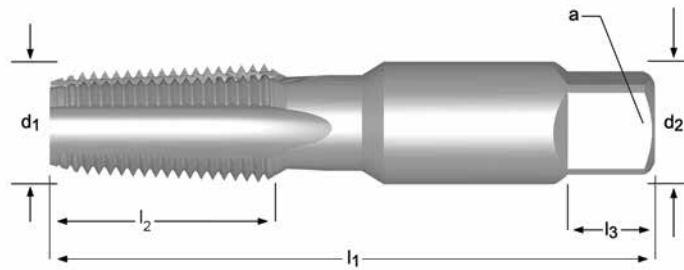
1/8 - 1.1/2

| 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 | 1 | 5977664 |
| 1/4 | 18 | 13.72 | 75 | 27 | 44.6 | 14.3 | 10.7 | 11 | 5 | 1 | 5977662 |
| 3/8 | 18 | 17.15 | 80 | 27 | 46.5 | 17.8 | 13.5 | 13 | 5 | 1 | 5977542 |
| 1/2 | 14 | 21.33 | 100 | 35 | 57.7 | 17.5 | 13.1 | 16 | 5 | 1 | 5977660 |
| 3/4 | 14 | 26.67 | 105 | 35 | 59.4 | 23.0 | 17.2 | 17 | 5 | 1 | 5977669 |
| 1" | 11.5 | 33.40 | 115 | 43 | 72.4 | 28.6 | 21.4 | 21 | 5 | 1 | 5977656 |
| 1.1/2 | 11.5 | 48.26 | 135 | 43 | 71.9 | 38.1 | 28.6 | 25 | 7 | 1 | 5977658 |

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.



| 1543(NPTF) | TN1543 |
|------------|-----------|
| | |
| | |
| | |
| | |
| | |
| | |
| 1/16 - 1" | 1/8 - 3/4 |

| NPTF | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | 6007345 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | — | 6007381 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6007134 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6007131 | — |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | — | 6007609 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6007128 | — |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | — | 6007389 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6007144 | — |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | — | 6007606 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6007126 | — |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | — | 6007385 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6007140 | — |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6007137 | — |

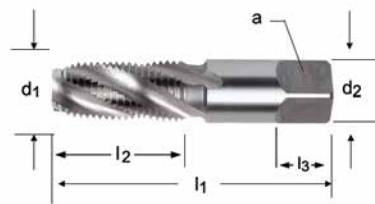
PIPE TAPS



Spiral Flute, Dryseal, NPTF

1549

Spiral Flute 30°. 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



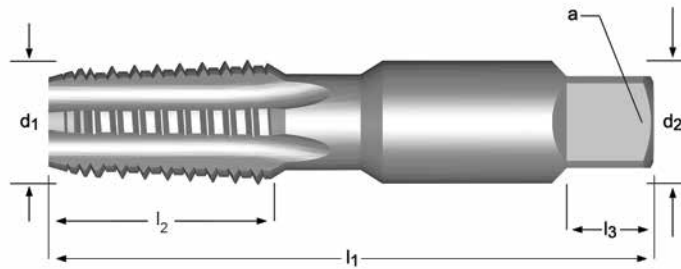
1/16 - 3/4

| NPTF | | l_1 | l_2 | d_2 Ø | \square a | l_3 | # of Flutes | Pack Qty | 1549 |
|------|------|--------|--------|------------|----------------|-------|----------------|-------------|-------------|
| TPI | Inch | Inch | Inch | Inch | Inch | Inch | | | |
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006842 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6006858 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6006854 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6006850 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6006872 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6006845 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6006868 |

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

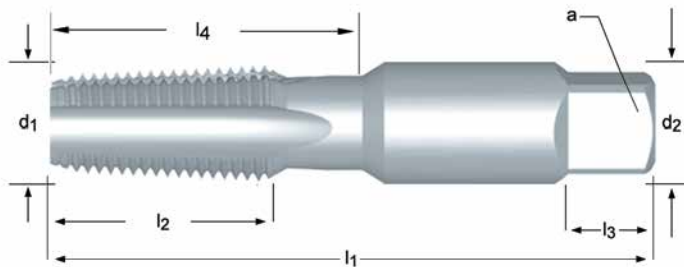


1/8 - 1"

| NPTF | TPI | l_1 Inch | l_2 Inch | d_2 Ø Inch | \square 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 | 6006888 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 5 | 1 | 6006885 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 5 | 1 | 6006883 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 5 | 1 | 6006894 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 5 | 1 | 6006881 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6006892 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6006890 |

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



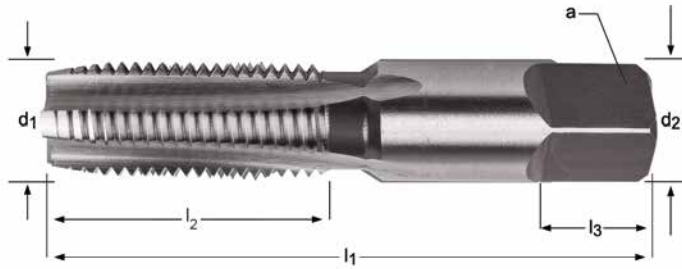
1/16 - 1.1/4

| 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 | 5977651 |
| 1/8 | 27 | 10.29 | 70 | 19 | 11.9 | 11.1 | 8.3 | 10 | 4 | 8.40 | 1 | 5977688 |
| 1/4 | 18 | 13.72 | 75 | 27 | 17.6 | 14.3 | 10.7 | 11 | 4 | 10.90 | 1 | 5977685 |
| 3/8 | 18 | 17.15 | 80 | 27 | 19.5 | 17.8 | 13.5 | 13 | 4 | 14.25 | 1 | 5977694 |
| 1/2 | 14 | 21.34 | 100 | 35 | 22.7 | 17.5 | 13.1 | 16 | 4 | 17.75 | 1 | 5977677 |
| 3/4 | 14 | 26.67 | 105 | 35 | 24.4 | 23.0 | 17.2 | 17 | 5 | 23.00 | 1 | 5977691 |
| 1" | 11.5 | 33.40 | 115 | 43 | 29.4 | 28.6 | 21.4 | 21 | 5 | 29.00 | 1 | 5977585 |
| 1.1/4 | 11.5 | 42.16 | 125 | 43 | 27.7 | 33.4 | 24.9 | 23 | 5 | 37.75 | 1 | 5977619 |

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.

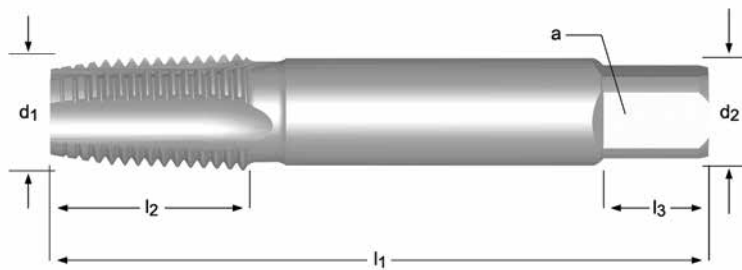


| 1542 | 1592 |
|-------------|-------------|
| NPSM | NPSF |
| ANSI | ANSI |
| Normal | Normal |
| | |
| HSS | HSS |
| | |
| 1/8 - 1" | 1/8 - 3/4" |

| Nominal d ₁ | TPI | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch / | □ a Inch | l ₃ Inch | # of Flutes | Pack Qty | 1542 | 1592 |
|---------------------------|------|------------------------|------------------------|-------------------------------|----------------|------------------------|----------------|-------------|---------|---------|
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 6007213 | 6007658 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 6007161 | 6007842 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 6007122 | 6007833 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 6007329 | 6007772 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 6006863 | 6007828 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 6007320 | 6007717 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 6007266 | — |

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"

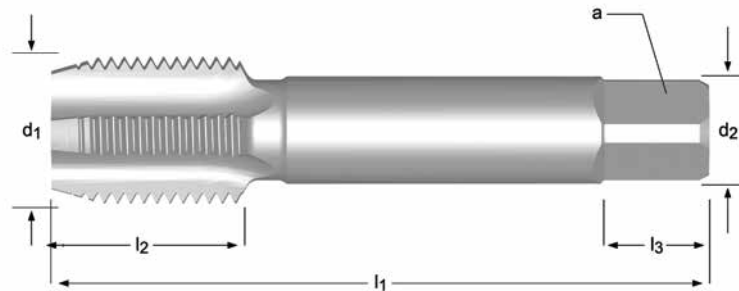
| Rc | TPI | d ₁ nom mm | l ₁ mm | l ₂ mm | d ₂ Ø mm | □ a mm | l ₃ mm | # of Flutes | | Pack Qty | E550 |
|-------|-----|-----------------------------|----------------------|----------------------|---------------------------|--------------|----------------------|----------------|-------|-------------|-----------------------|
| 1/8 | 28 | 9.728 | 59 | 15 | 8.0 | 6.3 | 9 | 3 | 8.4 | 1 | 5976468 |
| 1/8 | 28 | 9.728 | 59 | 15 | 8.0 | 6.3 | 9 | 3 | 8.4 | Set of 2 | 5976472 ¹⁾ |
| 1/4 | 19 | 13.157 | 67 | 19 | 10.0 | 8.0 | 11 | 3 | 11.2 | 1 | 5976464 |
| 1/4 | 19 | 13.157 | 67 | 19 | 10.0 | 8.0 | 11 | 3 | 11.2 | Set of 2 | 5976466 ¹⁾ |
| 3/8 | 19 | 16.662 | 75 | 21 | 12.5 | 10.0 | 13 | 3 | 14.75 | 1 | 5977464 |
| 3/8 | 19 | 16.662 | 75 | 21 | 12.5 | 10.0 | 13 | 3 | 14.75 | Set of 2 | 5977475 ¹⁾ |
| 1/2 | 14 | 20.955 | 87 | 26 | 16.0 | 12.5 | 16 | 5 | 18.25 | 1 | 5976459 |
| 1/2 | 14 | 20.955 | 87 | 26 | 16.0 | 12.5 | 16 | 5 | 18.25 | Set of 2 | 5976462 ¹⁾ |
| 3/4 | 14 | 26.441 | 96 | 28 | 20.0 | 16.0 | 20 | 5 | 23.75 | 1 | 5977442 |
| 3/4 | 14 | 26.441 | 96 | 28 | 20.0 | 16.0 | 20 | 5 | 23.75 | Set of 2 | 5977453 ¹⁾ |
| 1" | 11 | 33.249 | 109 | 33 | 25.0 | 20.0 | 24 | 5 | 30 | 1 | 5976452 |
| 1.1/4 | 11 | 41.910 | 119 | 36 | 31.5 | 25.0 | 28 | 5 | 38.5 | 1 | 5976457 |
| 1.1/2 | 11 | 47.803 | 125 | 37 | 35.5 | 28.0 | 31 | 7 | 44.5 | 1 | 5976455 |
| 2" | 11 | 59.614 | 140 | 41 | 40.0 | 31.5 | 34 | 7 | 56 | 1 | 5977431 |

Note: ISO shank and square dimensions will necessitate metric holders

¹⁾ Sets (No.7) include: 1pc. semi-bottoming + 1 pc. semi-bottoming (truncated)

Straight Pipe Taps, British Standard

E547 Similar to the NPS pipe taps, but manufactured to British Standard Parallel Pipe Thread specifications (BSPP).



E547

G

ISO 2284

Normal

HSS

1/8 - 2"

| Nominal d ₁ | TPI | l ₁ mm | l ₂ mm | d ₂ ∅ 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 | 5976343 | 5976346 | 5976349 |
| 1/4 | 19 | 67 | 19 | 10.0 | 8.0 | 11 | 4 | 11.8 | 1 | 5976327 | 5976330 | 5976335 |
| 3/8 | 19 | 75 | 21 | 12.5 | 10.0 | 13 | 4 | 15.25 | 1 | 5976408 | 5976412 | 5976416 |
| 1/2 | 14 | 87 | 26 | 16.0 | 12.5 | 16 | 4 | 19 | 1 | 5976474 | 5976477 | 5976480 |
| 5/8 | 14 | 91 | 26 | 18.0 | 14.0 | 18 | 4 | 21 | 1 | 5976423 | 5976427 | 5976430 |
| 3/4 | 14 | 96 | 28 | 20.0 | 16.0 | 20 | 4 | 24.5 | 1 | 5976389 | 5976392 | 5976397 |
| 7/8 | 14 | 102 | 29 | 22.4 | 18.0 | 22 | 4 | 28.25 | 1 | 5976438 | 5976445 | 5976448 |
| 1" | 11 | 109 | 33 | 25.0 | 20.0 | 24 | 4 | 30.75 | 1 | 5976357 | 5976361 | 5976369 |
| 1.1/4 | 11 | 119 | 36 | 31.5 | 25.0 | 28 | 6 | 39.5 | 1 | 5976365 | 5976404 | 5976442 |
| 1.1/2 | 11 | 125 | 37 | 35.5 | 28.0 | 31 | 6 | 45 | 1 | 5976717 | 5976722 | 5976322 |
| 2" | 11 | 140 | 41 | 40.0 | 31.5 | 34 | 6 | 57 | 1 | 5976379 | 5976382 | 5976385 |

Note: ISO shank and square dimensions will necessitate metric holders

SPECIAL PURPOSE TAPS

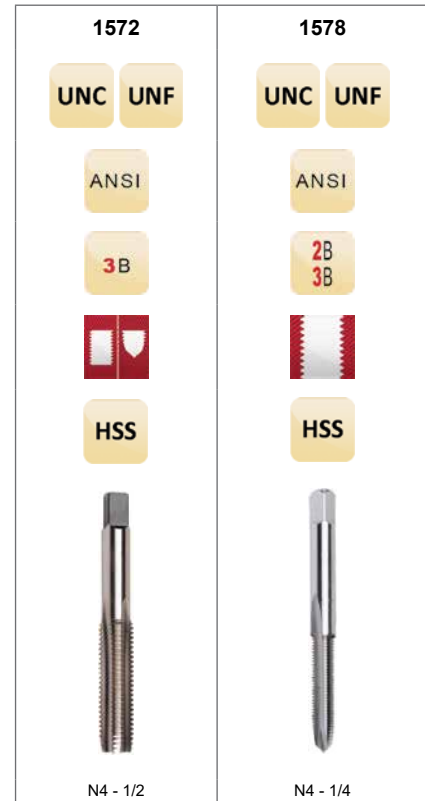
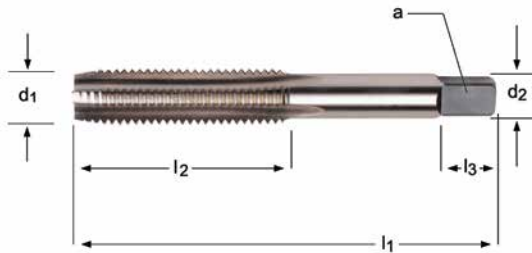


Screw Thread Insert, STI

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.



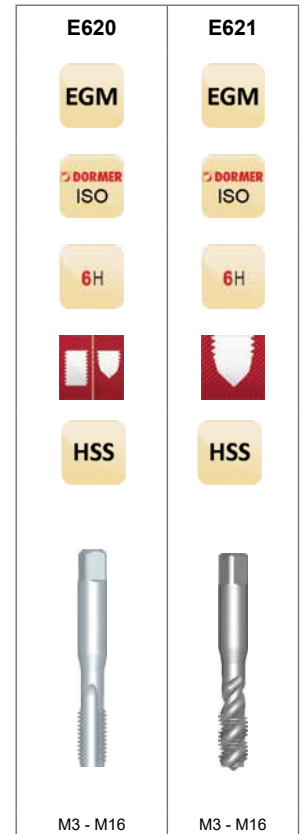
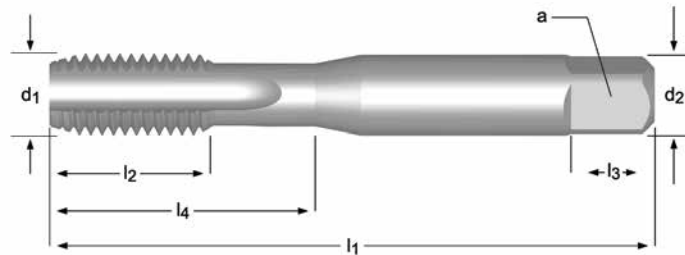
| Nominal d ₁ | TPI UNC | TPI UNF | l ₁ Inch | l ₂ Inch | d ₂ Ø Inch / | a Inch | l ₃ Inch | # of Flutes | Limits | Pack Qty | 1572 - Plug | 1572 Bottoming | 1578 - Plug |
|---------------------------|------------|------------|------------------------|------------------------|-------------------------------|-----------|------------------------|----------------|--------|-------------|-------------|-------------------|-------------|
| 4 | 40 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | — | 6006901 |
| 4 | 40 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 6006887 | 6006909 | — |
| 6 | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | 1 | — | — | 6006903 |
| 6 | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | — | — | 6006905 |
| 6 | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 6007013 | 6007020 | — |
| 8 | 32 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H2 | 1 | — | — | 6006907 |
| 8 | 32 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | 1 | — | — | 6006911 |
| 8 | 32 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 3 | H3 | 1 | 6007032 | 6006889 | — |
| 10 | 24 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H2 | 1 | 6006932 | 6006934 | — |
| 10 | | 32 | 2.1/2 | 1" | 0.2550 | 0.1910 | 9/32 | 2 | H2 | 1 | — | — | 6006899 |
| 10 | | 32 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H2 | 1 | 6006936 | 6006940 | — |
| 10 | | 32 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 6006945 | 6006950 | — |
| 1/4 | 20 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 5/16 | 2 | H2 | 1 | — | — | 6006891 |
| 1/4 | 20 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 5/16 | 2 | H3 | 1 | — | — | 6006893 |
| 1/4 | 20 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 6006921 | 6006925 | — |
| 1/4 | | 28 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 5/16 | 2 | H2 | 1 | — | — | 6006895 |
| 1/4 | | 28 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 5/16 | 2 | H3 | 1 | — | — | 6006897 |
| 1/4 | | 28 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H2 | 1 | — | 6006929 | — |
| 5/16 | 18 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 6006931 | — | — |
| 3/8 | 16 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 6006955 | 6006969 | — |
| 7/16 | 14 | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | 6007024 | — | — |
| 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 | 6006918 | — | — |
| 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 oversized 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.



| 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 | 5978063 | 5978441 |
| 4 | 0.70 | 58 | 11 | 5.00 | 4.00 | 7 | 3 | 4.2 | 20 | 1 | 5978072 | 5978446 |
| 5 | 0.80 | 66 | 13 | 6.30 | 5.00 | 8 | 3 | 5.2 | 26 | 1 | 5978280 | 5978285 |
| 6 | 1.00 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.3 | 29 | 1 | 5978336 | — |
| 6 | 1.00 | 72 | 16 | 8.00 | 6.30 | 9 | 3 | 6.3 | 31 | 1 | — | 5978290 |
| 8 | 1.25 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.4 | 32 | 1 | 5978371 | — |
| 8 | 1.25 | 80 | 18 | 10.00 | 8.00 | 11 | 3 | 8.4 | 34 | 1 | — | 5978295 |
| 10 | 1.50 | 89 | 22 | 9.00 | 7.10 | 10 | 3 | 10.5 | | 1 | 5978043 | 5978401 |
| 12 | 1.75 | 95 | 24 | 11.20 | 9.00 | 12 | 4 | 12.5 | | 1 | 5978049 | — |
| 12 | 1.75 | 95 | 24 | 11.20 | 9.00 | 12 | 3 | 12.5 | | 1 | — | 5978428 |
| 14 | 2.00 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 14.5 | | 1 | 5978053 | — |
| 14 | 2.00 | 112 | 29 | 14.00 | 11.20 | 14 | 3 | 14.5 | | 1 | — | 5978435 |
| 16 | 2.00 | 112 | 29 | 14.00 | 11.20 | 14 | 4 | 16.5 | | 1 | 5978059 | — |
| 16 | 2.00 | 112 | 29 | 14.00 | 11.20 | 14 | 3 | 16.5 | | 1 | — | 5978439 |

SPECIAL PURPOSE TAPS



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



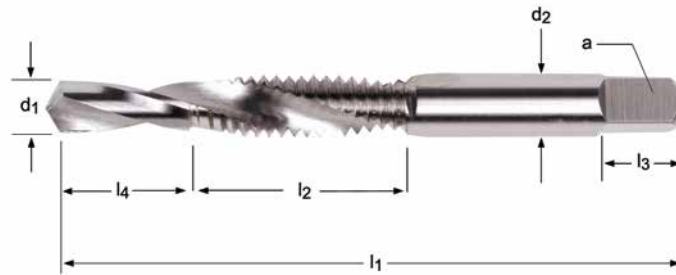
1/4 - 3/4

| | | l_1 | l_2 | d_2 | \square | l_3 | | | | Pack Qty | 1519 |
|------|-----|-------|---------|--------|-----------|-------|-------------|--------|---------|----------|---------|
| UNC | TPI | Inch | Inch | Inch | Inch | Inch | # of Flutes | Limits | Chamfer | | |
| 1/4 | 20 | 6" | 1.000 | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006701 |
| 1/4 | 20 | 8" | 1.000 | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 6006705 |
| 5/16 | 18 | 6" | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006740 |
| 5/16 | 18 | 8" | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 6006744 |
| 3/8 | 16 | 6" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006725 |
| 3/8 | 16 | 8" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006735 |
| 3/8 | 16 | 10" | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 6006720 |
| 1/2 | 13 | 6" | 1.21/32 | 0.5070 | 0.3800 | 9/16 | 4 | H3 | Plug | 1 | 6006693 |
| 1/2 | 13 | 8" | 1.21/32 | 0.5070 | 0.3800 | 9/16 | 4 | H3 | Plug | 1 | 6006697 |
| 1/2 | 13 | 10" | 1.21/32 | 0.5070 | 0.3800 | 9/16 | 4 | H3 | Plug | 1 | 6006684 |
| 5/8 | 11 | 6" | 1.13/16 | 0.6330 | 0.4750 | 11/16 | 4 | H3 | Plug | 1 | 6006755 |
| 5/8 | 11 | 8" | 1.13/16 | 0.6330 | 0.4750 | 11/16 | 4 | H3 | Plug | 1 | 6006762 |
| 5/8 | 11 | 10" | 1.13/16 | 0.6330 | 0.4750 | 11/16 | 4 | H3 | Plug | 1 | 6006749 |
| 3/4 | 10 | 10" | 2.000 | 0.7590 | 0.5690 | 3/4 | 4 | H3 | Plug | 1 | 6006710 |

Combination Drill & Tap

1994 Spiral Flute 15°. 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 | 6008951 |
| 5 | | 40 | 0.1015 | 1.15/16 | 13/32 | 0.1410 | 0.1100 | 3/16 | 9/32 | 2 | 1 | 6008961 |
| 6 | | 32 | 0.1110 | 2" | 7/16 | 0.1410 | 0.1100 | 3/16 | 5/16 | 2 | 1 | 6008987 |
| 8 | | 32 | 0.1360 | 2.1/8 | 1/2 | 0.1680 | 0.1310 | 1/4 | 3/8 | 2 | 1 | 6009013 |
| 10 | | 24 | 0.1540 | 2.3/8 | 5/8 | 0.1940 | 0.1520 | 1/4 | 13/32 | 2 | 1 | 6008914 |
| | 10 | 32 | 0.1610 | 2.3/8 | 5/8 | 0.1940 | 0.1520 | 1/4 | 13/32 | 2 | 1 | 6008918 |
| 12 | | 24 | 0.1800 | 2.3/8 | 21/32 | 0.2200 | 0.1650 | 9/32 | 15/32 | 2 | 1 | 6008921 |
| | 12 | 28 | 0.1850 | 2.3/8 | 21/32 | 0.2200 | 0.1650 | 9/32 | 15/32 | 2 | 1 | 6008925 |
| 1/4 | | 20 | 0.2055 | 2.1/2 | 25/32 | 0.2550 | 0.1910 | 5/16 | 17/32 | 2 | 1 | 6008905 |
| | 1/4 | 28 | 0.2188 | 2.1/2 | 25/32 | 0.2550 | 0.1910 | 5/16 | 17/32 | 2 | 1 | 6008909 |
| 5/16 | | 18 | 0.2660 | 2.27/32 | 15/16 | 0.3180 | 0.2380 | 3/8 | 11/16 | 2 | 1 | 6008975 |
| | 5/16 | 24 | 0.2770 | 2.27/32 | 15/16 | 0.3180 | 0.2380 | 3/8 | 11/16 | 2 | 1 | 6008980 |
| 3/8 | | 16 | 0.3230 | 3.3/8 | 1.1/16 | 0.3810 | 0.2860 | 7/16 | 13/16 | 2 | 1 | 6008934 |
| | 3/8 | 24 | 0.3390 | 3.3/8 | 1.1/16 | 0.3810 | 0.2860 | 7/16 | 13/16 | 2 | 1 | 6008946 |
| 7/16 | | 14 | 0.3770 | 3.3/4 | 1.1/4 | 0.3230 | 0.2420 | 13/32 | 1" | 2 | 1 | 6008996 |
| | 7/16 | 20 | 0.3937 | 3.3/4 | 1.1/4 | 0.3230 | 0.2420 | 13/32 | 1" | 2 | 1 | 6009006 |
| 1/2 | | 13 | 0.4331 | 4.1/16 | 1.3/8 | 0.3670 | 0.2750 | 7/16 | 1.1/8 | 2 | 1 | 6008897 |
| | 1/2 | 20 | 0.4531 | 4.1/16 | 1.3/8 | 0.3670 | 0.2750 | 7/16 | 1.1/8 | 2 | 1 | 6008901 |

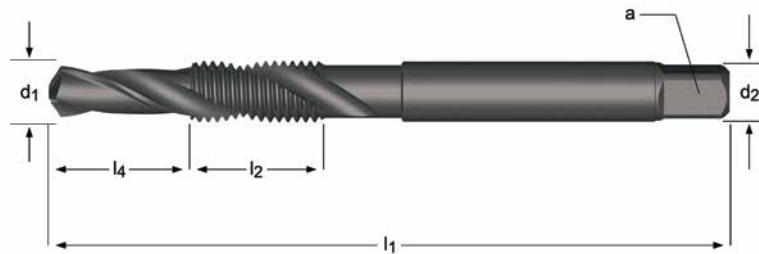
SPECIAL PURPOSE TAPS



Combination Drill & Tap

E651 Spiral Flute 30°. 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.
E654

Steam tempered finish reduces wear and chip welding in harder ferrous materials.



E651 / E654

UNC UNF

DORMER
DIN

2B

HSS

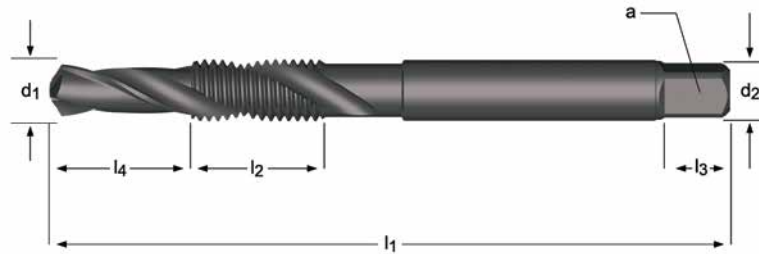
No.6 - 5/8

| 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 | 5978374 |
| 8 | | 32 | 3.50 | 64.0 | 12 | 8.0 | 4.50 | 3.55 | 2 | 1 | 5978380 |
| | 8 | 36 | 3.50 | 64.0 | 13 | 8.0 | 4.50 | 3.55 | 2 | 1 | 5978426 |
| 10 | | 24 | 3.90 | 72.0 | 15 | 10.0 | 5.00 | 4.00 | 2 | 1 | 5978357 |
| | 10 | 32 | 4.10 | 72.0 | 16 | 10.0 | 5.00 | 4.00 | 2 | 1 | 5978409 |
| 12 | | 24 | 4.50 | 77.0 | 15 | 11.0 | 5.60 | 4.50 | 2 | 1 | 5978360 |
| | 12 | 28 | 4.70 | 77.0 | 17 | 11.0 | 5.60 | 4.50 | 2 | 1 | 5978411 |
| 1/4 | | 20 | 5.10 | 83.0 | 17 | 13.0 | 6.30 | 5.00 | 2 | 1 | 5978353 |
| | 1/4 | 28 | 5.50 | 83.0 | 19 | 13.0 | 6.30 | 5.00 | 2 | 1 | 5978407 |
| 5/16 | | 18 | 6.60 | 94.0 | 21 | 16.0 | 8.00 | 6.30 | 2 | 1 | 5978365 |
| | 5/16 | 24 | 6.90 | 94.0 | 22 | 16.0 | 8.00 | 6.30 | 2 | 1 | 5978417 |
| 3/8 | | 16 | 8.00 | 104.0 | 23 | 19.0 | 10.00 | 8.00 | 2 | 1 | 5978362 |
| | 3/8 | 24 | 8.50 | 104.0 | 24 | 19.0 | 10.00 | 8.00 | 2 | 2 | 5978414 |
| 7/16 | | 14 | 9.40 | 107.0 | 25 | 22.0 | 8.00 | 6.30 | 2 | 1 | 5978377 |
| | 7/16 | 20 | 9.90 | 107.0 | 25 | 22.0 | 8.00 | 6.30 | 2 | 1 | 5978423 |
| 1/2 | | 13 | 10.80 | 114.0 | 29 | 25.0 | 9.00 | 7.10 | 2 | 1 | 5978350 |
| | 1/2 | 20 | 11.50 | 114.0 | 29 | 25.0 | 9.00 | 7.10 | 2 | 1 | 5978405 |
| 9/16 | | 12 | 12.20 | 124.0 | 29 | 28.0 | 11.20 | 9.00 | 2 | 1 | 5978383 |
| 5/8 | | 11 | 13.50 | 134.0 | 31 | 32.5 | 12.50 | 10.00 | 2 | 1 | 5978368 |
| | 5/8 | 18 | 14.50 | 134.0 | 32 | 32.0 | 12.50 | 10.00 | 2 | 1 | 5978420 |

Combination Drill & Tap

E650 Spiral Flute 30°. 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 tempered finish reduces wear and chip welding in harder ferrous materials.



E650

M

DORMER
ISO

6H



HSS



M3 - M16

| M | P mm | d ₁ ∅ mm | l ₁ mm | l ₂ mm | l ₄ mm | d ₂ ∅ 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 | 5978325 |
| 4 | 0.70 | 3.3 | 65 | 12 | 8 | 4.0 | 3.15 | 6.0 | 2 | 1 | 5978330 |
| 5 | 0.80 | 4.2 | 69 | 15 | 10 | 5.0 | 4.00 | 7.0 | 2 | 1 | 5978339 |
| 6 | 1.00 | 5.0 | 84 | 18 | 12 | 6.3 | 5.00 | 8.0 | 2 | 1 | 5978342 |
| 8 | 1.25 | 6.8 | 96 | 21 | 16 | 8.0 | 6.30 | 9.0 | 2 | 1 | 5978347 |
| 10 | 1.50 | 8.5 | 108 | 22 | 20 | 10.0 | 8.00 | 11.0 | 2 | 1 | 5978304 |
| 12 | 1.75 | 10.2 | 113 | 29 | 24 | 9.0 | 7.10 | 10.0 | 2 | 1 | 5978308 |
| 14 | 2.00 | 12.0 | 123 | 30 | 28 | 11.2 | 9.00 | 12.0 | 2 | 1 | 5978313 |
| 16 | 2.00 | 14.0 | 134 | 32 | 32 | 12.5 | 10.00 | 13.0 | 2 | 1 | 5978320 |

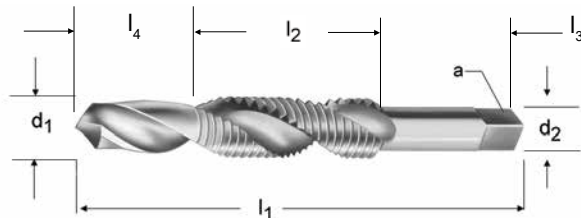
SPECIAL PURPOSE TAPS



Combination Drill & Tap, NPT Pipe Threads

E653 Spiral Flute 27°. 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 | 5978397 |
| 1/4 | 18 | 0.4331 | 3.5/16 | 1.1/16 | 7/16 | 7/8 | 0.5620 | 0.4210 | 2 | 1 | 5978395 |
| 3/8 | 18 | 0.5709 | 3.1/2 | 1.1/16 | 1/2 | 15/16 | 0.7000 | 0.5310 | 2 | 1 | 5978403 |
| 1/2 | 14 | 0.7087 | 4.3/8 | 1.3/8 | 5/8 | 1.1/4 | 0.6870 | 0.5150 | 2 | 1 | 5978392 |
| 3/4 | 14 | 0.9055 | 4.9/16 | 1.3/8 | 11/16 | 1.5/16 | 0.9060 | 0.6790 | 2 | 1 | 5978399 |
| 1" | 11.5 | 1.1417 | 5.3/8 | 1.3/4 | 13/16 | 1.5/8 | 1.1250 | 0.8430 | 2 | 1 | 5978386 |

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 | 6007552 |
| T1 | 3/16 - 5/16 | M4 - M7 | 3/16 - 7/16 | M4 - M10 | 1 | 6007557 |
| T2 | 1/4 - 15/32 | M6 - M14 | 1/4 - 9/16 | M6 - M14 | 1 | 6007563 |

MISCELLANEOUS



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 | 6009196 |
| 9 | 3/16 - 3/8 | M5 - M9 | 3/16 - 1/2 | M4 - M12 | 10.1/2" | 1 | 6009254 |
| 10 | 1/4 - 9/16 | M6 - M14 | 1/4 - 3/4 | M3 - M8 | 15" | 1 | 6009347 |
| 11 | 3/8 - 3/4 | M9 - M19 | 3/8 - 1" | M10 - M25 | 20" | 1 | 6009350 |
| 12 | 3/8 - 7/8 | M9 - M22 | 3/8 - 1.1/8 | M10 - M27 | 25.5/8" | 1 | 6009353 |
| 14 | 5/8 - 1.1/2 | M16 - M39 | 7/8 - 1.7/8 | M22 - M42 | 40.1/2" | 1 | 6009143 |

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 | 6009137 |













Visual Index - Dies

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)
example: 361 = SFM

| 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 | 6Al4V, 6Al4V-2Sn, Monel, Monel K | <28 |
| | 4.3 Titanium, alloyed | 6Al4V-4Mo, 7Al4V-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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB |
| | 6.2 β-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 | Ultrad, 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 - Dies

| Thread Form: | NPT | UNC | UNF | M | G | M |
|-------------------|---|---|---|---|---|---|
| Standard: | ANSI | BS 1127: 1950 | BS 1127: 1950 | ANSI | BS 1127: 1950 | ISO 2568 |
| Tolerance: | | | | | | 6g |
| Chamfer: | | 1.75XP | 1.75XP | | 1.75XP | 1.75XP |
| Tool Material: | CS | HSS | HSS | HSS | HSS | HSS |
| Direction of Cut: |  |  |  |  |  |  |
| Finish/Coating: |  |  |  |  |  |  |
| Style: | 2010(NPT) | F320 | F330 | 2710M | F370 | F201 |
| Range: | 1/8 - 1/2 | No.4 - 1.1/4 | No.4 - 1.1/2 | M2 - M20 | 1/8 - 1.1/2 | M3 - M20 |
| Page # | 378 | 379 | 379 | 381 | 382 | 383 |
| 1.1 | 26 | 26 | 26 | 26 | 26 | 26 |
| 1.2 | 23 | 23 | 23 | 23 | 23 | 23 |
| 1.3 | 20 | 20 | 20 | 20 | 20 | 20 |
| 1.4 | 16 | 16 | 16 | 16 | 16 | 16 |
| 1.5 | | | | | | |
| 1.6 | | | | | | |
| 1.7 | | | | | | |
| 1.8 | | | | | | |
| 2.1 | 13 | 13 | 13 | 13 | 13 | 13 |
| 2.2 | 7 | 7 | 7 | 7 | 7 | 7 |
| 2.3 | | | | | | |
| 2.4 | | | | | | |
| 3.1 | 26 | 26 | 26 | 26 | 26 | 26 |
| 3.2 | 23 | 23 | 23 | 23 | 23 | 23 |
| 3.3 | 20 | 20 | 20 | 20 | 20 | 20 |
| 3.4 | 16 | 16 | 16 | 16 | 16 | 16 |
| 4.1 | | | | | | |
| 4.2 | | | | | | |
| 4.3 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5.1 | 30 | 30 | 30 | 30 | 30 | 30 |
| 5.2 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5.3 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6.1 | 30 | 30 | 30 | 30 | 30 | 30 |
| 6.2 | 26 | 26 | 26 | 26 | 26 | 26 |
| 6.3 | 23 | 23 | 23 | 23 | 23 | 23 |
| 6.4 | | | | | | |
| 7.1 | 33 | 33 | 33 | 33 | 33 | 33 |
| 7.2 | 49 | 49 | 49 | 49 | 49 | 49 |
| 7.3 | 49 | 49 | 49 | 49 | 49 | 49 |
| 7.4 | 33 | 33 | 33 | 33 | 33 | 33 |
| 8.1 | 49 | 49 | 49 | 49 | 49 | 49 |
| 8.2 | 33 | 33 | 33 | 33 | 33 | 33 |
| 8.3 | 16 | 16 | 16 | 16 | 16 | 16 |
| 9.1 | | | | | | |
| 10.1 | | | | | | |

Visual Index - Dies

| | UNC | UNF | UNS | NPT | M | M | MF |
|------|---|---|---|---|---|--|---|
| | ANSI | ANSI | ANSI | ANSI | ANSI | BS 1127: 1950 | BS 1127: 1950 |
| | | | | | | 6g | 6g |
| | | | | | | 1.75XP | 1.75XP |
| | CS | CS | CS | CS | CS | HSS | HSS |
| |  |  |  |  |  |  |  |
| |  |  |  |  |  |  |  |
| |  |  |  |  |  |  |  |
| | 2025(UNC) | 2025(UNF) | 2025(UNS) | 2025(NPT) | 2325M | F302 | F312 |
| | 1/4 - 1.1/2 | 1/4 - 1.1/2 | 11/16 - 1" | 1/8 - 1" | M6 - M20 | M3 - M36 | M8 - M24 |
| | 384 | 384 | 384 | 384 | 385 | 386 | 387 |
| 1.1 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 1.2 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 1.3 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 1.4 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 1.5 | | | | | | | |
| 1.6 | | | | | | | |
| 1.7 | | | | | | | |
| 1.8 | | | | | | | |
| 2.1 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| 2.2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 2.3 | | | | | | | |
| 2.4 | | | | | | | |
| 3.1 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 3.2 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 3.3 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| 3.4 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 4.1 | | | | | | | |
| 4.2 | | | | | | | |
| 4.3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5.1 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 5.2 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 5.3 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| 6.1 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| 6.2 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| 6.3 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| 6.4 | | | | | | | |
| 7.1 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| 7.2 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| 7.3 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| 7.4 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| 8.1 | 49 | 49 | 49 | 49 | 49 | 49 | 49 |
| 8.2 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| 8.3 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| 9.1 | | | | | | | |
| 10.1 | | | | | | | |

List Number Index - Dies



Pgs. 378-388

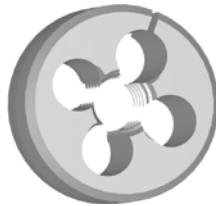
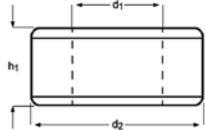
| | |
|------------|-----|
| 2010..... | 378 |
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| F201 | 383 |
| F302 | 386 |
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| F330 | 379 |
| F370 | 382 |
| L110..... | 388 |

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.

Thread Size



2010(NPT)

NPT

CS



ANSI

1/8 - 1/2

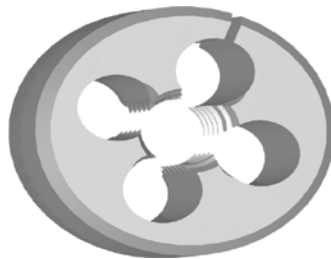
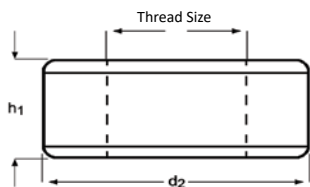
| NPT | TPI | d ₂ Ø Inch | h ₁ Inch | Pack Qty | 2010 (NPT) |
|-----|-----|-----------------------------|------------------------|-------------|---------------|
| 1/8 | 27 | 1" | 3/8 | 1 | 6008629 |
| 1/8 | 27 | 1.1/2 | 1/2 | 1 | 6008632 |
| 1/4 | 18 | 1.1/2 | 1/2 | 1 | 6009094 |
| 1/4 | 18 | 2" | 5/8 | 1 | 6009098 |
| 3/8 | 18 | 1.1/2 | 1/2 | 1 | 6008726 |
| 3/8 | 18 | 2" | 5/8 | 1 | 6008731 |
| 1/2 | 14 | 2" | 5/8 | 1 | 6009086 |

Round Adjustable, Split Type

F320 Round adjustable dies can be closed down by approximately 0.006" on diameter. Bright finish improves chip flow in soft or non-ferrous materials.

F330

Note: Die pictured has 4 clearance holes. The number of clearance holes will increase or decrease depending on the size of the die.



| F320 | F330 |
|---------------|---------------|
| UNC | UNF |
| HSS | HSS |
| | |
| BS 1127: 1950 | BS 1127: 1950 |
| 2B | 2B |
| | |
| N4 - 1.1/4 | N4 - 1.1/2 |

| 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 | — | 5978804 |
| 4 | | 40 | 2.85 | 13/16 | 1/4 | 1 | 5978041 | — |
| | 5 | 44 | 3.18 | 13/16 | 1/4 | 1 | — | 5978807 |
| 5 | | 40 | 3.18 | 13/16 | 1/4 | 1 | 5978045 | — |
| | 6 | 40 | 3.51 | 13/16 | 1/4 | 1 | — | 5978830 |
| 6 | | 32 | 3.51 | 13/16 | 1/4 | 1 | 5978080 | — |
| | 8 | 36 | 4.17 | 13/16 | 1/4 | 1 | — | 5978840 |
| 8 | | 32 | 4.17 | 1" | 3/8 | 1 | 5978846 | — |
| 8 | | 32 | 4.17 | 13/16 | 1/4 | 1 | 5978869 | — |
| | 10 | 32 | 4.83 | 13/16 | 1/4 | 1 | — | 5978776 |
| | 10 | 32 | 4.83 | 1" | 3/8 | 1 | — | 5978772 |
| 10 | | 24 | 4.83 | 1" | 3/8 | 1 | 5978004 | — |
| 10 | | 24 | 4.83 | 13/16 | 1/4 | 1 | 5978007 | — |
| | 12 | 28 | 5.49 | 13/16 | 1/4 | 1 | — | 5978779 |
| 12 | | 24 | 5.49 | 13/16 | 1/4 | 1 | 5978010 | — |
| | 1/4 | 28 | 6.35 | 1" | 3/8 | 1 | — | 5978757 |
| | 1/4 | 28 | 6.35 | 1.1/2 | 1/2 | 1 | — | 5978761 |
| | 1/4 | 28 | 6.35 | 13/16 | 1/4 | 1 | — | 5978765 |
| 1/4 | | 20 | 6.35 | 1" | 3/8 | 1 | 5977987 | — |
| 1/4 | | 20 | 6.35 | 1.1/2 | 1/2 | 1 | 5977990 | — |
| 1/4 | | 20 | 6.35 | 1.5/16 | 7/16 | 1 | 5977993 | — |
| 1/4 | | 20 | 6.35 | 13/16 | 1/4 | 1 | 5977996 | — |
| | 5/16 | 24 | 7.94 | 1" | 3/8 | 1 | — | 5978810 |
| | 5/16 | 24 | 7.94 | 1.1/2 | 1/2 | 1 | — | 5978813 |
| | 5/16 | 24 | 7.94 | 1.5/16 | 7/16 | 1 | — | 5978816 |
| 5/16 | | 18 | 7.94 | 1" | 3/8 | 1 | 5978050 | — |
| 5/16 | | 18 | 7.94 | 1.1/2 | 1/2 | 1 | 5978055 | — |
| | 3/8 | 24 | 9.53 | 1" | 3/8 | 1 | — | 5978794 |
| | 3/8 | 24 | 9.53 | 1.1/2 | 1/2 | 1 | — | 5978798 |
| | 3/8 | 24 | 9.53 | 1.5/16 | 7/16 | 1 | — | 5978801 |
| 3/8 | | 16 | 9.53 | 1" | 3/8 | 1 | 5978027 | — |
| 3/8 | | 16 | 9.53 | 1.1/2 | 1/2 | 1 | 5978031 | — |
| 3/8 | | 16 | 9.53 | 1.5/16 | 7/16 | 1 | 5978036 | — |

DIES



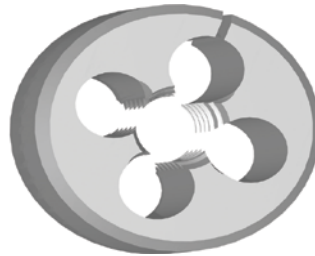
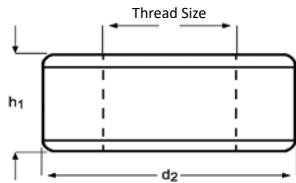
| UNC | UNF | TPI | d ₁ nom mm | d ₂ Ø Inch | h ₁ Inch | Pack Qty | F320 | F330 |
|-------|-------|-----|-----------------------------|-----------------------------|------------------------|-------------|---------|---------|
| | 7/16 | 20 | 11.11 | 1" | 3/8 | 1 | — | 5978832 |
| | 7/16 | 20 | 11.11 | 1.1/2 | 1/2 | 1 | — | 5978834 |
| | 7/16 | 20 | 11.11 | 1.5/16 | 7/16 | 1 | — | 5978836 |
| 7/16 | | 14 | 11.11 | 1.1/2 | 1/2 | 1 | 5978746 | — |
| 7/16 | | 14 | 11.11 | 1.5/16 | 7/16 | 1 | 5978787 | — |
| | 1/2 | 20 | 12.70 | 1.1/2 | 1/2 | 1 | — | 5978750 |
| | 1/2 | 20 | 12.70 | 1.5/16 | 7/16 | 1 | — | 5978753 |
| 1/2 | | 13 | 12.70 | 1.1/2 | 1/2 | 1 | 5977975 | — |
| 1/2 | | 13 | 12.70 | 1.5/16 | 7/16 | 1 | 5977978 | — |
| 1/2 | | 13 | 12.70 | 2" | 5/8 | 1 | 5977981 | — |
| | 9/16 | 18 | 14.29 | 1.1/2 | 1/2 | 1 | — | 5978842 |
| | 9/16 | 18 | 14.29 | 1.5/16 | 7/16 | 1 | — | 5978844 |
| 9/16 | | 12 | 14.29 | 1.1/2 | 1/2 | 1 | 5978875 | — |
| | 5/8 | 18 | 15.88 | 1.1/2 | 1/2 | 1 | — | 5978825 |
| | 5/8 | 18 | 15.88 | 2" | 5/8 | 1 | — | 5978827 |
| 5/8 | | 11 | 15.88 | 1.1/2 | 1/2 | 1 | 5978065 | — |
| 5/8 | | 11 | 15.88 | 2" | 5/8 | 1 | 5978069 | — |
| | 3/4 | 16 | 19.05 | 1.1/2 | 1/2 | 1 | — | 5978783 |
| | 3/4 | 16 | 19.05 | 2" | 5/8 | 1 | — | 5978791 |
| 3/4 | | 10 | 19.05 | 1.1/2 | 1/2 | 1 | 5978013 | — |
| 3/4 | | 10 | 19.05 | 2" | 5/8 | 1 | 5978016 | — |
| | 7/8 | 14 | 22.23 | 2" | 5/8 | 1 | — | 5978838 |
| 7/8 | | 9 | 22.23 | 2" | 5/8 | 1 | 5978821 | — |
| | 1" | 12 | 25.40 | 2" | 5/8 | 1 | — | 5978768 |
| 1" | | 8 | 25.40 | 2" | 5/8 | 1 | 5978001 | — |
| | 1.1/8 | 12 | 28.58 | 3" | 7/8 | 1 | — | 5978884 |
| 1.1/8 | | 7 | 28.58 | 3" | 7/8 | 1 | 5977972 | — |
| | 1.1/4 | 12 | 31.75 | 3" | 7/8 | 1 | — | 5978881 |
| 1.1/4 | | 7 | 31.75 | 3" | 7/8 | 1 | 5977968 | — |
| | 1.1/2 | 12 | 38.10 | 3" | 7/8 | 1 | — | 5978878 |

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

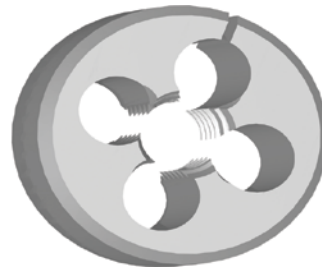
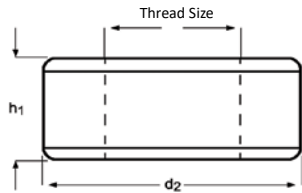
M2 - M20

| M | P mm | d ₂ Ø Inch | h ₁ Inch | Pack Qty | 2710M |
|------|---------|-----------------------------|------------------------|-------------|---------|
| 2 | 0.40 | 13/16 | 1/4 | 1 | 6009431 |
| 2.5 | 0.45 | 13/16 | 1/4 | 1 | 6009426 |
| 3 | 0.50 | 13/16 | 1/4 | 1 | 6009442 |
| 4 | 0.70 | 13/16 | 1/4 | 1 | 6009448 |
| 4.5 | 0.75 | 13/16 | 1/4 | 1 | 6009445 |
| 5 | 0.80 | 13/16 | 1/4 | 1 | 6009451 |
| 6 | 1.00 | 1" | 3/8 | 1 | 6009456 |
| 8 | 1.25 | 1" | 3/8 | 1 | 6009463 |
| 9 | 1.25 | 1" | 3/8 | 1 | 6009466 |
| 10.0 | 1.50 | 1" | 3/8 | 1 | 6009401 |
| 12 | 1.75 | 1" | 3/8 | 1 | 6009405 |
| 12 | 1.75 | 1.1/2 | 1/2 | 1 | 6009412 |
| 14 | 2.00 | 1.1/2 | 1/2 | 1 | 6009414 |
| 16 | 2.00 | 1.1/2 | 1/2 | 1 | 6009417 |
| 18 | 2.50 | 2" | 5/8 | 1 | 6009420 |
| 20 | 2.50 | 2" | 5/8 | 1 | 6009434 |

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



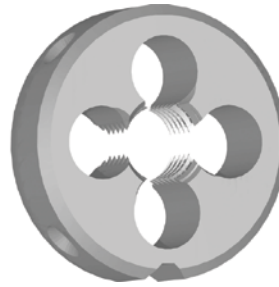
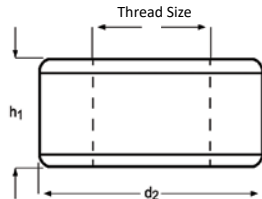
1/8 - 1.1/2

| 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 | 5978453 |
| 1/4 | 19 | 13.16 | 1.5/16 | 7/16 | 1 | 5978451 |
| 3/8 | 19 | 16.66 | 1.1/2 | 1/2 | 1 | 5978464 |
| 1/2 | 14 | 20.96 | 2" | 5/8 | 1 | 5978449 |
| 5/8 | 14 | 22.91 | 2" | 5/8 | 1 | 5978467 |
| 3/4 | 14 | 26.44 | 2" | 5/8 | 1 | 5978458 |
| 7/8 | 14 | 30.20 | 2.1/4 | 11/16 | 1 | 5978470 |
| 1" | 11 | 33.25 | 2.1/4 | 11/16 | 1 | 5978455 |
| 1.1/4 | 11 | 41.91 | 3" | 7/8 | 1 | 5978447 |
| 1.1/2 | 11 | 47.80 | 4" | 1" | 1 | 5978444 |

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

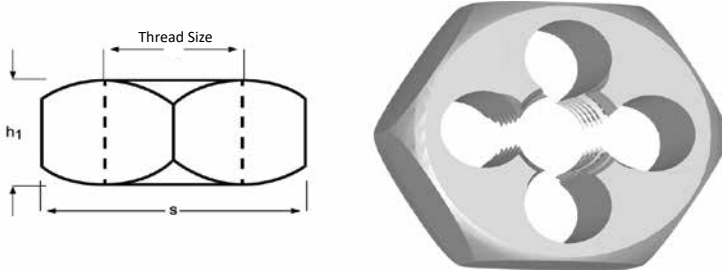
M3 - M20

| M | P mm | d_2 Ø mm | h_1 mm | Pack Qty | F201 |
|----|---------|------------------|-------------|-------------|---------|
| 3 | 0.50 | 20 | 5 | 1 | 5977853 |
| 4 | 0.70 | 20 | 5 | 1 | 5977857 |
| 5 | 0.80 | 20 | 7 | 1 | 5977860 |
| 6 | 1.00 | 20 | 7 | 1 | 5977863 |
| 8 | 1.25 | 25 | 9 | 1 | 5977866 |
| 10 | 1.50 | 30 | 11 | 1 | 5977822 |
| 12 | 1.75 | 38 | 14 | 1 | 5977826 |
| 14 | 2.00 | 38 | 14 | 1 | 5977831 |
| 16 | 2.00 | 45 | 18 | 1 | 5977836 |
| 18 | 2.50 | 45 | 18 | 1 | 5977840 |
| 20 | 2.50 | 45 | 18 | 1 | 5977845 |

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



| 2025(UNC) | 2025(UNF) | 2025(UNS) | 2025(NPT) |
|-------------|-------------|------------|-----------|
| UNC | UNF | UNS | NPT |
| CS | CS | CS | CS |
| ANSI | ANSI | ANSI | ANSI |
| 2B | 2B | 2B | |
| | | | |
| 1/4 - 1.1/2 | 1/4 - 1.1/2 | 11/16 - 1" | 1/8 - 1" |

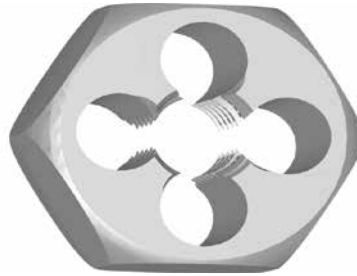
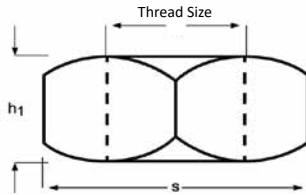
| UNC | UNF | UNS | NPT | TPI | S Inch | h ₁ Inch | Pack Qty | 2025(UNC) | 2025(UNF) | 2025(UNS) | 2025(NPT) |
|-------|-------|-------|------|---------|--------|------------------------|----------|-----------|-----------|-----------|-----------|
| | | 1/8 | 27 | 1.1/16 | 3/8 | 1 | — | — | — | 6009081 | |
| | 1/4 | | 28 | 5/8 | 1/2 | 1 | — | 6009075 | — | — | |
| 1/4 | | | 20 | 5/8 | 1/2 | 1 | 6009069 | — | — | — | |
| | | 1/4 | 18 | 1.1/4 | 5/8 | 1 | — | — | — | 6009060 | |
| | 5/16 | | 24 | 11/16 | 5/16 | 1 | — | 6009324 | — | — | |
| 5/16 | | | 18 | 11/16 | 5/16 | 1 | 6009316 | — | — | — | |
| | 3/8 | | 24 | 13/16 | 3/8 | 1 | — | 6009261 | — | — | |
| 3/8 | | | 16 | 13/16 | 3/8 | 1 | 6009155 | — | — | — | |
| | | 3/8 | 18 | 1.7/16 | 5/8 | 1 | — | — | — | 6009208 | |
| | 7/16 | | 20 | 7/8 | 7/16 | 1 | — | 6009122 | — | — | |
| 7/16 | | | 14 | 7/8 | 7/16 | 1 | 6009335 | — | — | — | |
| | 1/2 | | 20 | 1.1/16 | 1/2 | 1 | — | 6009055 | — | — | |
| 1/2 | | | 13 | 1.1/16 | 1/2 | 1 | 6009045 | — | — | — | |
| | | 1/2 | 14 | 1.5/8 | 3/4 | 1 | — | — | — | 6009050 | |
| | 9/16 | | 18 | 1.1/16 | 1/2 | 1 | — | 6009134 | — | — | |
| 9/16 | | | 12 | 1.1/16 | 1/2 | 1 | 6009131 | — | — | — | |
| | 5/8 | | 18 | 1.1/4 | 5/8 | 1 | — | 6009331 | — | — | |
| 5/8 | | | 11 | 1.1/4 | 5/8 | 1 | 6009328 | — | — | — | |
| | | 11/16 | 11 | 1.7/16 | 3/4 | 1 | — | — | 6009095 | — | |
| | | 11/16 | 16 | 1.7/16 | 3/4 | 1 | — | — | 6009097 | — | |
| | 3/4 | | 16 | 1.7/16 | 3/4 | 1 | — | 6009119 | — | — | |
| 3/4 | | | 10 | 1.7/16 | 3/4 | 1 | 6009099 | — | — | — | |
| | | 3/4 | 14 | 2" | 13/16 | 1 | — | — | — | 6009103 | |
| | 7/8 | | 14 | 1.5/8 | 7/8 | 1 | — | 6009125 | — | — | |
| 7/8 | | | 9 | 1.5/8 | 7/8 | 1 | 6009128 | — | — | — | |
| | | 1" | 14 | 1.13/16 | 1" | 1 | — | — | 6009091 | — | |
| | 1" | | 12 | 1.13/16 | 1" | 1 | — | 6009089 | — | — | |
| 1" | | | 8 | 1.13/16 | 1" | 1 | 6009093 | — | — | — | |
| | | 1" | 11.5 | 2.3/8 | 1" | 1 | — | — | — | 6009085 | |
| | 1.1/8 | | 12 | 2" | 1" | 1 | — | 6009025 | — | — | |
| 1.1/8 | | | 7 | 2" | 1" | 1 | 6009030 | — | — | — | |
| | 1.1/4 | | 12 | 2.3/16 | 1" | 1 | — | 6009017 | — | — | |
| 1.1/4 | | | 7 | 2.3/16 | 1" | 1 | 6009021 | — | — | — | |
| | 1.3/8 | | 12 | 2.3/8 | 1" | 1 | — | 6009035 | — | — | |
| 1.3/8 | | | 6 | 2.3/8 | 1" | 1 | 6009040 | — | — | — | |
| | 1.1/2 | | 12 | 2.9/16 | 1" | 1 | — | 6009003 | — | — | |
| 1.1/2 | | | 6 | 2.5/8 | 1" | 1 | 6009008 | — | — | — | |

DIES

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



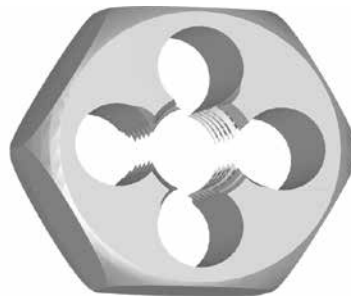
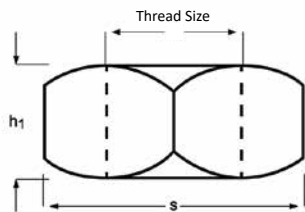
M6 - M20

| M | P mm | S Inch | h ₁ Inch | Pack Qty | 2325M |
|----|---------|-----------|------------------------|-------------|---------|
| 6 | 1.00 | 5/8 | 3/8 | 1 | 6009183 |
| 8 | 1.25 | 1 | 3/8 | 1 | 6009193 |
| 9 | 1.25 | 1 | 3/8 | 1 | 6009202 |
| 10 | 1.50 | 1 | 3/8 | 1 | 6009144 |
| 12 | 1.75 | 1 | 3/8 | 1 | 6009151 |
| 14 | 2.00 | 1.7/16 | 1/2 | 1 | 6009164 |
| 16 | 2.00 | 1.7/16 | 1/2 | 1 | 6009169 |
| 18 | 1.50 | 1.7/16 | 1/2 | 1 | 6009174 |
| 18 | 2.50 | 1.7/16 | 1/2 | 1 | 6009197 |
| 20 | 2.50 | 1.13/16 | 3/4 | 1 | 6009179 |

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 the size of the die.



