DORMER PRAMET

# CUTTING TOOLS FOR MAINTENANCE AND REPAIR APPLICATIONS (MRO)



DORMER

PRECISION

UNION BUTTERFIELD®

## TOOLS FOR MAINTENANCE, REPAIR AND OPERATIONS

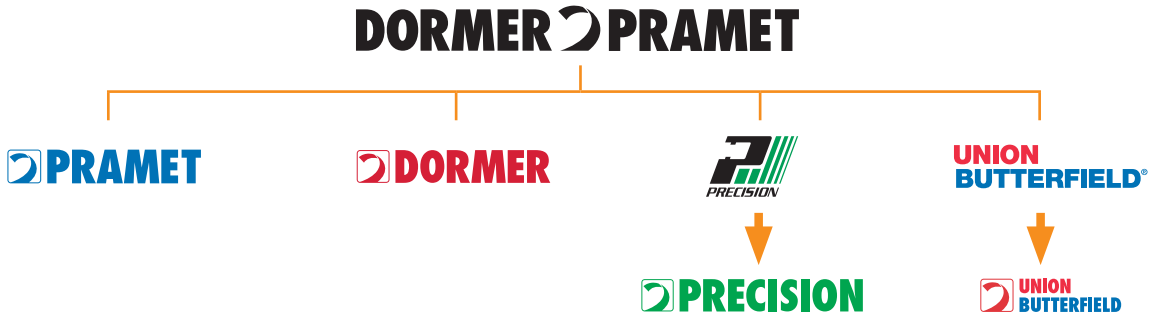


The team at Dormer Pramet has created a specific selection of cutting tools and accessories aimed at the MRO professional. The brands within this offer are Precision Twist Drill (PTD), Union Butterfield and Dormer.

Targeted at delivering MRO professionals an offer that is easy-to-select and comprehensive for their needs, our experts have identified drills, taps, dies, reamers, end mills and rotary burrs that will deliver reliable and cost effective results in portable and machine applications in a wide range of operating conditions in various materials.

Our core offer includes drilling, milling, threading and turning tools for the general engineering sector. As your full service supplier, we are committed to helping our customers carry out their machining processes efficiently with productivity as our goal.

## 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.

# INDEX


| DESCRIPTION | STYLE | PAGE |
|---|---|---|
| **JOBBER DRILLS** | | **5** |
| **General Purpose (MRO)** | 301JD | 5 |
| | 301JD Sets | 6 |
| **General Purpose** | R10P, R15P, R18P | 7 |
| | R10P, R15P, R18P Sets | 9 |
| | 2A | 10 |
| | 2A Sets | 12 |
| **General Purpose - Left Hand** | L10, L10 Sets | 12 |
| **Heavy Duty (MRO)** | 331HD, 332HD, 333HD | 13 |
| | 331HD, 332HD, 333HD Sets | 14 |
| **Heavy Duty Trailer Bits** | 239TBT | 15 |
| **Carbide Tipped** | D444 | 15 |
| **Solid Carbide** | D33F, D33W, D33L | 16 |
| | D33M | 19 |
| **MECHANICS LENGTH DRILLS** | | **20** |
| **Heavy Duty (MRO)** | 321MD , 321MD Sets | 20 |
| **STUB LENGTH DRILLS** | | **21** |
| **Heavy Duty (MRO)** | 311SM, 312SM | 21 |
| | 311SM Set | 22 |
| **REDUCED SHANK** | | **23** |
| **Silver & Deming (MRO)** | 341SD, 341SDSET | 23 |
| | 342SDT, 342SDTSET | 24 |
| **TAPER SHANK DRILLS** | | **25** |
| **General Purpose** | 209, S209 | 25 |
| **4-Flute Core Drill** | T400 | 27 |
| **CENTER DRILLS** | | **28** |
| **Carbide General Purpose** | DC | 28 |
| **HSS General Purpose** | 76HA | 28 |
| | A225, A217, A218 | 29 |
| | A217, A218 Sets | 29 |
| **SPOTTING DRILLS** | | **30** |
| **Short Length** | SPS-90, SPS-120 | 30 |
| **Regular Length** | SPR-90, SPR-120 | 30 |
| **Long Length** | SPL-90, SPL-120 | 30 |
| **SHEET METAL DRILLS** | | **31** |
| **Stub Length, Single End** | A123 | 31 |
| **Stub Length, Double End** | A119 | 31 |
| **Conical Drills** | G314 | 32 |
| **SPOT WELD DRILLS** | | **31** |
| **Cobalt Spot Weld Stub** | A723 | 31 |
| **DRILLING TROUBLESHOOTING** | | **33** |
| **GENERAL PURPOSE HAND TAP** | | **34** |
| **Straight Flute** | 1500, 1528, 1500S, 1528S | 34 |
| | 1500L | 36 |
| | 1500A | 37 |
| | TN1500 | 37 |
| | 1700M, 1700S | 38 |
| **8-Pitch** | 1505 | 38 |
| **Spiral Point** | 1534NR | 39 |
| | 1585NR | 40 |
| | 1785NR | 41 |
| | 1534NE | 41 |
| **Spiral Flute** | 1582, 1586 | 42 |
| | 1587, 1588 | 42 |
| | 1788M | 43 |
| | 1590, 1591 | 43 |
| **NPT** | 1541, TN1541 | 44 |
| | 6541 | 44 |
| | 1545, 1545A | 45 |
| **COMBINATION DRILL & TAP** | | **45** |
| | E653 | 45 |
| | 1994 | 46 |
| | E651, E654 | 46 |
| | E650 | 47 |
| | 229CSET | 47 |
| **DIES** | | **48** |
| **Round Adjustable, Split Type** | F320, F330 | 48 |
| | 2710M | 49 |
| **Hexagon Dienuts** | 2025 | 50 |
| | F302 | 51 |
| | F312 | 51 |
| **MISCELLANEOUS** | | **52** |
| **Sleeves & Keys** | 411, 430 | 52 |
| **Screw Extractor** | 1800, 1816 | 52 |
| **Drilling & Tapping Fluid** | 1900 | 53 |
| **Tap Handles** | 1215 | 54 |
| | 3850 | 54 |
| | L110 | 55 |

| DESCRIPTION | STYLE | PAGE |
|---|---|---|
| **HSS REAMER** | | **56** |
| **Hand Reamer** | 4500 | 56 |
| | 4587 | 56 |
| | 4591 | 57 |
| | B301 | 57 |
| | 4600 | 58 |
| **Car Reamer** | B122 | 58 |
| **Chucking Reamer** | 4533 | 59 |
| **Bridge Reamer** | 4579 | 61 |
| **Center Reamer** | 4608 | 62 |
| **HSS COUNTERSINK** | | **63** |
| **Straight Shank** | 4603 | 63 |
| | 4602 | 63 |
| **Taper Shank** | G137 | 64 |
| | G138, G338 | 64 |
| **HSS COUNTERBORE** | | **65** |
| **Body** | 4702 | 65 |
| | 4705, 4706 | 66 |
| | 4703 | 67 |
| **Detachable Pilot** | 4704 | 67 |
| **END MILLS** | | **69** |
| **2 Flute** | C110 | 69 |
| | C123 | 70 |
| | C600 | 71 |
| | C601 | 71 |
| | C602 | 72 |
| | C603 | 72 |
| | C604 | 73 |
| | C605 | 73 |
| | C606 | 73 |
| **3 Flute** | C607 | 74 |
| | C346 | 74 |
| **Multi-Flute** | C247 | 75 |
| | C273 | 76 |
| | C608, C609 | 77 |
| | C613 | 77 |
| | C610, C611 | 78 |
| | C612 | 78 |
| **4 Flute** | C614 | 79 |
| | C615 | 79 |
| | C617 | 80 |
| | C618 | 80 |
| **Type N Corner Rounding** | C700 | 81 |
| | C710 | 81 |
| **ROTARY BURRS** | | **82** |
| **ROTARY BURRS NOMENCLATURE & FEATURES** | | **82** |
| **Cylinder without end cut** | SA-DC | 83 |
| | SA-FM | 83 |
| **Cylinder with end cut** | SB-DC | 84 |
| | SB-FM | 84 |
| **Ball Nosed Cylinder** | SC-DC | 85 |
| | SC-FM | 85 |
| **Ball** | SD-DC | 86 |
| | SD-FM | 86 |
| **Oval** | SE-DC | 87 |
| | SE-FM | 87 |
| **Ball Nosed Tree** | SF-DC | 88 |
| | SF-FM | 88 |
| **Pointed Tree** | SG-DC | 89 |
| **Flame** | SH-DC | 89 |
| **60° Countersink** | SJ-DC | 90 |
| **90° Countersink** | SK-DC | 90 |
| **Ball Nosed Cone** | SL-DC | 91 |
| | SL-FM | 91 |
| **Cone** | SM-DC | 92 |
| **Inverted Cone** | SN-DC | 92 |
| **Bolt Removal** | P100, P101 | 93 |
| **Diamond Cut Router - Plain End** | FGR-A | 94 |
| **Diamond Cut Router - Burr End** | FGR-B | 94 |
| **End Mill Cut** | FGR-C | 94 |
| **- 135° Drill Point** | FGR-D | 95 |
| **Piloted Die Mill** | PDM-DC | 95 |
| **Burr Sets** | SET-DC-12 | 96 |
| | SET-DC-8 | 96 |
| | SET-FM-8 | 96 |
| **ROTARY BURR RPM'S** | | **97** |
| **ROTARY BURR TROUBLESHOOTING** | | **97** |
| **FLASHTAP SEVICE** | | **98** |

# MRO Jobber Length Drills

118° Point, HSS, Steam Tempered
Designed for portable and machine drilling under a wide range of operating conditions in various materials. Surface treated with a steam tempered finish for abrasion resistance and improved coolant adherence.



## 301JD

| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | |
| | N60 | | 0.0400 | 11/16 | 1.5/8 | 12 | 46480740 |
| | N59 | | 0.0410 | 11/16 | 1.5/8 | 12 | 46480741 |
| | N58 | | 0.0420 | 11/16 | 1.5/8 | 12 | 46480742 |
| | N57 | | 0.0430 | 3/4 | 1.3/4 | 12 | 46480743 |
| | N56 | | 0.0465 | 3/4 | 1.3/4 | 12 | 46480744 |
| | N55 | | 0.0520 | 7/8 | 1.7/8 | 12 | 46480745 |
| | N54 | | 0.0550 | 7/8 | 1.7/8 | 12 | 46480746 |
| | N53 | | 0.0595 | 7/8 | 1.7/8 | 12 | 46480747 |
| 1/16 | | | 0.0625 | 7/8 | 1.7/8 | 12 | 46480748 |
| | N52 | | 0.0635 | 7/8 | 1.7/8 | 12 | 46480749 |
| | N51 | | 0.0670 | 1" | 2" | 12 | 46480750 |
| | N50 | | 0.0700 | 1" | 2" | 12 | 46480751 |
| | N49 | | 0.0730 | 1" | 2" | 12 | 46480752 |
| | N48 | | 0.0760 | 1" | 2" | 12 | 46480753 |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 46480754 |
| | N47 | | 0.0785 | 1" | 2" | 12 | 46480755 |
| | N46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | 46480756 |
| | N45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | 46480757 |
| | N44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | 46480758 |
| | N43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | 46480759 |
| | N42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | 46480760 |
| 3/32 | | | 0.0937 | 1.1/4 | 2.1/4 | 12 | 46480761 |
| | N41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | 46480762 |
| | N40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | 46480763 |
| | N39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | 46480764 |
| | N38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | 46480765 |
| | N37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | 46480766 |
| | N36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | 46480767 |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 46480768 |
| | N35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | 46480769 |
| | N34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | 46480770 |
| | N33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | 46480771 |
| | N32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | 46480772 |
| | N31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | 46480773 |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 46480774 |
| | N30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | 46480775 |
| | N29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | 46480776 |
| | N28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | 46480777 |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 46480778 |
| | N27 | | 0.1440 | 1.7/8 | 3" | 12 | 46480779 |
| | N26 | | 0.1470 | 1.7/8 | 3" | 12 | 46480780 |
| | N25 | | 0.1495 | 1.7/8 | 3" | 12 | 46480781 |
| | N24 | | 0.1520 | 2" | 3.1/8 | 12 | 46480782 |
| | N23 | | 0.1540 | 2" | 3.1/8 | 12 | 46480783 |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 46480784 |
| | N22 | | 0.1570 | 2" | 3.1/8 | 12 | 46480785 |
| | N21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | 46480786 |
| | N20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | 46480787 |
| | N19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | 46480788 |
| | N18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | 46480789 |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 46480790 |
| | | | 0.1730 | 2.3/16 | 3.3/8 | 12 | 46480791 |
| | N16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | 46480792 |
| | N15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | 46480793 |
| | N14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | 46480794 |
| | N13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | 46480795 |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 46480796 |
| | N12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | 46480797 |

# MRO Jobber Length Drills

118° Point, HSS, Steam Tempered

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | |
| | N11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | 46480798 |
| | N10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | 46480799 |
| | N9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | 46480800 |
| | N8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | 46480801 |
| | N7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | 46480802 |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 46480803 |
| | N6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | 46480804 |
| | N5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | 46480805 |
| | N4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | 46480806 |
| | N3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | 46480807 |
| 7/32 | | | 0.2187 | 2.1/2 | 3.3/4 | 12 | 46480808 |
| | N2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | 46480809 |
| | N1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | 46480810 |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | 46480811 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 46480812 |
| | | B | 0.2380 | 2.3/4 | 4" | 12 | 46480813 |
| | | C | 0.2420 | 2.3/4 | 4" | 12 | 46480814 |
| | | D | 0.2460 | 2.3/4 | 4" | 12 | 46480815 |
| | | E | 0.2500 | 2.3/4 | 4" | 12 | 46480817 |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 46480816 |
| | | F | 0.2570 | 2.7/8 | 4.1/8 | 12 | 46480818 |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | 46480819 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 46480820 |
| | | H | 0.2660 | 2.7/8 | 4.1/8 | 12 | 46480821 |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | 46480822 |
| | | J | 0.2770 | 2.7/8 | 4.1/8 | 12 | 46480823 |
| | | K | 0.2810 | 2.15/16 | 4.1/4 | 12 | 46480824 |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 46480825 |
| | | L | 0.2900 | 2.15/16 | 4.1/4 | 12 | 46480826 |
| | | M | 0.2950 | 3.1/16 | 4.3/8 | 12 | 46480827 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 46480828 |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | 46480829 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 46480830 |
| | | O | 0.3160 | 3.3/16 | 4.1/2 | 6 | 46480831 |
| | | P | 0.3230 | 3.5/16 | 4.5/8 | 6 | 46480832 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 46480833 |
| | | Q | 0.3320 | 3.7/16 | 4.3/4 | 6 | 46480834 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | 46480835 |
| 11/32 | | | 0.3438 | 3.7/16 | 4.3/4 | 6 | 46480836 |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | 46480837 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | 46480838 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 46480839 |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | 46480840 |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 46480841 |
| | | V | 0.3770 | 3.5/8 | 5" | 6 | 46480842 |
| | | W | 0.3860 | 3.3/4 | 5.1/8 | 6 | 46480843 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 46480844 |
| | | X | 0.3970 | 3.3/4 | 5.1/8 | 6 | 46480845 |
| | | Y | 0.4040 | 3.7/8 | 5.1/4 | 6 | 46480846 |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 46480847 |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | 46480848 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 46480849 |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 46480850 |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 46480851 |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 46480852 |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 46480853 |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 46480854 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 301JDSET | 301JD | 29 | 1/16 - 1/2 x 64ths | 1 | 46481072 |
| 301JDSET | 301JD | 15 | 1/16 - 1/2 x 32nds | 1 | 47233502 |

# General Purpose Jobber Length Drills

118° Point, HSS, Bright Finish

Designed for general purpose hole making in a wide variety of metals and synthetic materials.
Uncoated (bright) finish for general use applications.

**R10P** - Fractional Sizes

**R15P** - Letter Sizes

**R18P** - Wire Gauge Sizes



| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | EDP# |
|---|---|---|---|---|---|---|---|
| Fractional | Drill Gauge | Letter | Decimal | | | | |
| | 97 | | 0.0059 | 1/16 | 3/4 | 12 | 018697 |
| | 96 | | 0.0063 | 1/16 | 3/4 | 12 | 018696 |
| | 95 | | 0.0067 | 1/16 | 3/4 | 12 | 018695 |
| | 94 | | 0.0071 | 1/16 | 3/4 | 12 | 018694 |
| | 93 | | 0.0075 | 1/16 | 3/4 | 12 | 018693 |
| | 92 | | 0.0079 | 1/16 | 3/4 | 12 | 018692 |
| | 91 | | 0.0083 | 5/64 | 3/4 | 12 | 018691 |
| | 90 | | 0.0087 | 5/64 | 3/4 | 12 | 018690 |
| | 89 | | 0.0091 | 5/64 | 3/4 | 12 | 018689 |
| | 88 | | 0.0095 | 5/64 | 3/4 | 12 | 018688 |
| | 87 | | 0.0100 | 5/64 | 3/4 | 12 | 018687 |
| | 86 | | 0.0105 | 3/32 | 3/4 | 12 | 018686 |
| | 85 | | 0.0110 | 3/32 | 3/4 | 12 | 018685 |
| | 84 | | 0.0115 | 3/32 | 3/4 | 12 | 018684 |
| | 83 | | 0.0120 | 3/32 | 3/4 | 12 | 018683 |
| | 82 | | 0.0125 | 3/32 | 3/4 | 12 | 018682 |
| | 81 | | 0.0130 | 3/32 | 3/4 | 12 | 018681 |
| | 80 | | 0.0135 | 1/8 | 3/4 | 12 | 018680 |
| | 79 | | 0.0145 | 1/8 | 3/4 | 12 | 018679 |
| 1/64 | | | 0.0156 | 3/16 | 3/4 | 12 | 010601 |
| | 78 | | 0.0160 | 3/16 | 7/8 | 12 | 018678 |
| | 77 | | 0.0180 | 3/16 | 7/8 | 12 | 018677 |
| | 76 | | 0.0200 | 3/16 | 7/8 | 12 | 018676 |
| | 75 | | 0.0210 | 1/4 | 1“ | 12 | 018675 |
| | 74 | | 0.0225 | 1/4 | 1“ | 12 | 018674 |
| | 73 | | 0.0240 | 5/16 | 1.1/8 | 12 | 018673 |
| | 72 | | 0.0250 | 5/16 | 1.1/8 | 12 | 018672 |
| | 71 | | 0.0260 | 3/8 | 1.1/4 | 12 | 018671 |
| | 70 | | 0.0280 | 3/8 | 1.1/4 | 12 | 018670 |
| | 69 | | 0.0292 | 1/2 | 1.3/8 | 12 | 018669 |
| | 68 | | 0.0310 | 1/2 | 1.3/8 | 12 | 018668 |
| 1/32 | | | 0.0313 | 1/2 | 1.3/8 | 12 | 010602 |
| | 67 | | 0.0320 | 1/2 | 1.3/8 | 12 | 018667 |
| | 66 | | 0.0330 | 1/2 | 1.3/8 | 12 | 018666 |
| | 65 | | 0.0350 | 5/8 | 1.1/2 | 12 | 018665 |
| | 64 | | 0.0360 | 5/8 | 1.1/2 | 12 | 018664 |
| | 63 | | 0.0370 | 5/8 | 1.1/2 | 12 | 018663 |
| | 62 | | 0.0380 | 5/8 | 1.1/2 | 12 | 018662 |
| | 61 | | 0.0390 | 11/16 | 1.5/8 | 12 | 018661 |
| | 60 | | 0.0400 | 11/16 | 1.5/8 | 12 | 018660 |
| | 59 | | 0.0410 | 11/16 | 1.5/8 | 12 | 018659 |
| | 58 | | 0.0420 | 11/16 | 1.5/8 | 12 | 018658 |
| | 57 | | 0.0430 | 3/4 | 1.3/4 | 12 | 018657 |
| | 56 | | 0.0465 | 3/4 | 1.3/4 | 12 | 018656 |
| 3/64 | | | 0.0469 | 3/4 | 1.3/4 | 12 | 010603 |
| | 55 | | 0.0520 | 7/8 | 1.7/8 | 12 | 018655 |
| | 54 | | 0.0550 | 7/8 | 1.7/8 | 12 | 018654 |
| | 53 | | 0.0595 | 7/8 | 1.7/8 | 12 | 018653 |
| 1/16 | | | 0.0625 | 7/8 | 1.7/8 | 12 | 010604 |
| | 52 | | 0.0635 | 7/8 | 1.7/8 | 12 | 018652 |
| | 51 | | 0.0670 | 1“ | 2“ | 12 | 018651 |
| | 50 | | 0.0700 | 1“ | 2“ | 12 | 018650 |
| | 49 | | 0.0730 | 1“ | 2“ | 12 | 018649 |
| | 48 | | 0.0760 | 1“ | 2“ | 12 | 018648 |
| 5/64 | | | 0.0781 | 1“ | 2“ | 12 | 010605 |
| | 47 | | 0.0785 | 1“ | 2“ | 12 | 018647 |
| | 46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | 018646 |
| | 45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | 018645 |
| | 44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | 018644 |
| | 43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | 018643 |
| | 42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | 018642 |
| 3/32 | | | 0.0938 | 1.1/4 | 2.1/4 | 12 | 010606 |
| | 41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | 018641 |
| | 40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | 018640 |
| | 39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | 018639 |
| | 38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | 018638 |
| | 37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | 018637 |
| | 36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | 018636 |

# General Purpose Jobber Length Drills

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | EDP# |
|---|---|---|---|---|---|---|---|
| Fractional | Drill Gauge | Letter | Decimal | | | | |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 010607 |
| | 35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | 018635 |
| | 34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | 018634 |
| | 33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | 018633 |
| | 32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | 018632 |
| | 31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | 018631 |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 010608 |
| | 30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | 018630 |
| | 29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | 018629 |
| | 28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | 018628 |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 010609 |
| | 27 | | 0.1440 | 1.7/8 | 3“ | 12 | 018627 |
| | 26 | | 0.1470 | 1.7/8 | 3“ | 12 | 018626 |
| | 25 | | 0.1495 | 1.7/8 | 3“ | 12 | 018625 |
| | 24 | | 0.1520 | 2“ | 3.1/8 | 12 | 018624 |
| | 23 | | 0.1540 | 2“ | 3.1/8 | 12 | 018623 |
| 5/32 | | | 0.1563 | 2“ | 3.1/8 | 12 | 010610 |
| | 22 | | 0.1570 | 2“ | 3.1/8 | 12 | 018622 |
| | 21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | 018621 |
| | 20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | 018620 |
| | 19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | 018619 |
| | 18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | 018618 |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 010611 |
| | 17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | 018617 |
| | 16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | 018616 |
| | 15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | 018615 |
| | 14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | 018614 |
| | 13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | 018613 |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 010612 |
| | 12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | 018612 |
| | 11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | 018611 |
| | 10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | 018610 |
| | 9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | 018609 |
| | 8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | 018608 |
| | 7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | 018607 |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 010613 |
| | 6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | 018606 |
| | 5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | 018605 |
| | 4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | 018604 |
| | 3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | 018603 |
| 7/32 | | | 0.2188 | 2.1/2 | 3.3/4 | 12 | 010614 |
| | 2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | 018602 |
| | 1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | 018601 |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | 015601 |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 010615 |
| | | B | 0.2380 | 2.3/4 | 4“ | 12 | 015602 |
| | | C | 0.2421 | 2.3/4 | 4“ | 12 | 015603 |
| | | D | 0.2461 | 2.3/4 | 4“ | 12 | 015604 |
| | | E | 0.2500 | 2.3/4 | 4“ | 12 | 015605 |
| 1/4 | | | 0.2500 | 2.3/4 | 4“ | 12 | 010616 |
| | | F | 0.2571 | 2.7/8 | 4.1/8 | 12 | 015606 |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | 015607 |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 010617 |
| | | H | 0.2661 | 2.7/8 | 4.1/8 | 12 | 015608 |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | 015609 |
| | | J | 0.2772 | 2.7/8 | 4.1/8 | 12 | 015610 |
| | | K | 0.2811 | 2.15/16 | 4.1/4 | 12 | 015611 |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 010618 |
| | | L | 0.2902 | 2.15/16 | 4.1/4 | 12 | 015612 |
| | | M | 0.2949 | 3.1/16 | 4.3/8 | 12 | 015613 |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 010619 |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | 015614 |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 010620 |
| | | O | 0.3161 | 3.3/16 | 4.1/2 | 6 | 015615 |
| | | P | 0.3228 | 3.5/16 | 4.5/8 | 6 | 015616 |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 010621 |
| | | Q | 0.3319 | 3.7/16 | 4.3/4 | 6 | 015617 |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | 015618 |
| 11/32 | | | 0.3437 | 3.7/16 | 4.3/4 | 6 | 010622 |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | 015619 |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | 015620 |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 010623 |
| | | U | 0.3680 | 3.5/8 | 5“ | 6 | 015621 |
| 3/8 | | | 0.3750 | 3.5/8 | 5“ | 6 | 010624 |
| | | V | 0.3772 | 3.5/8 | 5“ | 6 | 015622 |
| | | W | 0.3858 | 3.3/4 | 5.1/8 | 6 | 015623 |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 010625 |
| | | X | 0.3969 | 3.3/4 | 5.1/8 | 6 | 015624 |

# General Purpose Jobber Length Drills

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | EDP# |
|---|---|---|---|---|---|---|---|
| Fractional | Drill Gauge | Letter | Decimal | | | | |
| | | Y | 0.4039 | 3.7/8 | 5.1/4 | 6 | 015625 |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 010626 |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | 015626 |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 010627 |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 010628 |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 010629 |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 010630 |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 010631 |
| 1/2 | | | 0.5000 | 4.1/2 | 6“ | 6 | 010632 |
| 33/64 | | | 0.5156 | 4.13/16 | 6.5/8 | 1 | 010633 |
| 17/32 | | | 0.5313 | 4.13/16 | 6.5/8 | 1 | 010634 |
| 35/64 | | | 0.5469 | 4.13/16 | 6.5/8 | 1 | 010635 |
| 9/16 | | | 0.5625 | 4.13/16 | 6.5/8 | 1 | 010636 |
| 37/64 | | | 0.5781 | 4.13/16 | 6.5/8 | 1 | 010637 |
| 19/32 | | | 0.5937 | 5.3/16 | 7.1/8 | 1 | 010638 |
| 39/64 | | | 0.6094 | 5.3/16 | 7.1/8 | 1 | 010639 |
| 5/8 | | | 0.6250 | 5.3/16 | 7.1/8 | 1 | 010640 |
| 41/64 | | | 0.6406 | 5.3/16 | 7.1/8 | 1 | 010641 |
| 21/32 | | | 0.6563 | 5.3/16 | 7.1/8 | 1 | 010642 |
| 43/64 | | | 0.6719 | 5.5/8 | 7.5/8 | 1 | 010643 |
| 11/16 | | | 0.6875 | 5.5/8 | 7.5/8 | 1 | 010644 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| C15R10P | R10P | 15 | 1/16-1/2 x 32nds | 1 | 090163 |
| C29R10P | R10P | 29 | 1/16 - 1/2 x 64ths | 1 | 090162 |
| C26R15P | R15P | 26 | A-Z | 1 | 090126 |
| C20R18P | R18P | 20 | N61-N80 | 1 | 090161 |
| C60R18P | R18P | 60 | N1-N60 | 1 | 090101 |

# General Purpose Jobber Drills

Designed for general purpose hole making, performing best in steel or cast iron.
Uncoated (bright) finish for general use applications.