F302

M

HSS



BS
1127:
1950

6H



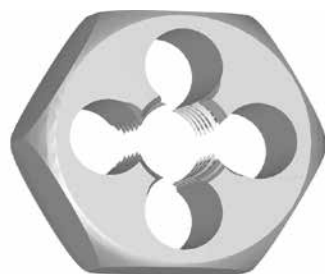
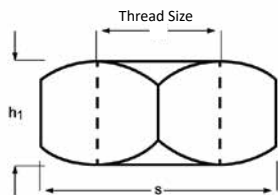
M3 - M36

| M | P mm | S decimal Inch | h ₁ Inch | Pack Qty | F302 |
|----|---------|----------------------|------------------------|-------------|---------|
| 3 | 0.50 | 0.7100 | 1/4 | 1 | 5978496 |
| 4 | 0.70 | 0.7100 | 1/4 | 1 | 5978508 |
| 5 | 0.80 | 0.7100 | 1/4 | 1 | 5978510 |
| 6 | 1.00 | 0.7100 | 1/4 | 1 | 5978513 |
| 7 | 1.00 | 0.8200 | 5/16 | 1 | 5978517 |
| 8 | 1.25 | 0.8200 | 5/16 | 1 | 5978521 |
| 10 | 1.50 | 0.9200 | 3/8 | 1 | 5978465 |
| 11 | 1.50 | 1.0100 | 7/16 | 1 | 5978468 |
| 12 | 1.75 | 1.1000 | 1/2 | 1 | 5978471 |
| 14 | 2.00 | 1.3000 | 5/8 | 1 | 5978473 |
| 16 | 2.00 | 1.3000 | 5/8 | 1 | 5978476 |
| 18 | 2.50 | 1.4800 | 11/16 | 1 | 5978479 |
| 20 | 2.50 | 1.4800 | 11/16 | 1 | 5978482 |
| 22 | 2.50 | 1.6700 | 13/16 | 1 | 5978484 |
| 24 | 3.00 | 2.0500 | 15/16 | 1 | 5978487 |
| 27 | 3.00 | 2.2200 | 1.1/16 | 1 | 5978493 |
| 30 | 3.50 | 2.2200 | 1.1/16 | 1 | 5978499 |
| 33 | 3.50 | 2.5800 | 1.1/8 | 1 | 5978502 |
| 36 | 4.00 | 2.7600 | 1.1/4 | 1 | 5978505 |

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 | 5977961 |
| 8 | 1.00 | 0.8200 | 5/16 | 1 | 5977964 |
| 10 | 1.00 | 0.9200 | 3/8 | 1 | 5977930 |
| 10 | 1.25 | 0.9200 | 3/8 | 1 | 5977934 |
| 12 | 1.00 | 1.0100 | 7/16 | 1 | 5977937 |
| 12 | 1.25 | 1.0100 | 7/16 | 1 | 5977939 |
| 12 | 1.50 | 1.0100 | 7/16 | 1 | 5977941 |
| 14 | 1.50 | 1.3000 | 5/8 | 1 | 5977944 |
| 16 | 1.50 | 1.3000 | 5/8 | 1 | 5977946 |
| 18 | 1.50 | 1.4800 | 11/16 | 1 | 5977948 |
| 20 | 1.50 | 1.4800 | 11/16 | 1 | 5977950 |
| 22 | 1.50 | 1.6700 | 13/16 | 1 | 5977954 |
| 24 | 1.50 | 2.0500 | 15/16 | 1 | 5977956 |
| 24 | 2.00 | 2.0500 | 15/16 | 1 | 5977959 |

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"

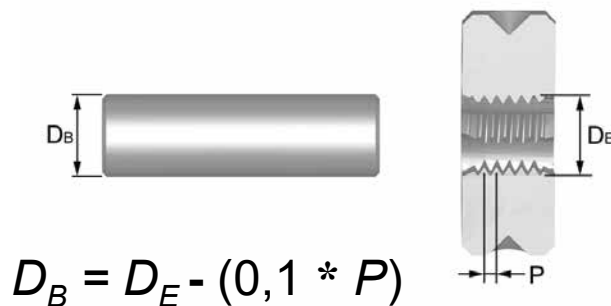
| Nr. | Die Size Ø x H | Pack Qty | L110 |
|-----|-------------------|-------------|---------|
| 1" | 16 x 5 | 1 | 5978506 |
| 2a | 20 x 5 | 1 | 5978542 |
| 2b | 20 x 7 | 1 | 5978547 |
| 3 | 25 x 9 | 1 | 5978556 |
| 4" | 30 x 11 | 1 | 5978566 |
| 5 | 38 x 14 | 1 | 5978576 |
| 5f | 38 x 10 | 1 | 5978581 |
| 6 | 45 x 18 | 1 | 5978589 |
| 6f | 45 x 14 | 1 | 5978749 |
| 7 | 55 x 22 | 1 | 5978792 |
| 7f | 55 x 16 | 1 | 5978826 |
| 8 | 65 x 25 | 1 | 5978850 |
| 8f | 65 x 18 | 1 | 5978876 |
| 9 | 75 x 30 | 1 | 5978882 |
| 9f | 75 x 20 | 1 | 5978885 |
| 10 | 90 x 36 | 1 | 5978522 |
| 10f | 90 x 22 | 1 | 5978526 |
| | 13/16 x 1/4 | 1 | 5978531 |
| | 1 x 3/8 | 1 | 5978518 |
| | 1.5/16 x 7/16 | 1 | 5978514 |
| | 1.1/2 x 1/2 | 1 | 5978511 |
| | 2 x 5/8 | 1 | 5978552 |
| | 2.1/4 x 11/16 | 1 | 5978539 |
| | 3 x 7/8 | 1 | 5978562 |
| | 4 x 1 | 1 | 5978571 |

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.










Visual Index - End Mills

HSS End Mill - Feed Rate Chart

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 | 0.0032 | 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 | 0.0056 | 0.0056 | 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 | 0.0031 | 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 | 0.0025 | 0.0021 | 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 | |

Carbide End Mill - Feed Rate Chart

| # 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 | | | | 0.0010 | 0.0015 | 0.0015 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 |
| | | | B | | | | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0040 | 0.0045 |
| | | | C | | | | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 | 0.0060 | 0.0070 |
| 3-4 |  | ↓ 1,5 ↔ 0,1 | A | 0.0010 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 |
| | | | B | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 | 0.0060 | 0.0070 |
| | | | C | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0065 | 0.0070 | 0.0080 | 0.0090 |
| 3-4 |  | ↓ 1 ↔ 0,5 | A | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 |
| | | | B | 0.0005 | 0.0005 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 |
| | | | C | 0.0005 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 |
| 2-3 |  | ↓ 0,5 ↔ 1 | A | 0.0005 | 0.0010 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 | 0.0030 |
| | | | B | 0.0010 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0035 | 0.0040 |
| | | | C | 0.0015 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0050 |
| 3-4 |  | ↓ 0,5 ↔ 1 ↓ 1 ↔ 0,5 | B | | | | 0.0010 | 0.0020 | 0.0030 | 0.0030 | 0.0035 | 0.0040 | 0.0040 | 0.0040 |
| | | | | | | | | | | | | | | |
| 2 & 4 |  | ↓ 0,1 - 0,5mm ↔ 0,1 - 0,5mm | A | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0030 | | |
| | | | BC | 0.0010 | 0.0010 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | | |
| 4 |  | ↓ 0,01 - 0,1 ↔ ≤ 1 | A | | | | 0.0020 | 0.0020 | 0.0025 | 0.0030 | | 0.0030 | | |
| | | | BC | | | | 0.0020 | 0.0025 | 0.0030 | 0.0035 | | 0.0040 | | |

Visual Index - End Mills

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, find your Alpha Code on the AMG Chart
 (example: 279 U : U is the Alpha Code)
- 5) Find the closest diameter for your cutting application on the Feed Rate chart to find your Ft
- 6) Select the type of cut and # of flutes to find your Ft Range

| 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 | 6A14V-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 β-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 | |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----------|
| Application: | | | | | | | | | | | | | | | |
| Type: | W | W | W | | | | | | | | | | | | |
| Number of Flutes: | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | Z 2 | |
| Cut Length: | | | | | | | | | | | | | | | |
| Helix: | $\lambda 45^\circ$ | $\lambda 45^\circ$ | $\lambda 37^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | |
| Shank: | | | | | | | | | | | | | | | |
| Finish/Coating: | | | | | | | | | | | | | | | |
| Tolerance: | | | | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | |
| Direction: | | | | | | | | | | | | | | | |
| Style: | S106 | S206 | S207 | S116 | S108 | S208 | S109 | S110 | S111 | S211 | S112 | S212 | S113 | S213 | S114 |
| Range: | 1/4 - 1" | 1/4 - 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 | 1/16 - 1/2 | 1/16 - 1/2 | 2.00 - 20.00 | 2.00 - 12.00 | 1/8 - 5/8 |
| Page # | 397 | 397 | 398 | 399 | 400 | 400 | 401 | 402 | 403 | 403 | 404 | 404 | 405 | 405 | 406 |
| 1.1 | | | | 289B | 289B | 400B | 289B | 269B | 249B | 361B | 289B | 400B | 289B | 400B | 269B |
| 1.2 | | | | 223B | 223B | 298B | 223B | 212B | 200B | 269B | 223B | 298B | 223B | 298B | 212B |
| 1.3 | | | | 223B | 223B | 298B | 223B | 212B | 200B | 269B | 223B | 298B | 223B | 298B | 212B |
| 1.4 | | | | 180B | 180B | 259B | 180B | 171B | 161B | 239B | 180B | 259B | 180B | 259B | 170B |
| 1.5 | | | | 161B | 161B | 230B | 161B | 152B | 144B | 200B | 161B | 230B | 161B | 230B | 152B |
| 1.6 | | | | 148B | 148B | 200B | 148B | 140B | 131B | 180B | 148B | 200B | 148B | 200B | 140B |
| 1.7 | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | |
| 2.1 | | | | 200A | 200A | 325A | 200A | 190A | 180A | 298A | 200A | 325A | 200A | 325A | 190A |
| 2.2 | | | | 141A | 141A | 223A | 141A | 125A | 108A | 180A | 141A | 223A | 141A | 223A | 125A |
| 2.3 | | | | 108A | 108A | 174A | 108A | 103A | 98A | 171A | 108A | 174A | 108A | 174A | 103A |
| 2.4 | | | | 89A | 89A | 131A | 89A | 78A | 66A | 131A | 89A | 131A | 89A | 131A | 78A |
| 3.1 | | | | 374B | 374B | 551B | 374B | 336A | 298B | 499B | 374B | 551B | 374B | 551B | 336A |
| 3.2 | | | | 318B | 318B | 525B | 318B | 284B | 249B | 400B | 318B | 525B | 318B | 525B | 284B |
| 3.3 | | | | 318B | 318B | 525B | 318B | 284B | 249B | 400B | 318B | 525B | 318B | 525B | 284B |
| 3.4 | | | | 249B | 249B | 374B | 249B | 225B | 200B | 341B | 249B | 374B | 249B | 374B | 225B |
| 4.1 | | | | | | | 230B | | | 200B | | 230B | | 230B | |
| 4.2 | | | | | | | 200B | | | 180B | | 200B | | 200B | |
| 4.3 | | | | | | | 190B | | | 174B | | 190B | | 190B | |
| 5.1 | | | | | | | 230B | | | 200B | | 230B | | 230B | |
| 5.2 | | | | | | | 161A | | | 141A | | 161A | | 161A | |
| 5.3 | | | | | | | 98A | | | 85A | | 98A | | 98A | |
| 6.1 | | | | 649C | 649C | | 649C | 617C | 584C | | 649C | | 649C | | 617C |
| 6.2 | | | | 499C | 499C | | 499C | 474C | 449C | | 499C | | 499C | | 474C |
| 6.3 | | | | 499C | 499C | | 499C | 474C | 449C | | 499C | | 499C | | 474C |
| 6.4 | | | | 125B | 125B | | 125B | 117B | 108B | | 125B | | 125B | | 117B |
| 7.1 | 2326C | 2326C | 2093C | 1499C | 1499C | | 1499C | 1424C | 1348C | | 1499C | | 1499C | | 1424C |
| 7.2 | 1749C | 1749C | 1575C | 1499C | 1499C | | 1499C | 1424C | 1348C | | 1499C | | 1499C | | 1424C |
| 7.3 | 1171C | 1171C | 1056C | 649C | 649C | | 649C | 617C | 584C | | 649C | | 649C | | 617C |
| 7.4 | 751B | 751B | 676B | 400B | 400B | | 400B | 380B | 361B | | 400B | | 400B | | 380B |
| 8.1 | | | | | | | | | | | | | | | |
| 8.2 | | | | | | | | | | | | | | | |
| 8.3 | | | | | | | | | | | | | | | |
| 9.1 | | | | | | | | | | | | | | | |
| 10.1 | | | | | | | | | | | | | | | |

Visual Index - End Mills

| | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | HM | |
|------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | | | | | | | | | | | | | | | |
| | Z 2 | Z 2 | Z 3 | Z 3 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 | Z 4 |
| | | | | | | | | | | | | | | | | | |
| | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ |
| | | | | | | | | | | | | | | | | | |
| | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal | Normal |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | S115 | S215 | S121 | S221 | S129 | S134 | S234 | S135 | S235 | S136 | S236 | S137 | S237 | S138 | S238 | S139 | S239 |
| | 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" | 1/8 - 1" | 1/16 - 3/4 | 1/16 - 3/4 | 2.00 - 12.00 | 2.00 - 12.00 |
| | 407 | 407 | 408 | 408 | 409 | 410 | 410 | 411 | 411 | 412 | 412 | 413 | 413 | 414 | 414 | 415 | 415 |
| 1.1 | 249B | 361B | 289B | 400B | 361B | 361B | 499B | 361B | 499B | 343B | 474B | 325B | 449B | 361B | 499B | 361B | 499B |
| 1.2 | 200B | 269B | 223B | 298B | 325B | 325B | 449B | 325B | 449B | 312B | 425B | 298B | 400B | 325B | 449B | 325B | 449B |
| 1.3 | 200B | 269B | 223B | 298B | 325B | 325B | 449B | 325B | 449B | 312B | 425B | 298B | 400B | 325B | 449B | 325B | 449B |
| 1.4 | 161B | 239B | 180B | 259B | 298B | 298B | 423B | 298B | 423B | 287B | 406B | 276B | 390B | 298B | 423B | 298B | 423B |
| 1.5 | 144B | 200B | 161B | 230B | 249B | 249B | 400B | 249B | 400B | 238B | 380B | 226B | 361B | 249B | 400B | 249B | 400B |
| 1.6 | 131B | 180B | 148B | 200B | 230B | 230B | 328B | 230B | 328B | 205B | 313B | 180B | 298B | 230B | 328B | 230B | 328B |
| 1.7 | | | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | | | |
| 2.1 | 180A | 298A | 200A | 325A | 239A | 239A | 351A | 239A | 351A | 220A | 338A | 200A | 325A | 239A | 351A | 239A | 351A |
| 2.2 | 108A | 180A | 141A | 223A | 171A | 171A | 276A | 171A | 276A | 156A | 251A | 141A | 226A | 171A | 276A | 171A | 276A |
| 2.3 | 98A | 171A | 108A | 174A | 131A | 131A | 200A | 131A | 200A | 123A | 182A | 115A | 164A | 131A | 200A | 131A | 200A |
| 2.4 | 82A | 89A | | | 105A | 105A | 164A | 105A | 164A | 97A | 140A | 89A | 115A | 98A | 148A | 98A | 148A |
| 3.1 | 298B | 499B | 374B | 551B | 449B | 449B | 699B | 449B | 699B | 405B | 650B | 361B | 600B | 449B | 699B | 449B | 699B |
| 3.2 | 249B | 400B | 318B | 525B | 377B | 377B | 649B | 377B | 649B | 338B | 578B | 298B | 508B | 377B | 649B | 377B | 649B |
| 3.3 | 249B | 400B | 318B | 525B | 377B | 377B | 649B | 377B | 649B | 338B | 578B | 298B | 508B | 377B | 649B | 377B | 649B |
| 3.4 | 200B | 341B | 249B | 374B | 279B | 279B | 430B | 279B | 430B | 254B | 415B | 230B | 400B | 279B | 430B | 279B | 430B |
| 4.1 | | 200B | | 230B | | | 259B | | 259B | | 245B | | 230B | | 259B | | 259B |
| 4.2 | | 180B | | 200B | | | 230B | | 230B | | 220B | | 210B | | 230B | | 230B |
| 4.3 | | 174B | | 190B | | | 200B | | 200B | | 190B | | 180B | | 200B | | 200B |
| 5.1 | 148B | 200B | | 230B | | | 266B | | 266B | | 251B | | 236B | | 266B | | 266B |
| 5.2 | | 141A | | 161A | | | 200A | | 200A | | 190A | | 180A | | 200A | | 200A |
| 5.3 | | 85A | | 98A | | | 131A | | 131A | | 123A | | 115A | | 131A | | 131A |
| 6.1 | 584C | | 649C | | 679C | 679C | | 679C | | 646C | | 613C | | 679C | | 679C | |
| 6.2 | 449C | | 499C | | 574C | 574C | | 574C | | 546C | | 518C | | 574C | | 574C | |
| 6.3 | 449C | | 499C | | 574C | 574C | | 574C | | 546C | | 518C | | 574C | | 574C | |
| 6.4 | 108B | | 125B | | 144B | 144B | | 144B | | 138B | | 131B | | 144B | | 144B | |
| 7.1 | 1348C | | 1499C | | 1601C | 1601C | | 1601C | | 1525C | | 1450C | | 1601C | | 1601C | |
| 7.2 | 1348C | | 1499C | | 1601C | 1601C | | 1601C | | 1525C | | 1450C | | 1601C | | 1601C | |
| 7.3 | 584C | | 649C | | 708C | 708C | | 708C | | 674C | | 640C | | 708C | | 708C | |
| 7.4 | 361B | | 400B | | 479B | 479B | | 479B | | 455B | | 430B | | 479B | | 479B | |
| 8.1 | | | | | | | | | | | | | | | | | |
| 8.2 | | | | | | | | | | | | | | | | | |
| 8.3 | | | | | | | | | | | | | | | | | |
| 9.1 | | | | | | | | | | | | | | | | | |
| 10.1 | | | | | | | | | | | | | | | | | |

Visual Index - End Mills

| | HM | HM | HM | HM | HM | HM | HM | HM | HSS-E PM | HSS | HSS | HSS | HSS-E | HSS-E PM | HSS | HSS |
|------|--------------------|--------------------|--------------------|--------------------|----------------|----------------|----------------|----------------|---|--------------------|--------------------|--------------------|--------------------|---|--------------------|--------------------|
| | | | | | | | | | | | | | | | | |
| | | | | | N | N | N | N | N | | | | | N | | |
| | Z ₄ | Z ₄ | Z ₄ | Z ₄ | Z ₄ | Z ₄ | Z ₅ | Z ₅ | Z ₂ | Z ₂ | Z ₂ | Z ₂ | Z ₂ | Z ₂ | Z ₂ | Z ₂ |
| | | | | | | | | | | | | | | | | |
| | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | λ^* | λ^* | λ^* | λ^* | $\lambda 30^\circ$ $\gamma 12^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ $\gamma 12^\circ$ | $\lambda 30^\circ$ | $\lambda 38^\circ$ |
| | | | | | | | | | DIN 1835B | | | | | DIN 1835B | | |
| | | AlTiN | | AlTiN | AlTiN | AlTiN | AlTiN | AlTiN | e8 | +0.003 +0.000 | +0.003 +0.000 | +0.001 +0.015 | +0.003 +0.000 | e8 | +0.003 +0.000 | +0.003 +0.000 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | S146 | S246 | S147 | S247 | S223HAS | S223HB | S248HAS | S248HB | C110 | C600 | C601 | C602 | C603 | C123 | C604 | C605 |
| | 1/4 - 5/8 | 1/4 - 5/8 | 1/8 - 5/8 | 1/8 - 5/8 | 1/8 - 1" | 1/8 - 1" | 5/16 - 1" | 5/16 - 1" | 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" |
| | 416 | 416 | 417 | 417 | 418 | 418 | 419 | 419 | 420 | 422 | 423 | 424 | 425 | 426 | 428 | 429 |
| 1.1 | 343B | 450B | 325B | 400B | 801C | 801C | 801C | 801C | 197A | 98A | 98A | 98A | 164A | 180A | 112S | 164A |
| 1.2 | 312B | 412B | 298B | 374B | 778C | 778C | 778C | 778C | 164A | 89A | 89A | 89A | 131A | 148A | 89S | 131A |
| 1.3 | 312B | 412B | 298B | 374B | 522C | 522C | 522C | 522C | 131B | 75B | 75B | 75B | 115B | 131B | 79T | 115B |
| 1.4 | 287B | 387B | 276B | 351B | 463B | 463B | 463B | 463B | 115B | | | | 98B | 115B | | |
| 1.5 | 238B | 363B | 226B | 325B | 328B | 328B | 328B | 328B | | | | | | | | |
| 1.6 | 205B | 288B | 180B | 249B | 285A | 285A | 285A | 285A | | | | | | | | |
| 1.7 | | | | | 187A | 187A | 364A | 364A | | | | | | | | |
| 1.8 | | | | | 125A | 125A | 240A | 240A | | | | | | | | |
| 2.1 | 220A | 288A | 200A | 226A | 489B | 489B | 489B | 489B | 98F | | | | 75F | 82F | | 75F |
| 2.2 | 156A | 233A | 141A | 190A | 400B | 400B | 400B | 400B | | | | | | | | 62F |
| 2.3 | 123A | 176A | 115A | 151A | 302B | 302B | 302B | 302B | | | | | | | | |
| 2.4 | | 135A | | 121A | 256A | 256A | 256A | 256A | | | | | | | | |
| 3.1 | 405B | 500B | 361B | 499B | 456C | 456C | 771C | 771C | 115A | 82A | 82A | 82A | 92A | 98A | 89S | |
| 3.2 | 338B | 540N | 298B | 430B | 381B | 381B | 571B | 571B | 98A | 66A | 66A | 66A | 75A | 82A | 72S | |
| 3.3 | 338B | 540B | 298B | 430B | 305B | 305B | 538B | 538B | 164B | 82B | 82B | 82B | 131B | 148B | 89T | |
| 3.4 | 255B | 384B | 230B | 338B | 256B | 256B | 433B | 433B | 98B | | | | 82B | 98B | | |
| 4.1 | | 230B | | 200B | 522B | 522B | 1017B | 1017B | 115D | 59D | 59D | 59D | 92D | 98D | 62V | 92D |
| 4.2 | | 210B | | 190B | 463B | 463B | 902B | 902B | 82D | 49D | 49D | 49D | 75D | 82D | 49V | |
| 4.3 | | 180B | | | 387A | 387A | 755B | 755B | | | | | | | | |
| 5.1 | | 238B | | 210B | 358B | 358B | 614B | 614B | 197D | 98D | 98D | 98D | 157D | 164D | 108V | 157D |
| 5.2 | | 176A | | | 269A | 269A | 525A | 525A | 49C | 20C | 20C | 20C | 43C | 49C | 20U | |
| 5.3 | | | | | 223A | 223A | 436A | 436A | | | | | | | | |
| 6.1 | 646C | | 613C | 699C | | | | | 279C | 180C | 180C | 180C | 410C | 262C | 200U | 410C |
| 6.2 | 602C | | 518C | 571C | | | | | 279C | 197C | 197C | 197C | 410C | 262C | 223U | |
| 6.3 | 546C | | 518C | 571C | | | | | 279C | 197C | 197C | 197C | 410C | 262C | 223U | |
| 6.4 | 137B | | 131B | 180B | | | | | | | | | | | | |
| 7.1 | 1526C | | 1450C | 1650C | | | | | 722E | 197E | 197E | 197E | 984E | 656E | 243X | 984E |
| 7.2 | 1526C | | 1450C | 1650C | | | | | 722E | 180E | 180E | 180E | 984E | 656E | 194X | 984E |
| 7.3 | 674C | | 640C | 708C | | | | | 279E | 115E | 115E | 115E | 295E | 262E | 144X | 295E |
| 7.4 | 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

| | HSS | HSS | HSS-E | HSS-E | HSS-E | HSS-E | HSS-E | HSS-E | HSS-E | HSS | HSS | HSS-E PM | HSS-E PM | HSS | HSS-E |
|------|----------------------|----------------------|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--------------------|----------------------|---|---|----------------------|----------------------|
| | | | | | | | | | | | | | | | |
| | Z 2 | Z 3 | Z 3 | Z 4-6 | Z 4-6 | Z 4-6 | Z 4-6 | Z 4-6 | Z 4-6 | Z 4 | Z 4 | Z 4-6 | Z 4-6 | Z 4-6 | Z 4-6 |
| | | | | | | | | | | | | | | | |
| | $\lambda 38^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ $\gamma 12^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ $\gamma 12^\circ$ | $\lambda 30^\circ$ $\gamma 12^\circ$ | $\lambda 30^\circ$ | $\lambda 30^\circ$ |
| | | | DIN 1835B | | | | | | | | | DIN 1835B | DIN 1835B | | |
| | $+0.003$ -0.000 | $+0.003$ -0.000 | e8 | $+0.005$ -0.000 | $+0.005$ -0.000 | $+0.005$ -0.000 | $+0.005$ -0.000 | $+0.005$ -0.000 | $+0.005$ -0.000 | Normal | $+0.003$ -0.000 | k10 | k10 | $+0.003$ -0.000 | $+0.003$ -0.000 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | C606 | C607 | C346 | C608 | C609 | C610 | C611 | C612 | C613 | C614 | C615 | C247 | C273 | C617 | C618 |
| | 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 | 1/8 - 1" | 1/8 - 1" |
| | 430 | 431 | 432 | 433 | 433 | 434 | 434 | 435 | 436 | 437 | 438 | 439 | 441 | 443 | 444 |
| 1.1 | 148A | | 148A | 164G | 197G | 164G | 197G | 148G | 148G | 115S | 164S | 180S | 164S | 115S | 164S |
| 1.2 | 118A | 131A | 115A | 131G | 184G | 131G | 184G | 118G | 118G | 92S | 131S | 148S | 164S | 92S | 131S |
| 1.3 | 102B | 115B | 98B | 115H | 161H | 115H | 161H | 102H | 102H | 79T | 115T | 131T | 115T | 79T | 115T |
| 1.4 | | 98B | 82B | 98H | 138H | 98H | 138H | 89H | 89H | 69T | 98T | 115T | 98T | 69T | 98T |
| 1.5 | | 66C | | | | | | | | | | | | | |
| 1.6 | | | | | | | | | | | | | | | |
| 1.7 | | | | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | | | | |
| 2.1 | 66F | | 66F | 75L | 105L | 75L | 105L | 66L | 66L | 52Y | 75Y | 82Y | 33Y | 52Y | 75Y |
| 2.2 | 56F | 62F | | | | | | | | | | | | | |
| 2.3 | | | | | | | | | | | | | | | |
| 2.4 | | | | | | | | | | | | | | | |
| 3.1 | | | 82A | 92G | 128G | 92G | 128G | 82G | 82G | 92S | 92S | 98S | 82S | 92S | 92S |
| 3.2 | | 75A | 66A | 75G | 105G | 75G | 105G | 66G | 66G | 75S | 75S | 82S | 66S | 75S | 75S |
| 3.3 | | 131B | 115B | 131H | 184H | 131H | 184H | 118H | 118H | 92T | 131T | 148T | 131T | 92T | 131T |
| 3.4 | | 82B | 66B | 82H | 128H | 82H | 128H | 72H | 72H | 56T | 82T | 82T | 82T | 56T | 82T |
| 4.1 | 82D | 92D | 82D | 92J | 128J | 92J | 128J | 82J | 82J | 62V | 92V | 98V | 82V | 62V | 92V |
| 4.2 | | 75D | 66D | 75J | 105J | 75J | 105J | 66J | 66J | 52V | 75V | 82V | 66V | 52V | 75V |
| 4.3 | | 33D | | | | | | | | | | | | | |
| 5.1 | 141D | | 148D | 157J | 220J | 157J | 220J | 141J | 141J | 108V | 157V | 164V | 148V | 108V | 157V |
| 5.2 | | 43C | 33C | 43I | 59I | 43I | 59I | 36I | 36I | 20U | 43U | 49U | 33U | 20U | 43U |
| 5.3 | | 20D | | | | | | | | | | | | | |
| 6.1 | 367C | | 230C | 410I | 574I | 410I | 574I | 367I | 367I | 203U | 410U | 262U | 230U | 203U | 410U |
| 6.2 | | 410C | 230C | 410I | 574I | 410I | 574I | 367I | 367I | 223U | 410U | 262U | 230U | 223U | 410U |
| 6.3 | | 410C | 230C | 410I | 574I | 410I | 574I | 367I | 367I | 223U | 410U | 262U | 230U | 223U | 410U |
| 6.4 | | 49C | | | | | | | | | | | | | |
| 7.1 | 886E | | 590E | | | | | | | | 984X | 656X | 590X | | 984X |
| 7.2 | 886E | | 590E | 984K | 1378K | 984K | 1378K | 886K | 886K | 197X | 984X | 656X | 590X | 197X | 984X |
| 7.3 | 266E | 295E | | 295K | 413K | 295K | 413K | 266K | 266K | 148X | 295X | 262X | 230X | 148X | 295X |
| 7.4 | | 197A | | | | | | | | | | | | | |
| 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 | | | | | | | | | | | | | | | |

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Pgs. 390-444

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| C123..... | 426 | S112 | 404 | S236 | 412 |
| C247..... | 439 | S113 | 405 | S237 | 413 |
| C273..... | 441 | S114 | 406 | S238 | 414 |
| C346..... | 432 | S115 | 407 | S239 | 415 |
| C600..... | 422 | S116 | 399 | S246 | 416 |
| C601..... | 423 | S121 | 408 | S247 | 417 |
| C602..... | 424 | S129..... | 409 | S248HA | 419 |
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Regular Length, Square End, 45° Helix

- S106** Double gullet flute design allows for fast, efficient evacuation of chips in soft and non-ferrous materials
- S206** Zirconium coating increases surface hardness, improves chip evacuation and tool life allowing for higher removal rates 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 | S106 | S206 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/4 | 0.2500 | 1/4 | 1" | 2-1/2 | 2 | 1 | 7648490 | 7648497 |
| 5/16 | 0.3125 | 5/16 | 1" | 3" | 2 | 1 | 7648491 | 7648498 |
| 3/8 | 0.3750 | 3/8 | 1" | 2-1/2 | 2 | 1 | 7648492 | 7648499 |
| 1/2 | 0.5000 | 1/2 | 1-1/4 | 3" | 2 | 1 | 7648493 | 7648500 |
| 5/8 | 0.6250 | 5/8 | 1-5/8 | 3-1/2 | 2 | 1 | 7648494 | 7648501 |
| 3/4 | 0.7500 | 3/4 | 1-3/4 | 4" | 2 | 1 | 7648495 | 7648502 |
| 1" | 1.0000 | 1" | 1-1/2 | 4" | 2 | 1 | 7648496 | 7648503 |

Solid Carbide 2-Flute End Mill



Regular Length, Square End, 37° Helix

S207 Unique flute design along with the Zirconium coating allow for faster speeds and feeds in soft and non-ferrous materials



S207

HM



Z
2

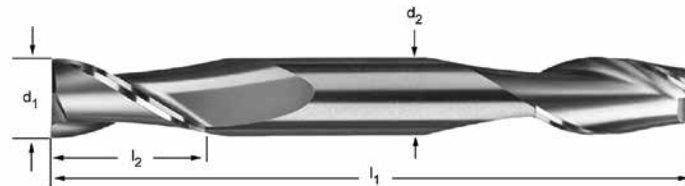


1/8 - 1"

| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S207 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 1/8 | 1/2 | 1-1/2 | 2 | 1 | 7648504 |
| 1/8 | 0.1250 | 1/8 | 3/4 | 2" | 2 | 1 | 7648505 |
| 5/32 | 0.1563 | 5/32 | 9/16 | 2" | 2 | 1 | 7648506 |
| 3/16 | 0.1875 | 3/16 | 3/4 | 2" | 2 | 1 | 7648507 |
| 3/16 | 0.1875 | 3/16 | 1-1/8 | 3" | 2 | 1 | 7648508 |
| 1/4 | 0.2500 | 1/4 | 1" | 2-1/2 | 2 | 1 | 7648509 |
| 1/4 | 0.2500 | 1/4 | 1-1/2 | 4" | 2 | 1 | 7648510 |
| 5/16 | 0.3125 | 5/16 | 3/4 | 2-1/2 | 2 | 1 | 7648511 |
| 5/16 | 0.3125 | 5/16 | 1-5/8 | 4" | 2 | 1 | 7648512 |
| 3/8 | 0.3750 | 3/8 | 1" | 2-1/2 | 2 | 1 | 7648513 |
| 3/8 | 0.3750 | 3/8 | 2" | 4" | 2 | 1 | 7648514 |
| 7/16 | 0.4375 | 7/16 | 1" | 2-1/2 | 2 | 1 | 7648515 |
| 7/16 | 0.4375 | 7/16 | 2" | 4" | 2 | 1 | 7648516 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 2 | 1 | 7648517 |
| 1/2 | 0.5000 | 1/2 | 3" | 6" | 2 | 1 | 7648518 |
| 9/16 | 0.5625 | 9/16 | 1-1/4 | 3" | 2 | 1 | 7648519 |
| 5/8 | 0.6250 | 5/8 | 1-5/8 | 3-1/2 | 2 | 1 | 7648520 |
| 5/8 | 0.6250 | 5/8 | 2-1/4 | 5" | 2 | 1 | 7648521 |
| 3/4 | 0.7500 | 3/4 | 1-3/4 | 4" | 2 | 1 | 7648522 |
| 3/4 | 0.7500 | 3/4 | 3" | 6" | 2 | 1 | 7648523 |
| 1" | 1.0000 | 1" | 1-1/2 | 4" | 2 | 1 | 7648524 |
| 1" | 1.0000 | 1" | 4" | 6" | 2 | 1 | 7648525 |

Regular Length, Square End, Double End, 30° Helix

S116 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials



S116

HM

Z
2

1/8 - 1/2

| d₁ Ø Inch | d₁ decimal Inch | d₂ Ø Inch | l₂ Inch | l₁ Inch | # of Flutes | Pack Qty | S116 |
|---|---|---|-------------------------------------|-------------------------------------|------------------------------|---------------------------|-------------|
| 1/8 | 0.1250 | 3/8 | 3/8 | 3" | 2 | 1 | 7648650 |
| 5/32 | 0.1562 | 3/8 | 7/16 | 3" | 2 | 1 | 7648651 |
| 3/16 | 0.1875 | 3/8 | 1/2 | 3" | 2 | 1 | 7648652 |
| 1/4 | 0.2500 | 3/8 | 5/8 | 3" | 2 | 1 | 7648653 |
| 5/16 | 0.3125 | 3/8 | 3/4 | 3.1/2 | 2 | 1 | 7648654 |
| 3/8 | 0.3750 | 3/8 | 3/4 | 3.1/2 | 2 | 1 | 7648655 |
| 1/2 | 0.5000 | 1/2 | 1" | 4" | 2 | 1 | 7648656 |

Solid Carbide 2-Flute End Mill



Regular Length, Square End, 30° Helix

S108 Bright finish improves chip flow in soft and non-ferrous materials.

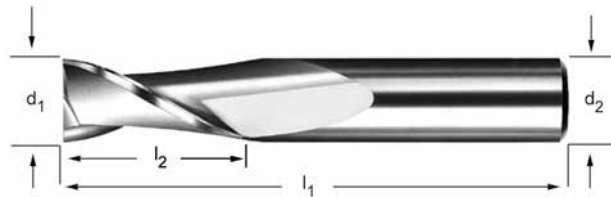
S208 ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S108 | S208 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/16 | 0.0625 | 1/8 | 1/4 | 1.1/2 | 2 | 1 | 7648526 | 7648544 |
| 5/64 | 0.0781 | 1/8 | 1/4 | 1.1/2 | 2 | 1 | 7648527 | 7648545 |
| 3/32 | 0.0938 | 1/8 | 3/8 | 1.1/2 | 2 | 1 | 7648528 | 7648546 |
| 1/8 | 0.1250 | 1/8 | 1/2 | 1.1/2 | 2 | 1 | 7648529 | 7648547 |
| 9/64 | 0.1406 | 3/16 | 9/16 | 2" | 2 | 1 | 7648530 | — |
| 5/32 | 0.1562 | 3/16 | 9/16 | 2" | 2 | 1 | 7648531 | 7648548 |
| 11/64 | 0.1719 | 3/16 | 9/16 | 2" | 2 | 1 | 7648532 | — |
| 3/16 | 0.1875 | 3/16 | 5/8 | 2" | 2 | 1 | 7648533 | 7648549 |
| 7/32 | 0.2188 | 1/4 | 5/8 | 2.1/2 | 2 | 1 | 7648534 | 7648550 |
| 1/4 | 0.2500 | 1/4 | 3/4 | 2.1/2 | 2 | 1 | 7648535 | 7648551 |
| 5/16 | 0.3125 | 5/16 | 7/8 | 2.1/2 | 2 | 1 | 7648536 | 7648552 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2.1/2 | 2 | 1 | 7648537 | 7648553 |
| 7/16 | 0.4375 | 7/16 | 1" | 2.1/2 | 2 | 1 | 7648538 | 7648554 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 2 | 1 | 7648539 | 7648555 |
| 9/16 | 0.5625 | 9/16 | 1.1/4 | 3.1/2 | 2 | 1 | 7648540 | 7648556 |
| 5/8 | 0.6250 | 5/8 | 1.1/4 | 3.1/2 | 2 | 1 | 7648541 | 7648557 |
| 3/4 | 0.7500 | 3/4 | 1.1/2 | 4" | 2 | 1 | 7648542 | — |
| 1" | 1.0000 | 1" | 1.1/2 | 4" | 2 | 1 | 7648543 | — |

Regular Length, Square End, 30° Helix

S109 Bright finish improves chip flow in soft and non-ferrous materials.



S109

HM



Z
2



2.00 - 25.00

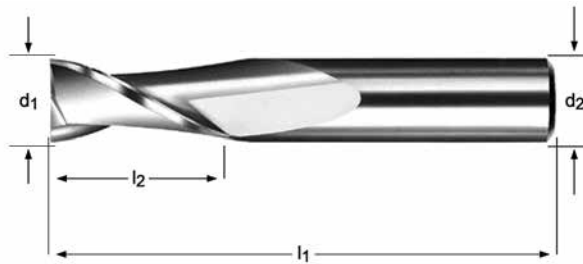
| d_1 Ø mm | d_1 decimal Inch | d_2 Ø mm | l_2 mm | l_1 mm | # of Flutes | Pack Qty | S109 |
|------------------|--------------------------|------------------|-------------|-------------|----------------|-------------|---------|
| 2.00 | 0.0787 | 3.0 | 6.0 | 38.0 | 2 | 1 | 7648558 |
| 2.50 | 0.0984 | 3.0 | 7.0 | 38.0 | 2 | 1 | 7648559 |
| 3.00 | 0.1181 | 3.0 | 12.0 | 38.0 | 2 | 1 | 7648560 |
| 4.00 | 0.1575 | 4.0 | 14.0 | 50.0 | 2 | 1 | 7648561 |
| 4.50 | 0.1772 | 5.0 | 14.0 | 50.0 | 2 | 1 | 7648562 |
| 5.00 | 0.1969 | 5.0 | 16.0 | 50.0 | 2 | 1 | 7648563 |
| 6.00 | 0.2362 | 6.0 | 19.0 | 63.0 | 2 | 1 | 7648564 |
| 7.00 | 0.2756 | 8.0 | 19.0 | 63.0 | 2 | 1 | 7648565 |
| 8.00 | 0.3150 | 8.0 | 20.0 | 63.0 | 2 | 1 | 7648566 |
| 9.00 | 0.3543 | 10.0 | 22.0 | 70.0 | 2 | 1 | 7648567 |
| 10.00 | 0.3937 | 10.0 | 22.0 | 70.0 | 2 | 1 | 7648568 |
| 11.00 | 0.4331 | 11.0 | 25.0 | 70.0 | 2 | 1 | 7648569 |
| 12.00 | 0.4724 | 12.0 | 25.0 | 75.0 | 2 | 1 | 7648570 |
| 14.00 | 0.5512 | 14.0 | 30.0 | 88.0 | 2 | 1 | 7648571 |
| 16.00 | 0.6299 | 16.0 | 32.0 | 88.0 | 2 | 1 | 7648572 |
| 20.00 | 0.7874 | 20.0 | 38.0 | 100.0 | 2 | 1 | 7648573 |
| 25.00 | 0.9843 | 25.0 | 38.0 | 100.0 | 2 | 1 | 7648574 |

Solid Carbide 2-Flute End Mill



Long Length, Square End, 30° Helix

S110 Bright finish improves chip flow in soft and non-ferrous materials.



S110

HM



Z
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 | S110 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 1/8 | 3/4 | 2" | 2 | 1 | 7648575 |
| 3/16 | 0.1875 | 3/16 | 3/4 | 2.1/2 | 2 | 1 | 7648576 |
| 1/4 | 0.2500 | 1/4 | 1.1/8 | 3" | 2 | 1 | 7648577 |
| 3/8 | 0.3750 | 3/8 | 1.1/8 | 3" | 2 | 1 | 7648578 |
| 1/2 | 0.5000 | 1/2 | 2" | 4" | 2 | 1 | 7648579 |

Extra Long Length, Square End, 30° Helix

- S111** Bright finish improves chip flow in soft and non-ferrous materials.
- S211** 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 | S111 | S211 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/8 | 0.1250 | 1/8 | 1" | 3" | 2 | 1 | 7648580 | 7648586 |
| 3/16 | 0.1875 | 3/16 | 1.1/8 | 3" | 2 | 1 | 7648581 | 7648587 |
| 1/4 | 0.2500 | 1/4 | 1.1/2 | 4" | 2 | 1 | 7648582 | 7648588 |
| 5/16 | 0.3125 | 5/16 | 1.5/8 | 4" | 2 | 1 | 7648583 | — |
| 3/8 | 0.3750 | 3/8 | 1.3/4 | 4" | 2 | 1 | 7648584 | 7648589 |
| 1/2 | 0.5000 | 1/2 | 3" | 6" | 2 | 1 | 7648585 | 7648590 |

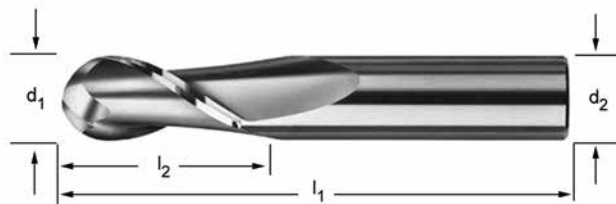
Solid Carbide 2-Flute End Mill



Regular Length, Ball Nose, 30° Helix

S112 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S212 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.

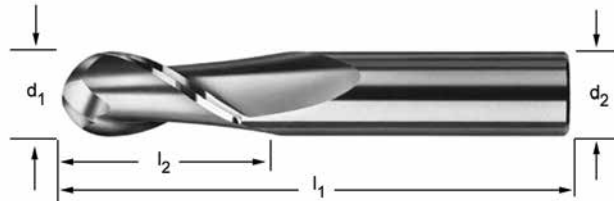


| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S112 | S212 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/16 | 0.0625 | 1/8 | 1/4 | 1.1/2 | 2 | 1 | 7648591 | 7648601 |
| 3/32 | 0.0938 | 1/8 | 3/8 | 1.1/2 | 2 | 1 | 7648592 | — |
| 1/8 | 0.1250 | 1/8 | 1/2 | 1.1/2 | 2 | 1 | 7648593 | 7648602 |
| 5/32 | 0.1562 | 3/16 | 9/16 | 2" | 2 | 1 | 7648594 | — |
| 3/16 | 0.1875 | 3/16 | 5/8 | 2" | 2 | 1 | 7648595 | 7648603 |
| 7/32 | 0.2188 | 1/4 | 5/8 | 2.1/2 | 2 | 1 | 7648596 | 7648604 |
| 1/4 | 0.2500 | 1/4 | 3/4 | 2.1/2 | 2 | 1 | 7648597 | 7648605 |
| 5/16 | 0.3125 | 5/16 | 7/8 | 2.1/2 | 2 | 1 | 7648598 | 7648606 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2.1/2 | 2 | 1 | 7648599 | 7648607 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 2 | 1 | 7648600 | 7648608 |

Regular Length, Ball Nose, 30° Helix

S113 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S213 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



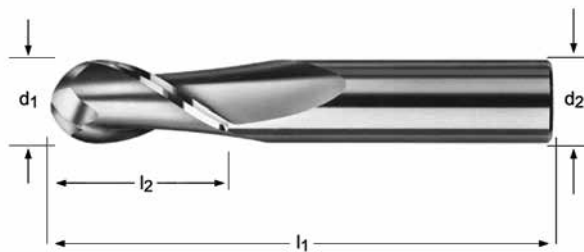
| d ₁ Ø mm | d ₁ decimal Inch | d ₂ Ø mm | l ₂ mm | l ₁ mm | # of Flutes | Pack Qty | S113 | S213 |
|---------------------------|-----------------------------------|---------------------------|----------------------|----------------------|----------------|-------------|---------|---------|
| 2.00 | 0.0787 | 3.0 | 6.0 | 38.0 | 2 | 1 | 7648609 | — |
| 2.50 | 0.0984 | 3.0 | 6.0 | 38.0 | 2 | 1 | 7648610 | — |
| 3.00 | 0.1181 | 3.0 | 12.0 | 38.0 | 2 | 1 | 7648611 | 7648622 |
| 4.00 | 0.1575 | 4.0 | 14.0 | 50.0 | 2 | 1 | 7648612 | 7648623 |
| 5.00 | 0.1969 | 5.0 | 16.0 | 50.0 | 2 | 1 | 7648613 | 7648624 |
| 6.00 | 0.2362 | 6.0 | 19.0 | 63.0 | 2 | 1 | 7648614 | 7648625 |
| 7.00 | 0.2756 | 8.0 | 19.0 | 63.0 | 2 | 1 | 7648615 | 7648626 |
| 8.00 | 0.3150 | 8.0 | 19.0 | 63.0 | 2 | 1 | 7648616 | 7648627 |
| 9.00 | 0.3543 | 10.0 | 22.0 | 70.0 | 2 | 1 | 7648617 | 7648628 |
| 10.00 | 0.3937 | 10.0 | 22.0 | 70.0 | 2 | 1 | 7648618 | 7648629 |
| 12.00 | 0.4724 | 12.0 | 25.0 | 75.0 | 2 | 1 | 7648619 | 7648630 |
| 16.00 | 0.6299 | 16.0 | 32.0 | 88.0 | 2 | 1 | 7648620 | — |
| 20.00 | 0.7874 | 20.0 | 38.0 | 100.0 | 2 | 1 | 7648621 | — |

Solid Carbide 2-Flute End Mill



Long Length, Ball Nose, 30° Helix

S114 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.



S114

HM



Z
2



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 | S114 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 1/8 | 3/4 | 2" | 2 | 1 | 7648631 |
| 3/16 | 0.1875 | 3/16 | 3/4 | 2.1/2 | 2 | 1 | 7648632 |
| 1/4 | 0.2500 | 1/4 | 1.1/8 | 3" | 2 | 1 | 7648633 |
| 5/16 | 0.3125 | 5/16 | 1.1/8 | 3" | 2 | 1 | 7648634 |
| 3/8 | 0.3750 | 3/8 | 1.1/8 | 3" | 2 | 1 | 7648635 |
| 1/2 | 0.5000 | 1/2 | 2" | 4" | 2 | 1 | 7648636 |
| 5/8 | 0.6250 | 5/8 | 2.1/4 | 5" | 2 | 1 | 7648637 |

Extra Long Length, Ball Nose, 30° Helix

S115 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S215 Ball nose for cutting internal part radius. ALTiN coating increases surface hardness, improves chip flow and tool life, allowing higher metal removal rates.



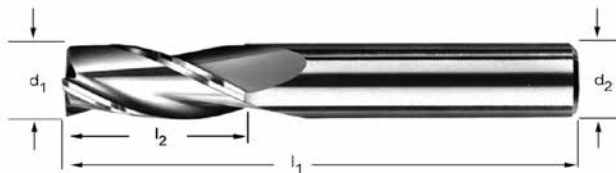
| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S115 | S215 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/8 | 0.1250 | 1/8 | 1" | 3" | 2 | 1 | 7648638 | 7648644 |
| 3/16 | 0.1875 | 3/16 | 1.1/8 | 3" | 2 | 1 | 7648639 | 7648645 |
| 1/4 | 0.2500 | 1/4 | 1.1/2 | 4" | 2 | 1 | 7648640 | 7648646 |
| 5/16 | 0.3125 | 5/16 | 1.5/8 | 4" | 2 | 1 | 7648641 | 7648647 |
| 3/8 | 0.3750 | 3/8 | 1.3/4 | 4" | 2 | 1 | 7648642 | 7648648 |
| 1/2 | 0.5000 | 1/2 | 3" | 6" | 2 | 1 | 7648643 | 7648649 |

Solid Carbide 3-Flute End Mill



Regular Length, Square End, 30° Helix

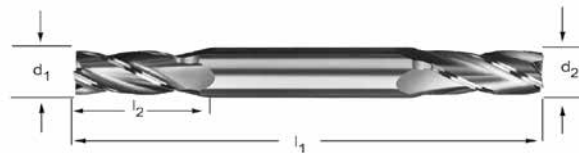
- S121** 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.
- S221** 3-flute design for less chatter. ALTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S121 | S221 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/16 | 0.0625 | 1/8 | 1/4 | 1.1/2 | 3 | 1 | 7648657 | 7648666 |
| 3/32 | 0.0938 | 1/8 | 3/8 | 1.1/2 | 3 | 1 | 7648658 | 7648667 |
| 1/8 | 0.1250 | 1/8 | 1/2 | 1.1/2 | 3 | 1 | 7648659 | 7648668 |
| 5/32 | 0.1562 | 3/16 | 9/16 | 2" | 3 | 1 | 7648660 | 7648669 |
| 3/16 | 0.1875 | 3/16 | 5/8 | 2" | 3 | 1 | 7648661 | 7648670 |
| 1/4 | 0.2500 | 1/4 | 3/4 | 2.1/2 | 3 | 1 | 7648662 | 7648671 |
| 5/16 | 0.3125 | 5/16 | 7/8 | 2.1/2 | 3 | 1 | 7648663 | 7648672 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2.1/2 | 3 | 1 | 7648664 | 7648673 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 3 | 1 | 7648665 | 7648674 |

Square End, Double End , 30° Helix

S129 Regular Length. Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft and non-ferrous materials.



S129

HM



Z
4



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 | S129 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 3/8 | 3" | 4 | 1 | 7648719 |
| 5/32 | 0.1562 | 3/8 | 7/16 | 3" | 4 | 1 | 7648720 |
| 3/16 | 0.1875 | 3/8 | 1/2 | 3" | 4 | 1 | 7648721 |
| 1/4 | 0.2500 | 3/8 | 5/8 | 3" | 4 | 1 | 7648722 |
| 5/16 | 0.3125 | 3/8 | 3/4 | 3.1/2 | 4 | 1 | 7648723 |
| 3/8 | 0.3750 | 3/8 | 3/4 | 3.1/2 | 4 | 1 | 7648724 |
| 1/2 | 0.5000 | 1/2 | 1" | 4" | 4 | 1 | 7648725 |

Solid Carbide 4-Flute End Mill



Regular Length, Square End , 30° Helix

S134 Bright finish improves chip flow in soft or non-ferrous materials.

S234 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 | S124 | S234 |
|-----------------------------|-----------------------------------|-----------------------------|------------------------|------------------------|----------------|-------------|---------|---------|
| 1/16 | 0.0625 | 1/8 | 1/4 | 1.1/2 | 4 | 1 | 7648726 | 7648748 |
| 5/64 | 0.0781 | 1/8 | 1/4 | 1.1/2 | 4 | 1 | 7648727 | 7648749 |
| 3/32 | 0.0938 | 1/8 | 3/8 | 1.1/2 | 4 | 1 | 7648728 | 7648750 |
| 7/64 | 0.1094 | 1/8 | 3/8 | 1.1/2 | 4 | 1 | 7648729 | 7648751 |
| 1/8 | 0.1250 | 1/8 | 1/2 | 1.1/2 | 4 | 1 | 7648730 | 7648752 |
| 9/64 | 0.1406 | 3/16 | 9/16 | 2" | 4 | 1 | 7648731 | 7648753 |
| 5/32 | 0.1562 | 3/16 | 9/16 | 2" | 4 | 1 | 7648732 | 7648754 |
| 11/64 | 0.1719 | 3/16 | 9/16 | 2" | 4 | 1 | 7648733 | 7648755 |
| 3/16 | 0.1875 | 3/16 | 5/8 | 2" | 4 | 1 | 7648734 | 7648756 |
| 13/64 | 0.2031 | 1/4 | 5/8 | 2.1/2 | 4 | 1 | 7648735 | 7648757 |
| 7/32 | 0.2188 | 1/4 | 5/8 | 2.1/2 | 4 | 1 | 7648736 | 7648758 |
| 1/4 | 0.2500 | 1/4 | 3/4 | 2.1/2 | 4 | 1 | 7648737 | 7648759 |
| 5/16 | 0.3125 | 5/16 | 7/8 | 2.1/2 | 4 | 1 | 7648738 | 7648760 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2.1/2 | 4 | 1 | 7648739 | 7648761 |
| 7/16 | 0.4375 | 7/16 | 1" | 2.1/2 | 4 | 1 | 7648740 | 7648762 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 4 | 1 | 7648741 | 7648763 |
| 9/16 | 0.5625 | 9/16 | 1.1/4 | 3.1/2 | 4 | 1 | 7648742 | 7648764 |
| 5/8 | 0.6250 | 5/8 | 1.1/4 | 3.1/2 | 4 | 1 | 7648743 | 7648765 |
| 11/16 | 0.6875 | 3/4 | 1.1/2 | 4" | 4 | 1 | 7648744 | 7648766 |
| 3/4 | 0.7500 | 3/4 | 1.1/2 | 4" | 4 | 1 | 7648745 | 7648767 |
| 7/8 | 0.8750 | 7/8 | 1.1/2 | 4" | 4 | 1 | 7648746 | 7648768 |
| 1" | 1.0000 | 1" | 1.1/2 | 4" | 4 | 1 | 7648747 | 7648769 |

Regular Length, Square End , 30° Helix

S135 Bright finish improves chip flow in soft or non-ferrous materials.

S235 AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.



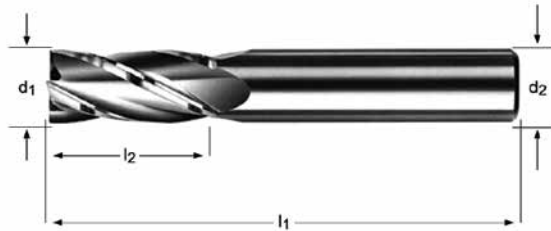
| d ₁ Ø mm | d ₁ decimal Inch | d ₂ Ø mm | l ₂ mm | l ₁ mm | # of Flutes | Pack Qty | S135 | S235 |
|---------------------------|-----------------------------------|---------------------------|----------------------|----------------------|----------------|-------------|---------|---------|
| 2.00 | 0.0787 | 3.0 | 6.0 | 38.0 | 4 | 1 | 7648770 | 7648789 |
| 2.50 | 0.0984 | 3.0 | 7.0 | 38.0 | 4 | 1 | 7648771 | 7648790 |
| 3.00 | 0.1181 | 3.0 | 12.0 | 38.0 | 4 | 1 | 7648772 | 7648791 |
| 3.50 | 0.1378 | 4.0 | 12.0 | 50.0 | 4 | 1 | 7648773 | 7648792 |
| 4.00 | 0.1575 | 4.0 | 14.0 | 50.0 | 4 | 1 | 7648774 | 7648793 |
| 4.50 | 0.1772 | 5.0 | 14.0 | 50.0 | 4 | 1 | 7648775 | 7648794 |
| 5.00 | 0.1969 | 5.0 | 16.0 | 50.0 | 4 | 1 | 7648776 | 7648795 |
| 6.00 | 0.2362 | 6.0 | 19.0 | 63.0 | 4 | 1 | 7648777 | 7648796 |
| 7.00 | 0.2756 | 8.0 | 19.0 | 63.0 | 4 | 1 | 7648778 | 7648797 |
| 8.00 | 0.3150 | 8.0 | 19.0 | 63.0 | 4 | 1 | 7648779 | 7648798 |
| 9.00 | 0.3543 | 10.0 | 22.0 | 70.0 | 4 | 1 | 7648780 | 7648799 |
| 10.00 | 0.3937 | 10.0 | 22.0 | 70.0 | 4 | 1 | 7648781 | 7648800 |
| 11.00 | 0.4331 | 11.0 | 25.0 | 70.0 | 4 | 1 | 7648782 | 7648801 |
| 12.00 | 0.4724 | 12.0 | 25.0 | 75.0 | 4 | 1 | 7648783 | 7648802 |
| 14.00 | 0.5512 | 14.0 | 30.0 | 88.0 | 4 | 1 | 7648784 | 7648803 |
| 16.00 | 0.6299 | 16.0 | 32.0 | 88.0 | 4 | 1 | 7648785 | 7648804 |
| 18.00 | 0.7087 | 18.0 | 36.0 | 100.0 | 4 | 1 | 7648786 | 7648805 |
| 20.00 | 0.7874 | 20.0 | 38.0 | 100.0 | 4 | 1 | 7648787 | 7648806 |
| 25.00 | 0.9843 | 25.0 | 38.0 | 100.0 | 4 | 1 | 7648788 | — |

Solid Carbide 4-Flute End Mill



Long Length, Square End , 30° Helix

- S136** Bright finish improves chip flow in soft or non-ferrous materials.
- S236** AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.

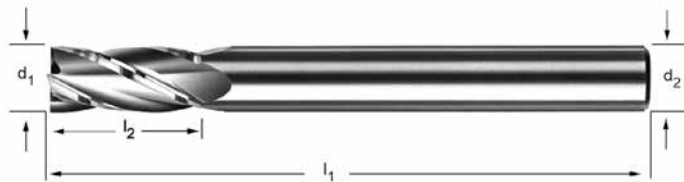


| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S136 | S236 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/8 | 0.1250 | 1/8 | 3/4 | 2" | 4 | 1 | 7648807 | 7648816 |
| 3/16 | 0.1875 | 3/16 | 3/4 | 2.1/2 | 4 | 1 | 7648808 | 7648817 |
| 1/4 | 0.2500 | 1/4 | 1.1/8 | 3" | 4 | 1 | 7648809 | 7648818 |
| 5/16 | 0.3125 | 5/16 | 1.1/8 | 3" | 4 | 1 | 7648810 | 7648819 |
| 3/8 | 0.3750 | 3/8 | 1.1/8 | 3" | 4 | 1 | 7648811 | 7648820 |
| 7/16 | 0.4375 | 7/16 | 2" | 4" | 4 | 1 | 7648812 | 7648821 |
| 1/2 | 0.5000 | 1/2 | 2" | 4" | 4 | 1 | 7648813 | 7648822 |
| 5/8 | 0.6250 | 5/8 | 2.1/4 | 5" | 4 | 1 | 7648814 | 7648823 |
| 3/4 | 0.7500 | 3/4 | 2.1/4 | 5" | 4 | 1 | 7648815 | 7648824 |

Extra Long Length, Square End , 30° Helix

S137 Bright finish improves chip flow in soft or non-ferrous materials.

S237 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 | S137 | S237 |
|-----------------------------|-----------------------------------|-----------------------------|------------------------|------------------------|----------------|-------------|---------|---------|
| 1/8 | 0.1250 | 1/8 | 1" | 3" | 4 | 1 | 7648825 | 7648835 |
| 3/16 | 0.1875 | 3/16 | 1.1/8 | 3" | 4 | 1 | 7648826 | 7648836 |
| 1/4 | 0.2500 | 1/4 | 1.1/2 | 4" | 4 | 1 | 7648827 | 7648837 |
| 5/16 | 0.3125 | 5/16 | 1.5/8 | 4" | 4 | 1 | 7648828 | 7648838 |
| 3/8 | 0.3750 | 3/8 | 1.3/4 | 4" | 4 | 1 | 7648829 | 7648839 |
| 7/16 | 0.4375 | 7/16 | 3" | 6" | 4 | 1 | 7648830 | 7648840 |
| 1/2 | 0.5000 | 1/2 | 3" | 6" | 4 | 1 | 7648831 | 7648841 |
| 5/8 | 0.6250 | 5/8 | 3" | 6" | 4 | 1 | 7648832 | 7648842 |
| 3/4 | 0.7500 | 3/4 | 3" | 6" | 4 | 1 | 7648833 | 7648843 |
| 1" | 1.0000 | 1" | 3" | 6" | 4 | 1 | 7648834 | 7648844 |

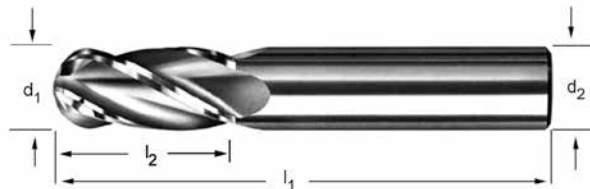
Solid Carbide 4-Flute End Mill



Regular Length, Ball Nose , 30° Helix

S138 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S238 Ball nose for cutting internal part radius. AlTiN coating increases surface hardness, improves chip flow and tool life allowing higher metal removal rates.

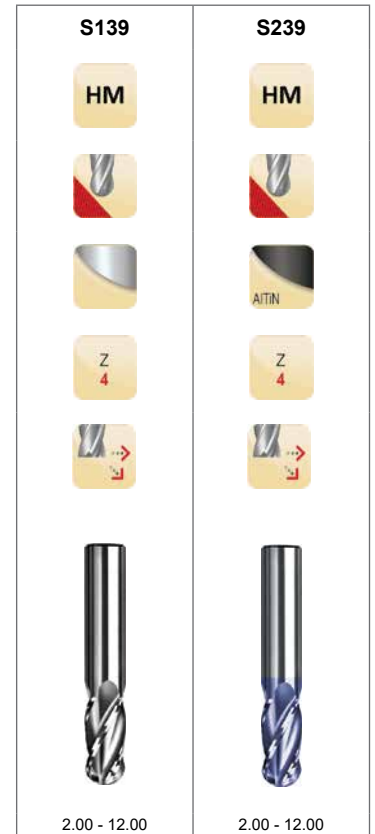
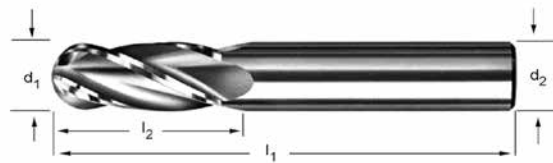


| d_1 Ø Inch | d_1 decimal Inch | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | S138 | S238 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/16 | 0.0625 | 1/8 | 1/4 | 1.1/2 | 4 | 1 | 7648845 | 7648857 |
| 3/32 | 0.0938 | 1/8 | 3/8 | 1.1/2 | 4 | 1 | 7648846 | 7648858 |
| 1/8 | 0.1250 | 1/8 | 1/2 | 1.1/2 | 4 | 1 | 7648847 | 7648859 |
| 5/32 | 0.1562 | 3/16 | 9/16 | 2" | 4 | 1 | 7648848 | 7648860 |
| 3/16 | 0.1875 | 3/16 | 5/8 | 2" | 4 | 1 | 7648849 | 7648861 |
| 1/4 | 0.2500 | 1/4 | 3/4 | 2.1/2 | 4 | 1 | 7648850 | 7648862 |
| 5/16 | 0.3125 | 5/16 | 7/8 | 2.1/2 | 4 | 1 | 7648851 | 7648863 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2.1/2 | 4 | 1 | 7648852 | 7648864 |
| 7/16 | 0.4375 | 7/16 | 1" | 2.1/2 | 4 | 1 | 7648853 | 7648865 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | 4 | 1 | 7648854 | 7648866 |
| 5/8 | 0.6250 | 5/8 | 1.1/4 | 3.1/2 | 4 | 1 | 7648855 | 7648867 |
| 3/4 | 0.7500 | 3/4 | 1.1/2 | 4" | 4 | 1 | 7648856 | 7648868 |

Regular Length, Ball Nose, 30° Helix

S139 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S239 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 | S139 | S239 |
|------------------|--------------------------|------------------|-------------|-------------|----------------|-------------|---------|---------|
| 2.00 | 0.0787 | 3.0 | 6.0 | 38.0 | 4 | 1 | 7648877 | 7648878 |
| 3.00 | 0.1181 | 3.0 | 12.0 | 38.0 | 4 | 1 | 7648876 | 7648879 |
| 4.00 | 0.1575 | 4.0 | 14.0 | 50.0 | 4 | 1 | 7648875 | 7648880 |
| 4.50 | 0.1772 | 5.0 | 14.0 | 50.0 | 4 | 1 | 7648874 | — |
| 5.00 | 0.1969 | 5.0 | 16.0 | 50.0 | 4 | 1 | 7648873 | 7648881 |
| 6.00 | 0.2362 | 6.0 | 19.0 | 63.0 | 4 | 1 | 7648872 | 7648882 |
| 8.00 | 0.3150 | 8.0 | 19.0 | 63.0 | 4 | 1 | 7648871 | 7648883 |
| 10.00 | 0.3937 | 10.0 | 22.0 | 70.0 | 4 | 1 | 7648870 | 7648884 |
| 12.00 | 0.4724 | 12.0 | 25.0 | 75.0 | 4 | 1 | 7648869 | 7648885 |

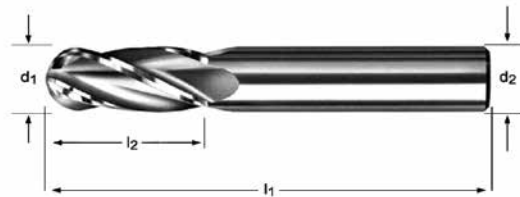
Solid Carbide 4-Flute End Mill



Long Length, Ball Nose, 30° Helix

S146 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S246 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 | S146 | S246 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|-------------|-------------|
| 1/4 | 0.2500 | 1/4 | 1.1/8 | 3" | 4 | 1 | 7648886 | 7648890 |
| 3/8 | 0.3750 | 3/8 | 1.1/8 | 3" | 4 | 1 | 7648887 | 7648891 |
| 1/2 | 0.5000 | 1/2 | 2" | 4" | 4 | 1 | 7648888 | 7648892 |
| 5/8 | 0.6250 | 5/8 | 2.1/4 | 5" | 4 | 1 | 7648889 | 7648893 |

Extra Long Length, Ball Nose, 30° Helix

S147 Ball nose for cutting internal part radius. Bright finish improves chip flow in soft or non-ferrous materials.

S247 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 | S147 | S247 |
|--------------------|--------------------------|--------------------|---------------|---------------|----------------|-------------|---------|---------|
| 1/8 | 0.1250 | 1/8 | 1" | 3" | 4 | 1 | 7648894 | 7648901 |
| 3/16 | 0.1875 | 3/16 | 1.1/8 | 3" | 4 | 1 | 7648895 | 7648902 |
| 1/4 | 0.2500 | 1/4 | 1.1/2 | 4" | 4 | 1 | 7648896 | 7648903 |
| 5/16 | 0.3125 | 5/16 | 1.5/8 | 4" | 4 | 1 | 7648897 | 7648904 |
| 3/8 | 0.3750 | 3/8 | 1.3/4 | 4" | 4 | 1 | 7648898 | 7648905 |
| 1/2 | 0.5000 | 1/2 | 3" | 6" | 4 | 1 | 7648899 | 7648906 |
| 5/8 | 0.6250 | 5/8 | 3" | 6" | 4 | 1 | 7648900 | 7648907 |

Solid Carbide 4-Flute End Mill



Regular Length, Corner Radius, Unequal Helix

S223HA ALTiN coating increases hardness, and improves tool life allowing higher metal removal rates. These unequal helix cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for milling tough alloys and hardened steels.

S223HB

S223HB has a Weldon shank.



| d ₁ Ø Inch | d ₁ decimal Inch | d ₂ Ø Inch | l ₂ Inch | l ₁ Inch | R Radius | # of Flutes | Pack Qty | S223HA | S223HB |
|-----------------------------|-----------------------------------|-----------------------------|------------------------|------------------------|-------------|----------------|-------------|-----------|-----------|
| 1/8 | 0.1250 | 1/8 | 3/8 | 1-1/2 | .015 | 4 | 1 | 7648675 | 7648697 |
| 1/8 | 0.1250 | 1/8 | 3/8 | 1-1/2 | .030 | 4 | 1 | 7648676 | 7648698 |
| 3/16 | 0.1875 | 3/16 | 7/16 | 2" | .015 | 4 | 1 | 7648677 | 7648699 |
| 3/16 | 0.1875 | 3/16 | 7/16 | 2" | .030 | 4 | 1 | 7648678 | 7648700 |
| 1/4 | 0.2500 | 1/4 | 5/8 | 2-1/2 | .015 | 4 | 1 | 7648679 | 7648701 |
| 1/4 | 0.2500 | 1/4 | 5/8 | 2-1/2 | .030 | 4 | 1 | 7648680 | 7648702 |
| 5/16 | 0.3125 | 1/4 | 1/2 | 2" | .015 | 4 | 1 | 7648681 | 7648703 |
| 5/16 | 0.3125 | 1/4 | 1/2 | 2" | .030 | 4 | 1 | 7648682 | 7648704 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2-1/2 | .015 | 4 | 1 | 7648683 | 7648705 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2-1/2 | .030 | 4 | 1 | 7648684 | 7648706 |
| 7/16 | 0.4375 | 7/16 | 5/8 | 2-1/2 | .020 | 4 | 1 | 7648685 | 7648707 |
| 7/16 | 0.4375 | 7/16 | 5/8 | 2-1/2 | .045 | 4 | 1 | 7648686 | 7648708 |
| 1/2 | 0.5000 | 1/2 | 1-1/4 | 3" | .030 | 4 | 1 | 7648687 | 7648709 |
| 1/2 | 0.5000 | 1/2 | 1-1/4 | 3" | .060 | 4 | 1 | 7648688 | 7648710 |
| 9/16 | 0.5625 | 9/16 | 1-1/8 | 3-1/2 | .045 | 4 | 1 | 7648689 | 7648711 |
| 9/16 | 0.5625 | 9/16 | 1-1/8 | 3-1/2 | .060 | 4 | 1 | 7648690 | 7648712 |
| 5/8 | 0.6250 | 5/8 | 1-1/4 | 3-1/2 | .060 | 4 | 1 | 7648691 | 7648713 |
| 5/8 | 0.6250 | 5/8 | 1-1/4 | 5" | .090 | 4 | 1 | 7648692 * | 7648714 * |
| 3/4 | 0.7500 | 3/4 | 1-1/2 | 4" | .030 | 4 | 1 | 7648693 | 7648715 |
| 3/4 | 0.7500 | 3/4 | 1-1/2 | 4" | .060 | 4 | 1 | 7648694 | 7648716 |
| 1" | 1.0000 | 1" | 2-1/4 | 5" | .030 | 4 | 1 | 7648695 * | 7648717 * |
| 1" | 1.0000 | 1" | 2-1/4 | 5" | .090 | 4 | 1 | 7648696 * | 7648718 * |

* Will require a reduction of 30% - 60% in cutting speed.

Regular Length, Corner Radius, Unequal Helix

S248HA ALTiN coating increases hardness, and improves tool life
S248HB allowing higher metal removal rates. These unequal helix cutters with corner radii are designed for higher speeds and deeper cuts. Provides superior workpiece finishes by eliminating vibrations and harmonics. Excellent for milling tough alloys and hardened steels.

S248HB has a Weldon shank.



| d ₁ Ø Inch | d ₁ decimal Inch | d ₂ Ø Inch | l ₂ Inch | l ₁ Inch | R Radius | # of Flutes | Pack Qty | S248HA | S248HB |
|-----------------------------|-----------------------------------|-----------------------------|------------------------|------------------------|-------------|----------------|-------------|-----------|-----------|
| 5/16 | 0.3125 | 5/16 | 13/16 | 2-1/2 | .015 | 5 | 1 | 7648908 | 7648927 |
| 5/16 | 0.3125 | 5/16 | 13/16 | 2-1/2 | .030 | 5 | 1 | 7648909 | 7648928 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2-1/2 | .015 | 5 | 1 | 7648910 | 7648929 |
| 3/8 | 0.3750 | 3/8 | 7/8 | 2-1/2 | .030 | 5 | 1 | 7648911 | 7648930 |
| 7/16 | 0.4375 | 7/16 | 5/8 | 2-1/2 | .020 | 5 | 1 | 7648912 | 7648931 |
| 7/16 | 0.4375 | 7/16 | 5/8 | 2-1/2 | .045 | 5 | 1 | 7648913 | 7648932 |
| 1/2 | 0.5000 | 1/2 | 1" | 3" | .030 | 5 | 1 | 7648914 | 7648933 |
| 1/2 | 0.5000 | 1/2 | 1-1/4 | 3" | .030 | 5 | 1 | 7648915 | 7648934 |
| 1/2 | 0.5000 | 1/2 | 1-1/4 | 3" | .060 | 5 | 1 | 7648916 | 7648935 |
| 9/16 | 0.5625 | 9/16 | 1-1/8 | 3-1/2 | .020 | 5 | 1 | 7648917 | 7648936 |
| 9/16 | 0.5625 | 9/16 | 1-1/8 | 3-1/2 | .045 | 5 | 1 | 7648918 | 7648937 |
| 9/16 | 0.5625 | 9/16 | 1-1/8 | 3-1/2 | .060 | 5 | 1 | 7648919 | 7648938 |
| 5/8 | 0.6250 | 5/8 | 1-1/4 | 3-1/2 | .045 | 5 | 1 | 7648920 | 7648939 |
| 5/8 | 0.6250 | 5/8 | 1-1/4 | 3-1/2 | .060 | 5 | 1 | 7648921 | 7648940 |
| 5/8 | 0.6250 | 5/8 | 1-1/4 | 3-1/2 | .090 | 5 | 1 | 7648922 | 7648941 |
| 3/4 | 0.7500 | 3/4 | 1-1/2 | 4" | .030 | 5 | 1 | 7648923 | 7648942 |
| 3/4 | 0.7500 | 3/4 | 1-1/2 | 4" | .060 | 5 | 1 | 7648924 | 7648943 |
| 1" | 1.0000 | 1" | 2-1/4 | 5" | .030 | 5 | 1 | 7648925 * | 7648944 * |
| 1" | 1.0000 | 1" | 2-1/4 | 5" | .090 | 5 | 1 | 7648926 * | 7648945 * |

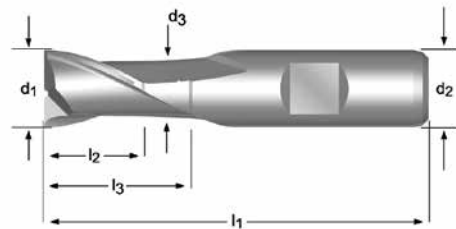
* Will require a reduction of 30% - 60% in cutting speed.

HSS-PM 2-Flute End Mill



Stub Length, Square End, Weldon Shank, 30° Helix

C110 Powdered Metal. P9 slotting tolerance.



C110

HSS-E PM

P9

Z 2

1.00 - 50.00

| d ₁ Ø Inch | d ₁ Ø mm | d ₂ Ø _{h_s} 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 | 5983761 |
| | 1.50 | 6 | 3 | 47 | 2 | - | - | 1 | 5983771 |
| 1/16 | 1.59 | 6 | 3 | 47 | 2 | - | - | 1 | 5983776 |
| | 1.80 | 6 | 4 | 48 | 2 | - | - | 1 | 5983773 |
| | 2.00 | 6 | 4 | 48 | 2 | - | - | 1 | 5983863 |
| 3/32 | 2.38 | 6 | 5 | 49 | 2 | - | - | 1 | 5983902 |
| | 2.50 | 6 | 5 | 49 | 2 | - | - | 1 | 5983866 |
| | 2.80 | 6 | 5 | 49 | 2 | - | - | 1 | 5983869 |
| | 3.00 | 6 | 5 | 49 | 2 | - | - | 1 | 5984089 |
| 1/8 | 3.18 | 6 | 6 | 50 | 2 | - | - | 1 | 5983788 |
| | 3.50 | 6 | 6 | 50 | 2 | - | - | 1 | 5984094 |
| | 3.80 | 6 | 7 | 51 | 2 | - | - | 1 | 5984099 |
| | 4.00 | 6 | 7 | 51 | 2 | - | - | 1 | 5983914 |
| | 4.50 | 6 | 7 | 51 | 2 | - | - | 1 | 5983917 |
| 3/16 | 4.76 | 6 | 8 | 52 | 2 | - | - | 1 | 5984103 |
| | 4.80 | 6 | 8 | 52 | 2 | - | - | 1 | 5983919 ¹⁾²⁾ |
| | 5.00 | 6 | 8 | 52 | 2 | - | - | 1 | 5983933 |
| | 5.50 | 6 | 8 | 52 | 2 | - | - | 1 | 5983937 |
| | 5.75 | 6 | 8 | 52 | 2 | - | - | 1 | 5983941 ¹⁾²⁾ |
| | 6.00 | 6 | 8 | 52 | 2 | - | - | 1 | 5983958 |
| 1/4 | 6.35 | 10 | 10 | 60 | 2 | - | - | 1 | 5983785 |
| | 6.50 | 10 | 10 | 60 | 2 | - | - | 1 | 5983962 |
| | 7.00 | 10 | 10 | 60 | 2 | - | - | 1 | 5983976 |
| | 7.50 | 10 | 10 | 60 | 2 | - | - | 1 | 5983981 |
| | 7.75 | 10 | 11 | 61 | 2 | - | - | 1 | 5983986 ¹⁾²⁾ |
| 5/16 | 7.94 | 10 | 11 | 61 | 2 | - | - | 1 | 5983946 |
| | 8.00 | 10 | 11 | 61 | 2 | - | - | 1 | 5984003 |
| | 8.50 | 10 | 11 | 61 | 2 | - | - | 1 | 5984007 |
| | 9.00 | 10 | 11 | 61 | 2 | - | - | 1 | 5984012 |

¹⁾ Diameter tolerance h10

²⁾ Slot not in P9 tolerance

³⁾ Available in HSCo only

| 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 | 5984017 |
| 3/8 | 9.52 | 10 | 13 | 63 | 2 | 22.5 | 9.5 | 1 | 5983905 |
| | 10.00 | 10 | 13 | 63 | 2 | 22.5 | 9.5 | 1 | 5983791 |
| 13/32 | 10.32 | 12 | 13 | 70 | 2 | - | - | 1 | 5983827 |
| | 10.50 | 12 | 13 | 70 | 2 | - | - | 1 | 5983794 |
| | 11.00 | 12 | 13 | 70 | 2 | - | - | 1 | 5983797 |
| 7/16 | 11.11 | 12 | 13 | 70 | 2 | - | - | 1 | 5983991 |
| | 11.50 | 12 | 13 | 70 | 2 | - | - | 1 | 5983800 |
| | 12.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983811 |
| | 12.50 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983816 |
| 1/2 | 12.70 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983782 |
| | 13.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983821 |
| 17/32 | 13.49 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983852 |
| | 14.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983831 |
| 9/16 | 14.29 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5984032 |
| | 15.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 5983834 |
| 5/8 | 15.88 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983949 |
| | 16.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983840 |
| | 17.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983843 |
| 11/16 | 17.46 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983808 |
| | 18.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983855 |
| | 19.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 5983857 |
| | 19.05 | 20 | 22 | 88 | 2 | 37.5 | 18.5 | 1 | 5983903 |
| 3/4 | 20.00 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 5983872 |
| | 22.00 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 5983881 |
| 7/8 | 22.22 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 5983996 |
| | 24.00 | 25 | 26 | 102 | 2 | 45.5 | 23.5 | 1 | 5983901 |
| 1" | 25.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 5983967 |
| | 25.40 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 5983749 |
| | 26.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 5984022 |
| | 28.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 5984079 |
| | 30.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 5983906 |
| | 32.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 5983908 |
| | 35.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 5983910 ¹⁾³⁾ |
| | 36.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 5983912 ¹⁾³⁾ |
| 40.00 | 40 | 38 | 130 | 2 | 59.5 | 39.0 | 1 | 5983925 ¹⁾³⁾ | |

¹⁾ Diameter tolerance h10

²⁾ Slot not in P9 tolerance

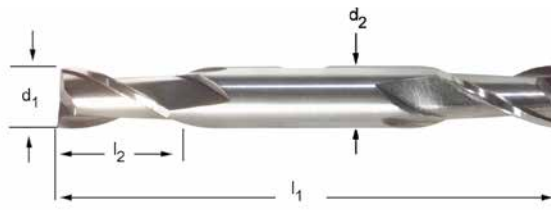
³⁾ Available in HSCo only

HSS 2-Flute End Mill



Regular Length, Square End, Weldon Shank, 30° Helix

C600 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.



C600

HSS



Z
2

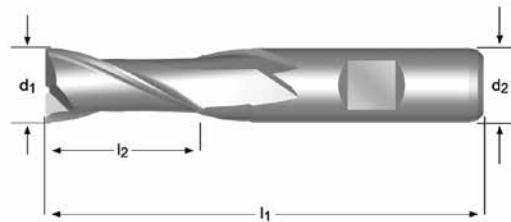


1/8 - 3/4

| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C600 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 3.1/16 | 3/8 | 2 | 1 | 7647759 |
| 5/32 | 0.1562 | 7/16 | 3.1/8 | 3/8 | 2 | 1 | 7647820 |
| 3/16 | 0.1875 | 7/16 | 3.1/4 | 3/8 | 2 | 1 | 7647821 |
| 1/4 | 0.2500 | 1/2 | 3.3/8 | 3/8 | 2 | 1 | 7647822 |
| 9/32 | 0.2812 | 9/16 | 3.3/8 | 3/8 | 2 | 1 | 7647823 |
| 5/16 | 0.3125 | 9/16 | 3.1/2 | 3/8 | 2 | 1 | 7647824 |
| 11/32 | 0.3437 | 9/16 | 3.1/2 | 3/8 | 2 | 1 | 7647825 |
| 3/8 | 0.3750 | 9/16 | 3.1/2 | 3/8 | 2 | 1 | 7647826 |
| 13/32 | 0.4062 | 13/16 | 4.1/8 | 1/2 | 2 | 1 | 7647827 |
| 7/16 | 0.4375 | 13/16 | 4.1/8 | 1/2 | 2 | 1 | 7647828 |
| 1/2 | 0.5000 | 13/16 | 4.1/8 | 1/2 | 2 | 1 | 7647829 |
| 5/8 | 0.6250 | 1.1/8 | 5" | 5/8 | 2 | 1 | 7647830 |
| 3/4 | 0.7500 | 1.5/16 | 5.5/8 | 3/4 | 2 | 1 | 7647831 |

Regular Length, Square End, Weldon Shank, 30° Helix

C601 Bright finish improves chip flow in soft or non-ferrous materials.



C601

HSS

Z
2

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 | C601 |
|-----------------------------|-----------------------------------|------------------------|------------------------|-----------------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 2 | 1 | 7647832 |
| 3/16 | 0.1875 | 7/16 | 2.3/8 | 3/8 | 2 | 1 | 7647833 |
| 1/4 | 0.2500 | 1/2 | 2.7/16 | 3/8 | 2 | 1 | 7647834 |
| 5/16 | 0.3125 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647835 |
| 3/8 | 0.3750 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647836 |
| 7/16 | 0.4375 | 13/16 | 2.11/16 | 3/8 | 2 | 1 | 7647837 |
| 1/2 | 0.5000 | 13/16 | 2.11/16 | 3/8 | 2 | 1 | 7647838 |
| 1/2 | 0.5000 | 1" | 3.1/4 | 1/2 | 2 | 1 | 7647839 |
| 9/16 | 0.5625 | 1.1/8 | 3.3/8 | 1/2 | 2 | 1 | 7647840 |
| 5/8 | 0.6250 | 1.1/8 | 3.3/8 | 1/2 | 2 | 1 | 7647841 |
| 5/8 | 0.6250 | 1.5/16 | 3.3/4 | 5/8 | 2 | 1 | 7647844 |
| 11/16 | 0.6875 | 1.5/16 | 3.5/8 | 1/2 | 2 | 1 | 7647842 |
| 11/16 | 0.6875 | 1.5/16 | 3.3/4 | 5/8 | 2 | 1 | 7647845 |
| 3/4 | 0.7500 | 1.5/16 | 3.5/8 | 1/2 | 2 | 1 | 7647843 |
| 3/4 | 0.7500 | 1.5/16 | 3.3/4 | 5/8 | 2 | 1 | 7647846 |
| 3/4 | 0.7500 | 1.5/16 | 3.7/8 | 3/4 | 2 | 1 | 7647859 |
| 13/16 | 0.8125 | 1.1/2 | 4" | 5/8 | 2 | 1 | 7647847 |
| 7/8 | 0.8750 | 1.1/2 | 4" | 5/8 | 2 | 1 | 7647848 |
| 7/8 | 0.8750 | 1.1/2 | 4.1/8 | 3/4 | 2 | 1 | 7647860 |
| 7/8 | 0.8750 | 1.1/2 | 4.1/8 | 7/8 | 2 | 1 | 7647851 |
| 15/16 | 0.9375 | 1.1/2 | 4" | 5/8 | 2 | 1 | 7647849 |
| 1" | 1.0000 | 1.1/2 | 4" | 5/8 | 2 | 1 | 7647850 |
| 1" | 1.0000 | 1.1/2 | 4.1/8 | 3/4 | 2 | 1 | 7647861 |
| 1" | 1.0000 | 1.1/2 | 4.1/8 | 7/8 | 2 | 1 | 7647852 |
| 1" | 1.0000 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647853 |
| 1.1/8 | 1.1250 | 1.5/8 | 4.1/4 | 3/4 | 2 | 1 | 7647862 |
| 1.1/8 | 1.1250 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647854 |
| 1.1/4 | 1.2500 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647855 |
| 1.1/4 | 1.2500 | 1.5/8 | 4.1/2 | 1.1/4 | 2 | 1 | 7647857 |
| 1.1/2 | 1.5000 | 1.5/8 | 4.1/4 | 3/4 | 2 | 1 | 7647863 |
| 1.1/2 | 1.5000 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647856 |
| 1.1/2 | 1.5000 | 1.5/8 | 4.1/2 | 1.1/4 | 2 | 1 | 7647858 |

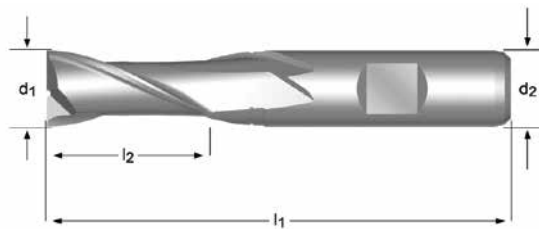
HSS 2-Flute End Mill



Regular Length, Square End, Keyway, Weldon Shank, 30° Helix

C602

Keyway cutter, close tolerance (+0.0000"/-0.0015").
Bright finish improves chip flow in soft or non-ferrous materials.



C602

HSS



Z
2

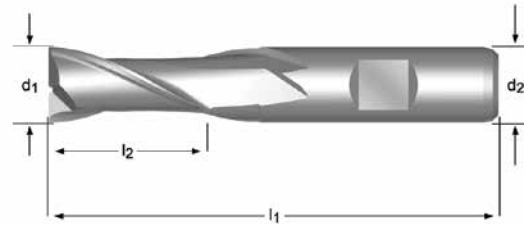


1/8 - 1"

| d ₁ Ø Inch | d ₁ decimal Inch | l ₂ Inch | l ₁ Inch | d ₂ Ø Inch | # of Flutes | Pack Qty | C602 |
|-----------------------------|-----------------------------------|------------------------|------------------------|-----------------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 2 | 1 | 7647864 |
| 3/16 | 0.1875 | 7/16 | 2.3/8 | 3/8 | 2 | 1 | 7647865 |
| 1/4 | 0.2500 | 1/2 | 2.7/16 | 3/8 | 2 | 1 | 7647866 |
| 5/16 | 0.3125 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647867 |
| 3/8 | 0.3750 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647868 |
| 1/2 | 0.5000 | 1" | 3.1/4 | 1/2 | 2 | 1 | 7647869 |
| 5/8 | 0.6250 | 1.5/16 | 3.3/4 | 5/8 | 2 | 1 | 7647870 |
| 3/4 | 0.7500 | 1.5/16 | 3.7/8 | 3/4 | 2 | 1 | 7647871 |
| 7/8 | 0.8750 | 1.1/2 | 4.1/8 | 7/8 | 2 | 1 | 7647872 |
| 1" | 1.0000 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647873 |

Regular Length, Square End, Weldon Shank, 30° Helix

C603 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 | C603 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 2 | 1 | 7647874 |
| 3/16 | 0.1875 | 7/16 | 2.3/8 | 3/8 | 2 | 1 | 7647875 |
| 1/4 | 0.2500 | 1/2 | 2.7/16 | 3/8 | 2 | 1 | 7647876 |
| 5/16 | 0.3125 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647877 |
| 3/8 | 0.3750 | 9/16 | 2.1/2 | 3/8 | 2 | 1 | 7647878 |
| 1/2 | 0.5000 | 1" | 3.1/4 | 1/2 | 2 | 1 | 7647879 |
| 5/8 | 0.6250 | 1.5/16 | 3.3/4 | 5/8 | 2 | 1 | 7647880 |
| 3/4 | 0.7500 | 1.5/16 | 3.7/8 | 3/4 | 2 | 1 | 7647881 |
| 1" | 1.0000 | 1.5/8 | 4.1/2 | 1" | 2 | 1 | 7647882 |

HSS-PM 2-Flute End Mill



Regular Length, Square End, Weldon Shank, 30° Helix

C123 Powdered Metal. P9 slotting tolerance.

C123

HSS-E
PM

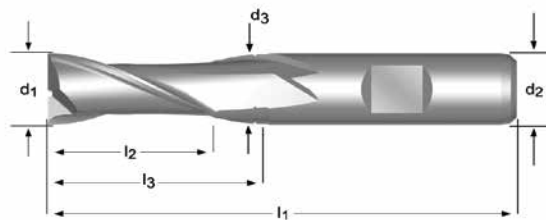
P9



Z
2



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 | 5984309 ¹⁾ |
| | 2.00 | 6 | 7 | 51 | 2 | — | — | 1 | 5984368 |
| | 2.50 | 6 | 8 | 52 | 2 | — | — | 1 | 5984375 |
| | 3.00 | 6 | 8 | 52 | 2 | — | — | 1 | 5984385 |
| 1/8 | 3.18 | 6 | 10 | 54 | 2 | — | — | 1 | 5984329 ¹⁾ |
| | 3.50 | 6 | 10 | 54 | 2 | — | — | 1 | 5984387 |
| 5/32 | 3.97 | 6 | 11 | 55 | 2 | — | — | 1 | 5983899 ¹⁾ |
| | 4.00 | 6 | 11 | 55 | 2 | — | — | 1 | 5983807 |
| | 4.50 | 6 | 11 | 55 | 2 | — | — | 1 | 5983844 |
| 3/16 | 4.76 | 6 | 13 | 57 | 2 | — | — | 1 | 5984389 ¹⁾ |
| | 5.00 | 6 | 13 | 57 | 2 | — | — | 1 | 5983895 |
| | 5.50 | 6 | 13 | 57 | 2 | — | — | 1 | 5983897 |
| | 6.00 | 6 | 13 | 57 | 2 | — | — | 1 | 5983778 |
| 1/4 | 6.35 | 10 | 16 | 66 | 2 | — | — | 1 | 5984319 ¹⁾ |
| | 6.50 | 10 | 16 | 66 | 2 | — | — | 1 | 5983781 |
| | 7.00 | 10 | 16 | 66 | 2 | — | — | 1 | 5983784 |
| | 7.50 | 10 | 16 | 66 | 2 | — | — | 1 | 5983787 |
| 5/16 | 7.94 | 10 | 19 | 69 | 2 | — | — | 1 | 5983898 ¹⁾ |
| | 8.00 | 10 | 19 | 69 | 2 | — | — | 1 | 5983790 |
| | 8.50 | 10 | 19 | 69 | 2 | — | — | 1 | 5983793 |
| | 9.00 | 10 | 19 | 69 | 2 | — | — | 1 | 5983796 |
| | 9.50 | 10 | 19 | 69 | 2 | — | — | 1 | 5983799 |
| 3/8 | 9.52 | 10 | 22 | 72 | 2 | 31.5 | 9.5 | 1 | 5984393 ¹⁾ |
| | 10.00 | 10 | 22 | 72 | 2 | 31.5 | 9.5 | 1 | 5984334 |
| | 11.00 | 12 | 22 | 79 | 2 | — | — | 1 | 5984339 |
| | 12.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 5984343 |
| 1/2 | 12.70 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 5984314 ¹⁾ |
| | 13.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 5984348 |
| | 14.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 5984352 |
| | 15.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 5984356 |

¹⁾ Diameter tolerance -.0005 inches / -.0013 inches

| d_1 Ø Inch | d_1 Ø mm | d_2 Ø _{h₆} mm | l_2 mm | l_1 mm | # of Flutes | l_3 mm | d_3 Ø mm | Pack Qty | C123 |
|--------------------|------------------|---|-------------|-------------|----------------|-------------|------------------|-------------|---------|
| | 16.00 | 16 | 32 | 92 | 2 | 43.5 | 15.5 | 1 | 5984360 |
| | 18.00 | 16 | 32 | 92 | 2 | 43.5 | 15.5 | 1 | 5984364 |
| | 20.00 | 20 | 38 | 104 | 2 | 53.5 | 19.5 | 1 | 5984378 |
| | 22.00 | 20 | 38 | 104 | 2 | 53.5 | 19.5 | 1 | 5984381 |
| | 25.00 | 25 | 45 | 121 | 2 | 64.5 | 24.5 | 1 | 5984384 |
| | 30.00 | 25 | 45 | 121 | 2 | 64.5 | 24.5 | 1 | 5984394 |

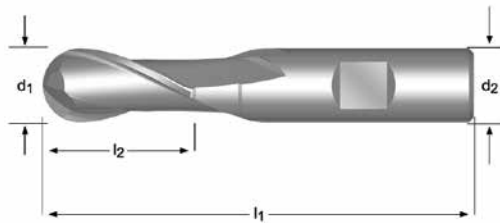
¹⁾ Diameter tolerance -.0005 inches / -.0013 inches

HSS 2-Flute End Mill



Regular Length, Ball Nose, Weldon Shank, 30° Helix

C604 Ball nose for cutting internal radius. Bright finish improves chip flow in soft or non-ferrous materials.



C604

HSS



Z
2

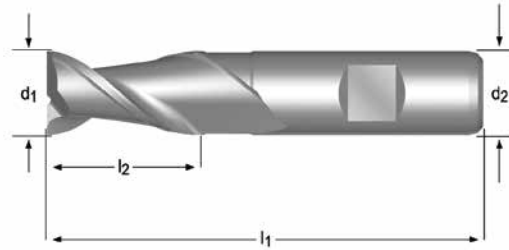


1/8 - 3/4

| d ₁ Ø Inch | d ₁ decimal Inch | l ₂ Inch | l ₁ inch | d ₂ Ø Inch | # of Flutes | Pack Qty | C604 |
|-----------------------------|-----------------------------------|------------------------|------------------------|-----------------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 2 | 1 | 7647883 |
| 3/16 | 0.1875 | 1/2 | 2.3/8 | 3/8 | 2 | 1 | 7647884 |
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 2 | 1 | 7647885 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 2 | 1 | 7647886 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 2 | 1 | 7647887 |
| 7/16 | 0.4375 | 1" | 3.1/4 | 1/2 | 2 | 1 | 7647888 |
| 1/2 | 0.5000 | 1" | 3.1/4 | 1/2 | 2 | 1 | 7647889 |
| 9/16 | 0.5625 | 1.1/8 | 3.3/8 | 1/2 | 2 | 1 | 7647890 |
| 5/8 | 0.6250 | 1.1/8 | 3.3/8 | 1/2 | 2 | 1 | 7647891 |
| 3/4 | 0.7500 | 1.5/16 | 3.5/8 | 1/2 | 2 | 1 | 7647892 |

Regular Length, Square End, Weldon Shank, 37° Helix

C605 High Helix design for aluminum and other non-ferrous materials.



C605

HSS

Z
2

1/4 - 1"

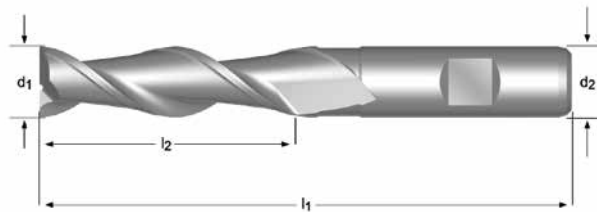
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C605 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|-------------|
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 2 | 1 | 7647893 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 2 | 1 | 7647895 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 2 | 1 | 7647896 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 2 | 1 | 7647897 |

HSS 2-Flute End Mill



Long Length, Square End, Weldon Shank, 37° Helix

C606 High Helix design for aluminum and other non-ferrous materials.



C606

HSS



Z
2

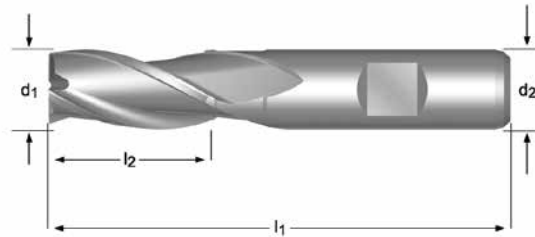


1/4 - 3/4

| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C606 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/4 | 0.2500 | 1.1/4 | 3.1/16 | 3/8 | 2 | 1 | 7647899 |
| 5/16 | 0.3125 | 1.3/8 | 3.1/8 | 3/8 | 2 | 1 | 7647900 |
| 3/8 | 0.3750 | 1.1/2 | 3.1/4 | 3/8 | 2 | 1 | 7647901 |
| 1/2 | 0.5000 | 2" | 4" | 1/2 | 2 | 1 | 7647902 |
| 3/4 | 0.7500 | 3" | 5.1/4 | 3/4 | 2 | 1 | 7647903 |

Regular Length, Square End, Weldon Shank, 30° Helix

C607 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 | C607 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 3 | 1 | 7647904 |
| 3/16 | 0.1875 | 1/2 | 2.3/8 | 3/8 | 3 | 1 | 7647905 |
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 3 | 1 | 7647906 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 3 | 1 | 7647907 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 3 | 1 | 7647908 |
| 7/16 | 0.4375 | 1" | 2.11/16 | 3/8 | 3 | 1 | 7647909 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 3 | 1 | 7647910 |
| 9/16 | 0.5625 | 1.3/8 | 3.3/8 | 1/2 | 3 | 1 | 7658817 |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 3 | 1 | 7647912 |
| 3/4 | 0.7500 | 1.5/8 | 3.3/4 | 5/8 | 3 | 1 | 7647913 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 3 | 1 | 7647916 |
| 1" | 1.0000 | 1.7/8 | 4" | 5/8 | 3 | 1 | 7647914 |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 3 | 1 | 7647915 |

Cobalt 3-Flute End Mill



Long Length, Square End, Weldon Shank, 30° Helix

C346 P9 slotting tolerance. 3 flute design provides less chatter.

C346

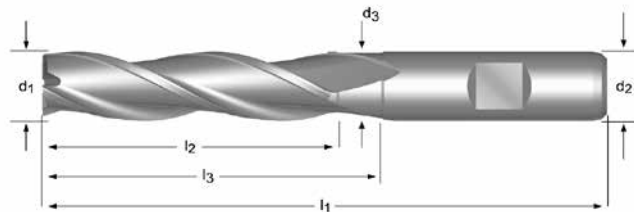
HSS-E



Z
3



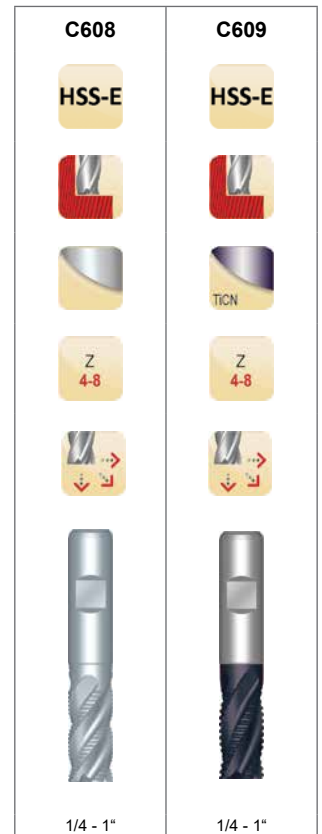
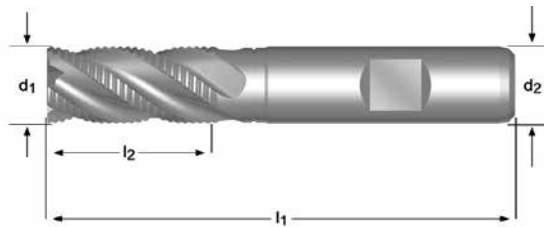
3.00 - 20.00



| d_1 Ø mm | d_2 Ø _{h6} 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 | 5984057 |
| 4.00 | 6 | 19 | 63 | 3 | - | - | 1 | 5984062 |
| 5.00 | 6 | 24 | 68 | 3 | - | - | 1 | 5984067 |
| 6.00 | 6 | 24 | 68 | 3 | - | - | 1 | 5984075 |
| 7.00 | 10 | 30 | 80 | 3 | - | - | 1 | 5984080 |
| 8.00 | 10 | 38 | 88 | 3 | - | - | 1 | 5984085 |
| 9.00 | 10 | 38 | 88 | 3 | - | - | 1 | 5984090 |
| 10.00 | 10 | 45 | 95 | 3 | - | - | 1 | 5984009 |
| 11.00 | 12 | 45 | 102 | 3 | - | - | 1 | 5984014 |
| 12.00 | 12 | 53 | 110 | 3 | - | - | 1 | 5984019 |
| 13.00 | 12 | 53 | 110 | 3 | 64.5 | 11.5 | 1 | 5984024 |
| 15.00 | 12 | 53 | 110 | 3 | 64.5 | 11.5 | 1 | 5984034 |
| 16.00 | 16 | 63 | 123 | 3 | 74.5 | 15.5 | 1 | 5984044 |
| 20.00 | 20 | 75 | 141 | 3 | 90.5 | 19.5 | 1 | 5984052 |

Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

- C608** Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.
- C609** TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.



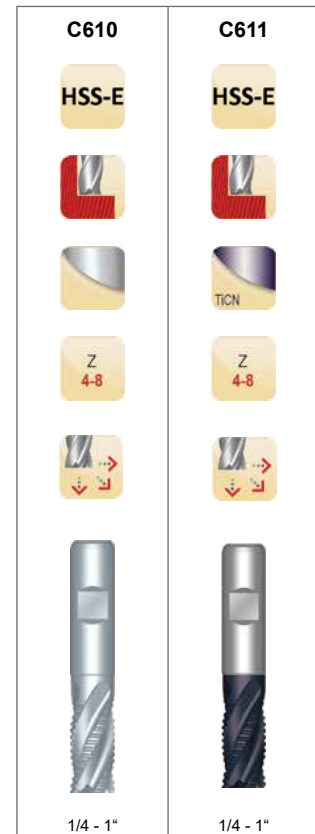
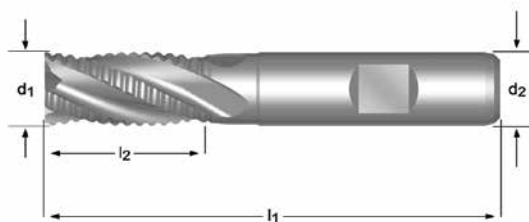
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C608 | C609 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|---------|
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 4 | 1 | 7647917 | 7647927 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647918 | 7647928 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647919 | 7647929 |
| 7/16 | 0.4375 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647920 | 7647930 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647921 | 7647931 |
| 9/16 | 0.5625 | 1.3/8 | 3.3/8 | 1/2 | 4 | 1 | 7647922 | — |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647923 | 7647932 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 4 | 1 | 7647924 | 7647933 |
| 7/8 | 0.8750 | 1.7/8 | 4.1/8 | 3/4 | 5 | 1 | 7647925 | — |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 5 | 1 | 7647926 | 7647934 |

Cobalt Multi-Flute End Mill



Regular Length, Square End, Roughing, Weldon Shank, 30° Helix

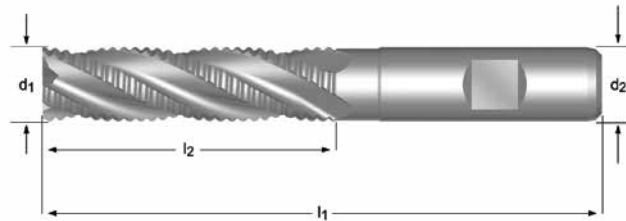
- C610** Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.
- C611** TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.



| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C610 | C611 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|---------|
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 4 | 1 | 7647935 | 7647945 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647936 | 7647946 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647937 | 7647947 |
| 7/16 | 0.4375 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647938 | 7647948 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647939 | 7647949 |
| 9/16 | 0.5625 | 1.3/8 | 3.3/8 | 1/2 | 4 | 1 | 7647940 | — |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647941 | 7647950 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 4 | 1 | 7647942 | 7647951 |
| 7/8 | 0.8750 | 1.7/8 | 4.1/8 | 3/4 | 5 | 1 | 7647943 | 7647952 |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 5 | 1 | 7647944 | 7647953 |

Long Length, Square End, Roughing, Weldon Shank, 30° Helix

C612 Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.



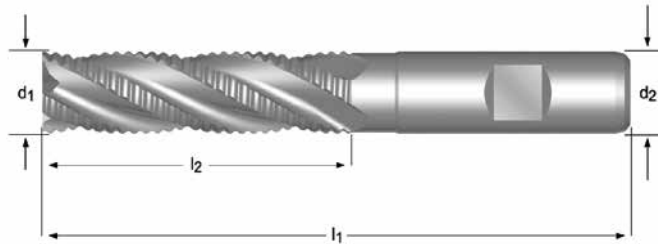
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C612 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/4 | 0.2500 | 1.1/4 | 3.1/8 | 3/8 | 4 | 1 | 7647954 |
| 3/8 | 0.3750 | 1.1/2 | 3.1/4 | 3/8 | 4 | 1 | 7647955 |
| 1/2 | 0.5000 | 2" | 4" | 1/2 | 4 | 1 | 7647956 |
| 5/8 | 0.6250 | 2.1/2 | 4.5/8 | 5/8 | 4 | 1 | 7647957 |
| 3/4 | 0.7500 | 3" | 5.1/4 | 3/4 | 4 | 1 | 7647958 |
| 7/8 | 0.8750 | 3.1/2 | 5.3/4 | 3/4 | 6 | 1 | 7647959 |
| 1" | 1.0000 | 4" | 6.1/2 | 1" | 5 | 1 | 7647960 |

Cobalt 4-Flute End Mill



Long Length, Square End, Roughing, Weldon Shank, 30° Helix

C613 Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.



C613

HSS-E



Z
4-8



1/4 - 3/4

| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C613 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/4 | 0.2500 | 1.1/4 | 3.1/8 | 3/8 | 4 | 1 | 7647961 |
| 3/8 | 0.3750 | 1.1/2 | 3.1/4 | 3/8 | 4 | 1 | 7647962 |
| 1/2 | 0.5000 | 2" | 4" | 1/2 | 4 | 1 | 7647963 |
| 3/4 | 0.7500 | 3" | 5.1/4 | 3/4 | 4 | 1 | 7647964 |

Regular Length, Square End, Weldon Shank, 30° Helix

C614 Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.

C614

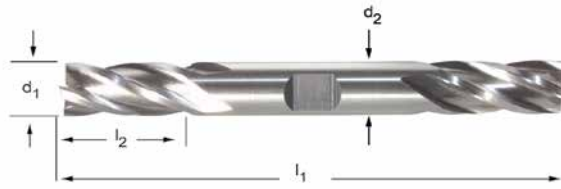
HSS



Z
4



1/8 - 3/4



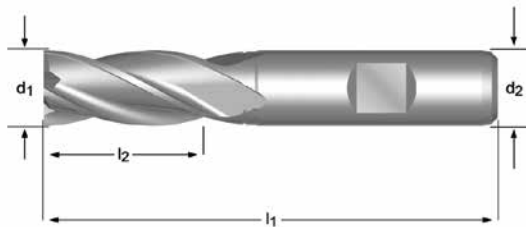
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C614 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 3.1/16 | 3/8 | 4 | 1 | 7647965 |
| 3/16 | 0.1875 | 1/2 | 3.1/4 | 3/8 | 4 | 1 | 7647966 |
| 1/4 | 0.2500 | 5/8 | 3.3/8 | 3/8 | 4 | 1 | 7647967 |
| 5/16 | 0.3125 | 3/4 | 3.1/2 | 3/8 | 4 | 1 | 7647968 |
| 3/8 | 0.3750 | 3/4 | 3.1/2 | 3/8 | 4 | 1 | 7647969 |
| 1/2 | 0.5000 | 1" | 4.1/8 | 1/2 | 4 | 1 | 7647970 |
| 5/8 | 0.6250 | 1.3/8 | 5" | 5/8 | 4 | 1 | 7647971 |
| 3/4 | 0.7500 | 1.5/8 | 5.5/8 | 3/4 | 4 | 1 | 7647972 |

HSS 4-Flute End Mill



Regular Length, Square End, Weldon Shank, 30° Helix

C615 Bright finish improves chip flow in soft or non-ferrous materials.



C615

HSS



Z
4



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 | C615 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 4 | 1 | 7647973 |
| 3/16 | 0.1875 | 1/2 | 2.3/8 | 3/8 | 4 | 1 | 7647974 |
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 4 | 1 | 7647975 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647976 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647977 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647978 |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647979 |
| 11/16 | 0.6875 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647980 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 4 | 1 | 7647981 |
| 7/8 | 0.8750 | 1.7/8 | 4.1/8 | 7/8 | 4 | 1 | 7647982 |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 4 | 1 | 7647983 |

Regular Length, Square End, Weldon Shank, 30° Helix

C247 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.

C247

HSS-E PM

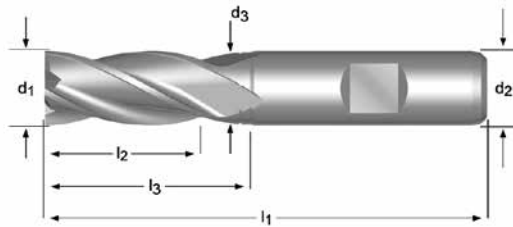


N

Z 4-8




2.00 - 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 | C247 |
|-----------------------------|---------------------------|---|----------------------|----------------------|----------------|----------------------|---------------------------|-------------|-----------------------|
| | 2.00 | 6 | 7 | 51 | 4 | — | — | 1 | 5984300 |
| | 2.50 | 6 | 8 | 52 | 4 | — | — | 1 | 5984305 |
| | 3.00 | 6 | 8 | 52 | 4 | — | — | 1 | 5984880 |
| 1/8 | 3.18 | 6 | 10 | 54 | 4 | — | — | 1 | 5984242 ¹⁾ |
| | 3.50 | 6 | 10 | 54 | 4 | — | — | 1 | 5984882 |
| | 4.00 | 6 | 11 | 55 | 4 | — | — | 1 | 5984712 |
| | 4.50 | 6 | 11 | 55 | 4 | — | — | 1 | 5984716 |
| 3/16 | 4.76 | 6 | 13 | 57 | 4 | — | — | 1 | 5984884 ¹⁾ |
| | 5.00 | 6 | 13 | 57 | 4 | — | — | 1 | 5984724 |
| | 5.50 | 6 | 13 | 57 | 4 | — | — | 1 | 5984728 |
| | 6.00 | 6 | 13 | 57 | 4 | — | — | 1 | 5984747 |
| 1/4 | 6.35 | 10 | 16 | 66 | 4 | — | — | 1 | 5984237 ¹⁾ |
| | 6.50 | 10 | 16 | 66 | 4 | — | — | 1 | 5984752 |
| | 7.00 | 10 | 16 | 66 | 4 | — | — | 1 | 5984757 |
| | 7.50 | 10 | 16 | 66 | 4 | — | — | 1 | 5984762 |
| 5/16 | 7.94 | 10 | 19 | 69 | 4 | — | — | 1 | 5984731 ¹⁾ |
| | 8.00 | 10 | 19 | 69 | 4 | — | — | 1 | 5984775 |
| | 8.50 | 10 | 19 | 69 | 4 | — | — | 1 | 5984780 |
| | 9.00 | 10 | 19 | 69 | 4 | — | — | 1 | 5984785 |
| | 9.50 | 10 | 19 | 69 | 4 | — | — | 1 | 5984794 |
| 3/8 | 9.52 | 10 | 22 | 72 | 4 | 31.5 | 9.5 | 1 | 5984696 ¹⁾ |
| | 10.00 | 10 | 22 | 72 | 4 | 31.5 | 9.5 | 1 | 5984245 |
| | 11.00 | 12 | 22 | 79 | 4 | — | — | 1 | 5984250 |
| | 12.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984256 |
| 1/2 | 12.70 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984233 ¹⁾ |
| | 13.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984261 |
| | 14.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984271 |
| 9/16 | 14.29 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984799 ¹⁾ |
| | 15.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 5984275 |
| 5/8 | 15.88 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 5984738 ¹⁾ |

¹⁾ Diameter tolerance +.0025 inches / -.0005 inches

²⁾ Not center Cutting

³⁾ Available in HSCo only

Cobalt-PM Multi-Flute End Mill



| d_1 Ø Inch | d_1 Ø mm | d_2 Ø _{h₆} 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 | 5984280 |
| | 17.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 5984285 |
| | 18.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 5984290 |
| | 19.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 5984296 |
| 3/4 | 19.05 | 20 | 38 | 104 | 4 | 53.5 | 18.5 | 1 | 5984886 ¹⁾ |
| | 20.00 | 20 | 38 | 104 | 4 | 53.5 | 19.5 | 1 | 5984310 |
| | 21.00 | 20 | 38 | 104 | 4 | 53.5 | 19.5 | 1 | 5984315 |
| | 22.00 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 5984325 |
| 7/8 | 22.22 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 5984767 ¹⁾ |
| | 23.00 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 5984690 |
| | 24.00 | 25 | 45 | 121 | 5 | 64.5 | 23.5 | 1 | 5984734 |
| | 25.00 | 25 | 45 | 121 | 5 | 64.5 | 24.5 | 1 | 5984789 |
| 1" | 25.40 | 25 | 45 | 121 | 5 | 64.5 | 24.5 | 1 | 5984228 ¹⁾ |
| | 26.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 5984840 |
| | 28.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 5984876 |
| | 30.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 5984700 |
| | 32.00 | 32 | 53 | 133 | 6 | 72.5 | 31.5 | 1 | 5984703 |
| | 36.00 | 32 | 53 | 133 | 6 | 72.5 | 31.5 | 1 | 5984707 ²⁾³⁾ |
| | 40.00 | 40 | 63 | 155 | 6 | 84.5 | 39.0 | 1 | 5984720 ²⁾³⁾ |
| | 50.00 | 50 | 75 | 177 | 8 | 96.5 | 48.0 | 1 | 5984742 ²⁾³⁾ |

¹⁾ Diameter tolerance +.0025 inches / -.0005 inches

²⁾ Not center Cutting

³⁾ Available in HSCo only

Long Length, Square End, Weldon Shank

C273 Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.

C273

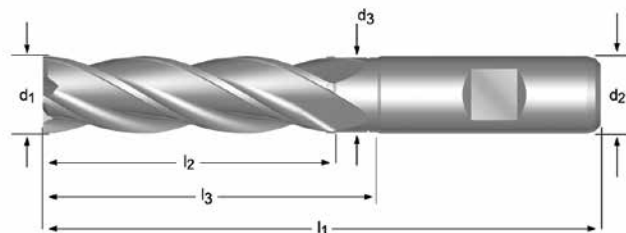
HSS-E
PM



Z
4-6



2.00 - 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 | C273 |
|-----------------------------|---------------------------|---|----------------------|----------------------|----------------|----------------------|---------------------------|-------------|-----------------------|
| | 2.00 | 6 | 10 | 54 | 4 | — | — | 1 | 5984621 |
| | 2.50 | 6 | 12 | 56 | 4 | — | — | 1 | 5984625 |
| | 3.00 | 6 | 12 | 56 | 4 | — | — | 1 | 5984695 |
| 1/8 | 3.18 | 6 | 15 | 59 | 4 | — | — | 1 | 5984576 ¹⁾ |
| | 3.50 | 6 | 15 | 59 | 4 | — | — | 1 | 5984736 |
| | 4.00 | 6 | 19 | 63 | 4 | — | — | 1 | 5984662 |
| | 4.50 | 6 | 19 | 63 | 4 | — | — | 1 | 5984665 |
| 3/16 | 4.76 | 6 | 24 | 68 | 4 | — | — | 1 | 5984791 ¹⁾ |
| | 5.00 | 6 | 24 | 68 | 4 | — | — | 1 | 5984670 |
| | 5.50 | 6 | 24 | 68 | 4 | — | — | 1 | 5984673 |
| | 6.00 | 6 | 24 | 68 | 4 | — | — | 1 | 5984680 |
| 1/4 | 6.35 | 10 | 30 | 80 | 4 | — | — | 1 | 5984571 ¹⁾ |
| | 7.00 | 10 | 30 | 80 | 4 | — | — | 1 | 5984683 |
| | 8.00 | 10 | 38 | 88 | 4 | — | — | 1 | 5984692 |
| | 9.00 | 10 | 38 | 88 | 4 | — | — | 1 | 5984699 |
| 3/8 | 9.52 | 10 | 45 | 95 | 4 | 54.5 | 9.5 | 1 | 5984850 ¹⁾ |
| | 10.00 | 10 | 45 | 95 | 4 | 54.5 | 9.5 | 1 | 5984584 |
| | 11.00 | 12 | 45 | 102 | 4 | — | — | 1 | 5984588 |
| | 12.00 | 12 | 53 | 110 | 4 | 64.5 | 11.5 | 1 | 5984597 |
| 1/2 | 12.70 | 12 | 53 | 110 | 4 | 64.5 | 11.5 | 1 | 5984566 ¹⁾ |
| | 13.00 | 12 | 53 | 110 | 4 | 64.5 | 11.5 | 1 | 5984603 |
| | 14.00 | 12 | 53 | 110 | 4 | 64.5 | 11.5 | 1 | 5984606 |
| | 15.00 | 12 | 53 | 110 | 4 | 64.5 | 11.5 | 1 | 5984610 |
| 5/8 | 15.88 | 16 | 63 | 123 | 4 | 74.5 | 15.5 | 1 | 5984677 ¹⁾ |
| | 16.00 | 16 | 63 | 123 | 4 | 74.5 | 15.5 | 1 | 5984614 |
| | 18.00 | 16 | 63 | 123 | 4 | 74.5 | 15.5 | 1 | 5984618 |
| 3/4 | 19.05 | 20 | 75 | 141 | 4 | 90.5 | 18.5 | 1 | 5984843 ¹⁾ |
| | 20.00 | 20 | 75 | 141 | 4 | 90.5 | 19.5 | 1 | 5984626 |
| | 22.00 | 20 | 75 | 141 | 5 | 90.5 | 19.5 | 1 | 5984628 |
| | 25.00 | 25 | 90 | 166 | 5 | 109.5 | 24.5 | 1 | 5984632 |

¹⁾ Diameter tolerance +.0025 inches / -.0005 inches

²⁾ Available in HSCo only

³⁾ Not Center Cutting

Cobalt-PM Multi-Flute End Mill



| d_1 Ø Inch | d_1 Ø mm | d_2 Ø _{h₆} 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 | 5984556 ¹⁾ |
| | 28.00 | 25 | 90 | 166 | 6 | 109.5 | 24.5 | 1 | 5984660 |
| | 30.00 | 25 | 90 | 166 | 6 | 109.5 | 24.5 | 1 | 5984854 |
| | 32.00 | 32 | 106 | 186 | 6 | 125.5 | 31.5 | 1 | 5984857 |
| | 40.00 | 40 | 125 | 217 | 6 | 146.5 | 39.0 | 1 | 5984667 ²⁾³⁾ |

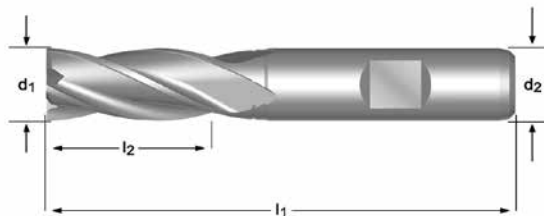
¹⁾ Diameter tolerance +.0025 inches / -.0005 inches

²⁾ Available in HSCo only

³⁾ Not Center Cutting

Regular Length, Square End, Weldon Shank, 30° Helix

C617 Multi-flute finishing. Bright finish improves chip flow in soft or non-ferrous materials.



C617

HSS



Z
4-8



1/8 - 1"

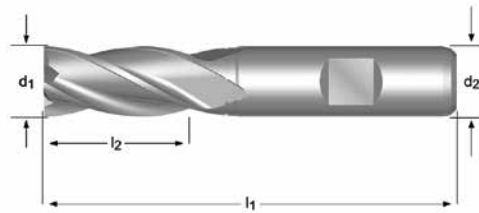
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | d_2 Ø Inch | # of Flutes | Pack Qty | C617 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 4 | 1 | 7647984 |
| 3/16 | 0.1875 | 1/2 | 2.3/8 | 3/8 | 4 | 1 | 7647985 |
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 4 | 1 | 7647986 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647987 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7647988 |
| 7/16 | 0.4375 | 1" | 2.11/16 | 3/8 | 4 | 1 | 7647989 |
| 1/2 | 0.5000 | 1" | 2.11/16 | 3/8 | 4 | 1 | 7647990 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7647991 |
| 9/16 | 0.5625 | 1.3/8 | 3.3/8 | 1/2 | 4 | 1 | 7647992 |
| 5/8 | 0.6250 | 1.3/8 | 3.3/8 | 1/2 | 4 | 1 | 7647993 |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647996 |
| 11/16 | 0.6875 | 1.5/8 | 3.5/8 | 1/2 | 4 | 1 | 7647994 |
| 11/16 | 0.6875 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647997 |
| 3/4 | 0.7500 | 1.5/8 | 3.5/8 | 1/2 | 4 | 1 | 7647995 |
| 3/4 | 0.7500 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7647998 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 4 | 1 | 7648005 |
| 13/16 | 0.8125 | 1.7/8 | 4" | 5/8 | 6 | 1 | 7647999 |
| 7/8 | 0.8750 | 1.7/8 | 4" | 5/8 | 6 | 1 | 7648000 |
| 7/8 | 0.8750 | 1.7/8 | 4.1/8 | 3/4 | 4 | 1 | 7648006 |
| 7/8 | 0.8750 | 1.7/8 | 4.1/8 | 7/8 | 4 | 1 | 7648002 |
| 1" | 1.0000 | 1.7/8 | 4" | 5/8 | 6 | 1 | 7648001 |
| 1" | 1.0000 | 1.7/8 | 4.1/8 | 3/4 | 4 | 1 | 7648007 |
| 1" | 1.0000 | 1.7/8 | 4.1/8 | 7/8 | 4 | 1 | 7648003 |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 4 | 1 | 7648004 |

Cobalt 4-Flute End Mill



Regular Length, Square End, Weldon Shank, 30° Helix

C618 Multi-flute finishing for high strength heat resistant materials, stainless and alloy steel, super alloys, and titanium alloys.