## **2A** - 118° Split Point, HSS



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

| Drill Sizes | | Flute Length | Over-All-Length | EDP# |
|---|---|---|---|---|
| Metric | Decimal | | | |
| 0.15 | 0.0059 | 1.5 | 19 | 016215 |
| 0.16 | 0.0063 | 1.5 | 19 | 016216 |
| 0.17 | 0.0067 | 1.5 | 19 | 016217 |
| 0.18 | 0.0070 | 1.5 | 19 | 016218 |
| 0.19 | 0.0075 | 1.5 | 19 | 016219 |
| 0.20 | 0.0078 | 2.5 | 19 | 016002 |
| 0.21 | 0.0083 | 2.5 | 19 | 016221 |
| 0.22 | 0.0087 | 2.5 | 19 | 016222 |
| 0.23 | 0.0091 | 2.5 | 19 | 016223 |
| 0.24 | 0.0094 | 2.5 | 19 | 016224 |
| 0.25 | 0.0098 | 3 | 19 | 016225 |
| 0.26 | 0.0102 | 3 | 19 | 016226 |
| 0.27 | 0.0106 | 3 | 19 | 016227 |
| 0.28 | 0.0110 | 3 | 19 | 016228 |
| 0.29 | 0.0114 | 3 | 19 | 016229 |
| 0.30 | 0.0118 | 3 | 19 | 016003 |
| 0.32 | 0.0126 | 4 | 19 | 016232 |
| 0.34 | 0.0134 | 4 | 19 | 016234 |
| 0.35 | 0.0138 | 4 | 19 | 016235 |
| 0.36 | 0.0142 | 4 | 19 | 016236 |
| 0.38 | 0.0150 | 4 | 19 | 016238 |
| 0.40 | 0.0157 | 5 | 20 | 016004 |
| 0.42 | 0.0165 | 5 | 20 | 016242 |
| 0.44 | 0.0173 | 5 | 20 | 016244 |
| 0.45 | 0.0177 | 5 | 20 | 016245 |
| 0.46 | 0.0181 | 5 | 20 | 016246 |
| 0.48 | 0.0189 | 5 | 20 | 016248 |
| 0.50 | 0.0197 | 6 | 22 | 016005 |
| 0.55 | 0.0217 | 7 | 24 | 016250 |
| 0.60 | 0.0236 | 7 | 24 | 016006 |
| 0.65 | 0.0256 | 8 | 26 | 016251 |
| 0.70 | 0.0276 | 9 | 28 | 016007 |
| 0.75 | 0.0295 | 9 | 28 | 016252 |
| 0.80 | 0.0315 | 10 | 30 | 016008 |
| 0.85 | 0.0335 | 10 | 30 | 016253 |
| 0.90 | 0.0354 | 11 | 32 | 016009 |
| 0.95 | 0.0374 | 11 | 32 | 016254 |
| 1.00 | 0.0394 | 12 | 34 | 016010 |
| 1.10 | 0.0433 | 14 | 36 | 016011 |
| 1.15 | 0.0453 | 14 | 36 | 016256 |
| 1.20 | 0.0472 | 16 | 38 | 016012 |
| 1.25 | 0.0492 | 16 | 38 | 016257 |
| 1.30 | 0.0512 | 16 | 38 | 016013 |
| 1.35 | 0.0531 | 18 | 40 | 016258 |
| 1.40 | 0.0551 | 18 | 40 | 016014 |
| 1.45 | 0.0571 | 18 | 40 | 016259 |
| 1.50 | 0.0591 | 18 | 40 | 016015 |
| 1.55 | 0.0610 | 20 | 43 | 016260 |
| 1.60 | 0.0630 | 20 | 43 | 016016 |
| 1.65 | 0.0650 | 20 | 43 | 016261 |
| 1.70 | 0.0669 | 20 | 43 | 016017 |
| 1.75 | 0.0689 | 22 | 46 | 016262 |
| 1.80 | 0.0709 | 22 | 46 | 016018 |
| 1.90 | 0.0748 | 22 | 46 | 016019 |
| 1.95 | 0.0768 | 24 | 49 | 46790303 |
| 2.00 | 0.0787 | 24 | 49 | 016020 |
| 2.10 | 0.0827 | 24 | 49 | 016021 |
| 2.15 | 0.0846 | 27 | 53 | 016266 |
| 2.20 | 0.0866 | 27 | 53 | 016022 |
| 2.25 | 0.0886 | 27 | 53 | 016267 |
| 2.30 | 0.0906 | 27 | 53 | 016023 |
| 2.35 | 0.0925 | 27 | 53 | 016268 |
| 2.40 | 0.0945 | 30 | 57 | 016024 |
| 2.50 | 0.0984 | 30 | 57 | 016025 |
| 2.60 | 0.1024 | 30 | 57 | 016026 |
| 2.70 | 0.1063 | 33 | 61 | 016027 |

Package quantities: 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**

# General Purpose Jobber Drills

continued

| Drill Sizes | | Flute Length | Over-All-Length | EDP# |
|---|---|---|---|---|
| Metric | Decimal | | | |
| 2.75 | 0.1083 | 33 | 61 | 016270 |
| 2.90 | 0.1142 | 33 | 61 | 016029 |
| 3.00 | 0.1181 | 33 | 61 | 016030 |
| 3.10 | 0.1220 | 36 | 65 | 016031 |
| 3.20 | 0.1260 | 36 | 65 | 016032 |
| 3.25 | 0.1280 | 36 | 65 | 016271 |
| 3.30 | 0.1299 | 36 | 65 | 016033 |
| 3.40 | 0.1339 | 39 | 70 | 016034 |
| 3.50 | 0.1378 | 39 | 70 | 016035 |
| 3.60 | 0.1417 | 39 | 70 | 016036 |
| 3.70 | 0.1457 | 39 | 70 | 016037 |
| 4.00 | 0.1575 | 43 | 75 | 016040 |
| 4.10 | 0.1614 | 43 | 75 | 016041 |
| 4.20 | 0.1654 | 43 | 75 | 016042 |
| 4.30 | 0.1693 | 47 | 80 | 016043 |
| 4.40 | 0.1732 | 47 | 80 | 016044 |
| 4.50 | 0.1772 | 47 | 80 | 016045 |
| 4.60 | 0.1811 | 47 | 80 | 016046 |
| 4.80 | 0.1890 | 52 | 86 | 016048 |
| 5.00 | 0.1968 | 52 | 86 | 016050 |
| 5.10 | 0.2008 | 52 | 86 | 016051 |
| 5.20 | 0.2047 | 52 | 86 | 016052 |
| 5.30 | 0.2087 | 52 | 86 | 016053 |
| 5.40 | 0.2126 | 57 | 93 | 016054 |
| 5.50 | 0.2165 | 57 | 93 | 016055 |
| 5.60 | 0.2205 | 57 | 93 | 016056 |
| 5.70 | 0.2244 | 57 | 93 | 016057 |
| 5.75 | 0.2264 | 57 | 93 | 016276 |
| 5.80 | 0.2283 | 57 | 93 | 016058 |
| 6.00 | 0.2362 | 57 | 93 | 016060 |
| 6.10 | 0.2402 | 63 | 101 | 016061 |
| 6.20 | 0.2441 | 63 | 101 | 016062 |
| 6.30 | 0.2480 | 63 | 101 | 016063 |
| 6.40 | 0.2520 | 63 | 101 | 016064 |
| 6.50 | 0.2559 | 63 | 101 | 016065 |
| 6.60 | 0.2598 | 63 | 101 | 016066 |
| 6.70 | 0.2638 | 63 | 101 | 016067 |
| 6.75 | 0.2657 | 69 | 109 | 016278 |
| 6.80 | 0.2677 | 69 | 109 | 016068 |
| 7.00 | 0.2756 | 69 | 109 | 016070 |
| 7.20 | 0.2835 | 69 | 109 | 016072 |
| 7.25 | 0.2854 | 69 | 109 | 016279 |
| 7.30 | 0.2874 | 69 | 109 | 016073 |
| 7.40 | 0.2913 | 69 | 109 | 016074 |
| 7.50 | 0.2953 | 69 | 109 | 016075 |
| 7.60 | 0.2992 | 75 | 117 | 016076 |
| 7.80 | 0.3071 | 75 | 117 | 016078 |
| 7.90 | 0.3110 | 75 | 117 | 016079 |
| 8.00 | 0.3150 | 75 | 117 | 016080 |
| 8.10 | 0.3189 | 75 | 117 | 016081 |
| 8.20 | 0.3228 | 75 | 117 | 016082 |
| 8.25 | 0.3248 | 75 | 117 | 016282 |
| 8.40 | 0.3307 | 75 | 117 | 016084 |
| 8.50 | 0.3346 | 75 | 117 | 016085 |
| 8.60 | 0.3386 | 81 | 125 | 016086 |
| 8.70 | 0.3425 | 81 | 125 | 016087 |
| 8.75 | 0.3445 | 81 | 125 | 016283 |
| 8.80 | 0.3465 | 81 | 125 | 016088 |
| 8.90 | 0.3504 | 81 | 125 | 016089 |
| 9.00 | 0.3543 | 81 | 125 | 016090 |
| 9.30 | 0.3661 | 81 | 125 | 016093 |
| 9.40 | 0.3701 | 81 | 125 | 016094 |
| 9.50 | 0.3740 | 81 | 125 | 016095 |
| 9.60 | 0.3780 | 87 | 133 | 016096 |
| 9.70 | 0.3819 | 87 | 133 | 016097 |
| 9.80 | 0.3858 | 87 | 133 | 016098 |
| 9.90 | 0.3898 | 87 | 133 | 016099 |
| 10.00 | 0.3937 | 87 | 133 | 016100 |
| 10.20 | 0.4016 | 87 | 133 | 016102 |
| 10.30 | 0.4055 | 87 | 133 | 016103 |
| 10.50 | 0.4134 | 87 | 133 | 016105 |
| 10.60 | 0.4173 | 87 | 133 | 016106 |
| 10.80 | 0.4252 | 94 | 142 | 016108 |
| 10.90 | 0.4291 | 94 | 142 | 016109 |
| 11.00 | 0.4331 | 94 | 142 | 016110 |
| 11.20 | 0.4409 | 94 | 142 | 016112 |
| 11.30 | 0.4449 | 94 | 142 | 016113 |

Package quantities: 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**

# General Purpose Jobber Drills

continued

| Drill Sizes | | Flute Length | Over-All-Length | EDP# |
|---|---|---|---|---|
| Metric | Decimal | | | |
| 11.40 | 0.4488 | 94 | 142 | 016114 |
| 11.50 | 0.4528 | 94 | 142 | 016115 |
| 11.70 | 0.4606 | 94 | 142 | 016117 |
| 11.80 | 0.4646 | 94 | 142 | 016118 |
| 12.00 | 0.4724 | 101 | 151 | 016120 |
| 12.10 | 0.4764 | 101 | 151 | 016121 |
| 12.20 | 0.4803 | 101 | 151 | 016122 |
| 12.50 | 0.4921 | 101 | 151 | 016125 |
| 12.80 | 0.5039 | 101 | 151 | 016128 |
| 13.00 | 0.5118 | 101 | 151 | 016130 |
| 13.50 | 0.5315 | 108 | 160 | 034135 |
| 14.00 | 0.5512 | 108 | 160 | 034140 |
| 14.50 | 0.5709 | 114 | 169 | 034145 |
| 15.00 | 0.5906 | 114 | 169 | 034150 |

Package quantities: 0.15mm - 7.90mm = **12**; 8.00mm - 12.50mm = **6**; 12.70mm and above = **1**



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| C252A | 2A | 25 | 1.0mm - 13mm x .5mm | 1 | 099987 |

# General Purpose Jobber Drills - Left Hand

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

## **L10** - 118° Point, HSS, Bright Finish



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



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

# Heavy Duty MRO Jobber Length Drills

135° Split Point, HSS

Heavier web construction than 301JD MRO drills, providing greater rigidity and strength in drilling medium strength alloy materials. The Self-Centering 135° Split Point reduces thrust requirements and minimizes 'walking' particularly on curved surfaces.

**331HD** - Steam Oxide
for improved abrasion resistance



**332HD** - Steam & Bronze Oxide
for improved abrasion resistance, lubricity and enhanced penetration



**333HD** - TiN Coated
Titanium Nitride (TiN) surface finish for an effective 'heat shield' with higher lubricity at higher speeds and feeds



| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | 331HD EDP# | 332HD EDP# | 333HD EDP# |
|---|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | | |
| | N60 | | 0.0400 | 11/16 | 1.5/8 | 12 | | 47233745 | * |
| | N59 | | 0.0410 | 11/16 | 1.5/8 | 12 | | 47233744 | * |
| | N58 | | 0.0420 | 11/16 | 1.5/8 | 12 | | 47233743 | * |
| | N57 | | 0.0430 | 3/4 | 1.3/4 | 12 | | 47233742 | * |
| | N56 | | 0.0465 | 3/4 | 1.3/4 | 12 | | 47233741 | * |
| | N55 | | 0.0520 | 7/8 | 1.7/8 | 12 | | 47233740 | * |
| | N54 | | 0.0550 | 7/8 | 1.7/8 | 12 | | 47233739 | * |
| | N53 | | 0.0595 | 7/8 | 1.7/8 | 12 | | 47233738 | |
| 1/16 | | | 0.0625 | 7/8 | 1.7/8 | 12 | 46480999 | 47233631 | 47233748 |
| | N52 | | 0.0635 | 7/8 | 1.7/8 | 12 | 47233620 | 47233737 | |
| | N51 | | 0.0670 | 1" | 2" | 12 | 47233619 | 47233736 | |
| | N50 | | 0.0700 | 1" | 2" | 12 | 47233618 | 47233735 | |
| | N49 | | 0.0730 | 1" | 2" | 12 | 47233617 | 47233734 | |
| | N48 | | 0.0760 | 1" | 2" | 12 | 47233616 | 47233733 | |
| 5/64 | | | 0.0781 | 1" | 2" | 12 | 46481000 | 47233632 | 47233749 |
| | N47 | | 0.0785 | 1" | 2" | 12 | 47233615 | 47233732 | |
| | N46 | | 0.0810 | 1.1/8 | 2.1/8 | 12 | 47233614 | 47233731 | |
| | N45 | | 0.0820 | 1.1/8 | 2.1/8 | 12 | 47233613 | 47233730 | |
| | N44 | | 0.0860 | 1.1/8 | 2.1/8 | 12 | 47233612 | 47233729 | |
| | N43 | | 0.0890 | 1.1/4 | 2.1/4 | 12 | 47233611 | 47233728 | |
| | N42 | | 0.0935 | 1.1/4 | 2.1/4 | 12 | 47233610 | 47233727 | |
| 3/32 | | | 0.0937 | 1.1/4 | 2.1/4 | 12 | 46481001 | 47233633 | 47233750 |
| | N41 | | 0.0960 | 1.3/8 | 2.3/8 | 12 | 47233609 | 47233726 | |
| | N40 | | 0.0980 | 1.3/8 | 2.3/8 | 12 | 47233608 | 47233725 | |
| | N39 | | 0.0995 | 1.3/8 | 2.3/8 | 12 | 47233607 | 47233724 | |
| | N38 | | 0.1015 | 1.7/16 | 2.1/2 | 12 | 47233606 | 47233723 | |
| | N37 | | 0.1040 | 1.7/16 | 2.1/2 | 12 | 47233605 | 47233722 | |
| | N36 | | 0.1065 | 1.7/16 | 2.1/2 | 12 | 47233604 | 47233721 | |
| 7/64 | | | 0.1094 | 1.1/2 | 2.5/8 | 12 | 46481002 | 47233634 | 47233751 |
| | N35 | | 0.1100 | 1.1/2 | 2.5/8 | 12 | 47233603 | 47233720 | |
| | N34 | | 0.1110 | 1.1/2 | 2.5/8 | 12 | 47233602 | 47233719 | |
| | N33 | | 0.1130 | 1.1/2 | 2.5/8 | 12 | 47233601 | 47233718 | |
| | N32 | | 0.1160 | 1.5/8 | 2.3/4 | 12 | 47233600 | 47233717 | |
| | N31 | | 0.1200 | 1.5/8 | 2.3/4 | 12 | 47233599 | 47233716 | |
| 1/8 | | | 0.1250 | 1.5/8 | 2.3/4 | 12 | 46481003 | 47233635 | 47233752 |
| | N30 | | 0.1285 | 1.5/8 | 2.3/4 | 12 | 47233598 | 47233715 | |
| | N29 | | 0.1360 | 1.3/4 | 2.7/8 | 12 | 47233597 | 47233714 | |
| | N28 | | 0.1405 | 1.3/4 | 2.7/8 | 12 | 47233596 | 47233713 | |
| 9/64 | | | 0.1406 | 1.3/4 | 2.7/8 | 12 | 46481004 | 47233636 | 47233753 |
| | N27 | | 0.1440 | 1.7/8 | 3" | 12 | 47233595 | 47233712 | |
| | N26 | | 0.1470 | 1.7/8 | 3" | 12 | 47233594 | 47233711 | |
| | N25 | | 0.1495 | 1.7/8 | 3" | 12 | 47233593 | 47233710 | |
| | N24 | | 0.1520 | 2" | 3.1/8 | 12 | 47233592 | 47233709 | |
| | N23 | | 0.1540 | 2" | 3.1/8 | 12 | 47233591 | 47233708 | |
| 5/32 | | | 0.1563 | 2" | 3.1/8 | 12 | 46481005 | 47233637 | 47233754 |
| | N22 | | 0.1570 | 2" | 3.1/8 | 12 | 47233590 | 47233707 | |
| | N21 | | 0.1590 | 2.1/8 | 3.1/4 | 12 | 47233589 | 47233706 | |
| | N20 | | 0.1610 | 2.1/8 | 3.1/4 | 12 | 47233588 | 47233705 | |
| | N19 | | 0.1660 | 2.1/8 | 3.1/4 | 12 | 47233587 | 47233704 | |

* Not Split Point

# Heavy Duty MRO Jobber Length Drills

135° Split Point, HSS

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | 331HD EDP# | 332HD EDP# | 333HD EDP# |
|---|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | | |
| | N18 | | 0.1695 | 2.1/8 | 3.1/4 | 12 | 47233586 | 47233703 | |
| 11/64 | | | 0.1719 | 2.1/8 | 3.1/4 | 12 | 46481006 | 47233638 | 47233755 |
| | N17 | | 0.1730 | 2.3/16 | 3.3/8 | 12 | 47233585 | 47233702 | |
| | N16 | | 0.1770 | 2.3/16 | 3.3/8 | 12 | 47233584 | 47233701 | |
| | N15 | | 0.1800 | 2.3/16 | 3.3/8 | 12 | 47233583 | 47233700 | |
| | N14 | | 0.1820 | 2.3/16 | 3.3/8 | 12 | 47233582 | 47233699 | |
| | N13 | | 0.1850 | 2.5/16 | 3.1/2 | 12 | 47233581 | 47233698 | |
| 3/16 | | | 0.1875 | 2.5/16 | 3.1/2 | 12 | 46481007 | 47233639 | 47233756 |
| | N12 | | 0.1890 | 2.5/16 | 3.1/2 | 12 | 47233580 | 47233697 | |
| | N11 | | 0.1910 | 2.5/16 | 3.1/2 | 12 | 47233579 | 47233696 | |
| | N10 | | 0.1935 | 2.7/16 | 3.5/8 | 12 | 47233578 | 47233695 | |
| | N9 | | 0.1960 | 2.7/16 | 3.5/8 | 12 | 47233577 | 47233694 | |
| | N8 | | 0.1990 | 2.7/16 | 3.5/8 | 12 | 47233576 | 47233693 | |
| | N7 | | 0.2010 | 2.7/16 | 3.5/8 | 12 | 47233575 | 47233692 | |
| 13/64 | | | 0.2031 | 2.7/16 | 3.5/8 | 12 | 46481008 | 47233640 | 47233757 |
| | N6 | | 0.2040 | 2.1/2 | 3.3/4 | 12 | 47233574 | 47233691 | |
| | N5 | | 0.2055 | 2.1/2 | 3.3/4 | 12 | 47233573 | 47233690 | |
| | N4 | | 0.2090 | 2.1/2 | 3.3/4 | 12 | 47233572 | 47233689 | |
| | N3 | | 0.2130 | 2.1/2 | 3.3/4 | 12 | 47233571 | 47233688 | |
| 7/32 | | | 0.2187 | 2.1/2 | 3.3/4 | 12 | 46481009 | 47233641 | 47233758 |
| | N2 | | 0.2210 | 2.5/8 | 3.7/8 | 12 | 47233570 | 47233687 | |
| | N1 | | 0.2280 | 2.5/8 | 3.7/8 | 12 | 47233569 | 47233686 | |
| | | A | 0.2340 | 2.5/8 | 3.7/8 | 12 | 47233503 | 47233660 | |
| 15/64 | | | 0.2344 | 2.5/8 | 3.7/8 | 12 | 46481010 | 47233642 | 47233759 |
| | | B | 0.2380 | 2.3/4 | 4" | 12 | 47233504 | 47233661 | |
| | | C | 0.2420 | 2.3/4 | 4" | 12 | 47233505 | 47233662 | |
| | | D | 0.2460 | 2.3/4 | 4" | 12 | 47233506 | 47233663 | |
| | | E | 0.2500 | 2.3/4 | 4" | 12 | 47233507 | 47233664 | |
| 1/4 | | | 0.2500 | 2.3/4 | 4" | 12 | 46481011 | 47233643 | 47233760 |
| | | F | 0.2570 | 2.7/8 | 4.1/8 | 12 | 47233508 | 47233665 | |
| | | G | 0.2610 | 2.7/8 | 4.1/8 | 12 | 47233509 | 47233666 | |
| 17/64 | | | 0.2656 | 2.7/8 | 4.1/8 | 12 | 46481012 | 47233644 | 47233761 |
| | | H | 0.2660 | 2.7/8 | 4.1/8 | 12 | 47233550 | 47233667 | |
| | | I | 0.2720 | 2.7/8 | 4.1/8 | 12 | 47233551 | 47233668 | |
| | | J | 0.2770 | 2.7/8 | 4.1/8 | 12 | 47233552 | 47233669 | |
| | | K | 0.2810 | 2.15/16 | 4.1/4 | 12 | 47233553 | 47233670 | |
| 9/32 | | | 0.2813 | 2.15/16 | 4.1/4 | 12 | 46481013 | 47233645 | 47233762 |
| | | L | 0.2900 | 2.15/16 | 4.1/4 | 12 | 47233554 | 47233671 | |
| | | M | 0.2950 | 3.1/16 | 4.3/8 | 12 | 47233555 | 47233672 | |
| 19/64 | | | 0.2969 | 3.1/16 | 4.3/8 | 12 | 46481014 | 47233646 | 47233763 |
| | | N | 0.3020 | 3.1/16 | 4.3/8 | 12 | 47233556 | 47233673 | |
| 5/16 | | | 0.3125 | 3.3/16 | 4.1/2 | 6 | 46481015 | 47233647 | 47233764 |
| | | O | 0.3160 | 3.3/16 | 4.1/2 | 6 | 47233557 | 47233674 | |
| | | P | 0.3230 | 3.5/16 | 4.5/8 | 6 | 47233558 | 47233675 | |
| 21/64 | | | 0.3281 | 3.5/16 | 4.5/8 | 6 | 46481016 | 47233648 | 47233765 |
| | | Q | 0.3320 | 3.7/16 | 4.3/4 | 6 | 47233559 | 47233676 | |
| | | R | 0.3390 | 3.7/16 | 4.3/4 | 6 | 47233560 | 47233677 | |
| 11/32 | | | 0.3438 | 3.7/16 | 4.3/4 | 6 | 46481017 | 47233649 | 47233766 |
| | | S | 0.3480 | 3.1/2 | 4.7/8 | 6 | 47233561 | 47233678 | |
| | | T | 0.3580 | 3.1/2 | 4.7/8 | 6 | 47233562 | 47233679 | |
| 23/64 | | | 0.3594 | 3.1/2 | 4.7/8 | 6 | 46481018 | 47233650 | 47233767 |
| | | U | 0.3680 | 3.5/8 | 5" | 6 | 47233563 | 47233680 | |
| 3/8 | | | 0.3750 | 3.5/8 | 5" | 6 | 46481019 | 47233651 | 47233768 |
| | | V | 0.3770 | 3.5/8 | 5" | 6 | 47233564 | 47233681 | |
| | | W | 0.3860 | 3.3/4 | 5.1/8 | 6 | 47233565 | 47233682 | |
| 25/64 | | | 0.3906 | 3.3/4 | 5.1/8 | 6 | 46481020 | 47233652 | 47233769 |
| | | X | 0.3970 | 3.3/4 | 5.1/8 | 6 | 47233566 | 47233683 | |
| | | Y | 0.4040 | 3.7/8 | 5.1/4 | 6 | 47233567 | 47233684 | |
| 13/32 | | | 0.4063 | 3.7/8 | 5.1/4 | 6 | 46481021 | 47233653 | 47233770 |
| | | Z | 0.4130 | 3.7/8 | 5.1/4 | 6 | 47233568 | 47233685 | |
| 27/64 | | | 0.4219 | 3.15/16 | 5.3/8 | 6 | 46481022 | 47233654 | 47233771 |
| 7/16 | | | 0.4375 | 4.1/16 | 5.1/2 | 6 | 46481023 | 47233655 | 47233772 |
| 29/64 | | | 0.4531 | 4.3/16 | 5.5/8 | 6 | 46481024 | 47233656 | 47233773 |
| 15/32 | | | 0.4687 | 4.5/16 | 5.3/4 | 6 | 46481025 | 47233657 | 47233774 |
| 31/64 | | | 0.4844 | 4.3/8 | 5.7/8 | 6 | 46481026 | 47233658 | 47233775 |
| 1/2 | | | 0.5000 | 4.1/2 | 6" | 6 | 46481027 | 47233659 | 47233776 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 331HDSET | 331HD | 29 | 1/16 - 1/2 x 64ths | 1 | 47233629 |
| 331HDSET | 331HD | 15 | 1/16 - 1/2 x 32nds | 1 | 47233630 |
| 332HDSET | 332HD | 29 | 1/16 - 1/2 x 64ths | 1 | 47233746 |
| 332HDSET | 332HD | 15 | 1/16 - 1/2 x 32nds | 1 | 47233747 |
| 333HDSET | 333HD | 29 | 1/16 - 1/2 x 64ths | 1 | 47233777 |

# Trailer Bit Drills

Designed for Hand Drilling through stacked materials found in Bus and Truck Trailer manufacturing. Steam Oxide surface treatment for increased wear resistance. Conforms to NAS 907 Type B Aerospace Standards

**239TBT** - 135° Split Point, HSS, Steam Oxide



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|
| Inch | Decimal | | | | |
| 1/8 | 0.125 | 1.5/8 | 2.3/4 | 288 | 041957 |
| 11/64 | 0.172 | 2.1/8 | 3.1/4 | 288 | 041960 |
| 11 | 0.191 | 2.5/16 | 3.1/2 | 288 | 041926 |
| 7/32 | 0.219 | 2.1/2 | 3.3/4 | 288 | 041963 |
| 1/4 | 0.250 | 2.3/4 | 4" | 288 | 041965 |
| F | 0.257 | 2.7/8 | 4.1/8 | 144 | 041948 |
| 17/64 | 0.266 | 2.7/8 | 4.1/8 | 144 | 041966 |
| 9/32 | 0.281 | 2.15/16 | 4.1/4 | 144 | 041967 |
| 5/16 | 0.313 | 3.3/16 | 4.1/2 | 144 | 041969 |

# Jobber Length Carbide Tipped Drills

Designed for general purpose drilling with heavy duty brazed Carbide Tipped for abrasive materials or non-ferrous, such as cast iron.

**D444 -** 118°, HSS / HM, Bright Finish



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

# Jobber Length Carbide Tipped Drills

continued

| Diameter Inch | Diameter Decimal | Flute Length | Over-All-Length | Pack Qty | D444 |
|---|---|---|---|---|---|
| G | 0.2610 | 2.7/8 | 4.1/8 | 1 | 034507 |
| 17/64 | 0.2656 | 2.7/8 | 4.1/8 | 1 | 034417 |
| H | 0.2660 | 2.7/8 | 4.1/8 | 1 | 034508 |
| I | 0.2720 | 2.7/8 | 4.1/8 | 1 | 034509 |
| J | 0.2770 | 2.7/8 | 4.1/8 | 1 | 034510 |
| K | 0.2810 | 2.15/16 | 4.1/4 | 1 | 034511 |
| 9/32 | 0.2813 | 2.15/16 | 4.1/4 | 1 | 034418 |
| L | 0.2900 | 2.15/16 | 4.1/4 | 1 | 034512 |
| 19/64 | 0.2969 | 3.1/16 | 4.3/8 | 1 | 034419 |
| N | 0.3020 | 3.1/16 | 4.3/8 | 1 | 034514 |
| 5/16 | 0.3125 | 3.3/16 | 4.1/2 | 1 | 034420 |
| O | 0.3160 | 3.3/16 | 4.1/2 | 1 | 034515 |
| P | 0.3230 | 3.5/16 | 4.5/8 | 1 | 034516 |
| 21/64 | 0.3281 | 3.5/16 | 4.5/8 | 1 | 034421 |
| Q | 0.3320 | 3.7/16 | 4.3/4 | 1 | 034517 |
| R | 0.3390 | 3.7/16 | 4.3/4 | 1 | 034518 |
| 11/32 | 0.3437 | 3.7/16 | 4.3/4 | 1 | 034422 |
| S | 0.3480 | 3.1/2 | 4.7/8 | 1 | 034519 |
| T | 0.3580 | 3.1/2 | 4.7/8 | 1 | 034520 |
| 23/64 | 0.3594 | 3.1/2 | 4.7/8 | 1 | 034423 |
| U | 0.3680 | 3.5/8 | 5“ | 1 | 034521 |
| 3/8 | 0.3750 | 3.5/8 | 5“ | 1 | 034424 |
| 25/64 | 0.3906 | 3.3/4 | 5.1/8 | 1 | 034425 |
| 13/32 | 0.4063 | 3.7/8 | 5.1/4 | 1 | 034426 |
| Z | 0.4130 | 3.7/8 | 5.1/4 | 1 | 034526 |
| 27/64 | 0.4219 | 3.15/16 | 5.3/8 | 1 | 034427 |
| 7/16 | 0.4375 | 4.1/16 | 5.1/2 | 1 | 034428 |
| 29/64 | 0.4531 | 4.3/16 | 5.5/8 | 1 | 034429 |
| 15/32 | 0.4687 | 4.5/16 | 5.3/4 | 1 | 034430 |
| 31/64 | 0.4844 | 4.3/8 | 5.7/8 | 1 | 034431 |
| 1/2 | 0.5000 | 4.1/2 | 6“ | 1 | 034432 |

# Jobber Length Solid Carbide Drills

Designed for heavy duty general purpose use in a variety of materials. 4-Facet Self Centering Point with low thrust design.