C618

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 | C618 |
|--------------------|--------------------------|---------------|---------------|--------------------|----------------|-------------|---------|
| 1/8 | 0.1250 | 3/8 | 2.5/16 | 3/8 | 4 | 1 | 7648008 |
| 3/16 | 0.1875 | 1/2 | 2.3/8 | 3/8 | 4 | 1 | 7648009 |
| 1/4 | 0.2500 | 5/8 | 2.7/16 | 3/8 | 4 | 1 | 7648010 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7648011 |
| 3/8 | 0.3750 | 3/4 | 2.1/2 | 3/8 | 4 | 1 | 7648012 |
| 1/2 | 0.5000 | 1.1/4 | 3.1/4 | 1/2 | 4 | 1 | 7648013 |
| 5/8 | 0.6250 | 1.5/8 | 3.3/4 | 5/8 | 4 | 1 | 7648014 |
| 3/4 | 0.7500 | 1.5/8 | 3.7/8 | 3/4 | 4 | 1 | 7648015 |
| 1" | 1.0000 | 2" | 4.1/2 | 1" | 4 | 1 | 7648016 |

Visual Index - Reamers

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, find your Alpha Code on the AMG Chart
(example: 279 U : U is the Alpha Code)
- 5) Find the closest diameter for your cutting application on the Feed Rate chart below to find your IPR

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, 6Al4V-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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 S 3 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB N 3 |
| | 6.2 β-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 | --- |
| | 8.2 Thermosetting plastics | Bakelit, Pertinax | --- |
| | 8.3 Reinforced plastic materials | CFK, GFKAFK | --- |
| 9. Hard Mat. | 9.1 Cermet (Metal-ceramics) | Ferrotic | <54 H |
| 10. Graphite | 10.1 Standard graphite | | --- |

Visual Index - Reamers

| Tool Material: | HM | HM | HM | HM | HM | HSS-E | HSS | HSS | HSS-E | HSS-E | HSS | HSS |
|--------------------|---------------|--------------|---------------|--------------|---|---|-------------|-----------|------------|--------------|--------------|----------|
| Finish/Coating: | | | | | | | | | | | | |
| Standard: | DIN 8050 | DIN 8093 | DIN 8051 | DIN 8094 | DIN 8093 | DIN 212 | ANSI | ANSI | BS 328 | DIN 212 | ANSI | ANSI |
| Direction of Cut: | | | | | | | | | | | | |
| Shank: | | | | | | | | | | | | |
| Tolerance: | H7 | H7 | H7 | H7 | 0.25-5.5 0,+0.004 0,0.51-12 0,+0.005 | 0.25-5.5 0,+0.004 0,0.51-12 0,+0.005 | USCTI | USCTI | H7 | H7 | | USCTI |
| Tolerance: | | | | | | | | | | | | |
| Countersink Angle: | | | | | | | | | | | | |
| Taper Gradient: | | | | | | | | | | | | 1:48 |
| Style: | B441 | B400 | B442 | B411 | B481 | B170 | B610 | B620 | B901 | B157 | B122 | B630 |
| 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 | 1/16 - 1" | 1.50 - 1/2 | 2.00 - 20.00 | 3/8 - 1.1/16 | 7/0 - 10 |
| Page # | 449 | 450 | 451 | 452 | 453 | 455 | 458 | 462 | 463 | 464 | 465 | 466 |
| 1.1 | 59B | 59B | 59B | 59B | 59B | 82C | 82C | 82C | 59C | 82C | 59C | 59C |
| 1.2 | 59B | 59B | 59B | 59B | 59B | 66C | 66C | 66C | 46C | 66C | 46C | 46C |
| 1.3 | 46B | 46B | 46B | 46B | 46B | 52C | 52C | 52C | 36C | 52C | 36C | 36C |
| 1.4 | 46B | 46B | 46B | 46B | 46B | 49B | 49B | 49B | 33B | 49B | 33B | 33B |
| 1.5 | 33C | 33C | 33C | 33C | 33C | 30B | 30B | 30B | 16B | 30B | 16B | 16B |
| 1.6 | 33C | 33C | 33C | 33C | 33C | 16A | 16A | 16A | 13A | 16A | 13A | 13A |
| 1.7 | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | |
| 2.1 | | | | | | 36C | 36C | 36C | 26C | 36C | 26C | 26C |
| 2.2 | | | | | | 20B | 20B | 20B | | 20B | 16B | 16B |
| 2.3 | | | | | | 26B | 26B | 26B | | 26B | 20B | 20B |
| 2.4 | | | | | | | 20B | 20B | | | | |
| 3.1 | 56D | 56D | 56D | 56D | 56D | 52E | 52E | 52E | 46E | | 46E | 46E |
| 3.2 | 56D | 56D | 56D | 56D | 56D | 49D | 49D | 49D | 36D | | 36D | 36D |
| 3.3 | 56D | 56D | 56D | 56D | 56D | 43C | 43C | 43C | 33C | | 33C | 33C |
| 3.4 | 46D | 46D | 46D | 46D | 46D | 36C | 36C | 36C | 30C | | 30C | 30C |
| 4.1 | 46C | 46C | 46C | 46C | 46C | 49C | 49C | 49C | 36C | 49C | 36C | 36C |
| 4.2 | 46C | 46C | 46C | 46C | 46C | 30B | 30B | 30B | 16B | 30B | 16B | 16B |
| 4.3 | 33B | 33B | 33B | 33B | 33B | 16B | 16B | 16B | 13B | 16B | 13B | 13B |
| 5.1 | 33C | 33C | 33C | 33C | 33C | 26D | 26D | 26D | 16D | 26D | 16D | 16D |
| 5.2 | 33B | 33B | 33B | 33B | 33B | 16C | 16C | 16C | 10C | 16C | | |
| 5.3 | 33B | 33B | 33B | 33B | 33B | 10C | 10C | 10C | 7C | 10C | | |
| 6.1 | 125E | 125E | 125E | 125E | 125E | 82D | 82D | 82D | 59D | 82D | 59D | 59D |
| 6.2 | 125E | 125E | 125E | 125E | 125E | 92E | 92E | 92E | 66E | 92E | 66E | 66E |
| 6.3 | 125E | 125E | 125E | 125E | 125E | 82D | 82D | 82D | 59D | | 59D | 59D |
| 6.4 | 125D | 125D | 125D | 125D | 125D | 46D | 46D | 46D | 36D | | 36D | 36D |
| 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 | | | | | | | | | | | | |

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| | | | | | | | | | | | | |
| | ST | ST | ST | | | | | | ST | ST | | |
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| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
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| 1.1 | 59C | 59C | 59C | 82C | 59C | | 59C | 59C | 59C | 59C | 59C | 98F |
| 1.2 | 46C | 46C | 46C | 66C | 46C | | 46C | 46C | 46C | 46C | 46C | 82E |
| 1.3 | 36C | 36C | 36C | 52C | 36C | | 36C | 36C | 36C | 36C | 36C | 66D |
| 1.4 | 33B | 33B | 33B | 49B | 33B | | 33B | 33B | 33B | 33B | 33B | 49D |
| 1.5 | 16B | 16B | 16B | 30B | 16B | | 16B | 16B | 16B | 16B | 16B | 33B |
| 1.6 | 13A | 13A | 13A | 16A | 13A | | 13A | 13A | 13A | 13A | 13A | 20A |
| 1.7 | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | |
| 2.1 | 26C | | 26C | 36C | 26F | | 26C | 26C | 26C | 26F | 26C | 26C |
| 2.2 | | | 16B | 20B | | | 16B | 16B | 16B | | 16B | 20B |
| 2.3 | | | 20B | 26B | | | 20B | 20B | 20B | | 20B | 13A |
| 2.4 | | | | 20B | | | | | 20B | | | |
| 3.1 | 46E | 46E | 46E | 52E | 46E | | 46E | 46E | 46E | 46E | 46E | 82F |
| 3.2 | 36D | 36D | 36D | 49D | 36D | | 36D | 36D | 36D | 36D | 36D | 49D |
| 3.3 | 33C | 33C | 33C | 43C | 33C | | 33C | 33C | 33C | 33C | 33C | 39C |
| 3.4 | 30C | 30C | 30C | 36C | 30C | | 30C | 30C | 30C | 30C | 30C | 26C |
| 4.1 | 36C | 36C | 36C | 49C | 36C | | 36C | 36C | 36C | 36C | 36C | 39C |
| 4.2 | 16B | | 16B | 30B | 16B | | 16B | 16B | 16B | 16B | 16B | 33A |
| 4.3 | 13B | | 13B | 16B | 13B | | 13B | 13B | 13B | 13B | 13B | 26A |
| 5.1 | 16D | | 16D | 26D | 16D | | 16D | 16D | 16D | 16D | 16D | 39C |
| 5.2 | 10C | | | 16C | 10C | | | | | 10C | | 20B |
| 5.3 | 7C | | | 10C | 7C | | | | | 7C | | 13A |
| 6.1 | 59D | | 59D | 82D | 59D | | 59D | 59D | 59D | 59D | 59D | 82D |
| 6.2 | 66E | | 66E | 92E | 66E | | 66E | 66E | 66E | 66E | 66E | 66F |
| 6.3 | 59D | | 59D | 82D | 59D | | 59D | 59D | 59D | 59D | 59D | 82F |
| 6.4 | 36D | | 36D | 46D | 36D | | 36D | 36D | 36D | 36D | 36D | 33D |
| 7.1 | 75F | | 75F | | 75F | | 75F | 75F | 75F | 75F | 75F | 98G |
| 7.2 | 59F | | 59F | | 59F | | 59F | 59F | 59F | 59F | 59F | 82F |
| 7.3 | | | 49E | | 49E | | 49E | 49E | 49E | 49E | 49E | 66F |
| 7.4 | | | 46D | | 46D | | 46D | 46D | 46D | | 46D | 33F |
| 8.1 | | | | | | | | | | | | 98G |
| 8.2 | 69B | 69B | 69B | | 69B | | 69B | 69B | 69B | 69B | 69B | 66G |
| 8.3 | | | | | | | | | | | | |
| 9.1 | | | | | | | | | | | | |
| 10.1 | | | | | | | | | | | | |

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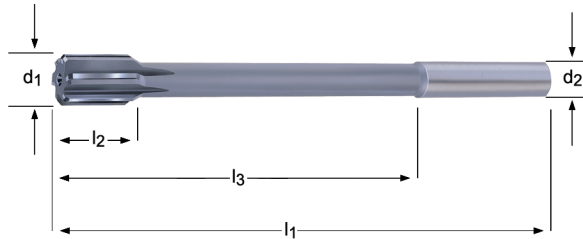
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| B442..... | 451 | | |

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

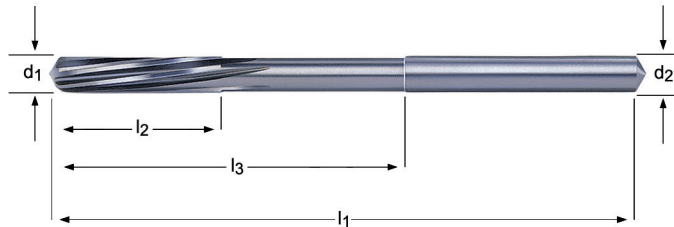
| d_1 Ø mm | l_1 mm | l_2 mm | l_3 mm | # of Flutes | d_2 Ø h_9 mm | Pack Qty | B441 |
|------------------|-------------|-------------|-------------|----------------|------------------------|-------------|---------|
| 10.0 | 133 | 19 | 87 | 6 | 10 | 1 | 5987160 |
| 11.0 | 142 | 19 | 96 | 6 | 10 | 1 | 5987164 |
| 12.0 | 151 | 19 | 105 | 6 | 10 | 1 | 5987167 |
| 13.0 | 151 | 19 | 105 | 6 | 10 | 1 | 5987170 |
| 14.0 | 160 | 19 | 110 | 6 | 12.5 | 1 | 5987173 |
| 15.0 | 162 | 19 | 112 | 6 | 12.5 | 1 | 5987176 |
| 16.0 | 170 | 22 | 120 | 6 | 12.5 | 1 | 5987179 |
| 17.0 | 175 | 22 | 123 | 6 | 14 | 1 | 5987185 |
| 18.0 | 182 | 22 | 130 | 6 | 14 | 1 | 5987189 |
| 19.0 | 189 | 22 | 131 | 6 | 16 | 1 | 5987193 |
| 20.0 | 195 | 22 | 137 | 6 | 16 | 1 | 5987196 |

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 Ø h_3 mm | Pack Qty | B400 |
|------------------|-------------|-------------|-------------|----------------|------------------------|-------------|-----------------------|
| 1.0 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5987088 ¹⁾ |
| 1.2 | 38 | 7.5 | 16.5 | 3 | 1.2 | 1 | 5987126 ¹⁾ |
| 1.4 | 40 | 8 | 18 | 3 | 1.5 | 1 | 5987163 ¹⁾ |
| 1.5 | 40 | 8 | 18 | 3 | 1.5 | 1 | 5987198 ¹⁾ |
| 1.6 | 43 | 9 | 20 | 3 | 1.6 | 1 | 5987237 ¹⁾ |
| 1.8 | 46 | 10 | 22 | 4 | 1.8 | 1 | 5987244 ¹⁾ |
| 2.0 | 49 | 11 | 24 | 4 | 2.0 | 1 | 5987100 ¹⁾ |
| 2.2 | 53 | 12 | 25 | 4 | 2.2 | 1 | 5987103 ¹⁾ |
| 2.5 | 57 | 14 | 29 | 4 | 2.5 | 1 | 5987107 ¹⁾ |
| 2.8 | 61 | 15 | 33 | 6 | 3.0 | 1 | 5987111 ¹⁾ |
| 3.0 | 61 | 15 | 33 | 6 | 3.0 | 1 | 5987117 ¹⁾ |
| 3.2 | 65 | 16 | 37 | 6 | 3.2 | 1 | 5987120 ¹⁾ |
| 3.5 | 70 | 18 | 42 | 6 | 3.5 | 1 | 5987123 ¹⁾ |
| 4.0 | 75 | 19 | 47 | 6 | 4.0 | 1 | 5987129 ¹⁾ |
| 4.5 | 80 | 21 | 52 | 6 | 4.5 | 1 | 5987132 ¹⁾ |
| 5.0 | 86 | 23 | 58 | 6 | 5.0 | 1 | 5987134 ¹⁾ |
| 5.5 | 93 | 26 | 57 | 6 | 5.6 | 1 | 5987137 ¹⁾ |
| 6.0 | 93 | 26 | 57 | 6 | 5.6 | 1 | 5987141 ¹⁾ |
| 6.5 | 101 | 28 | 65 | 6 | 6.3 | 1 | 5987144 ²⁾ |
| 7.0 | 109 | 31 | 73 | 6 | 7.1 | 1 | 5987148 ²⁾ |
| 8.0 | 117 | 33 | 81 | 6 | 8.0 | 1 | 5987152 ²⁾ |
| 9.0 | 125 | 36 | 85 | 6 | 9.0 | 1 | 5987155 ²⁾ |
| 10.0 | 133 | 38 | 93 | 6 | 10.0 | 1 | 5987247 ²⁾ |
| 12.0 | 151 | 44 | 111 | 6 | 10.0 | 1 | 5987250 ²⁾ |
| 14.0 | 160 | 47 | 115 | 6 | 12.5 | 1 | 5987253 ²⁾ |
| 16.0 | 170 | 52 | 125 | 6 | 12.5 | 1 | 5987094 ²⁾ |
| 18.0 | 182 | 56 | 137 | 6 | 14.0 | 1 | 5987097 ³⁾ |
| 20.0 | 195 | 60 | 147 | 6 | 16.0 | 1 | 5987114 ³⁾ |

¹⁾ Solid Carbide

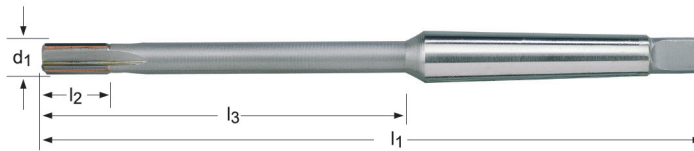
²⁾ Carbide Head

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 | 5987200 |
| 12.0 | 182 | 19 | 116.5 | 6 | 1 | 1 | 5987204 |
| 14.0 | 189 | 19 | 123.5 | 6 | 1 | 1 | 5987208 |
| 15.0 | 204 | 19 | 124 | 6 | 2 | 1 | 5987212 |
| 16.0 | 210 | 22 | 130 | 6 | 2 | 1 | 5987216 |
| 17.0 | 214 | 22 | 134 | 6 | 2 | 1 | 5987220 |
| 18.0 | 219 | 22 | 139 | 6 | 2 | 1 | 5987228 |
| 19.0 | 223 | 22 | 143 | 6 | 2 | 1 | 5987230 |
| 20.0 | 228 | 22 | 148 | 6 | 2 | 1 | 5987233 |

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.

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



B411

HM



DIN
8094



5.00 - 30.00

| 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 | 5987213 ¹⁾ |
| 6.0 | 138 | 26 | 72.5 | 6 | 1 | 1 | 5987217 ¹⁾ |
| 7.0 | 150 | 31 | 84.5 | 6 | 1 | 1 | 5987221 ¹⁾ |
| 8.0 | 156 | 33 | 90.5 | 6 | 1 | 1 | 5987226 ¹⁾ |
| 9.0 | 162 | 36 | 96.5 | 6 | 1 | 1 | 5987229 ¹⁾ |
| 10.0 | 168 | 38 | 102.5 | 6 | 1 | 1 | 5987159 ¹⁾ |
| 12.0 | 182 | 44 | 116.5 | 6 | 1 | 1 | 5987166 ¹⁾ |
| 14.0 | 189 | 47 | 123.5 | 8 | 1 | 1 | 5987169 ¹⁾ |
| 15.0 | 204 | 50 | 124 | 8 | 2 | 1 | 5987172 ¹⁾ |
| 16.0 | 210 | 52 | 130 | 8 | 2 | 1 | 5987175 ¹⁾ |
| 17.0 | 214 | 54 | 134 | 6 | 2 | 1 | 5987178 ²⁾ |
| 18.0 | 219 | 56 | 139 | 6 | 2 | 1 | 5987181 ²⁾ |
| 19.0 | 223 | 58 | 143 | 6 | 2 | 1 | 5987184 ²⁾ |
| 20.0 | 228 | 60 | 148 | 6 | 2 | 1 | 5987187 ²⁾ |
| 22.0 | 237 | 64 | 157 | 6 | 2 | 1 | 5987190 ²⁾ |
| 24.0 | 268 | 68 | 169 | 8 | 3 | 1 | 5987194 ²⁾ |
| 25.0 | 268 | 68 | 169 | 8 | 3 | 1 | 5987202 ²⁾ |
| 26.0 | 273 | 70 | 174 | 8 | 3 | 1 | 5987206 ²⁾ |
| 30.0 | 281 | 73 | 182 | 8 | 3 | 1 | 5987209 ²⁾ |

¹⁾ Carbide Head
²⁾ Carbide Tipped

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.

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



B481

HM



DIN
8093



0.98 - 12.05

| 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 | 5987462 |
| 0.99 | 49.5 | 6 | 21.5 | 3 | 4 | 1 | 5987467 |
| 1.00 | 49.5 | 6 | 21.5 | 3 | 4 | 1 | 5987475 |
| 1.01 | 49.5 | 6 | 21.5 | 3 | 4 | 1 | 5987478 |
| 1.02 | 49.5 | 6 | 21.5 | 3 | 4 | 1 | 5987482 |
| 1.03 | 49.5 | 9 | 21.5 | 3 | 4 | 1 | 5987485 |
| 1.48 | 49 | 9 | 21 | 3 | 4 | 1 | 5987488 |
| 1.49 | 49 | 9 | 21 | 3 | 4 | 1 | 5987491 |
| 1.50 | 49 | 9 | 21 | 3 | 4 | 1 | 5987494 |
| 1.51 | 49 | 9 | 21 | 3 | 4 | 1 | 5987497 |
| 1.52 | 49 | 9 | 21 | 3 | 4 | 1 | 5987499 |
| 1.53 | 49 | 9 | 21 | 3 | 4 | 1 | 5987501 |
| 1.98 | 49 | 12 | 21 | 4 | 4 | 1 | 5987506 |
| 1.99 | 49 | 12 | 21 | 4 | 4 | 1 | 5987509 |
| 2.00 | 49 | 12 | 21 | 4 | 4 | 1 | 5987602 |
| 2.01 | 49 | 12 | 21 | 4 | 4 | 1 | 5987603 |
| 2.02 | 49 | 12 | 21 | 4 | 4 | 1 | 5987604 |
| 2.03 | 49 | 12 | 21 | 4 | 4 | 1 | 5987507 |
| 2.48 | 59 | 16 | 31 | 4 | 4 | 1 | 5987510 |
| 2.49 | 59 | 16 | 31 | 4 | 4 | 1 | 5987513 |
| 2.50 | 59 | 16 | 31 | 4 | 4 | 1 | 5987516 |
| 2.51 | 59 | 16 | 31 | 4 | 4 | 1 | 5987519 |
| 2.52 | 59 | 16 | 31 | 4 | 4 | 1 | 5987522 |
| 2.53 | 59 | 16 | 31 | 4 | 4 | 1 | 5987524 |
| 2.97 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987526 |
| 2.98 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987529 |
| 2.99 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987534 |
| 3.00 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987540 |
| 3.01 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987543 |
| 3.02 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987546 |
| 3.03 | 62.5 | 17 | 35 | 6 | 4 | 1 | 5987549 |
| 3.97 | 75 | 19 | 47 | 6 | 4 | 1 | 5987551 |
| 3.98 | 75 | 19 | 47 | 6 | 4 | 1 | 5987553 |

APPLICATION CARBIDE REAMER



| d_1 Ø | l_1 | l_2 | l_3 | # of Flutes | d_2 Ø _{h₆} mm | Pack Qty | B481 |
|------------|-------|-------|-------|----------------|---|-------------|---------|
| 3.99 | 75 | 19 | 47 | 6 | 4 | 1 | 5987556 |
| 4.00 | 75 | 19 | 47 | 6 | 4 | 1 | 5987558 |
| 4.01 | 75 | 19 | 47 | 6 | 4 | 1 | 5987560 |
| 4.02 | 75 | 19 | 47 | 6 | 4 | 1 | 5987562 |
| 4.03 | 75 | 19 | 47 | 6 | 4 | 1 | 5987565 |
| 4.97 | 86 | 23 | 50 | 6 | 6 | 1 | 5987567 |
| 4.98 | 86 | 23 | 50 | 6 | 6 | 1 | 5987569 |
| 4.99 | 86 | 23 | 50 | 6 | 6 | 1 | 5987571 |
| 5.00 | 86 | 23 | 50 | 6 | 6 | 1 | 5987573 |
| 5.01 | 86 | 23 | 50 | 6 | 6 | 1 | 5987575 |
| 5.02 | 86 | 23 | 50 | 6 | 6 | 1 | 5987577 |
| 5.03 | 86 | 23 | 50 | 6 | 6 | 1 | 5987578 |
| 5.97 | 93 | 26 | 57 | 6 | 6 | 1 | 5987580 |
| 5.98 | 93 | 26 | 57 | 6 | 6 | 1 | 5987582 |
| 5.99 | 93 | 26 | 57 | 6 | 6 | 1 | 5987586 |
| 6.00 | 93 | 26 | 57 | 6 | 6 | 1 | 5987588 |
| 6.01 | 93 | 26 | 57 | 6 | 6 | 1 | 5987590 |
| 6.02 | 93 | 26 | 57 | 6 | 6 | 1 | 5987592 |
| 6.03 | 93 | 26 | 57 | 6 | 6 | 1 | 5987593 |
| 7.97 | 117 | 33 | 81 | 6 | 8 | 1 | 5987594 |
| 7.98 | 117 | 33 | 81 | 6 | 8 | 1 | 5987595 |
| 7.99 | 117 | 33 | 81 | 6 | 8 | 1 | 5987596 |
| 8.00 | 117 | 33 | 81 | 6 | 8 | 1 | 5987597 |
| 8.01 | 117 | 33 | 81 | 6 | 8 | 1 | 5987598 |
| 8.02 | 117 | 33 | 81 | 6 | 8 | 1 | 5987600 |
| 8.03 | 117 | 33 | 81 | 6 | 8 | 1 | 5986965 |
| 8.04 | 117 | 33 | 81 | 6 | 8 | 1 | 5986973 |
| 9.97 | 133 | 38 | 93 | 6 | 10 | 1 | 5986978 |
| 9.98 | 133 | 38 | 93 | 6 | 10 | 1 | 5986981 |
| 9.99 | 133 | 38 | 93 | 6 | 10 | 1 | 5986985 |
| 10.00 | 133 | 38 | 93 | 6 | 10 | 1 | 5987511 |
| 10.01 | 133 | 38 | 93 | 6 | 10 | 1 | 5987514 |
| 10.02 | 133 | 38 | 93 | 6 | 10 | 1 | 5987517 |
| 10.03 | 133 | 38 | 93 | 6 | 10 | 1 | 5987520 |
| 10.04 | 133 | 38 | 93 | 6 | 10 | 1 | 5987525 |
| 10.05 | 133 | 38 | 93 | 6 | 10 | 1 | 5987528 |
| 11.97 | 151 | 44 | 106 | 6 | 12 | 1 | 5987531 |
| 11.98 | 151 | 44 | 106 | 6 | 12 | 1 | 5987533 |
| 11.99 | 151 | 44 | 106 | 6 | 12 | 1 | 5987538 |
| 12.00 | 151 | 44 | 106 | 6 | 12 | 1 | 5987503 |
| 12.01 | 151 | 44 | 106 | 6 | 12 | 1 | 5987537 |
| 12.02 | 151 | 44 | 106 | 6 | 12 | 1 | 5987563 |
| 12.03 | 151 | 44 | 106 | 6 | 12 | 1 | 5987584 |
| 12.04 | 151 | 44 | 106 | 6 | 12 | 1 | 5987599 |
| 12.05 | 151 | 44 | 106 | 6 | 12 | 1 | 5987601 |

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 | 5986212 |
| 0.99 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986213 |
| 1.00 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986214 |
| 1.01 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986215 |
| 1.02 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986216 |
| 1.03 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986217 |
| 1.04 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986219 |
| 1.05 | 34 | 5.5 | 15 | 3 | 1.0 | 1 | 5986221 |
| 1.49 | 40 | 8.0 | 18 | 3 | 1.5 | 1 | 5986223 |
| 1.50 | 40 | 8.0 | 18 | 3 | 1.5 | 1 | 5986225 |
| 1.51 | 43 | 9.0 | 20 | 3 | 1.6 | 1 | 5986229 |
| 1.52 | 43 | 9.0 | 20 | 3 | 1.6 | 1 | 5986232 |
| 1.98 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986235 |
| 1.99 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986238 |
| 2.00 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986940 |
| 2.01 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986795 |
| 2.02 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986798 |
| 2.03 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986801 |
| 2.04 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986805 |
| 2.05 | 49 | 11.0 | 24 | 4 | 2.0 | 1 | 5986809 |
| 2.49 | 57 | 14.0 | 28 | 4 | 2.5 | 1 | 5986813 |
| 2.50 | 57 | 14.0 | 28 | 4 | 2.5 | 1 | 5986817 |
| 2.51 | 57 | 14.0 | 28 | 4 | 2.5 | 1 | 5986821 |
| 2.52 | 57 | 14.0 | 28 | 4 | 2.5 | 1 | 5986825 |
| 2.98 | 61 | 15.0 | 32 | 6 | 3.0 | 1 | 5986829 |
| 2.99 | 61 | 15.0 | 32 | 6 | 3.0 | 1 | 5986836 |
| 3.00 | 61 | 15.0 | 32 | 6 | 3.0 | 1 | 5986839 |
| 3.01 | 65 | 16.0 | 35 | 6 | 3.2 | 1 | 5986842 |
| 3.02 | 65 | 16.0 | 35 | 6 | 3.2 | 1 | 5986845 |
| 3.03 | 65 | 16.0 | 35 | 6 | 3.2 | 1 | 5986848 |
| 3.04 | 65 | 16.0 | 35 | 6 | 3.2 | 1 | 5986851 |
| 3.05 | 65 | 16.0 | 35 | 6 | 3.2 | 1 | 5986852 |
| 3.49 | 70 | 18.0 | 40 | 6 | 3.5 | 1 | 5986855 |

APPLICATION COBALT REAMER



| d_1 Ø mm | l_1 mm | l_2 mm | l_3 mm | # of Flutes | d_2 Ø h_s mm | Pack Qty | B170 |
|------------------|-------------|-------------|-------------|----------------|------------------------|-------------|---------|
| 3.50 | 70 | 18.0 | 40 | 6 | 3.5 | 1 | 5986858 |
| 3.51 | 70 | 18.0 | 40 | 6 | 3.5 | 1 | 5986860 |
| 3.52 | 70 | 18.0 | 40 | 6 | 3.5 | 1 | 5986865 |
| 3.98 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986867 |
| 3.99 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986872 |
| 4.00 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986875 |
| 4.01 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986878 |
| 4.02 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986881 |
| 4.03 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986884 |
| 4.04 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986887 |
| 4.05 | 75 | 19.0 | 43 | 6 | 4.0 | 1 | 5986890 |
| 4.49 | 80 | 21.0 | 47 | 6 | 4.5 | 1 | 5986892 |
| 4.50 | 80 | 21.0 | 47 | 6 | 4.5 | 1 | 5986896 |
| 4.51 | 80 | 21.0 | 47 | 6 | 4.5 | 1 | 5986898 |
| 4.52 | 80 | 21.0 | 47 | 6 | 4.5 | 1 | 5986901 |
| 4.98 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986903 |
| 4.99 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986906 |
| 5.00 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986909 |
| 5.01 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986912 |
| 5.02 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986915 |
| 5.03 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986918 |
| 5.04 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986921 |
| 5.05 | 86 | 23.0 | 52 | 6 | 5.0 | 1 | 5986927 |
| 5.49 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986545 |
| 5.50 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986586 |
| 5.51 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986616 |
| 5.52 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986647 |
| 5.98 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986682 |
| 5.99 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986689 |
| 6.00 | 93 | 26.0 | 57 | 6 | 5.6 | 1 | 5986693 |
| 6.01 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986696 |
| 6.02 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986700 |
| 6.03 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986550 |
| 6.04 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986554 |
| 6.05 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986558 |
| 6.49 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986562 |
| 6.50 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986566 |
| 6.51 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986570 |
| 6.52 | 101 | 28.0 | 63 | 6 | 6.3 | 1 | 5986573 |
| 6.98 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986578 |
| 6.99 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986581 |
| 7.00 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986584 |
| 7.01 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986590 |
| 7.02 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986593 |
| 7.03 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986596 |
| 7.04 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986598 |
| 7.05 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986602 |
| 7.49 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986603 |
| 7.50 | 109 | 31.0 | 69 | 6 | 7.1 | 1 | 5986606 |
| 7.51 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986609 |
| 7.52 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986612 |
| 7.98 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986614 |
| 7.99 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986620 |
| 8.00 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986622 |
| 8.01 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986626 |
| 8.02 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986629 |
| 8.03 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986632 |
| 8.04 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986637 |
| 8.05 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986639 |
| 8.49 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986641 |
| 8.50 | 117 | 33.0 | 75 | 6 | 8.0 | 1 | 5986643 |
| 8.51 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986645 |
| 8.52 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986650 |
| 8.98 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986652 |
| 8.99 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986655 |
| 9.00 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986658 |

| d_1 Ø | l_1 | l_2 | l_3 | # of Flutes | d_2 Øh ₉ mm | Pack Qty | B170 |
|------------|-------|-------|-------|----------------|--------------------------------|-------------|---------|
| 9.01 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986663 |
| 9.02 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986666 |
| 9.03 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986669 |
| 9.04 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986672 |
| 9.05 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986675 |
| 9.49 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986678 |
| 9.50 | 125 | 36.0 | 81 | 6 | 9.0 | 1 | 5986685 |
| 9.51 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986611 |
| 9.52 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986642 |
| 9.98 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986671 |
| 9.99 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986709 |
| 10.00 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986241 |
| 10.01 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986244 |
| 10.02 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986246 |
| 10.03 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986249 |
| 10.04 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986253 |
| 10.05 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986256 |
| 10.49 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986261 |
| 10.51 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986267 |
| 10.52 | 133 | 38.0 | 87 | 6 | 10.0 | 1 | 5986270 |
| 10.98 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986273 |
| 10.99 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986276 |
| 11.00 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986279 |
| 11.01 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986282 |
| 11.02 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986285 |
| 11.03 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986288 |
| 11.04 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986292 |
| 11.05 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986789 |
| 11.49 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986832 |
| 11.50 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986862 |
| 11.51 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986894 |
| 11.52 | 142 | 41.0 | 96 | 6 | 10.0 | 1 | 5986924 |
| 11.98 | 151 | 44.0 | 105 | 6 | 10.0 | 1 | 5986930 |
| 11.99 | 151 | 44.0 | 105 | 6 | 10.0 | 1 | 5986933 |
| 12.00 | 151 | 44.0 | 105 | 6 | 10.0 | 1 | 5986937 |

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 | 6009742 |
| N59 | 0.0410 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 6009730 |
| N58 | 0.0420 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 6009687 |
| N57 | 0.0430 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 6009640 |
| N56 | 0.0465 | 0.0455 | 1/2 | 2.1/2 | 4 | 1 | 6009596 |
| 3/64 | 0.0469 | 0.0455 | 1/2 | 2.1/2 | 4 | 1 | 6009652 |
| N55 | 0.0520 | 0.0510 | 1/2 | 2.1/2 | 4 | 1 | 6009565 |
| N54 | 0.0550 | 0.0510 | 1/2 | 2.1/2 | 4 | 1 | 6009966 |
| N53 | 0.0595 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 6009960 |
| 1/16 | 0.0625 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 6009644 |
| N52 | 0.0635 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 6009958 |
| N51 | 0.0670 | 0.0660 | 3/4 | 3" | 4 | 1 | 6009955 |
| N50 | 0.0700 | 0.0660 | 3/4 | 3" | 4 | 1 | 6009952 |
| N49 | 0.0730 | 0.0660 | 3/4 | 3" | 4 | 1 | 6009947 |
| N48 | 0.0760 | 0.0720 | 3/4 | 3" | 4 | 1 | 6009944 |
| 5/64 | 0.0781 | 0.0720 | 3/4 | 3" | 4 | 1 | 6009716 |
| N47 | 0.0785 | 0.0720 | 3/4 | 3" | 4 | 1 | 6009941 |
| N46 | 0.0810 | 0.0771 | 3/4 | 3" | 4 | 1 | 6009938 |
| N45 | 0.0820 | 0.0771 | 3/4 | 3" | 4 | 1 | 6009935 |
| N44 | 0.0860 | 0.0810 | 3/4 | 3" | 4 | 1 | 6009927 |
| N43 | 0.0890 | 0.0810 | 3/4 | 3" | 4 | 1 | 6009925 |
| N42 | 0.0935 | 0.0880 | 3/4 | 3" | 4 | 1 | 6009922 |
| 3/32 | 0.0938 | 0.0880 | 3/4 | 3" | 4 | 1 | 6009811 |
| N41 | 0.0960 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 6009918 |
| N40 | 0.0980 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 6009915 |
| N39 | 0.0995 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 6009910 |
| N38 | 0.1015 | 0.0950 | 7/8 | 3.1/2 | 4 | 1 | 6009906 |
| N37 | 0.1040 | 0.0950 | 7/8 | 3.1/2 | 4 | 1 | 6009903 |
| N36 | 0.1065 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 6009901 |
| 7/64 | 0.1094 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 6009765 |
| N35 | 0.1100 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 6009892 |
| N34 | 0.1110 | 0.1055 | 7/8 | 3.1/2 | 4 | 1 | 6009887 |
| N33 | 0.1130 | 0.1055 | 7/8 | 3.1/2 | 4 | 1 | 6009883 |

| 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 | 6009879 |
| N31 | 0.1200 | 0.1120 | 7/8 | 3.1/2 | 4 | 1 | 6009875 |
| | 0.1230 | 0.1120 | 7/8 | 3.1/2 | 4 | 1 | 6009898 |
| | 0.1240 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009763 |
| | 0.1247 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009767 |
| 1/8 | 0.1250 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009659 |
| | 0.1260 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009770 |
| N30 | 0.1285 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009871 |
| N29 | 0.1360 | 0.1275 | 1" | 4" | 4 | 1 | 6009864 |
| N28 | 0.1405 | 0.1350 | 1" | 4" | 4 | 1 | 6009860 |
| 9/64 | 0.1410 | 0.1350 | 1" | 4" | 4 | 1 | 6009781 |
| N27 | 0.1440 | 0.1350 | 1" | 4" | 4 | 1 | 6009856 |
| N26 | 0.1470 | 0.1430 | 1" | 4" | 4 | 1 | 6009847 |
| N25 | 0.1495 | 0.1430 | 1" | 4" | 4 | 1 | 6009844 |
| N24 | 0.1520 | 0.1460 | 1" | 4" | 4 | 1 | 6009841 |
| N23 | 0.1540 | 0.1460 | 1" | 4" | 4 | 1 | 6009836 |
| 5/32 | 0.1562 | 0.1510 | 1" | 4" | 6 | 1 | 6009713 |
| N22 | 0.1570 | 0.1510 | 1" | 4" | 6 | 1 | 6009832 |
| N21 | 0.1590 | 0.1530 | 1.1/8 | 4.1/2 | 6 | 1 | 6009829 |
| N20 | 0.1610 | 0.1530 | 1.1/8 | 4.1/2 | 6 | 1 | 6009827 |
| N19 | 0.1660 | 0.1595 | 1.1/8 | 4.1/2 | 6 | 1 | 6009822 |
| N18 | 0.1695 | 0.1595 | 1.1/8 | 4.1/2 | 6 | 1 | 6009820 |
| 11/64 | 0.1719 | 0.1645 | 1.1/8 | 4.1/2 | 6 | 1 | 6009671 |
| N17 | 0.1730 | 0.1645 | 1.1/8 | 4.1/2 | 6 | 1 | 6009978 |
| N16 | 0.1770 | 0.1700 | 1.1/8 | 4.1/2 | 6 | 1 | 6009975 |
| N15 | 0.1800 | 0.1755 | 1.1/8 | 4.1/2 | 6 | 1 | 6009972 |
| N14 | 0.1820 | 0.1755 | 1.1/8 | 4.1/2 | 6 | 1 | 6009969 |
| N13 | 0.1850 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009963 |
| | 0.1855 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009773 |
| | 0.1865 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009776 |
| | 0.1870 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009779 |
| 3/16 | 0.1875 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009809 |
| | 0.1885 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009782 |
| N12 | 0.1890 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009932 |
| N11 | 0.1910 | 0.1860 | 1.1/4 | 5" | 6 | 1 | 6009895 |
| N10 | 0.1935 | 0.1860 | 1.1/4 | 5" | 6 | 1 | 6009852 |
| N9 | 0.1960 | 0.1895 | 1.1/4 | 5" | 6 | 1 | 6009568 |
| N8 | 0.1990 | 0.1895 | 1.1/4 | 5" | 6 | 1 | 6009750 |
| N7 | 0.2010 | 0.1945 | 1.1/4 | 5" | 6 | 1 | 6009746 |
| 13/64 | 0.2031 | 0.1945 | 1.1/4 | 5" | 6 | 1 | 6009683 |
| N6 | 0.2040 | 0.1945 | 1.1/4 | 5" | 6 | 1 | 6009738 |
| N5 | 0.2055 | 0.2016 | 1.1/4 | 5" | 6 | 1 | 6009949 |
| N4 | 0.2090 | 0.2016 | 1.1/4 | 5" | 6 | 1 | 6009913 |
| N3 | 0.2130 | 0.2075 | 1.1/4 | 5" | 6 | 1 | 6009868 |
| 7/32 | 0.2188 | 0.2075 | 1.1/4 | 5" | 6 | 1 | 6009761 |
| N2 | 0.2210 | 0.2173 | 1.1/2 | 6" | 6 | 1 | 6009824 |
| N1 | 0.2280 | 0.2173 | 1.1/2 | 6" | 6 | 1 | 6009817 |
| A | 0.2340 | 0.2265 | 1.1/2 | 6" | 6 | 1 | 6009826 |
| 15/64 | 0.2344 | 0.2265 | 1.1/2 | 6" | 6 | 1 | 6009698 |
| B | 0.2380 | 0.2329 | 1.1/2 | 6" | 6 | 1 | 6009828 |
| C | 0.2420 | 0.2329 | 1.1/2 | 6" | 6 | 1 | 6009831 |
| D | 0.2460 | 0.2329 | 1.1/2 | 6" | 6 | 1 | 6009837 |
| | 0.2480 | 0.2329 | 1.1/2 | 6" | 6 | 1 | 6009784 |
| | 0.2490 | 0.2400 | 1.1/2 | 6" | 6 | 1 | 6009787 |
| | 0.2495 | 0.2400 | 1.1/2 | 6" | 6 | 1 | 6009788 |
| 1/4 | 0.2500 | 0.2400 | 1.1/2 | 6" | 6 | 1 | 6009653 |
| | 0.2510 | 0.2400 | 1.1/2 | 6" | 6 | 1 | 6009792 |
| F | 0.2570 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009842 |
| G | 0.2610 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009845 |
| 17/64 | 0.2656 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009706 |
| H | 0.2660 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009850 |
| I | 0.2720 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009867 |
| J | 0.2770 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009853 |
| K | 0.2810 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009858 |
| 9/32 | 0.2812 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009775 |
| L | 0.2900 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009861 |

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 |
|-------------------------------------|-----------------------------------|-----------------------------------|------------------------|------------------------|----------------|-------------|---------|
| M | 0.2950 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009873 |
| 19/64 | 0.2969 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009715 |
| N | 0.3020 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009881 |
| | 0.3105 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009794 |
| | 0.3115 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009796 |
| | 0.3120 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009798 |
| 5/16 | 0.3125 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009709 |
| | 0.3135 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009800 |
| O | 0.3160 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009570 |
| P | 0.3230 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009573 |
| 21/64 | 0.3281 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009723 |
| Q | 0.3320 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009575 |
| R | 0.3390 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009578 |
| 11/32 | 0.3438 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009667 |
| S | 0.3480 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009581 |
| T | 0.3580 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009584 |
| 23/64 | 0.3594 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009734 |
| U | 0.3680 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009587 |
| | 0.3730 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009802 |
| | 0.3740 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009804 |
| | 0.3745 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009806 |
| 3/8 | 0.3750 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009657 |
| | 0.3760 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009808 |
| V | 0.3770 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009590 |
| W | 0.3860 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009593 |
| 25/64 | 0.3906 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009692 |
| X | 0.3970 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009600 |
| Y | 0.4040 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009604 |
| 13/32 | 0.4062 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009679 |
| Z | 0.4130 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009608 |
| 27/64 | 0.4219 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009778 |
| | 0.4355 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009810 |
| | 0.4365 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009814 |
| | 0.4370 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009815 |
| 7/16 | 0.4375 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009758 |
| | 0.4385 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009816 |
| 29/64 | 0.4531 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009807 |
| 15/32 | 0.4688 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009694 |
| 31/64 | 0.4844 | 0.4355 | 2" | 8" | 6 | 1 | 6009665 |
| | 0.4980 | 0.4355 | 2" | 8" | 6 | 1 | 6009818 |
| | 0.4990 | 0.4355 | 2" | 8" | 6 | 1 | 6009819 |
| | 0.4995 | 0.4355 | 2" | 8" | 6 | 1 | 6009821 |
| 1/2 | 0.5000 | 0.4355 | 2" | 8" | 6 | 1 | 6009648 |
| | 0.5010 | 0.4355 | 2" | 8" | 6 | 1 | 6009823 |
| 33/64 | 0.5156 | 0.4355 | 2" | 8" | 6 | 1 | 6009669 |
| 17/32 | 0.5312 | 0.4355 | 2" | 8" | 6 | 1 | 6009702 |
| 35/64 | 0.5469 | 0.4355 | 2" | 8" | 8 | 1 | 6009673 |
| 9/16 | 0.5625 | 0.4355 | 2" | 8" | 8 | 1 | 6009772 |
| 37/64 | 0.5781 | 0.4355 | 2" | 8" | 8 | 1 | 6009677 |
| 19/32 | 0.5938 | 0.4355 | 2" | 8" | 8 | 1 | 6009712 |
| 39/64 | 0.6094 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009681 |
| 5/8 | 0.6250 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009722 |
| 41/64 | 0.6406 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009684 |
| 21/32 | 0.6562 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009719 |
| 43/64 | 0.6719 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009688 |
| 11/16 | 0.6875 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009663 |
| 45/64 | 0.7031 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009697 |
| 23/32 | 0.7188 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009727 |
| 47/64 | 0.7344 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009701 |
| 3/4 | 0.7500 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009813 |
| 49/64 | 0.7656 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009705 |
| 25/32 | 0.7812 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009645 |
| 51/64 | 0.7969 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009726 |
| 13/16 | 0.8125 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009675 |
| 53/64 | 0.8281 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009731 |
| 27/32 | 0.8438 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009739 |

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 |
|-------------------------------------|-----------------------------------|-----------------------------------|------------------------|------------------------|----------------|-------------|---------|
| 55/64 | 0.8594 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009735 |
| 7/8 | 0.8750 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009769 |
| 57/64 | 0.8906 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009743 |
| 29/32 | 0.9062 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009803 |
| 59/64 | 0.9219 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009747 |
| 15/16 | 0.9375 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009690 |
| 61/64 | 0.9531 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009751 |
| 31/32 | 0.9688 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009661 |
| 63/64 | 0.9844 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 6009754 |
| 1" | 1.0000 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 6009612 |
| 1.1/16 | 1.0625 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 6009616 |
| 1.1/8 | 1.1250 | 0.8745 | 2.7/8 | 11" | 8 | 1 | 6009630 |
| 1.3/16 | 1.1875 | 0.9995 | 2.7/8 | 11" | 8 | 1 | 6009634 |
| 1.1/4 | 1.2500 | 0.9995 | 3" | 11.1/2 | 8 | 1 | 6009626 |
| 1.3/8 | 1.3750 | 0.9995 | 3.1/4 | 12" | 8 | 1 | 6009636 |
| 1.1/2 | 1.5000 | 1.2495 | 3.1/2 | 12.1/2 | 8 | 1 | 6009620 |

HSS REAMER



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

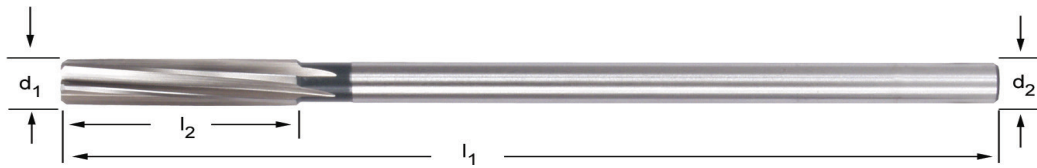
HSS



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 | 6009805 |
| 5/64 | 0.0781 | 0.0720 | 3/4 | 3" | 4 | 1 | 6009708 |
| 3/32 | 0.0938 | 0.0880 | 3/4 | 3" | 4 | 1 | 6009676 |
| 7/64 | 0.1094 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 6009721 |
| 1/8 | 0.1250 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 6009685 |
| 5/32 | 0.1562 | 0.1510 | 1" | 4" | 6 | 1 | 6009704 |
| 11/64 | 0.1719 | 0.1645 | 1.1/8 | 4.1/2 | 6 | 1 | 6009774 |
| 3/16 | 0.1875 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 6009672 |
| 13/64 | 0.2031 | 0.1945 | 1.1/4 | 5" | 6 | 1 | 6009785 |
| 7/32 | 0.2188 | 0.2075 | 1.1/4 | 5" | 6 | 1 | 6009718 |
| 1/4 | 0.2500 | 0.2400 | 1.1/2 | 6" | 6 | 1 | 6009639 |
| 17/64 | 0.2656 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009615 |
| 9/32 | 0.2812 | 0.2485 | 1.1/2 | 6" | 6 | 1 | 6009737 |
| 5/16 | 0.3125 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009700 |
| 11/32 | 0.3438 | 0.2792 | 1.1/2 | 6" | 6 | 1 | 6009768 |
| 3/8 | 0.3750 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009689 |
| 25/64 | 0.3906 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009651 |
| 13/32 | 0.4062 | 0.3100 | 1.3/4 | 7" | 6 | 1 | 6009780 |
| 7/16 | 0.4375 | 0.3730 | 1.3/4 | 7" | 6 | 1 | 6009714 |
| 31/64 | 0.4844 | 0.4355 | 2" | 8" | 6 | 1 | 6009696 |
| 1/2 | 0.5000 | 0.4355 | 2" | 8" | 6 | 1 | 6009594 |
| 17/32 | 0.5312 | 0.4355 | 2" | 8" | 6 | 1 | 6009611 |
| 9/16 | 0.5625 | 0.4355 | 2" | 8" | 8 | 1 | 6009733 |
| 5/8 | 0.6250 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009711 |
| 11/16 | 0.6875 | 0.5620 | 2.1/4 | 9" | 8 | 1 | 6009725 |
| 3/4 | 0.7500 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 6009680 |
| 7/8 | 0.8750 | 0.7495 | 2.5/8 | 10" | 8 | 1 | 6009729 |
| 1" | 1.0000 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 6009783 |

Machine Reamer, Straight Shank

B901 Left Hand Slow Spiral, Right Hand Cut. Steam tempered in flutes reduces wear and chip welding in soft ferrous materials.



B901

HSS-E



**BS
328**



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 | 5986427 |
| 1/16 | 1.59 | 44 | 21 | 4 | 1 | 5986431 |
| | 2.00 | 50 | 25 | 4 | 1 | 5986481 |
| 3/32 | 2.38 | 58 | 29 | 4 | 1 | 5986504 |
| | 2.50 | 58 | 29 | 4 | 1 | 5986485 |
| | 3.00 | 62 | 31 | 4 | 1 | 5986489 |
| 1/8 | 3.18 | 66 | 33 | 4 | 1 | 5986444 |
| | 3.50 | 71 | 35 | 4 | 1 | 5986493 |
| 5/32 | 3.97 | 76 | 38 | 6 | 1 | 5986528 |
| | 4.00 | 76 | 38 | 6 | 1 | 5986512 |
| | 4.50 | 81 | 41 | 6 | 1 | 5986514 |
| 3/16 | 4.76 | 87 | 44 | 6 | 1 | 5986500 |
| | 5.00 | 87 | 44 | 6 | 1 | 5986520 |
| 13/64 | 5.16 | 87 | 44 | 6 | 1 | 5986469 |
| | 5.50 | 93 | 47 | 6 | 1 | 5986523 |
| 7/32 | 5.56 | 93 | 47 | 6 | 1 | 5986540 |
| 15/64 | 5.95 | 93 | 47 | 6 | 1 | 5986477 |
| | 6.00 | 93 | 47 | 6 | 1 | 5986531 |
| 1/4 | 6.35 | 100 | 50 | 6 | 1 | 5986440 |
| | 7.00 | 107 | 54 | 6 | 1 | 5986534 |
| 9/32 | 7.14 | 107 | 54 | 6 | 1 | 5986555 |
| 5/16 | 7.94 | 115 | 58 | 6 | 1 | 5986525 |
| | 8.00 | 115 | 58 | 6 | 1 | 5986543 |
| | 9.00 | 124 | 62 | 6 | 1 | 5986547 |
| 3/8 | 9.52 | 133 | 66 | 6 | 1 | 5986508 |
| | 10.00 | 133 | 66 | 6 | 1 | 5986448 |
| | 11.00 | 142 | 71 | 6 | 1 | 5986453 |
| 7/16 | 11.11 | 142 | 71 | 6 | 1 | 5986537 |
| | 12.00 | 152 | 76 | 6 | 1 | 5986461 |
| 1/2 | 12.70 | 152 | 76 | 6 | 1 | 5986437 |

COBALT REAMER



Machine Reamer, Straight Shank

B157 Left Hand Fast Spiral, 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 Ø h_9 mm | Pack Qty | B157 |
|------------------|-------------|-------------|-------------|-------------|----------------|------------------------|-------------|---------|
| 2.0 | 49 | 11 | 3.5 | 24 | 3 | 2.0 | 1 | 5986889 |
| 3.0 | 61 | 15 | 4.0 | 32 | 3 | 3.0 | 1 | 5986732 |
| 4.0 | 75 | 19 | 4.0 | 43 | 3 | 4.0 | 1 | 5986736 |
| 5.0 | 86 | 23 | 4.5 | 52 | 3 | 5.0 | 1 | 5986739 |
| 6.0 | 93 | 26 | 6.0 | 57 | 3 | 5.6 | 1 | 5986743 |
| 7.0 | 109 | 31 | 7.0 | 69 | 3 | 7.1 | 1 | 5986747 |
| 8.0 | 117 | 33 | 9.0 | 75 | 3 | 8.0 | 1 | 5986751 |
| 9.0 | 125 | 36 | 9.5 | 81 | 3 | 9.0 | 1 | 5986755 |
| 10.0 | 133 | 38 | 10.0 | 87 | 3 | 10.0 | 1 | 5986588 |
| 11.0 | 142 | 41 | 10.5 | 96 | 3 | 10.0 | 1 | 5986594 |
| 12.0 | 151 | 44 | 11.0 | 105 | 3 | 10.0 | 1 | 5986724 |
| 13.0 | 151 | 44 | 11.5 | 105 | 3 | 10.0 | 1 | 5986765 |
| 14.0 | 160 | 47 | 12.0 | 110 | 3 | 12.5 | 1 | 5986804 |
| 15.0 | 162 | 50 | 12.5 | 112 | 3 | 12.5 | 1 | 5986841 |
| 16.0 | 170 | 52 | 13.0 | 120 | 3 | 12.5 | 1 | 5986874 |
| 17.0 | 175 | 54 | 13.5 | 123 | 3 | 14.0 | 1 | 5986880 |
| 18.0 | 182 | 56 | 14.0 | 130 | 3 | 14.0 | 1 | 5986883 |
| 19.0 | 189 | 58 | 14.5 | 131 | 3 | 16.0 | 1 | 5986886 |
| 20.0 | 195 | 60 | 15.0 | 137 | 3 | 16.0 | 1 | 5986728 |

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 tempered in flutes reduces wear and chip welding in harder ferrous materials. Used to align or enlarge holes.

B122

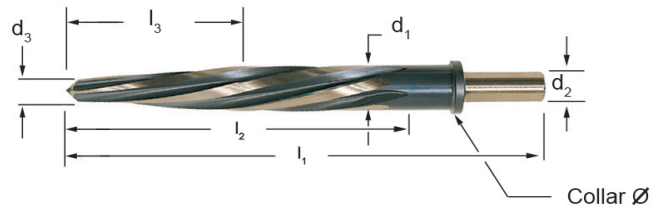
HSS



ANSI



3/8 - 1.1/16



Note: Collar diameter = $d_1 + 1/8"$
 Collar thickness = $3/16"$
 Shank Length = $1.1/2"$

| 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 | 5.1/4 | 3.1/16 | 2 | 5 | 3/8 | 7/32 | 1 | 5986460 |
| 1/2 | 0.5000 | 5.5/16 | 3.3/4 | 2.5/8 | 5 | 1/2 | 1/4 | 1 | 5986446 |
| 9/16 | 0.5625 | 6.9/16 | 4.5/16 | 3.3/16 | 5 | 1/2 | 5/16 | 1 | 5986471 |
| 5/8 | 0.6250 | 6.9/16 | 4.5/16 | 3.3/16 | 5 | 1/2 | 3/8 | 1 | 5986463 |
| 11/16 | 0.6875 | 7 | 4.13/16 | 3.9/16 | 5 | 1/2 | 7/16 | 1 | 5986449 |
| 3/4 | 0.7500 | 7 | 4.13/16 | 3.9/16 | 5 | 1/2 | 1/2 | 1 | 5986457 |
| 13/16 | 0.8125 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 9/16 | 1 | 5986451 |
| 7/8 | 0.8750 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 5/8 | 1 | 5986467 |
| 15/16 | 0.9375 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 11/16 | 1 | 5986454 |
| 1" | 1.0000 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 3/4 | 1 | 5986605 |
| 1.1/16 | 1.0625 | 7.1/4 | 5.1/4 | 3.7/8 | 5 | 1/2 | 13/16 | 1 | 5986608 |

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.

4588

HSS



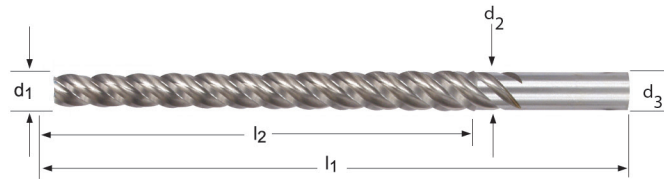
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7/0 - 10

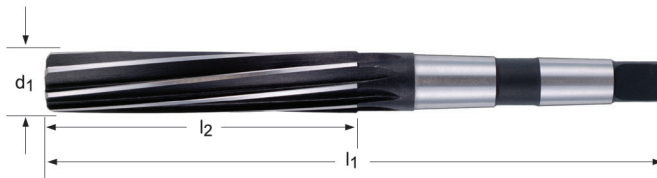


| nom Ø | d_1 Ø Inch | d_2 Ø Inch | d_3 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | 4588 |
|----------|--------------------|--------------------|--------------------|---------------|---------------|----------------|-------------|---------|
| 7/0 | 0.0497 | 0.0666 | 5/64 | 13/16 | 1.13/16 | 2 | 1 | 6009536 |
| 6/0 | 0.0611 | 0.0810 | 3/32 | 15/16 | 1.15/16 | 2 | 1 | 6009535 |
| 5/0 | 0.0719 | 0.0966 | 7/64 | 1.3/16 | 2.3/16 | 2 | 1 | 6009534 |
| 4/0 | 0.0869 | 0.1142 | 1/8 | 1.5/16 | 2.5/16 | 2 | 1 | 6009523 |
| 3/0 | 0.1029 | 0.1300 | 9/64 | 1.5/16 | 2.5/16 | 2 | 1 | 6009512 |
| 2/0 | 0.1137 | 0.1462 | 5/32 | 1.9/16 | 2.9/16 | 3 | 1 | 6009970 |
| 1 | 0.1447 | 0.1798 | 3/16 | 1.11/16 | 2.15/16 | 3 | 1 | 6009933 |
| 2 | 0.1600 | 0.2010 | 13/64 | 1.15/16 | 3.3/16 | 3 | 1 | 6009939 |
| 3 | 0.1813 | 0.2294 | 15/64 | 2.5/16 | 3.11/16 | 3 | 1 | 6009942 |
| 4 | 0.2071 | 0.2600 | 17/64 | 2.9/16 | 4.1/16 | 3 | 1 | 6009945 |
| 5 | 0.2410 | 0.2994 | 5/16 | 2.13/16 | 4.5/16 | 3 | 1 | 6009950 |
| 6 | 0.2773 | 0.3540 | 23/64 | 3.11/16 | 5.7/16 | 3 | 1 | 6009953 |
| 7 | 0.3297 | 0.4220 | 13/32 | 4.7/16 | 6.5/16 | 3 | 1 | 6009956 |
| 8 | 0.3971 | 0.5050 | 7/16 | 5.3/16 | 7.3/16 | 3 | 1 | 6009961 |
| 9 | 0.4800 | 0.6066 | 9/16 | 6.1/16 | 8.5/16 | 4 | 1 | 6009964 |
| 10 | 0.5799 | 0.7216 | 5/8 | 6.13/16 | 9.5/16 | 4 | 1 | 6009936 |

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

Machine Reamer, Taper Shank

B101 Left hand slow spiral, right hand. Steam tempered in flutes reduces wear chip welding harder ferrous materials.



Note: All sizes have 1mm x 45 chamfer (lead).
Cutting diameters are produced to H7 tolerance

B101

HSS-E



BS
328



3.00mm - 2"

| 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 | 5986595 |
| 1/8 | 3.18 | 112 | 33 | 4 | 1 | 1 | 5986589 |
| | 3.50 | 115 | 35 | 6 | 1 | 1 | 5986599 |
| | 4.00 | 117 | 38 | 6 | 1 | 1 | 5986814 |
| | 4.50 | 120 | 41 | 6 | 1 | 1 | 5986818 |
| 3/16 | 4.76 | 124 | 44 | 6 | 1 | 1 | 5986601 |
| | 5.00 | 124 | 44 | 6 | 1 | 1 | 5986673 |
| | 5.50 | 127 | 47 | 6 | 1 | 1 | 5986676 |
| | 6.00 | 127 | 47 | 6 | 1 | 1 | 5986699 |
| 1/4 | 6.35 | 130 | 50 | 6 | 1 | 1 | 5986548 |
| | 6.50 | 130 | 50 | 6 | 1 | 1 | 5986703 |
| | 7.00 | 134 | 54 | 6 | 1 | 1 | 5986705 |
| 5/16 | 7.94 | 138 | 58 | 6 | 1 | 1 | 5986679 |
| | 8.00 | 138 | 58 | 6 | 1 | 1 | 5986727 |
| | 8.50 | 138 | 58 | 6 | 1 | 1 | 5986731 |
| | 9.00 | 142 | 62 | 6 | 1 | 1 | 5986735 |
| | 9.50 | 142 | 62 | 6 | 1 | 1 | 5986740 |
| 3/8 | 9.52 | 146 | 66 | 6 | 1 | 1 | 5986607 |
| | 10.00 | 146 | 66 | 6 | 1 | 1 | 5986621 |
| | 10.50 | 146 | 66 | 6 | 1 | 1 | 5986627 |
| | 11.00 | 151 | 71 | 6 | 1 | 1 | 5986630 |
| 7/16 | 11.11 | 151 | 71 | 6 | 1 | 1 | 5986711 |
| | 12.00 | 156 | 76 | 6 | 1 | 1 | 5986479 |
| | 12.50 | 156 | 76 | 6 | 1 | 1 | 5986483 |
| 1/2 | 12.70 | 156 | 76 | 6 | 1 | 1 | 5986513 |
| | 13.00 | 156 | 76 | 6 | 1 | 1 | 5986486 |
| | 13.50 | 161 | 81 | 6 | 1 | 1 | 5986490 |
| | 14.00 | 161 | 81 | 8 | 1 | 1 | 5986501 |
| 9/16 | 14.29 | 181 | 81 | 8 | 2 | 1 | 5986744 |
| | 14.50 | 181 | 81 | 8 | 2 | 1 | 5986505 |
| | 15.00 | 181 | 81 | 8 | 2 | 1 | 5986509 |
| | 15.50 | 187 | 87 | 8 | 2 | 1 | 5986516 |
| 5/8 | 15.88 | 187 | 87 | 8 | 2 | 1 | 5986688 |

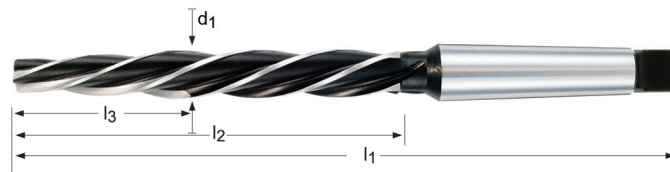
COBALT REAMER



| 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 | 5986526 |
| | 16.50 | 187 | 87 | 8 | 2 | 1 | 5986529 |
| | 17.00 | 187 | 87 | 8 | 2 | 1 | 5986532 |
| | 18.00 | 193 | 93 | 8 | 2 | 1 | 5986538 |
| | 19.00 | 193 | 93 | 8 | 2 | 1 | 5986541 |
| 3/4 | 19.05 | 200 | 100 | 8 | 2 | 1 | 5986604 |
| | 20.00 | 200 | 100 | 8 | 2 | 1 | 5986556 |
| 13/16 | 20.64 | 200 | 100 | 8 | 2 | 1 | 5986494 |
| | 21.00 | 200 | 100 | 8 | 2 | 1 | 5986560 |
| | 22.00 | 207 | 107 | 8 | 2 | 1 | 5986564 |
| 7/8 | 22.22 | 207 | 107 | 8 | 2 | 1 | 5986719 |
| | 23.00 | 207 | 107 | 8 | 2 | 1 | 5986568 |
| | 24.00 | 242 | 115 | 8 | 3 | 1 | 5986574 |
| | 25.00 | 242 | 115 | 10 | 3 | 1 | 5986576 |
| 1" | 25.40 | 242 | 115 | 10 | 3 | 1 | 5986328 |
| | 26.00 | 242 | 115 | 10 | 3 | 1 | 5986579 |
| | 27.00 | 251 | 124 | 10 | 3 | 1 | 5986582 |
| | 28.00 | 251 | 124 | 10 | 3 | 1 | 5986585 |
| 1.1/8 | 28.58 | 251 | 124 | 10 | 3 | 1 | 5986339 |
| | 29.00 | 251 | 124 | 10 | 3 | 1 | 5986592 |
| | 30.00 | 251 | 124 | 10 | 3 | 1 | 5986610 |
| | 31.00 | 260 | 133 | 10 | 3 | 1 | 5986613 |
| 1.1/4 | 31.75 | 260 | 133 | 10 | 3 | 1 | 5986336 |
| | 32.00 | 293 | 133 | 10 | 4 | 1 | 5986615 |
| | 34.00 | 302 | 142 | 10 | 4 | 1 | 5986624 |
| 1.3/8 | 34.93 | 302 | 142 | 10 | 4 | 1 | 5986470 |
| | 35.00 | 302 | 142 | 10 | 4 | 1 | 5986649 |
| | 36.00 | 302 | 142 | 10 | 4 | 1 | 5986681 |
| | 37.00 | 302 | 142 | 10 | 4 | 1 | 5986723 |
| | 38.00 | 312 | 152 | 10 | 4 | 1 | 5986768 |
| 1.1/2 | 38.10 | 312 | 152 | 10 | 4 | 1 | 5986333 |
| | 39.00 | 312 | 152 | 10 | 4 | 1 | 5986807 |
| | 40.00 | 312 | 152 | 10 | 4 | 1 | 5986823 |
| | 41.00 | 312 | 152 | 10 | 4 | 1 | 5986827 |
| | 42.00 | 312 | 152 | 10 | 4 | 1 | 5986653 |
| | 43.00 | 323 | 163 | 10 | 4 | 1 | 5986656 |
| | 44.00 | 323 | 163 | 10 | 4 | 1 | 5986659 |
| 1.3/4 | 44.45 | 323 | 163 | 10 | 4 | 1 | 5986348 |
| | 45.00 | 323 | 163 | 12 | 4 | 1 | 5986661 |
| | 46.00 | 323 | 163 | 12 | 4 | 1 | 5986664 |
| | 47.00 | 323 | 163 | 12 | 4 | 1 | 5986667 |
| | 48.00 | 334 | 174 | 12 | 4 | 1 | 5986670 |
| | 50.00 | 334 | 174 | 12 | 4 | 1 | 5986692 |
| 2" | 50.80 | 334 | 174 | 12 | 4 | 1 | 5986552 |

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



DIN
311



10.00 - 30.00

| d_1 Ø | l_1 | l_2 | l_3 | # of Flutes | MTS | Pack Qty | B121 |
|------------|-------|-------|-------|----------------|-----|-------------|---------|
| 10.0 | 171 | 95 | 30 | 4 | 1 | 1 | 5986764 |
| 11.0 | 176 | 100 | 33 | 4 | 1 | 1 | 5986772 |
| 12.0 | 199 | 105 | 39 | 4 | 2 | 1 | 5986775 |
| 13.0 | 199 | 105 | 39 | 4 | 2 | 1 | 5986778 |
| 14.0 | 209 | 115 | 42 | 4 | 2 | 1 | 5986781 |
| 15.0 | 219 | 125 | 45 | 4 | 2 | 1 | 5986784 |
| 16.0 | 229 | 135 | 48 | 4 | 2 | 1 | 5986787 |
| 17.0 | 251 | 135 | 51 | 4 | 3 | 1 | 5986791 |
| 18.0 | 261 | 145 | 58 | 4 | 3 | 1 | 5986794 |
| 19.0 | 261 | 145 | 58 | 4 | 3 | 1 | 5986797 |
| 20.0 | 271 | 155 | 62 | 4 | 3 | 1 | 5986803 |
| 21.0 | 271 | 155 | 62 | 4 | 3 | 1 | 5986810 |
| 22.0 | 281 | 165 | 66 | 4 | 3 | 1 | 5986442 |
| 23.0 | 281 | 165 | 66 | 4 | 3 | 1 | 5986478 |
| 24.0 | 296 | 180 | 72 | 4 | 3 | 1 | 5986521 |
| 25.0 | 296 | 180 | 72 | 4 | 3 | 1 | 5986557 |
| 26.0 | 296 | 180 | 72 | 4 | 3 | 1 | 5986591 |
| 30.0 | 311 | 195 | 78 | 5 | 3 | 1 | 5986597 |

HSS REAMER



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

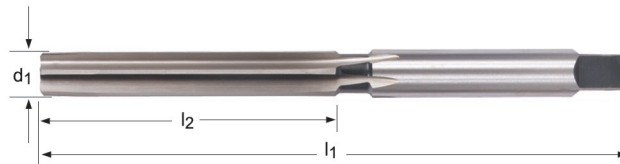


7/16 - 1.1/16

| 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 | 6009884 |
| 1/2 | 9/32 | 1/2 | 2 | 5.1/8 | 9" | 4 | 1 | 6009857 |
| 9/16 | 11/32 | 9/16 | 2 | 5.1/8 | 9" | 4 | 1 | 6009891 |
| 5/8 | 3/8 | 5/8 | 2 | 6.1/8 | 10" | 4 | 1 | 6009880 |
| 11/16 | 25/64 | 11/16 | 3 | 7.1/8 | 11.3/4 | 4 | 1 | 6009865 |
| 3/4 | 7/16 | 3/4 | 3 | 7.3/8 | 12" | 4 | 1 | 6009876 |
| 13/16 | 1/2 | 13/16 | 3 | 7.3/8 | 12" | 4 | 1 | 6009869 |
| 7/8 | 9/16 | 7/8 | 3 | 7.3/8 | 12" | 4 | 1 | 6009888 |
| 15/16 | 5/8 | 15/16 | 3 | 7.3/8 | 12" | 4 | 1 | 6009872 |
| 1" | 11/16 | 1" | 3 | 7.3/8 | 12" | 4 | 1 | 6009838 |
| 1.1/16 | 3/4 | 1.1/16 | 3 | 7.3/8 | 12" | 4 | 1 | 6009840 |


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"

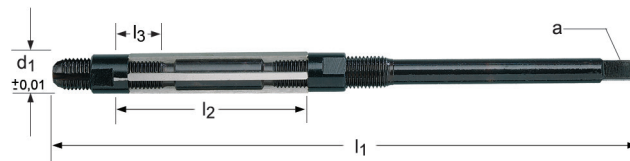
| d_1 Ø Inch | d_1 decimal Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | 4500 |
|--------------------|--------------------------|---------------|---------------|----------------|-------------|-------------|
| 1/8 | 0.1250 | 1.1/2 | 3" | 4 | 1 | 6009989 |
| 3/16 | 0.1875 | 1.3/4 | 3.1/2 | 6 | 1 | 6009878 |
| 1/4 | 0.2500 | 2" | 4" | 6 | 1 | 6009988 |
| 5/16 | 0.3125 | 2.1/4 | 4.1/2 | 6 | 1 | 6009894 |
| 3/8 | 0.3750 | 2.1/2 | 5" | 6 | 1 | 6009886 |
| 7/16 | 0.4375 | 2.3/4 | 5.1/2 | 6 | 1 | 6009905 |
| 1/2 | 0.5000 | 3" | 6" | 6 | 1 | 6009987 |
| 9/16 | 0.5625 | 3.1/4 | 6.1/2 | 8 | 1 | 6009916 |
| 5/8 | 0.6250 | 3.1/2 | 7" | 8 | 1 | 6009900 |
| 3/4 | 0.7500 | 4.3/16 | 8.3/8 | 8 | 1 | 6009882 |
| 7/8 | 0.8750 | 4.7/8 | 9.3/4 | 8 | 1 | 6009912 |
| 1" | 1.0000 | 5.7/16 | 10.7/8 | 8 | 1 | 6009848 |

HSS REAMER



Adjustable Hand Reamer, Replaceable Blade Type

B334 For light duty sizing of uninterrupted holes.



B334

HSS

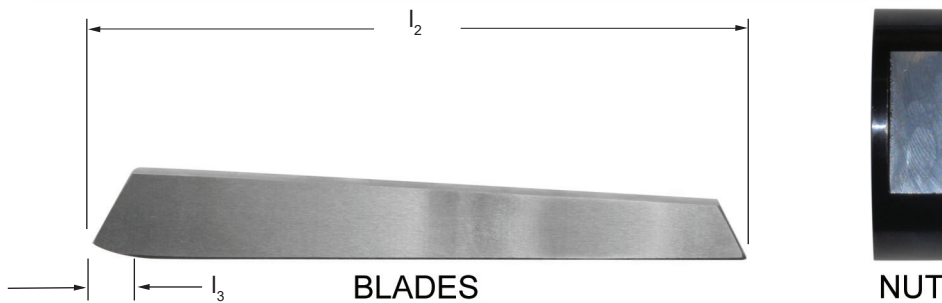


N000 - N16

| 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 | 5987076 |
| 00 | 7.2 - 8.0 | 110 | 32 | 7 | 4 | 3.4 | 1 | 5987047 |
| 0 | 8.0 - 9.0 | 115 | 34 | 9 | 5 | 3.8 | 1 | 5987015 |
| 1 | 9.0 - 10.0 | 115 | 34 | 9 | 5 | 4.3 | 1 | 5987081 |
| 2 | 10.0 - 11.0 | 115 | 34 | 9 | 5 | 4.9 | 1 | 5986955 |
| 3 | 11.0 - 12.0 | 125 | 35 | 9 | 5 | 4.9 | 1 | 5986958 |
| 4 | 12.0 - 13.5 | 135 | 41 | 9 | 5 | 6.2 | 1 | 5986963 |
| 5 | 13.5 - 15.5 | 146 | 50 | 12 | 5 | 7.0 | 1 | 5986968 |
| 6 | 15.5 - 18.0 | 166 | 60 | 12 | 5 | 8.0 | 1 | 5986972 |
| 7 | 18.0 - 21.0 | 178 | 65 | 15 | 5 | 9.0 | 1 | 5986975 |
| 8 | 21.0 - 24.0 | 195 | 76 | 15 | 5 | 11.0 | 1 | 5986983 |
| 9 | 24.0 - 27.5 | 218 | 82 | 18 | 5 | 12.0 | 1 | 5986987 |
| 10 | 27.5 - 31.5 | 245 | 86 | 18 | 5 | 14.5 | 1 | 5987084 |
| 11 | 31.5 - 37.0 | 280 | 98 | 18 | 6 | 18.0 | 1 | 5987087 |
| 12 | 37.0 - 45.0 | 325 | 108 | 20 | 6 | 20.0 | 1 | 5987091 |
| 13 | 45.0 - 55.0 | 370 | 118 | 20 | 6 | 26.0 | 1 | 5986943 |
| 14 | 55.0 - 67.0 | 400 | 125 | 20 | 6 | 32.0 | 1 | 5986946 |
| 15 | 67.0 - 80.0 | 435 | 140 | 23 | 8 | 39.0 | 1 | 5986949 |
| 16 | 80.0 - 95.0 | 475 | 155 | 23 | 8 | 49.0 | 1 | 5986952 |

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 | 5987006 | 4 | 5987003 |
| 00 | 32 | 7 | 1 | 5987000 | 4 | 5986997 |
| 0 | 34 | 9 | 1 | 5986993 | 5 | 5986990 |
| 1 | 34 | 9 | 1 | 5987012 | 5 | 5987009 |
| 2 | 34 | 9 | 1 | 5987062 | 5 | 5987060 |
| 3 | 35 | 9 | 1 | 5987067 | 5 | 5987064 |
| 4 | 41 | 9 | 1 | 5987073 | 5 | 5987070 |
| 5 | 50 | 12 | 1 | 5986401 | 5 | 5987078 |
| 6 | 60 | 12 | 1 | 5986473 | 5 | 5986434 |
| 7 | 65 | 15 | 1 | 5986551 | 5 | 5986517 |
| 8 | 76 | 15 | 1 | 5986563 | 5 | 5986559 |
| 9 | 82 | 18 | 1 | 5986571 | 5 | 5986567 |
| 10 | 86 | 18 | 1 | 5987020 | 5 | 5987017 |
| 11 | 98 | 18 | 1 | 5987027 | 6 | 5987023 |
| 12 | 108 | 20 | 1 | 5987032 | 6 | 5987029 |
| 13 | 118 | 20 | 1 | 5987038 | 6 | 5987035 |
| 14 | 125 | 20 | 1 | 5987044 | 6 | 5987041 |
| 15 | 140 | 23 | 1 | 5987053 | 8 | 5987050 |
| 16 | 155 | 23 | 1 | 5987058 | 8 | 5987056 |

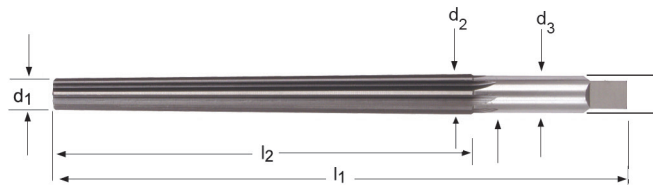
HSS REAMER



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 | 6009896 |
| 1 | 0.1447 | 0.1798 | 3/16 | 1.11/16 | 2.15/16 | 6 | 1 | 6009899 |
| 2 | 0.1600 | 0.2010 | 13/64 | 1.15/16 | 3.3/16 | 6 | 1 | 6009907 |
| 3 | 0.1813 | 0.2294 | 15/64 | 2.5/16 | 3.11/16 | 6 | 1 | 6009908 |
| 4 | 0.2071 | 0.2600 | 17/64 | 2.9/16 | 4.1/16 | 6 | 1 | 6009911 |
| 5 | 0.2410 | 0.2994 | 5/16 | 2.13/16 | 4.5/16 | 6 | 1 | 6009914 |
| 6 | 0.2773 | 0.3540 | 23/64 | 3.11/16 | 5.7/16 | 6 | 1 | 6009917 |
| 7 | 0.3297 | 0.4220 | 13/32 | 4.7/16 | 6.5/16 | 6 | 1 | 6009919 |
| 8 | 0.3971 | 0.5050 | 7/16 | 5.3/16 | 7.3/16 | 6 | 1 | 6009921 |
| 9 | 0.4800 | 0.6066 | 9/16 | 6.1/16 | 8.5/16 | 8 | 1 | 6009924 |
| 10 | 0.5799 | 0.7216 | 5/8 | 6.13/16 | 9.5/16 | 8 | 1 | 6009904 |

Note: Nom Ø is the Taper Pin number
Per American Standard Taper Pin Specification (ASA B5.20-1958)

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 | 6009537 |
| 1 | 0.1447 | 0.1798 | 3/16 | 1.11/16 | 2.15/16 | 6 | 1 | 6009538 |
| 2 | 0.1600 | 0.2010 | 13/64 | 1.15/16 | 3.3/16 | 6 | 1 | 6009540 |
| 3 | 0.1813 | 0.2294 | 15/64 | 2.5/16 | 3.11/16 | 6 | 1 | 6009513 |
| 4 | 0.2071 | 0.2600 | 17/64 | 2.9/16 | 4.1/16 | 6 | 1 | 6009514 |
| 5 | 0.2410 | 0.2994 | 5/16 | 2.13/16 | 4.5/16 | 6 | 1 | 6009515 |
| 6 | 0.2773 | 0.3540 | 23/64 | 3.11/16 | 5.7/16 | 6 | 1 | 6009516 |
| 7 | 0.3297 | 0.4220 | 13/32 | 4.7/16 | 6.5/16 | 6 | 1 | 6009517 |
| 8 | 0.3971 | 0.5050 | 7/16 | 5.3/16 | 7.3/16 | 6 | 1 | 6009518 |
| 9 | 0.4800 | 0.6066 | 9/16 | 6.1/16 | 8.5/16 | 8 | 1 | 6009519 |
| 10 | 0.5799 | 0.7216 | 5/8 | 6.13/16 | 9.5/16 | 8 | 1 | 6009539 |

Note: Nom Ø is the Taper Pin number
 Per American Standard Taper Pin Specification (ASA B5.20-1958)

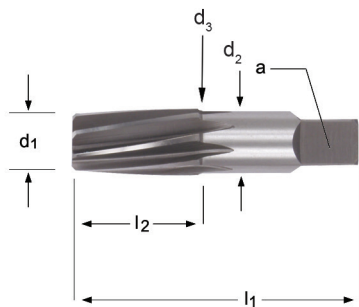
HSS REAMER



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 | 6009526 |
| 1/4 | 0.4060 | 0.4720 | 0.5625 | 1.1/16 | 2.7/16 | 0.4210 | 6 | 1 | 6009525 |
| 3/8 | 0.5400 | 0.6060 | 0.7000 | 1.1/16 | 2.9/16 | 0.5310 | 8 | 1 | 6009529 |
| 1/2 | 0.6650 | 0.7510 | 0.6875 | 1.3/8 | 3.1/8 | 0.5150 | 8 | 1 | 6009524 |
| 3/4 | 0.8760 | 0.9620 | 0.9063 | 1.3/8 | 3.1/4 | 0.6790 | 10 | 1 | 6009528 |
| 1" | 1.1030 | 1.2120 | 1.1250 | 1.3/4 | 3.3/4 | 0.8430 | 10 | 1 | 6009520 |

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.



Produced per DIN206 Form B.
Cutting diameters are produced to H7 tolerance.
Shank diameters (same as cutting diameters) but produced to e9 tolerance.

B100

HSS



DIN 206



1.50 - 50.00

| 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 | 5986266 |
| 1/16 | 1.59 | 41 | 20 | 5 | 3 | 1.12 | 1 | 5986338 |
| | 1.60 | 44 | 21 | 5 | 3 | 1.25 | 1 | 5986300 |
| 5/64 | 1.98 | 47 | 23 | 6 | 4 | 1.40 | 1 | 5986265 |
| | 2.00 | 50 | 25 | 6 | 4 | 1.60 | 1 | 5986320 |
| 3/32 | 2.38 | 54 | 27 | 7 | 4 | 1.80 | 1 | 5986312 |
| | 2.50 | 58 | 29 | 7 | 4 | 2.10 | 1 | 5986323 |
| 7/64 | 2.78 | 62 | 31 | 8 | 6 | 2.10 | 1 | 5986296 |
| | 3.00 | 62 | 31 | 8 | 6 | 2.40 | 1 | 5986378 |
| 1/8 | 3.18 | 66 | 33 | 8 | 6 | 2.40 | 1 | 5986385 |
| | 3.20 | 66 | 33 | 8 | 6 | 2.40 | 1 | 5986218 |
| | 3.50 | 71 | 35 | 9 | 6 | 2.70 | 1 | 5986245 |
| 9/64 | 3.57 | 71 | 35 | 9 | 6 | 2.70 | 1 | 5986325 |
| 5/32 | 3.97 | 76 | 38 | 10 | 6 | 3.00 | 1 | 5986263 |
| | 4.00 | 76 | 38 | 10 | 6 | 3.00 | 1 | 5986236 |
| 11/64 | 4.37 | 81 | 41 | 10 | 6 | 3.40 | 1 | 5986247 |
| | 4.50 | 81 | 41 | 10 | 6 | 3.40 | 1 | 5986239 |
| 3/16 | 4.76 | 87 | 44 | 11 | 6 | 3.80 | 1 | 5986277 |
| | 5.00 | 87 | 44 | 11 | 6 | 3.80 | 1 | 5986254 |
| 13/64 | 5.16 | 87 | 44 | 11 | 6 | 3.80 | 1 | 5986272 |
| | 5.50 | 93 | 47 | 12 | 6 | 4.30 | 1 | 5986257 |
| 7/32 | 5.56 | 93 | 47 | 12 | 6 | 4.30 | 1 | 5986293 |
| 15/64 | 5.95 | 93 | 47 | 12 | 6 | 4.90 | 1 | 5986287 |
| | 6.00 | 93 | 47 | 12 | 6 | 4.90 | 1 | 5986274 |
| 1/4 | 6.35 | 100 | 50 | 13 | 6 | 4.90 | 1 | 5986381 |
| | 6.50 | 100 | 50 | 13 | 6 | 4.90 | 1 | 5986280 |
| 17/64 | 6.75 | 107 | 54 | 14 | 6 | 5.50 | 1 | 5986304 |
| | 7.00 | 107 | 54 | 14 | 6 | 5.50 | 1 | 5986284 |
| 9/32 | 7.14 | 107 | 54 | 14 | 6 | 6.20 | 1 | 5986321 |
| | 7.50 | 107 | 54 | 14 | 6 | 6.20 | 1 | 5986286 |
| 19/64 | 7.54 | 115 | 58 | 15 | 6 | 6.20 | 1 | 5986317 |
| 5/16 | 7.94 | 115 | 58 | 15 | 6 | 6.20 | 1 | 5986260 |
| | 8.00 | 115 | 58 | 15 | 6 | 6.20 | 1 | 5986303 |

HSS REAMER

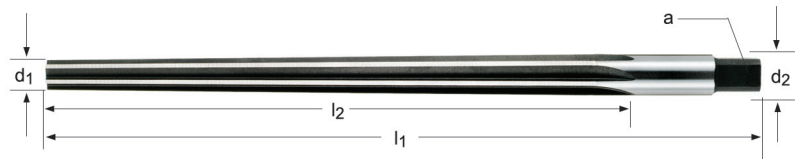


| d ₁ Ø Inch | d ₁ Ø mm | l ₁ mm | l ₂ mm | l ₃ mm | # of Flutes | □ a mm | Pack Qty | B100 |
|-----------------------------|---------------------------|----------------------|----------------------|----------------------|----------------|--------------|-------------|---------|
| 21/64 | 8.33 | 115 | 58 | 15 | 6 | 7.00 | 1 | 5986334 |
| | 8.50 | 115 | 58 | 15 | 6 | 7.00 | 1 | 5986307 |
| 11/32 | 8.73 | 124 | 62 | 16 | 6 | 7.00 | 1 | 5986243 |
| | 9.00 | 124 | 62 | 16 | 6 | 7.00 | 1 | 5986310 |
| 23/64 | 9.13 | 124 | 62 | 16 | 6 | 8.00 | 1 | 5986347 |
| | 9.50 | 124 | 62 | 16 | 6 | 8.00 | 1 | 5986315 |
| 3/8 | 9.52 | 124 | 62 | 17 | 6 | 8.00 | 1 | 5986351 |
| 25/64 | 9.92 | 133 | 66 | 17 | 6 | 8.00 | 1 | 5986356 |
| | 10.00 | 133 | 66 | 17 | 6 | 8.00 | 1 | 5986388 |
| 13/32 | 10.32 | 133 | 66 | 17 | 6 | 8.00 | 1 | 5986268 |
| | 10.50 | 133 | 66 | 17 | 6 | 8.00 | 1 | 5986391 |
| | 11.00 | 142 | 71 | 18 | 6 | 9.00 | 1 | 5986234 |
| 7/16 | 11.11 | 142 | 71 | 18 | 6 | 9.00 | 1 | 5986289 |
| | 11.50 | 142 | 71 | 18 | 6 | 9.00 | 1 | 5986237 |
| | 12.00 | 152 | 76 | 19 | 6 | 9.00 | 1 | 5986250 |
| 1/2 | 12.50 | 152 | 76 | 19 | 6 | 10.00 | 1 | 5986252 |
| | 12.70 | 152 | 76 | 19 | 6 | 10.00 | 1 | 5986375 |
| | 13.00 | 152 | 76 | 19 | 6 | 10.00 | 1 | 5986255 |
| 17/32 | 13.49 | 163 | 81 | 20 | 8 | 11.00 | 1 | 5986297 |
| | 13.50 | 163 | 81 | 20 | 8 | 11.00 | 1 | 5986259 |
| | 14.00 | 163 | 81 | 20 | 8 | 11.00 | 1 | 5986275 |
| 9/16 | 14.29 | 163 | 81 | 20 | 8 | 11.00 | 1 | 5986318 |
| | 14.50 | 163 | 81 | 20 | 8 | 11.00 | 1 | 5986278 |
| | 15.00 | 163 | 81 | 20 | 8 | 12.00 | 1 | 5986281 |
| 19/32 | 15.08 | 163 | 81 | 22 | 8 | 12.00 | 1 | 5986314 |
| 5/8 | 15.88 | 175 | 87 | 22 | 8 | 12.00 | 1 | 5986269 |
| | 16.00 | 175 | 87 | 22 | 8 | 12.00 | 1 | 5986291 |
| | 17.00 | 175 | 87 | 22 | 8 | 13.00 | 1 | 5986294 |
| 11/16 | 17.46 | 188 | 93 | 23 | 8 | 14.50 | 1 | 5986240 |
| | 18.00 | 188 | 93 | 23 | 8 | 14.50 | 1 | 5986308 |
| | 19.00 | 188 | 93 | 23 | 8 | 14.50 | 1 | 5986311 |
| 3/4 | 19.05 | 188 | 93 | 25 | 8 | 14.50 | 1 | 5986345 |
| | 20.00 | 201 | 100 | 25 | 8 | 16.00 | 1 | 5986327 |
| 13/16 | 20.64 | 201 | 100 | 25 | 8 | 16.00 | 1 | 5986262 |
| | 21.00 | 201 | 100 | 25 | 8 | 16.00 | 1 | 5986330 |
| | 22.00 | 215 | 107 | 27 | 8 | 18.00 | 1 | 5986341 |
| 7/8 | 22.22 | 215 | 107 | 27 | 8 | 18.00 | 1 | 5986299 |
| | 23.00 | 215 | 107 | 27 | 8 | 18.00 | 1 | 5986344 |
| | 24.00 | 231 | 115 | 29 | 8 | 18.00 | 1 | 5986349 |
| | 25.00 | 231 | 115 | 29 | 8 | 20.00 | 1 | 5986353 |
| 1" | 25.40 | 231 | 115 | 29 | 8 | 20.00 | 1 | 5986230 |
| | 26.00 | 231 | 115 | 29 | 8 | 20.00 | 1 | 5986360 |
| | 27.00 | 247 | 124 | 31 | 10 | 22.00 | 1 | 5986364 |
| | 28.00 | 247 | 124 | 31 | 10 | 22.00 | 1 | 5986367 |
| | 29.00 | 247 | 124 | 31 | 10 | 22.00 | 1 | 5986373 |
| | 30.00 | 247 | 124 | 31 | 10 | 24.00 | 1 | 5986355 |
| | 31.00 | 265 | 133 | 33 | 10 | 24.00 | 1 | 5986358 |
| | 32.00 | 265 | 133 | 33 | 10 | 24.00 | 1 | 5986362 |
| | 33.00 | 265 | 133 | 33 | 10 | 26.00 | 1 | 5986220 |
| | 34.00 | 284 | 142 | 36 | 10 | 26.00 | 1 | 5986222 |
| | 35.00 | 284 | 142 | 36 | 10 | 29.00 | 1 | 5986224 |
| | 36.00 | 284 | 142 | 36 | 10 | 29.00 | 1 | 5986226 |
| | 37.00 | 284 | 142 | 36 | 10 | 29.00 | 1 | 5986228 |
| | 38.00 | 305 | 152 | 38 | 10 | 29.00 | 1 | 5986231 |
| | 39.00 | 305 | 152 | 38 | 10 | 32.00 | 1 | 5986233 |
| 40.00 | 305 | 152 | 38 | 10 | 32.00 | 1 | 5986242 | |
| 45.00 | 326 | 163 | 41 | 12 | 35.00 | 1 | 5986251 | |
| 50.00 | 347 | 174 | 44 | 12 | 39.00 | 1 | 5986271 | |

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.



B301

HSS

ST

BS 328

1:48

1/16 - 1/2

| 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 | 5986376 ¹⁾ |
| 5/64 | 1.50 | 51 | 25 | 4 | 1.6 | 2.03 | 1 | 5986412 ¹⁾ |
| 3/32 | 1.75 | 57 | 32 | 4 | 2.0 | 2.41 | 1 | 5986397 ¹⁾ |
| 7/64 | 2.03 | 64 | 38 | 4 | 2.2 | 2.82 | 1 | 5986424 ¹⁾ |
| 1/8 | 2.30 | 70 | 44 | 4 | 2.5 | 3.23 | 1 | 5986384 ¹⁾ |
| 9/64 | 2.64 | 73 | 48 | 4 | 2.8 | 3.63 | 1 | 5986979 ¹⁾ |
| 5/32 | 2.95 | 76 | 51 | 4 | 3.1 | 4.01 | 1 | 5986409 ¹⁾ |
| 11/64 | 3.23 | 89 | 57 | 4 | 3.6 | 4.42 | 1 | 5986390 ¹⁾ |
| 3/16 | 3.50 | 102 | 70 | 4 | 4.0 | 4.95 | 1 | 5986395 ¹⁾ |
| 7/32 | 4.13 | 102 | 70 | 6 | 4.5 | 5.59 | 1 | 5986421 ¹⁾ |
| 1/4 | 4.64 | 117 | 86 | 6 | 5.0 | 6.43 | 1 | 5986382 ²⁾ |
| 9/32 | 5.23 | 143 | 105 | 6 | 5.6 | 7.42 | 1 | 5986936 ²⁾ |
| 5/16 | 5.84 | 143 | 105 | 6 | 6.3 | 8.03 | 1 | 5986406 ²⁾ |
| 11/32 | 6.43 | 152 | 114 | 6 | 7.1 | 8.81 | 1 | 5986387 ²⁾ |
| 3/8 | 7.03 | 165 | 127 | 6 | 8.0 | 9.68 | 1 | 5986404 ²⁾ |
| 13/32 | 7.42 | 191 | 146 | 6 | 8.0 | 10.46 | 1 | 5986393 ²⁾ |
| 7/16 | 8.21 | 191 | 146 | 6 | 9.0 | 11.25 | 1 | 5986418 ²⁾ |
| 1/2 | 9.41 | 210 | 165 | 6 | 10.0 | 12.85 | 1 | 5986379 ²⁾ |

¹⁾ Limit of tolerance +0.0030

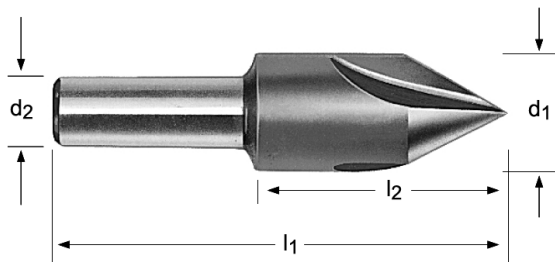
²⁾ Limit of tolerance +0.0050

HSS REAMER



Straight Shank, 3-Flute

4608 Center Reamer, Available in 60°, 82°, 90°, or 100° angles. Widely used to finish ream lathe centers in shafts, and countersink angles for screw heads and rivets. The odd number of flutes promotes smooth reamed finishes while eliminating chatter and providing better accuracy in most applications.



4608

HSS



ANSI



1/4 - 1"

| d_1 Ø Inch | Angle | d_2 Ø Inch | l_2 Inch | l_1 Inch | # of Flutes | Pack Qty | 4608 |
|--------------------|-------|--------------------|---------------|---------------|----------------|-------------|---------|
| 1/4 | 60° | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 6004826 |
| 1/4 | 82° | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 6004872 |
| 1/4 | 90° | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 6004913 |
| 1/4 | 100° | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 6005726 |
| 3/8 | 60° | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 6004996 |
| 3/8 | 82° | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 6004830 |
| 3/8 | 90° | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 6004834 |
| 3/8 | 100° | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 6004994 |
| 1/2 | 60° | 3/8 | 1" | 2" | 3 | 1 | 6005717 |
| 1/2 | 82° | 3/8 | 1" | 2" | 3 | 1 | 6005720 |
| 1/2 | 90° | 3/8 | 1" | 2" | 3 | 1 | 6005722 |
| 1/2 | 100° | 3/8 | 1" | 2" | 3 | 1 | 6005714 |
| 5/8 | 60° | 3/8 | 1" | 2.1/4 | 3 | 1 | 6004842 |
| 5/8 | 82° | 3/8 | 1" | 2.1/4 | 3 | 1 | 6004846 |
| 5/8 | 90° | 3/8 | 1" | 2.1/4 | 3 | 1 | 6004850 |
| 5/8 | 100° | 3/8 | 1" | 2.1/4 | 3 | 1 | 6004838 |
| 3/4 | 60° | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 6004986 |
| 3/4 | 82° | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 6004990 |
| 3/4 | 90° | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 6004992 |
| 3/4 | 100° | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 6004959 |
| 1" | 60° | 1/2 | 1" | 3" | 3 | 1 | 6262132 |
| 1" | 82° | 1/2 | 1" | 3" | 3 | 1 | 6262133 |
| 1" | 90° | 1/2 | 1" | 3" | 3 | 1 | 6262134 |
| 1" | 100° | 1/2 | 1" | 3" | 3 | 1 | 6262135 |

Visual Index - Countersinks & Counterbores



Visual Index - Countersinks & Counterbores

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, find your Alpha Code on the AMG Chart
(example: 279 U : U is the Alpha Code)
- 5) Find the closest diameter for your cutting application on the Feed Rate chart below to find your IPR

| 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 | 6Al4V, 6Al4V-2Sn, Monel, Monel K | <28 | S 2 |
| | 4.3 Titanium, alloyed | 6Al4V-4Mo, 7Al14V-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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 | S 3 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB | N 3 |
| | 6.2 β-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 | Ultradid, 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-E | HSS | HSS | HSS | HSS-E | HSS |
|--------------------|--------------|-------------|----------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Finish/Coating: | | | | | TiN | | | | TiAlN | | AlTiCN | TiAlN |
| Standard: | DIN 335C | 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° | 82° | 90° | 90° | 90° | 90° | 90° | 100° |
| | | ↓ | ↓ | | | | | | | | | |
| | | 90° | 82° | | | | | | | | | |
| | | | | | | | | | | | | |
| Style: | G400 | 4603 | 4602 | G135 | G335 | G154 | G149 | G136 | G560 | G142 | G570 | G171 |
| Range: | 6.30 - 31.00 | 1/4 - 1.1/2 | 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 # | 486 | 487 | 488 | 489 | 489 | 490 | 491 | 492 | 492 | 493 | 494 | 495 |
| 1.1 | 98F | 98F | 98F | 98F | 164E | 98F | 98D | 98F | 164E | 98F | 148E | 164E |
| 1.2 | 82E | 82E | 82E | 82E | 131E | 82E | 82D | 82E | 131E | 82E | 118E | 131E |
| 1.3 | 66D | 66D | 66D | 66D | 98D | 66D | 66C | 66D | 98D | 66D | 89D | 98D |
| 1.4 | 49D | 49D | 49D | 49D | 66D | 49D | 49B | 49D | 66D | 49D | 72D | 66D |
| 1.5 | 33B | 33B | 33B | 33B | 49B | 33B | 33A | 33B | 49B | 33B | 56B | 49B |
| 1.6 | 20A | 20A | 20A | 20A | 33B | 20A | 20A | 20A | 33B | | 39B | 33B |
| 1.7 | | | | | | | | | | | | |
| 1.8 | | | | | | | | | | | | |
| 2.1 | 26C | 26C | 26C | 26C | | 26C | 26B | 26C | | 26C | 56C | |
| 2.2 | 20B | 20B | 20B | 20B | | 20B | 20A | 20B | | 20B | 39B | |
| 2.3 | 13A | 13A | 13A | 13A | | 13A | | 13A | | 13A | 49A | |
| 2.4 | | | | | | | | | | | 33A | |
| 3.1 | 82F | 82F | 82F | 82F | 148F | 82F | 82D | 82F | 148F | | 131C | 148F |
| 3.2 | 49D | 49D | 49D | 49D | 115D | 49D | 49C | 49D | 115D | | 105C | 115D |
| 3.3 | 39C | 39C | 39C | 39C | 98C | 39C | 39A | 39C | 98C | | 89C | 98C |
| 3.4 | 26C | 26C | 26C | 26C | 98C | 26C | 26A | 26C | 98C | | 79C | 98C |
| 4.1 | 39C | 39C | 39C | 39C | 66C | 39C | 39B | 39C | 66C | 39C | | 66C |
| 4.2 | 33A | 33A | 33A | 33A | 49A | 33A | 33A | 33A | 49A | 33A | | 49A |
| 4.3 | 26A | 26A | 26A | 26A | 33A | 26A | 26A | 26A | 33A | | | 33A |
| 5.1 | 39C | 39C | 39C | 39C | 66C | 39C | 39B | 39C | 66C | 39C | | 66C |
| 5.2 | 20B | 20B | 20B | 20B | 33B | 20B | 20A | 20B | 33B | 20B | 20A | 33B |
| 5.3 | 13A | 13A | 13A | 13A | 20A | 13A | 13A | 13A | 20A | | 13A | 20A |
| 6.1 | 82D | 82D | 82D | 82D | 131D | 82D | 82B | 82D | 131D | 82D | 131D | 131D |
| 6.2 | 66F | 66F | 66F | 66F | 98F | 66F | 66C | 66F | 98F | 66F | 98F | 98F |
| 6.3 | 82F | 82F | 82F | 82F | 131F | 82F | 82C | 82F | 131F | 82F | 131F | 131F |
| 6.4 | 33D | 33D | 33D | 33D | 49D | 33D | 33B | 33D | 49D | | 49D | 49D |
| 7.1 | 98G | 98G | 98G | 98G | 164G | 98G | 98D | 98G | 164G | 98G | 148G | 164G |
| 7.2 | 82F | 82F | 82F | 82F | 131F | 82F | 82C | 82F | 131F | 82F | 118F | 131F |
| 7.3 | 66F | 66F | 66F | 66F | 98F | 66F | 66C | 66F | 98F | 66F | 89F | 98F |
| 7.4 | 33F | 33F | 33F | 33F | 49F | 33F | 33C | 33F | 49F | 33F | 43F | 49F |
| 8.1 | 98G | 98G | 98G | 98G | 164G | 98G | 98D | 98G | 164G | 98G | | 164G |
| 8.2 | 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 |
|------|--------------|--------------|---------------|---------------|---------------|----------|----------|----------|----------|-------------|-----------|
| | | | | | | | | | | | |
| | 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 | G702 | G706 | G705 | G703 | G704 |
| | 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" |
| | 496 | 497 | 498 | 499 | 499 | 500 | 501 | 502 | 502 | 504 | 505 |
| 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 | | | | | | | | | | | |

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| G171..... | 495 |
| G236..... | 500 |
| G335..... | 489 |
| G338..... | 499 |
| G400..... | 486 |
| G560..... | 492 |
| G570..... | 494 |
| G600..... | 496 |
| G702..... | 501 |
| G703..... | 504 |
| G704..... | 505 |
| G705..... | 502 |
| G706..... | 502 |

MULTI-APPLICATION CARBIDE COUNTERSINK

Solid Carbide, Straight Shank, 3-Flute

G400 90° 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

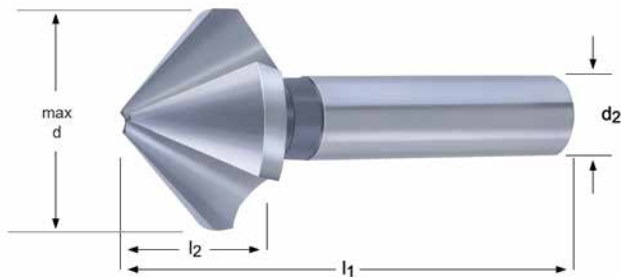
HM



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 | 5979252 |
| 8.3 (5/16) | 2.0 | 6.0 | 50 | 6 | 3 | 1 | 5979084 |
| 10.4 (3/8) | 2.5 | 7.1 | 50 | 6 | 3 | 1 | 5979159 |
| 12.4 (1/2) | 2.8 | 8.0 | 56 | 8 | 3 | 1 | 5979199 |
| 16.5 (5/8) | 3.2 | 10.0 | 60 | 10 | 3 | 1 | 5979234 |
| 20.5 (3/4) | 3.5 | 12.5 | 63 | 10 | 3 | 1 | 5979242 |
| 25.0 (1") | 3.8 | 15.0 | 67 | 10 | 3 | 1 | 5979245 |
| 31.0 (1.1/4) | 4.2 | 18.0 | 71 | 12 | 3 | 1 | 5979248 |

Countersink, Straight Shank, Single-Flute

4603 Available in 60°, 82°, or 90° 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 | 6005665 |
| 1/4 | 90° | 3/16 | 11/16 | 1.7/16 | 1 | 1 | 6005669 |
| 3/8 | 60° | 1/4 | 7/8 | 1.3/4 | 1 | 1 | 6005698 |
| 3/8 | 82° | 1/4 | 25/32 | 1.21/32 | 1 | 1 | 6005702 |
| 3/8 | 90° | 1/4 | 3/4 | 1.5/8 | 1 | 1 | 6005705 |
| 1/2 | 60° | 1/4 | 1" | 2" | 1 | 1 | 6005655 |
| 1/2 | 82° | 1/4 | 27/32 | 1.27/32 | 1 | 1 | 6005659 |
| 1/2 | 90° | 1/4 | 13/32 | 1.13/16 | 1 | 1 | 6005662 |
| 5/8 | 82° | 3/8 | 1.3/32 | 2.3/32 | 1 | 1 | 6005708 |
| 5/8 | 90° | 3/8 | 1" | 2" | 1 | 1 | 6005711 |
| 3/4 | 60° | 3/8 | 1.13/32 | 2.21/32 | 1 | 1 | 6005682 |
| 3/4 | 82° | 3/8 | 1.5/32 | 2.13/32 | 1 | 1 | 6005685 |
| 3/4 | 90° | 3/8 | 1.1/16 | 2.5/16 | 1 | 1 | 6005694 |
| 1" | 60° | 1/2 | 1.9/16 | 3.1/8 | 1 | 1 | 6005673 |
| 1" | 82° | 1/2 | 1.1/4 | 2.13/16 | 1 | 1 | 6005677 |
| 1" | 90° | 1/2 | 1.1/4 | 2.13/16 | 1 | 1 | 6005679 |
| 1.1/4 | 60° | 1/2 | 1.3/4 | 3.3/4 | 1 | 1 | 6005639 |
| 1.1/4 | 82° | 1/2 | 1.1/2 | 3.1/2 | 1 | 1 | 6005644 |
| 1.1/4 | 90° | 1/2 | 1.9/16 | 3.9/16 | 1 | 1 | 6005648 |
| 1.1/2 | 60° | 1/2 | 2.5/16 | 4.1/4 | 1 | 1 | 6005624 |
| 1.1/2 | 82° | 1/2 | 1.15/16 | 3.7/8 | 1 | 1 | 6005629 |
| 1.1/2 | 90° | 1/2 | 1.13/16 | 3.3/4 | 1 | 1 | 6005634 |

HSS COUNTERSINK



Countersink, Straight Shank, 4-Flute

4602

Countersink with angles of 60° for centers or 82° 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 | 6005567 |
| 1/2 | 82° | 1/2 | 1.5/8 | 3.7/8 | 4 | 1 | 6005571 |
| 5/8 | 60° | 1/2 | 1.3/4 | 4" | 4 | 1 | 6005600 |
| 5/8 | 82° | 1/2 | 1.3/4 | 4" | 4 | 1 | 6005605 |
| 3/4 | 60° | 1/2 | 1.7/8 | 4.1/8 | 4 | 1 | 6005586 |
| 3/4 | 82° | 1/2 | 1.7/8 | 4.1/8 | 4 | 1 | 6005591 |
| 7/8 | 60° | 1/2 | 2" | 4.1/4 | 4 | 1 | 6005614 |
| 7/8 | 82° | 1/2 | 2" | 4.1/4 | 4 | 1 | 6005619 |
| 1" | 60° | 1/2 | 2.1/8 | 4.3/8 | 4 | 1 | 6005576 |
| 1" | 82° | 1/2 | 2.1/8 | 4.3/8 | 4 | 1 | 6005581 |

Straight Shank, 3-Flute

60° 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.



| G135 | G335 |
|--------------|--------------|
| | |
| | |
| | |
| | |
| | |
| 6.30 - 25.00 | 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 | G135 | G335 |
|------------|----------|-------------------|-------------------|-----------------------------------|-------------|----------|---------|---------|
| 6.3 (1/4) | 1.6 | 6.8 | 45 | 5 | 3 | 1 | 5973354 | 5972779 |
| 8.0 (5/16) | 2.0 | 8.5 | 50 | 6 | 3 | 1 | 5973356 | 5972782 |
| 10.0 (3/8) | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5973342 | 5972759 |
| 12.5 (1/2) | 3.2 | 11.7 | 56 | 8 | 3 | 1 | 5973344 | 5972763 |
| 16.0 (5/8) | 4.0 | 14.5 | 63 | 10 | 3 | 1 | 5973346 | 5972767 |
| 20.0 (3/4) | 5.0 | 17.5 | 67 | 10 | 3 | 1 | 5973350 | 5972771 |
| 25.0 (1") | 6.3 | 20.5 | 71 | 10 | 3 | 1 | 5973352 | 5972775 |

HSS COUNTERSINK



Straight Shank, 3-Flute

G154 82° countersink for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G154

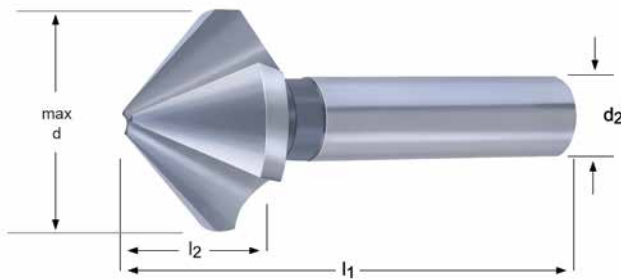
HSS



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 | 5972617 |
| 8.3 (5/16) | 2.0 | 6.5 | 50 | 6 | 3 | 1 | 5972621 |
| 10.4 (3/8) | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5972788 |
| 12.4 (1/2) | 2.8 | 8.5 | 56 | 8 | 3 | 1 | 5972795 |
| 16.5 (5/8) | 3.2 | 10.5 | 60 | 10 | 3 | 1 | 5972798 |
| 20.5 (3/4) | 3.5 | 13.0 | 63 | 10 | 3 | 1 | 5972801 |
| 25.0 (1") | 3.8 | 15.5 | 67 | 10 | 3 | 1 | 5972804 |

Straight Shank, Single Flute

G149 90° Countersink, single flute, for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.



| 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 | 5972702 |
| 10 | 5 | 23.0 | 48 | 8 | 14 | 1 | 1 | 5973182 |
| 15 | 10 | 34.0 | 65 | 10 | 21 | 1 | 1 | 5973188 |
| 20 | 15 | 43.0 | 84 | 12 | 28 | 1 | 1 | 5973198 |
| 25 | 20 | 48.0 | 102 | 15 | 35 | 1 | 1 | 5973203 |
| 30 | 25 | 61.0 | 115 | 15 | 44 | 1 | 1 | 5973211 |
| 35 | 30 | 65.0 | 127 | 15 | 48 | 1 | 1 | 5972612 |
| 40 | 35 | 66.0 | 136 | 15 | 53 | 1 | 1 | 5972656 |
| 50 | 40 | 85.0 | 166 | 20 | 60 | 1 | 1 | 5972744 |

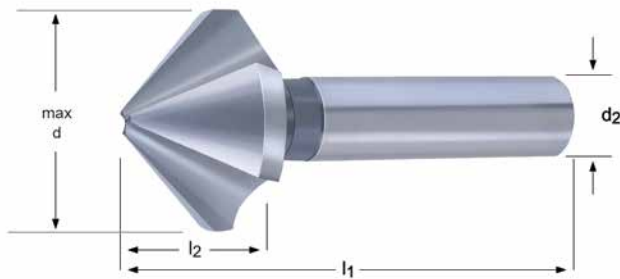
HSS COUNTERSINK



Straight Shank, 3-Flute

G136 90° Countersink with straight shank for multiple materials. Bright finish improves chip flow in soft ferrous or non-ferrous materials.

G560 90° Countersink with straight shank for multiple materials. TiAIN coating increases surface hardness, improves chip flow, and increases tool life.

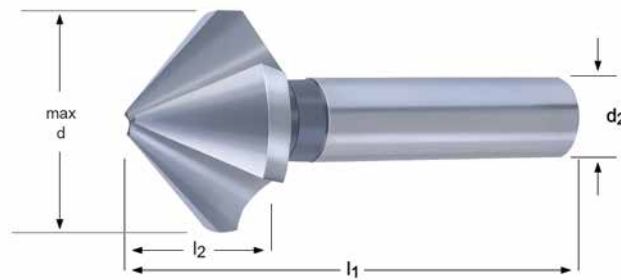


| G136 | G560 |
|--------------|--------------|
| | |
| | |
| | |
| | |
| | |
| 4.30 - 31.00 | 6.30 - 31.00 |

| 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 | 5973389 | — |
| 5.0 | 1.5 | 4.5 | 40 | 4 | 3 | 1 | 5973393 | — |
| 5.3 | 1.5 | 4.5 | 40 | 4 | 3 | 1 | 5973395 | — |
| 5.8 | 1.5 | 5.0 | 45 | 5 | 3 | 1 | 5973398 | — |
| 6.0 | 1.5 | 5.0 | 45 | 5 | 3 | 1 | 5973399 | — |
| 6.3 | 1.5 | 5.5 | 45 | 5 | 3 | 1 | 5973400 | 5973351 |
| 7.0 | 1.8 | 5.5 | 50 | 6 | 3 | 1 | 5973401 | — |
| 7.3 | 1.8 | 6.1 | 50 | 6 | 3 | 1 | 5973402 | — |
| 8.0 | 2.0 | 6.1 | 50 | 6 | 3 | 1 | 5973403 | 5973353 |
| 8.3 | 2.0 | 6.5 | 50 | 6 | 3 | 1 | 5973404 | 5973355 |
| 9.4 | 2.2 | 7.2 | 50 | 6 | 3 | 1 | 5973405 | — |
| 10.0 | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5973358 | 5973336 |
| 10.4 | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5973360 | 5973337 |
| 11.5 | 2.8 | 8.0 | 56 | 8 | 3 | 1 | 5973362 | — |
| 12.4 | 2.8 | 8.5 | 56 | 8 | 3 | 1 | 5973364 | 5973339 |
| 13.4 | 2.9 | 9.0 | 56 | 8 | 3 | 1 | 5973366 | — |
| 15.0 | 3.2 | 9.5 | 60 | 10 | 3 | 1 | 5973368 | — |
| 16.5 | 3.2 | 10.5 | 60 | 10 | 3 | 1 | 5973371 | 5973341 |
| 19.0 | 3.5 | 11.7 | 63 | 10 | 3 | 1 | 5973373 | — |
| 20.5 | 3.5 | 13.0 | 63 | 10 | 3 | 1 | 5973375 | 5973345 |
| 23.0 | 3.8 | 13.7 | 67 | 10 | 3 | 1 | 5973377 | — |
| 25.0 | 3.8 | 15.5 | 67 | 10 | 3 | 1 | 5973379 | 5973347 |
| 26.0 | 3.8 | 15.5 | 67 | 10 | 3 | 1 | 5973381 | — |
| 28.0 | 4.0 | 16.5 | 71 | 12 | 3 | 1 | 5973383 | — |
| 30.0 | 4.2 | 18.5 | 71 | 12 | 3 | 1 | 5973386 | — |
| 31.0 | 4.2 | 18.5 | 71 | 12 | 3 | 1 | 5973387 | 5973349 |

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 | 5973137 |
| 5.0 | 1.5 | 4.5 | 40 | 4 | 3 | 1 | 5973143 |
| 6.0 | 1.5 | 5.0 | 45 | 5 | 3 | 1 | 5973152 |
| 6.3 | 1.5 | 5.5 | 45 | 5 | 3 | 1 | 5973157 |
| 7.0 | 1.8 | 5.5 | 50 | 6 | 3 | 1 | 5973162 |
| 7.3 | 1.8 | 6.1 | 50 | 6 | 3 | 1 | 5973166 |
| 8.0 | 2.0 | 6.1 | 50 | 6 | 3 | 1 | 5973173 |
| 8.3 | 2.0 | 6.5 | 50 | 6 | 3 | 1 | 5973178 |
| 10.0 | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5973088 |
| 10.4 | 2.5 | 7.6 | 50 | 6 | 3 | 1 | 5973091 |
| 11.5 | 2.8 | 8.0 | 56 | 8 | 3 | 1 | 5973094 |
| 12.4 | 2.8 | 8.5 | 56 | 8 | 3 | 1 | 5973100 |
| 15.0 | 3.2 | 9.5 | 60 | 10 | 3 | 1 | 5973105 |
| 16.5 | 3.2 | 10.5 | 60 | 10 | 3 | 1 | 5973108 |
| 19.0 | 3.5 | 11.7 | 63 | 10 | 3 | 1 | 5973112 |
| 20.5 | 3.5 | 13.0 | 63 | 10 | 3 | 1 | 5973117 |
| 23.0 | 3.8 | 13.7 | 67 | 10 | 3 | 1 | 5973121 |
| 25.0 | 3.8 | 15.5 | 67 | 10 | 3 | 1 | 5973126 |
| 31.0 | 4.2 | 18.5 | 71 | 12 | 3 | 1 | 5973131 |

Straight Shank, 3-Flute

G570 90° 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

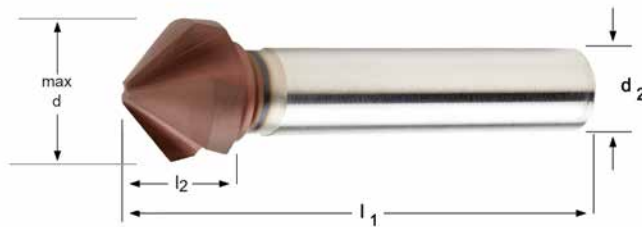
HSS-E

AlTiCN

DIN 335C



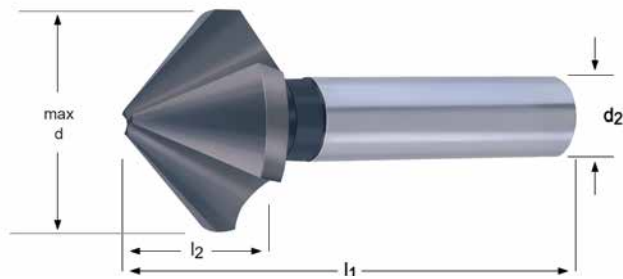
6.30 - 31.00



| max d mm | min d mm | l ₂ mm | l ₁ mm | d ₂ Øh ₉ mm | # of Flutes | Pack Qty | G570 |
|----------|----------|-------------------|-------------------|-----------------------------------|-------------|----------|---------|
| 6.3 | 1.5 | 6.5 | 45 | 5 | 3 | 1 | 6381760 |
| 8.3 | 2.0 | 8.2 | 50 | 6 | 3 | 1 | 6381761 |
| 10.4 | 2.5 | 9.7 | 50 | 6 | 3 | 1 | 6381762 |
| 12.4 | 2.8 | 10.6 | 56 | 8 | 3 | 1 | 6381763 |
| 16.5 | 3.2 | 13.9 | 60 | 10 | 3 | 1 | 6381764 |
| 20.5 | 3.5 | 17.1 | 63 | 10 | 3 | 1 | 6381765 |
| 25.0 | 3.8 | 21.4 | 67 | 10 | 3 | 1 | 6381766 |
| 31.0 | 4.2 | 24.4 | 71 | 12 | 3 | 1 | 6381767 |

Straight Shank, 3-Flute

G171 100° Countersink with straight shank design for cast iron, soft steels & aluminum. TiAIN coating increases surface hardness and improves tool life at higher speeds.



G171

HSS



DIN 335C

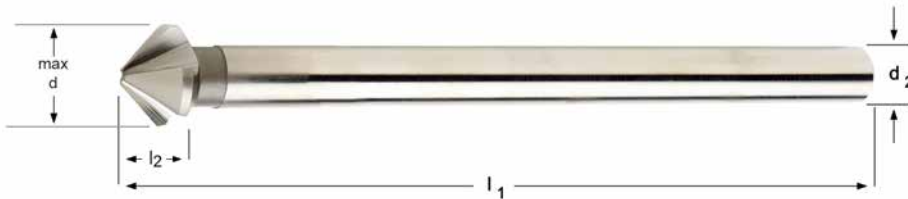


6.30 - 25.00

| max d mm | min d mm | l ₂ mm | l ₁ mm | d ₂ Øh ₃ mm | # of Flutes | Pack Qty | G171 |
|----------|----------|-------------------|-------------------|-----------------------------------|-------------|----------|---------|
| 6.3 | 1.5 | 4.5 | 44.0 | 5.0 | 3 | 1 | 5972697 |
| 8.3 | 2.0 | 5.5 | 49.0 | 6.0 | 3 | 1 | 5972706 |
| 10.4 | 2.5 | 6.6 | 49.0 | 6.0 | 3 | 1 | 5972677 |
| 12.4 | 2.8 | 7.0 | 53.0 | 6.0 | 3 | 1 | 5972680 |
| 16.5 | 3.2 | 9.0 | 56.0 | 6.0 | 3 | 1 | 5972684 |
| 20.5 | 3.5 | 11.0 | 61.0 | 10.0 | 3 | 1 | 5972689 |
| 25.0 | 3.8 | 13.5 | 65.0 | 10.0 | 3 | 1 | 5972693 |

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

HSS

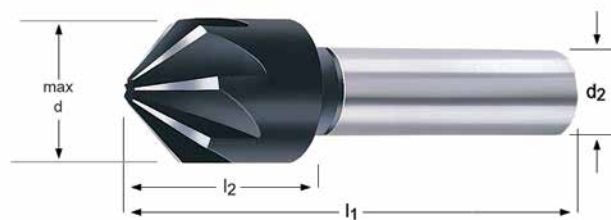


6.30 - 25.00

| 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 | 6381768 |
| 8.3 | 1.8 | 8.3 | 155 | 6 | 3 | 1 | 6381769 |
| 10.4 | 2.2 | 9.7 | 157 | 6 | 3 | 1 | 6381770 |
| 12.4 | 2.5 | 10.6 | 158 | 8 | 3 | 1 | 6381771 |
| 15.0 | 2.8 | 12.6 | 159 | 10 | 3 | 1 | 6381772 |
| 16.5 | 2.8 | 13.9 | 161 | 10 | 3 | 1 | 6381773 |
| 20.5 | 3.0 | 17.1 | 164 | 10 | 3 | 1 | 6381774 |
| 25.0 | 3.2 | 21.4 | 168 | 10 | 3 | 1 | 6381775 |

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.



G132

HSS



DIN
335A



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 | 5973340 |
| 12.5 | 2.0 | 15.5 | 48 | 8 | 5 | 1 | 5973334 |
| 16.0 | 3.2 | 19.5 | 56 | 10 | 7 | 1 | 5973335 |
| 20.0 | 5.0 | 23.0 | 60 | 10 | 7 | 1 | 5973338 |

HSS COUNTERSINK



Taper Shank, 3-Flute

G137 60° Countersink with Morse Taper Shank for multiple materials. Bright finish improves chip flow in soft ferrous and non-ferrous materials.



G137

HSS



DIN 334D



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 | 5973407 |
| 20.0 (3/4) | 5.0 | 17.5 | 106 | 2 | 3 | 1 | 5973061 |
| 25.0 (1") | 6.3 | 20.0 | 112 | 2 | 3 | 1 | 5973073 |
| 31.5 (1.1/4) | 10.0 | 23.0 | 118 | 2 | 3 | 1 | 5973099 |
| 40.0 (1.1/2) | 12.5 | 28.5 | 150 | 3 | 3 | 1 | 5973147 |
| 50.0 (2") | 16.0 | 36.0 | 160 | 3 | 3 | 1 | 5973208 |
| 63.0 (2.1/2) | 20.0 | 43.0 | 190 | 4 | 3 | 1 | 5973217 |
| 80.0 (3") | 25.0 | 54.0 | 200 | 4 | 3 | 1 | 5973222 |

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 | 5973066 | 5973321 |
| 30.0 | 4.2 | 18.5 | 112 | 2 | 3 | 1 | 5973069 | — |
| 31.0 | 4.2 | 20.0 | 112 | 2 | 3 | 1 | 5973070 | 5973322 |
| 34.0 | 4.5 | 19.5 | 118 | 2 | 3 | 1 | 5973071 | — |
| 37.0 | 4.8 | 21.7 | 118 | 2 | 3 | 1 | 5973072 | 5973324 |
| 40.0 | 10.0 | 20.5 | 140 | 3 | 3 | 1 | 5973074 | 5973326 |
| 50.0 | 14.0 | 24.1 | 150 | 3 | 3 | 1 | 5973075 | 5973327 |
| 63.0 | 16.0 | 28.5 | 180 | 4 | 3 | 1 | 5973076 | 5973329 |
| 80.0 | 22.0 | 36.0 | 190 | 4 | 3 | 1 | 5973078 | — |

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.



| 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 | 5972710 |
| 2 | G136 | 4 | 6.30 mm, 10.40 mm, 16.50 mm, 20.50 mm | 1 | 5972714 |
| 3 | G560 | 6 | 6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm | 1 | 6521338 |

Counterbore Body - Interchangeable Pilot Type

G702 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.



G702

HSS



ANSI



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 | G702 |
|-----------------------------|------------------------|------------------------|-----------------------------|----------------|---------------------------------|-------------------|-------------------|-------------|---------|
| 1/4 | 3/4 | 3.13/16 | 15/64 | 3 | 3/32 | 1/8 | 3/16 | 1 | 8203127 |
| 9/32 | 3/4 | 3.13/16 | 17/64 | 3 | 3/32 | 1/8 | 7/32 | 1 | 8203128 |
| 5/16 | 3/4 | 3.13/16 | 19/64 | 3 | 3/32 | 1/8 | 1/4 | 1 | 8203183 |
| 11/32 | 3/4 | 3.13/16 | 5/16 | 3 | 3/32 | 1/8 | 9/32 | 1 | 8203180 |
| 3/8 | 1" | 4.1/16 | 5/16 | 3 | 5/32 | 3/16 | 5/16 | 1 | 8203181 |
| 13/32 | 1" | 4.1/16 | 3/8 | 3 | 5/32 | 3/16 | 11/32 | 1 | 8203182 |
| 7/16 | 1" | 4.1/16 | 3/8 | 3 | 5/32 | 3/16 | 3/8 | 1 | 8203129 |
| 15/32 | 1.1/4 | 4.5/16 | 7/16 | 3 | 3/16 | 3/16 | 13/32 | 1 | 8203184 |
| 1/2 | 1.1/4 | 4.5/16 | 7/16 | 3 | 3/16 | 3/16 | 7/16 | 1 | 8203185 |
| 9/16 | 1.1/4 | 4.5/16 | 1/2 | 3 | 3/16 | 3/16 | 1/2 | 1 | 8203186 |
| 19/32 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 17/32 | 1 | 8203187 |
| 5/8 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 9/16 | 1 | 8203188 |
| 11/16 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 5/8 | 1 | 8203189 |
| 3/4 | 1.1/2 | 5.3/8 | 1/2 | 3 | 1/4 | 5/16 | 11/16 | 1 | 8203190 |
| 25/32 | 1.1/2 | 5.3/8 | 5/8 | 3 | 1/4 | 5/16 | 23/32 | 1 | 8203191 |
| 13/16 | 1.1/2 | 5.3/8 | 5/8 | 3 | 1/4 | 5/16 | 3/4 | 1 | 8203192 |
| 27/32 | 1.1/2 | 5.3/8 | 3/4 | 3 | 1/4 | 5/16 | 25/32 | 1 | 8203193 |
| 7/8 | 1.1/2 | 5.3/8 | 3/4 | 3 | 1/4 | 5/16 | 13/16 | 1 | 8203194 |
| 1" | 1.3/4 | 6.3/8 | 3/4 | 3 | 5/16 | 3/8 | 15/16 | 1 | 8203195 |
| 2" | 2.1/2 | 8.3/8 | 1.1/2 | 5 | 1/2 | 9/16 | 1.15/16 | 1 | 8203196 |

HSS COUNTERBORE

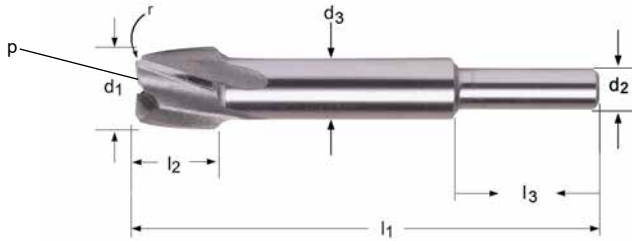


Counterbore Body, Aircraft Series - Interchangeable Pilot Type

G705 Long Series, 3-flute

G706 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.



| 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) Moun- ting Ø Inch | Pilot Ø min | Pilot Ø max | Pack Qty | G705 | 4706 |
|--------------------|---------------|---------------|--------------------|---------------|--------------------|----------------|--------------------------------------|-------------------|-------------------|-------------|---------|-----------------------|
| 1/4 | 1/2 | 2.3/8 | 1/4 | 1.1/8 | 15/64 | 4 | 3/32 | 1/8 | 3/16 | 1 | — | 8203307 ¹⁾ |
| 1/4 | 3/4 | 3.13/16 | 15/64 | 3.1/16 | 15/64 | 3 | 3/32 | 1/8 | 3/16 | 1 | 8203291 | — |
| 5/16 | 1/2 | 2.3/8 | 1/4 | 7/8 | 17/64 | 4 | 3/32 | 1/8 | 1/4 | 1 | — | 8203308 ¹⁾ |
| 5/16 | 3/4 | 3.13/16 | 19/64 | 3.1/16 | 19/64 | 3 | 3/32 | 1/8 | 1/4 | 1 | 8203292 | — |
| 11/32 | 1/2 | 2.3/8 | 1/4 | 7/8 | 19/64 | 4 | 3/32 | 1/8 | 9/32 | 1 | — | 8203309 ¹⁾ |
| 3/8 | 1/2 | 2.3/8 | 1/4 | 7/8 | 5/16 | 4 | 3/32 | 3/16 | 5/16 | 1 | — | 8203310 ²⁾ |
| 3/8 | 3/4 | 3.13/16 | 5/16 | 3.1/16 | 5/16 | 3 | 3/32 | 3/16 | 5/16 | 1 | 8203293 | — |
| 13/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 3/16 | 11/32 | 1 | — | 8203311 ²⁾ |
| 7/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 3/16 | 3/8 | 1 | — | 8203312 ²⁾ |
| 7/16 | 3/4 | 3.13/16 | 3/8 | 3.1/16 | 3/8 | 3 | 1/8 | 3/16 | 3/8 | 1 | 8203294 | — |
| 15/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 1/4 | 13/32 | 1 | — | 8203313 ²⁾ |
| 1/2 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 7/16 | 1 | — | 8203314 ²⁾ |
| 1/2 | 3/4 | 3.13/16 | 7/16 | 3.1/16 | 7/16 | 3 | 1/8 | 1/4 | 7/16 | 1 | 8203295 | — |
| 17/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 15/32 | 1 | — | 8203315 ²⁾ |
| 17/32 | 3/4 | 5.3/8 | 1/2 | 4.5/8 | 1/2 | 3 | 1/8 | 1/4 | 15/32 | 1 | 8203296 | — |
| 9/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 1/2 | 1 | — | 8203316 ²⁾ |
| 9/16 | 3/4 | 5.3/8 | 1/2 | 4.5/8 | 1/2 | 3 | 1/8 | 1/4 | 1/2 | 1 | 8203297 | — |
| 19/32 | 3/4 | 5.3/8 | 1/2 | 4.3/16 | 9/16 | 3 | 1/8 | 1/4 | 17/32 | 1 | 8203298 | — |
| 5/8 | 3/4 | 5.3/8 | 1/2 | 4.3/16 | 9/16 | 3 | 1/8 | 1/4 | 9/16 | 1 | 8203299 | — |
| 11/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 1/8 | 1/4 | 5/8 | 1 | — | 8203317 ³⁾ |
| 21/32 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 9/16 | 3 | 3/16 | 1/4 | 19/32 | 1 | 8203300 | — |
| 11/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 5/8 | 3 | 3/16 | 1/4 | 5/8 | 1 | 8203301 | — |
| 3/4 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 11/16 | 3 | 3/16 | 5/16 | 11/16 | 1 | 8203302 | — |

¹⁾ 1/32 Corner Radius

²⁾ 3/64 Corner Radius

³⁾ 0.0550" Corner Radius

| 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 | G705 | G706 |
|-----------------------------|------------------------|------------------------|-----------------------------|------------------------|-----------------------------|----------------|-----------------------------|-------------------|-------------------|-------------|---------|-----------------------|
| 3/4 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 11/16 | 1 | — | 8203318 ³⁾ |
| 25/32 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 11/16 | 3 | 3/16 | 5/16 | 23/32 | 1 | 8203303 | — |
| 13/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 3/4 | 1 | 8203304 | — |
| 13/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 3/4 | 1 | — | 8203319 ³⁾ |
| 7/8 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 13/16 | 1 | 8203305 | — |
| 7/8 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 13/16 | 1 | — | 8203320 ³⁾ |
| 15/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 7/8 | 1 | 8203306 | — |
| 1" | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 3/8 | 15/16 | 1 | — | 8203321 ³⁾ |

¹⁾1/32 Corner Radius

²⁾3/64 Corner Radius

³⁾0.0550" Corner Radius

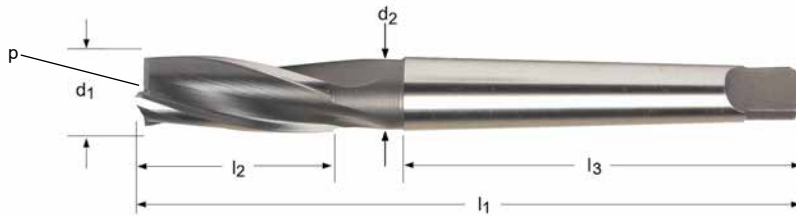
HSS COUNTERBORE



Counterbore Body, Taper Shank, Short Series - Interchangeable Pilot Type

G703

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.