**D33F** - Fractional Sizes

**D33W** - Wire Gauge Sizes

**D33L** - Letter Sizes



| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | D33F EDP# | D33W EDP# | D33L EDP# |
|---|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | | |
| | 68 | | 0.0310 | 5/16 | 1.1/4 | 1 | — | 003500 | — |
| 1/32 | | | 0.0313 | 5/16 | 1.1/4 | 1 | 003501 | — | — |
| | 67 | | 0.0320 | 5/16 | 1.1/4 | 1 | — | 003502 | — |
| | 66 | | 0.0330 | 5/16 | 1.1/4 | 1 | — | 003503 | — |
| | 65 | | 0.0350 | 5/8 | 1.3/8 | 1 | — | 003504 | — |
| | 64 | | 0.0360 | 5/8 | 1.3/8 | 1 | — | 003505 | — |
| | 63 | | 0.0370 | 5/8 | 1.3/8 | 1 | — | 003506 | — |
| | 62 | | 0.0380 | 5/8 | 1.3/8 | 1 | — | 003507 | — |
| | 61 | | 0.0390 | 5/8 | 1.3/8 | 1 | — | 003508 | — |
| | 60 | | 0.0400 | 3/4 | 1.1/2 | 1 | — | 003509 | — |
| | 59 | | 0.0410 | 3/4 | 1.1/2 | 1 | — | 003510 | — |
| | 58 | | 0.0420 | 3/4 | 1.1/2 | 1 | — | 003511 | — |

# Jobber Length Solid Carbide Drills

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | D33F EDP# | D33W EDP# | D33L EDP# |
|---|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | | |
| | 57 | | 0.0430 | 3/4 | 1.1/2 | 1 | — | 003512 | — |
| | 56 | | 0.0465 | 3/4 | 1.1/2 | 1 | — | 003513 | — |
| 3/64 | | | 0.0469 | 3/4 | 1.1/2 | 1 | 003514 | — | — |
| | 55 | | 0.0520 | 3/4 | 1.1/2 | 1 | — | 003515 | — |
| | 54 | | 0.0550 | 3/4 | 1.1/2 | 1 | — | 003516 | — |
| | 53 | | 0.0595 | 3/4 | 1.1/2 | 1 | — | 003517 | — |
| 1/16 | | | 0.0625 | 3/4 | 1.1/2 | 1 | 003518 | — | — |
| | 52 | | 0.0635 | 3/4 | 1.1/2 | 1 | — | 003519 | — |
| | 51 | | 0.0670 | 3/4 | 1.1/2 | 1 | — | 003520 | — |
| | 50 | | 0.0700 | 7/8 | 1.3/4 | 1 | — | 003521 | — |
| | 49 | | 0.0730 | 7/8 | 1.3/4 | 1 | — | 003522 | — |
| | 48 | | 0.0760 | 7/8 | 1.3/4 | 1 | — | 003523 | — |
| 5/64 | | | 0.0781 | 7/8 | 1.3/4 | 1 | 003524 | — | — |
| | 47 | | 0.0785 | 7/8 | 1.3/4 | 1 | — | 003525 | — |
| | 46 | | 0.0810 | 7/8 | 1.3/4 | 1 | — | 003526 | — |
| | 45 | | 0.0820 | 7/8 | 1.3/4 | 1 | — | 003527 | — |
| | 44 | | 0.0860 | 1“ | 2“ | 1 | — | 003528 | — |
| | 43 | | 0.0890 | 1“ | 2“ | 1 | — | 003529 | — |
| | 42 | | 0.0935 | 1“ | 2“ | 1 | — | 003530 | — |
| 3/32 | | | 0.0938 | 1“ | 2“ | 1 | 003531 | — | — |
| | 41 | | 0.0960 | 1“ | 2“ | 1 | — | 003532 | — |
| | 40 | | 0.0980 | 1“ | 2“ | 1 | — | 003533 | — |
| | 39 | | 0.0995 | 1.1/4 | 2.1/4 | 1 | — | 003534 | — |
| | 38 | | 0.1015 | 1.1/4 | 2.1/4 | 1 | — | 003535 | — |
| | 37 | | 0.1040 | 1.1/4 | 2.1/4 | 1 | — | 003536 | — |
| | 36 | | 0.1065 | 1.1/4 | 2.1/4 | 1 | — | 003537 | — |
| 7/64 | | | 0.1094 | 1.1/4 | 2.1/4 | 1 | 003538 | — | — |
| | 35 | | 0.1100 | 1.1/4 | 2.1/4 | 1 | — | 003539 | — |
| | 34 | | 0.1110 | 1.1/4 | 2.1/4 | 1 | — | 003540 | — |
| | 33 | | 0.1130 | 1.1/4 | 2.1/4 | 1 | — | 003541 | — |
| | 32 | | 0.1160 | 1.1/4 | 2.1/4 | 1 | — | 003542 | — |
| | 31 | | 0.1200 | 1.1/4 | 2.1/4 | 1 | — | 003543 | — |
| 1/8 | | | 0.1250 | 1.1/4 | 2.1/4 | 1 | 003544 | — | — |
| | 30 | | 0.1285 | 1.3/8 | 2.1/2 | 1 | — | 003545 | — |
| | 29 | | 0.1360 | 1.3/8 | 2.1/2 | 1 | — | 003546 | — |
| | 28 | | 0.1405 | 1.3/8 | 2.1/2 | 1 | — | 003547 | — |
| 9/64 | | | 0.1406 | 1.3/8 | 2.1/2 | 1 | 003548 | — | — |
| | 27 | | 0.1440 | 1.3/8 | 2.1/2 | 1 | — | 003549 | — |
| | 26 | | 0.1470 | 1.3/8 | 2.1/2 | 1 | — | 003550 | — |
| | 25 | | 0.1495 | 1.3/8 | 2.1/2 | 1 | — | 003551 | — |
| | 24 | | 0.1520 | 1.3/8 | 2.1/2 | 1 | — | 003552 | — |
| | 23 | | 0.1540 | 1.3/8 | 2.1/2 | 1 | — | 003553 | — |
| 5/32 | | | 0.1563 | 1.3/8 | 2.1/2 | 1 | 003554 | — | — |
| | 22 | | 0.1570 | 1.3/8 | 2.1/2 | 1 | — | 003555 | — |
| | 21 | | 0.1590 | 1.3/8 | 2.1/2 | 1 | — | 003556 | — |
| | 20 | | 0.1610 | 1.3/8 | 2.1/2 | 1 | — | 003557 | — |
| | 19 | | 0.1660 | 1.5/8 | 2.3/4 | 1 | — | 003558 | — |
| | 18 | | 0.1695 | 1.5/8 | 2.3/4 | 1 | — | 003559 | — |
| 11/64 | | | 0.1719 | 1.5/8 | 2.3/4 | 1 | 003560 | — | — |
| | 17 | | 0.1730 | 1.5/8 | 2.3/4 | 1 | — | 003561 | — |
| | 16 | | 0.1770 | 1.5/8 | 2.3/4 | 1 | — | 003562 | — |
| | 15 | | 0.1800 | 1.5/8 | 2.3/4 | 1 | — | 003563 | — |
| | 14 | | 0.1820 | 1.5/8 | 2.3/4 | 1 | — | 003564 | — |
| | 13 | | 0.1850 | 1.5/8 | 2.3/4 | 1 | — | 003565 | — |
| 3/16 | | | 0.1875 | 1.5/8 | 2.3/4 | 1 | 003566 | — | — |
| | 12 | | 0.1890 | 1.5/8 | 2.3/4 | 1 | — | 003567 | — |
| | 11 | | 0.1910 | 1.5/8 | 2.3/4 | 1 | — | 003568 | — |
| | 10 | | 0.1935 | 1.5/8 | 2.3/4 | 1 | — | 003569 | — |
| | 9 | | 0.1960 | 1.3/4 | 3“ | 1 | — | 003570 | — |
| | 8 | | 0.1990 | 1.3/4 | 3“ | 1 | — | 003571 | — |
| | 7 | | 0.2010 | 1.3/4 | 3“ | 1 | — | 003572 | — |
| 13/64 | | | 0.2031 | 1.3/4 | 3“ | 1 | 003573 | — | — |

# Jobber Length Solid Carbide Drills

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pack Qty | D33F EDP# | D33W EDP# | D33L EDP# |
|---|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | | |
| | 6 | | 0.2040 | 1.3/4 | 3“ | 1 | — | 003574 | — |
| | 5 | | 0.2055 | 1.3/4 | 3“ | 1 | — | 003575 | — |
| | 4 | | 0.2090 | 1.3/4 | 3“ | 1 | — | 003576 | — |
| | 3 | | 0.2130 | 1.3/4 | 3“ | 1 | — | 003577 | — |
| 7/32 | | | 0.2188 | 1.3/4 | 3“ | 1 | 003578 | — | — |
| | 2 | | 0.2210 | 1.3/4 | 3“ | 1 | — | 003579 | — |
| | 1 | | 0.2280 | 1.3/4 | 3“ | 1 | — | 003580 | — |
| | | A | 0.2340 | 2“ | 3.1/4 | 1 | — | — | 003581 |
| 15/64 | | | 0.2344 | 2“ | 3.1/4 | 1 | 003582 | — | — |
| | | B | 0.2380 | 2“ | 3.1/4 | 1 | — | — | 003583 |
| | | C | 0.2420 | 2“ | 3.1/4 | 1 | — | — | 003584 |
| | | D | 0.2460 | 2“ | 3.1/4 | 1 | — | — | 003585 |
| 1/4 | | | 0.2500 | 2“ | 3.1/4 | 1 | 003586 | — | — |
| | | F | 0.2570 | 2“ | 3.1/4 | 1 | — | — | 003587 |
| | | G | 0.2610 | 2.1/8 | 3.1/2 | 1 | — | — | 003588 |
| 17/64 | | | 0.2656 | 2.1/8 | 3.1/2 | 1 | 003589 | — | — |
| | | H | 0.2660 | 2.1/8 | 3.1/2 | 1 | — | — | 003590 |
| | | I | 0.2720 | 2.1/8 | 3.1/2 | 1 | — | — | 003591 |
| | | J | 0.2770 | 2.1/8 | 3.1/2 | 1 | — | — | 003592 |
| | | K | 0.2810 | 2.1/8 | 3.1/2 | 1 | — | — | 003593 |
| 9/32 | | | 0.2813 | 2.1/8 | 3.1/2 | 1 | 003594 | — | — |
| | | L | 0.2900 | 2.1/8 | 3.1/2 | 1 | — | — | 003595 |
| | | M | 0.2950 | 2.3/8 | 4“ | 1 | — | — | 003596 |
| 19/64 | | | 0.2969 | 2.3/8 | 4“ | 1 | 003597 | — | — |
| | | N | 0.3020 | 2.3/8 | 4“ | 1 | — | — | 003598 |
| 5/16 | | | 0.3125 | 2.3/8 | 4“ | 1 | 003599 | — | — |
| | | O | 0.3160 | 2.3/8 | 4“ | 1 | — | — | 003600 |
| | | P | 0.3230 | 2.3/8 | 4“ | 1 | — | — | 003601 |
| 21/64 | | | 0.3281 | 2.3/8 | 4“ | 1 | 003602 | — | — |
| | | Q | 0.3320 | 2.3/8 | 4“ | 1 | — | — | 003603 |
| | | R | 0.3390 | 2.3/8 | 4“ | 1 | — | — | 003604 |
| 11/32 | | | 0.3437 | 2.3/8 | 4“ | 1 | 003605 | — | — |
| | | S | 0.3480 | 2.3/8 | 4“ | 1 | — | — | 003606 |
| | | T | 0.3580 | 2.3/4 | 4.1/4 | 1 | — | — | 003607 |
| 23/64 | | | 0.3594 | 2.3/4 | 4.1/4 | 1 | 003608 | — | — |
| | | U | 0.3680 | 2.3/4 | 4.1/4 | 1 | — | — | 003609 |
| 3/8 | | | 0.3750 | 2.3/4 | 4.1/4 | 1 | 003610 | — | — |
| | | V | 0.3770 | 2.3/4 | 4.1/4 | 1 | — | — | 003611 |
| | | W | 0.3860 | 2.7/8 | 4.1/2 | 1 | — | — | 003612 |
| 25/64 | | | 0.3906 | 2.7/8 | 4.1/2 | 1 | 003613 | — | — |
| | | X | 0.3970 | 2.7/8 | 4.1/2 | 1 | — | — | 003614 |
| | | Y | 0.4040 | 2.7/8 | 4.1/2 | 1 | — | — | 003615 |
| 13/32 | | | 0.4063 | 2.7/8 | 4.1/2 | 1 | 003616 | — | — |
| | | Z | 0.4130 | 2.7/8 | 4.1/2 | 1 | — | — | 003617 |
| 27/64 | | | 0.4219 | 2.7/8 | 4.1/2 | 1 | 003618 | — | — |
| 7/16 | | | 0.4375 | 2.7/8 | 4.1/2 | 1 | 003619 | — | — |
| 29/64 | | | 0.4531 | 3“ | 4.3/4 | 1 | 003620 | — | — |
| 15/32 | | | 0.4687 | 3“ | 4.3/4 | 1 | 003621 | — | — |
| 31/64 | | | 0.4844 | 3“ | 4.3/4 | 1 | 003622 | — | — |
| 1/2 | | | 0.5000 | 3“ | 4.3/4 | 1 | 003623 | — | — |

# Metric Jobber Length Solid Carbide Drills

Designed for heavy duty general purpose use in a variety of materials. Self-centering point with low thrust design.

**D33M** - 118° Point, Bright Finish



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|
| Inch | Decimal | | | | |
| 0.80 | 0.0315 | 5/16 | 1.1/4 | 1 | 003470 |
| 0.90 | 0.0354 | 5/8 | 1.3/8 | 1 | 003471 |
| 1.00 | 0.0394 | 5/8 | 1.1/2 | 1 | 003472 |
| 1.50 | 0.0591 | 3/4 | 1.1/2 | 1 | 003473 |
| 2.00 | 0.0787 | 7/8 | 1.3/4 | 1 | 003474 |
| 2.05 | 0.0807 | 7/8 | 1.3/4 | 1 | 003475 |
| 2.50 | 0.0984 | 1“ | 2“ | 1 | 003476 |
| 3.00 | 0.1181 | 1.1/4 | 2.1/4 | 1 | 003477 |
| 3.30 | 0.1299 | 1.3/8 | 2.1/2 | 1 | 003624 |
| 3.50 | 0.1378 | 1.3/8 | 2.1/2 | 1 | 003478 |
| 4.00 | 0.1575 | 1.3/8 | 2.1/2 | 1 | 003626 |
| 4.50 | 0.1772 | 1.5/8 | 2.3/4 | 1 | 003479 |
| 5.00 | 0.1969 | 1.3/4 | 3“ | 1 | 003630 |
| 5.50 | 0.2165 | 1.3/4 | 3“ | 1 | 003480 |
| 6.00 | 0.2362 | 2“ | 3.1/4 | 1 | 003481 |
| 6.50 | 0.2559 | 2“ | 3.1/4 | 1 | 003482 |
| 7.00 | 0.2756 | 2.1/8 | 3.1/2 | 1 | 003483 |
| 7.50 | 0.2953 | 2.3/8 | 4“ | 1 | 003484 |
| 8.00 | 0.3150 | 2.3/8 | 4“ | 1 | 003485 |
| 8.50 | 0.3346 | 2.3/8 | 4“ | 1 | 003486 |
| 9.00 | 0.3543 | 2.3/4 | 4.1/4 | 1 | 003487 |
| 9.50 | 0.3740 | 2.3/4 | 4.1/4 | 1 | 003488 |
| 10.00 | 0.3937 | 2.7/8 | 4.1/2 | 1 | 003631 |
| 10.50 | 0.4134 | 2.7/8 | 4.1/2 | 1 | 003489 |
| 10.75 | 0.4232 | 2.7/8 | 4.1/2 | 1 | 003490 |
| 11.00 | 0.4331 | 2.7/8 | 4.1/2 | 1 | 003491 |
| 11.50 | 0.4528 | 3“ | 4.3/4 | 1 | 003492 |
| 12.00 | 0.4724 | 3“ | 4.3/4 | 1 | 003493 |

# Heavy Duty MRO Mechanics Length Drills

135° Split Point, HSS, Steam & Bronze Tempered
Designed with a shorter flute and overall length than the MRO 332HD drills for superior rigidity when used in portable drills. Additionally, features 3 flats on the shank for tighter chucking particularly in keyless chucks.

The Self-Centering 135° Split Point for reduced thrust requirements. Steam & Bronze tempered surface treatment provides both abrasion resistance & improved lubricity.

## 321MD



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | EDP# | |
|---|---|---|---|---|---|---|
| Fractional | Decimal | | | | | |
| 1/16 | 0.0625 | 7/8 | 1.7/8 | 12 | 46480970 | * |
| 5/64 | 0.0781 | 1" | 2" | 12 | 46480971 | * |
| 3/32 | 0.0937 | 1.1/4 | 2.1/4 | 12 | 46480972 | * |
| 7/64 | 0.1094 | 1.5/16 | 2.3/8 | 12 | 46480973 | * |
| 1/8 | 0.1250 | 1.7/16 | 2.1/2 | 12 | 46480974 | * |
| 9/64 | 0.1406 | 1.9/16 | 2.5/8 | 12 | 46480975 | * |
| 5/32 | 0.1563 | 1.11/16 | 2.3/4 | 12 | 46480976 | * |
| 11/64 | 0.1719 | 1.13/16 | 2.7/8 | 12 | 46480977 | * |
| 3/16 | 0.1875 | 1.7/8 | 3" | 12 | 46480978 | |
| 13/64 | 0.2031 | 1.15/16 | 3.1/8 | 12 | 46480979 | |
| 7/32 | 0.2187 | 2" | 3.1/4 | 12 | 46480980 | |
| 15/64 | 0.2344 | 2.1/16 | 3.3/8 | 12 | 46480981 | |
| 1/4 | 0.2500 | 2" | 3.1/2 | 12 | 46480982 | |
| 17/64 | 0.2656 | 2.1/8 | 3.5/8 | 12 | 46480983 | |
| 9/32 | 0.2813 | 2.1/4 | 3.3/4 | 12 | 46480984 | |
| 19/64 | 0.2969 | 2.3/8 | 3.7/8 | 12 | 46480985 | |
| 5/16 | 0.3125 | 2.1/2 | 4" | 6 | 46480986 | |
| 21/64 | 0.3281 | 2.9/16 | 4.1/16 | 6 | 46480987 | |
| 11/32 | 0.3438 | 2.5/8 | 4.1/8 | 6 | 46480988 | |
| 23/64 | 0.3594 | 2.11/16 | 4.3/16 | 6 | 46480989 | |
| 3/8 | 0.3750 | 2.11/16 | 4.1/4 | 6 | 46480990 | |
| 25/64 | 0.3906 | 2.3/4 | 4.5/16 | 6 | 46480991 | |
| 13/32 | 0.4063 | 2.13/16 | 4.3/8 | 6 | 46480992 | |
| 27/64 | 0.4219 | 2.7/8 | 4.7/16 | 6 | 46480993 | |
| 7/16 | 0.4375 | 2.15/16 | 4.1/2 | 6 | 46480994 | |
| 29/64 | 0.4531 | 3" | 4.5/8 | 6 | 46480995 | |
| 15/32 | 0.4687 | 3.1/8 | 4.3/4 | 6 | 46480996 | |
| 31/64 | 0.4844 | 3.1/4 | 4.7/8 | 6 | 46480997 | |
| 1/2 | 0.5000 | 3.3/8 | 5" | 6 | 46480998 | |

* No Tri Flats on Shank



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 321MDSET | 321MD | 29 | 1/16 - 1/2 x 64ths | 1 | 46481073 |
| 321MDSET | 321MD | 15 | 1/16 - 1/2 x 32nds | 1 | 47233808 |

# Heavy Duty MRO Stub Length Drills

135° Split Point, HSS

Designed with a short flute and overall length for increased rigidity, hole accuracy and tool life. Self-Centering 135° Split Point for reduced the thrust requirements and minimizes 'walking' particularly on curved surfaces. Recommended for use in portable power tools.

**311SM** - Steam Oxide
for improved abrasion resistance.



**312SM** - Steam and Bronze Tempered
for improved abrasion resistance, lubricity and enhanced penetration



| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | 311SM EDP# | 312SM EDP# |
|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | |
| | N60 | | 0.0400 | 1/2 | 1.3/8 | 12 | 46480855 | * |
| | N59 | | 0.0410 | 1/2 | 1.3/8 | 12 | 46480856 | * |
| | N58 | | 0.0420 | 1/2 | 1.3/8 | 12 | 46480857 | * |
| | N57 | | 0.0430 | 1/2 | 1.3/8 | 12 | 46480858 | * |
| | N56 | | 0.0465 | 1/2 | 1.3/8 | 12 | 46480859 | * |
| | N55 | | 0.0520 | 5/8 | 1.5/8 | 12 | 46480860 | * |
| | N54 | | 0.0550 | 5/8 | 1.5/8 | 12 | 46480861 | * |
| | N53 | | 0.0595 | 5/8 | 1.5/8 | 12 | 46480862 | |
| 1/16 | | | 0.0625 | 5/8 | 1.5/8 | 12 | 46480863 | 47233779 |
| | N52 | | 0.0635 | 11/16 | 1.11/16 | 12 | 46480864 | |
| | N51 | | 0.0670 | 11/16 | 1.11/16 | 12 | 46480865 | |
| | N50 | | 0.0700 | 11/16 | 1.11/16 | 12 | 46480866 | |
| | N49 | | 0.0730 | 11/16 | 1.11/16 | 12 | 46480867 | |
| | N48 | | 0.0760 | 11/16 | 1.11/16 | 12 | 46480868 | |
| 5/64 | | | 0.0781 | 11/16 | 1.11/16 | 12 | 46480869 | 47233780 |
| | N47 | | 0.0785 | 11/16 | 1.11/16 | 12 | 46480870 | |
| | N46 | | 0.0810 | 3/4 | 1.3/4 | 12 | 46480871 | |
| | N45 | | 0.0820 | 3/4 | 1.3/4 | 12 | 46480872 | |
| | N44 | | 0.0860 | 3/4 | 1.3/4 | 12 | 46480873 | |
| | N43 | | 0.0890 | 3/4 | 1.3/4 | 12 | 46480874 | |
| | N42 | | 0.0935 | 3/4 | 1.3/4 | 12 | 46480875 | |
| 3/32 | | | 0.0937 | 3/4 | 1.3/4 | 12 | 46480876 | 47233781 |
| | N41 | | 0.0960 | 13/16 | 1.13/16 | 12 | 46480877 | |
| | N40 | | 0.0980 | 13/16 | 1.13/16 | 12 | 46480878 | |
| | N39 | | 0.0995 | 13/16 | 1.13/16 | 12 | 46480879 | |
| | N38 | | 0.1015 | 13/16 | 1.13/16 | 12 | 46480880 | |
| | N37 | | 0.1040 | 13/16 | 1.13/16 | 12 | 46480881 | |
| | N36 | | 0.1065 | 13/16 | 1.13/16 | 12 | 46480882 | |
| 7/64 | | | 0.1094 | 13/16 | 1.13/16 | 12 | 46480883 | 47233782 |
| | N35 | | 0.1100 | 7/8 | 1.7/8 | 12 | 46480884 | |
| | N34 | | 0.1110 | 7/8 | 1.7/8 | 12 | 46480885 | |
| | N33 | | 0.1130 | 7/8 | 1.7/8 | 12 | 46480886 | |
| | N32 | | 0.1160 | 7/8 | 1.7/8 | 12 | 46480887 | |
| | N31 | | 0.1200 | 7/8 | 1.7/8 | 12 | 46480888 | |
| 1/8 | | | 0.1250 | 7/8 | 1.7/8 | 12 | 46480889 | 47233783 |
| | N30 | | 0.1285 | 15/16 | 1.15/16 | 12 | 46480890 | |
| | N29 | | 0.1360 | 15/16 | 1.15/16 | 12 | 46480891 | |
| | N28 | | 0.1405 | 15/16 | 1.15/16 | 12 | 46480892 | |
| 9/64 | | | 0.1406 | 15/16 | 1.15/16 | 12 | 46480893 | 47233784 |
| | N27 | | 0.1440 | 1" | 2.1/16 | 12 | 46480894 | |
| | N26 | | 0.1470 | 1" | 2.1/16 | 12 | 46480895 | |
| | N25 | | 0.1495 | 1" | 2.1/16 | 12 | 46480896 | |
| | N24 | | 0.1520 | 1" | 2.1/16 | 12 | 46480897 | |
| | N23 | | 0.1540 | 1" | 2.1/16 | 12 | 46480898 | |
| 5/32 | | | 0.1563 | 1" | 2.1/16 | 12 | 46480899 | 47233785 |
| | N22 | | 0.1570 | 1.1/16 | 2.1/8 | 12 | 46480900 | |
| | N21 | | 0.1590 | 1.1/16 | 2.1/8 | 12 | 46480901 | |
| | N20 | | 0.1610 | 1.1/16 | 2.1/8 | 12 | 46480902 | |
| | N19 | | 0.1660 | 1.1/16 | 2.1/8 | 12 | 46480903 | |
| | N18 | | 0.1695 | 1.1/16 | 2.1/8 | 12 | 46480904 | |
| 11/64 | | | 0.1719 | 1.1/16 | 2.1/8 | 12 | 46480905 | 47233786 |
| | N17 | | 0.1730 | 1.1/8 | 2.3/16 | 12 | 46480906 | |
| | N16 | | 0.1770 | 1.1/8 | 2.3/16 | 12 | 46480907 | |
| | N15 | | 0.1800 | 1.1/8 | 2.3/16 | 12 | 46480908 | |
| | N14 | | 0.1820 | 1.1/8 | 2.3/16 | 12 | 46480909 | |

* Not Split Point

# Heavy Duty MRO Stub Length Drills

135° Split Point, HSS

continued

| Drill Sizes | | | | Flute Length | Over-All-Length | Pkg Qty | 311SM EDP# | 312SM EDP# |
|---|---|---|---|---|---|---|---|---|
| Fractional | Wire Gauge | Letter | Decimal | | | | | |
| | N13 | | 0.1850 | 1.1/8 | 2.3/16 | 12 | 46480910 | |
| 3/16 | | | 0.1875 | 1.1/8 | 2.3/16 | 12 | 46480911 | 47233787 |
| | N12 | | 0.1890 | 1.3/16 | 2.1/4 | 12 | 46480912 | |
| | N11 | | 0.1910 | 1.3/16 | 2.1/4 | 12 | 46480913 | |
| | N10 | | 0.1935 | 1.3/16 | 2.1/4 | 12 | 46480914 | |
| | N9 | | 0.1960 | 1.3/16 | 2.1/4 | 12 | 46480915 | |
| | N8 | | 0.1990 | 1.3/16 | 2.1/4 | 12 | 46480916 | |
| | N7 | | 0.2010 | 1.3/16 | 2.1/4 | 12 | 46480917 | |
| 13/64 | | | 0.2031 | 1.3/16 | 2.1/4 | 12 | 46480918 | 47233788 |
| | N6 | | 0.2040 | 1.1/4 | 2.3/8 | 12 | 46480919 | |
| | N5 | | 0.2055 | 1.1/4 | 2.3/8 | 12 | 46480920 | |
| | N4 | | 0.2090 | 1.1/4 | 2.3/8 | 12 | 46480921 | |
| | N3 | | 0.2130 | 1.1/4 | 2.3/8 | 12 | 46480922 | |
| 7/32 | | | 0.2187 | 1.1/4 | 2.3/8 | 12 | 46480923 | 47233789 |
| | N2 | | 0.2210 | 1.5/16 | 2.7/16 | 12 | 46480924 | |
| | N1 | | 0.2280 | 1.5/16 | 2.7/16 | 12 | 46480925 | |
| | | A | 0.2340 | 1.5/16 | 2.7/16 | 12 | 46480926 | |
| 15/64 | | | 0.2344 | 1.5/16 | 2.7/16 | 12 | 46480927 | 47233790 |
| | | B | 0.2380 | 1.3/8 | 2.1/2 | 12 | 46480928 | |
| | | C | 0.2420 | 1.3/8 | 2.1/2 | 12 | 46480929 | |
| | | D | 0.2460 | 1.3/8 | 2.1/2 | 12 | 46480930 | |
| | | E | 0.2500 | 1.3/8 | 2.1/2 | 12 | 46480932 | |
| 1/4 | | | 0.2500 | 1.3/8 | 2.1/2 | 12 | 46480931 | 47233791 |
| | | F | 0.2570 | 1.7/16 | 2.5/8 | 12 | 46480933 | |
| | | G | 0.2610 | 1.7/16 | 2.5/8 | 12 | 46480934 | |
| 17/64 | | | 0.2656 | 1.7/16 | 2.5/8 | 12 | 46480935 | 47233792 |
| | | H | 0.2660 | 1.1/2 | 2.11/16 | 12 | 46480936 | |
| | | I | 0.2720 | 1.1/2 | 2.11/16 | 12 | 46480937 | |
| | | J | 0.2770 | 1.1/2 | 2.11/16 | 12 | 46480938 | |
| | | K | 0.2810 | 1.1/2 | 2.11/16 | 12 | 46480939 | |
| 9/32 | | | 0.2813 | 1.1/2 | 2.11/16 | 12 | 46480940 | 47233793 |
| | | L | 0.2900 | 1.9/16 | 2.3/4 | 12 | 46480941 | |
| | | M | 0.2950 | 1.9/16 | 2.3/4 | 12 | 46480942 | |
| 19/64 | | | 0.2969 | 1.9/16 | 2.3/4 | 12 | 46480943 | 47233794 |
| | | N | 0.3020 | 1.5/8 | 2.13/16 | 12 | 46480944 | |
| 5/16 | | | 0.3125 | 1.5/8 | 2.13/16 | 6 | 46480945 | 47233795 |
| | | O | 0.3160 | 1.11/16 | 2.15/16 | 6 | 46480946 | |
| | | P | 0.3230 | 1.11/16 | 2.15/16 | 6 | 46480947 | |
| 21/64 | | | 0.3281 | 1.11/16 | 2.15/16 | 6 | 46480948 | 47233796 |
| | | Q | 0.3320 | 1.11/16 | 3" | 6 | 46480949 | |
| | | R | 0.3390 | 1.11/16 | 3" | 6 | 46480950 | |
| 11/32 | | | 0.3438 | 1.11/16 | 3" | 6 | 46480951 | 47233797 |
| | | S | 0.3480 | 1.3/4 | 3.1/16 | 6 | 46480952 | |
| | | T | 0.3580 | 1.3/4 | 3.1/16 | 6 | 46480953 | |
| 23/64 | | | 0.3594 | 1.3/4 | 3.1/16 | 6 | 46480954 | 47233798 |
| | | U | 0.3680 | 1.13/16 | 3.1/8 | 6 | 46480955 | |
| 3/8 | | | 0.3750 | 1.13/16 | 3.1/8 | 6 | 46480956 | 47233799 |
| | | V | 0.3770 | 1.7/8 | 3.1/4 | 6 | 46480957 | |
| | | W | 0.3860 | 1.7/8 | 3.1/4 | 6 | 46480958 | |
| 25/64 | | | 0.3906 | 1.7/8 | 3.1/4 | 6 | 46480959 | 47233800 |
| | | X | 0.3970 | 1.15/16 | 3.5/16 | 6 | 46480960 | |
| | | Y | 0.4040 | 1.15/16 | 3.5/16 | 6 | 46480961 | |
| 13/32 | | | 0.4063 | 1.15/16 | 3.5/16 | 6 | 46480962 | 47233801 |
| | | Z | 0.4130 | 2" | 3.3/8 | 6 | 46480963 | |
| 27/64 | | | 0.4219 | 2" | 3.3/8 | 6 | 46480964 | 47233802 |
| 7/16 | | | 0.4375 | 2.1/16 | 3.7/16 | 6 | 46480965 | 47233803 |
| 29/64 | | | 0.4531 | 2.1/8 | 3.9/16 | 6 | 46480966 | 47233804 |
| 15/32 | | | 0.4687 | 2.1/8 | 3.5/8 | 6 | 46480967 | 47233805 |
| 31/64 | | | 0.4844 | 2.3/16 | 3.11/16 | 6 | 46480968 | 47233806 |
| 1/2 | | | 0.5000 | 2.1/4 | 3.3/4 | 6 | 46480969 | 47233807 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 311SMSET | 311SM | 29 | 1/16 - 1/2 x 64ths | 1 | 47233778 |

# MRO Reduced Shank Drills

118° Point, HSS. Steam Tempered and Bright

Designed with a ½" diameter reduced shank, ideal for portable drilling and drill presses where the maximum chuck capacity is ½". Surface treated with a black steam oxide finish for abrasion resistance and improved coolant adherence. Not recommended for enlarging existing holes.