G703

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 | G703 |
|-----------------------------|------------------------|------------------------|-----|--|---|----------------|------------------------------------|-------------------|-------------------|-------------|---------|
| 1/2 | 1.1/4 | 4.5/16 | 1 | 29/64 | 2.9/16 | 3 | 3/16 | 1/4 | 7/16 | 1 | 8203197 |
| 11/16 | 1.1/4 | 5.1/8 | 2 | 5/8 | 3.1/8 | 3 | 3/16 | 1/4 | 5/8 | 1 | 8203198 |
| 3/4 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 11/16 | 1 | 8203199 |
| 13/16 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 3/4 | 1 | 8203200 |
| 7/8 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 13/16 | 1 | 8203201 |
| 15/16 | 1.1/2 | 6.1/8 | 2 | 7/8 | 3.7/8 | 3 | 1/4 | 5/16 | 7/8 | 1 | 8203202 |
| 1" | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 15/16 | 1 | 8203203 |
| 1.1/16 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1" | 1 | 8203204 |
| 1.1/8 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1.1/16 | 1 | 8203205 |
| 1.3/16 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1.1/8 | 1 | 8203206 |
| 1.1/4 | 2" | 6.5/8 | 3 | 7/8 | 3.7/8 | 5 | 3/8 | 7/16 | 1.3/16 | 1 | 8203207 |
| 1.3/8 | 2" | 6.5/8 | 3 | 7/8 | 3.7/8 | 5 | 3/8 | 7/16 | 1.5/16 | 1 | 8203208 |
| 1.1/2 | 2" | 7.7/8 | 4 | 1.3/16 | 4.7/8 | 5 | 3/8 | 7/16 | 1.7/16 | 1 | 8203209 |
| 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 | 8203210 |
| 2" | 2.1/2 | 8.3/8 | 4 | 1.1/2 | 4.7/8 | 5 | 1/2 | 9/16 | 1.5/16 | 1 | 8203211 |
| 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 | 8203212 |

Counterbore Pilot, Detachable

G704 Interchangeable detachable pilots for use with counterbore bodies. Pilot shank diameters must match counterbore body “pilot diameter” for proper match.



G704

HSS

ANSI

3/32 - 2"

| pilot Ø Inch | d ₁ Ø Inch | l ₂ Inch | l ₁ Inch | Pack Qty | G704 |
|-----------------|-----------------------------|------------------------|------------------------|----------|---------|
| 1/8 | 3/32 | 1/8 | 1.1/4 | 1 | 8203213 |
| 5/32 | 3/32 | 3/16 | 1.5/16 | 1 | 8203214 |
| 3/16 | 3/32 | 3/16 | 1.5/16 | 1 | 8203215 |
| 7/32 | 3/32 | 1/4 | 1.3/8 | 1 | 8203216 |
| 1/4 | 3/32 | 1/4 | 1.3/8 | 1 | 8203217 |
| 1/8 | 1/8 | 1/8 | 1.7/16 | 1 | 8203218 |
| 5/32 | 1/8 | 3/16 | 1.1/2 | 1 | 8203219 |
| 3/16 | 1/8 | 3/16 | 1.1/2 | 1 | 8203220 |
| 7/32 | 1/8 | 1/4 | 1.9/16 | 1 | 8203221 |
| 1/4 | 1/8 | 1/4 | 1.9/16 | 1 | 8203222 |
| 9/32 | 1/8 | 5/16 | 1.5/8 | 1 | 8203223 |
| 5/16 | 1/8 | 5/16 | 1.5/8 | 1 | 8203224 |
| 3/8 | 1/8 | 3/8 | 1.11/16 | 1 | 8203225 |
| 7/16 | 1/8 | 7/16 | 1.3/4 | 1 | 8203226 |
| 1/2 | 1/8 | 1/2 | 1.13/16 | 1 | 8203227 |
| 3/16 | 5/32 | 3/16 | 1.9/16 | 1 | 8203228 |
| 7/32 | 5/32 | 1/4 | 1.5/8 | 1 | 8203229 |
| 1/4 | 5/32 | 1/4 | 1.5/8 | 1 | 8203230 |
| 9/32 | 5/32 | 5/16 | 1.11/16 | 1 | 8203231 |
| 5/16 | 5/32 | 5/16 | 1.11/16 | 1 | 8203232 |
| 3/8 | 5/32 | 3/8 | 1.3/4 | 1 | 8203233 |
| 3/16 | 3/16 | 1/4 | 1.7/8 | 1 | 8203234 |
| 7/32 | 3/16 | 1/4 | 1.7/8 | 1 | 8203235 |
| 1/4 | 3/16 | 1/4 | 1.7/8 | 1 | 8203236 |
| 9/32 | 3/16 | 5/16 | 1.15/16 | 1 | 8203237 |
| 5/16 | 3/16 | 5/16 | 1.15/16 | 1 | 8203238 |
| 11/32 | 3/16 | 3/8 | 2" | 1 | 8203239 |
| 3/8 | 3/16 | 3/8 | 2" | 1 | 8203240 |
| 13/32 | 3/16 | 7/16 | 2.1/16 | 1 | 8203241 |
| 7/16 | 3/16 | 7/16 | 2.1/16 | 1 | 8203242 |
| 15/32 | 3/16 | 1/2 | 2.1/8 | 1 | 8203243 |
| 1/2 | 3/16 | 1/2 | 2.1/8 | 1 | 8203244 |
| 9/16 | 3/16 | 9/16 | 2.3/16 | 1 | 8203245 |
| 5/8 | 3/16 | 9/16 | 2.3/16 | 1 | 8203246 |
| 13/16 | 3/16 | 13/16 | 2.7/16 | 1 | 8203247 |

HSS COUNTERBORE



| pilot Ø Inch | d ₁ Ø Inch | l ₂ Inch | l ₁ Inch | Pack Qty | G704 |
|--------------------|-----------------------------|------------------------|------------------------|-------------|---------|
| 7/8 | 3/16 | 7/8 | 2.1/2 | 1 | 8203248 |
| 1/4 | 1/4 | 1/4 | 1.11/16 | 1 | 8203249 |
| 9/32 | 1/4 | 5/16 | 1.3/4 | 1 | 8203250 |
| 5/16 | 1/4 | 5/16 | 1.3/4 | 1 | 8203251 |
| 3/8 | 1/4 | 3/8 | 1.13/16 | 1 | 8203252 |
| 7/16 | 1/4 | 7/16 | 1.7/8 | 1 | 8203253 |
| 1/2 | 1/4 | 1/2 | 1.15/16 | 1 | 8203254 |
| 17/32 | 1/4 | 9/16 | 2" | 1 | 8203255 |
| 9/16 | 1/4 | 9/16 | 2" | 1 | 8203256 |
| 5/8 | 1/4 | 5/8 | 2.1/16 | 1 | 8203257 |
| 11/16 | 1/4 | 11/16 | 2.1/8 | 1 | 8203258 |
| 3/4 | 1/4 | 3/4 | 2.3/16 | 1 | 8203259 |
| 13/16 | 1/4 | 7/8 | 2.5/16 | 1 | 8203260 |
| 1" | 1/4 | 1" | 2.7/16 | 1 | 8203261 |
| 3/8 | 5/16 | 3/8 | 2" | 1 | 8203262 |
| 7/16 | 5/16 | 7/16 | 2.1/16 | 1 | 8203263 |
| 1/2 | 5/16 | 1/2 | 2.1/8 | 1 | 8203264 |
| 9/16 | 5/16 | 9/16 | 2.3/16 | 1 | 8203265 |
| 5/8 | 5/16 | 5/8 | 2.1/4 | 1 | 8203266 |
| 11/16 | 5/16 | 11/16 | 2.5/16 | 1 | 8203267 |
| 3/4 | 5/16 | 3/4 | 2.3/8 | 1 | 8203268 |
| 13/16 | 5/16 | 7/8 | 2.1/2 | 1 | 8203269 |
| 15/16 | 5/16 | 1" | 2.5/8 | 1 | 8203270 |
| 1" | 5/16 | 1" | 2.5/8 | 1 | 8203271 |
| 7/16 | 3/8 | 7/16 | 2.5/16 | 1 | 8203272 |
| 1/2 | 3/8 | 1/2 | 2.3/8 | 1 | 8203273 |
| 9/16 | 3/8 | 9/16 | 2.7/16 | 1 | 8203274 |
| 5/8 | 3/8 | 5/8 | 2.1/2 | 1 | 8203275 |
| 11/16 | 3/8 | 11/16 | 2.9/16 | 1 | 8203276 |
| 3/4 | 3/8 | 3/4 | 2.5/8 | 1 | 8203277 |
| 13/16 | 3/8 | 7/8 | 2.3/4 | 1 | 8203278 |
| 7/8 | 3/8 | 7/8 | 2.3/4 | 1 | 8203279 |
| 15/16 | 3/8 | 1" | 2.5/8 | 1 | 8203280 |
| 9/16 | 7/16 | 5/8 | 2.7/8 | 1 | 8203281 |
| 11/16 | 7/16 | 3/4 | 3" | 1 | 8203282 |
| 3/4 | 7/16 | 3/4 | 3" | 1 | 8203283 |
| 13/16 | 7/16 | 7/8 | 3.1/8 | 1 | 8203284 |
| 7/8 | 7/16 | 7/8 | 3.1/8 | 1 | 8203285 |
| 15/16 | 7/16 | 1" | 3.1/4 | 1 | 8203286 |
| 1" | 7/16 | 1" | 3.1/4 | 1 | 8203287 |
| 9/16 | 1/2 | 5/8 | 3.1/8 | 1 | 8203288 |
| 1" | 1/2 | 1" | 3.1/2 | 1 | 8203289 |
| 1.1/2 | 1/2 | 1.1/2 | 4" | 1 | 8203290 |

List Number Index - Miscellaneous

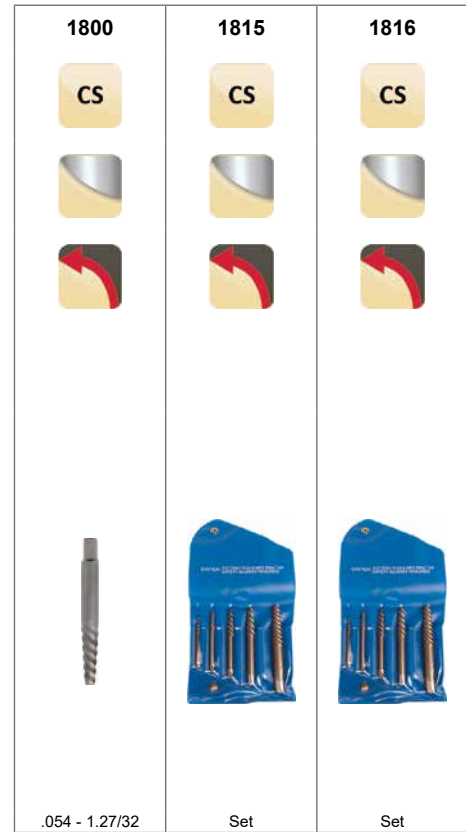


Pgs. 507-511

| | |
|-----------|-----|
| 411..... | 510 |
| 430..... | 510 |
| K520..... | 511 |
| K521..... | 511 |
| 1800..... | 508 |
| 1815..... | 508 |
| 1816..... | 508 |
| 1900..... | 509 |

SCREW EXTRACTOR

- 1800** Screw Extractor
- 1815** Screw Extractor Set, 5 piece
- 1816** Screw Extractor Set, 6 piece



| Nr. | d ₁ Ø Inch | Sizes in Set | d ₂ Ø Inch | Pieces per Set | l ₁ Inch | Capacity For Screws & Bolts | Pipe Sizes | Pack Qty | 1800 | 1815set | 1816set |
|------|-----------------------------|-----------------|-----------------------------|----------------------|------------------------|-----------------------------------|---------------|-------------|---------|---------|---------|
| | | | | | | | | | | | |
| 801 | 0.0540 | | 5/32 | | 2" | 3/16 - 1/4 | | 12 | 6005042 | — | — |
| 802 | 0.0860 | | 3/16 | | 2.3/8 | 1/4 - 5/16 | | 12 | 6005058 | — | — |
| 803 | 1/8 | | 1/4 | | 2.3/4 | 5/16 - 7/16 | | 12 | 6005062 | — | — |
| 804 | 11/64 | | 5/16 | | 3" | 7/16 - 9/16 | | 6 | 6005066 | — | — |
| 805 | 1/4 | | 7/16 | | 3.3/8 | 9/16 - 3/4 | 1/8 - 1/4 | 6 | 6005068 | — | — |
| 806 | 3/8 | | 5/8 | | 3.3/4 | 3/4 - 1" | 3/8 | 1 | 6005072 | — | — |
| 807 | 31/64 | | 3/4 | | 4.1/8 | 1 - 1.3/8 | 1/2 | 1 | 6005084 | — | — |
| 808 | 47/64 | | 1" | | 4.3/8 | 1.3/8 - 1.3/4 | 3/4 | 1 | 6005089 | — | — |
| 809 | 31/32 | | 1.1/4 | | 4.5/8 | 1.3/4 - 2.1/8 | 1 | 1 | 6005093 | — | — |
| 1815 | | 801 - 805 | | 5 | | 3/16 - 3/4 | 1/8 - 1/4 | 1 | — | 6005098 | — |
| 1816 | | 801 - 806 | | 6 | | 3/16 - 1 | 1/8 - 3/8 | 1 | — | — | 6005103 |

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 tremendous 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 | 6009993 |
| 4 oz | Squirt Bottle | Drilling & Tapping Fluid | 24 | 6010002 |
| 16 oz | Squirt Bottle | Drilling & Tapping Fluid | 12 | 8106244 |
| 16 oz | Squirt Bottle | Drilling & Tapping Fluid (single) | 1 | 8106246 |
| 1 gal | Bottle | Drilling & Tapping Fluid | 4 | 8106242 |
| 5 gal | Dispenser | Drilling & Tapping Fluid | 1 | 6010003 |
| 5 gal | Pail | Drilling & Tapping Fluid | 1 | 6009994 |
| 1 lb | Stick | Wax | 24 | 6009998 |
| 1 lb | Stick | Wax (single) | 1 | 6437430 |
| 20 oz | Aerosal Can | Foam | 12 | 6010001 |
| 20 oz | Aerosal Can | Foam (single) | 1 | 6437349 |
| 1 gal | Bottle | Light Drilling & Tapping Fluid | 4 | 8106243 |
| 16 oz | Squirt Bottle | Light Tapping Fluid | 12 | 8106245 |
| 16 oz | Squirt Bottle | Light Tapping Fluid (single) | 1 | 8106247 |

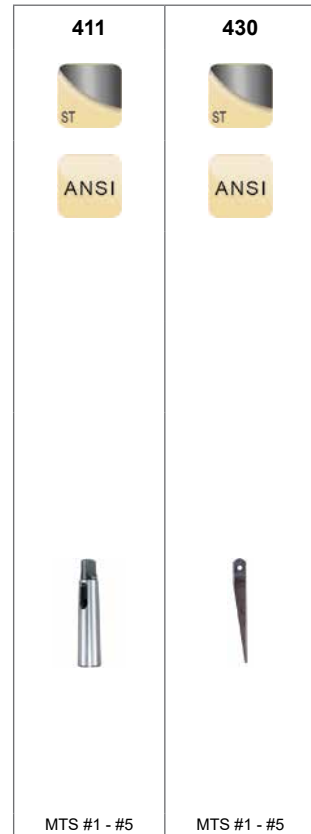
MISCELLANEOUS



SLEEVES & KEYS

411 Taper shank (internal and external) adapters. Heat treated and externally ground. Steam tempered surface finish prevents corrosion.

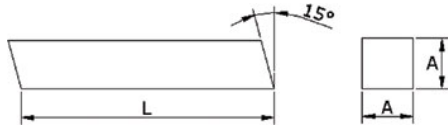
430 Drill Drift. Dropped forged steel keys used for removing taper shank tools from adapting sleeves and machine spindles.



| 430 MTS # | 411 Inside Taper | 411 Outside Taper | Length | Pack Qty | 411 | 430 |
|--------------|------------------------|-------------------------|---------|-------------|---------|---------|
| 1 | | | 4.1/2 | 1 | — | 6005736 |
| 2 | | | 5.1/2 | 1 | — | 6005552 |
| 3 | | | 7 | 1 | — | 6005555 |
| 4 | | | 8 | 1 | — | 6005558 |
| 5 | | | 9.7/8 | 1 | — | 6005562 |
| | 1 | 2 | 3.1/2 | 1 | 6004701 | — |
| | 1 | 3 | 3.15/16 | 1 | 6005545 | — |
| | 1 | 4 | 4.13/16 | 1 | 6005595 | — |
| | 2 | 3 | 4.3/8 | 1 | 6005651 | — |
| | 2 | 4 | 4.13/16 | 1 | 6005690 | — |
| | 3 | 4 | 5.5/16 | 1 | 6005724 | — |
| | 3 | 5 | 6.1/16 | 1 | 6005728 | — |
| | 4 | 5 | 6.1/2 | 1 | 6005731 | — |
| | 5 | 6 | 8.1/2 | 1 | 6005733 | — |

TOOL BIT BLANKS

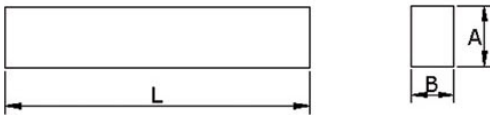
K520 Cobalt ground blank with 15° beveled ends



K521 Cobalt round blank



K522 Cobalt rectangular blank



| Sizes | Overall Length | K520 |
|-------|----------------|---------|
| 4 | 100 | 5982467 |
| 5 | 160 | 5982472 |
| 6 | 100 | 5982327 |
| 6 | 160 | 5982332 |
| 6 | 200 | 5982336 |
| 8 | 100 | 5982358 |
| 8 | 160 | 5982361 |
| 8 | 200 | 5982365 |
| 10 | 100 | 5982322 |
| 10 | 160 | 5982330 |
| 10 | 200 | 5982333 |
| 12 | 100 | 5982344 |
| 12 | 160 | 5982348 |
| 12 | 200 | 5982355 |
| 14 | 160 | 5982363 |
| 14 | 200 | 5982367 |
| 16 | 100 | 5982371 |
| 16 | 160 | 5982374 |
| 16 | 200 | 5982378 |
| 20 | 160 | 5982387 |
| 20 | 200 | 5982392 |
| 25 | 200 | 5982403 |
| 3/16 | 2.1/2 | 5982304 |
| 1/4 | 2.1/2 | 5982311 |
| 1/4 | 4" | 5982314 |
| 5/16 | 2.1/2 | 5982309 |
| 5/16 | 3" | 5982313 |
| 5/16 | 4" | 5982316 |
| 3/8 | 3" | 5982427 |
| 3/8 | 4" | 5982458 |
| 3/8 | 6" | 5982464 |
| 7/16 | 3.1/2 | 5982354 |
| 1/2 | 4" | 5982303 |
| 1/2 | 6" | 5982305 |
| 5/8 | 4.1/2 | 5982319 |
| 5/8 | 6" | 5982323 |

| Sizes | Overall Length | K521 |
|-------|----------------|---------|
| 3 | 100 | 5982442 |
| 4 | 100 | 5982451 |
| 5 | 160 | 5982461 |
| 6 | 100 | 5982357 |
| 6 | 160 | 5982400 |
| 8 | 100 | 5982474 |
| 8 | 160 | 5982478 |
| 8 | 200 | 5982480 |
| 10 | 100 | 5982386 |
| 10 | 200 | 5982397 |
| 12 | 100 | 5982401 |
| 12 | 200 | 5982408 |
| 14 | 200 | 5982416 |
| 16 | 200 | 5982430 |
| 20 | 200 | 5982439 |

| A Height | B Width | Overall Length | K522 |
|----------|---------|----------------|---------|
| 10 | 3 | 200 | 5982321 |
| 12 | 3 | 200 | 5982342 |
| 10 | 4 | 200 | 5982331 |
| 16 | 4 | 200 | 5982398 |
| 20 | 4 | 200 | 5982438 |
| 18 | 5 | 200 | 5982417 |
| 20 | 5 | 200 | 5982444 |
| 10 | 6 | 200 | 5982335 |
| 12 | 6 | 200 | 5982366 |
| 16 | 6 | 200 | 5982404 |
| 20 | 6 | 200 | 5982447 |
| 25 | 6 | 200 | 5982460 |
| 12 | 8 | 200 | 5982373 |
| 16 | 8 | 200 | 5982413 |
| 20 | 8 | 200 | 5982450 |
| 12 | 10 | 200 | 5982338 |
| 16 | 10 | 200 | 5982385 |
| 20 | 10 | 200 | 5982426 |
| 25 | 12 | 200 | 5982455 |
| 25 | 16 | 200 | 5982457 |

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



Zirconium Coating

Technical Section - Icon Descriptions

Common Icons

Direction



Right hand rotation



Left hand rotation

Depth



Drilling icons

Point Angle



Countersink °



60° Countersink



82° Countersink



90° Countersink

Form



Normal Helix



Quick Helix



Continuously Thinned Web

Coolant



Internal Coolant

Technical Section - Icon Descriptions

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



Technical Section - Icon Descriptions

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 °



60°



82°



90°



100°

Shank



Straight



Morse taper

Manufacturing Standards



DORMER



DIN
206



DIN
212



DIN
311



BS
328



DIN
334C



DIN
334D



DIN
335A



DIN
335C



DIN
373



DIN
8050



DIN
8051



DIN
8093



DIN
8094



ANSI

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



15° Helix



17° Helix



27° Helix



30° Helix



40° Helix



45° Helix



50° Helix



52° Helix



Straight Flute (hand tap)

Hole Type



Through hole



Blind hole



Through or blind hole

Technical Section - Icon Descriptions

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



Technical Section - General

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 HSSCo 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 HSSCo resulting in a tougher product. Tool life and wear resistance is normally higher than HSSCo and this grade has superior edge strength and rigidity. Mainly used for milling cutters and taps.

Sintered Cobalt High Speed Steel

HSS-E PM

HSSCo-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 | HSSCO |
| | 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 | HSSCO 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 |

Technical Section - General

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 |

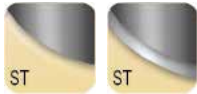
The combination of hard particle (WC) and binder metal (Co) give the following changes in characteristics.

| 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 Treatments | Color | Coating material | Hardness (HV) | Thick-ness (µm) | Coating structure | Frict. coeff. against steel | Max. appl. temp. (°C) |
|--------------------|-------------|------------------|---------------|-----------------|-----------------------------|-----------------------------|-----------------------|
| ST | Dark grey | Fe 304 | 400 | Max. 5 | Conversion into the surface | – | 550 |
| Bronze | Bronze | Fe 304 | 400 | Max. 5 | Conversion into the surface | – | 550 |
| N | Grey | FeN | 1300 | 20 | Diffusion zone | – | 550 |
| TiN | Gold | TiN | 2300 | 1-4 | Mono-layer | 0.4 | 600 |
| TiCN | Blue grey | TiCN | 3000 | 1-4 | Multi-layer gradient | 0.4 | 500 |
| TiAlN | Black grey | TiAlN | 3300 | 3 | Nano structured | 0.3-0.35 | 900 |
| CrN | Silver grey | CrN | 1750 | 3-4 | Mono-layer | 0.5 | 700 |
| Alcrona Top | Blue grey | AlCrN Top | 3200 | | Mono-layer | 0.35 | 1100 |
| Super B | Black | TiAlN+ WC/C | 3000 | 2-6 | Multi-layer lamellar | 0.2 | 800 |

Technical Section - General

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 | | |

Technical Section - General

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. |

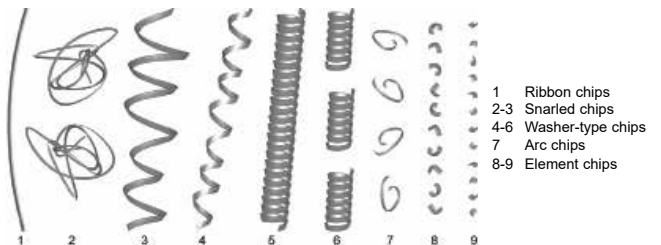


TYPES OF CHIPS

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 desirable 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 a minimum.

Technical Section - General

INDUSTRY STANDARD TOLERANCES FOR SHAFTS & HOLES

Tolerance values are shown in Microns (μm)

Formula for Microns ...1 μm = 0.001 mm / 0.000039

| Tolerance | 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

(CONTINUED FROM PRIOR PAGE)

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 | $IPR \times RPM = \mathbf{IPM}$ |
| IPR = Inches Per Revolution | $\frac{IPM}{RPM} = \mathbf{IPR}$ |
| RPM = Revolutions Per Minute | $\frac{SFM \times 3.82}{D} = \mathbf{RPM}$ |
| SFM = Surface Feet Per Minute | $D \times RPM \times .26 = \mathbf{SFM}$ |
| D = Drill Diameter | |

Note: For element and tolerance information, see specific technical sections on Solid Carbide or High Speed Steel.

Technical Section - Drilling

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 | <ul style="list-style-type: none"> • Reduce cutting speed • Increase feed (IPR) • Improve direction of coolant flow • Increase coolant pressure • Add corner break |
| Chipping of Chisel Edge | <ul style="list-style-type: none"> • Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Check point centrality and lip height • Increase feed rate |
| Chipping of Cutting Lips | <ul style="list-style-type: none"> • Check accuracy of drill runout • Check workpiece clamping accuracy and movement • Reduce speed • Reduce point clearance • Increase hone |
| Cracking of Lands | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Improve direction of coolant flow • Reduce cutting speed, increase feed • Check drill diameter |
| Hole Not Round | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 |

Technical Section - Drilling

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)

| Ø (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)

| Ø (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 |

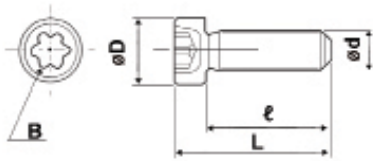
In view of the ability of some drills to produce a much tighter hole tolerance, due consideration should be given to drilled holes which are subject to secondary operations, eg. tapping, reaming. The diameter of the drill will need to be increased from what is recommended to account for the fact that the hole size produced will be smaller.

Technical Section - Drilling - Hydra

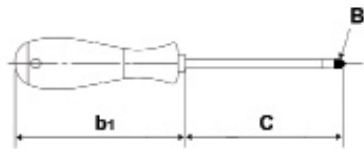
Torque Table

| | |  | | | TORQUE VALUES Nm (metric System) | TORQUE VALUES in/lbs (inch System) |
|--------|--------|---|----------------------------------|---------------|----------------------------------|------------------------------------|
| H860 | H861 | H853 3xD | H855 5xD | H858 8xD | | |
| 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 |

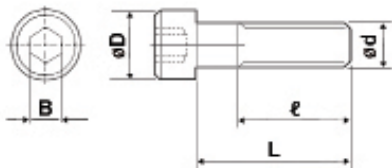
Screws and screw-drivers data



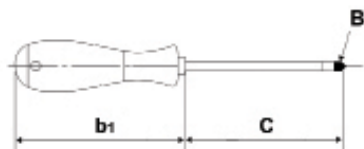
| e-code | d | Pitch | L (mm) | l (mm) | D (mm) | B |
|--------|------|-------|--------|--------|--------|------|
| H860N1 | M2.2 | 0.45 | 7.5 | 5.7 | 3.5 | 8IP |
| H860N2 | M2.5 | 0.45 | 9.0 | 7.0 | 4.1 | 10IP |
| H860N3 | M3.0 | 0.50 | 10.5 | 8.0 | 4.9 | 15IP |
| H860N4 | M3.5 | 0.60 | 11.5 | 8.8 | 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 |

Technical Section - Drilling - Hydra

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 recommended 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

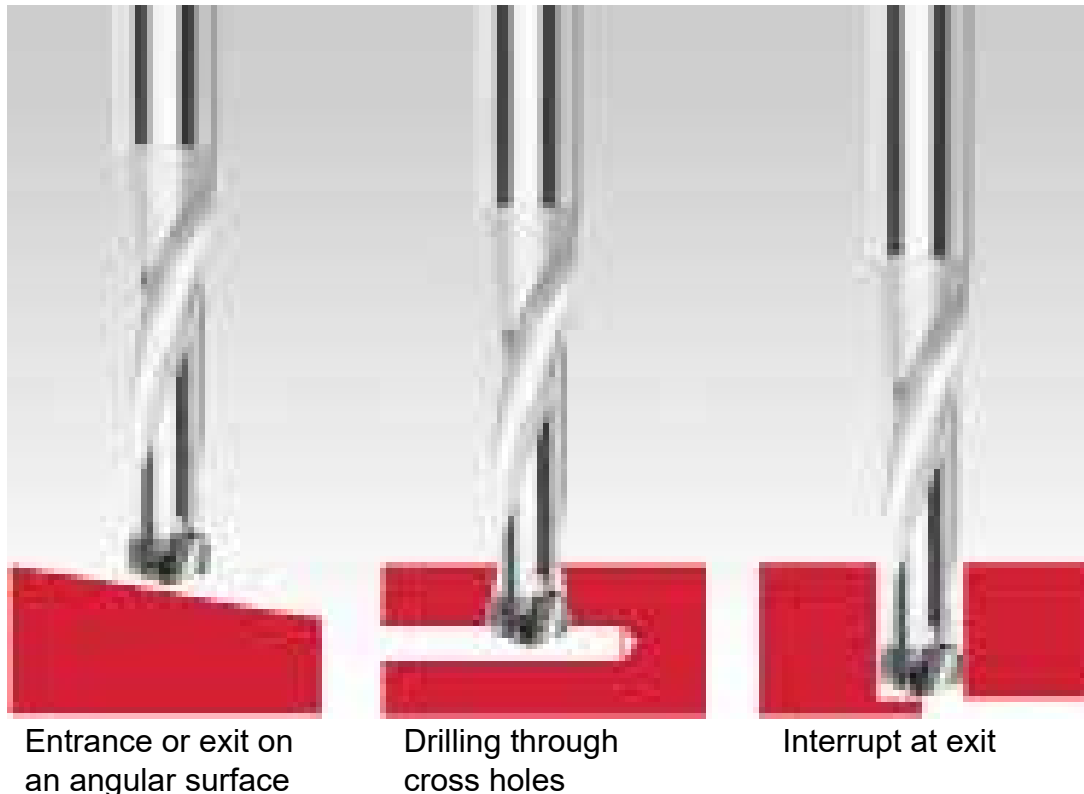
Always use tool holders and collets that provide good concentricity between the drill and the machine spindle. Use a positive stop to prevent the tool from backing up into the holder. Radial runout in the tool assembly must be accurately checked and maintained.

WORKPIECE

A secure and rigid workpiece will minimise deflection, and allow for better accuracy and true position of the hole.

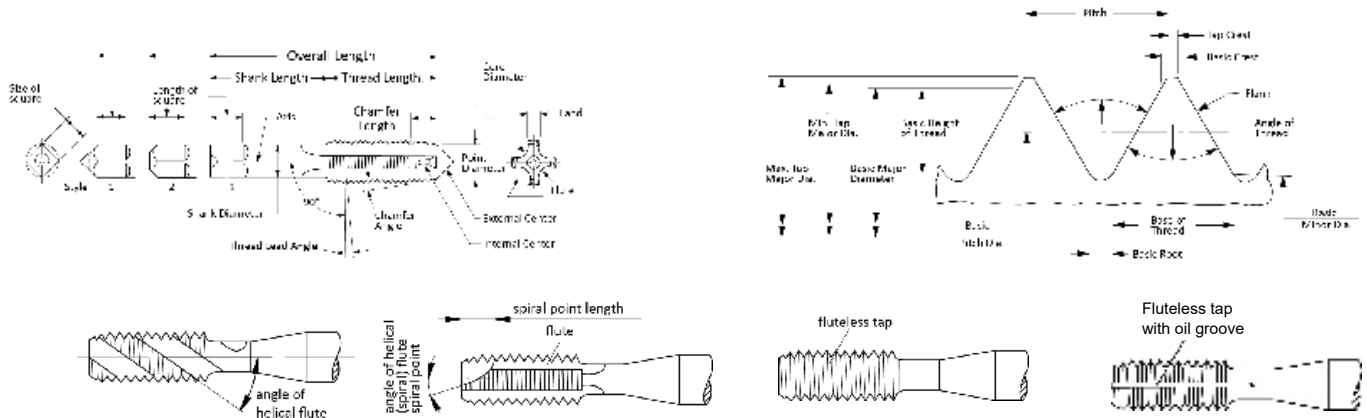
FEEDS

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.



In these drilling scenarios, reducing feed rate to 1/3 (33%) is generally recommended. Drilling into an entry angle of more than 10° 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.

Technical Section - Threading

TAP GEOMETRIES & APPLICATIONS

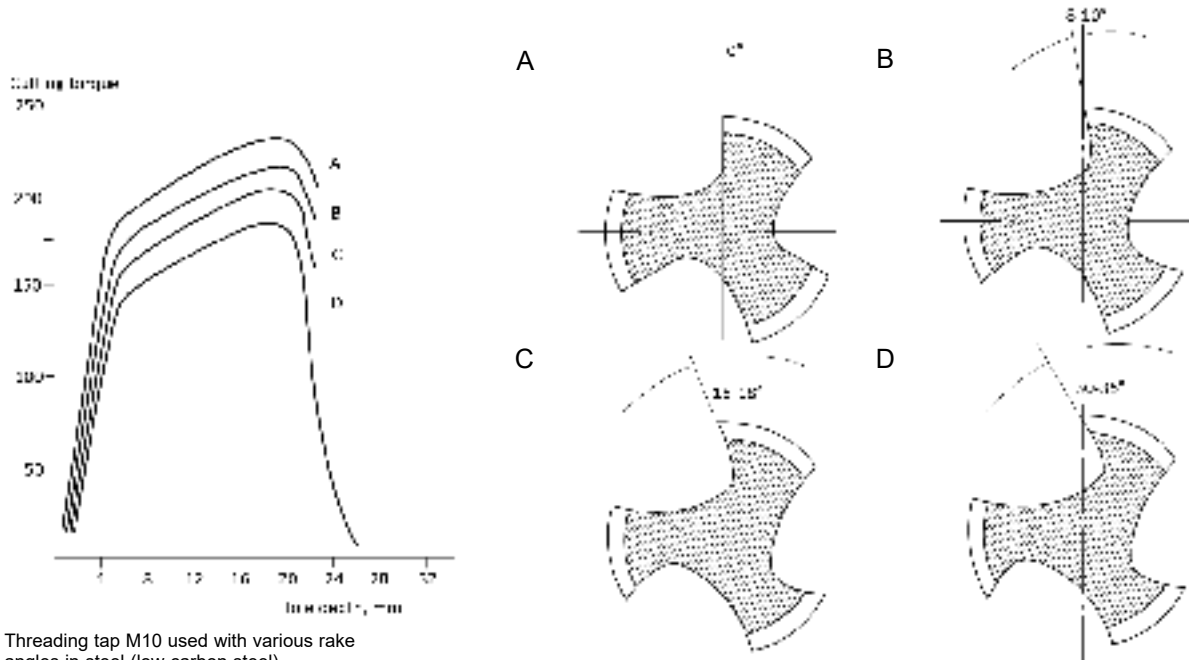
| Description | Chips |
|---|---|
| <p>Taps with straight flutes</p> <p>Straight flutes are the most commonly used type of tap. Suitable for use on most materials, mainly short chipping steel and cast iron, they form the basis of the program.</p> |  |
| <p>Taps with interrupted thread</p> <p>The interrupted 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</p> |  |
| <p>Spiral point taps</p> <p>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.</p> |  |
| <p>Nut taps</p> <p>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.</p> <p>They are used on special machines designed to thread huge amounts of nuts. They can work in steel and stainless steel.</p> <p>The first serial tap has a very long chamfer, in order to spread the cutting load on almost two thirds of the thread length.</p> |  |

| Description | Chips |
|---|---|
| <p>Taps with flutes only on the chamfer lead</p> <p>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 $1.5 \times \varnothing$.</p> |  |
| <p>Taps with spiral flutes</p> <p>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.</p> |  |
| <p>Cold forming taps</p> <p>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 (R_m) should not exceed 1200 N/mm^2 and the elongation factor (A_5) should not be less than 10%.</p> <p>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.</p> |  |
| <p>Through coolant taps</p> <p>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.</p> <p>Lubrication can be oil, emulsion or air pressurised with oil mist. Working pressure not less than 15 bar is required, but good results can be obtained with minimal lubrication.</p> |  |

Technical Section - Threading

TAPPING TECHNICAL DATA

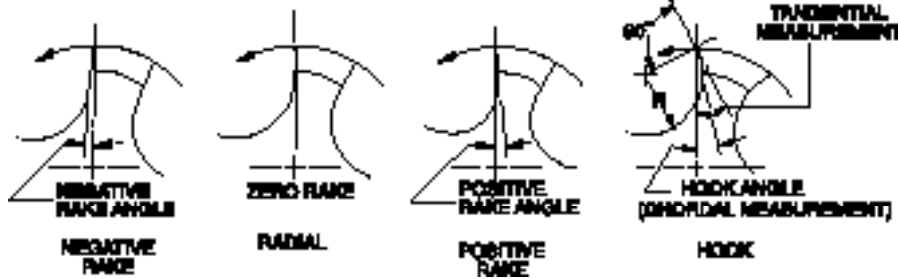
Rake Angles



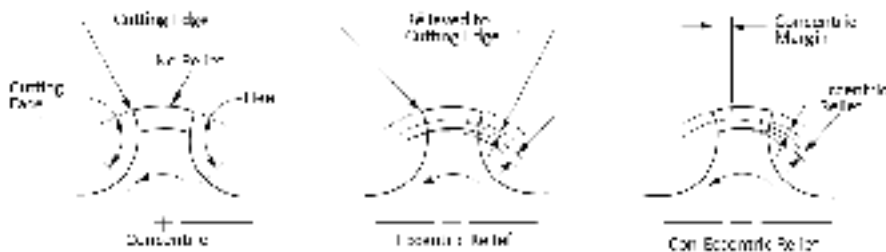
Threading tap M10 used with various rake angles in steel (low carbon steel)

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

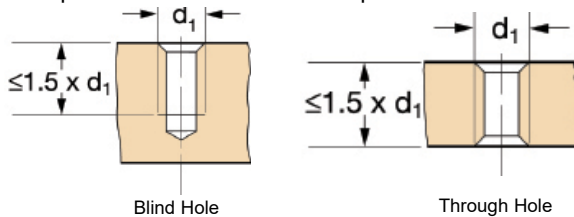


Technical Section - Threading

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.

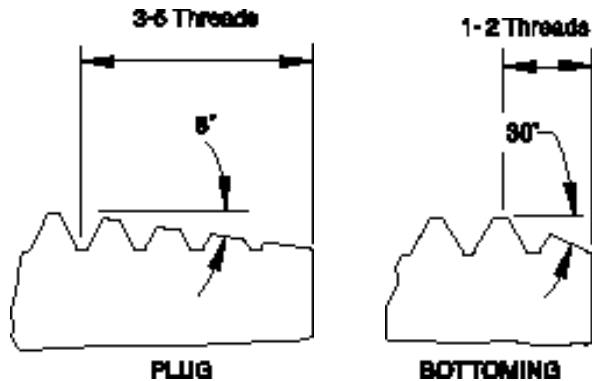
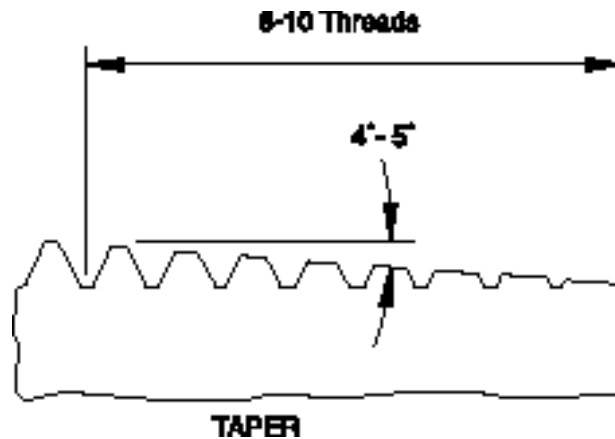
Generally, the form and length of chamfer depend on the type of hole to be tapped. Though holes do not normally cause difficulties whereas the tapping of blind holes can create certain problems associated with chip evacuation.



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.


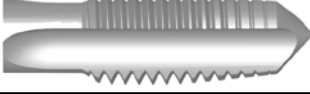

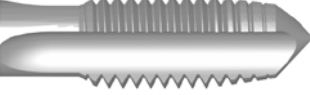

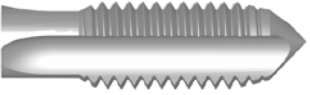



$$\text{RPM} = \frac{3.82 \times \text{SFM}}{D}$$

$$\text{SFM} = .26 \times \text{RPM} \times D$$

Technical Section - Threading

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 | |
|  | | | |
| | $\varnothing \leq M10$ | | $\varnothing \geq M12$ |

| | | |
|-------------|------------------------|---|
| 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) |

Technical Section - Threading

TAPPING TECHNICAL DATA

The Relationship Between H-Limit and Class of Fit

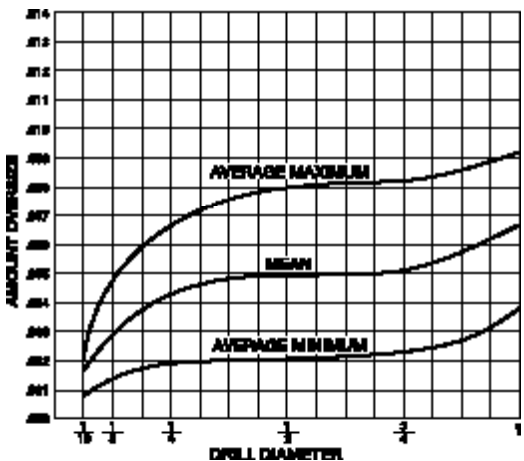
H-limits are used to properly size a tap for the threaded hole to be produced. They are selected based upon the tolerance required for the part. These tolerances are defined by the symbols class 1B, 2B, or 3B. Class 1B has the broadest tolerance and is generally applied to DIY (Do It Yourself) type nuts 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 the 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 or 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 chart 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 |

Technical Section - Threading

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

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 Limit No. = Amt. Tap PD High Limit Is Over Basic PD
.00052"

DU Limit No. = 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"

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.

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.

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.

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.

Technical Section - Threading

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 treatment 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.

Technical Section - Threading

SELF-LOCKING THREAD FORM

Concept

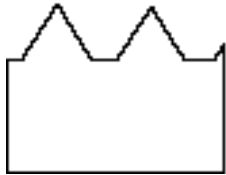
Designed to produce threads for self-locking operations and put a lock on fastener costs.

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.

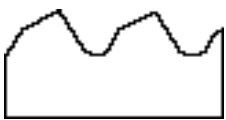
Although this is a made-to-order program, quantities of up to 48 pieces of any style would be delivered in no greater than 10 working days.

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



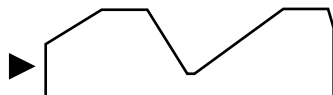
Standard Thread Form



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

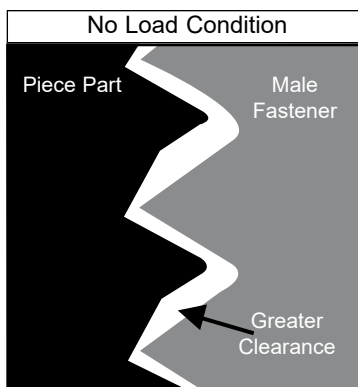
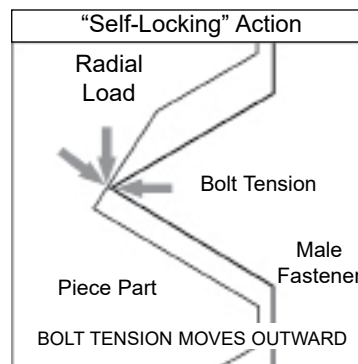
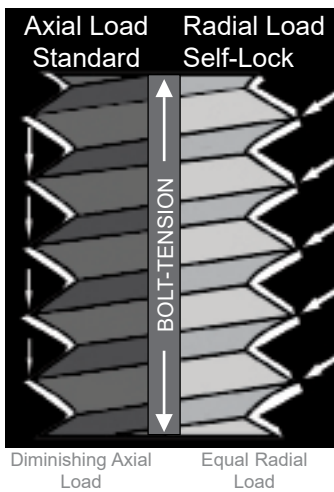
There is no loss of locking power in those applications requiring frequent loosening and tightening of the male fastener. This eliminates time intensive disassembly and assembly procedures. Conventional locking fasteners would be either destroyed or their locking power severely diminished.

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.



Technical Section - Threading

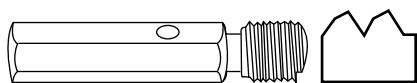
SELF-LOCKING THREAD FORM

Gaging for Self-Locking Threads

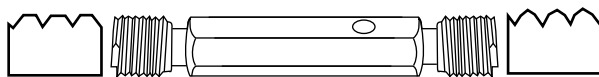
An essential element in high quality thread production is an accurate gaging capability. To facilitate the latter Precision offers a complete gaging system for self-locking threads, which consists of the following:

LARGER DIAMETERS

Go-Pitch Diameter and Ramp Gage

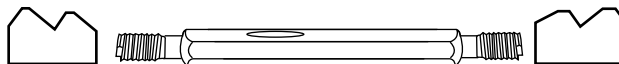


Hi-Pitch Diameter and Ramp Gage



SMALLER DIAMETERS

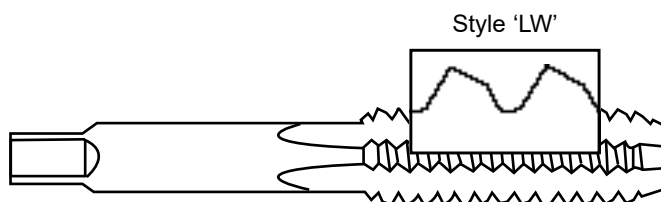
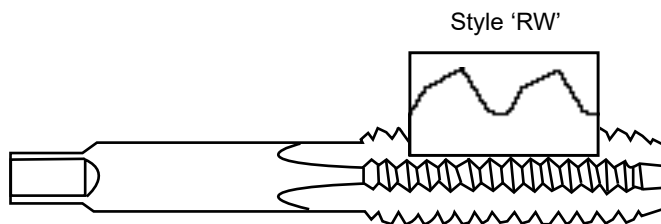
Go-Pitch Diameter and Ramp Gage Hi-Limit Gage



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



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) | 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 | 8-36 | 29 | .1360 | 78 | .0029 | .1389 | 70 |
| — | 3/64 | .0469 | 81 | .0015 | .0484 | 71 | — | 3.5mm | .1378 | 72 | .0029 | .1407 | 65 |
| — | 1.20mm | .0472 | 79 | .0015 | .0487 | 69 | 10-24 | 27 | .1440 | 85 | .0032 | .1472 | 79 |
| — | 1.25mm | .0492 | 67 | .0015 | .0507 | 57 | — | 3.70mm | .1457 | 82 | .0032 | .1489 | 76 |
| 1-64 | 54 | .0550 | 89 | .0015 | .0565 | 81 | — | 26 | .1470 | 79 | .0032 | .1502 | 74 |
| — | 1.45mm | .0571 | 78 | .0015 | .0586 | 71 | — | 25 | .1495 | 75 | .0032 | .1527 | 69 |
| — | 53 | .0595 | 67 | .0015 | .0610 | 59 | — | 24 | .1520 | 70 | .0032 | .1552 | 64 |
| 1-72 | 1.5mm | .0591 | 77 | .0015 | .0606 | 68 | 10-32 | 5/32 | .1563 | 83 | .0032 | .1595 | 75 |
| — | 53 | .0595 | 75 | .0015 | .0610 | 67 | — | 22 | .1570 | 81 | .0032 | .1602 | 73 |
| — | 1.55mm | .0610 | 67 | .0015 | .0606 | 68 | — | 21 | .1590 | 76 | .0032 | .1622 | 68 |
| 2-56 | 51 | .0670 | 82 | .0017 | .0687 | 74 | 12-24 | 11/64 | .1719 | 82 | .0035 | .1754 | 75 |
| — | 1.75mm | .0689 | 73 | .0017 | .0706 | 66 | — | 17 | .1730 | 79 | .0035 | .1765 | 73 |
| — | 50 | .0700 | 69 | .0017 | .0717 | 62 | — | 16 | .1770 | 72 | .0035 | .1805 | 66 |
| — | 1.80mm | .0709 | 65 | .0017 | .0726 | 58 | 12-28 | 16 | .1770 | 84 | .0035 | .1805 | 77 |
| 2-64 | 50 | .0700 | 79 | .0017 | .0717 | 70 | — | 15 | .1800 | 78 | .0035 | .1835 | 70 |
| — | 1.80mm | .0709 | 74 | .0017 | .0726 | 66 | — | 4.60mm | .1811 | 75 | .0035 | .1846 | 67 |
| — | 49 | .0730 | 64 | .0017 | .0747 | 56 | — | 14 | .1820 | 73 | .0035 | .1855 | 66 |
| 3-48 | 48 | .0760 | 85 | .0019 | .0779 | 78 | 1/4-20 | 9 | .1960 | 83 | .0038 | .1998 | 77 |
| — | 5/64 | .0781 | 77 | .0019 | .0800 | 70 | — | 8 | .1990 | 79 | .0038 | .2028 | 73 |
| — | 47 | .0785 | 76 | .0019 | .0804 | 69 | — | 7 | .2010 | 75 | .0038 | .2048 | 70 |
| — | 2.00mm | .0787 | 75 | .0019 | .0806 | 68 | — | 13/64 | .2031 | 72 | .0038 | .2069 | 66 |
| — | 46 | .0810 | 67 | .0019 | .0829 | 60 | 1/4-28 | 5.40mm | .2126 | 81 | .0038 | .2164 | 72 |
| — | 45 | .0820 | 63 | .0019 | .0839 | 56 | — | 3 | .2130 | 80 | .0038 | .2168 | 72 |
| 3-56 | 46 | .0810 | 78 | .0019 | .0829 | 69 | 5/16-18 | F | .2570 | 77 | .0038 | .2608 | 72 |
| — | 45 | .0820 | 73 | .0019 | .0839 | 65 | — | 6.60mm | .2598 | 73 | .0038 | .2636 | 68 |
| — | 2.10mm | .0827 | 70 | .0019 | .0846 | 62 | — | G | .2610 | 71 | .0041 | .2651 | 66 |
| — | 1.15mm | .0846 | 62 | .0019 | .0865 | 54 | 5/16-24 | H | .2660 | 86 | .0041 | .2701 | 78 |
| 4-40 | 44 | .0860 | 80 | .0020 | .0880 | 74 | — | 6.80mm | .2677 | 83 | .0041 | .2718 | 75 |
| — | 2.20mm | .0866 | 78 | .0020 | .0886 | 72 | — | I | .2720 | 75 | .0041 | .2761 | 67 |
| — | 43 | .0890 | 71 | .0020 | .0910 | 65 | 3/8-16 | 7.80mm | .3071 | 84 | .0044 | .3115 | 78 |
| — | 2.30mm | .0906 | 66 | .0020 | .0926 | 60 | — | 7.90mm | .3110 | 79 | .0044 | .3154 | 73 |
| 4-48 | 2.35mm | .0925 | 72 | .0020 | .0926 | 72 | — | 5/16 | .3125 | 77 | .0044 | .3169 | 72 |
| — | 42 | .0935 | 68 | .0020 | .0955 | 61 | — | O | .3160 | 73 | .0044 | .3204 | 68 |
| — | 3/32 | .0938 | 68 | .0020 | .0958 | 60 | 3/8-24 | 21/64 | .3281 | 87 | .0044 | .3325 | 79 |
| — | 2.40mm | .0945 | 65 | .0020 | .0965 | 57 | — | 8.40mm | .3307 | 82 | .0044 | .3351 | 74 |
| 5-40 | 40 | .0980 | 83 | .0023 | .1003 | 76 | — | Q | .3320 | 79 | .0044 | .3364 | 71 |
| — | 39 | .0995 | 79 | .0023 | .1018 | 71 | — | 8.50mm | .3346 | 75 | .0044 | .3390 | 67 |
| — | 38 | .1015 | 72 | .0023 | .1038 | 65 | 7/16-14 | T | .3580 | 86 | .0046 | .3626 | 81 |
| — | 2.60mm | .1024 | 70 | .0023 | .1047 | 63 | — | 23/64 | .3594 | 84 | .0046 | .3640 | 79 |
| 5-44 | 38 | .1015 | 79 | .0023 | .1038 | 72 | — | 9.20mm | .3622 | 81 | .0046 | .3668 | 76 |
| — | 2.60mm | .1024 | 77 | .0023 | .1047 | 69 | — | 9.30mm | .3661 | 77 | .0046 | .3707 | 72 |
| — | 37 | .1040 | 71 | .0023 | .1063 | 63 | — | U | .3680 | 75 | .0046 | .3726 | 70 |
| 6-32 | 37 | .1040 | 84 | .0023 | .1063 | 78 | — | 9.40mm | .3701 | 73 | .0046 | .3747 | 68 |
| — | 36 | .1065 | 78 | .0023 | .1088 | 72 | 7/16-20 | W | .3860 | 79 | .0046 | .3906 | 72 |
| — | 7/64 | .1094 | 70 | .0026 | .1120 | 64 | — | 25/64 | .3906 | 72 | .0046 | .3952 | 65 |
| — | 35 | .1100 | 69 | .0026 | .1126 | 63 | 1/2-13 | 10.50mm | .4134 | 87 | .0047 | .4181 | 82 |
| — | 34 | .1100 | 67 | .0026 | .1136 | 60 | — | 27/64 | .4219 | 78 | .0047 | .4266 | 73 |
| 6-40 | 34 | .1110 | 83 | .0026 | .1136 | 75 | 1/2-20 | 29/64 | .4531 | 72 | .0047 | .4578 | 65 |
| — | 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 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 | 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 | M5 x 0.8 | 4.2mm | .1654 | 77 | .0032 | .1686 | 69 |
| — | 1.25mm | .0492 | 77 | .0014 | .0506 | 69 | — | 19 | .1660 | 75 | .0032 | .1692 | 68 |
| M2 x 0.4 | 1/16 | .0625 | 79 | .0015 | .0640 | 72 | M6 x 1 | 10 | .1935 | 84 | .0038 | .1973 | 76 |
| — | 1.60mm | .0630 | 77 | .0017 | .0647 | 69 | — | 9 | .1960 | 79 | .0038 | .1998 | 71 |
| — | 52 | .0635 | 74 | .0017 | .0652 | 66 | — | 5mm | .1969 | 77 | .0038 | .2006 | 70 |
| M2.5 x 0.45 | 2.05mm | .0807 | 77 | .0019 | .0826 | 69 | — | 8 | .1990 | 73 | .0038 | .2028 | 65 |
| — | 46 | .0810 | 76 | .0019 | .0829 | 67 | M7 x 1 | A | .2340 | 81 | .0038 | .2378 | 74 |
| — | 45 | .0820 | 71 | .0019 | .0839 | 63 | — | 6mm | .2362 | 77 | .0038 | .2400 | 70 |
| M3 x 0.5 | 40 | .0980 | 79 | .0023 | .1003 | 70 | — | B | .2380 | 74 | .0038 | .2418 | 66 |
| — | 2.5mm | .0984 | 77 | .0023 | .1007 | 68 | M8 x 1.25 | 6.7mm | .2638 | 80 | .0041 | .2679 | 74 |
| — | 39 | .0995 | 73 | .0023 | .1018 | 64 | — | 17/64 | .2656 | 77 | .0041 | .2697 | 71 |
| M3.5 x 0.6 | 33 | .1130 | 81 | .0026 | .1156 | 72 | — | H | .2660 | 77 | .0041 | .2701 | 70 |
| — | 2.9mm | .1142 | 77 | .0026 | .1168 | 68 | — | 6.8mm | .2677 | 74 | .0041 | .2718 | 68 |
| — | 32 | .1160 | 71 | .0026 | .1186 | 63 | M10 x 1.5 | 8.4mm | .3307 | 82 | .0044 | .3344 | .3351 |
| M4 x 0.7 | 3.2mm | .1260 | 88 | .0029 | .1289 | 80 | — | Q | .3320 | 80 | .0044 | .3364 | 75 |
| — | 30 | .1285 | 81 | .0029 | .1314 | 73 | — | 8.5mm | .3346 | 77 | .0044 | .3390 | 71 |
| — | 3.3mm | .1299 | 77 | .0029 | .1328 | 69 | M12 x 1.5 | 10.4mm | .4094 | 81 | .0047 | .4141 | .4141 |
| M4.5 x 0.75 | 3.7mm | .1457 | 82 | .0032 | .1489 | 74 | — | Z | .4130 | 77 | .0047 | .4177 | 71 |
| — | 26 | .1470 | 79 | .0032 | .1502 | 70 | M12 x 1.75 | 10.20mm | .4016 | 79 | .0047 | .4047 | .4063 |
| — | 25 | .1495 | 72 | .0032 | .1527 | 64 | — | 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.

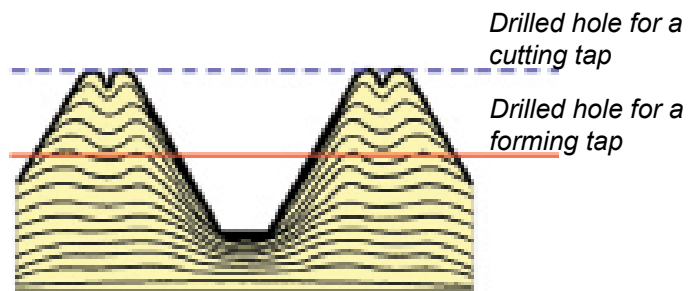
Technical Section - Threading

FLOW OF MATERIAL WHEN FORMING A THREAD

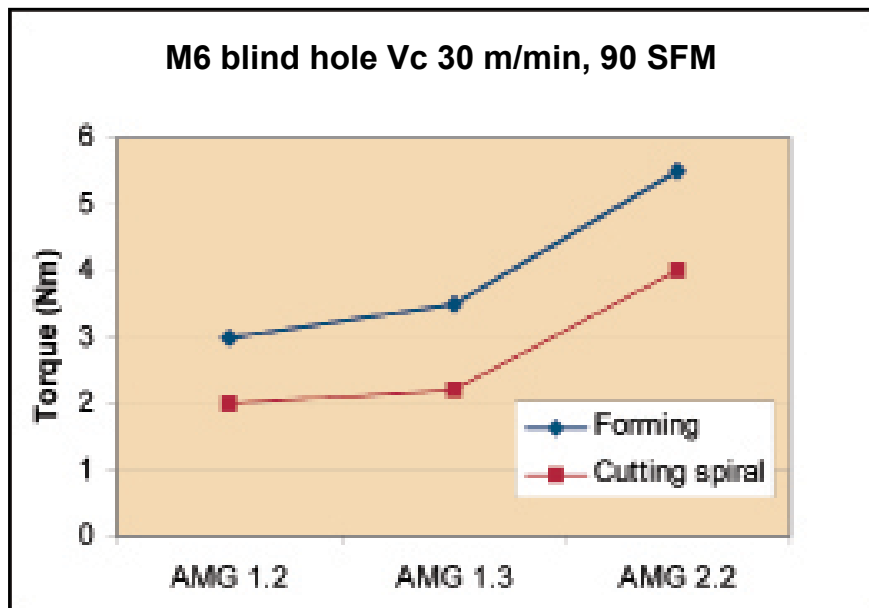
The tapping hole size depends upon the material being drilled, the cutting conditions selected and the condition of the equipment being used. If material is pushed up at the thread entry by the tap and/or the life of the tap is too short, select a slightly larger drill diameter. If on the other hand 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 % | 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 x 0.5 | 36 | 0.1065 | 86 | .0026 | .1091 | 67 | M8 x 1.25 | 7.4mm | 0.2910 | 71 | .0042 | .2952 | 59 |
| — | 2.7mm | 0.1062 | 88 | .0026 | .1088 | 70 | — | L | 0.2900 | 75 | .0042 | .2942 | 62 |
| M4 x 0.7 | 27 | 0.1440 | 72 | .0032 | .1472 | 54 | — | 7.3mm | .2874 | 82 | .0042 | .2916 | 70 |
| — | 3.6mm | .1417 | 84 | .0032 | .1449 | 67 | M10 x 1.5 | U | 0.3680 | 64 | .0046 | .3726 | 53 |
| — | 9/64 | .1406 | 90 | .0032 | .1438 | 73 | — | 9.3mm | 0.3660 | 69 | .0046 | .3706 | 58 |
| M5 x 0.8 | 14 | 0.1820 | 69 | .0035 | .1855 | 53 | — | 9.2mm | 0.3620 | 78 | .0046 | .3666 | 67 |
| — | 4.6mm | .1811 | 74 | .0035 | .1846 | 57 | — | 23/64 | .3594 | 85 | .0046 | .3640 | 74 |
| — | 15 | .1800 | 79 | .0035 | .1835 | 62 | M12 x 1.5 | 11.3mm | .4449 | 70 | .0047 | .4496 | 57 |
| — | 16 | 0.1770 | 92 | .0035 | .1805 | 76 | — | 7/16 | .4375 | 86 | .0047 | .4422 | 75 |
| M6 x 1 | 7/32 | .2188 | 65 | .0038 | .2226 | 51 | M12 x 1.75 | 7/16 | .4375 | 75 | .0047 | .4422 | 65 |
| — | 5.4mm | .2126 | 88 | .0038 | .2164 | 74 | — | 11mm | .4331 | 84 | .0047 | .4378 | 73 |

*Probable percent of full thread produced in tapped hole using standard drill sizes.

Technical Section - Threading

Tap Projection and Hole Size for Pipe Taps

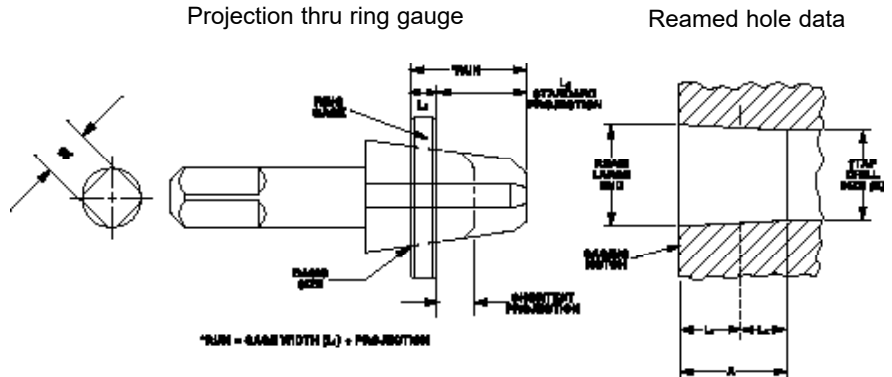
| Nominal Size | Tap Thread Limits | | | | Projection | | | | Ream Dia. Large End | Gage Width L ₁ | L ₃ | A | Tap Drill Size B | Tap Drill Size BB |
|----------------|-------------------|--------------------------|----------------------|-------|------------|--------|-------------|--------|---------------------|---------------------------|----------------|-------|------------------|-------------------|
| | L ₂ | L ₂ Tolerance | Taper Per Ft. Limits | | NPT & NPTF | | SAE - Short | | | | | | | |
| | | | Min. | Max. | Min. | Max. | Min. | Max. | | | | | | |
| 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 | 37/64 |
| 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 |
| 8 | Ground Thread |
| | 25' Plus or Minus |
| 11-1/2 to 27 inclusive | 30' Plus or minus |

*Distance small end of tap projects through L₁ Taper Thread Ring Gage.
 **Recommended sizes given permit direct tapping without reaming the hole, but only give a full thread for approx. L₁ 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



Recommended Minor Diameters and Tap Drills for STI Spiral Point and Hand Taps

| Nominal Diameter | T.R.I. | | Aluminum | | | | Plastic - Steel - Magnesium | | | |
|------------------|--------|-----|--------------------------|-------|-------------------------------|---------|-----------------------------|-------|-------------------------------|---------|
| | UNC | UNF | Diameter of Tapped Holes | | Recommended Minor/ Drill Size | | Diameter of Tapped Holes | | Recommended Minor/ Drill Size | |
| | | | Min. | Max. | Tap Drill Size | Dec Eq. | Min. | Max. | Tap 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 | 17/32 | .5312 |
| 1/2 | — | 20 | .5130 | .5220 | 33/64 | .5156 | .5150 | .5240 | 17/32 | .5312 |

Technical Section - Threading

TAP SIZE RECOMMENDATIONS FOR CLASSES 2B AND 3B

Machine Screw Sizes

| Size | Threads Per Inch | | Recommended Tap For Class of Thread | | Pitch Diameter Limits for Class of Thread | | |
|------|------------------|----|-------------------------------------|----------|---|--------------|--------------|
| | NC | NF | Class 2B | Class 3B | Min. All Classes (Basic) | Max Class 2B | 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 | | Recommended Tap For Class of Thread | | Pitch Diameter Limits for Class of Thread | | |
|------|------------------|----|-------------------------------------|----------|---|--------------|--------------|
| | NC | NF | Class 2B | Class 3B | Min. All Classes (Basic) | Max Class 2B | 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 | | Internal Thread-Class 6H (Inches) | | | | Recommended Tap | | |
|-------------------|------------|-----------------------------------|--------|------------|--------|-----------------|-------------|--------------|
| Nominal Dia. (mm) | Pitch (mm) | Minor Dia. | | Pitch Dia. | | Major Dia. | Tap Size | Limit Number |
| | | Min. | Max. | Min. | Max. | | | |
| 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 | Basic | Tap Recommendations For Class 2B Fit | | Tap Recommendations For Class 3B Fit | | Oversize Forming Taps | | Tap Size UNC-NF | Basic P.D. | Tap Recommendations For Class 2B Fit | | Tap Recommendations For Class 3B Fit | | Oversize Forming Taps | |
|----------|-------|--------------------------------------|-----------------|--------------------------------------|-----------------|-----------------------|-----------------|-----------------|------------|--------------------------------------|-----------------|--------------------------------------|-----------------|-----------------------|-----------------|
| | | Styles | Max. PD. Thread | Styles | Max. PD. Thread | Styles | Max. PD. Thread | | | Styles | Max. PD. Thread | Styles | Max. PD. Thread | Styles | Max. PD. Thread |
| 0-80 | .0519 | — | — | H-2 | .0536 | — | — | 10-24 | .1629 | H-6 | .1672 | H-4 | .1661 | — | — |
| 1-64 | .0629 | — | — | H-2 | .0648 | — | — | 10-32 | .1697 | H-6 | .1736 | H-4 | .1762 | — | — |
| 1-72 | .0640 | — | — | H-2 | .0659 | — | — | 12-24 | .1889 | H-6 | .1933 | H-4 | .1922 | — | — |
| 2-56 | .0744 | H-3 | .0772 | H-2 | .0765 | — | — | 12-2 8 | .1928 | H-6 | .1970 | H-4 | .1959 | — | — |
| 2-64 | .0759 | H-3 | .0786 | H-2 | .0779 | — | — | 1/4-20 | .2175 | H-6 | .2223 | H-4 | .2211 | H-8 | .2215 |
| 3-48 | .0855 | H-3 | .0885 | H-2 | .0877 | — | — | 1/4-28 | .2268 | H-6 | .2311 | H-4 | .2300 | H-8 | .2308 |
| 3-56 | .0874 | H-3 | .0902 | H-2 | .0895 | — | — | 5/16-18 | .2764 | H-7 | .2817 | H-5 | .2803 | H-9 | .2809 |
| 4-40 | .0958 | H-5 | .0991 | H-3 | .0982 | — | — | 5/16-24 | .2854 | H-7 | .2902 | H-5 | .2890 | H-9 | .2899 |
| 4-48 | .0985 | H-5 | .1016 | H-3 | .1008 | — | — | 3/8-16 | .3344 | H-7 | .3401 | H-5 | .3387 | H-9 | .3389 |
| 5-40 | .1088 | H-5 | .1121 | H-3 | .1113 | — | — | 3/8-24 | .3479 | H-7 | .3528 | H-5 | .3516 | H-9 | .3524 |
| 5-44 | .1102 | H-5 | .1134 | H-3 | .1126 | — | — | 7/16-14 | .3911 | H-8 | .3972 | H-5 | .3957 | — | — |
| 6-32 | .1177 | H-5 | .1214 | H-3 | .1204 | — | — | 7/16-20 | .4050 | H-8 | .4104 | H-5 | .4091 | — | — |
| 6-40 | .1218 | H-5 | .1252 | H-3 | .1243 | — | — | 1/2-13 | .4500 | H-8 | .4565 | H-5 | .4548 | H-10 | .4550 |
| 8-32 | .1437 | H-5 | .1475 | H-3 | .1465 | — | — | 1/2-20 | .4675 | H-8 | .4731 | H-5 | .4717 | H-10 | .4725 |
| 8-36 | .1460 | H-5 | .1496 | H-3 | .1487 | — | — | | | | | | | | |

Technical Section - Threading

UNIFIED SCREW THREAD LIMITS

Diameter - Pitch Combinations for Class of Fit

| Nominal Size Threads Per Inch and Series Designation | Class | Internal | | | | Major Diameter Min. |
|---|-------|----------------|-------|----------------|-------|------------------------|
| | | Minor Diameter | | Pitch Diameter | | |
| | | 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 | | | | Major Diameter Min. |
|---|-------|----------------|-------|----------------|-------|------------------------|
| | | Minor Diameter | | Pitch Diameter | | |
| | | 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 | | | | Major Diameter Min. |
|---|-------|----------------|-------|----------------|-------|---------------------------|
| | | Minor Diameter | | Pitch Diameter | | |
| | | 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 | | | | Major Diameter Min. |
|---|-------|----------------|-------|----------------|-------|---------------------------|
| | | Minor Diameter | | Pitch Diameter | | |
| | | 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 Description | 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 |
| 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 Description | 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 |
| 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.

Technical Section - Threading

TAPPING SPEEDS

Conventional Table (Surface Feet Per Minute to Revolutions Per Minute)

| Tap Sizes UNC/ UNF | Pipe | Surface Feet Per Minute | | | | | | | | | | | | | | | | | |
|--------------------------|------|-------------------------|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 5' | 10' | 15' | 20' | 25' | 30' | 40' | 50' | 60' | 70' | 80' | 90' | 100' | 110' | 120' | 130' | 140' | 150' |
| | | 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 |

Technical Section - Threading

TYPICAL TAPPING PROBLEMS

| Problem | Cause | Solution |
|-------------------------------------|----------------------|--|
| DIMENSIONAL ACCURACY | | |
| Oversize Pitch Diameter | | |
| | Incorrect Tap | <ol style="list-style-type: none"> 1. Use correct H limit 2. Use longer chamfered taps 3. Consider less free cutting NR style |
| | Chip packing | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 1. Apply surface treatment such as steam tempered, TiN, TiCN or CrN 2. Use recommended lubricant 3. Reduce tapping speed 4. Use correct tap for the material being tapped |
| | Operating Conditions | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 1. Use oversize taps <ul style="list-style-type: none"> » 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 1. Use thread relieved taps 2. Reduce land width 3. Apply surface treatment such as steam tempered, 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 | <ol style="list-style-type: none"> 1. Use spiral pointed or spiral fluted taps 2. Use larger drill size |
| Chattering on Tapped Thread | | |
| | Too Positive | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 tempered, TiN, TiCN or CrN |
| | Excessive Tapping Torque | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 tempered, TiN, TiCN or CrN 4. Increase chamfer length |
| | Operating Conditions | <ol style="list-style-type: none"> 1. Reduce tapping speed 2. Apply adequate lubrication 3. Avoid work hardening the material being tapped 4. Use larger drill size |
| | Tool Condition | <ol style="list-style-type: none"> 1. Ensure correct rake angle 2. Minimize heat in grinding process to avoid de-tempering |

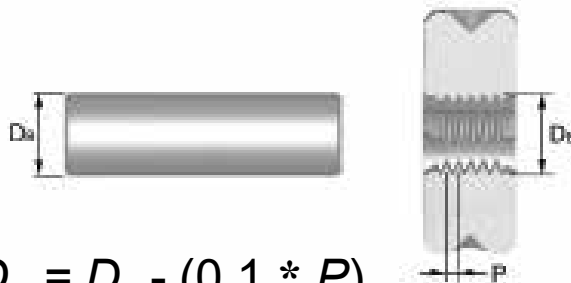
Technical Section - Threading

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.

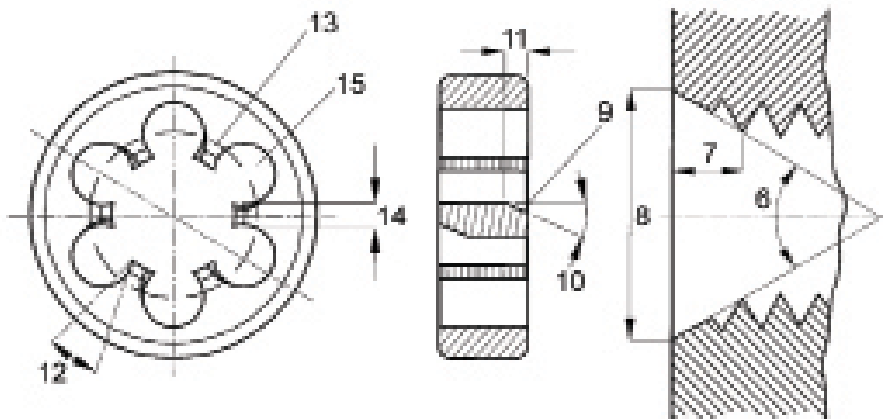
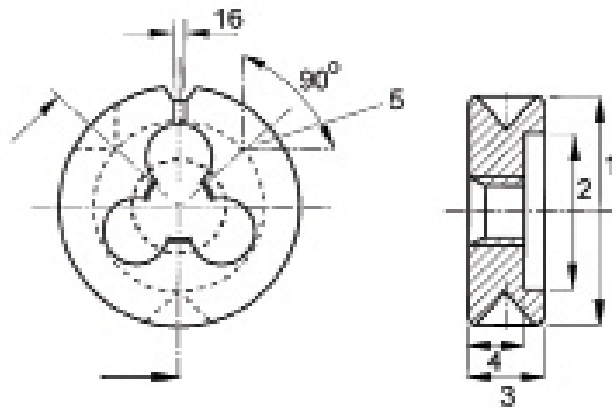
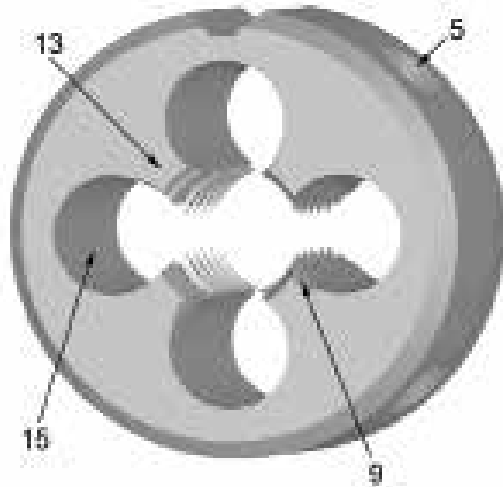


$$D_B = D_E - (0,1 * P)$$

Technical Section - Threading

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



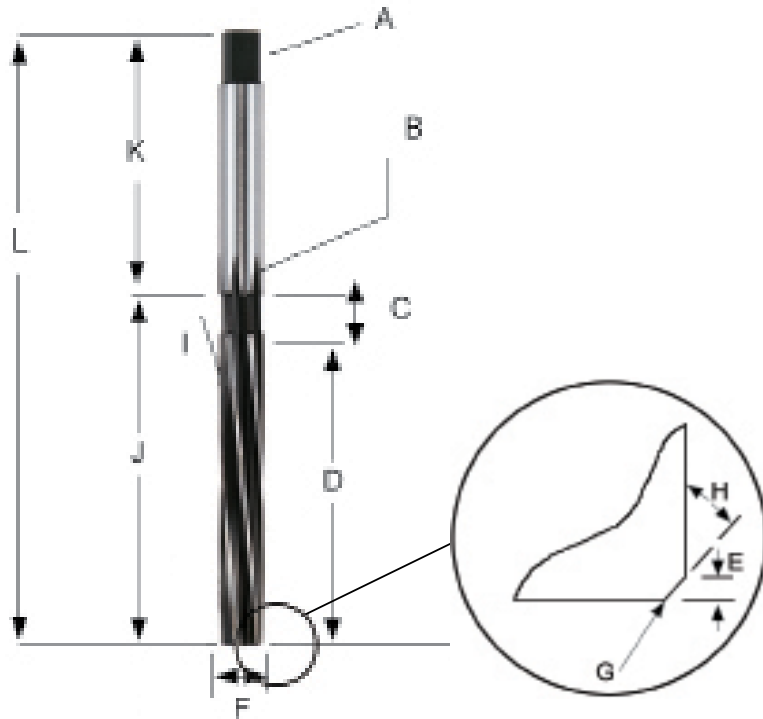
Technical Section - Threading

TROUBLE SHOOTING WHEN THREADING WITH DIES

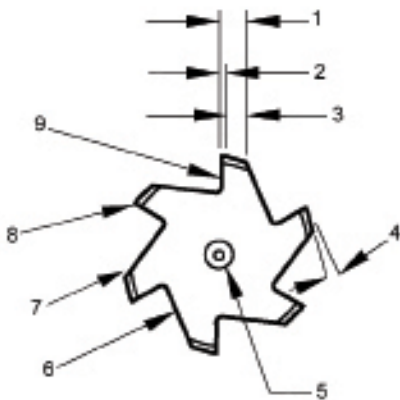
| <i>Problem</i> | <i>Cause</i> | <i>Solution</i> |
|-----------------------------|---------------------------------------|---|
| Oversize / Undersize | | |
| | Misalignment | Correct alignment, ensure cleanliness |
| | Incorrect axial feed rate | Ensure axial feed rate is controlled accurately |
| Poor 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 |

Technical Section - Reaming

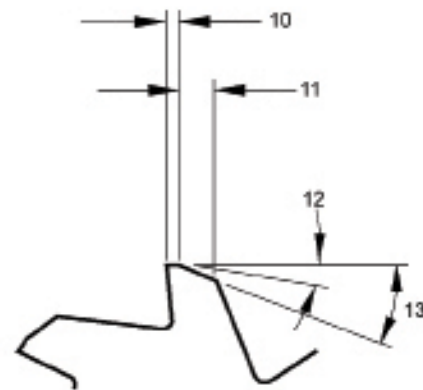
REAMER DEFINITIONS / NOMENCLATURE



- 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 Section - Reaming

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.

Technical Section - Reaming

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* | .004 | .004 – .008 | .006 – .010 | .008 – .014 | .010 – .018 | .016 – .025 |
| Hard cast-iron | | | | | | |
| Soft cast-iron | .005 | .005 – .012 | .008 – .016 | .010 – .020 | .016 – .024 | .024 – .031 |
| Light alloys* | | | | | | |
| Copper, soft | | | | | | |
| Copper, alloys | | | | | | |
| 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) | | Type of Feed |
|--|-------------------|------------|--------------|
| | HSS | Carbide | |
| Magnesium | 200 – 400 | 500 – 1000 | M-H |
| Aluminum | 150 – 300 | 500 – 1000 | M-H |
| Brass and Bronze – Free Mach. – Tough | 125 – 200 | 250 – 400 | M |
| | 75 – 125 | 150 – 250 | M |
| Copper and Hard Bronze | 50 – 75 | 100 – 150 | L |
| Cast Iron – Soft (Ferritic) – Medium (Pearlitic) – Hard (Mart. or Acicular) | 50 – 100 | 150 – 250 | H |
| | 25 – 50 | 75 – 150 | L-M |
| | 15 – 25 | 50 – 75 | L |
| Steel – Under 200 BHN – 200 - 300 BHN – 300 - 400 BHN – 400 - 500 BHN – 500 - BHN Plus | 55 – 80 | 200 – 300 | M-H |
| | 30 – 55 | 125 – 200 | M |
| | 20 – 30 | 50 – 125 | L |
| | 10 – 20 | 35 – 50 | L |
| | — | 15 – 35 | L |
| Stainless – Free Mach. and 400 Ann. – 300 Series – P.H. and H.T. 400 series | 40 – 60 | 150 – 250 | M |
| | 20 – 30 | 80 – 120 | M |
| | 15 – 25 | 60 – 100 | L-M |
| High Temp Alloy – Nickel Base – Cobalt Base | 10 – 20 | 40 – 70 | L |
| | 10 – 15 | 30 – 45 | L |
| Titanium – Pure – Alloys | 35 – 50 | 50 – 100 | M |
| | 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 | Size of reamed hole (inches) | When pre-drilled | When Pre-core-drilled |
|--------------------------|------------------|-----------------------|------------------------------|------------------|-----------------------|
| Below 4 | 0.1 | 0.1 | Below 3/16 | 0.004 | 0.004 |
| Over 4 to 11 | 0.2 | 0.15 | 3/16 to 1/2 | 0.008 | 0.006 |
| Over 11 to 3 | 0.3 | 0.2 | 1/2 to 1. 1/2 | 0.010 | 0.008 |
| Over 39 to 50 | 0.4 | 0.3 | 1. 1/2 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.

Technical Section - Reaming

Applications - Reamer Selection

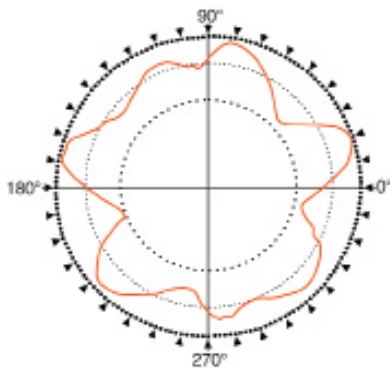
The most common types of reamers have a left-hand spiral because the main applications involve through holes requiring chips to be pushed forward. For blind holes, reamers with straight flutes or right hand spirals are recommended.

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 10 μm with unequal spacing.

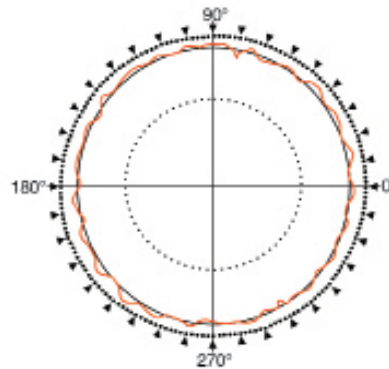
CARBIDE REAMERS - COMPARISON SPACING / EU SPACING

unequal spacing
roundness error up to 10 μm



Results of roundness

extremely unequal spacing
roundness error up to 1 - 2 μm



Results of roundness

Technical Section - Reaming

TROUBLE SHOOTING WHEN REAMING

| <i>Problem</i> | <i>Cause</i> | <i>Solution</i> |
|-----------------------------------|---|---|
| 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 |

Technical Section - Counterboring and Countersinking

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 a 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.



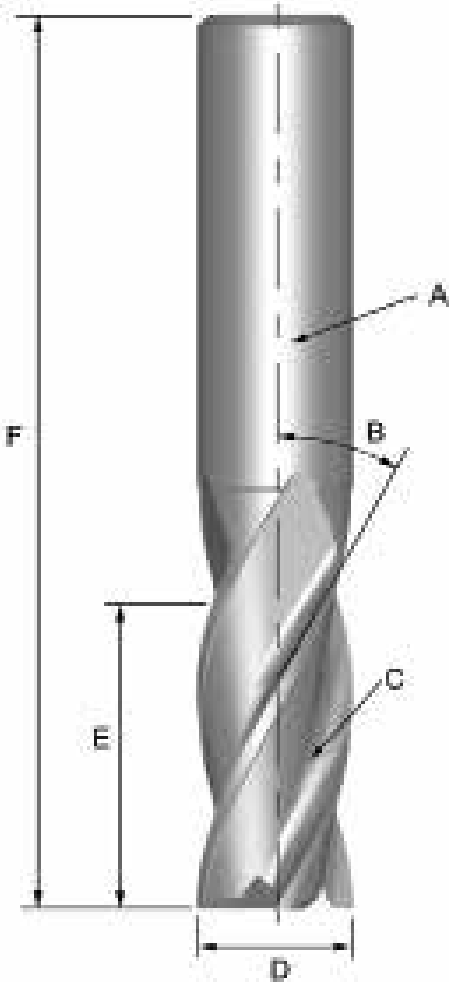
Technical Section - Counterboring and Countersinking

TROUBLE SHOOTING WHEN COUNTERBORING

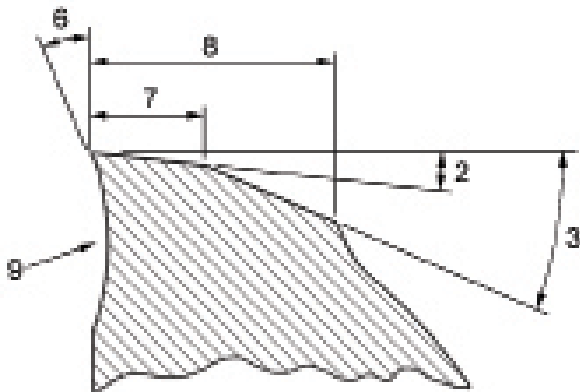
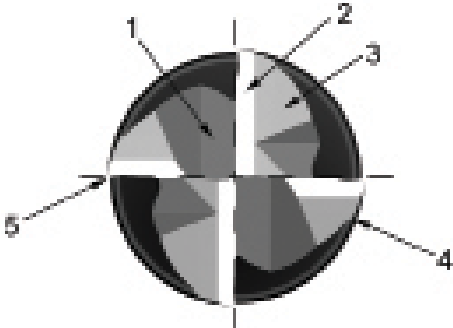
| <i>Problem</i> | <i>Cause</i> | <i>Solution</i> |
|------------------------------------|---------------------------------|--|
| Excessive Cutting Edge Wear | | |
| | Incorrect feeds & speeds | Increase feed - especially when machining ductile or free machining materials. Also try reducing speed |
| | 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 |

Technical Section - Milling

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

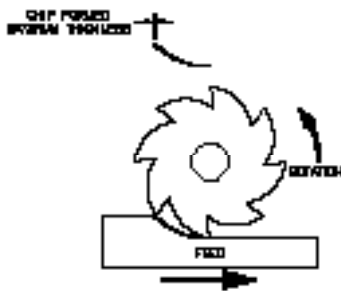
Technical Section - Milling

MILLING EFFECTIVELY

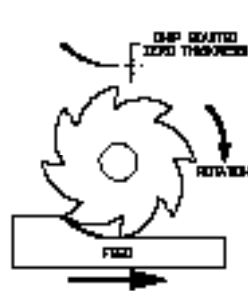
Types Of Cuts

Climb Milling Versus Conventional Milling

CLIMB MILLING



CONVENTIONAL MILLING



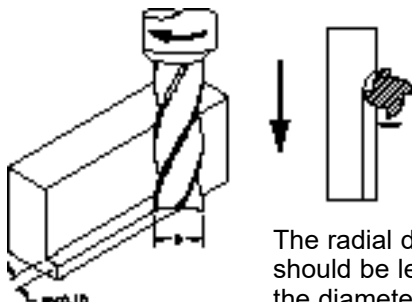
In conventional milling, the cutter revolves opposite to the direction of table feed. Therefore the width of the chip starts at zero and increases to a maximum at the end of the cut. This can lead to accelerated tool wear under some conditions. Conventional milling may be advantageous when milling hot 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.

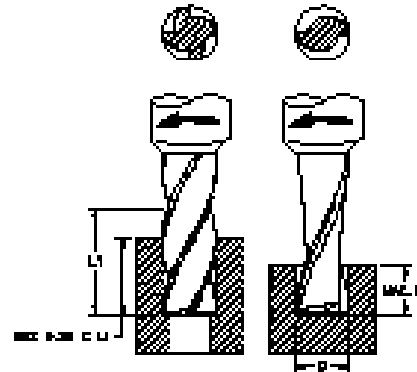
Peripheral Milling The milling of a surface which is parallel to the end mill axis.

Peripheral (Cylindrical, Slab) Milling



The radial depth of cut should be less than 0.1 of the diameter of the mill:
 $a_r < 0.1 D$.

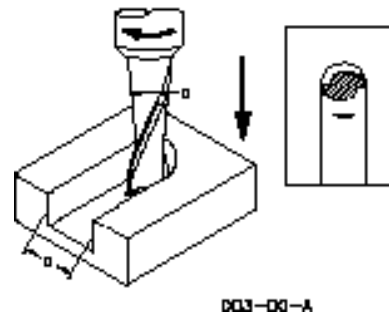
Plunge Milling The direct movement between the workpiece and the center line of the end mill when the end mill sinks directly into the workpiece.



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: $a_r = D$.

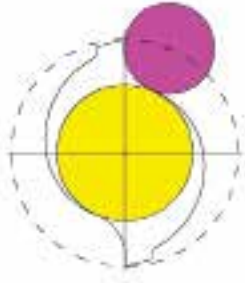
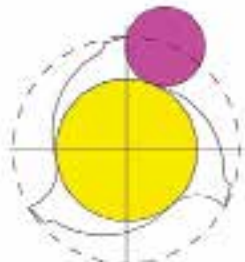
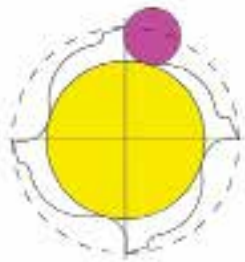
All slotting applications are a combination of conventional and climb milling. Refer to adjacent section.

Technical Section - Milling

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 |
| | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Chip space almost as large as for 2 flutes. • Larger section area - higher rigidity than 2 flutes • Improved surface finish | <ul style="list-style-type: none"> • 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.

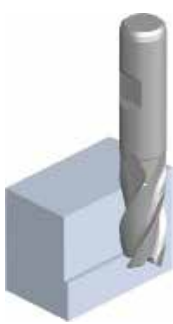

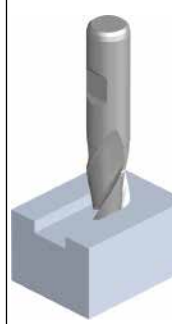
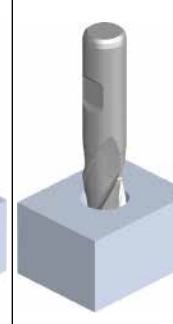
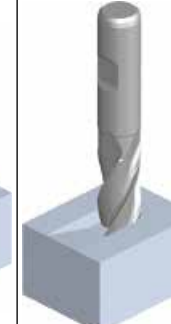
$$Q = \frac{a_p * a_e * v_f}{1000}$$

Q = MRR (cm³/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 workpiece 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. |

Technical Section - Milling

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 | $D \times \text{RPM} \times .26 = \text{SFM}$ |
| RPM = Revolutions Per Minute | $\frac{\text{SFM} \times 3.82}{D} = \text{RPM}$ |
| F = Feed in Inches Per Minute | $\text{Ft} \times \text{T} \times \text{RPM} = \text{F}$ |
| Ft = Feed Per Tooth | $\frac{F}{T \times \text{RPM}} = \text{Ft}$ |
| D = Cutting Diameter | |
| 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 | | | | | | | | | | | | | | | | DIA. In Inches | |
|----------------------|-------------------------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|-------|
| | 15' | 20' | 25' | 30' | 35' | 40' | 45' | 50' | 60' | 70' | 80' | 90' | 100' | 110' | 120' | 130' | | 140' |
| | 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' | |

Technical Section - Milling

CUTTING DATA

S400HA SLOTING

| 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 SLOTING

| 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 SLOTING

| 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 | | | | |

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

| 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 | | | | |

Technical Section - Milling

S406HA & S406HB SLOTING & 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)

SLOTING & 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)

SLOTING & 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)

SLOTING & 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)

SLOTING & 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

Technical Section - Milling

CUTTING DATA

S407HA

SLOTING & 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) | | | | |

SLOTING & 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) | | | | |

Technical Section - Milling

MILLING TROUBLESHOOTING GUIDE

| <i>Problem</i> | <i>Solution</i> | |
|-------------------------------------|---|--|
| Chipping of the Cutting Edge | <ul style="list-style-type: none"> • Apply hone .0005" to .001" • Try air blow or coolant • Reduce depth of cut • Check amount of wear on collet | <ul style="list-style-type: none"> • Reduce feed per tooth • If wet cutting, change to dry cutting • Check tool runout • Improve the stability of the work-holding |
| Extreme Flank Wear | <ul style="list-style-type: none"> • Use coated end mill • If conventional milling, change to climb • If using water soluble cutting fluid, change to non-water soluble cutting fluid | <ul style="list-style-type: none"> • Increase helix angle • If conventional milling, change to climb |
| Vibration / Chattering | <ul style="list-style-type: none"> • Use larger diameter end mill • Increase feed per tooth • Increase helix angle • Reduce length of flutes or overhang | <ul style="list-style-type: none"> • Reduce cutting speed • Check or change the holder • Increase number of flutes • Tighten chuck or use stronger chuck |
| Deflection | <ul style="list-style-type: none"> • Reduce depth of cut • Increase feed per tooth • Increase helix angle • If using water soluble cutting fluid, change to non-water soluble cutting fluid | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • Reduce end mill runout • Increase cutting speed • Reduce feed per tooth • Use small hone .0003" to .0006" • Increase helix angle | <ul style="list-style-type: none"> • Increase number of flutes • Increase volume of air or cutting fluid • Reduce depth of cut • If dry cutting, change to wet cutting |
| Waviness | <ul style="list-style-type: none"> • Reduce helix angle • Check end mill runout | <ul style="list-style-type: none"> • Reduce depth of cut • Check or change the holder |
| End Mill Fracturing | <ul style="list-style-type: none"> • Reduce depth of cut • Reduce feed per tooth | <ul style="list-style-type: none"> • Reduce length of flutes or overhang • If chip jamming occurs, reduce the number of flutes |
| Poor Chip Disposal | <ul style="list-style-type: none"> • Use air blow • Reduce depth of cut • Reduce feed per tooth | <ul style="list-style-type: none"> • Reduce the number of flutes • Increase volume of air or cutting fluid • Increase cutting speed |
| Burring Workpiece Chipping | <ul style="list-style-type: none"> • Reduce helix angle • Reduce feed per tooth | <ul style="list-style-type: none"> • Reduce depth of cut |
| Chip Welding | <ul style="list-style-type: none"> • Use coolant • Use coated end mill | <ul style="list-style-type: none"> • Increase volume of cutting fluid • Increase helix angle |

Technical Section - General



Technical Section - General

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 | 6Al4V, 6A14V-2Sn, Monel, Monel K | <28 |
| | 4.3 Titanium, alloyed | 6Al4V-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 | Inconel 718, Nimonic 75-95, Rene 41, Inconel 825, A286 | >28<38 |
| 6. Copper | 6.1 Copper | Commercially Pure | <100 HB |
| | 6.2 β -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 - 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 | | | | | |

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.

| | 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 |
| 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 |
| A720 | 115A | 98A | 89A | 75A | 56A | 33A | | | 72A | 33A | 49A | | 98A | 79A | 66A | 46A | 75A |
| A730 | 115J | 98H | 89G | 75F | 56E | 33D | | | 79E | 36G | 56C | | 115J | 92G | 72E | 56E | 92G |
| 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 |
| DS-120 | 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 | |
| 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 | | | | |
| A720 | 56A | 26A | 33A | 23A | 13A | 115A | 131A | 115A | 89A | 115A | 98A | 89A | 89A | 157A | 82A | | | |
| A730 | 66D | 36C | 49G | 23E | 20B | 125L | 131J | 89H | 69F | 108J | 98I | 98H | 89F | 115K | 92J | 66H | 16C | |
| 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 | | | |
| DS-120 | 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 |
|------------------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|
| DS-142 | 279S | 246S | 246S | 230S | 148S | 148S | 98S | 98S | 174S | 148S | | | 246T | 246T | 180T | 180T | 148T |
| 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 | |
| R463 | | | | | | | | | 279G | 246G | 197F | | | | | | 180V |
| R467 | | | | | | | | | 279G | 246G | 197F | | | | | | 180V |
| 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 1.5x | | | 361W | 307W | 307W | 217T | | | | | | 127T | | | 318U | 318U | |
| 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 | |

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 |
|-----------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|------|
| DS-142 | 115T | 82S | 148T | 98S | 66S | 902V | 820V | 820V | 230T | 656V | 656V | 367V | 197V | 197X | 328V | | | |
| 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 | | | | | |
| R463 | 148V | 131U | 180U | 148U | 131U | | | | | | | | | | | | | |
| R467 | 148V | 131U | 180U | 148U | 131U | | | | | | | | | | | | | |
| 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 1.5x | | | | | | | | | | | | | | | | | | |
| R950 3x | | | | | | | | | | | | | | | | | | |
| R950 5x | | | | | | | | | | | | | | | | | | |
| R950 8x | | | | | | | | | | | | | | | | | | |

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 |
|------------------|------|------|------|------|------|------|-----|-----|------|------|------|-----|------|------|------|------|------|
| R950 12x | | | 262U | 223U | 223U | 158S | | | | | | 92S | | | | 231U | 231U |
| R960 1.5x | 397W | 361W | | | | | | | 217V | 180T | 144T | | 433V | 418V | | | 163T |
| 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 |
| R960 12x | 289U | 262U | | | | | | | 157U | 131S | 92S | | 315U | 304U | | | 118S |
| R970 1.5x | 397W | 361W | | | | | | | | | | | 433V | 418V | 318U | 318U | |
| R970 3x | 361W | 328W | | | | | | | | | | | 394V | 380V | 289U | 289U | |
| R970 5x | 361V | 328V | | | | | | | | | | | 374V | 354V | 279V | 279V | |
| R970 8x | 328U | 295U | | | | | | | | | | | 346U | 328U | 262U | 262U | |
| R970 12x | 289U | 262U | | | | | | | | | | | 315U | 314U | 231U | 231U | |
| S209 | 115I | 98I | 82F | 66F | 39E | 30D | | | 49E | 30G | 33C | | 98I | 79E | 66E | 46E | 75F |
| 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 |
| T400 | 75F | 46F | 49F | 49D | 36D | | | | 66F | 39D | 39D | | 108E | 59H | 59F | | 69F |
| TS10CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS15CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS18CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS40CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS41CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS42CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS51CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS52CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS55CO | 125K | 108H | 98G | 89G | 59F | 36E | | | 72F | 36H | 49D | | 112K | 98F | 72F | 56F | 98G |
| TS10HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS15HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS18HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS40HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS41HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS42HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS51HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS52HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |
| TS55HS | 115J | 98J | 89G | 69G | 46F | 33E | | | 52F | 30H | 33D | | 105J | 89G | 66F | 52F | 89G |

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 |
|-----------|------|------|------|------|-----|------|------|------|-----|------|------|------|-----|------|------|-----|-----|------|
| R950 12x | | | | | | | | | | | | | | | | | | |
| R960 1.5x | 127T | 108S | 127T | 108S | 90S | | | | | | | | | | | | | |
| R960 3x | 115T | 98S | 115T | 98S | 82S | | | | | | | | | | | | | |
| R960 5x | 115T | 98S | 115T | 98S | 82S | | | | | | | | | | | | | |
| R960 8x | 98S | 82S | 98S | 82S | 66S | | | | | | | | | | | | | |
| R960 12x | 92S | 78S | 92S | 78S | 66S | | | | | | | | | | | | | |
| R970 1.5x | | | | | | | | | | | | | | | | | | |
| R970 3x | | | | | | | | | | | | | | | | | | |
| R970 5x | | | | | | | | | | | | | | | | | | |
| R970 8x | | | | | | | | | | | | | | | | | | |
| R970 12x | | | | | | | | | | | | | | | | | | |
| S209 | 43D | 23B | 33G | 23E | 13A | 108F | 115I | 115H | 52F | 85J | 98I | 92H | 75H | 98K | 92J | 46H | 10B | |
| 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 | |
| T400 | 36D | | 49D | | | | | | | | | | | | | | | |
| TS10CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS15CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS18CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS40CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS41CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS42CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS51CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS52CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS55CO | 59F | 33C | 49H | 30F | 20C | 125I | 131K | 89J | 52I | 115K | 108J | 102I | 98G | 115M | 92K | 56I | 20C | |
| TS10HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS15HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS18HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS40HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS41HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS42HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS51HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS52HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |
| TS55HS | 52E | 26C | 43H | 26F | 13B | 118H | 125J | 89I | 52H | 108K | 98J | 98I | 82I | 98K | 115I | 56G | 13C | |

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 | |
| 1634 | 65 | 60 | 40 | 40 | 25 | 15 | | | 30 | 20 | 20 | | 50 | 30 | 30 | 20 | 20 |
| 1641 | 150 | 125 | 90 | 90 | | | | | 70 | 60 | 50 | | | | | | 60 |
| 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 | |
| 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 |

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 | | | | | | | | | |
| 1634 | 16 | 7 | 26 | 10 | | 30 | 89 | 69 | 10 | 49 | 98 | 66 | 20 | 98 | 26 | | | |
| 1641 | | | 45 | | | 55 | 180 | 130 | | 180 | 200 | 230 | | | | | | |
| 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 | | | | |
| 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 | | | | | | |

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 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 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 | | | | | | |
| 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 | | | | | | |
| 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 | | | | | | |
| E624 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E625 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E626 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E627 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E628 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E629 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E630 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E631 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| 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 | |
| E764 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E765 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E766 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E767 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E768 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E769 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E770 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E771 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E805 | | | | | 55 | 42 | 22 | | | | | | | | | | |

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 |
|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| 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 | | | | | | | | | | | | | | | | | | |
| E033 | | | | | | | | | | | | | | | | | | |
| E035 | 16 | | 39 | 16 | | 39 | 98 | 66 | | 52 | 115 | 66 | 49 | 98 | | | | |
| E036 | | | | | | | | | | | | | | | | | | |
| E037 | 16 | | 39 | 16 | | | | | | 52 | 115 | 66 | 49 | 98 | | | | |
| E038 | | | | | | | | | | | | | | | | | | |
| 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 | | | | | |
| E624 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E625 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E626 | 33 | | | 33 | | | | | | | | | | | | | | |
| E627 | 33 | | | 33 | | | | | | | | | | | | | | |
| E628 | | | | | | | | | | | | | | | | | | |
| E629 | | | | | | | | | | | | | | | | | | |
| E630 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E631 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| 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 | | | | |
| E764 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E765 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E766 | 33 | | | 33 | | | | | | | | | | | | | | |
| E767 | 33 | | | 33 | | | | | | | | | | | | | | |
| E768 | | | | | | | | | | | | | | | | | | |
| E769 | | | | | | | | | | | | | | | | | | |
| E770 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E771 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E805 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |

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 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| E806 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E808 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E809 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E810 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E811 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E812 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E813 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E814 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E815 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E816 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E817 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E905 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E906 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E908 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E909 | 108 | 95 | 75 | 69 | 43 | | | | | | | | | | | | |
| E910 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E911 | | | | 98 | 66 | 36 | | | | | | | | | | | |
| E912 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E913 | | 72 | 59 | 52 | 33 | | | | 46 | 33 | 20 | | | | | | |
| E914 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E915 | | | | | | | | | | | | | 98 | 82 | 115 | 82 | |
| E916 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| E917 | | | | | 55 | 42 | 22 | | | | | | | | | | |
| 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 |
| 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 | |

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 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| E806 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E808 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E809 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E810 | 33 | | | 33 | | | | | | | | | | | | | | |
| E811 | 33 | | | 33 | | | | | | | | | | | | | | |
| E812 | | | | | | | | | | | | | | | | | | |
| E813 | | | | | | | | | | | | | | | | | | |
| E814 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E815 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E816 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E817 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E905 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E906 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E908 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E909 | | | | | | 39 | 98 | 66 | | | | | | | | | | |
| E910 | 33 | | | 33 | | | | | | | | | | | | | | |
| E911 | 33 | | | 33 | | | | | | | | | | | | | | |
| E912 | | | | | | | | | | | | | | | | | | |
| E913 | | | | | | | | | | | | | | | | | | |
| E914 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E915 | | | | | | | 98 | | 16 | | | | 66 | | 49 | | | |
| E916 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| E917 | 42 | 26 | | 16 | 10 | | | | | | | | | | | | | |
| 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 | | | | |
| 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 | | | |

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 - 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 |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 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 |
| C600 | 98A | 89A | 75B | | | | | | | | | | 82A | 66A | 82B | | 59D |
| C601 | 98A | 89A | 75B | | | | | | | | | | 82A | 66A | 82B | | 59D |
| C602 | 98A | 89A | 75B | | | | | | | | | | 82A | 66A | 82B | | 59D |
| C603 | 164A | 131A | 115B | 98B | | | | | 75F | | | | 92A | 75A | 131B | 82B | 92D |
| C604 | 112S | 89S | 79T | | | | | | | | | | 89S | 72S | 89T | | 62V |
| C605 | 164A | 131A | 115B | | | | | | 75F | 62F | | | | | | | 92D |
| C606 | 148A | 118A | 102B | | | | | | 66F | 56F | | | | | | | 82D |
| C607 | | 131A | 115B | 98B | 66C | | | | | 62F | | | | 75A | 131B | 82B | 92D |
| C608 | 164G | 131G | 115H | 98H | | | | | 75L | | | | 92G | 75G | 131H | 82H | 92J |
| C609 | 197G | 184G | 161H | 138H | | | | | 105L | | | | 128G | 105G | 184H | 128H | 128J |
| C610 | 164G | 131G | 115H | 98H | | | | | 75L | | | | 92G | 75G | 131H | 82H | 92J |
| C611 | 197G | 184G | 161H | 138H | | | | | 105L | | | | 128G | 105G | 184H | 128H | 128J |
| C612 | 148G | 118G | 102H | 89H | | | | | 66L | | | | 82G | 66G | 118H | 72H | 82J |
| C613 | 148G | 118G | 102H | 89H | | | | | 66L | | | | 82G | 66G | 118H | 72H | 82J |
| C614 | 115S | 92S | 79T | 69T | | | | | 52Y | | | | 92S | 75S | 92T | 56T | 62V |
| C615 | 164S | 131S | 115T | 98T | | | | | 75Y | | | | 92S | 75S | 131T | 82T | 92V |
| C617 | 115S | 92S | 79T | 69T | | | | | 52Y | | | | 92S | 75S | 92T | 56T | 62V |
| C618 | 164S | 131S | 115T | 98T | | | | | 75Y | | | | 92S | 75S | 131T | 82T | 92V |
| S106 | | | | | | | | | | | | | | | | | |
| S108 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | 89A | 374B | 318B | 318B | 249B | |
| S109 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | 89A | 374B | 318B | 318B | 249B | |
| S110 | 269B | 212B | 212B | 171B | 152B | 140B | | | 190A | 125A | 103A | 78A | 336B | 284B | 284B | 225B | |
| S111 | 249B | 200B | 200B | 161B | 144B | 131B | | | 180A | 108A | 98A | 66A | 298B | 249B | 249B | 200B | |
| S112 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | 89A | 374B | 318B | 318B | 249B | |
| S113 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | 89A | 374B | 318B | 318B | 249B | |
| S114 | 269B | 212B | 212B | 171B | 152B | 140B | | | 190A | 125A | 103A | 78A | 336B | 284B | 284B | 225B | |
| S115 | 249B | 200B | 200B | 161B | 144B | 131B | | | 180A | 108A | 98A | 82A | 298B | 249B | 249B | 200B | |
| S116 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | 89A | 374B | 318B | 318B | 249B | |
| S121 | 289B | 223B | 223B | 180B | 161B | 148B | | | 200A | 141A | 108A | | 374B | 318B | 318B | 249B | |
| S129 | 361B | 325B | 325B | 298B | 249B | 230B | | | 239A | 171A | 131A | 105A | 449B | 377B | 377B | 279B | |
| S134 | 361B | 325B | 325B | 298B | 249B | 230B | | | 239A | 171A | 131A | 105A | 449B | 377B | 377B | 279B | |
| S135 | 361B | 325B | 325B | 298B | 249B | 230B | | | 239A | 171A | 131A | 105A | 449B | 377B | 377B | 279B | |
| S136 | 343B | 312B | 312B | 287B | 238B | 205B | | | 220A | 156A | 123A | 97A | 405B | 338B | 338B | 254B | |
| S137 | 325B | 298B | 298B | 276B | 226B | 180B | | | 200A | 141A | 115A | 89A | 361B | 298B | 298B | 230B | |
| S138 | 361B | 325B | 325B | 298B | 249B | 230B | | | 239A | 171A | 131A | 98A | 449B | 377B | 377B | 279B | |
| S139 | 361B | 325B | 325B | 298B | 249B | 230B | | | 239A | 171A | 131A | 98A | 449B | 377B | 377B | 279B | |
| S146 | 343B | 312B | 312B | 287B | 238B | 205B | | | 220A | 156A | 123A | 97A | 405B | 338B | 338B | 254B | |
| S147 | 325B | 298B | 298B | 276B | 226B | 180B | | | 200A | 141A | 115A | | 361B | 298B | 298B | 230B | |
| S206 | | | | | | | | | | | | | | | | | |
| S207 | | | | | | | | | | | | | | | | | |
| S208 | 400B | 298B | 298B | 259B | 230B | 200B | | | 325A | 223A | 174A | 131A | 551B | 525B | 525B | 374B | 230B |
| S211 | 361B | 269B | 269B | 239B | 200B | 180B | | | 298A | 180A | 171A | 131A | 499B | 400B | 400B | 341B | 200B |
| S212 | 400B | 298B | 298B | 259B | 230B | 200B | | | 325A | 223A | 174A | 131A | 551B | 525B | 525B | 374B | 230B |
| S213 | 400B | 298B | 298B | 259B | 230B | 200B | | | 325A | 223A | 174A | 131A | 551B | 525B | 525B | 374B | 230B |
| S215 | 361B | 269B | 269B | 239B | 200B | 180B | | | 298A | 180A | 171A | 89A | 499B | 400B | 400B | 341B | 200B |
| S221 | 400B | 298B | 298B | 259B | 230B | 200B | | | 325A | 223A | 174A | | 551B | 525B | 525B | 374B | 230B |
| S223HA | 801C | 778C | 522C | 463B | 328B | 285A | 187A | 125A | 489B | 400B | 302B | 256B | 456C | 381B | 305B | 256B | 255B |
| S223HB | 801C | 778C | 522C | 463B | 328B | 285A | 187A | 125A | 489B | 400B | 302B | 256B | 456C | 381B | 305B | 256B | 255B |
| S234 | 499B | 449B | 449B | 423B | 400B | 328B | | | 351A | 276A | 200A | 164A | 699B | 649B | 649B | 430B | 259B |
| S235 | 499B | 449B | 449B | 423B | 400B | 328B | | | 351A | 276A | 200A | 164A | 699B | 649B | 649B | 430B | 259B |
| S236 | 474B | 425B | 425B | 406B | 380B | 313B | | | 338A | 251A | 182A | 140A | 650B | 578B | 578B | 415B | 245B |

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 |
|--------|------|------|------|------|------|------|------|------|------|-------|-------|-------|------|------|------|-----|-----|------|
| 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 | | | | |
| C600 | 49D | | 98D | 20C | | 180C | 197C | 197C | | 197E | 180E | 115E | | 197C | | | | |
| C601 | 49D | | 98D | 20C | | 180C | 197C | 197C | | 197E | 180E | 115E | | 197C | | | | |
| C602 | 49D | | 98D | 20C | | 180C | 197C | 197C | | 197E | 180E | 115E | | 197C | | | | |
| C603 | 75D | | 157D | 43C | | 410C | 410C | 410C | | 984E | 984E | 295E | | 410C | | | | |
| C604 | 49V | | 108V | 20U | | 200U | 223U | 223U | | 243X | 194X | 144X | | 200U | | | | |
| C605 | | | 157D | | | 410C | | | | 984E | 984E | 295E | | 410C | | | | |
| C606 | | | 141D | | | 367C | | | | 886E | 886E | 266E | | 367C | | | | |
| C607 | 75D | 33D | | 43C | 20D | | 410C | 410C | 49C | | | 295E | 197A | | 410C | | | |
| C608 | 75J | | 157J | 43I | | 410I | 410I | 410I | | | 984K | 295K | | 410I | | | | |
| C609 | 105J | | 220J | 59I | | 574I | 574I | 574I | | | 1378K | 413K | | 574I | | | | |
| C610 | 75J | | 157J | 43I | | 410I | 410I | 410I | | | 984K | 295K | | 410I | | | | |
| C611 | 105J | | 220J | 59I | | 574I | 574I | 574I | | | 1378K | 413K | | 574I | | | | |
| C612 | 66J | | 141J | 36I | | 367I | 367I | 367I | | | 886K | 266K | | 367I | | | | |
| C613 | 66J | | 141J | 36I | | 367I | 367I | 367I | | | 886K | 266K | | 367I | | | | |
| C614 | 52V | | 108V | 20U | | 203U | 223U | 223U | | | 197X | 148X | | 203U | | | | |
| C615 | 75V | | 157V | 43U | | 410U | 410U | 410U | | 984X | 984X | 295X | | 410U | | | | |
| C617 | 52V | | 108V | 20U | | 203U | 223U | 223U | | | 197X | 148X | | 203U | | | | |
| C618 | 75V | | 157V | 43U | | 410U | 410U | 410U | | 984X | 984X | 295X | | 410U | | | | |
| S106 | | | | | | | | | | 2326C | 1749C | 1171C | 751B | | | | | |
| S108 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S109 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S110 | | | | | | 617C | 474C | 474C | 117B | 1424C | 1424C | 617C | 380B | | | | | |
| S111 | | | | | | 584C | 449C | 449C | 108B | 1348C | 1348C | 584C | 361B | | | | | |
| S112 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S113 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S114 | | | | | | 617C | 474C | 474C | 117B | 1424C | 1424C | 617C | 380B | | | | | |
| S115 | | | 148B | | | 584C | 449C | 449C | 108B | 1348C | 1348C | 584C | 361B | | | | | |
| S116 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S121 | | | | | | 649C | 499C | 499C | 125B | 1499C | 1499C | 649C | 400B | | | | | |
| S129 | | | | | | 679C | 574C | 574C | 144B | 1601C | 1601C | 708C | 479B | | | | | |
| S134 | | | | | | 679C | 574C | 574C | 144B | 1601C | 1601C | 708C | 479B | | | | | |
| S135 | | | | | | 679C | 574C | 574C | 144B | 1601C | 1601C | 708C | 479B | | | | | |
| S136 | | | | | | 646C | 546C | 546C | 138B | 1525C | 1525C | 674C | 455B | | | | | |
| S137 | | | | | | 613C | 518C | 518C | 131B | 1450C | 1450C | 640C | 430B | | | | | |
| S138 | | | | | | 679C | 574C | 574C | 144B | 1601C | 1601C | 708C | 479B | | | | | |
| S139 | | | | | | 679C | 574C | 574C | 144B | 1601C | 1601C | 708C | 479B | | | | | |
| S146 | | | | | | 646C | 546C | 546C | 138B | 1525C | 1525C | 674C | 455B | | | | | |
| S147 | | | | | | 613C | 518C | 518C | 131B | 1450C | 1450C | 640C | 430B | | | | | |
| S206 | | | | | | | | | | 2326C | 1749C | 1171C | 751B | | | | | |
| S207 | | | | | | | | | | 2093C | 1575C | 1056C | 676B | | | | | |
| S208 | 200B | 190B | 230B | 161A | 98A | | | | | | | | | | | | | |
| S211 | 180B | 174B | 200B | 141A | 85A | | | | | | | | | | | | | |
| S212 | 200B | 190B | 230B | 161A | 98A | | | | | | | | | | | | | |
| S213 | 200B | 190B | 230B | 161A | 98A | | | | | | | | | | | | | |
| S215 | 180B | 174B | 200B | 141A | 85A | | | | | | | | | | | | | |
| S221 | 200B | 190B | 230B | 161A | 98A | | | | | | | | | | | | | |
| S223HA | 463B | 387A | 358B | 269A | 223A | | | | | | | | | | | | | |
| S223HB | 463B | 387A | 358B | 269A | 223A | | | | | | | | | | | | | |
| S234 | 230B | 200B | 266B | 200A | 131A | | | | | | | | | | | | | |
| S235 | 230B | 200B | 266B | 200A | 131A | | | | | | | | | | | | | |
| S236 | 220B | 190B | 251B | 190A | 123A | | | | | | | | | | | | | |
| S237 | 210B | 180B | 236B | 180A | 115A | | | | | | | | | | | | | |

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 |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| S237 | 449B | 400B | 400B | 390B | 361B | 298B | | | 325A | 226A | 164A | 115A | 600B | 508B | 508B | 400B | 230B |
| S238 | 499B | 449B | 449B | 423B | 400B | 328B | | | 351A | 276A | 200A | 148A | 699B | 649B | 649B | 430B | 259B |
| S239 | 499B | 449B | 449B | 423B | 400B | 328B | | | 351A | 276A | 200A | 148A | 699B | 649B | 649B | 430B | 259B |
| S246 | 450B | 412B | 412B | 387B | 363B | 288B | | | 288A | 233A | 176A | 135A | 500B | 540B | 540B | 384B | 230B |
| S247 | 400B | 374B | 374B | 351B | 325B | 249B | | | 226A | 190A | 151A | 121A | 499B | 430B | 430B | 338B | 200B |
| S248HA | 801C | 778C | 522C | 463B | 328B | 285A | 364A | 240A | 489B | 400B | 302B | 256A | 771C | 571B | 538B | 433B | 1017B |
| S248HB | 801C | 778C | 522C | 463B | 328B | 285A | 364A | 240A | 489B | 400B | 302B | 256A | 771C | 571B | 538B | 433B | 1017B |

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 | | | | 0.0010 | 0.0015 | 0.0015 | 0.0015 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 |
| | | | B | | | | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0040 | 0.0045 | |
| | | | C | | | | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 | 0.0060 | 0.0070 | |
| 3-4 |  | ↑ 1,5 ↔ 0,1 | A | 0.0010 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | |
| | | | B | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0055 | 0.0060 | 0.0070 | |
| | | | C | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 | 0.0050 | 0.0060 | 0.0065 | 0.0070 | 0.0080 | 0.0090 | |
| 3-4 |  | ↑ 1 ↔ 0,5 | A | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 | |
| | | | B | 0.0005 | 0.0005 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | |
| | | | C | 0.0005 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | |
| 2-3 |  | ↑ 0,5 ↔ 1 | A | 0.0005 | 0.0010 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0025 | 0.0030 | |
| | | | B | 0.0010 | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0035 | 0.0040 | |
| | | | C | 0.0015 | 0.0015 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | 0.0045 | 0.0050 | 0.0050 | |
| 3-4 |  | ↑ 0,5 ↔ 1 ↑ 1 ↔ 0,5 | B | | | | 0.0010 | 0.0020 | 0.0030 | 0.0030 | 0.0035 | 0.0040 | 0.0040 | 0.0040 | |
| | | | | | | | | | | | | | | | |
| 2 & 4 |  | ↑ 0,1 - 0,5mm ↔ 0,1 - 0,5mm | A | 0.0010 | 0.0010 | 0.0015 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0030 | | | |
| | | | BC | 0.0010 | 0.0010 | 0.0015 | 0.0020 | 0.0020 | 0.0025 | 0.0030 | 0.0035 | 0.0040 | | | |
| 4 |  | ↑ 0,01 - 0,1 ↔ ≤ 1 | A | | | | 0.0020 | 0.0020 | 0.0025 | 0.0030 | | 0.0030 | | | |
| | | | BC | | | | 0.0020 | 0.0025 | 0.0030 | 0.0035 | | 0.0040 | | | |

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 |
|--------|------|------|------|------|------|------|------|------|------|-------|-------|------|------|-----|-----|-----|-----|------|
| S238 | 230B | 200B | 266B | 200A | 131A | | | | | | | | | | | | | |
| S239 | 230B | 200B | 266B | 200A | 131A | | | | | | | | | | | | | |
| S246 | 210B | 180B | 238B | 176A | | | | | | | | | | | | | | |
| S247 | 190B | | 210B | | | 699C | 571C | 571C | 180B | 1650C | 1650C | 708C | 410B | | | | | |
| S248HA | 902B | 755B | 614B | 525A | 436A | | | | | | | | | | | | | |
| S248HB | 902B | 755B | 614B | 525A | 436A | | | | | | | | | | | | | |

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 | |
|  | 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 | 0.0031 | 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 | 0.0032 | 0.0033 | 0.0035 | 0.0038 | 0.0040 |
| | ↓ 0,5D | E | 0.0005 | 0.0007 | 0.0009 | 0.0014 | 0.0017 | 0.0025 | 0.0034 | 0.0041 | 0.0048 | 0.0055 | 0.0056 | 0.0060 | 0.0060 | 0.0060 | 0.0066 | 0.0069 |
| | ↔ D | 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 |
|  | 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 | |
| | ↓ D | 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 |
| | ↔ 0,8D | 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 |
|  | 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 | |
| | ↓ 1,5D | 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 |
| | ↔ 0,25D | 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 | |
|  | 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 | |
| | ↓ 1,5D | 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 |
| | ↔ 0,1D | 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 |
| 4608 | 82C | 66C | 52C | 49B | 30B | 16A | | | 36C | 20B | 26B | | 52E | 49D | 43C | 36C | 49C |
| 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 |

APPLICATION MATERIAL GROUPS - COUNTERSINKS

Feed rate chart see page 584. **SURFACE FEET PER MINUTE (SFM)**

| | 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 |
| 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 | | | |
| 4608 | 30B | 16B | 26D | 16C | 10C | 82D | 92E | 82D | 46D | | | | | | | | | |
| 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 | | | |