## **341SD** - 1/2" Shank Diameter, Silver & Deming



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|
| Fractional | Decimal | | | | |
| 33/64 | 0.5156 | 3" | 6" | 1 | 46481031 |
| 17/32 | 0.5313 | 3" | 6" | 1 | 46481032 |
| 35/64 | 0.5469 | 3" | 6" | 1 | 46481033 |
| 9/16 | 0.5625 | 3" | 6" | 1 | 46481034 |
| 37/64 | 0.5781 | 3" | 6" | 1 | 46481035 |
| 19/32 | 0.5937 | 3" | 6" | 1 | 46481036 |
| 39/64 | 0.6094 | 3" | 6" | 1 | 46481030 |
| 5/8 | 0.6250 | 3" | 6" | 1 | 46481037 |
| 41/64 | 0.6406 | 3" | 6" | 1 | 46481038 |
| 21/32 | 0.6562 | 3" | 6" | 1 | 46481039 |
| 43/64 | 0.6719 | 3" | 6" | 1 | 46481040 |
| 11/16 | 0.6875 | 3" | 6" | 1 | 46481041 |
| 45/64 | 0.7031 | 3" | 6" | 1 | 46481042 |
| 23/32 | 0.7187 | 3" | 6" | 1 | 46481043 |
| 47/64 | 0.7344 | 3" | 6" | 1 | 46481044 |
| 3/4 | 0.7500 | 3" | 6" | 1 | 46481045 |
| 49/64 | 0.7656 | 3" | 6" | 1 | 46481046 |
| 25/32 | 0.7812 | 3" | 6" | 1 | 46481047 |
| 51/64 | 0.7969 | 3" | 6" | 1 | 46481048 |
| 13/16 | 0.8125 | 3" | 6" | 1 | 46481049 |
| 53/64 | 0.8281 | 3" | 6" | 1 | 46481050 |
| 27/32 | 0.8437 | 3" | 6" | 1 | 46481051 |
| 55/64 | 0.8594 | 3" | 6" | 1 | 46481052 |
| 7/8 | 0.8750 | 3" | 6" | 1 | 46481053 |
| 57/64 | 0.8906 | 3" | 6" | 1 | 46481028 |
| 29/32 | 0.9062 | 3" | 6" | 1 | 46481054 |
| 59/64 | 0.9219 | 3" | 6" | 1 | 46481055 |
| 15/16 | 0.9375 | 3" | 6" | 1 | 46481056 |
| 61/64 | 0.9531 | 3" | 6" | 1 | 46481029 |
| 31/32 | 0.9688 | 3" | 6" | 1 | 46481057 |
| 63/64 | 0.9844 | 3" | 6" | 1 | 46481058 |
| 1" | 1.0000 | 3" | 6" | 1 | 46481059 |
| 1.1/32 | 1.0312 | 3" | 6" | 1 | 46481060 |
| 1.1/16 | 1.0625 | 3" | 6" | 1 | 46481061 |
| 1.3/32 | 1.0938 | 3" | 6" | 1 | 46481062 |
| 1.1/8 | 1.1250 | 3" | 6" | 1 | 46481063 |
| 1.5/32 | 1.1562 | 3" | 6" | 1 | 46481064 |
| 1.3/16 | 1.1875 | 3" | 6" | 1 | 46481065 |
| 1.7/32 | 1.2187 | 3" | 6" | 1 | 46481066 |
| 1.1/4 | 1.2500 | 3" | 6" | 1 | 46481067 |
| 1.5/16 | 1.3125 | 3" | 6" | 1 | 46481068 |
| 1.3/8 | 1.3750 | 3" | 6" | 1 | 46481069 |
| 1.7/16 | 1.4375 | 3" | 6" | 1 | 46481070 |
| 1.1/2 | 1.5000 | 3" | 6" | 1 | 46481071 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 341SDSET | 341SD | 8 | 9/16 - 1" x 16ths | 1 | 47233816 |

# MRO Reduced Shank Drills

118° Split Point, HSS, Steam and Bronze Tempered

Designed with a ½" diameter reduced shank, ideal for portable drilling and drill presses where the maximum chuck capacity is ½". Self-Centering 118° Split Point for reduced thrust. Steam & Bronze tempered surface treatment provides both abrasion resistance and improved lubricity.

**342SDT** - 1/2" Shank Diameter, Silver & Deming with Tri- Flats, enhanced penetration geometry



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | EDP# |
|---|---|---|---|---|---|
| Fractional | Decimal | | | | |
| 33/64 | 0.5156 | 3" | 6" | 1 | 47233817 |
| 17/32 | 0.5313 | 3" | 6" | 1 | 47233818 |
| 35/64 | 0.5469 | 3" | 6" | 1 | 47233819 |
| 9/16 | 0.5625 | 3" | 6" | 1 | 47233820 |
| 37/64 | 0.5781 | 3" | 6" | 1 | 47233821 |
| 19/32 | 0.5937 | 3" | 6" | 1 | 47233822 |
| 39/64 | 0.6094 | 3" | 6" | 1 | 47233823 |
| 5/8 | 0.6250 | 3" | 6" | 1 | 47233824 |
| 41/64 | 0.6406 | 3" | 6" | 1 | 47233825 |
| 21/32 | 0.6562 | 3" | 6" | 1 | 47233826 |
| 43/64 | 0.6719 | 3" | 6" | 1 | 47233827 |
| 11/16 | 0.6875 | 3" | 6" | 1 | 47233828 |
| 45/64 | 0.7031 | 3" | 6" | 1 | 47233829 |
| 23/32 | 0.7187 | 3" | 6" | 1 | 47233830 |
| 47/64 | 0.7344 | 3" | 6" | 1 | 47233831 |
| 3/4 | 0.7500 | 3" | 6" | 1 | 47233832 |
| 49/64 | 0.7656 | 3" | 6" | 1 | 47233833 |
| 25/32 | 0.7812 | 3" | 6" | 1 | 47233834 |
| 51/64 | 0.7969 | 3" | 6" | 1 | 47233835 |
| 13/16 | 0.8125 | 3" | 6" | 1 | 47233836 |
| 53/64 | 0.8281 | 3" | 6" | 1 | 47233837 |
| 27/32 | 0.8437 | 3" | 6" | 1 | 47233838 |
| 55/64 | 0.8594 | 3" | 6" | 1 | 47233839 |
| 7/8 | 0.8750 | 3" | 6" | 1 | 47233840 |
| 57/64 | 0.8906 | 3" | 6" | 1 | 47233841 |
| 29/32 | 0.9062 | 3" | 6" | 1 | 47233842 |
| 59/64 | 0.9219 | 3" | 6" | 1 | 47233843 |
| 15/16 | 0.9375 | 3" | 6" | 1 | 47233844 |
| 61/64 | 0.9531 | 3" | 6" | 1 | 47233845 |
| 31/32 | 0.9688 | 3" | 6" | 1 | 47233846 |
| 63/64 | 0.9844 | 3" | 6" | 1 | 47233847 |
| 1 | 1.0000 | 3" | 6" | 1 | 47233848 |



| Set | Style | Pieces per Set | Sizes | Pack Qty | EDP# |
|---|---|---|---|---|---|
| 342SDTSET | 342SDT | 8 | 9/16 - 1" x 16ths | 1 | 47233849 |

# General Purpose Taper Shank Drills

118°, HSS, Steam Oxide

**209** - Standard Taper

**S209** - Small Taper



| Drill Sizes | | Flute Length | Over-All-Length | MTS | Pack Qty | 209 | S209 |
|---|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | | |
| 1/8 | 0.1250 | 1.7/8 | 5.1/8 | 1 | 1 | 020008 | — |
| 9/64 | 0.1406 | 2.1/8 | 5.3/8 | 1 | 1 | 020009 | — |
| 5/32 | 0.1563 | 2.1/8 | 5.3/8 | 1 | 1 | 020010 | — |
| 11/64 | 0.1719 | 2.1/2 | 5.3/4 | 1 | 1 | 020011 | — |
| 3/16 | 0.1875 | 2.1/2 | 5.3/4 | 1 | 1 | 020012 | — |
| 13/64 | 0.2031 | 2.3/4 | 6“ | 1 | 1 | 020013 | — |
| 7/32 | 0.2188 | 2.3/4 | 6“ | 1 | 1 | 020014 | — |
| 15/64 | 0.2344 | 2.7/8 | 6.1/8 | 1 | 1 | 020015 | — |
| 1/4 | 0.2500 | 2.7/8 | 6.1/8 | 1 | 1 | 020016 | — |
| 17/64 | 0.2656 | 3“ | 6.1/4 | 1 | 1 | 020017 | — |
| 9/32 | 0.2813 | 3“ | 6.1/4 | 1 | 1 | 020018 | — |
| 19/64 | 0.2969 | 3.1/8 | 6.3/8 | 1 | 1 | 020019 | — |
| 5/16 | 0.3125 | 3.1/8 | 6.3/8 | 1 | 1 | 020020 | — |
| 21/64 | 0.3281 | 3.1/4 | 6.1/2 | 1 | 1 | 020021 | — |
| 11/32 | 0.3437 | 3.1/4 | 6.1/2 | 1 | 1 | 020022 | — |
| 23/64 | 0.3594 | 3.1/2 | 6.3/4 | 1 | 1 | 020023 | — |
| 3/8 | 0.3750 | 3.1/2 | 6.3/4 | 1 | 1 | 020024 | — |
| 25/64 | 0.3906 | 3.5/8 | 7“ | 1 | 1 | 020025 | — |
| 13/32 | 0.4063 | 3.5/8 | 7“ | 1 | 1 | 020026 | — |
| 27/64 | 0.4219 | 3.7/8 | 7.1/4 | 1 | 1 | 020027 | — |
| 7/16 | 0.4375 | 3.7/8 | 7.1/4 | 1 | 1 | 020028 | — |
| 29/64 | 0.4531 | 4.1/8 | 7.1/2 | 1 | 1 | 020029 | — |
| 15/32 | 0.4687 | 4.1/8 | 7.1/2 | 1 | 1 | 020030 | — |
| 31/64 | 0.4844 | 4.3/8 | 8.1/4 | 2 | 1 | 020031 | — |
| 1/2 | 0.5000 | 4.3/8 | 7.3/4 | 1 | 1 | — | 023032 |
| 1/2 | 0.5000 | 4.3/8 | 8.1/4 | 2 | 1 | 020032 | — |
| 33/64 | 0.5156 | 4.5/8 | 8“ | 1 | 1 | — | 023033 |
| 33/64 | 0.5156 | 4.5/8 | 8.1/2 | 2 | 1 | 020033 | — |
| 17/32 | 0.5313 | 4.5/8 | 8“ | 1 | 1 | — | 023034 |
| 17/32 | 0.5313 | 4.5/8 | 8.1/2 | 2 | 1 | 020034 | — |
| 35/64 | 0.5469 | 4.7/8 | 8.1/4 | 1 | 1 | — | 023035 |
| 35/64 | 0.5469 | 4.7/8 | 8.3/4 | 2 | 1 | 020035 | — |
| 9/16 | 0.5625 | 4.7/8 | 8.1/4 | 1 | 1 | — | 023036 |
| 9/16 | 0.5625 | 4.7/8 | 8.3/4 | 2 | 1 | 020036 | — |
| 37/64 | 0.5781 | 4.7/8 | 8.3/4 | 2 | 1 | 020037 | — |
| 19/32 | 0.5937 | 4.7/8 | 8.3/4 | 2 | 1 | 020038 | — |
| 39/64 | 0.6094 | 4.7/8 | 8.3/4 | 2 | 1 | 020039 | — |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 2 | 1 | 020040 | — |
| 41/64 | 0.6406 | 5.1/8 | 9“ | 2 | 1 | 020041 | — |
| 21/32 | 0.6563 | 5.1/8 | 9“ | 2 | 1 | 020042 | — |
| 43/64 | 0.6719 | 5.3/8 | 9.1/4 | 2 | 1 | 020043 | — |
| 11/16 | 0.6875 | 5.3/8 | 9.1/4 | 2 | 1 | 020044 | — |
| 45/64 | 0.7031 | 5.5/8 | 9.1/2 | 2 | 1 | 020045 | — |
| 23/32 | 0.7188 | 5.5/8 | 9.1/2 | 2 | 1 | 020046 | — |
| 47/64 | 0.7344 | 5.7/8 | 9.3/4 | 2 | 1 | 020047 | — |
| 3/4 | 0.7500 | 5.7/8 | 9.3/4 | 2 | 1 | 020048 | — |
| 49/64 | 0.7656 | 6“ | 9.7/8 | 2 | 1 | 020049 | — |
| 25/32 | 0.7813 | 6“ | 9.7/8 | 2 | 1 | 020050 | — |
| 51/64 | 0.7969 | 6.1/8 | 10“ | 2 | 1 | — | 023051 |
| 51/64 | 0.7969 | 6.1/8 | 10.3/4 | 3 | 1 | 020051 | — |
| 13/16 | 0.8125 | 6.1/8 | 10“ | 2 | 1 | — | 023052 |
| 13/16 | 0.8125 | 6.1/8 | 10.3/4 | 3 | 1 | 020052 | — |
| 53/64 | 0.8281 | 6.1/8 | 10“ | 2 | 1 | — | 023053 |
| 53/64 | 0.8281 | 6.1/8 | 10.3/4 | 3 | 1 | 020053 | — |
| 27/32 | 0.8438 | 6.1/8 | 10“ | 2 | 1 | — | 023054 |
| 27/32 | 0.8438 | 6.1/8 | 10.3/4 | 3 | 1 | 020054 | — |
| 55/64 | 0.8594 | 6.1/8 | 10.3/4 | 3 | 1 | 020055 | — |

# General Purpose Taper Shank Drills

continued

| Drill Sizes | | Flute Length | Over-All-Length | MTS | Pack Qty | 209 | S209 |
|---|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | | |
| 7/8 | 0.8750 | 6.1/8 | 10“ | 2 | 1 | — | 023056 |
| 7/8 | 0.8750 | 6.1/8 | 10.3/4 | 3 | 1 | 020056 | — |
| 57/64 | 0.8906 | 6.1/8 | 10.3/4 | 3 | 1 | 020057 | — |
| 29/32 | 0.9063 | 6.1/8 | 10“ | 2 | 1 | — | 023058 |
| 29/32 | 0.9063 | 6.1/8 | 10.3/4 | 3 | 1 | 020058 | — |
| 59/64 | 0.9219 | 6.1/8 | 10.3/4 | 3 | 1 | 020059 | — |
| 15/16 | 0.9375 | 6.1/8 | 10.3/4 | 3 | 1 | 020060 | — |
| 61/64 | 0.9531 | 6.3/8 | 11“ | 3 | 1 | 020061 | — |
| 31/32 | 0.9688 | 6.3/8 | 11“ | 3 | 1 | 020062 | — |
| 63/64 | 0.9844 | 6.3/8 | 11“ | 3 | 1 | 020063 | — |
| 1“ | 1.0000 | 6.3/8 | 11“ | 3 | 1 | 020100 | — |
| 1.1/64 | 1.0156 | 6.1/2 | 11.1/8 | 3 | 1 | 020101 | — |
| 1.1/32 | 1.0312 | 6.1/2 | 11.1/8 | 3 | 1 | 020102 | — |
| 1.3/64 | 1.0469 | 6.5/8 | 11.1/4 | 3 | 1 | 020103 | — |
| 1.1/16 | 1.0625 | 6.5/8 | 11.1/4 | 3 | 1 | 020104 | — |
| 1.5/64 | 1.0781 | 6.7/8 | 12.1/2 | 4 | 1 | 020105 | — |
| 1.3/32 | 1.0937 | 6.7/8 | 11.1/2 | 3 | 1 | — | 023106 |
| 1.3/32 | 1.0937 | 6.7/8 | 12.1/2 | 4 | 1 | 020106 | — |
| 1.7/64 | 1.1094 | 7.1/8 | 11.3/4 | 3 | 1 | — | 023107 |
| 1.7/64 | 1.1094 | 7.1/8 | 12.3/4 | 4 | 1 | 020107 | — |
| 1.1/8 | 1.1250 | 7.1/8 | 11.3/4 | 3 | 1 | — | 023108 |
| 1.1/8 | 1.1250 | 7.1/8 | 12.3/4 | 4 | 1 | 020108 | — |
| 1.9/64 | 1.1406 | 7.1/4 | 11.7/8 | 3 | 1 | — | 023109 |
| 1.9/64 | 1.1406 | 7.1/4 | 12.7/8 | 4 | 1 | 020109 | — |
| 1.5/32 | 1.1563 | 7.1/4 | 11.7/8 | 3 | 1 | — | 023110 |
| 1.5/32 | 1.1563 | 7.1/4 | 12.7/8 | 4 | 1 | 020110 | — |
| 1.11/64 | 1.1719 | 7.3/8 | 12“ | 3 | 1 | — | 023111 |
| 1.11/64 | 1.1719 | 7.3/8 | 13“ | 4 | 1 | 020111 | — |
| 1.3/16 | 1.1875 | 7.3/8 | 12“ | 3 | 1 | — | 023112 |
| 1.3/16 | 1.1875 | 7.3/8 | 13“ | 4 | 1 | 020112 | — |
| 1.13/64 | 1.2031 | 7.1/2 | 12.1/8 | 3 | 1 | — | 023113 |
| 1.7/32 | 1.2187 | 7.1/2 | 12.1/8 | 3 | 1 | — | 023114 |
| 1.7/32 | 1.2187 | 7.1/2 | 13.1/8 | 4 | 1 | 020114 | — |
| 1.15/64 | 1.2344 | 7.7/8 | 13.1/2 | 4 | 1 | 020115 | — |
| 1.1/4 | 1.2500 | 7.7/8 | 12.1/2 | 3 | 1 | — | 023116 |
| 1.1/4 | 1.2500 | 7.7/8 | 13.1/2 | 4 | 1 | 020116 | — |
| 1.17/64 | 1.2656 | 8.1/2 | 14.1/8 | 4 | 1 | 020117 | — |
| 1.9/32 | 1.2813 | 8.1/2 | 14.1/8 | 4 | 1 | 020118 | — |
| 1.19/64 | 1.2969 | 8.5/8 | 14.1/4 | 4 | 1 | 020119 | — |
| 1.5/16 | 1.3125 | 8.5/8 | 14.1/4 | 4 | 1 | 020120 | — |
| 1.21/64 | 1.3281 | 8.3/4 | 14.3/8 | 4 | 1 | 020121 | — |
| 1.11/32 | 1.3437 | 8.3/4 | 14.3/8 | 4 | 1 | 020122 | — |
| 1.3/8 | 1.3750 | 8.7/8 | 14.1/2 | 4 | 1 | 020124 | — |
| 1.13/32 | 1.4063 | 9“ | 14.5/8 | 4 | 1 | 020126 | — |
| 1.27/64 | 1.4219 | 9.1/8 | 14.3/4 | 4 | 1 | 020127 | — |
| 1.7/16 | 1.4375 | 9.1/8 | 14.3/4 | 4 | 1 | 020128 | — |
| 1.15/32 | 1.4687 | 9.1/4 | 14.7/8 | 4 | 1 | 020130 | — |
| 1.31/64 | 1.4844 | 9.3/8 | 15“ | 4 | 1 | 020131 | — |
| 1.1/2 | 1.5000 | 9.3/8 | 15“ | 4 | 1 | 020132 | — |
| 1.33/64 | 1.5156 | 9.3/8 | 15“ | 4 | 1 | — | 023133 |
| 1.17/32 | 1.5313 | 9.3/8 | 15“ | 4 | 1 | — | 023134 |
| 1.17/32 | 1.5313 | 9.3/8 | 16.3/8 | 5 | 1 | 020134 | — |
| 1.35/64 | 1.5469 | 9.5/8 | 15.1/4 | 4 | 1 | — | 023135 |
| 1.9/16 | 1.5625 | 9.5/8 | 15.1/4 | 4 | 1 | — | 023136 |
| 1.9/16 | 1.5625 | 9.5/8 | 16.5/8 | 5 | 1 | 020136 | — |
| 1.19/32 | 1.5937 | 9.7/8 | 15.1/2 | 4 | 1 | — | 023138 |
| 1.39/64 | 1.6094 | 10“ | 15.5/8 | 4 | 1 | — | 023139 |
| 1.5/8 | 1.6250 | 10“ | 15.5/8 | 4 | 1 | — | 023140 |
| 1.5/8 | 1.6250 | 10“ | 17“ | 5 | 1 | 020140 | — |
| 1.21/32 | 1.6563 | 10.1/8 | 15.3/4 | 4 | 1 | — | 023142 |
| 1.11/16 | 1.6875 | 10.1/8 | 15.3/4 | 4 | 1 | — | 023144 |
| 1.11/16 | 1.6875 | 10.1/8 | 17.1/8 | 5 | 1 | 020144 | — |
| 1.47/64 | 1.7344 | 10.3/8 | 16.1/4 | 4 | 1 | — | 023147 |

continued

| Drill Sizes | | Flute Length | Over-All-Length | MTS | Pack Qty | 209 | S209 |
|---|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | | |
| 1.3/4 | 1.7500 | 10.1/8 | 17.1/8 | 5 | 1 | 020148 | — |
| 1.3/4 | 1.7500 | 10.3/8 | 16.1/4 | 4 | 1 | — | 023148 |
| 1.25/32 | 1.7813 | 10.3/8 | 16.1/4 | 4 | 1 | — | 023150 |
| 1.13/16 | 1.8125 | 10.1/8 | 17.1/8 | 5 | 1 | 020152 | — |
| 1.13/16 | 1.8125 | 10.3/8 | 16.1/4 | 4 | 1 | — | 023152 |
| 1.7/8 | 1.8750 | 10.1/2 | 16.1/2 | 4 | 1 | — | 023156 |
| 1.7/8 | 1.8750 | 10.3/8 | 17.3/8 | 5 | 1 | 020156 | — |
| 1.15/16 | 1.9375 | 10.3/8 | 17.3/8 | 5 | 1 | 020160 | — |
| 1.15/16 | 1.9375 | 10.5/8 | 16.5/8 | 4 | 1 | — | 023160 |
| 1.31/32 | 1.9687 | 10.5/8 | 16.5/8 | 4 | 1 | — | 023162 |
| 2“ | 2.0000 | 10.3/8 | 17.3/8 | 5 | 1 | 020200 | — |
| 2“ | 2.0000 | 10.5/8 | 16.5/8 | 4 | 1 | — | 023200 |

# Core Drill

## Taper Shank - 4-Flute

HSS, Steam tempered
Designed with a taper shank for enlarging pre-drilled or cast holes in a wide range of materials.



## T400

| Drill Sizes | | Flute Length | Over-All-Length | MTS | Pack Qty | T400 |
|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | |
| 1/2 | 0.5000 | 4.3/8 | 8.1/4 | 2 | 1 | 024532 |
| 17/32 | 0.5312 | 4.5/8 | 8.1/2 | 2 | 1 | 024534 |
| 9/16 | 0.5625 | 4.7/8 | 8.3/4 | 2 | 1 | 024536 |
| 5/8 | 0.6250 | 4.7/8 | 8.3/4 | 2 | 1 | 024540 |
| 21/32 | 0.6562 | 5.1/8 | 9“ | 2 | 1 | 024542 |
| 3/4 | 0.7500 | 5.7/8 | 9.3/4 | 2 | 1 | 024548 |
| 25/32 | 0.7812 | 6“ | 9.7/8 | 2 | 1 | 024550 |
| 7/8 | 0.8750 | 6.1/8 | 10.3/4 | 3 | 1 | 024556 |
| 1“ | 1.0000 | 6.3/8 | 11“ | 3 | 1 | 024600 |
| 1.1/32 | 1.0312 | 6.1/2 | 11.1/8 | 3 | 1 | 024602 |
| 1.1/16 | 1.0625 | 6.5/8 | 11.1/4 | 3 | 1 | 024604 |
| 1.1/8 | 1.1250 | 7.1/8 | 12.3/4 | 4 | 1 | 024608 |
| 1.5/32 | 1.1562 | 7.1/4 | 12.7/8 | 4 | 1 | 024610 |
| 1.1/4 | 1.2500 | 7.7/8 | 13.1/2 | 4 | 1 | 024616 |
| 1.5/16 | 1.3125 | 8.5/8 | 14.1/4 | 4 | 1 | 024620 |
| 1.11/32 | 1.3438 | 8.3/4 | 14.3/8 | 4 | 1 | 024622 |
| 1.3/8 | 1.3750 | 8.7/8 | 14.1/2 | 4 | 1 | 024624 |
| 1.1/2 | 1.5000 | 9.3/8 | 15“ | 4 | 1 | 024632 |
| 1.9/16 | 1.5625 | 9.5/8 | 16.5/8 | 5 | 1 | 024636 |
| 1.5/8 | 1.6250 | 10“ | 17“ | 5 | 1 | 024640 |

# Center Drills

60° Countersink, Solid Carbide, Bright Finish

Combined drill and countersink (center drill) designed for better abrasion resistance and longer tool live in soft or non ferrous materials.



## DC

| Nr. | Pilot Diameter | Pilot Length | Over-All-Length | Shank Diameter | Pack Qty | DC |
|---|---|---|---|---|---|---|
| 0 | 1/32 | 1/32 | 1.1/2 | 1/8 | 1 | 003251 |
| 1 | 3/64 | 3/64 | 1.1/2 | 1/8 | 1 | 003252 |
| 2 | 5/64 | 5/64 | 2“ | 3/16 | 1 | 003253 |
| 3 | 7/64 | 7/64 | 2“ | 1/4 | 1 | 003254 |
| 4 | 1/8 | 1/8 | 2.1/8 | 5/16 | 1 | 003255 |
| 5 | 3/16 | 3/16 | 2.3/4 | 7/16 | 1 | 003256 |
| 6 | 7/32 | 7/32 | 3“ | 1/2 | 1 | 003257 |

60° Countersink, HSS, Bright Finish

Combined drill and countersink (center drill) for general purpose use in soft or non ferrous materials.



## 76HA

| Nr. | Pilot Diameter | Pilot Length | Over-All-Length | Shank Diameter | Pack Qty | DC |
|---|---|---|---|---|---|---|
| 000 | 0.0200 | 0.0300 | 1.1/4 | 1/8 | 12 | 097630 |
| 00 | 0.0250 | 0.0300 | 1.1/8 | 1/8 | 12 | 097620 |
| 0 | 1/32 | 0.0380 | 1.1/8 | 1/8 | 12 | 097610 |
| 1 | 3/64 | 3/64 | 1.1/4 | 1/8 | 12 | 097601 |
| 2 | 5/64 | 5/64 | 1.7/8 | 3/16 | 12 | 097602 |
| 3 | 7/64 | 7/64 | 2“ | 1/4 | 12 | 097603 |
| 4 | 1/8 | 1/8 | 2.1/8 | 5/16 | 12 | 097604 |
| 5 | 3/16 | 3/16 | 2.3/4 | 7/16 | 6 | 097605 |
| 6 | 7/32 | 7/32 | 3“ | 1/2 | 6 | 097606 |
| 7 | 1/4 | 1/4 | 3.1/4 | 5/8 | 1 | 097607 |
| 8 | 5/16 | 5/16 | 3.1/2 | 3/4 | 1 | 097608 |

HSS, Bright
Combined drill and countersink (center drill) for use in soft or non ferrous materials.

**A225** 60° Countersink
**A217** 82° Countersink
**A217SET** 5 pc. set consists of N1, N2, N3, N4 & N5
**A218** 90° Countersink
**A218SET** 5 pc. set consists of N1, N2, N3, N4 & N5



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



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

# Special Purpose Drills

## Spotting Drill - Short Length

**SPS-90** 90°, HSS, Bright Finish

**SPS-120** 120°, HSS, Bright Finish



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | SPS-90 | SPS-120 |
|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | |
| 1/4 | 0.2500 | 3/4 | 2.1/2 | 1 | 087900 | 087950 |
| 3/8 | 0.3750 | 1.1/8 | 3.1/8 | 1 | 087901 | 087951 |
| 1/2 | 0.5000 | 1.3/8 | 3.3/4 | 1 | 087902 | 087952 |
| 5/8 | 0.6250 | 1.5/8 | 4.3/8 | 1 | 087903 | 087953 |
| 3/4 | 0.7500 | 1.7/8 | 5“ | 1 | 087904 | 087954 |
| 1“ | 1.0000 | 2.1/4 | 6“ | 1 | 087905 | 087955 |

## Spotting Drill - Regular Length

**SPR-90** 90°, HSS, Bright Finish

**SPR-120** 120°, HSS, Bright Finish



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | SPR-90 | SPR-120 |
|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | |
| 1/4 | 0.2500 | 3/4 | 4“ | 1 | 087912 | 087962 |
| 3/8 | 0.3750 | 1.1/8 | 5“ | 1 | 087913 | 087963 |
| 1/2 | 0.5000 | 1.3/8 | 6“ | 1 | 087914 | 087964 |
| 5/8 | 0.6250 | 1.5/8 | 7“ | 1 | 087915 | 087965 |
| 3/4 | 0.7500 | 1.7/8 | 8“ | 1 | 087916 | 087966 |
| 1“ | 1.0000 | 2.1/4 | 8“ | 1 | 087917 | 087967 |

## Spotting Drill - Long Length

**SPL-90** 90°, HSS, Bright Finish

**SPL-120** 120°, HSS, Bright Finish



| Drill Sizes | | Flute Length | Over-All-Length | Pkg Qty | SPL-90 | SPL-120 |
|---|---|---|---|---|---|---|
| Inch | Decimal | | | | | |
| 1/4 | 0.2500 | 3/4 | 6“ | 1 | 087924 | 087974 |
| 3/8 | 0.3750 | 1.1/8 | 7“ | 1 | 087925 | 087975 |
| 1/2 | 0.5000 | 1.3/8 | 8“ | 1 | 087926 | 087976 |
| 5/8 | 0.6250 | 1.5/8 | 9“ | 1 | 087927 | 087977 |
| 3/4 | 0.7500 | 1.7/8 | 10“ | 1 | 087928 | — |
| 1“ | 1.0000 | 2.1/4 | 10“ | 1 | 087929 | — |

## Sheet Metal Stub Length Drill, Double Ended

120° point, HSS, Steam Tempered
Designed for drilling thin materials.



### A119

| Drill Sizes | | Flute Length mm | Over-All-Length mm | A119 |
|---|---|---|---|---|
| Metric | Decimal Inch | | | |
| 3.30 | 0.1299 | 11 | 49 | 47189827 |
| 3.60 | 0.1417 | 12 | 52 | 47189828 |
| 4.10 | 0.1614 | 14 | 55 | 47189829 |
| 4.20 | 0.1654 | 14 | 55 | 47189840 |
| 4.90 | 0.1929 | 17 | 62 | 47189841 |
| 5.10 | 0.2008 | 17 | 62 | 47189842 |

## Sheet Metal Stub Length Drills

120° point, HSS, Steam Tempered
Designed for drilling thin materials.



### A123

| Drill Sizes | | | Flute Length mm | Over-All-Length mm | A123 |
|---|---|---|---|---|---|
| Fractional | Metric | Decimal Inch | | | |
| 3/32 | 2.38 | 0.0937 | 14 | 43 | 47189761 |
| | 2.50 | 0.0984 | 14 | 43 | 47189762 |
| | 3.00 | 0.1181 | 16 | 46 | 47189763 |
| 1/8 | 3.18 | 0.1252 | 18 | 49 | 47189764 |
| | 3.20 | 0.1260 | 18 | 49 | 47189765 |
| | 3.30 | 0.1299 | 18 | 49 | 47189766 |
| | 3.50 | 0.1378 | 18 | 52 | 47189767 |
| | 3.70 | 0.1457 | 18 | 52 | 47189769 |
| 5/32 | 3.97 | 0.1563 | 18 | 55 | 47189780 |
| | 4.00 | 0.1575 | 18 | 55 | 47189781 |
| | 4.10 | 0.1614 | 18 | 55 | 47189782 |
| | 4.20 | 0.1654 | 18 | 55 | 47189783 |
| | 4.50 | 0.1772 | 18 | 58 | 47189784 |
| 3/16 | 4.76 | 0.1874 | 18 | 62 | 47189785 |
| | 4.80 | 0.1890 | 18 | 62 | 47189786 |
| | 4.90 | 0.1929 | 18 | 62 | 47189787 |
| | 5.00 | 0.1969 | 18 | 62 | 47189788 |
| | 5.50 | 0.2165 | 18 | 66 | 47189789 |
| 7/32 | 5.56 | 0.2189 | 18 | 66 | 47189790 |
| | 6.00 | 0.2362 | 18 | 66 | 47189791 |
| 1/4 | 6.35 | 0.2500 | 19 | 70 | 47189792 |

## Spot Weld Drill

Spot weld drill point, HSCO, Bronze Tempered
Designed with special point to center and create a flat drilling surface prior to drilling holes in welded areas.



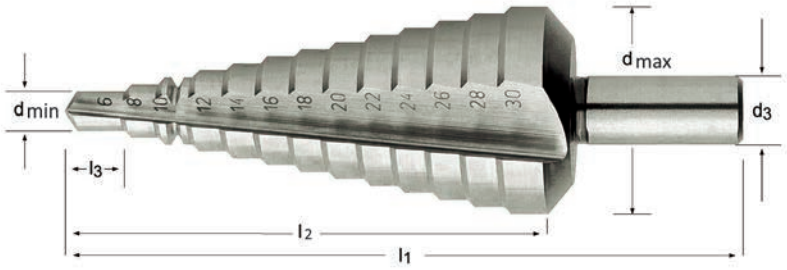
### A723

| Drill Sizes | | Flute Length mm | Over-All-Length mm | A119 |
|---|---|---|---|---|
| Metric | Decimal Inch | | | |
| 6.00 | 0.2362 | 18 | 66 | 47189822 |
| 6.00 | 0.2362 | 18 | 93 | 47189823 |
| 8.00 | 0.3150 | 24 | 79 | 47189824 |
| 8.00 | 0.3150 | 24 | 117 | 47189825 |

# Special Purpose Drills

## Conical Drill

HSS, Bright Finish
Designed to drill holes in sheet metal up to 1/4" thick. Each step enlarges the original hole from the previous step and can drill a range of hole sizes with a single bit.




## G314

| Nr. | d min-max mm | $l_3$ mm | $l_2$ mm | $l_1$ mm | $d_3$ Ø mm | G314 |
|---|---|---|---|---|---|---|
| 412 | 4.0 mm - 12.0 mm x 1.0 mm | 5.0 | 61 | 80 | 6.0 | 0149416 |
| 1220 | 12.0 mm - 20.0 mm x 1.0 mm | 4.0 | 55 | 76 | 9.0 | 0149423 |
| 2030 | 20.0 mm - 30.0 mm x 1.0 mm | 4.0 | 67 | 88 | 12.0 | 0149430 |
| 3040 | 30.0 mm - 40.0 mm x 1.0 mm | 4.0 | 74 | 98 | 13.0 | 0149447 |
| 420 | 4.0 mm - 20.0 mm x 2.0 mm | 4.0 | 48 | 76 | 8.0 | 0149461 |
| 630 | 6.0 mm - 30.0 mm x 2.0 mm | 4.0 | 73 | 98 | 10.0 | 0149478 |
| M | 9.0 mm - 36.0 mm x 3.0 mm | 3.0 | 57 | 86 | 12.0 | 0149485 |

# Drilling Troubleshooting

| Problem | Solution |
|---|---|
| **Wear on Outer Corners** | Reduce cutting speed |
| | Increase feed (IPR) |
| | Improve direction of coolant flow |
| | Increase coolant pressure |
| | Add corner break |
| **Chipping of Chisel Edge** | Check accuracy of drill runout |
| | Check workpiece clamping accuracy and movement |
| | Check point centrality and lip height |
| | Increase feed rate |
| **Chipping of Cutting Lips** | Check accuracy of drill runout |
| | Check workpiece clamping accuracy and movement |
| | Reduce speed |
| | Reduce point clearance |
| | Increase hone |
| **Cracking of Lands** | Check movement of workpiece |
| | Increase back taper |
| | Check accuracy of drill runout |
| | Chip packing; increase flute form opening or peck drill (HSS or HSCO only) |
| | Slow down helix, horizontal drilling |
| | Increase feed |
| | When spot drilling, reduce feed |
| | Improve direction of coolant flow |
| | Increase coolant pressure |
| **Oversize Hole** | Increase speed, reduce feed |
| | Check workpiece clamping accuracy and movement |
| | Check accuracy of drill runout |
| | Chip packing, increase flute form opening or peck drill (HSS or HSCO only) |
| | Check point centrality and lip height |
| **Undersize Hole** | Improve direction of coolant flow |
| | Reduce cutting speed, increase feed |
| | Check drill diameter |
| **Hole Not Round** | Check accuracy of drill runout |
| | Check workpiece clamping accuracy and movement |
| | Check point centrality and lip height |
| | Chip packing, increase flute form opening or peck drill (HSS or HSCO only) |
| **Drill Breakage** | Chip packing, increase flute form opening or peck drill (HSS or HSCO only) |
| | Check workpiece clamping accuracy and movement |
| | Check accuracy of drill runout |
| | Reduce feed rate, increase feed rate |
| | Improve direction of coolant flow |
| | Increase coolant pressure |

# General Purpose Hand Taps

UNION BUTTERFIELD®

The most versatile HSS 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)



| Nominal Point Diameter | TPI UNC | TPI UNF | TPI UNS | Over-All-Length | Thread Length | Shank Diameter Inch | Square Diameter | Square Length | # of Flutes | Limits | Pack Qty | Taper | Plug | Bottoming | Sets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 80 | | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | 1 | 1010593 | 1010594 | 1010596 | 1010999 |
| 0 | | 80 | | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 1010595 | 1010597 | — |
| 1 | 64 | | | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | 1 | 1010598 | 1010599 | 1010601 | 1011000 |
| 1 | | 72 | | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | 1 | 1010603 | 1010604 | 1010606 | 1011001 |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | -— | 1010615 | 1010617 | — |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 1010608 | 1010610 | 1010612 | — |
| 2 | 56 | | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010609 | 1010611 | 1010613 | 1011003 |
| 2 | | 64 | | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | —- | —- | —- | 1011073 |
| 3 | 48 | | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | —- | 1010631 | — | — |
| 3 | 48 | | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010625 | 1010627 | 1010629 | 1011005 |
| 3 | | 56 | | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010634 | 1010636 | 1010637 | 1011074 |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 1010650 | 1010652 | — |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 1010643 | 1010645 | 1010647 | — |
| 4 | 40 | | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010644 | 1010646 | 1010648 | 1011008 |
| 4 | | 48 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010653 | 1010655 | 1010656 | 1011075 |
| 4 | | | 36 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | — | — | — | 1011006 |
| 5 | 40 | | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010660 | 1010662 | 1010664 | 1011010 |
| 5 | | 44 | | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010669 | 1010671 | 1010672 | 1011076 |
| 6 | 32 | | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | — | 1010685 | 1010688 | — |
| 6 | 32 | | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | — | 1010686 | 1010689 | — |
| 6 | 32 | | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H1 | 1 | 1010675 | 1010678 | 1010681 | — |
| 6 | 32 | | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010676 | 1010679 | 1010682 | 1011012 |
| 6 | 32 | | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H3 | 1 | 1010677 | 1010680 | 1010683 | 1011013 |
| 6 | | 40 | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 3 | H2 | 1 | 1010690 | 1010692 | 1010693 | 1011014 |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | 1 | — | 1010706 | 1010709 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | — | 1010707 | 1010710 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H2 | 1 | — | 1010712 | 1010715 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H3 | 1 | — | 1010713 | 1010716 | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H1 | 1 | — | 1010699 | — | — |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H2 | 1 | 1010697 | 1010700 | 1010703 | 1011016 |
| 8 | 32 | | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H3 | 1 | 1010698 | 1010701 | 1010704 | 1011017 |
| 8 | | 36 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 4 | H2 | 1 | 1010717 | 1010719 | 1010720 | 1011018 |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | 1 | — | 1010733 | 1010736 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | — | 1010734 | 1010737 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H2 | 1 | — | 1010739 | — | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | — | 1010740 | 1010743 | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H1 | 1 | — | 1010726 | — | — |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H2 | 1 | 1010724 | 1010727 | 1010730 | 1011020 |
| 10 | 24 | | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H3 | 1 | 1010725 | 1010728 | 1010731 | 1011021 |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | 1 | — | 1010754 | 1010757 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | — | 1010755 | 1010758 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H2 | 1 | — | 1010760 | 1010763 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | — | 1010761 | 1010764 | — |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H2 | 1 | 1010745 | 1010748 | 1010751 | 1011023 |
| 10 | | 32 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 4 | H3 | 1 | 1010746 | 1010749 | 1010752 | 1011024 |
| 12 | 24 | | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 4 | H3 | 1 | 1010765 | 1010767 | 1010768 | 1011025 |

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

# General Purpose Hand Taps

| Nominal Point Diameter | TPI UNC | TPI UNF | TPI UNS | Over-All-Length | Thread Length | Shank Diameter Inch | Square Diameter | Square Length | # of Flutes | Limits | Pack Qty | Taper | Plug | Bottoming | Sets |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | | 28 | | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 4 | H3 | 1 | 1010769 | 1010771 | 1010772 | 1011026 |
| 1/4 | 20 | | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H1 | 1 | 1010001 | 1010004 | 1010008 | — |
| 1/4 | 20 | | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H2 | 1 | 1010002 | 1010005 | 1010009 | — |
| 1/4 | 20 | | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H3 | 1 | 1010003 | 1010006 | 1010010 | 1011029 |
| 1/4 | 20 | | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H5 | 1 | | 1010007 | 1010011 | — |
| 1/4 | | 28 | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H2 | 1 | — | 1010016 | 1010020 | — |
| 1/4 | | 28 | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H3 | 1 | 1010014 | 1010017 | 1010021 | 1011032 |
| 1/4 | | 28 | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H4 | 1 | — | 1010018 | 1010022 | — |
| 5/16 | 18 | | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H2 | 1 | 1010024 | 1010027 | 1010031 | — |
| 5/16 | 18 | | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | 1010025 | 1010028 | 1010032 | 1011035 |
| 5/16 | | 24 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | 1 | 1010036 | 1010039 | 1010043 | 1011038 |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H2 | 1 | 1010046 | 1010049 | 1010053 | — |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 1010047 | 1010050 | 1010054 | 1011041 |
| 3/8 | 16 | | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H5 | 1 | — | 1010051 | 1010055 | — |
| 3/8 | | 24 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | 1 | 1010058 | 1010061 | 1010065 | 1011044 |
| 7/16 | 14 | | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | 1 | 1010067 | 1010070 | 1010074 | 1011045 |
| 7/16 | | 20 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | 1 | 1010076 | 1010079 | 1010083 | 1011046 |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H2 | 1 | — | 1010087 | 1010091 | — |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 1010085 | 1010088 | 1010092 | 1011047 |
| 1/2 | 13 | | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H5 | 1 | — | 1010089 | 1010093 | — |
| 1/2 | | 20 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | 1 | 1010094 | 1010097 | 1010101 | 1011048 |
| 9/16 | 12 | | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | 1010103 | 1010106 | 1010108 | 1011049 |
| 9/16 | | 18 | | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | 1 | 1010110 | 1010113 | 1010116 | 1011050 |
| 5/8 | 11 | | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | 1 | 1010118 | 1010121 | 1010123 | 1011051 |
| 5/8 | | 18 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | 1 | 1010125 | 1010128 | 1010131 | 1011052 |
| 11/16 | | | 11 | 4.1/32 | 1.13/16 | 0.5420 | 0.4060 | 5/8 | 4 | H3 | 1 | — | — | — | 1011053 |
| 11/16 | | | 16 | 4.1/32 | 1.13/16 | 0.5420 | 0.4060 | 5/8 | 4 | H3 | 1 | — | — | — | 1011054 |
| 3/4 | 10 | | | 4.1/4 | 2“ | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | 1010139 | 1010142 | 1010144 | 1011055 |
| 3/4 | | 16 | | 4.1/4 | 2“ | 0.5900 | 0.4420 | 11/16 | 4 | H3 | 1 | 1010146 | 1010149 | 1010152 | 1011056 |
| 7/8 | 9 | | | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | 1 | 1010154 | 1010157 | 1010159 | 1011057 |
| 7/8 | | 14 | | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | 1 | 1010160 | 1010163 | 1010166 | 1011058 |
| 1“ | 8 | | | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | 1 | 1010167 | 1010170 | 1010172 | 1011059 |
| 1“ | | 12 | | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | 1 | 1010173 | 1010174 | 1010175 | 1011060 |
| 1“ | | | 14 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | 1 | 1010176 | 1010178 | 1010181 | 1011061 |
| 1.1/8 | 7 | | | 5.7/16 | 2.9/16 | 0.8960 | 0.6720 | 7/8 | 4 | H4 | 1 | 1010182 | 1010183 | 1010184 | 1011062 |
| 1.1/8 | | 12 | | 5.7/16 | 2.9/16 | 0.8960 | 0.6720 | 7/8 | 4 | H4 | 1 | 1010185 | 1010186 | 1010187 | 1011063 |
| 1.1/4 | 7 | | | 5.3/4 | 2.9/16 | 1.0210 | 0.7660 | 1“ | 4 | H4 | 1 | 1010188 | 1010189 | 1010190 | 1011064 |
| 1.1/4 | | 12 | | 5.3/4 | 2.9/16 | 1.0210 | 0.7660 | 1“ | 6 | H4 | 1 | 1010191 | 1010192 | 1010193 | 1011065 |
| 1.3/8 | 6 | | | 6.1/16 | 3“ | 1.1000 | 0.8310 | 1.1/16 | 4 | H4 | 1 | 1010194 | 1010195 | 1010196 | 1011066 |
| 1.3/8 | | 12 | | 6.1/16 | 3“ | 1.1000 | 0.8310 | 1.1/16 | 6 | H4 | 1 | 1010197 | 1010198 | 1010199 | 1011067 |
| 1.1/2 | 6 | | | 6.3/8 | 3“ | 1.2300 | 0.9250 | 1.1/8 | 4 | H4 | 1 | 1010200 | 1010201 | 1010202 | 1011068 |
| 1.1/2 | | 12 | | 6.3/8 | 3“ | 1.2300 | 0.9250 | 1.1/8 | 6 | H4 | 1 | 1010203 | 1010204 | 1010205 | 1011069 |

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

# HSS General Purpose Hand Taps - 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 | TPI | Over-All-Length | Thread Length | Shank Diameter | Square Diameter | Square Length | # of Flutes | Limits | Chamfer | Pack Qty | EDP# |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1/4 | | 28 | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 1011775 |
| 1/4 | | | 20 | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 4 | H3 | Plug | 1 | 1011772 |
| | 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 1011781 |
| 5/16 | | | 18 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 4 | H3 | Plug | 1 | 1011778 |
| | 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 1011787 |
| 3/8 | | | 16 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 4 | H3 | Plug | 1 | 1011784 |
| | 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 1011793 |
| 7/16 | | | 14 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 4 | H3 | Plug | 1 | 1011790 |
| | 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 1011799 |
| 1/2 | | | 13 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 4 | H3 | Plug | 1 | 1011796 |
| | 9/16 | | 18 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 1011805 |
| 9/16 | | | 12 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 4 | H3 | Plug | 1 | 1011802 |
| | 5/8 | | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 1011811 |
| 5/8 | | | 11 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 4 | H3 | Plug | 1 | 1011808 |
| | 3/4 | | 16 | 4.1/4 | 2“ | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 1011823 |
| 3/4 | | | 10 | 4.1/4 | 2“ | 0.5900 | 0.4420 | 11/16 | 4 | H3 | Plug | 1 | 1011820 |
| | 7/8 | | 14 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 1011829 |
| 7/8 | | | 9 | 4.11/16 | 2.7/32 | 0.6970 | 0.5230 | 3/4 | 4 | H4 | Plug | 1 | 1011826 |
| | | 1“ | 14 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 1011838 |
| | 1“ | | 12 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 1011835 |
| 1“ | | | 8 | 5.1/8 | 2.1/2 | 0.8000 | 0.6000 | 13/16 | 4 | H4 | Plug | 1 | 1011832 |

# HSS General Purpose Hand Taps

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

## 1500A



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

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

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

## TN1500



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

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

# HSS General Purpose Hand Taps

UNION BUTTERFIELD®

Versatile HSS metric 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





**1700(M)** Metric Hand Tap

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

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

# HSS General Purpose Hand Taps, 8-Pitch

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**

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

## Non-Relieved Style, Machine Screw Sizes

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



## 1534NR

| UNC | UNF | UNS | TPI | Over-All-Length | Thread Length | Shank Diameter | Square Diameter | Square Length | # of Flutes | Limits | Chamfer | Pack Qty | 1534NR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010775 |
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010776 |
| | 0 | | 80 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010778 |
| | 1 | | 72 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010783 |
| | 1 | | 72 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010784 |
| 1 | | | 64 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010779 |
| 1 | | | 64 | 1.11/16 | 3/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010780 |
| | 2 | | 64 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010791 |
| | 2 | | 64 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010792 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010787 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010788 |
| 2 | | | 56 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010790 |
| | 3 | | 56 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010799 |
| | 3 | | 56 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010800 |
| 3 | | | 48 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010796 |
| 3 | | | 48 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010798 |
| | | 4 | 36 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010803 |
| | 4 | | 48 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010809 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010804 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010805 |
| | 4 | | 48 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010811 |
| 4 | | | 40 | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010807 |
| | 5 | | 44 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010817 |
| 5 | | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010813 |
| 5 | | | 40 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010815 |
| | 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010825 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H1 | Plug | 1 | 1010818 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Plug | 1 | 1010819 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Plug | 1 | 1010820 |
| | 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010827 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | Bottoming | 1 | 1010822 |
| 6 | | | 32 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | Bottoming | 1 | 1010823 |
| | 8 | | 36 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 1010835 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H1 | Plug | 1 | 1010828 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Plug | 1 | 1010829 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Plug | 1 | 1010830 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H2 | Bottoming | 1 | 1010832 |
| 8 | | | 32 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | Bottoming | 1 | 1010833 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H1 | Plug | 1 | 1010843 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 1010844 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 1010845 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 1010847 |
| | 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 1010848 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H1 | Plug | 1 | 1010837 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Plug | 1 | 1010838 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Plug | 1 | 1010839 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H2 | Bottoming | 1 | 1010841 |
| 10 | | | 24 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | Bottoming | 1 | 1010842 |
| | 12 | | 28 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 1010853 |
| 12 | | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Plug | 1 | 1011071 |
| 12 | | | 24 | 2.3/8 | 15/16 | 0.2200 | 0.1650 | 9/32 | 2 | H3 | Bottoming | 1 | 1011072 |

# HSS Spiral Point Taps

UNION BUTTERFIELD®

## Non-Relieved Style, Fractional Sizes

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

| Nominal Point Diameter | TPI UNC | TPI UNF | Over-All-Length | Thread Length | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | # of Flutes | Limits | Pack Qty | Plug | Bottoming |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H1 | 1 | 1012813 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H2 | 1 | 1012814 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 1012815 | 1012817 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H5 | 1 | 1012816 | — |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1012818 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H1 | 1 | 1012820 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H2 | 1 | 1012821 | — |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 1012822 | 1012824 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H2 | 1 | 1012828 | — |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | 1012829 | 47197820 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H5 | 1 | 1012830 | — |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1012832 | 1012831 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | 1012836 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H2 | 1 | 1012842 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1012843 | — |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H5 | 1 | 1012844 | — |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1012847 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H2 | 1 | 1012849 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1012850 | — |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H5 | 1 | 1012851 | — |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1012853 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H2 | 1 | 1012856 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1012857 | — |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H5 | 1 | 1012858 | — |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1012861 | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H3 | 1 | 1012863 | — |
| 5/8 | 11 | | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H5 | 1 | 1012864 | — |
| 5/8 | | 18 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | H3 | 1 | 1012867 | — |
| 3/4 | 10 | | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H3 | 1 | 1012865 | — |
| 3/4 | 10 | | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H5 | 1 | 1012866 | — |
| 3/4 | | 16 | 4.1/2 | 2" | 0.5900 | 0.4420 | 11/16 | 3 | H3 | 1 | 1012868 | — |

## Non-Relieved, Metric Sizes

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 | P | $l_1$ | $l_2$ | $l_3$ | $d_2$ Ø | ▨ a | # of | | | Pack | 1785NR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | mm | Inch | Inch | Inch | Inch | Inch | Flutes | Limits | Chamfer | Qty | |
| 1.6 | 0.35 | 1.5/8 | 5/16 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 1012890 |
| 2 | 0.40 | 1.3/4 | 7/16 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 1012891 |
| 2.5 | 0.45 | 1.13/16 | 1/2 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 1012893 |
| 3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | Plug | 1 | 1012896 |
| 3.5 | 0.60 | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | D4 | Plug | 1 | 1012897 |
| 4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | D4 | Plug | 1 | 1012898 |
| 4.5 | 0.75 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | D4 | Plug | 1 | 1012899 |
| 5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | D4 | Plug | 1 | 1012900 |
| 6 | 1.00 | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | D5 | Plug | 1 | 1012901 |
| 7 | 1.00 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | D5 | Plug | 1 | 1012902 |
| 8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | D5 | Plug | 1 | 1012903 |
| 10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | D6 | Plug | 1 | 1012904 |
| 12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | D6 | Plug | 1 | 1012905 |
| 14 | 2.00 | 3.19/32 | 1.21/32 | 0.4290 | 0.3220 | 1/2 | 3 | D7 | Plug | 1 | 1012906 |
| 16 | 2.00 | 3.13/16 | 1.13/16 | 0.4800 | 0.3600 | 9/16 | 3 | D7 | Plug | 1 | 1012907 |
| 20 | 2.50 | 4.15/32 | 2“ | 0.6520 | 0.4890 | 11/16 | 3 | D7 | Plug | 1 | 1012909 |

## Extension / Non-Relieved Style

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 | UNF | TPI | Over-All-Length | Thread Length Inch | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | # of Flutes | Limits | Pack Qty | Chamfer | 1534NE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | 40 | 4“ | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | Plug | 1020002 |
| 6 | | 32 | 4“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | Plug | 1020004 |
| 6 | | 32 | 6“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | Plug | 1020006 |
| 8 | | 32 | 4“ | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | Plug | 1020008 |
| 8 | | 32 | 6“ | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | Plug | 1020010 |
| | 10 | 32 | 4“ | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 1020016 |
| | 10 | 32 | 6“ | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 1020018 |
| 10 | | 24 | 4“ | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 1020012 |
| 10 | | 24 | 6“ | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | Plug | 1020014 |
| | 1/4 | 28 | 4“ | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 1020024 |
| | 1/4 | 28 | 6“ | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 1020026 |
| 1/4 | | 20 | 4“ | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 1020020 |
| 1/4 | | 20 | 6“ | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | Plug | 1020022 |
| | 5/16 | 24 | 4“ | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 1020032 |
| | 5/16 | 24 | 6“ | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 1020034 |
| 5/16 | | 18 | 4“ | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 1020028 |
| 5/16 | | 18 | 6“ | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 2 | H3 | 1 | Plug | 1020030 |
| | 3/8 | 24 | 4“ | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 1020040 |
| | 3/8 | 24 | 6“ | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 1020042 |
| 3/8 | | 16 | 4“ | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 1020036 |
| 3/8 | | 16 | 6“ | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | Plug | 1020038 |
| | 7/16 | 20 | 6“ | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | Plug | 1020046 |
| 7/16 | | 14 | 6“ | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | Plug | 1020044 |
| | 1/2 | 20 | 6“ | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | Plug | 1020050 |
| 1/2 | | 13 | 6“ | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | Plug | 1020048 |

# HSS Spiral Flute Taps

## Regular Spiral 30°

Generally used where chip disposal is a problem. The spiral flute design effictively draws chips out of the hole. Recommended for use when tapping blind or through holes in a variety of materials. Excellent choice for non-ferrous applications.