APPLICATION MATERIAL GROUPS - COUNTERSINKS

Material examples page 585. **SURFACE FEET PER MINUTE (SFM)**

| | 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 | | | |
| 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 - 000021 - 003342

| EDP# | E-Code | MID# | Page # | EDP# | E-Code | MID# | Page # | EDP# | E-Code | MID# | Page # | EDP# | E-Code | MID# | Page # |
|---------|----------|---------|--------|---------|----------|---------|--------|---------|----------|---------|--------|---------|---------|---------|--------|
| 000021 | A1002 | 5967598 | 95 | 0000816 | A100120 | 5967421 | 100 | 0001608 | A10030 | 5967003 | 97 | 0002391 | A10080 | 5968105 | 99 |
| 0000038 | A10025 | 5967601 | 95 | 0000823 | A100121 | 5967431 | 100 | 0001615 | A10031 | 5967006 | 97 | 0002407 | A10081 | 5967926 | 99 |
| 0000045 | A1003 | 5967603 | 95 | 0000830 | A100122 | 5967436 | 100 | 0001622 | A100315 | 5967009 | 97 | 0002414 | A10082 | 5967932 | 99 |
| 0000052 | A10032 | 5967605 | 95 | 0000847 | A1001225 | 5967441 | 100 | 0001639 | A10032 | 5967012 | 97 | 0002421 | A100825 | 5967935 | 99 |
| 0000069 | A10035 | 5967609 | 95 | 0000854 | A100123 | 5967445 | 100 | 0001646 | A100325 | 5967015 | 97 | 0002438 | A10083 | 5967940 | 99 |
| 0000076 | A10038 | 5967611 | 95 | 0000861 | A100124 | 5967306 | 100 | 0001653 | A10033 | 5967018 | 97 | 0002445 | A10084 | 5967944 | 99 |
| 0000083 | A1004 | 5967613 | 95 | 0000878 | A100125 | 5967310 | 101 | 0001660 | A10034 | 5967020 | 97 | 0002452 | A10085 | 5967950 | 99 |
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| 015011 | R15K | 5998819 | 89 | 015314 | R15CON | 5999044 | 126 | 015844 | QC21P11/16 | 5997101 | 121 | 016082 | 2A82 | 6000842 | 99 |
| 015012 | R15L | 5998822 | 89 | 015315 | R15COO | 5999048 | 126 | 016002 | 2A2 | 6000303 | 95 | 0016084 | R960150 | 5988714 | 24 |
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| 015014 | R15N | 5998828 | 89 | 015317 | R15COQ | 5999059 | 126 | 016004 | 2A4 | 6000354 | 95 | 016085 | 2A85 | 6000853 | 99 |
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| 015016 | R15P | 5998834 | 89 | 015319 | R15COS | 5999066 | 126 | 016006 | 2A6 | 6000393 | 96 | 016087 | 2A87 | 6000864 | 99 |
| 015017 | R15Q | 5999304 | 89 | 015320 | R15COT | 5999069 | 126 | 016007 | 2A7 | 6000401 | 96 | 016088 | 2A88 | 6000872 | 100 |
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| 015107 | R15AG | 5998674 | 109 | 015610 | R15PJ | 5998866 | 89 | 0016022 | R960135 | 5988791 | 24 | 016106 | 2A106 | 6000675 | 100 |
| 015108 | R15AH | 5998677 | 109 | 015611 | R15PK | 5998869 | 89 | 016022 | 2A22 | 6000703 | 97 | 0016107 | R96039/64 | 5988595 | 25 |
| 015109 | R15AI | 5998680 | 109 | 015612 | R15PL | 5998873 | 89 | 016023 | 2A23 | 6000707 | 97 | 016108 | 2A108 | 6000709 | 100 |
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| 016117 | 2A117 | 6000628 | 100 | 016318 | 2ACO118 | 6000617 | 127 | 016471 | 2ACO71 | 6000699 | 126 | 018021 | R18N21 | 5998330 | 88 |
| 016118 | 2A118 | 6000635 | 100 | 016320 | 2ACO120 | 6000665 | 127 | 016472 | 2ACO72 | 6000702 | 126 | 018022 | R18N22 | 5998333 | 88 |
| 016120 | 2A120 | 6000640 | 100 | 016322 | 2ACO122 | 6000704 | 127 | 016473 | 2ACO73 | 6000545 | 126 | 018023 | R18N23 | 5998336 | 88 |
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| 016122 | 2A122 | 6000648 | 100 | 016355 | 2ACO105 | 5999614 | 123 | 016479 | 2ACO79 | 6000553 | 126 | 018026 | R18N26 | 5998345 | 88 |
| 016125 | 2A125 | 6000651 | 101 | 016356 | 2ACO115 | 5999621 | 123 | 016480 | 2ACO80 | 6000556 | 126 | 018027 | R18N27 | 5998348 | 88 |
| 016128 | 2A128 | 6000660 | 101 | 016357 | 2ACO125 | 5999629 | 124 | 016482 | 2ACO82 | 6000559 | 126 | 018028 | R18N28 | 5998351 | 88 |
| 016130 | 2A130 | 6000670 | 101 | 016358 | 2ACO135 | 5999639 | 124 | 016484 | 2ACO84 | 6000562 | 126 | 018029 | R18N29 | 5998357 | 88 |
| 016135 | 2AB135 | 6000579 | 101 | 016359 | 2ACO145 | 5999648 | 124 | 016485 | 2ACO85 | 6000564 | 126 | 018030 | R18N30 | 5998363 | 88 |
| 0016138 | R960160 | 5988763 | 25 | 016360 | 2ACO155 | 5999656 | 124 | 016488 | 2ACO88 | 6000567 | 126 | 018031 | R18N31 | 5998366 | 88 |
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| 016145 | 2AB145 | 6000588 | 101 | 016363 | 2ACO185 | 5999686 | 124 | 016491 | 2ACO91 | 6000577 | 126 | 018034 | R18N34 | 5998377 | 88 |
| 016150 | 2AB150 | 6000591 | 101 | 016364 | 2ACO195 | 5999694 | 124 | 016492 | 2ACO92 | 6000581 | 126 | 018035 | R18N35 | 5998381 | 88 |
| 0016152 | R960165 | 5988787 | 25 | 016365 | 2ACO205 | 6000766 | 124 | 016493 | 2ACO93 | 6000583 | 126 | 018036 | R18N36 | 5998385 | 88 |
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| 016217 | 2A17 | 6000294 | 95 | 016415 | 2ACO15 | 5999652 | 124 | 0016817 | R960190 | 5988868 | 25 | 018048 | R18N48 | 5999115 | 88 |
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| 016245 | 2A45 | 6000365 | 95 | 016434 | 2ACO34 | 6000680 | 124 | 0017456 | R96059/64 | 5988653 | 25 | 018067 | R18N67 | 5999164 | 88 |
| 016246 | 2A46 | 6000370 | 96 | 016435 | 2ACO35 | 6000684 | 125 | 0017562 | R96015/16 | 5988754 | 25 | 018068 | R18N68 | 5999166 | 88 |
| 016248 | 2A48 | 6000380 | 96 | 016436 | 2ACO36 | 6000688 | 125 | 0017579 | R960240 | 5988476 | 25 | 018069 | R18N69 | 5999170 | 87 |
| 016250 | 2A55 | 6000389 | 96 | 016437 | 2ACO37 | 6000692 | 125 | 0017586 | R96061/64 | 5988656 | 25 | 018070 | R18N70 | 5999174 | 87 |
| 016251 | 2A65 | 6000397 | 96 | 016438 | 2ACO38 | 6000698 | 125 | 0017593 | R96031/32 | 5988572 | 26 | 018071 | R18N71 | 5999176 | 87 |
| 016252 | 2A75 | 6000404 | 96 | 016440 | 2ACO40 | 6000701 | 125 | 0017722 | R960250 | 5988488 | 26 | 018072 | R18N72 | 5999178 | 87 |
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| 016254 | 2A95 | 6000423 | 96 | 016442 | 2ACO42 | 6000708 | 125 | 0017753 | R9601 | 5988905 | 26 | 018074 | R18N74 | 5999184 | 87 |
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| 051357 | M51CO57/64 | 5996348 | 159 | 0051856 | A920100 | 5972357 | 71 | 052061 | R52N61 | 6000229 | 148 | 0052334 | B3351BLADES | 5987009 | 473 |
| 051358 | M51CO29/32 | 5996400 | 159 | 0051863 | A920102 | 5972360 | 71 | 052062 | R52N62 | 6000232 | 148 | 052334 | M52CON34 | 5995701 | 158 |
| 051359 | M51CO59/64 | 5996350 | 159 | 0051870 | A920103 | 5972361 | 71 | 052063 | R52N63 | 6000239 | 148 | 0052335 | M52CON35 | 5995702 | 158 |
| 051360 | M51CO15/16 | 5996599 | 159 | 0051887 | A92013/32 | 5972453 | 71 | 052064 | R52N64 | 6000242 | 148 | 052336 | M52CON36 | 5995704 | 158 |
| 051361 | M51CO61/64 | 5996358 | 159 | 0051900 | A920105 | 5972367 | 71 | 052065 | R52N65 | 6000245 | 148 | 052339 | M52CON39 | 5995706 | 158 |
| 051362 | M51CO31/32 | 5996271 | 159 | 0051917 | A92027/64 | 5972271 | 71 | 052066 | R52N66 | 6000248 | 148 | 052340 | M52CON40 | 5995712 | 158 |
| 051363 | M51CO63/64 | 5996361 | 159 | 0051924 | A920108 | 5972374 | 71 | 052067 | R52N67 | 6000250 | 148 | 0052341 | B33510BLADES | 5987017 | 473 |
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| 0051368 | A92017/64 | 5972516 | 70 | 0051948 | A9207/16 | 5972421 | 71 | 052068 | R52N68 | 6000254 | 148 | 052365 | B33512BLADES | 5987029 | 473 |
| 0051375 | A92068 | 5972369 | 70 | 0051962 | A920115 | 5972395 | 71 | 052069 | R52N69 | 6000257 | 148 | 052372 | B3352BLADES | 5987026 | 473 |
| 0051382 | A92069 | 5972373 | 70 | 0051979 | A92029/64 | 5972275 | 71 | 052070 | R52N70 | 6000262 | 148 | 0052389 | B3353BLADES | 5987064 | 473 |
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| 0052495 | A92126 | 5972620 | 69 | 0053034 | B40018 | 5987244 | 450 | 053708 | CO501-6N8 | 5995507 | 176 | 055014 | R55N | 6000307 | 150 |
| 0052501 | A92130 | 5972655 | 69 | 0053041 | B40020 | 5987100 | 450 | 053709 | CO501-6N9 | 5995556 | 176 | 055015 | R55O | 6000310 | 150 |
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| 0052556 | A92135 | 5972675 | 70 | 0053096 | A92179 | 5972948 | 70 | 053714 | CO501-6N14 | 5996147 | 176 | 055020 | R55T | 6000325 | 150 |
| 0052563 | A92136 | 5972683 | 70 | 0053102 | A92180 | 5972965 | 70 | 053715 | CO501-6N15 | 5996151 | 176 | 055021 | R55U | 6000331 | 150 |
| 0052570 | A92137 | 5972688 | 70 | 0053119 | A92181 | 5972969 | 70 | 053716 | CO501-6N16 | 5996155 | 176 | 055022 | R55V | 6000333 | 150 |
| 0052587 | A92138 | 5972691 | 70 | 0053126 | B411100 | 5987159 | 452 | 053717 | CO501-6N17 | 5996159 | 176 | 055023 | R55W | 6000336 | 150 |
| 0052594 | A92139 | 5972696 | 70 | 0053133 | A92182 | 5972973 | 70 | 053718 | CO501-6N18 | 5995984 | 176 | 055024 | R55X | 6000338 | 150 |
| 0052600 | A92140 | 5972737 | 70 | 0053140 | B411120 | 5987166 | 452 | 053719 | CO501-6N19 | 5995988 | 176 | 055025 | R55Y | 6000341 | 150 |
| 052604 | CO500-121/16 | 5995755 | 175 | 0053157 | A92183 | 5972981 | 70 | 053720 | CO501-6N20 | 5995996 | 176 | 055026 | R55Z | 6000344 | 150 |
| 052605 | CO500-125/64 | 5995796 | 175 | 0053164 | B411140 | 5987169 | 452 | 053721 | CO501-6N21 | 5996000 | 176 | 0055465 | A94031 | 5973146 | 81 |
| 052606 | CO500-123/32 | 5995792 | 175 | 0053171 | B411150 | 5987172 | 452 | 053722 | CO501-6N22 | 5996004 | 176 | 0055472 | A94018 | 5972921 | 81 |
| 052607 | CO500-127/64 | 5995802 | 175 | 0053188 | B411160 | 5987175 | 452 | 053723 | CO501-6N23 | 5996007 | 176 | 0055533 | A94032 | 5973151 | 81 |
| 052608 | CO500-121/8 | 5995763 | 175 | 0053195 | B411150 | 5987213 | 452 | 053724 | CO501-6N24 | 5996010 | 176 | 0055540 | A94033 | 5973156 | 81 |
| 052609 | CO500-129/64 | 5995805 | 175 | 0053201 | B411160 | 5987217 | 452 | 053725 | CO501-6N25 | 5996014 | 176 | 0055588 | A94034 | 5973161 | 81 |
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| 052611 | CO500-1211/64 | 5995767 | 176 | 0053225 | B411180 | 5987226 | 452 | 053727 | CO501-6N27 | 5996024 | 176 | 055608 | QC0860P1/8 | 5995727 | 167 |
| 052612 | CO500-123/16 | 5995779 | 176 | 0053232 | B411190 | 5987229 | 452 | 053728 | CO501-6N28 | 5996029 | 176 | 055609 | QC0860P9/64 | 5995814 | 167 |
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| 0052655 | A92145 | 5972756 | 70 | 0053324 | A92192 | 5973019 | 71 | 053737 | CO501-6N37 | 5996072 | 176 | 0055618 | A9409/64 | 5972865 | 81 |
| 0052662 | A92146 | 5972760 | 70 | 0053331 | A92193 | 5973026 | 71 | 053738 | CO501-6N38 | 5996077 | 176 | 055618 | QC0860P9/32 | 5995810 | 167 |
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| 0052686 | A92148 | 5972769 | 70 | 0053355 | A92195 | 5972404 | 71 | 053740 | CO501-6N40 | 5996086 | 176 | 055620 | QC0860P5/16 | 5995794 | 167 |
| 0052693 | A92149 | 5972777 | 70 | 0053362 | A92196 | 5972449 | 71 | 053741 | CO501-6N41 | 5996088 | 176 | 055621 | QC0860P21/64 | 5995758 | 167 |
| 0052709 | A92150 | 5972834 | 70 | 0053379 | A92197 | 5972494 | 71 | 053742 | CO501-6N42 | 5996092 | 176 | 055622 | QC0860P11/32 | 5995730 | 167 |
| 0052716 | A92151 | 5972875 | 70 | 0053386 | A92198 | 5972539 | 71 | 053743 | CO501-6N43 | 5996094 | 176 | 055623 | QC0860P23/64 | 5995762 | 167 |
| 0052723 | A92152 | 5972928 | 70 | 0053393 | A92199 | 5972547 | 71 | 053744 | CO501-6N44 | 5996097 | 176 | 055624 | QC0860P3/8 | 5995786 | 167 |
| 0052730 | A92153 | 5972977 | 70 | 0053409 | A921100 | 5971794 | 71 | 053745 | CO501-6N45 | 5996104 | 176 | 0055625 | A94036 | 59973175 | 82 |
| 0052747 | A92154 | 5973023 | 70 | 0053416 | A921102 | 5971798 | 71 | 053746 | CO501-6N46 | 5996107 | 176 | 055625 | QC0860P25/64 | 5995766 | 168 |
| 0052754 | A92155 | 5973030 | 70 | 0053423 | A921103 | 5971802 | 71 | 053747 | CO501-6N47 | 5996110 | 176 | 055626 | QC0860P13/32 | 5995740 | 168 |
| 0052761 | A92156 | 5973034 | 70 | 0053447 | A921105 | 5971807 | 71 | 053748 | CO501-6N48 | 5996113 | 176 | 055627 | QC0860P27/64 | 5995770 | 168 |
| 0052778 | A92157 | 5973038 | 70 | 0053454 | A921108 | 5971812 | 71 | 053749 | CO501-6N49 | 5996116 | 176 | 055628 | QC0860P7/16 | 5995803 | 168 |
| 0052785 | A92158 | 5973041 | 70 | 0053461 | A921110 | 5971814 | 71 | 053750 | CO501-6N50 | 5996123 | 176 | 055629 | QC0860P29/64 | 5995778 | 168 |
| 0052792 | A92159 | 5972838 | 70 | 0053485 | A921115 | 5971822 | 71 | 0053751 | A94014 | 5973062 | 81 | 055630 | QC0860P15/32 | 5995746 | 168 |
| 052802 | CO501-12N2 | 5995880 | 176 | 0053492 | A921118 | 5971824 | 71 | 053751 | CO501-6N51 | 5996127 | 176 | 055631 | QC0860P31/64 | 5995790 | 168 |
| 0052808 | A92160 | 5972852 | 70 | 0053508 | A921120 | 5971830 | 71 | 053752 | CO501-6N52 | 5996131 | 176 | 0055632 | A94037 | 5973183 | 82 |
| 052810 | CO501-12N10 | 5995861 | 176 | 0053522 | A921125 | 5971834 | 71 | 0053768 | A94015 | 5972881 | 81 | 055632 | QC0860P1/2 | 5995722 | 168 |
| 052811 | CO501-12N11 | 5995869 | 176 | 0053546 | A921130 | 5971842 | 71 | 0053775 | A94016 | 5972905 | 81 | 055904 | QC91G1/16 | 5996826 | 155 |
| 052815 | A92161 | 5972854 | 70 | 0053553 | A921135 | 5972603 | 71 | 0054253 | A94016 | 5972885 | 81 | 055905 | QC91G5/64 | 5997143 | 155 |
| 052816 | CO501-12N16 | 5995873 | 176 | 0053560 | A921140 | 5972726 | 71 | 0054260 | A94017 | 5972890 | 81 | 055906 | QC91G3/32 | 5996895 | 155 |
| 052819 | CO501-12N19 | 5995877 | 176 | 0053577 | A921145 | 5972772 | 71 | 0054383 | A94018 | 5972895 | 81 | 055907 | QC91G7/64 | 5997198 | 155 |
| 052820 | CO501-12N20 | 5995883 | 176 | 0053584 | A921150 | 5972785 | 71 | 0054390 | A94019 | 5972900 | 81 | 055908 | QC91G1/8 | 5996834 | 155 |
| 052821 | CO501-12N21 | 5995887 | 176 | 0053591 | A921155 | 5972789 | 71 | 0054406 | A9405/64 | 5972177 | 81 | 055909 | QC91G9/64 | 5997204 | 155 |
| 0052822 | A92162 | 5972858 | 70 | 053604 | CO500-61/16 | 5995809 | 175 | 0054604 | A94020 | 5973278 | 81 | 055910 | QC91G5/32 | 5997098 | 156 |
| 052827 | CO501-12N27 | 5995891 | 176 | 053605 | CO500-65/64 | 5995848 | 175 | 0054611 | A94021 | 5973282 | 81 | 055911 | QC91G11/64 | 5996840 | 156 |
| 052829 | CO501-12N29 | 5995895 | 176 | 053606 | CO500-63/32 | 5995842 | 175 | 0054628 | A94022 | 5973286 | 81 | 055912 | QC91G3/16 | 5996891 | 156 |
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| 0052839 | A92163 | 5972863 | 70 | 053607 | CO500-67/64 | 5995854 | 175 | 0054727 | A9403/32 | 5973207 | 81 | 055914 | QC91G7/32 | 5997195 | 156 |
| 052840 | CO501-12N40 | 5995909 | 175 | 053608 | CO500-61/8 | 5995818 | 176 | 0054734 | A94024 | 5973084 | 81 | 055915 | QC91G15/64 | 5996859 | 156 |
| 0052846 | A92164 | 5972867 | 70 | 053609 | CO500-69/64 | 5995858 | 175 | 0054789 | A94025 | 5973087 | 81 | 055916 | QC91G1/4 | 5996831 | 156 |
| 0052853 | A92165 | 5972870 | 70 | 053610 | CO500-65/32 | 5995845 | 176 | 0054796 | A94026 | 5973090 | 81 | 055917 | QC91G17/64 | 5996863 | 156 |
| 0052860 | A92166 | 5972879 | 70 | 053611 | CO500-611/64 | 5995822 | 176 | 0054802 | A94027 | 5973092 | 81 | 055918 | QC91G9/32 | 5997201 | 156 |
| 0052877 | A92167 | 5972884 | 70 | 053612 | CO500-63/16 | 5995839 | 176 | 0054833 | A9407/64 | 5972281 | 81 | 055919 | QC91G19/64 | 5996867 | 156 |
| 0052884 | A92168 | 5972889 | 70 | 053613 | CO500-613/64 | 5995831 | 176 | 0054840 | A94028 | 5973095 | 81 | 055920 | QC91G5/16 | 5997063 | 156 |
| 0052891 | A92169 | 5972894 | 70 | 0053614 | A94010 | 5973055 | 81 | 0054857 | A94029 | 5973098 | 81 | 055921 | QC91G21/64 | 5996870 | 156 |
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| 056200 | 5ATL20 | 6000810 | 152 | 057185 | 5ATL185 | 6000799 | 153 | 057935 | QC91P35/64 | 5997541 | 156 | 058142 | 501-6N42 | 6001268 | 170 |
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| 081713 | QC21G13/64 | 5996287 | 120 | 087959 | SPSG-1205/8 | 6000133 | 208 | 091447 | R5647/64 | 5999950 | 194 | 091570 | R5713/32 | 5999577 | 197 |
| 081714 | QC21G7/32 | 5996351 | 120 | 087960 | SPSG-1203/4 | 6000116 | 208 | 091448 | R563/4 | 5999976</ | | | | | |

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| 091584 | R5717/16 | 5999602 | 197 | 0094341 | E500M24NO2 | 5975659 | 315 | 0096239 | E513M16X15NO7 | 5977401 | 317 | 0099278 | E5471/4NO3 | 5976335 | 363 |
| 091585 | R5711/2 | 5999543 | 197 | 0094358 | E500M24NO3 | 5975663 | 315 | 0096246 | E513M16X10NO3 | 5976823 | 317 | 0099285 | E5471/8NO3 | 5976349 | 363 |
| 091586 | R5711/32 | 5999545 | 197 | 0094365 | E500M27NO2 | 5975687 | 315 | 0096253 | E513M16X10NO7 | 5977250 | 317 | 0099292 | E5472NO3 | 5976385 | 363 |
| 091587 | R5715/32 | 5999594 | 197 | 0094372 | E500M27NO3 | 5975688 | 315 | 0096260 | E513M18X15NO3 | 5977267 | 318 | 0099308 | E5473/4NO3 | 5976397 | 363 |
| 091588 | R5717/32 | 5999606 | 197 | 0094402 | E500M35NO1 | 5975690 | 315 | 0096277 | E513M18X10NO2 | 5977405 | 318 | 0099315 | E5473/8NO3 | 5976416 | 363 |
| 091589 | R5719/32 | 5999616 | 197 | 0094419 | E500M35NO2 | 5975691 | 315 | 0096284 | E513M18X10NO3 | 5977255 | 318 | 0099322 | E5475/8NO2 | 5976427 | 363 |
| 091592 | R5711/32 | 5999554 | 197 | 0094426 | E500M35NO3 | 5975693 | 315 | 0096291 | E513M18X10NO7 | 5977258 | 318 | 0099339 | E5475/8NO3 | 5976430 | 363 |
| 091595 | R5711/32 | 5999559 | 197 | 0094440 | E500M3NO2 | 5975705 | 315 | 0096307 | E513M18X20NO2 | 5977283 | 318 | 0099353 | E5477/8NO2 | 5976445 | 363 |
| 091598 | R5711/32 | 5999566 | 197 | 0094457 | E500M3NO3 | 5975707 | 315 | 0096314 | E513M18X20NO3 | 5977287 | 318 | 0099360 | E5477/8NO3 | 5976448 | 363 |
| 092333 | R56CO33/64 | 6000402 | 199 | 0094464 | E500M3NO6 | 5975709 | 315 | 0096321 | E513M18X20NO7 | 5977295 | 318 | 0099445 | E5501/1 | 5976452 | 362 |
| 092334 | R56CO17/32 | 6000364 | 199 | 0094471 | E500M3NO8 | 5975713 | 315 | 0096338 | E513M20X15NO3 | 5977318 | 318 | 0099452 | E5501/2 | 5976455 | 362 |
| 092335 | R56CO35/64 | 6000409 | 199 | 0094488 | E500M3NO2 | 5975727 | 315 | 0096345 | E513M20X10NO2 | 5977302 | 318 | 0099469 | E5501/4 | 5976457 | 362 |
| 092336 | R56CO9/16 | 6000007 | 199 | 0094495 | E500M3NO3 | 5976741 | 315 | 0096352 | E513M20X10NO3 | 5977305 | 318 | 0099476 | E5501/2 | 5976459 | 362 |
| 092337 | R56CO37/64 | 6000413 | 199 | 0094525 | E500M33NO3 | 5976875 | 315 | 0096369 | E513M20X10NO7 | 5977308 | 318 | 0099483 | E5501/4 | 5976464 | 362 |
| 092338 | R56CO19/32 | 6000367 | 199 | 0094549 | E500M36NO2 | 5976933 | 315 | 0096376 | E513M20X20NO2 | 5977333 | 318 | 0099490 | E5501/8 | 5976468 | 362 |
| 092339 | R56CO39/64 | 6000417 | 199 | 0094556 | E500M36NO3 | 5976938 | 315 | 0096383 | E513M20X20NO3 | 5977336 | 318 | 0099506 | E5502 | 5977431 | 362 |
| 092340 | R56CO5/8 | 6000439 | 199 | 0094587 | E500M39NO3 | 5976746 | 315 | 0096390 | E513M22X15NO3 | 5977359 | 318 | 0099513 | E5503/4 | 5977442 | 362 |
| 092341 | R56CO41/64 | 6000420 | 199 | 0094617 | E500M45NO2 | 5976752 | 315 | 0096406 | E513M22X10NO2 | 5977344 | 318 | 0099520 | E5503/8 | 5977464 | 362 |
| 092342 | R56CO21/32 | 6000372 | 199 | 0094624 | E500M45NO3 | 5976754 | 315 | 0096413 | E513M22X10NO3 | 5977347 | 318 | 099701 | C21R10COSET | 5995560 | 234 |
| 092343 | R56CO43/64 | 6000424 | 199 | 0094648 | E500M4NO2 | 5976770 | 315 | 0096420 | E513M22X20NO2 | 5977372 | 318 | 099705 | C114COMBCSET | 5995600 | 235 |
| 092344 | R56CO11/16 | 6000350 | 199 | 0094655 | E500M4NO3 | 5976774 | 315 | 0096437 | E513M22X20NO3 | 5977375 | 318 | 099706 | C115COMBCSET | 5995679 | 235 |
| 092345 | R56CO45/64 | 6000428 | 199 | 0094662 | E500M4NO6 | 5976783 | 315 | 0096444 | E513M22X20NO7 | 5977378 | 318 | 0099834 | E7101 | 5977609 | 350 |
| 092346 | R56CO23/32 | 6000377 | 199 | 0094679 | E500M4NO8 | 5976791 | 315 | 0096451 | E513M24X15NO3 | 5977392 | 318 | 0099841 | E7101/2 | 5977612 | 350 |
| 092347 | R56CO47/64 | 6000432 | 199 | 0094686 | E500M42NO3 | 5976815 | 315 | 0096468 | E513M24X15NO7 | 5977399 | 318 | 0099858 | E7101/4 | 5977615 | 350 |
| 092348 | R56CO3/4 | 6000394 | 199 | 0094709 | E500M45NO3 | 5976841 | 315 | 0096475 | E513M24X10NO2 | 5977381 | 318 | 0099865 | E7101/2 | 5977622 | 350 |
| 092349 | R56CO49/64 | 6000435 | 199 | 0094730 | E500M48NO3 | 5976850 | 315 | 0096482 | E513M24X10NO3 | 5977383 | 318 | 0099872 | E7101/4 | 5977628 | 350 |
| 092350 | R56CO25/32 | 6000382 | 199 | 0094761 | E500M5NO2 | 5976878 | 315 | 0096499 | E513M24X20NO2 | 5977038 | 318 | 0099889 | E7101/8 | 5977634 | 350 |
| 092351 | R56CO51/64 | 6000442 | 199 | 0094778 | E500M5NO3 | 5976886 | 315 | 0096505 | E513M24X20NO3 | 5977079 | 318 | 0099896 | E7102 | 5977643 | 350 |
| 092352 | R56CO13/16 | 6000353 | 199 | 0094785 | E500M5NO8 | 5976898 | 315 | 0096512 | E513M25X15NO3 | 5977179 | 318 | 0099902 | E7103/4 | 5977646 | 350 |
| 092353 | R56CO53/64 | 6000448 | 199 | 0094792 | E500M52NO3 | 5976992 | 315 | 0096529 | E513M26X15NO2 | 5977000 | 318 | 0099903 | C29R40COSET | 5995632 | 238 |
| 092354 | R56CO27/32 | 6000386 | 199 | 0094808 | E500M6NO1 | 5977074 | 315 | 0096536 | E513M26X15NO3 | 5977003 | 318 | 0099919 | E7103/8 | 5977652 | 350 |
| 092355 | R56CO55/64 | 5999837 | 199 | 0094815 | E500M6NO2 | 5977116 | 315 | 0096543 | E513M28X15NO2 | 5977017 | 318 | 0099926 | E7111 | 5977656 | 356 |
| 092356 | R56CO7/8 | 6000004 | 199 | 0094822 | E500M6NO3 | 5977162 | 315 | 0096550 | E513M28X15NO3 | 5977021 | 318 | 099930 | C60R41COSET | 5995677 | 238 |
| 092357 | R56CO57/64 | 5999886 | 199 | 0094839 | E500M6NO8 | 5977180 | 315 | 0096567 | E513M30X35NO3 | 5977041 | 318 | 0099933 | E7111/2 | 5977660 | 356 |
| 092358 | R56CO29/32 | 6000390 | 199 | 0094846 | E500M7NO3 | 5976999 | 315 | 0096574 | E513M30X15NO2 | 5977045 | 318 | 099935 | C29L10SET | 5995612 | 231 |
| 092359 | R56CO59/64 | 5999931 | 199 | 0094853 | E500M7NO6 | 5977002 | 315 | 0096581 | E513M30X15NO3 | 5977049 | 318 | 0099940 | E7111/2 | 5977662 | 356 |
| 092360 | R56CO15/16 | 6000356 | 199 | 0094877 | E500M8NO2 | 5977016 | 315 | 0096598 | E513M32X15NO3 | 5977068 | 318 | 099944 | C13R10COSET | 5995685 | 234 |
| 092361 | R56CO61/64 | 5999965 | 199 | 0094884 | E500M8NO3 | 5977020 | 315 | 0096604 | E513M32X20NO2 | 5977071 | 318 | 099955 | C15L10SET | 5995520 | 231 |
| 092362 | R56CO31/32 | 6000398 | 199 | 0094891 | E500M8NO6 | 5977024 | 315 | 0096611 | E513M33X20NO3 | 5977075 | 318 | 0099957 | E7111/8 | 5977664 | 356 |
| 092363 | R56CO63/64 | 5999998 | 199 | 0094907 | E500M8NO8 | 5977036 | 315 | 0096628 | E513M35X15NO2 | 5977082 | 318 | 099960 | C60M41COSET | 5995667 | 239 |
| 092364 | R56CO1 | 6000347 | 199 | 0094914 | E500M9NO3 | 5977047 | 315 | 0096635 | E513M35X15NO3 | 5977086 | 318 | 099961 | C26M42COSET | 5995585 | 239 |
| 093900 | E500M16NO3 | 5976989 | 315 | 0094938 | E501M10NO2 | 5977066 | 323 | 0096642 | E513M36X20NO3 | 5977097 | 318 | 099962 | C29M40COSET | 5995616 | 239 |
| 093924 | E500M17NO2 | 5976994 | 315 | 0094945 | E501M10NO3 | 5977070 | 323 | 0096659 | E513M36X30NO2 | 5977101 | 318 | 009964 | E7113/4 | 5977669 | 356 |
| 093931 | E500M17NO3 | 5976995 | 315 | 0094952 | E501M12NO2 | 5977081 | 323 | 0096666 | E513M36X30NO3 | 5977105 | 318 | 0099971 | E7113/8 | 5977542 | 356 |
| 093948 | E500M18NO2 | 5977011 | 315 | 0094969 | E501M12NO3 | 5977085 | 323 | 0096673 | E513M39X30NO3 | 5977113 | 318 | 099976 | C60R18SET | 5995674 | 225 |
| 093955 | E500M18NO3 | 5977015 | 315 | 0094976 | E501M14NO2 | 5977092 | 323 | 0096680 | E513M44X5NO3 | 5977128 | 318 | 099977 | C29R10SET | 5995628 | 224 |
| 093979 | E500M10NO2 | 5975320 | 315 | 0094983 | E501M14NO3 | 5977096 | 323 | 0096697 | E513M40X15NO3 | 5977140 | 318 | 099978 | C15R10SET | 5995533 | 224 |
| 093986 | E500M10NO3 | 5975367 | 315 | 0094990 | E501M16NO2 | 5977104 | 323 | 0096703 | E513M42X15NO3 | 5977151 | 318 | 099981 | C20R18SET | 5995552 | 225 |
| 093993 | E500M10NO8 | 5975480 | 315 | 0095003 | E501M16NO3 | 5977108 | 323 | 0096710 | E513M45X15NO3 | 5977164 | 318 | 099982 | C115COMBSET | 5995683 | 227 |
| 094006 | E500M11NO2 | 5975484 | 315 | 0095010 | E501M18NO3 | 5977120 | 323 | 0096727 | E513M5X5NO2 | 5977196 | 318 | 099983 | C26R15SET | 5995597 | 226 |
| 094013 | E500M11NO3 | 5975486 | 315 | 0095027 | E501M20NO2 | 5977129 | 323 | 0096734 | E501M5X5NO3 | 5977223 | 318 | 099985 | C502ABSET | 5995661 | 228 |
| 094037 | E500M12NO2 | 5975293 | 315 | 0095034 | E501M20NO3 | 5977132 | 323 | 0096741 | E513M5X5NO7 | 5977227 | 318 | 099987 | C252ASET | 5995581 | 228 |
| 094044 | E500M12NO3 | 5975296 | 315 | 0095041 | E501M24NO3 | 5977150 | 323 | 0096758 | E513M50X15NO3 | 5977072 | 318 | 0099988 | E7121 | 5977585 | 360 |
| 094051 | E500M12NO6 | 5975302 | 315 | 0095058 | E501M3NO2 | 5977158 | 323 | 0096765 | E513M6X75NO3 | 5977098 | 317 | 099988 | C252ABSET | 5995577 | 228 |
| 094068 | E500M12NO8 | 5975309 | 315 | 0095065 | E501M3NO3 | 5977169 | 323 | 0096772 | E513M6X75NO7 | 5977102 | 317 | 099990 | C114COMBSET | 5995676 | 227 |
| 094075 | E500M14NO2 | 5975317 | 315 | 0095072 | E501M4NO2 | 5976814 | 323 | 0096789 | E513M7X75NO2 | 5977114 | 317 | 0099995 | E7121/4 | 5977619 | 360 |
| 094082 | E500M14NO3 | 5975324 | 315 | 0095089 | E501M4NO3 | 5976856 | 323 | 0096796 | E513M7X75NO3 | 5977118 | 317 | 0100004 | E7121/16 | 5977651 | 360 |
| 094099 | E500M14NO8 | 5975336 | 315 | 0095096 | E501M5NO2 | 5976942 | 323 | 0096802 | E513M8X75NO3 | 5977141 | 317 | 0100011 | E7121/2 | 5977677 | 360 |
| 094105 | E500M16NO2 | 5975344 | 315 | 0095102 | E501M5NO3 | 5976949 | 323 | 0096819 | E513M8X75NO7 | 5977145 | 317 | 0100028 | E7121/4 | 5977685 | 360 |
| 094112 | E500M16NO3 | 5975349 | 315 | 0095119 | E501M6NO2 | 5976955 | 323 | 0096826 | E513M8X10NO3 | 5977161 | 317 | 0100035 | E7121/8 | 5977688 | 360 |
| 094129 | E500M16NO8 | 5975363 | 315 | 0095126 | E501M6NO3 | 5976958 | 323 | 0096833 | E513M9X10NO3 | 5977182 | 317 | 0100042 | E7123/4 | 5977691 | 360 |
| 094136 | E500M18NO2 | 5975375 | 315 | 0095133 | E501M8NO2 | 5976775 | 323 | 097601 | 76HAN1 | 6001213 | 212 | 0100059 | E7123/8 | 5977694 | 360 |
| 094143 | E500M18NO3 | 5975380 | 315 | 0095140 | E501M8NO3 | 5976779 | 323 | 097602 | 76HAN2 | 6001215 | 212 | 0104996 | F201M10 | 5977822 | 383 |
| 094167 | E500M22NO2 | 5975404 | 315 | 0096079 | E513M10X125NO3 | 5976817 | 317 | 097603 | 76HAN3 | 6001217 | 212 | 0105009 | F201M12 | 5977826 | 383 |
| 094174 | E500M22NO3 | 5975410 | 315 | 0096086 | E513M10X10NO3 | 5977407 | 317 | 097604 | 76HAN4 | 6001219 | 212 | 0105016 | F201M14 | 5977831 | 383 |
| 094198 | E500M23NO2 | 5975437 | 315 | 0096093 | E513M11X10NO2 | 5976693 | 317 | 097605 | 76HAN5 | 6001221 | 212 | 0105023 | F201M16 | 5977836 | 383 |
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| 0105610 | F302M27 | 5978493 | 386 | 0109632 | G560100 | 5973336 | 492 | 0115763 | R51051 | 5980565 | 54 | 0116548 | R52095 | 5981180 | 46 |
| 0105627 | F302M3 | 5978496 | 386 | 0109649 | G560104 | 5973337 | 492 | 0115770 | R51055 | 5980571 | 54 | 0121863 | A17029/32 | 5968783 | 193 |
| 0105634 | F302M30 | 5978499 | 386 | 0109656 | G560124 | 5973339 | 492 | 0115787 | R51060 | 5980607 | 54 | 0121870 | A17033/64 | 5968798 | 192 |
| 0105641 | F302M33 | 5978502 | 386 | 0109663 | G560165 | 5973341 | 492 | 0115794 | R51065 | 5980615 | 54 | 0121887 | A17035/64 | 5968804 | 192 |
| 0105658 | F302M36 | 5978505 | 386 | 0109670 | G560205 | 5973345 | 492 | 0115800 | R51068 | 5980622 | 54 | 0121894 | A17037/64 | 5968809 | 192 |
| 0105672 | F302M4 | 5978508 | 386 | 0109687 | G560250 | 5973347 | 492 | 0115817 | R51069 | 5980626 | 54 | 0121900 | A17039/64 | 5968814 | 192 |
| 0105719 | F302M5 | 5978510 | 386 | 0109694 | G56063 | 5973351 | 492 | 0115824 | R51070 | 5980478 | 54 | 0121917 | A17043/64 | 5968828 | 192 |
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| 0105740 | F302M7 | 5978517 | 386 | 0110195 | K520100X1600 | 5982330 | 511 | 0115848 | R51074 | 5980484 | 54 | 0121931 | A17049/64 | 5968842 | 192 |
| 0105757 | F302M8 | 5978521 | 386 | 0110201 | K520100X2000 | 5982333 | 511 | 0115855 | R51075 | 5980488 | 54 | 0121948 | A17053/64 | 5968858 | 193 |
| 0108260 | G132125 | 5973334 | 497 | 0110225 | K520120X1000 | 5982344 | 511 | 0115862 | R51080 | 5980505 | 55 | 0121955 | A17055/64 | 5968862 | 193 |
| 0108277 | G132160 | 5973335 | 497 | 0110249 | K520120X1600 | 5982348 | 511 | 0115879 | R51085 | 5980507 | 55 | 0121962 | A17059/64 | 5968878 | 193 |
| 0108284 | G132200 | 5973338 | 497 | 0110256 | K520120X2000 | 5982355 | 511 | 0115886 | R51090 | 5980519 | 55 | 0121979 | A17061/64 | 5969699 | 193 |
| 0108291 | G13280 | 5973340 | 497 | 0110294 | K520140X1600 | 5982363 | 511 | 0115893 | R51092 | 5980521 | 55 | 0121986 | A17063/64 | 5969741 | 193 |
| 0108444 | G135125 | 5973344 | 489 | 0110300 | K520140X2000 | 5982367 | 511 | 0115909 | R51093 | 5980525 | 55 | 0122198 | B15730 | 5986732 | 464 |
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| 0108505 | G136100 | 5973358 | 492 | 0110409 | K520250X2000 | 5982403 | 511 | 0115961 | R520110 | 5980569 | 46 | 0122457 | E500M56NO3 | 5977032 | 315 |
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| 0108536 | G136124 | 5973364 | 492 | 0110492 | K52060X2000 | 5982336 | 511 | 0115992 | R520125 | 5980591 | 46 | 0122488 | E500M14NO3 | 5976985 | 315 |
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| 0108550 | G136150 | 5973368 | 492 | 0110553 | K52080X1600 | 5982361 | 511 | 0116012 | R520140 | 5980612 | 46 | 0122501 | E504M5NO3 | 5976848 | 328 |
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| 0181911 | B101240 | 5986574 | 467 | 0206805 | F3203/8X15/16 | 5978036 | 379 | 0214480 | A12519/64X315 | 5968507 | 164 | 0239292 | A218N1 | 5968986 | 213 |
| 0181928 | B101250 | 5986576 | 467 | 0206812 | F3203/8X11/2 | 5978031 | 379 | 0214497 | A12519/64X500 | 5968510 | 164 | 0239308 | A218N2 | 5969045 | 213 |
| 0181935 | B101260 | 5986579 | 467 | 0206843 | F3207/16X15/16 | 5978787 | 379 | 0214503 | A12521/64X500 | 5968551 | 164 | 0239315 | A218N3 | 5969099 | 213 |
| 0181942 | B101270 | 5986582 | 467 | 0206850 | F3207/16X11/2 | 5978746 | 379 | 0214510 | A12511/32X500 | 5968122 | 164 | 0239322 | A218N4 | 5969147 | 213 |
| 0181959 | B101280 | 5986585 | 467 | 0206867 | F3201/2X15/16 | 5977978 | 379 | 0214527 | A12523/64X500 | 5968574 | 164 | 0239339 | A218N5 | 5969175 | 213 |
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| 0182017 | B101340 | 5986624 | 467 | 0206935 | F3205/8X2 | 5978069 | 379 | 0214589 | A1257/16X500 | 5969158 | 164 | 0240434 | A2431/8X6 | 5968845 | 169 |
| 0182024 | B101350 | 5986649 | 467 | 0206959 | F3203/4X11/2 | 5978013 | 379 | 0214596 | A12529/64X315 | 5968597 | 164 | 0240441 | A2433/16X6 | 5968850 | 169 |
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| 0182048 | B101370 | 5986723 | 467 | 0206973 | F3207/8X2 | 5978821 | 379 | 0214619 | A12515/32X500 | 5968166 | 165 | 0240465 | A2435/32X6 | 5968861 | 169 |
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| 0182062 | B101390 | 5986807 | 467 | 0206997 | F32011/8X3 | 5977972 | 379 | 0214633 | A12531/64X500 | 5968772 | 165 | 0240823 | A243N11X6 | 5968813 | 169 |
| 0182079 | B101400 | 5986823 | 467 | 0207000 | F32011/4X3 | 5977968 | 379 | 0214640 | A12533/64X315 | 5968825 | 165 | 0240922 | A243N20X6 | 5968818 | 169 |
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| 0182093 | B101420 | 5986653 | 467 | 0209332 | F3701/4X15/16 | 5978451 | 382 | 0214664 | A12517/32X315 | 5968603 | 165 | 0241035 | A243N30X6 | 5968830 | 169 |
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| 0182116 | B101440 | 5986659 | 467 | 0209356 | F3701/2X2 | 5978449 | 382 | 0214688 | A12535/64X315 | 5968910 | 162 | 0241844 | A221N0 | 5969065 | 214 |
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| 0182345 | B30111/64 | 5986390 | 479 | 0210741 | R5201/4 | 5980546 | 46 | 0214824 | A12511/16X315 | 5968107 | 165 | 0252376 | B1221/2 | 5986446 | 465 |
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| 3210297 | G7047/8X3/16 | 8203248 | 505 | 5010186 | B610N56 | 8157153 | 458 | 5010585 | B610B | 8157231 | 458 | 5010711 | B61025/32 | 8157309 | 458 |
| 3210300 | G7041/4X1/4 | 8203249 | 505 | 5010187 | B6103/64 | 8157154 | 458 | 5010593 | B610C | 8157232 | 458 | 5010712 | B61051/64 | 8157310 | 458 |
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| 5010727 | B6101.1/8 | 8157325 | 458 | 5011166 | B630N3 | 8157388 | 466 | 7332949 | R970122 | 7332949 | 27 | 7333057 | R97013/16 | 7333057 | 28 |
| 5010728 | B6101.3/16 | 8157326 | 458 | 5011167 | B630N4 | 8157389 | 466 | 7332980 | R97031/64 | 7332980 | 27 | 7333058 | R970210 | 7333058 | 28 |
| 5010729 | B6101.1/4 | 8157327 | 458 | 5011168 | B630N5 | 8157390 | 466 | 7332981 | R970125 | 7332981 | 27 | 7333059 | R97053/64 | 7333059 | 28 |
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| 5010940 | B6501/2 | 8157143 | 471 | 6210034 | G70211/32 | 8203180 | 501 | 7332990 | R970135 | 7332990 | 27 | 7333068 | R970230 | 7333068 | 28 |
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| 5011100 | B6901/2X82 | 8157422 | 480 | 6210088 | G7031.1/16 | 8203204 | 504 | 7333014 | R970160 | 7333014 | 28 | 7333092 | R970280 | 7333092 | 29 |
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| 5011102 | B6903/4X82 | 8157430 | 480 | 6210090 | G7031.3/16 | 8203206 | 504 | 7333016 | R970161 | 7333016 | 28 | 7333094 | R970285 | 7333094 | 29 |
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| 5011109 | B6903/8X100 | 8157420 | 480 | 6210107 | G7051/4 | 8203291 | 502 | 7333023 | R970167 | 7333023 | 28 | 7333101 | R970300 | 7333101 | 29 |
| 5011110 | B6901/2X100 | 8157424 | 480 | 6210109 | G7055/16 | 8203292 | 502 | 7333024 | R970170 | 7333024 | 28 | 7333102 | R97013/16 | 7333102 | 29 |
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| 5011112 | B6903/4X100 | 8157432 | 480 | 6210113 | G7057/16 | 8203294 | 502 | 7333026 | R970171 | 7333026 | 28 | 7333104 | R97017/32 | 7333104 | 29 |
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| 5011131 | B660N2 | 8157371 | 474 | 6210117 | G7059/16 | 8203297 | 502 | 7333029 | R970175 | 7333029 | 28 | 7333107 | R970320 | 7333107 | 29 |
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| 5011146 | B670N0 | 8157396 | 475 | 6210127 | G70515/16 | 8203306 | 502 | 7333038 | R970186 | 7333038 | 28 | 7333116 | R970350 | 7333116 | 29 |
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| 5011150 | B670N4 | 8157400 | 475 | 6210141 | G7063/8 | 8203310 | 502 | 7333042 | R970190 | 7333042 | 28 | 7333120 | R970370 | 7333120 | 29 |
| 5011151 | B670N5 | 8157401 | 475 | 6210142 | G70613/32 | 8203311 | 502 | 7333043 | R9703/4 | 7333043 | 28 | 7333121 | R97015/32 | 7333121 | 29 |
| 5011152 | B670N6 | 8157402 | 475 | 6210143 | G7067/16 | 8203312 | 502 | 7333044 | R970191 | 7333044 | 28 | 7333122 | R970375 | 7333122 | 29 |
| 5011153 | B670N7 | 8157403 | 475 | 6210144 | G70615/32 | 8203313 | 502 | 7333045 | R970192 | 7333045 | 28 | 7333123 | R970380 | 7333123 | 29 |
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| 7350256 | E630M18 | 7350256 | 260 | 7350334 | E769M18X15 | 7350334 | 267 | 7350412 | E9117/8 | 7350412 | 264 | 7350490 | E9097/8 | 7350490 | 261 |
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| 7350262 | E770M12X1257350262 | 7350262 | 260 | 7350340 | E8121/4H3 | 7350340 | 271 | 7350418 | E627M8 | 7350418 | 268 | 7350496 | E625M10 | 7350496 | 266 |
| 7350263 | E770M12X15 | 7350263 | 260 | 7350341 | E8125/16H5 | 7350341 | 271 | 7350419 | E627M10 | 7350419 | 268 | 7350497 | E625M12 | 7350497 | 266 |
| 7350264 | E770M14X15 | 7350264 | 260 | 7350342 | E8125/16H3 | 7350342 | 271 | 7350420 | E627M12 | 7350420 | 268 | 7350498 | E625M14 | 7350498 | 266 |
| 7350265 | E631M6 | 7350265 | 260 | 7350343 | E8123/8H5 | 7350343 | 271 | 7350421 | E627M14 | 7350421 | 268 | 7350499 | E625M16 | 7350499 | 266 |
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| 7350269 | E631M14 | 7350269 | 260 | 7350347 | E8121/2H3 | 7350347 | 271 | 7350425 | E627M24 | 7350425 | 268 | 7350503 | E765M8X10 | 7350503 | 266 |
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| 7350526 | E9083/8 | 7350526 | 270 | 7361254 | R457V | 7361254 | 49 | 7624984 | R46313/64 | 7624984 | 60 | 7625062 | R463112 | 7625062 | 62 |
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| 7350529 | E9085/8 | 7350529 | 270 | 7361257 | R457113 | 7361257 | 49 | 7624987 | R46353 | 7624987 | 61 | 7625065 | R463115 | 7625065 | 62 |
| 7350530 | E9083/4 | 7350530 | 270 | 7361258 | R457133 | 7361258 | 50 | 7624988 | R46354 | 7624988 | 61 | 7625066 | R46329/64 | 7625066 | 62 |
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| 7350532 | E9081 | 7350532 | 270 | 7361260 | R45853 | 7361260 | 47 | 7624990 | R4637/32 | 7624990 | 61 | 7625068 | R463118 | 7625068 | 62 |
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| 7350534 | E624M5 | 7350534 | 275 | 7361262 | R45859 | 7361262 | 47 | 7624992 | R46357 | 7624992 | 61 | 7625070 | R463120 | 7625070 | 62 |
| 7350535 | E624M6 | 7350535 | 275 | 7361263 | R458B | 7361263 | 48 | 7624993 | R46358 | 7624993 | 61 | 7625071 | R4631205 | 7625071 | 62 |
| 7350536 | E624M8 | 7350536 | 275 | 7361264 | R458C | 7361264 | 48 | 7624994 | R46359 | 7624994 | 61 | 7625072 | R463122 | 7625072 | 62 |
| 7350537 | E624M10 | 7350537 | 275 | 7361265 | R458E | 7361265 | 48 | 7624995 | R46315/64 | 7624995 | 61 | 7625073 | R46331/64 | 7625073 | 62 |
| 7350538 | E624M12 | 7350538 | 275 | 7361266 | R458F | 7361266 | 48 | 7624996 | R46360 | 7624996 | 61 | 7625074 | R463125 | 7625074 | 62 |
| 7350539 | E624M14 | 7350539 | 275 | 7361267 | R458G | 7361267 | 48 | 7624997 | R463605 | 7624997 | 61 | 7625075 | R4631/2 | 7625075 | 62 |
| 7350540 | E624M16 | 7350540 | 275 | 7361268 | R458I | 7361268 | 48 | 7624998 | R46361 | 7624998 | 61 | 7625076 | R463127 | 7625076 | 62 |
| 7350541 | E624M18 | 7350541 | 275 | 7361269 | R458J | 7361269 | 48 | 7624999 | R46362 | 7624999 | 61 | 7625077 | R463128 | 7625077 | 62 |
| 7350542 | E624M20 | 7350542 | 275 | 7361270 | R458K | 7361270 | 48 | 7625000 | R46363 | 7625000 | 61 | 7625078 | R463130 | 7625078 | 62 |
| 7350543 | E624M24 | 7350543 | 275 | 7361271 | R45872 | 7361271 | 48 | 7625001 | R4631/4 | 7625001 | 61 | 7625079 | R46333/64 | 7625079 | 62 |
| 7350544 | E764M8X10 | 7350544 | 275 | 7361272 | R458P | 7361272 | 49 | 7625002 | R46364 | 7625002 | 61 | 7625080 | R463133 | 7625080 | 62 |
| 7350545 | E764M10X1257350545 | 7350545 | 275 | 7361273 | R45883 | 7361273 | 49 | 7625003 | R46365 | 7625003 | 61 | 7625081 | R46317/32 | 7625081 | 62 |
| 7350546 | E764M12X1257350546 | 7350546 | 275 | 7361274 | R458R | 7361274 | 49 | 7625004 | R46366 | 7625004 | 61 | 7625082 | R463135 | 7625082 | 62 |
| 7350547 | E764M12X15 | 7350547 | 275 | 7361275 | R458S | 7361275 | 49 | 7625005 | R46367 | 7625005 | 61 | 7625083 | R463138 | 7625083 | 62 |
| 7350548 | E764M14X15 | 7350548 | 275 | 7361276 | R45889 | 7361276 | 49 | 7625006 | R46317/64 | 7625006 | 61 | 7625084 | R46335/64 | 7625084 | 62 |
| 7350549 | E764M16X15 | 7350549 | 275 | 7361277 | R45892 | 7361277 | 49 | 7625007 | R46368 | 7625007 | 61 | 7625085 | R463140 | 7625085 | 62 |
| 7350550 | E764M18X15 | 7350550 | 275 | 7361278 | R458V | 7361278 | 49 | 7625008 | R46369 | 7625008 | 61 | 7625086 | R4631425 | 7625086 | 62 |
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| 7361208 | R453G | 7361208 | 57 | 7361286 | R458133 | 7361286 | 50 | 7625016 | R46319/64 | 7625016 | 61 | 7625094 | R463153 | 7625094 | 62 |
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| 7361212 | R45372 | 7361212 | 57 | 7378065 | DS1203/8 | 7378065 | 207 | 7625020 | R46379 | 7625020 | 61 | 7625098 | R4635/8 | 7625098 | 62 |
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| 7361214 | R45383 | 7361214 | 58 | 7378067 | DS1201/2 | 7378067 | 207 | 7625022 | R46380 | 7625022 | 61 | 7625100 | R46730 | 7625100 | 51 |
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| 7361216 | R453S | 7361216 | 58 | 7378069 | DS1421/8 | 7378069 | 207 | 7625024 | R46381 | 7625024 | 61 | 7625101 | R46731 | 7625101 | 51 |
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| 7361223 | R453153 | 7361223 | 59 | 7624913 | R46330 | 7624913 | 60 | 7625031 | R46387 | 7625031 | 61 | 7625104 | R46733 | 7625104 | 51 |
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| 7361226 | R454E | 7361226 | 57 | 7624916 | R46332 | 7624916 | 60 | 7625034 | R46389 | 7625034 | 61 | 7625106 | R467N29 | 7625106 | 51 |
| 7361227 | R454F | 7361227 | 57 | 7624917 | R46333 | 7624917 | 60 | 7625035 | R46390 | 7625035 | 61 | 7625106 | R467N29 | 7625106 | 51 |
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| 7647913 | C6073/4X5/8 | 7647913 | 431 | 7647991 | C6171/2X1/2 | 7647991 | 443 | 7648542 | S1083/4 | 7648542 | 400 | 7648620 | S113160 | 7648620 | 405 |
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| 7648715 | S223HB3/4XR030 | 7648715 | 418 | 7648793 | S23540 | 7648793 | 411 | 7648871 | S13980 | 7648871 | 415 | 7658817 | C6079/16X1/2 | 7658817 | 34 |
| 7648716 | S223HB3/4XR060 | 7648716 | 418 | 7648794 | S23545 | 7648794 | 411 | 7648872 | S13960 | 7648872 | 415 | 7812046 | E8164-40 | 7812046 | 265 |
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| 7648721 | S1293/16 | 7648721 | 409 | 7648799 | S23590 | 7648799 | 411 | 7648877 | S13920 | 7648877 | 415 | 7812101 | E8165/16 | 7812101 | 265 |
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| 7812119 | E817M8 | 7812119 | 269 | 7833365 | H8512146 | 7833365 | 42 | 7877974 | TS18HSN36 | 7877974 | 215 | 7878052 | TS51HS5/32 | 7878052 | 216 |
| 7812120 | E817M10 | 7812120 | 269 | 7833366 | H8512156 | 7833366 | 42 | 7877975 | TS10HS7/64 | 7877975 | 215 | 7878053 | TS52HSN22 | 7878053 | 216 |
| 7812121 | E817M12 | 7812121 | 269 | 7833367 | H8512166 | 7833367 | 43 | 7877976 | TS18HSN35 | 7877976 | 215 | 7878054 | TS52HSN21 | 7878054 | 216 |
| 7812122 | E917M8X10 | 7812122 | 269 | 7833368 | H8512176 | 7833368 | 43 | 7877977 | TS18HSN34 | 7877977 | 215 | 7878055 | TS52HSN20 | 7878055 | 216 |
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| 7812149 | E806M8 | 7812149 | 278 | 7877926 | TS41HSN26 | 7877926 | 216 | 7878004 | TS18HSN12 | 7878004 | 217 | 7878083 | TS55HSD | 7878083 | 218 |
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| 7812154 | E906M12X1257812154 | 278 | 7877931 | TS41HSN22 | 7877931 | 216 | 7878009 | TS18HSN7 | 7878009 | 217 | 7878088 | TS51HS5/16 | 7878088 | 218 | |
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| 7833299 | H851130 | 7833299 | 30 | 7877938 | TS41HSN16 | 7877938 | 217 | 7878016 | TS18HSN2 | 7878016 | 217 | 7878115 | TS41CON37 | 7878115 | 219 |
| 7833300 | H851140 | 7833300 | 30 | 7877939 | TS41HSN15 | 7877939 | 217 | 7878017 | TS18HSN1 | 7878017 | 217 | 7878116 | TS41CON36 | 7878116 | 219 |
| 7833301 | H8519/16 | 7833301 | 30 | 7877940 | TS41HSN14 | 7877940 | 217 | 7878018 | TS15HSA | 7878018 | 217 | 7878117 | TS40CO7/64 | 7878117 | 219 |
| 7833302 | H85139/64 | 7833302 | 30 | 7877941 | TS41HSN13 | 7877941 | 217 | 7878019 | TS10HS15/64 | 7878019 | 217 | 7878118 | TS41CON35 | 7878118 | 219 |
| 7833303 | H85141/64 | 7833303 | 31 | 7877942 | TS40HS3/16 | 7877942 | 217 | 7878020 | TS15HSB | 7878020 | 218 | 7878119 | TS41CON34 | 7878119 | 219 |
| 7833304 | H85111/16 | 7833304 | 31 | 7877943 | TS41HSN12 | 7877943 | 217 | 7878021 | TS15HSC | 7878021 | 218 | 7878120 | TS41CON33 | 7878120 | 219 |
| 7833305 | H85123/32 | 7833305 | 31 | 7877944 | TS41HSN11 | 7877944 | 217 | 7878022 | TS15HSD | 7878022 | 218 | 7878121 | TS41CON32 | 7878121 | 220 |
| 7833306 | H851150 | 7833306 | 30 | 7877945 | TS41HSN10 | 7877945 | 217 | 7878023 | TS10HS1/4 | 7878023 | 218 | 7878122 | TS41CON31 | 7878122 | 220 |
| 7833307 | H851160 | 7833307 | 31 | 7877946 | TS41HSN9 | 7877946 | 217 | 7878024 | TS15HSF | 7878024 | 218 | 7878123 | TS40CO1/8 | 7878123 | 220 |
| 7833308 | H851170 | 7833308 | 31 | 7877947 | TS41HSN8 | 7877947 | 217 | 7878025 | TS15HSG | 7878025 | 218 | 7878124 | TS41CON30 | 7878124 | 220 |
| 7833309 | H851180 | 7833309 | 31 | 7877948 | TS41HSN7 | 7877948 | 217 | 7878026 | TS10HS9/32 | 7878026 | 218 | 7878125 | TS41CON29 | 7878125 | 220 |
| 7833310 | H851190 | 7833310 | 31 | 7877949 | TS40HS13/64 | 7877949 | 217 | 7878027 | TS10HS5/16 | 7878027 | 218 | 7878126 | TS41CON28 | 7878126 | 220 |
| 7833311 | H851200 | 7833311 | 31 | 7877950 | TS41HSN6 | 7877950 | 217 | 7878028 | TS10HS3/8 | 7878028 | 218 | 7878127 | TS40CO9/64 | 7878127 | 220 |
| 7833312 | H851210 | 7833312 | 31 | 7877951 | TS41HSN5 | 7877951 | 217 | 7878029 | TS52HSN50 | 7878029 | 215 | 7878128 | TS41CON27 | 7878128 | 220 |
| 7833313 | H851220 | 7833313 | 31 | 7877952 | TS41HSN4 | 7877952 | 217 | 7878030 | TS51HS3/32 | 7878030 | 215 | 7878129 | TS41CON26 | 7878129 | 220 |
| 7833314 | H851230 | 7833314 | 31 | 7877953 | TS41HSN3 | 7877953 | 217 | 7878031 | TS52HSN40 | 7878031 | 215 | 7878130 | TS41CON25 | 7878130 | 220 |
| 7833315 | H85149/64 | 7833315 | 31 | 7877954 | TS40HS7/32 | 7877954 | 217 | 7878032 | TS52HSN39 | 7878032 | 215 | 7878131 | TS41CON24 | 7878131 | 220 |
| 7833316 | H85151/64 | 7833316 | 31 | 7877955 | TS41HSN2 | 7877955 | 217 | 7878033 | TS52HSN38 | 7878033 | 215 | 7878132 | TS41CON23 | 7878132 | 220 |
| 7833317 | H85127/32 | 7833317 | 31 | 7877956 | TS41HSN1 | 7877956 | 217 | 7878034 | TS52HSN37 | 7878034 | 215 | 7878133 | TS40CO5/32 | 7878133 | 220 |
| 7833318 | H85157/64 | 7833318 | 31 | 7877957 | TS42HSA | 7877957 | 217 | 7878035 | TS52HSN36 | 7878035 | 215 | 7878134 | TS41CON22 | 7878134 | 220 |
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