**1582** - Machine Screw Sizes

**1586** - Fractional Sizes



| Nominal Point Diameter | TPI UNC | TPI UNF | Over-All-Length | Thread Length Inch | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | # of Flutes | Limits | Pack Qty | Plug | Bottoming |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | 1010905 | 1010906 |
| 6 | 32 | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | 1010909 | 1010910 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 2 | H3 | 1 | 1010913 | 1010914 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | 1010915 | 1010916 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 2 | H3 | 1 | 1010917 | 1010918 |
| 1/4 | 20 | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 1010346 | 1010347 |
| 1/4 | 20 | | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010348 | 1010349 |
| 1/4 | | 28 | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 2 | H3 | 1 | 1010350 | 1010351 |
| 1/4 | | 28 | 2.1/2 | 1“ | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010352 | 1010353 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1010354 | 1010355 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1010356 | 1010357 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1010358 | 1010359 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1010360 | 1010361 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1010362 | 1010363 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1010366 | 1010367 |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1010368 | 1010369 |

## High Spiral Helicut 52°

Similar to the regular spiral flute design of 1582/1586 except that the faster spiral improves the chip drawing action and permits the bridging of larger gaps inside a hole. For blind or through hole applications. Excellent choice for non-ferous applications.

**1587** - Machine Screw Sizes

**1588** - Fractional Sizes



| Nominal Point Diameter | TPI UNC | TPI UNF | Over-All-Length | Thread Length Inch | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | # of Flutes | Limits | Pack Qty | Plug | Bottoming |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 40 | | 1.7/8 | 9/16 | 0.1410 | 0.1100 | 3/16 | 2 | H2 | 1 | 1010887 | 1010888 |
| 6 | 32 | | 2“ | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | 1010891 | 1010892 |
| 8 | 32 | | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | H3 | 1 | 1010895 | 1010896 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 1010897 | 1010898 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 1010899 | 1010900 |
| 1/4 | 20 | | 2.1/2 | 1.000 | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010398 | 1010399 |
| 1/4 | | 28 | 2.1/2 | 1.000 | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010400 | 1010401 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1010402 | 1010403 |
| 5/16 | | 24 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1010404 | 1010405 |
| 3/8 | 16 | | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1010406 | 1010407 |
| 3/8 | | 24 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1010408 | 1010409 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1010410 | 1010411 |
| 7/16 | | 20 | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1010412 | 1010413 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1010414 | 1010415 |
| 1/2 | | 20 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1010416 | 1010417 |

## High Spiral Helicut 52°, Metric

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)

| Nominal Point Diameter mm | Pitch M | Over-All-Length | Thread Length inch | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | No. of Flutes | Limits | Pack Qty | Plug | Bottoming |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M3 | 0.50 | 1.15/16 | 5/8 | 0.1410 | 0.1100 | 3/16 | 2 | D3 | 1 | 1012920 | 1012940 |
| M4 | 0.70 | 2.1/8 | 3/4 | 0.1680 | 0.1310 | 1/4 | 3 | D4 | 1 | 1012923 | 1012943 |
| M5 | 0.80 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | D4 | 1 | 1012925 | 1012945 |
| M6 | 1.00 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | D5 | 1 | 1012926 | 1012946 |
| M8 | 1.25 | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | D5 | 1 | 1012928 | 1012948 |
| M10 | 1.50 | 2.15/16 | 1.1/4 | 0.3810 | 0.2860 | 7/16 | 3 | D6 | 1 | 1012930 | 1012950 |
| M12 | 1.75 | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | D6 | 1 | 1012932 | 1012952 |

## Heavy Duty Spiral 40°

A slower helix angle, larger core diameter, three flutes and wider throat dimensions than the regular 1587/1588 series. Designed for tough blind or through hole tapping. Chip ejection is more efficient and problems such as chipping and breakage are largely eliminated. A steam oxide finish makes this tap ideal for use in ferrous materials and higher strength alloys.

**1590** - Machine Screw Sizes

**1591** - Fractional Sizes



| Nominal Point Diameter | TPI UNC | TPI UNF | Over-All-Length | Thread Length inch | Shank Diameter Inch | Square Diameter Inch | Square Length Inch | No. of Flutes | Limits | Pack Qty | Plug | Bottoming |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 32 | | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | 1010937 | 1010938 |
| 6 | | 40 | 2" | 11/16 | 0.1410 | 0.1100 | 3/16 | 2 | H3 | 1 | — | 1010940 |
| 10 | 24 | | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 1010945 | 1010946 |
| 10 | | 32 | 2.3/8 | 7/8 | 0.1940 | 0.1520 | 1/4 | 3 | H3 | 1 | 1010947 | 1010948 |
| 1/4 | 20 | | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010953 | 1010954 |
| 1/4 | | 28 | 2.1/2 | 1" | 0.2550 | 0.1910 | 5/16 | 3 | H3 | 1 | 1010955 | 1010956 |
| 5/16 | 18 | | 2.23/32 | 1.1/8 | 0.3180 | 0.2380 | 3/8 | 3 | H3 | 1 | 1010957 | 1010958 |
| 3/8 | 16 | | 2.5/16 | 1.1.4 | 0.3810 | 0.2860 | 7/16 | 3 | H3 | 1 | 1010961 | 1010962 |
| 7/16 | 14 | | 3.5/32 | 1.7/16 | 0.3230 | 0.2420 | 13/32 | 3 | H3 | 1 | 1010965 | 1010966 |
| 1/2 | 13 | | 3.3/8 | 1.21/32 | 0.3670 | 0.2750 | 7/16 | 3 | H3 | 1 | 1010969 | 1010970 |

# HSS General Purpose, Medium Hook, NPT Taps

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.
Made to Metal Cutting Tool Institute Standards



**1541** Bright finish

**TN1541** TiN coating increases surface hardness and improves tool life.

| Nominal Point Diameter | TPI | Over-All-Length | Thread Length | Shank Length | Square Diameter | Square Length | # of Flutes | Pack Qty | 1541 | TN1541 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 1010518 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 1010528 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 1010519 | 1060519 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 1010520 | 1060520 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 1010521 | 1060521 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 1010522 | 1060522 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 1010523 | 1060523 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 1010524 | — |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 1010525 | — |
| 1.1/2 | 11.5 | 4.1/4 | 1.3/4 | 1.5000 | 1.1250 | 1" | 7 | 1 | 1010526 | — |
| 2" | 11.5 | 4.1/2 | 1.3/4 | 1.8750 | 1.4060 | 1.1/8 | 7 | 1 | 1010527 | — |

# HSS General Purpose, NPT Taps - Work-Rite

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 | TPI | Over-All-Length | Thread Length | Shank Diameter | Square Diameter | Square Length | # of Flutes | Pack Qty | 6541 |
|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 8110601 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 8110602 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 8110603 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 8110604 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 8110605 |
| 1" | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 8110606 |
| 1.1/4 | 11.5 | 4" | 1.3/4 | 1.3130 | 0.9840 | 15/16 | 5 | 1 | 8110607 |
| 1.1/2 | 11.5 | 4.1/4 | 1.3/4 | 1.5000 | 1.1250 | 1 | 7 | 1 | 8110608 |
| 2" | 11.5 | 4.1/2 | 1.3/4 | 1.8750 | 1.4060 | 1.1/8 | 7 | 1 | 8110609 |

UNION BUTTERFIELD®

# HSS High Hook, NPT Pipe Taps

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.

**1545** Bright finish

**1545A** Identical to the 1545 series but with steam oxide surface treatment to prevent galling and chipping.



| NPT | TPI | Over-All-Length | Thread Length | Shank Diameter | Square Diameter | Square Length | # of Flutes | Pack Qty | 1545 | 1545A |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/16 | 27 | 2.1/8 | 11/16 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | — | 1052869 |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.3130 | 0.2340 | 3/8 | 4 | 1 | 1012879 | — |
| 1/8 | 27 | 2.1/8 | 3/4 | 0.4380 | 0.3280 | 3/8 | 4 | 1 | 1012870 | 1052870 |
| 1/4 | 18 | 2.7/16 | 1.1/16 | 0.5630 | 0.4210 | 7/16 | 4 | 1 | 1012871 | 1052871 |
| 3/8 | 18 | 2.9/16 | 1.1/16 | 0.7000 | 0.5310 | 1/2 | 4 | 1 | 1012872 | 1052872 |
| 1/2 | 14 | 3.1/8 | 1.3/8 | 0.6880 | 0.5150 | 5/8 | 4 | 1 | 1012873 | 1052873 |
| 3/4 | 14 | 3.1/4 | 1.3/8 | 0.9060 | 0.6790 | 11/16 | 5 | 1 | 1012874 | 1052874 |
| 1“ | 11.5 | 3.3/4 | 1.3/4 | 1.1250 | 0.8430 | 13/16 | 5 | 1 | 1012875 | — |

# HSS Combination Drill & Tap, NPT Pipe Threads

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 | TPI | Drill Diameter inch | Over-All-Length inch | Thread Length inch | Drilling Length inch | Shank Diameter inch | Square Diameter inch | Square Length inch | # of Flutes | Pack Qty | E653 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 27 | 0.3346 | 2.7/8 | 3/4 | 3/4 | 0.4370 | 0.3280 | 3/8 | 2 | 1 | 0297285 |
| 1/4 | 18 | 0.4331 | 3.5/16 | 1.1/16 | 7/8 | 0.5620 | 0.4210 | 7/16 | 2 | 1 | 0297278 |
| 3/8 | 18 | 0.5709 | 3.1/2 | 1.1/16 | 15/16 | 0.7000 | 0.5310 | 1/2 | 2 | 1 | 0297308 |
| 1/2 | 14 | 0.7087 | 4.3/8 | 1.3/8 | 1.1/4 | 0.6870 | 0.5150 | 5/8 | 2 | 1 | 0297261 |
| 3/4 | 14 | 0.9055 | 4.9/16 | 1.3/8 | 1.5/16 | 0.9060 | 0.6790 | 11/16 | 2 | 1 | 0297292 |
| 1“ | 11.5 | 1.1417 | 5.3/8 | 1.3/4 | 1.5/8 | 1.1250 | 0.8430 | 13/16 | 2 | 1 | 0297247 |

# HSS Combination Drill & Tap

UNION BUTTERFIELD®

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

| UNC | UNF | TPI | Drilling Diameter Inch | Over-All-Length | Thread Length | Shank Diameter | Square Diameter | Square Length | Drilling Length | # of Flutes | Pack Qty | 1994 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | | 40 | 0.0890 | 1.7/8 | 3/8 | 0.1410 | 0.1100 | 3/16 | 1/4 | 2 | 1 | 1110010 |
| 5 | | 40 | 0.1015 | 1.15/16 | 13/32 | 0.1410 | 0.1100 | 3/16 | 9/32 | 2 | 1 | 1110020 |
| 6 | | 32 | 0.1110 | 2“ | 7/16 | 0.1410 | 0.1100 | 3/16 | 5/16 | 2 | 1 | 1110030 |
| 8 | | 32 | 0.1360 | 2.1/8 | 1/2 | 0.1680 | 0.1310 | 1/4 | 3/8 | 2 | 1 | 1110040 |
| 10 | | 24 | 0.1540 | 2.3/8 | 5/8 | 0.1940 | 0.1520 | 1/4 | 13/32 | 2 | 1 | 1110050 |
| | 10 | 32 | 0.1610 | 2.3/8 | 5/8 | 0.1940 | 0.1520 | 1/4 | 13/32 | 2 | 1 | 1110054 |
| 12 | | 24 | 0.1800 | 2.3/8 | 21/32 | 0.2200 | 0.1650 | 9/32 | 15/32 | 2 | 1 | 1110060 |
| | 12 | 28 | 0.1850 | 2.3/8 | 21/32 | 0.2200 | 0.1650 | 9/32 | 15/32 | 2 | 1 | 1110064 |
| 1/4 | | 20 | 0.2055 | 2.1/2 | 25/32 | 0.2550 | 0.1910 | 5/16 | 17/32 | 2 | 1 | 1110080 |
| | 1/4 | 28 | 0.2188 | 2.1/2 | 25/32 | 0.2550 | 0.1910 | 5/16 | 17/32 | 2 | 1 | 1110084 |
| 5/16 | | 18 | 0.2660 | 2.27/32 | 15/16 | 0.3180 | 0.2380 | 3/8 | 11/16 | 2 | 1 | 1110090 |
| | 5/16 | 24 | 0.2770 | 2.27/32 | 15/16 | 0.3180 | 0.2380 | 3/8 | 11/16 | 2 | 1 | 1110094 |
| 3/8 | | 16 | 0.3230 | 3.3/8 | 1.1/16 | 0.3810 | 0.2860 | 7/16 | 13/16 | 2 | 1 | 1110100 |
| | 3/8 | 24 | 0.3390 | 3.3/8 | 1.1/16 | 0.3810 | 0.2860 | 7/16 | 13/16 | 2 | 1 | 1110104 |
| 7/16 | | 14 | 0.3770 | 3.3/4 | 1.1/4 | 0.3230 | 0.2420 | 13/32 | 1“ | 2 | 1 | 1110110 |
| | 7/16 | 20 | 0.3937 | 3.3/4 | 1.1/4 | 0.3230 | 0.2420 | 13/32 | 1“ | 2 | 1 | 1110114 |
| 1/2 | | 13 | 0.4331 | 4.1/16 | 1.3/8 | 0.3670 | 0.2750 | 7/16 | 1.1/8 | 2 | 1 | 1110120 |
| | 1/2 | 20 | 0.4531 | 4.1/16 | 1.3/8 | 0.3670 | 0.2750 | 7/16 | 1.1/8 | 2 | 1 | 1110124 |

DORMER

Metric, 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 oxide finish reduces wear and chip welding in harder ferrous materials.

## E651
## E654



| UNC | UNF | TPI | Drilling Diameter mm | Over-All-Length mm | Thread Length mm | Drilling Length mm | Shank Diam-eter mm | Square Diameter mm | # of Flutes | Pack Qty | E651 / E654 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | | 32 | 2.85 | 56.9 | 12 | 6.0 | 3.50 | 2.90 | 2 | 1 | 0388907 |
| 8 | | 32 | 3.50 | 64.0 | 12 | 8.0 | 4.50 | 3.55 | 2 | 1 | 0273272 |
| | 8 | 36 | 3.50 | 64.0 | 13 | 8.0 | 4.50 | 3.55 | 2 | 1 | 0339053 |
| 10 | | 24 | 3.90 | 72.0 | 15 | 10.0 | 5.00 | 4.00 | 2 | 1 | 0273197 |
| | 10 | 32 | 4.10 | 72.0 | 16 | 10.0 | 5.00 | 4.00 | 2 | 1 | 0338971 |
| 12 | | 24 | 4.50 | 77.0 | 15 | 11.0 | 5.60 | 4.50 | 2 | 1 | 0273210 |
| | 12 | 28 | 4.70 | 77.0 | 17 | 11.0 | 5.60 | 4.50 | 2 | 1 | 0338995 |
| 1/4 | | 20 | 5.10 | 83.0 | 17 | 13.0 | 6.30 | 5.00 | 2 | 1 | 0273227 |
| | 1/4 | 28 | 5.50 | 83.0 | 19 | 13.0 | 6.30 | 5.00 | 2 | 1 | 0339008 |
| 5/16 | | 18 | 6.60 | 94.0 | 21 | 16.0 | 8.00 | 6.30 | 2 | 1 | 0273241 |
| | 5/16 | 24 | 6.90 | 94.0 | 22 | 16.0 | 8.00 | 6.30 | 2 | 1 | 0339022 |
| 3/8 | | 16 | 8.00 | 104.0 | 23 | 19.0 | 10.00 | 8.00 | 2 | 1 | 0273234 |
| | 3/8 | 24 | 8.50 | 104.0 | 24 | 19.0 | 10.00 | 8.00 | 2 | 2 | 0339015 |
| 7/16 | | 14 | 9.40 | 107.0 | 25 | 22.0 | 8.00 | 6.30 | 2 | 1 | 0273265 |
| | 7/16 | 20 | 9.90 | 107.0 | 25 | 22.0 | 8.00 | 6.30 | 2 | 1 | 0339046 |
| 1/2 | | 13 | 10.80 | 114.0 | 29 | 25.0 | 9.00 | 7.10 | 2 | 1 | 0273203 |
| | 1/2 | 20 | 11.50 | 114.0 | 29 | 25.0 | 9.00 | 7.10 | 2 | 1 | 0338988 |
| 9/16 | | 12 | 12.20 | 124.0 | 29 | 28.0 | 11.20 | 9.00 | 2 | 1 | 0273289 |
| 5/8 | | 11 | 13.50 | 134.0 | 31 | 32.5 | 12.50 | 10.00 | 2 | 1 | 0273258 |
| | 5/8 | 18 | 14.50 | 134.0 | 32 | 32.0 | 12.50 | 10.00 | 2 | 1 | 0339039 |

DORMER

# HSS Combination Drill & Tap

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 oxide finish reduces wear and chip welding in harder ferrous materials.

## E650



| M | P mm | Drill Diameter mm | Over-All-Length mm | Thread Length mm | Drilling Length mm | Shank Diameter mm | Square Diameter mm | Square Length mm | # of Flutes | Pack Qty | E650 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 0.50 | 2.5 | 56 | 10 | 6 | 3.15 | 2.5 | 5.0 | 2 | 1 | 0167861 |
| 4 | 0.70 | 3.3 | 65 | 12 | 8 | 4.0 | 3.15 | 6.0 | 2 | 1 | 0127551 |
| 5 | 0.80 | 4.2 | 69 | 15 | 10 | 5.0 | 4.00 | 7.0 | 2 | 1 | 0127568 |
| 6 | 1.00 | 5.0 | 84 | 18 | 12 | 6.3 | 5.00 | 8.0 | 2 | 1 | 0127575 |
| 8 | 1.25 | 6.8 | 96 | 21 | 16 | 8.0 | 6.30 | 9.0 | 2 | 1 | 0127582 |
| 10 | 1.50 | 8.5 | 108 | 22 | 20 | 10.0 | 8.00 | 11.0 | 2 | 1 | 0127513 |
| 12 | 1.75 | 10.2 | 113 | 29 | 24 | 9.0 | 7.10 | 10.0 | 2 | 1 | 0127520 |
| 14 | 2.00 | 12.0 | 123 | 30 | 28 | 11.2 | 9.00 | 12.0 | 2 | 1 | 0127537 |
| 16 | 2.00 | 14.0 | 134 | 32 | 32 | 12.5 | 10.00 | 13.0 | 2 | 1 | 0127544 |

UNION BUTTERFIELD®

# HSS Tap & Drill Combination Sets

18 piece tap (styles 1500 and 1528) with corresponding drills (styles R10P & R18P). Metal index.



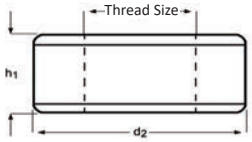
## 229CSET

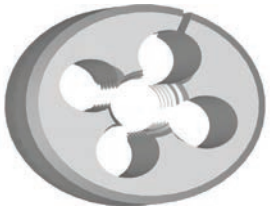
| Set | Style | Pieces per Set | UNC Tap Sizes | Tap Drill Sizes | Pack Qty | 229CSET |
|---|---|---|---|---|---|---|
| 229C | 1500,1528 Taps; R10P,R15P,R18P Drills | 18 | 6-32,8-32,10-24,10-32,1/4-20,5/16-18,3/8-16,7/16-14,1/2-13 | #36,#29,#25,#21,#7,F,5/16,U,27/64 | 1 | 4111502 |

# HSS Round Adjustable, Split Type Die

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.*



## F320 - UNF

## F330 - UNC

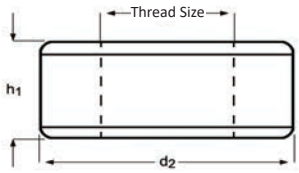
| UNC | UNF | TPI | $d_1$ nom mm | $d_2$ Ø Inch | $h_1$ Inch | Pack Qty | F320 EDP | F330 EDP |
|---|---|---|---|---|---|---|---|---|
| | 4 | 48 | 2.85 | 13/16 | 1/4 | 1 | — | 0207307 |
| 4 | | 40 | 2.85 | 13/16 | 1/4 | 1 | 0206614 | — |
| | 5 | 44 | 3.18 | 13/16 | 1/4 | 1 | — | 0207314 |
| 5 | | 40 | 3.18 | 13/16 | 1/4 | 1 | 0206621 | — |
| | 6 | 40 | 3.51 | 13/16 | 1/4 | 1 | — | 0207338 |
| 6 | | 32 | 3.51 | 13/16 | 1/4 | 1 | 0206645 | — |
| | 8 | 36 | 4.17 | 13/16 | 1/4 | 1 | — | 0207352 |
| 8 | | 32 | 4.17 | 1“ | 3/8 | 1 | 0206676 | — |
| 8 | | 32 | 4.17 | 13/16 | 1/4 | 1 | 0206669 | — |
| | 10 | 32 | 4.83 | 13/16 | 1/4 | 1 | — | 0207376 |
| | 10 | 32 | 4.83 | 1“ | 3/8 | 1 | — | 0207383 |
| 10 | | 24 | 4.83 | 1“ | 3/8 | 1 | 0206690 | — |
| 10 | | 24 | 4.83 | 13/16 | 1/4 | 1 | 0206683 | — |
| | 12 | 28 | 5.49 | 13/16 | 1/4 | 1 | — | 0207390 |
| 12 | | 24 | 5.49 | 13/16 | 1/4 | 1 | 0206706 | — |
| | 1/4 | 28 | 6.35 | 1“ | 3/8 | 1 | — | 0207420 |
| | 1/4 | 28 | 6.35 | 1.1/2 | 1/2 | 1 | — | 0207444 |
| | 1/4 | 28 | 6.35 | 13/16 | 1/4 | 1 | — | 0207413 |
| 1/4 | | 20 | 6.35 | 1“ | 3/8 | 1 | 0206737 | — |
| 1/4 | | 20 | 6.35 | 1.1/2 | 1/2 | 1 | 0206751 | — |
| 1/4 | | 20 | 6.35 | 1.5/16 | 7/16 | 1 | 0206744 | — |
| 1/4 | | 20 | 6.35 | 13/16 | 1/4 | 1 | 0206720 | — |
| | 5/16 | 24 | 7.94 | 1“ | 3/8 | 1 | — | 0207451 |
| | 5/16 | 24 | 7.94 | 1.1/2 | 1/2 | 1 | — | 0207475 |
| | 5/16 | 24 | 7.94 | 1.5/16 | 7/16 | 1 | — | 0207468 |
| 5/16 | | 18 | 7.94 | 1“ | 3/8 | 1 | 0206768 | — |
| 5/16 | | 18 | 7.94 | 1.1/2 | 1/2 | 1 | 0206782 | — |
| | 3/8 | 24 | 9.53 | 1“ | 3/8 | 1 | — | 0207482 |
| | 3/8 | 24 | 9.53 | 1.1/2 | 1/2 | 1 | — | 0207505 |
| | 3/8 | 24 | 9.53 | 1.5/16 | 7/16 | 1 | — | 0207499 |
| 3/8 | | 16 | 9.53 | 1“ | 3/8 | 1 | 0206799 | — |
| 3/8 | | 16 | 9.53 | 1.1/2 | 1/2 | 1 | 0206812 | — |
| 3/8 | | 16 | 9.53 | 1.5/16 | 7/16 | 1 | 0206805 | — |
| | 7/16 | 20 | 11.11 | 1“ | 3/8 | 1 | — | 0207512 |
| | 7/16 | 20 | 11.11 | 1.1/2 | 1/2 | 1 | — | 0207536 |
| | 7/16 | 20 | 11.11 | 1.5/16 | 7/16 | 1 | — | 0207529 |
| 7/16 | | 14 | 11.11 | 1.1/2 | 1/2 | 1 | 0206850 | — |
| 7/16 | | 14 | 11.11 | 1.5/16 | 7/16 | 1 | 0206843 | — |
| | 1/2 | 20 | 12.70 | 1.1/2 | 1/2 | 1 | — | 0207550 |
| | 1/2 | 20 | 12.70 | 1.5/16 | 7/16 | 1 | — | 0207543 |
| 1/2 | | 13 | 12.70 | 1.1/2 | 1/2 | 1 | 0206874 | — |
| 1/2 | | 13 | 12.70 | 1.5/16 | 7/16 | 1 | 0206867 | — |
| 1/2 | | 13 | 12.70 | 2“ | 5/8 | 1 | 0206881 | — |
| | 9/16 | 18 | 14.29 | 1.1/2 | 1/2 | 1 | — | 0207581 |
| | 9/16 | 18 | 14.29 | 1.5/16 | 7/16 | 1 | — | 0207574 |
| 9/16 | | 12 | 14.29 | 1.1/2 | 1/2 | 1 | 0206904 | — |
| | 5/8 | 18 | 15.88 | 1.1/2 | 1/2 | 1 | — | 0207604 |
| | 5/8 | 18 | 15.88 | 2“ | 5/8 | 1 | — | 0207611 |
| 5/8 | | 11 | 15.88 | 1.1/2 | 1/2 | 1 | 0206928 | — |
| 5/8 | | 11 | 15.88 | 2“ | 5/8 | 1 | 0206935 | — |
| | 3/4 | 16 | 19.05 | 1.1/2 | 1/2 | 1 | — | 0207635 |
| | 3/4 | 16 | 19.05 | 2“ | 5/8 | 1 | — | 0207642 |
| 3/4 | | 10 | 19.05 | 1.1/2 | 1/2 | 1 | 0206959 | — |
| 3/4 | | 10 | 19.05 | 2“ | 5/8 | 1 | 0206966 | — |
| | 7/8 | 14 | 22.23 | 2“ | 5/8 | 1 | — | 0207659 |
| 7/8 | | 9 | 22.23 | 2“ | 5/8 | 1 | 0206973 | — |
| | 1“ | 12 | 25.40 | 2“ | 5/8 | 1 | — | 0207666 |
| 1“ | | 8 | 25.40 | 2“ | 5/8 | 1 | 0206980 | — |
| | 1.1/8 | 12 | 28.58 | 3“ | 7/8 | 1 | — | 0207673 |
| 1.1/8 | | 7 | 28.58 | 3“ | 7/8 | 1 | 0206997 | — |
| | 1.1/4 | 12 | 31.75 | 3“ | 7/8 | 1 | — | 0207680 |
| 1.1/4 | | 7 | 31.75 | 3“ | 7/8 | 1 | 0207000 | — |
| | 1.1/2 | 12 | 38.10 | 3“ | 7/8 | 1 | — | 0207703 |

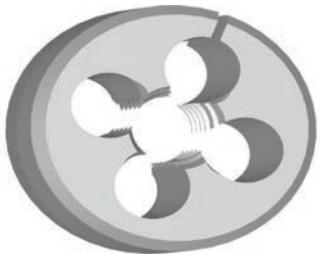
UNION BUTTERFIELD®

# HSS Round Adjustable, Split Type Die

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

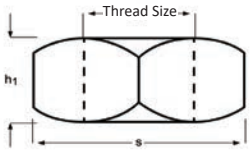
| M | P mm | $d_2$ Ø Inch | $h_1$ Inch | Pack Qty | 2710M |
|---|---|---|---|---|---|
| 2 | 0.40 | 13/16 | 1/4 | 1 | 1410573 |
| 2.5 | 0.45 | 13/16 | 1/4 | 1 | 1410575 |
| 3 | 0.50 | 13/16 | 1/4 | 1 | 1410577 |
| 4 | 0.70 | 13/16 | 1/4 | 1 | 1410579 |
| 4.5 | 0.75 | 13/16 | 1/4 | 1 | 1410580 |
| 5 | 0.80 | 13/16 | 1/4 | 1 | 1410581 |
| 6 | 1.00 | 1“ | 3/8 | 1 | 1410582 |
| 8 | 1.25 | 1“ | 3/8 | 1 | 1410584 |
| 9 | 1.25 | 1“ | 3/8 | 1 | 1410585 |
| 10.0 | 1.50 | 1“ | 3/8 | 1 | 1410586 |
| 12 | 1.75 | 1“ | 3/8 | 1 | 1410630 |
| 12 | 1.75 | 1.1/2 | 1/2 | 1 | 1410588 |
| 14 | 2.00 | 1.1/2 | 1/2 | 1 | 1410589 |
| 16 | 2.00 | 1.1/2 | 1/2 | 1 | 1410590 |
| 18 | 2.50 | 2“ | 5/8 | 1 | 1410591 |
| 20 | 2.50 | 2“ | 5/8 | 1 | 1410592 |

# CS Hexagon Rethreading Bolt Dies (Dienuts)

UNION BUTTERFIELD®

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. Made of CS tool material

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





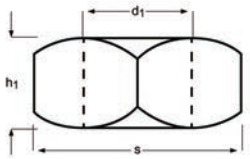

## 2025

| UNC | UNF | UNS | NPT | TPI | S Inch | $h_1$ Inch | Pack Qty | 2025(UNC) | 2025(UNF) | 2025(UNS) | 2025(NPT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1/8 | 27 | 1.1/16 | 3/8 | 1 | — | — | — | 1410270 |
| | 1/4 | | | 28 | 19/32 | 1/2 | 1 | — | 1410240 | — | — |
| 1/4 | | | | 20 | 19/32 | 1/2 | 1 | 1410239 | — | — | — |
| | | | 1/4 | 18 | 1.1/4 | 5/8 | 1 | — | — | — | 1410271 |
| | 5/16 | | | 24 | 11/16 | 5/16 | 1 | — | 1410242 | — | — |
| 5/16 | | | | 18 | 11/16 | 5/16 | 1 | 1410241 | — | — | — |
| | 3/8 | | | 24 | 25/32 | 3/8 | 1 | — | 1410244 | — | — |
| 3/8 | | | | 16 | 25/32 | 3/8 | 1 | 1410243 | — | — | — |
| | | | 3/8 | 18 | 1.7/16 | 5/8 | 1 | — | — | — | 1410272 |
| | 7/16 | | | 20 | 7/8 | 7/16 | 1 | — | 1410246 | — | — |
| 7/16 | | | | 14 | 7/8 | 7/16 | 1 | 1410245 | — | — | — |
| | 1/2 | | | 20 | 1.1/16 | 1/2 | 1 | — | 1410248 | — | — |
| 1/2 | | | | 13 | 1.1/16 | 1/2 | 1 | 1410247 | — | — | — |
| | | | 1/2 | 14 | 1.5/8 | 3/4 | 1 | — | — | — | 1410273 |
| | 9/16 | | | 18 | 1.1/16 | 1/2 | 1 | — | 1410250 | — | — |
| 9/16 | | | | 12 | 1.1/16 | 1/2 | 1 | 1410249 | — | — | — |
| | 5/8 | | | 18 | 1.1/4 | 5/8 | 1 | — | 1410252 | — | — |
| 5/8 | | | | 11 | 1.1/4 | 5/8 | 1 | 1410251 | — | — | — |
| | | 11/16 | | 11 | 1.7/16 | 3/4 | 1 | — | — | 1410253 | — |
| | | 11/16 | | 16 | 1.7/16 | 3/4 | 1 | — | — | 1410254 | — |
| | 3/4 | | | 16 | 1.7/16 | 3/4 | 1 | — | 1410256 | — | — |
| 3/4 | | | | 10 | 1.7/16 | 3/4 | 1 | 1410255 | — | — | — |
| | | | 3/4 | 14 | 2“ | 13/16 | 1 | — | — | — | 1410274 |
| | 7/8 | | | 14 | 1.5/8 | 7/8 | 1 | — | 1410258 | — | — |
| 7/8 | | | | 9 | 1.5/8 | 7/8 | 1 | 1410257 | — | — | — |
| | | 1“ | | 14 | 1.13/16 | 1“ | 1 | — | — | 1410261 | — |
| | 1“ | | | 12 | 1.13/16 | 1“ | 1 | — | 1410260 | — | — |
| 1“ | | | | 8 | 1.13/16 | 1“ | 1 | 1410259 | — | — | — |
| | | | 1“ | 11.5 | 2.3/8 | 1“ | 1 | — | — | — | 1410275 |
| | 1.1/8 | | | 12 | 2“ | 1“ | 1 | — | 1410263 | — | — |
| 1.1/8 | | | | 7 | 2“ | 1“ | 1 | 1410262 | — | — | — |
| | 1.1/4 | | | 12 | 2.3/16 | 1“ | 1 | — | 1410265 | — | — |
| 1.1/4 | | | | 7 | 2.3/16 | 1“ | 1 | 1410264 | — | — | — |
| | 1.3/8 | | | 12 | 2.3/8 | 1“ | 1 | — | 1410267 | — | — |
| 1.3/8 | | | | 6 | 2.3/8 | 1“ | 1 | 1410266 | — | — | — |
| | 1.1/2 | | | 12 | 2.9/16 | 1“ | 1 | — | 1410269 | — | — |
| 1.1/2 | | | | 6 | 2.9/16 | 1“ | 1 | 1410268 | — | — | — |

# HSS Hexagon Rethreading Bolt Dies (Dienuts)

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.*



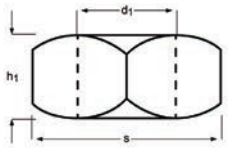



## F302

| M | P mm | S decimal Inch | $h_1$ Inch | Pack Qty | F302 |
|---|---|---|---|---|---|
| 3 | 0.50 | 0.7100 | 1/4 | 1 | 0105627 |
| 4 | 0.70 | 0.7100 | 1/4 | 1 | 0105672 |
| 5 | 0.80 | 0.7100 | 1/4 | 1 | 0105719 |
| 6 | 1.00 | 0.7100 | 1/4 | 1 | 0105733 |
| 7 | 1.00 | 0.8200 | 5/16 | 1 | 0105740 |
| 8 | 1.25 | 0.8200 | 5/16 | 1 | 0105757 |
| 10 | 1.50 | 0.9200 | 3/8 | 1 | 0105528 |
| 11 | 1.50 | 1.0100 | 7/16 | 1 | 0105535 |
| 12 | 1.75 | 1.1000 | 1/2 | 1 | 0105542 |
| 14 | 2.00 | 1.3000 | 5/8 | 1 | 0105559 |
| 16 | 2.00 | 1.3000 | 5/8 | 1 | 0105566 |
| 18 | 2.50 | 1.4800 | 11/16 | 1 | 0105573 |
| 20 | 2.50 | 1.4800 | 11/16 | 1 | 0105580 |
| 22 | 2.50 | 1.6700 | 13/16 | 1 | 0105597 |
| 24 | 3.00 | 2.0500 | 15/16 | 1 | 0105603 |
| 27 | 3.00 | 2.2200 | 1.1/16 | 1 | 0105610 |
| 30 | 3.50 | 2.2200 | 1.1/16 | 1 | 0105634 |
| 33 | 3.50 | 2.5800 | 1.1/8 | 1 | 0105641 |
| 36 | 4.00 | 2.7600 | 1.1/4 | 1 | 0105658 |

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 | P mm | S decimal Inch | $h_1$ Inch | Pack Qty | F312 |
|---|---|---|---|---|---|
| 8 | 0.75 | 0.8200 | 5/16 | 1 | 0206331 |
| 8 | 1.00 | 0.8200 | 5/16 | 1 | 0206348 |
| 10 | 1.00 | 0.9200 | 3/8 | 1 | 0206379 |
| 10 | 1.25 | 0.9200 | 3/8 | 1 | 0206386 |
| 12 | 1.00 | 1.0100 | 7/16 | 1 | 0206393 |
| 12 | 1.25 | 1.0100 | 7/16 | 1 | 0206409 |
| 12 | 1.50 | 1.0100 | 7/16 | 1 | 0206416 |
| 14 | 1.50 | 1.3000 | 5/8 | 1 | 0206430 |
| 16 | 1.50 | 1.3000 | 5/8 | 1 | 0206454 |
| 18 | 1.50 | 1.4800 | 11/16 | 1 | 0206461 |
| 20 | 1.50 | 1.4800 | 11/16 | 1 | 0206485 |
| 22 | 1.50 | 1.6700 | 13/16 | 1 | 0206508 |
| 24 | 1.50 | 2.0500 | 15/16 | 1 | 0206522 |
| 24 | 2.00 | 2.0500 | 15/16 | 1 | 0206539 |

# Miscellaneous

## Sleeves & Keys

**411** Taper shank (internal and external) adapters. Heat treated and externally ground. Steam oxide surface finish prevents corosion.



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



| 430 MTS # | 411 Inside Taper | 411 Outside Taper | Length | Pack Qty | 411 | 430 |
|---|---|---|---|---|---|---|
| 1 | | | 4.1/2 | 1 | — | 3210338 |
| 2 | | | 5.1/2 | 1 | — | 3210339 |
| 3 | | | 7 | 1 | — | 3210340 |
| 4 | | | 8 | 1 | — | 3210341 |
| 5 | | | 9.7/8 | 1 | — | 3210342 |
| | 1 | 2 | 3.1/2 | 1 | 3210046 | — |
| | 1 | 3 | 3.15/16 | 1 | 3210047 | — |
| | 1 | 4 | 4.13/16 | 1 | 3210048 | — |
| | 2 | 3 | 4.3/8 | 1 | 3210050 | — |
| | 2 | 4 | 4.13/16 | 1 | 3210051 | — |
| | 3 | 4 | 5.5/16 | 1 | 3210053 | — |
| | 3 | 5 | 6.1/16 | 1 | 3210054 | — |
| | 4 | 5 | 6.1/2 | 1 | 3210055 | — |
| | 5 | 6 | 8.1/2 | 1 | 3210057 | — |

## Screw Extractor

**1800** Screw Extractor

**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 | Capacity For Pipe Sizes | Pack Qty | 1800 | 1816set |
|---|---|---|---|---|---|---|---|---|---|---|
| 801 | 0.0540 | | 5/32 | | 2“ | 3/16 - 1/4 | | 12 | 3210001 | — |
| 802 | 0.0860 | | 3/16 | | 2.3/8 | 1/4 - 5/16 | | 12 | 3210002 | — |
| 803 | 1/8 | | 1/4 | | 2.3/4 | 5/16 - 7/16 | | 12 | 3210003 | — |
| 804 | 11/64 | | 5/16 | | 3“ | 7/16 - 9/16 | | 6 | 3210004 | — |
| 805 | 1/4 | | 7/16 | | 3.3/8 | 9/16 - 3/4 | 1/8 - 1/4 | 6 | 3210005 | — |
| 806 | 3/8 | | 5/8 | | 3.3/4 | 3/4 - 1“ | 3/8 | 1 | 3210006 | — |
| 807 | 31/64 | | 3/4 | | 4.1/8 | 1 - 1.3/8 | 1/2 | 1 | 3210007 | — |
| 808 | 47/64 | | 1“ | | 4.3/8 | 1.3/8 - 1.3/4 | 3/4 | 1 | 3210008 | — |
| 809 | 31/32 | | 1.1/4 | | 4.5/8 | 1.3/4 - 2.1/8 | 1 | 1 | 3210009 | — |
| 810 | 1.7/32 | | 1.17/32 | | 5“ | 2.1/8 - 2.1/2 | 1.1/4 | 1 | 3210010 | — |
| 811 | 1.15/32 | | 1.27/32 | | 5.5/8 | 2.1/2 - 3 | 1.1/2 | 1 | 3210011 | — |
| 812 | 1.27/32 | | 2.9/32 | | 6.1/4 | 3 - 3.1/2 | 2 | 1 | 3210012 | — |
| 1816 | | 801 - 806 | | 6 | | 3/16 - 1 | 1/8 - 3/8 | 1 | — | 3210014 |

## Drilling & Tapping Fluid

**1900**

**Drilling & Tapping Fluid -** A heavy oil for drilling & tapping all ferrous and non-ferrous materials. Increases productivity and extends tool life. Environmentally safe.

**Wax Stick -** Multi-purpose wax that sticks to the tool and effectively removes heat while adding lubrication. Withstands trememdous pressure. Can be used in lieu of drilling/tapping fluids and cutting oils.

**Foam -** Heavy duty aerosol foam coats the tools as it foams on contact. Will not contaminate existing coolant.

**Light Tapping Fluid -** A light viscosity heavy duty drilling & tapping fluid for reducing torque. Ideal for use with a re-circulation system. Can be added to existing cutting oils to increase lubricity. Will not contaminate existing coolant as it will float to the surface for easy skimming.




| Sizes | Style | Description | Pack Qty | 1900 |
|---|---|---|---|---|
| 1/2 oz | Trial Size | Drilling & Tapping Fluid | 1 | 1910512 |
| 4 oz | Squirt Bottle | Drilling & Tapping Fluid | 24 | 1910501 |
| 16 oz | Squirt Bottle | Drilling & Tapping Fluid | 12 | 1930502 |
| 1 gal | Bottle | Drilling & Tapping Fluid | 4 | 1930503 |
| 5 gal | Dispenser | Drilling & Tapping Fluid | 1 | 1910506 |
| 5 gal | Pail | Drilling & Tapping Fluid | 1 | 1910504 |
| 55 gal | Drum | Drilling & Tapping Fluid | 1 | 1910505 |
| 1 lb | Stick | Wax | 24 | 1950501 |
| 20 oz | Aerosal Can | Foam | 12 | 1910509 |
| 1 gal | Bottle | Light Drilling & Tapping Fluid | 4 | 1910503 |
| 16 oz | Squirt Bottle | Light Drilling & Tapping Fluid | 12 | 1910502 |
| 16 oz | Squirt Bottle | Light Tapping Fluid (single) | 1 | 46437347 |
| 16 oz | Squirt Bottle | Drilling & Tapping Fluid (single) | 1 | 46437348 |
| 20 oz | Aerosal Can | Foam (single) | 1 | 46437349 |
| 1 lb | Stick | Wax (single) | 1 | 46437430 |

# Miscellaneous

## Tap Wrench, T-Handle

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

| Tap Wrench # | Hand Reamer Capacity Inch | Hand Reamer Capacity mm | Hand Tap Capacity Inch | Hand Tap Capacity mm | Pack Qty | EDP# |
|---|---|---|---|---|---|---|
| T0 | 1/8 - 3/16 | M3 - M5 | 1/16 - 5/32 | M1 - M4 | 1 | 1810372 |
| T1 | 3/16 - 5/16 | M4 - M7 | 3/16 - 7/16 | M4 - M10 | 1 | 1810373 |
| T2 | 1/4 - 15/32 | M6 - M14 | 1/4 - 9/16 | M6 - M14 | 1 | 1810374 |

## Tap Wrench, Straight Handle

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

| Number | Hand Reamer Capacity Inch | Hand Reamer Capacity mm | Hand Tap Capacity Inch | Hand Tap Capacity mm | Over-All-Length | Pack Qty | EDP# |
|---|---|---|---|---|---|---|---|
| 8 | 1/8 - 5/16 | M3 - M8 | 1/16 - 5/16 | M1 - M8 | 7“ | 1 | 1810017 |
| 9 | 3/16 - 3/8 | M5 - M9 | 3/16 - 1/2 | M4 - M12 | 10.1/2“ | 1 | 1810018 |
| 10 | 1/4 - 9/16 | M6 - M14 | 1/4 - 3/4 | M3 - M8 | 15“ | 1 | 1810019 |
| 11 | 3/8 - 3/4 | M9 - M19 | 3/8 - 1“ | M10 - M25 | 20“ | 1 | 1810020 |
| 12 | 3/8 - 7/8 | M9 - M22 | 3/8 - 1.1/8 | M10 - M27 | 25.5/8“ | 1 | 1810021 |
| 14 | 5/8 - 1.1/2 | M16 - M39 | 7/8 - 1.7/8 | M22 - M42 | 40.1/2“ | 1 | 1810022 |

## Die Stocks, Straight Handle

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

| Nr. | Die Size Ø x H | Pack Qty | EDP# |
|---|---|---|---|
| 1“ | 16 x 5 | 1 | 0111604 |
| 2a | 20 x 5 | 1 | 0111611 |
| 2b | 20 x 7 | 1 | 0111628 |
| 3 | 25 x 9 | 1 | 0111635 |
| 4“ | 30 x 11 | 1 | 0111642 |
| 5 | 38 x 14 | 1 | 0111666 |
| 5f | 38 x 10 | 1 | 0111659 |
| 6 | 45 x 18 | 1 | 0111680 |
| 6f | 45 x 14 | 1 | 0111673 |
| 7 | 55 x 22 | 1 | 0111703 |
| 7f | 55 x 16 | 1 | 0111697 |
| 8 | 65 x 25 | 1 | 0111727 |
| 8f | 65 x 18 | 1 | 0111710 |
| 9 | 75 x 30 | 1 | 0111741 |
| 9f | 75 x 20 | 1 | 0111734 |
| 10 | 90 x 36 | 1 | 0111765 |
| 10f | 90 x 22 | 1 | 0111758 |
| | 13/16 x 1/4 | 1 | 0218013 |
| | 1 x 3/8 | 1 | 0218020 |
| | 1.5/16 x 7/16 | 1 | 0218037 |
| | 1.1/2 x 1/2 | 1 | 0218044 |
| | 2 x 5/8 | 1 | 0218051 |
| | 2.1/4 x 11/16 | 1 | 0218068 |
| | 3 x 7/8 | 1 | 0218075 |
| | 4 x 1 | 1 | 0218082 |

# HSS Reamers

## Hand Reamer, Square Drive

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



| Diameter Inch | Diameter Decimal Inch | Flute Length Inch | Over-All-Length Inch | # of Flutes | Pack Qty | 4500 |
|---|---|---|---|---|---|---|
| 1/8 | 0.1250 | 1.1/2 | 3“ | 4 | 1 | 5010928 |
| 3/16 | 0.1875 | 1.3/4 | 3.1/2 | 6 | 1 | 5010930 |
| 1/4 | 0.2500 | 2“ | 4“ | 6 | 1 | 5010932 |
| 5/16 | 0.3125 | 2.1/4 | 4.1/2 | 6 | 1 | 5010934 |
| 3/8 | 0.3750 | 2.1/2 | 5“ | 6 | 1 | 5010936 |
| 7/16 | 0.4375 | 2.3/4 | 5.1/2 | 6 | 1 | 5010938 |
| 1/2 | 0.5000 | 3“ | 6“ | 6 | 1 | 5010940 |
| 9/16 | 0.5625 | 3.1/4 | 6.1/2 | 8 | 1 | 5010942 |
| 5/8 | 0.6250 | 3.1/2 | 7“ | 8 | 1 | 5010944 |
| 3/4 | 0.7500 | 4.3/16 | 8.3/8 | 8 | 1 | 5010948 |
| 7/8 | 0.8750 | 4.7/8 | 9.3/4 | 8 | 1 | 5010950 |
| 1“ | 1.0000 | 5.7/16 | 10.7/8 | 8 | 1 | 5010952 |

## Hand Reamer, Taper Pin Type, Square Drive

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



| Nominal Diameter | Diameter Small End Inch | Diameter Large End Inch | Shank Diameter Inch | Flute Length Inch | Over-All-Length Inch | # of Flutes | Pack Qty | 4587 |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.1287 | 0.1638 | 11/64 | 1.11/16 | 2.15/16 | 6 | 1 | 5011129 |
| 1 | 0.1447 | 0.1798 | 3/16 | 1.11/16 | 2.15/16 | 6 | 1 | 5011130 |
| 2 | 0.1600 | 0.2010 | 13/64 | 1.15/16 | 3.3/16 | 6 | 1 | 5011131 |
| 3 | 0.1813 | 0.2294 | 15/64 | 2.5/16 | 3.11/16 | 6 | 1 | 5011132 |
| 4 | 0.2071 | 0.2600 | 17/64 | 2.9/16 | 4.1/16 | 6 | 1 | 5011133 |
| 5 | 0.2410 | 0.2994 | 5/16 | 2.13/16 | 4.5/16 | 6 | 1 | 5011134 |
| 6 | 0.2773 | 0.3540 | 23/64 | 3.11/16 | 5.7/16 | 6 | 1 | 5011135 |
| 7 | 0.3297 | 0.4220 | 13/32 | 4.7/16 | 6.5/16 | 6 | 1 | 5011136 |
| 8 | 0.3971 | 0.5050 | 7/16 | 5.3/16 | 7.3/16 | 6 | 1 | 5011137 |
| 9 | 0.4800 | 0.6066 | 9/16 | 6.1/16 | 8.5/16 | 8 | 1 | 5011138 |
| 10 | 0.5799 | 0.7216 | 5/8 | 6.13/16 | 9.5/16 | 8 | 1 | 5011139 |

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

## Hand Reamer, Taper Pin, Square Drive

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

| nom Ø | $d_1$ Ø Inch | $d_2$ Ø Inch | $d_3$ Ø Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4591 |
|---|---|---|---|---|---|---|---|---|
| 0 | 0.1287 | 0.1638 | 11/64 | 1.11/16 | 2.15/16 | 6 | 1 | 5011146 |
| 1 | 0.1447 | 0.1798 | 3/16 | 1.11/16 | 2.15/16 | 6 | 1 | 5011147 |
| 2 | 0.1600 | 0.2010 | 13/64 | 1.15/16 | 3.3/16 | 6 | 1 | 5011148 |
| 3 | 0.1813 | 0.2294 | 15/64 | 2.5/16 | 3.11/16 | 6 | 1 | 5011149 |
| 4 | 0.2071 | 0.2600 | 17/64 | 2.9/16 | 4.1/16 | 6 | 1 | 5011150 |
| 5 | 0.2410 | 0.2994 | 5/16 | 2.13/16 | 4.5/16 | 6 | 1 | 5011151 |
| 6 | 0.2773 | 0.3540 | 23/64 | 3.11/16 | 5.7/16 | 6 | 1 | 5011152 |
| 7 | 0.3297 | 0.4220 | 13/32 | 4.7/16 | 6.5/16 | 6 | 1 | 5011153 |
| 8 | 0.3971 | 0.5050 | 7/16 | 5.3/16 | 7.3/16 | 6 | 1 | 5011154 |
| 9 | 0.4800 | 0.6066 | 9/16 | 6.1/16 | 8.5/16 | 8 | 1 | 5011155 |
| 10 | 0.5799 | 0.7216 | 5/8 | 6.13/16 | 9.5/16 | 8 | 1 | 5011156 |

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

## Hand Reamer, Taper Pin Type, Square Drive

DORMER

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

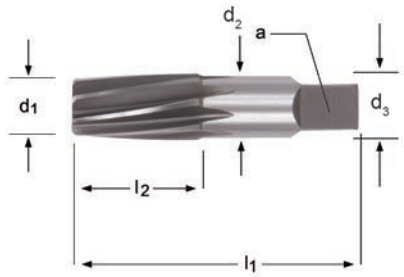
| nom Ø | $d_1$ Ø mm | $l_1$ mm | $l_2$ mm | # of Flutes | ☐ a mm | $d_2$ Ø mm | Pack Qty | B301 |
|---|---|---|---|---|---|---|---|---|
| 1/16 | 1.10 | 51 | 25 | 4 | 1.2 | 1.63 | 1 | 0182277 [1] |
| 5/64 | 1.50 | 51 | 25 | 4 | 1.6 | 2.03 | 1 | 0182284 [1] |
| 3/32 | 1.75 | 57 | 32 | 4 | 2.0 | 2.41 | 1 | 0182291 [1] |
| 7/64 | 2.03 | 64 | 38 | 4 | 2.2 | 2.82 | 1 | 0182307 [1] |
| 1/8 | 2.30 | 70 | 44 | 4 | 2.5 | 3.23 | 1 | 0182314 [1] |
| 9/64 | 2.64 | 73 | 48 | 4 | 2.8 | 3.63 | 1 | 0182321 [1] |
| 5/32 | 2.95 | 76 | 51 | 4 | 3.1 | 4.01 | 1 | 0182338 [1] |
| 11/64 | 3.23 | 89 | 57 | 4 | 3.6 | 4.42 | 1 | 0182345 [1] |
| 3/16 | 3.50 | 102 | 70 | 4 | 4.0 | 4.95 | 1 | 0182352 [1] |
| 7/32 | 4.13 | 102 | 70 | 6 | 4.5 | 5.59 | 1 | 0182369 [1] |
| 1/4 | 4.64 | 117 | 86 | 6 | 5.0 | 6.43 | 1 | 0182376 [2] |
| 9/32 | 5.23 | 143 | 105 | 6 | 5.6 | 7.42 | 1 | 0182383 [2] |
| 5/16 | 5.84 | 143 | 105 | 6 | 6.3 | 8.03 | 1 | 0182390 [2] |
| 11/32 | 6.43 | 152 | 114 | 6 | 7.1 | 8.81 | 1 | 0182406 [2] |
| 3/8 | 7.03 | 165 | 127 | 6 | 8.0 | 9.68 | 1 | 0182413 [2] |
| 13/32 | 7.42 | 191 | 146 | 6 | 8.0 | 10.46 | 1 | 0182420 [2] |
| 7/16 | 8.21 | 191 | 146 | 6 | 9.0 | 11.25 | 1 | 0182437 [2] |
| 1/2 | 9.41 | 210 | 165 | 6 | 10.0 | 12.85 | 1 | 0182444 [2] |

# HSS Reamers

UNION BUTTERFIELD®

## Hand Reamer, Taper Pipe Type, Square Drive

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

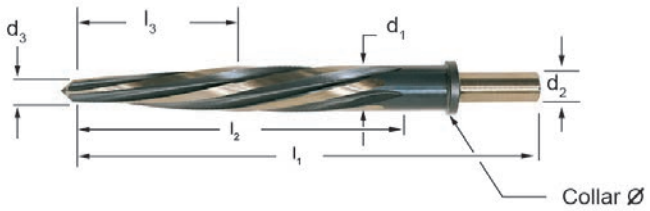
| nom Ø | $d_1$ Ø Inch | $d_2$ Ø Inch | $d_3$ Ø Inch | $l_2$ Inch | $l_1$ Inch | ▨ a mm | # of Flutes | Pack Qty | 4600 |
|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 0.3160 | 0.3620 | 0.4375 | 3/4 | 2.1/8 | 0.3280 | 6 | 1 | 1810007 |
| 1/4 | 0.4060 | 0.4720 | 0.5625 | 1.1/16 | 2.7/16 | 0.4210 | 6 | 1 | 1810008 |
| 3/8 | 0.5400 | 0.6060 | 0.7000 | 1.1/16 | 2.9/16 | 0.5310 | 8 | 1 | 1810009 |
| 1/2 | 0.6650 | 0.7510 | 0.6875 | 1.3/8 | 3.1/8 | 0.5150 | 8 | 1 | 1810010 |
| 3/4 | 0.8760 | 0.9620 | 0.9063 | 1.3/8 | 3.1/4 | 0.6790 | 10 | 1 | 1810011 |
| 1“ | 1.1030 | 1.2120 | 1.1250 | 1.3/4 | 3.3/4 | 0.8430 | 10 | 1 | 1810012 |

Note: Nom Ø (column 1) is the NPT pipe thread size.
This is not the tool diameter.

DORMER

## Car Reamer (Alignment Reamer), Reduced Shank

Left Hand Helical Flute, Right Hand Cut. 1/2” Reduced Shank with Tri-Flats. Combination Bronze and Steam Oxide in flutes reduces wear and chip welding in harder ferrous materials. Used to align or enlarge holes.




### B122

| $d_1$ 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 | 0426296 |
| 1/2 | 0.5000 | 5.5/16 | 3.3/4 | 2.5/8 | 5 | 1/2 | 1/4 | 1 | 0252376 |
| 9/16 | 0.5625 | 6.9/16 | 4.5/16 | 3.3/16 | 5 | 1/2 | 5/16 | 1 | 0252437 |
| 5/8 | 0.6250 | 6.9/16 | 4.5/16 | 3.3/16 | 5 | 1/2 | 3/8 | 1 | 0252413 |
| 11/16 | 0.6875 | 7 | 4.13/16 | 3.9/16 | 5 | 1/2 | 7/16 | 1 | 0252369 |
| 3/4 | 0.7500 | 7 | 4.13/16 | 3.9/16 | 5 | 1/2 | 1/2 | 1 | 0252406 |
| 13/16 | 0.8125 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 9/16 | 1 | 0252383 |
| 7/8 | 0.8750 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 5/8 | 1 | 0252420 |
| 15/16 | 0.9375 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 11/16 | 1 | 0252390 |
| 1“ | 1.0000 | 7.1/4 | 5.1/8 | 3.7/8 | 5 | 1/2 | 3/4 | 1 | 0252345 |
| 1.1/16 | 1.0625 | 7.1/4 | 5.1/4 | 3.7/8 | 5 | 1/2 | 13/16 | 1 | 0252352 |

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

## Chucking Reamer, Straight Shank

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

| $d_1$ Ø "/Nr./letter | $d_1$ decimal Inch | $d_2$ decimal Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4533 |
|---|---|---|---|---|---|---|---|
| N60 | 0.0400 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 5010173 |
| N59 | 0.0410 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 5010175 |
| N58 | 0.0420 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 5010177 |
| N57 | 0.0430 | 0.0390 | 1/2 | 2.1/2 | 4 | 1 | 5010179 |
| N56 | 0.0465 | 0.0455 | 1/2 | 2.1/2 | 4 | 1 | 5010186 |
| 3/64 | 0.0469 | 0.0455 | 1/2 | 2.1/2 | 4 | 1 | 5010187 |
| N55 | 0.0520 | 0.0510 | 1/2 | 2.1/2 | 4 | 1 | 5010198 |
| N54 | 0.0550 | 0.0510 | 1/2 | 2.1/2 | 4 | 1 | 5010204 |
| N53 | 0.0595 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 5010213 |
| 1/16 | 0.0625 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 5010219 |
| N52 | 0.0635 | 0.0585 | 1/2 | 2.1/2 | 4 | 1 | 5010221 |
| N51 | 0.0670 | 0.0660 | 3/4 | 3“ | 4 | 1 | 5010228 |
| N50 | 0.0700 | 0.0660 | 3/4 | 3“ | 4 | 1 | 5010234 |
| N49 | 0.0730 | 0.0660 | 3/4 | 3“ | 4 | 1 | 5010240 |
| N48 | 0.0760 | 0.0720 | 3/4 | 3“ | 4 | 1 | 5010246 |
| 5/64 | 0.0781 | 0.0720 | 3/4 | 3“ | 4 | 1 | 5010251 |
| N47 | 0.0785 | 0.0720 | 3/4 | 3“ | 4 | 1 | 5010252 |
| N46 | 0.0810 | 0.0771 | 3/4 | 3“ | 4 | 1 | 5010257 |
| N45 | 0.0820 | 0.0771 | 3/4 | 3“ | 4 | 1 | 5010259 |
| N44 | 0.0860 | 0.0810 | 3/4 | 3“ | 4 | 1 | 5010267 |
| N43 | 0.0890 | 0.0810 | 3/4 | 3“ | 4 | 1 | 5010273 |
| N42 | 0.0935 | 0.0880 | 3/4 | 3“ | 4 | 1 | 5010282 |
| 3/32 | 0.0938 | 0.0880 | 3/4 | 3“ | 4 | 1 | 5010283 |
| N41 | 0.0960 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 5010288 |
| N40 | 0.0980 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 5010292 |
| N39 | 0.0995 | 0.0928 | 7/8 | 3.1/2 | 4 | 1 | 5010295 |
| N38 | 0.1015 | 0.0950 | 7/8 | 3.1/2 | 4 | 1 | 5010299 |
| N37 | 0.1040 | 0.0950 | 7/8 | 3.1/2 | 4 | 1 | 5010304 |
| N36 | 0.1065 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 5010309 |
| 7/64 | 0.1094 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 5010316 |
| N35 | 0.1100 | 0.1030 | 7/8 | 3.1/2 | 4 | 1 | 5010318 |
| N34 | 0.1110 | 0.1055 | 7/8 | 3.1/2 | 4 | 1 | 5010320 |
| N33 | 0.1130 | 0.1055 | 7/8 | 3.1/2 | 4 | 1 | 5010324 |
| N32 | 0.1160 | 0.1120 | 7/8 | 3.1/2 | 4 | 1 | 5010330 |
| N31 | 0.1200 | 0.1120 | 7/8 | 3.1/2 | 4 | 1 | 5010338 |
| | 0.1230 | 0.1120 | 7/8 | 3.1/2 | 4 | 1 | 5010344 |
| | 0.1240 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 5010346 |
| | 0.1247 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 5010349 |
| 1/8 | 0.1250 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 5010350 |
| | 0.1260 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 5010354 |
| N30 | 0.1285 | 0.1190 | 7/8 | 3.1/2 | 4 | 1 | 5010359 |
| N29 | 0.1360 | 0.1275 | 1“ | 4“ | 4 | 1 | 5010374 |
| N28 | 0.1405 | 0.1350 | 1“ | 4“ | 4 | 1 | 5010383 |
| 9/64 | 0.1410 | 0.1350 | 1“ | 4“ | 4 | 1 | 5010384 |
| N27 | 0.1440 | 0.1350 | 1“ | 4“ | 4 | 1 | 5010391 |
| N26 | 0.1470 | 0.1430 | 1“ | 4“ | 4 | 1 | 5010397 |
| N25 | 0.1495 | 0.1430 | 1“ | 4“ | 4 | 1 | 5010402 |
| N24 | 0.1520 | 0.1460 | 1“ | 4“ | 4 | 1 | 5010407 |
| N23 | 0.1540 | 0.1460 | 1“ | 4“ | 4 | 1 | 5010411 |
| 5/32 | 0.1562 | 0.1510 | 1“ | 4“ | 6 | 1 | 5010416 |
| N22 | 0.1570 | 0.1510 | 1“ | 4“ | 6 | 1 | 5010418 |
| N21 | 0.1590 | 0.1530 | 1.1/8 | 4.1/2 | 6 | 1 | 5010422 |
| N20 | 0.1610 | 0.1530 | 1.1/8 | 4.1/2 | 6 | 1 | 5010426 |
| N19 | 0.1660 | 0.1595 | 1.1/8 | 4.1/2 | 6 | 1 | 5010436 |
| N18 | 0.1695 | 0.1595 | 1.1/8 | 4.1/2 | 6 | 1 | 5010443 |
| 11/64 | 0.1719 | 0.1645 | 1.1/8 | 4.1/2 | 6 | 1 | 5010448 |
| N17 | 0.1730 | 0.1645 | 1.1/8 | 4.1/2 | 6 | 1 | 5010451 |
| N16 | 0.1770 | 0.1700 | 1.1/8 | 4.1/2 | 6 | 1 | 5010459 |
| N15 | 0.1800 | 0.1755 | 1.1/8 | 4.1/2 | 6 | 1 | 5010465 |
| N14 | 0.1820 | 0.1755 | 1.1/8 | 4.1/2 | 6 | 1 | 5010469 |
| N13 | 0.1850 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010475 |
| | 0.1855 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010476 |

# HSS Reamers

UNION BUTTERFIELD®

| $d_1$ Ø "/Nr./letter | $d_1$ decimal Inch | $d_2$ decimal Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4533 |
|---|---|---|---|---|---|---|---|
| | 0.1865 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010478 |
| | 0.1870 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010479 |
| 3/16 | 0.1875 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010480 |
| | 0.1885 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010482 |
| N12 | 0.1890 | 0.1800 | 1.1/8 | 4.1/2 | 6 | 1 | 5010483 |
| N11 | 0.1910 | 0.1860 | 1.1/4 | 5“ | 6 | 1 | 5010487 |
| N10 | 0.1935 | 0.1860 | 1.1/4 | 5“ | 6 | 1 | 5010492 |
| N9 | 0.1960 | 0.1895 | 1.1/4 | 5“ | 6 | 1 | 5010498 |
| N8 | 0.1990 | 0.1895 | 1.1/4 | 5“ | 6 | 1 | 5010504 |
| N7 | 0.2010 | 0.1945 | 1.1/4 | 5“ | 6 | 1 | 5010508 |
| 13/64 | 0.2031 | 0.1945 | 1.1/4 | 5“ | 6 | 1 | 5010513 |
| N6 | 0.2040 | 0.1945 | 1.1/4 | 5“ | 6 | 1 | 5010515 |
| N5 | 0.2055 | 0.2016 | 1.1/4 | 5“ | 6 | 1 | 5010518 |
| N4 | 0.2090 | 0.2016 | 1.1/4 | 5“ | 6 | 1 | 5010525 |
| N3 | 0.2130 | 0.2075 | 1.1/4 | 5“ | 6 | 1 | 5010533 |
| 7/32 | 0.2188 | 0.2075 | 1.1/4 | 5“ | 6 | 1 | 5010545 |
| N2 | 0.2210 | 0.2173 | 1.1/2 | 6“ | 6 | 1 | 5010550 |
| N1 | 0.2280 | 0.2173 | 1.1/2 | 6“ | 6 | 1 | 5010564 |
| A | 0.2340 | 0.2265 | 1.1/2 | 6“ | 6 | 1 | 5010576 |
| 15/64 | 0.2344 | 0.2265 | 1.1/2 | 6“ | 6 | 1 | 5010577 |
| B | 0.2380 | 0.2329 | 1.1/2 | 6“ | 6 | 1 | 5010585 |
| C | 0.2420 | 0.2329 | 1.1/2 | 6“ | 6 | 1 | 5010593 |
| D | 0.2460 | 0.2329 | 1.1/2 | 6“ | 6 | 1 | 5010602 |
| | 0.2480 | 0.2329 | 1.1/2 | 6“ | 6 | 1 | 5010606 |
| | 0.2490 | 0.2400 | 1.1/2 | 6“ | 6 | 1 | 5010608 |
| | 0.2495 | 0.2400 | 1.1/2 | 6“ | 6 | 1 | 5010609 |
| 1/4 | 0.2500 | 0.2400 | 1.1/2 | 6“ | 6 | 1 | 5010610 |
| E | 0.2500 | 0.2400 | 1.1/2 | 6“ | 6 | 1 | 5011202 |
| | 0.2510 | 0.2400 | 1.1/2 | 6“ | 6 | 1 | 5010612 |
| F | 0.2570 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010619 |
| G | 0.2610 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010622 |
| 17/64 | 0.2656 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010623 |
| H | 0.2660 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010624 |
| I | 0.2720 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010626 |
| J | 0.2770 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010627 |
| K | 0.2810 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010628 |
| 9/32 | 0.2812 | 0.2485 | 1.1/2 | 6“ | 6 | 1 | 5010629 |
| L | 0.2900 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010630 |
| M | 0.2950 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010631 |
| 19/64 | 0.2969 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010632 |
| N | 0.3020 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010633 |
| | 0.3105 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010636 |
| | 0.3115 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010638 |
| | 0.3120 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010639 |
| 5/16 | 0.3125 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010640 |
| | 0.3135 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010642 |
| O | 0.3160 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010645 |
| P | 0.3230 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010647 |
| 21/64 | 0.3281 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010648 |
| Q | 0.3320 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010649 |
| R | 0.3390 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010650 |
| 11/32 | 0.3438 | 0.2792 | 1.1/2 | 6“ | 6 | 1 | 5010651 |
| S | 0.3480 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010652 |
| T | 0.3580 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010653 |
| 23/64 | 0.3594 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010654 |
| U | 0.3680 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010655 |
| | 0.3730 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010658 |
| | 0.3740 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010659 |
| | 0.3745 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010660 |
| 3/8 | 0.3750 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010661 |
| | 0.3760 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010662 |
| V | 0.3770 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010663 |
| W | 0.3860 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010665 |
| 25/64 | 0.3906 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010666 |
| X | 0.3970 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010667 |
| Y | 0.4040 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010668 |
| 13/32 | 0.4062 | 0.3100 | 1.3/4 | 7“ | 6 | 1 | 5010670 |
| Z | 0.4130 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010671 |
| 27/64 | 0.4219 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010672 |
| | 0.4355 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010673 |
| | 0.4365 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010674 |
| | 0.4370 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010675 |
| 7/16 | 0.4375 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010676 |
| | 0.4385 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010677 |
| 29/64 | 0.4531 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010678 |
| 15/32 | 0.4688 | 0.3730 | 1.3/4 | 7“ | 6 | 1 | 5010679 |
| 31/64 | 0.4844 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010680 |
| | 0.4980 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010681 |
| | 0.4990 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010682 |
| | 0.4995 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010683 |
| 1/2 | 0.5000 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010684 |
| | 0.5010 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010685 |
| 33/64 | 0.5156 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010690 |
| 17/32 | 0.5312 | 0.4355 | 2“ | 8“ | 6 | 1 | 5010691 |

| $d_1$ Ø "/Nr./letter | $d_1$ decimal Inch | $d_2$ decimal Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4533 |
|---|---|---|---|---|---|---|---|
| 35/64 | 0.5469 | 0.4355 | 2“ | 8“ | 8 | 1 | 5010692 |
| 9/16 | 0.5625 | 0.4355 | 2“ | 8“ | 8 | 1 | 5010693 |
| 37/64 | 0.5781 | 0.4355 | 2“ | 8“ | 8 | 1 | 5010694 |
| 19/32 | 0.5938 | 0.4355 | 2“ | 8“ | 8 | 1 | 5010695 |
| 39/64 | 0.6094 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010696 |
| 5/8 | 0.6250 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010698 |
| 41/64 | 0.6406 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010700 |
| 21/32 | 0.6562 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010701 |
| 43/64 | 0.6719 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010702 |
| 11/16 | 0.6875 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010703 |
| 45/64 | 0.7031 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010704 |
| 23/32 | 0.7188 | 0.5620 | 2.1/4 | 9“ | 8 | 1 | 5010705 |
| 47/64 | 0.7344 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010706 |
| 3/4 | 0.7500 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010708 |
| 49/64 | 0.7656 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010710 |
| 25/32 | 0.7812 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010711 |
| 51/64 | 0.7969 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010712 |
| 13/16 | 0.8125 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010713 |
| 53/64 | 0.8281 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010714 |
| 27/32 | 0.8438 | 0.6245 | 2.1/2 | 9.1/2 | 8 | 1 | 5010715 |
| 55/64 | 0.8594 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010716 |
| 7/8 | 0.8750 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010717 |
| 57/64 | 0.8906 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010718 |
| 29/32 | 0.9062 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010719 |
| 59/64 | 0.9219 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010720 |
| 15/16 | 0.9375 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010721 |
| 61/64 | 0.9531 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010722 |
| 31/32 | 0.9688 | 0.7495 | 2.5/8 | 10“ | 8 | 1 | 5010723 |
| 63/64 | 0.9844 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 5010724 |
| 1“ | 1.0000 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 5010725 |
| 1.1/16 | 1.0625 | 0.8745 | 2.3/4 | 10.1/2 | 8 | 1 | 5010726 |
| 1.1/8 | 1.1250 | 0.8745 | 2.7/8 | 11“ | 8 | 1 | 5010727 |
| 1.3/16 | 1.1875 | 0.9995 | 2.7/8 | 11“ | 8 | 1 | 5010728 |
| 1.1/4 | 1.2500 | 0.9995 | 3“ | 11.1/2 | 8 | 1 | 5010729 |
| 1.3/8 | 1.3750 | 0.9995 | 3.1/4 | 12“ | 8 | 1 | 5010731 |
| 1.1/2 | 1.5000 | 1.2495 | 3.1/2 | 12.1/2 | 8 | 1 | 5010733 |

## Bridge Reamer, Taper Shank

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.



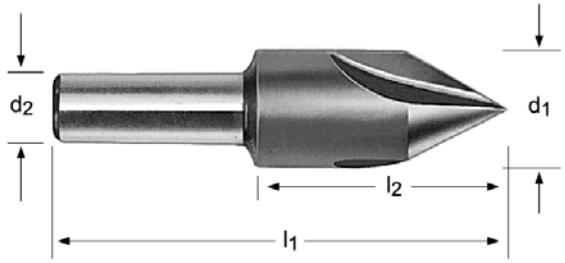

## 4579

| nom Ø | $d_1$ Ø (min) | $d_2$ Ø (max) | MTS | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4579 |
|---|---|---|---|---|---|---|---|---|
| 7/16 | 1/4 | 7/16 | 2 | 4.3/8 | 8.1/4 | 4 | 1 | 5011055 |
| 1/2 | 9/32 | 1/2 | 2 | 5.1/8 | 9“ | 4 | 1 | 5011056 |
| 9/16 | 11/32 | 9/16 | 2 | 5.1/8 | 9“ | 4 | 1 | 5011057 |
| 5/8 | 3/8 | 5/8 | 2 | 6.1/8 | 10“ | 4 | 1 | 5011058 |
| 11/16 | 25/64 | 11/16 | 3 | 7.1/8 | 11.3/4 | 4 | 1 | 5011059 |
| 3/4 | 7/16 | 3/4 | 3 | 7.3/8 | 12“ | 4 | 1 | 5011060 |
| 13/16 | 1/2 | 13/16 | 3 | 7.3/8 | 12“ | 4 | 1 | 5011061 |
| 7/8 | 9/16 | 7/8 | 3 | 7.3/8 | 12“ | 4 | 1 | 5011062 |
| 15/16 | 5/8 | 15/16 | 3 | 7.3/8 | 12“ | 4 | 1 | 5011063 |
| 1“ | 11/16 | 1“ | 3 | 7.3/8 | 12“ | 4 | 1 | 5011064 |
| 1.1/16 | 3/4 | 1.1/16 | 3 | 7.3/8 | 12“ | 4 | 1 | 5011065 |

# HSS Reamers

## Straight Shank, 3-Flute

Center Reamer for Countersinks, available in 60°, 82°, 90°, or 100° angles. Widely used to finish countersink angles for screw heads, rivet heads, and lathe centers. The odd number of flutes reduces vibrations while providing better accuracy than single-flute countersinks.



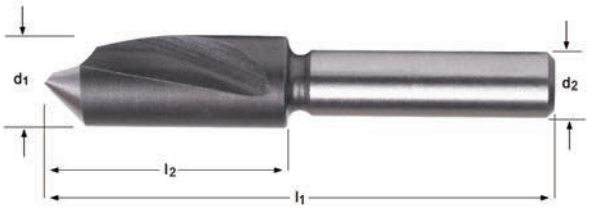

## 4608

| $d_1$ Ø Inch | Angle | $d_2$ Ø Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4608 |
|---|---|---|---|---|---|---|---|
| 1/4 | 60º | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 5011093 |
| 1/4 | 82º | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 5011098 |
| 1/4 | 90º | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 5011103 |
| 1/4 | 100º | 3/16 | 3/4 | 1.1/2 | 3 | 1 | 5011108 |
| 3/8 | 60º | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 5011094 |
| 3/8 | 82º | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 5011099 |
| 3/8 | 90º | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 5011104 |
| 3/8 | 100º | 1/4 | 7/8 | 1.3/4 | 3 | 1 | 5011109 |
| 1/2 | 60º | 3/8 | 1“ | 2“ | 3 | 1 | 5011095 |
| 1/2 | 82º | 3/8 | 1“ | 2“ | 3 | 1 | 5011100 |
| 1/2 | 90º | 3/8 | 1“ | 2“ | 3 | 1 | 5011105 |
| 1/2 | 100º | 3/8 | 1“ | 2“ | 3 | 1 | 5011110 |
| 5/8 | 60º | 3/8 | 1“ | 2.1/4 | 3 | 1 | 5011096 |
| 5/8 | 82º | 3/8 | 1“ | 2.1/4 | 3 | 1 | 5011101 |
| 5/8 | 90º | 3/8 | 1“ | 2.1/4 | 3 | 1 | 5011106 |
| 5/8 | 100º | 3/8 | 1“ | 2.1/4 | 3 | 1 | 5011111 |
| 3/4 | 60º | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 5011097 |
| 3/4 | 82º | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 5011102 |
| 3/4 | 90º | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 5011107 |
| 3/4 | 100º | 1/2 | 1.1/4 | 2.5/8 | 3 | 1 | 5011112 |
| 1“ | 60º | 1/2 | 1“ | 3“ | 3 | 1 | 46262132 |
| 1“ | 82º | 1/2 | 1“ | 3“ | 3 | 1 | 46262133 |
| 1“ | 90º | 1/2 | 1“ | 3“ | 3 | 1 | 46262134 |
| 1“ | 100º | 1/2 | 1“ | 3“ | 3 | 1 | 46262135 |

## Countersink, Straight Shank, Single-Flute

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.

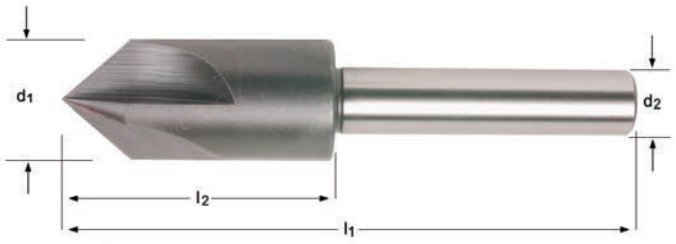



### 4603

| $d_1$ Ø Inch | angle | $d_2$ Ø Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4603 |
|---|---|---|---|---|---|---|---|
| 1/4 | 82° | 3/16 | 11/16 | 1.7/16 | 1 | 1 | 4710797 |
| 1/4 | 90° | 3/16 | 11/16 | 1.7/16 | 1 | 1 | 4710805 |
| 3/8 | 60° | 1/4 | 7/8 | 1.3/4 | 1 | 1 | 4710790 |
| 3/8 | 82° | 1/4 | 25/32 | 1.21/32 | 1 | 1 | 4710798 |
| 3/8 | 90° | 1/4 | 3/4 | 1.5/8 | 1 | 1 | 4710806 |
| 1/2 | 60° | 1/4 | 1“ | 2“ | 1 | 1 | 4710791 |
| 1/2 | 82° | 1/4 | 27/32 | 1.27/32 | 1 | 1 | 4710799 |
| 1/2 | 90° | 1/4 | 13/32 | 1.13/16 | 1 | 1 | 4710807 |
| 5/8 | 82° | 3/8 | 1.3/32 | 2.3/32 | 1 | 1 | 4710800 |
| 5/8 | 90° | 3/8 | 1“ | 2“ | 1 | 1 | 4710808 |
| 3/4 | 60° | 3/8 | 1.13/32 | 2.21/32 | 1 | 1 | 4710793 |
| 3/4 | 82° | 3/8 | 1.5/32 | 2.13/32 | 1 | 1 | 4710801 |
| 3/4 | 90° | 3/8 | 1.1/16 | 2.5/16 | 1 | 1 | 4710809 |
| 1“ | 60° | 1/2 | 1.9/16 | 3.1/8 | 1 | 1 | 4710794 |
| 1“ | 82° | 1/2 | 1.1/4 | 2.13/16 | 1 | 1 | 4710802 |
| 1“ | 90° | 1/2 | 1.1/4 | 2.13/16 | 1 | 1 | 4710810 |
| 1.1/4 | 60° | 1/2 | 1.3/4 | 3.3/4 | 1 | 1 | 4710795 |
| 1.1/4 | 82° | 1/2 | 1.1/2 | 3.1/2 | 1 | 1 | 4710803 |
| 1.1/4 | 90° | 1/2 | 1.9/16 | 3.9/16 | 1 | 1 | 4710811 |
| 1.1/2 | 60° | 1/2 | 2.5/16 | 4.1/4 | 1 | 1 | 4710796 |
| 1.1/2 | 82° | 1/2 | 1.15/16 | 3.7/8 | 1 | 1 | 4710804 |
| 1.1/2 | 90° | 1/2 | 1.13/16 | 3.3/4 | 1 | 1 | 4710812 |

## Countersink, Straight Shank, 4-Flute

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.



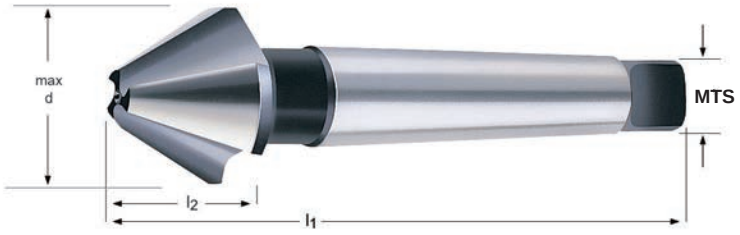

### 4602

| $d_1$ Ø Inch | angle | $d_2$ Ø Inch | $l_2$ Inch | $l_1$ Inch | # of Flutes | Pack Qty | 4602 |
|---|---|---|---|---|---|---|---|
| 1/2 | 60° | 1/2 | 1.5/8 | 3.7/8 | 4 | 1 | 4710588 |
| 1/2 | 82° | 1/2 | 1.5/8 | 3.7/8 | 4 | 1 | 4710593 |
| 5/8 | 60° | 1/2 | 1.3/4 | 4“ | 4 | 1 | 4710589 |
| 5/8 | 82° | 1/2 | 1.3/4 | 4“ | 4 | 1 | 4710594 |
| 3/4 | 60° | 1/2 | 1.7/8 | 4.1/8 | 4 | 1 | 4710590 |
| 3/4 | 82° | 1/2 | 1.7/8 | 4.1/8 | 4 | 1 | 4710595 |
| 7/8 | 60° | 1/2 | 2“ | 4.1/4 | 4 | 1 | 4710591 |
| 7/8 | 82° | 1/2 | 2“ | 4.1/4 | 4 | 1 | 4710596 |
| 1“ | 60° | 1/2 | 2.1/8 | 4.3/8 | 4 | 1 | 4710592 |
| 1“ | 82° | 1/2 | 2.1/8 | 4.3/8 | 4 | 1 | 4710597 |

# HSS Countersinks

## Taper Shank, 3-Flute

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




### G137

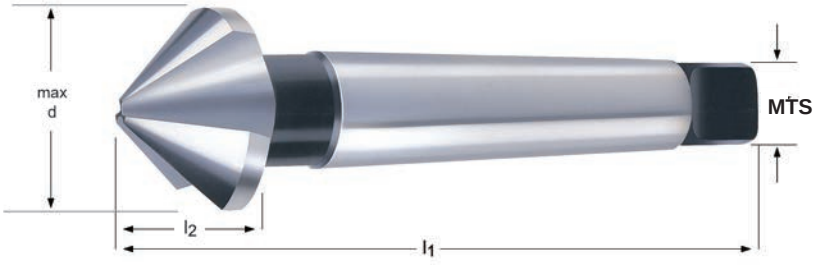
| max d mm | min d mm | $l_2$ mm | $l_1$ mm | MTS | # of Flutes | Pack Qty | G137 |
|---|---|---|---|---|---|---|---|
| 16.0 (5/8) | 4.0 | 14.5 | 90 | 1 | 3 | 1 | 0108765 |
| 20.0 (3/4) | 5.0 | 17.5 | 106 | 2 | 3 | 1 | 0108772 |
| 25.0 (1") | 6.3 | 20.0 | 112 | 2 | 3 | 1 | 0108789 |
| 31.5 (1.1/4) | 10.0 | 23.0 | 118 | 2 | 3 | 1 | 0108796 |
| 40.0 (1.1/2) | 12.5 | 28.5 | 150 | 3 | 3 | 1 | 0108802 |
| 50.0 (2") | 16.0 | 36.0 | 160 | 3 | 3 | 1 | 0108819 |
| 63.0 (2.1/2) | 20.0 | 43.0 | 190 | 4 | 3 | 1 | 0108826 |
| 80.0 (3") | 25.0 | 54.0 | 200 | 4 | 3 | 1 | 0108833 |

## Taper Shank, 3-Flute

90° Countersink with Morse Taper Shank for multiple materials.

**G138** Bright finish improves chip flow in soft ferrous and non-ferrous materials. Excellent for steel, titanium & nickle alloys.

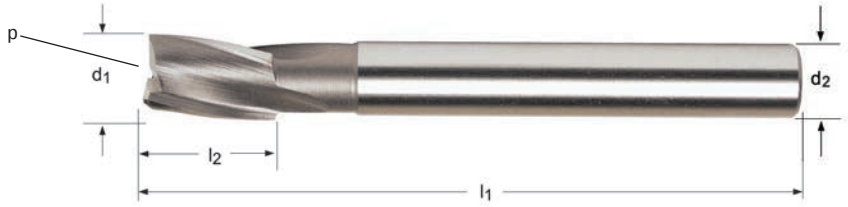
**G338** TiN coating increases surface hardness and improves chip flow in steel, cast iron and aluminum alloys.




| max d mm | min d mm | $l_2$ mm | $l_1$ mm | MTS | # of Flutes | Pack Qty | G138 | G338 |
|---|---|---|---|---|---|---|---|---|
| 25.0 | 3.8 | 15.5 | 106 | 2 | 3 | 1 | 0108895 | 0109502 |
| 30.0 | 4.2 | 18.5 | 112 | 2 | 3 | 1 | 0108925 | — |
| 31.0 | 4.2 | 20.0 | 112 | 2 | 3 | 1 | 0108932 | 0109519 |
| 34.0 | 4.5 | 19.5 | 118 | 2 | 3 | 1 | 0108949 | — |
| 37.0 | 4.8 | 21.7 | 118 | 2 | 3 | 1 | 0108956 | 0109526 |
| 40.0 | 10.0 | 20.5 | 140 | 3 | 3 | 1 | 0108963 | 0109533 |
| 50.0 | 14.0 | 24.1 | 150 | 3 | 3 | 1 | 0108970 | 0109540 |
| 63.0 | 16.0 | 28.5 | 180 | 4 | 3 | 1 | 0108987 | 0109557 |
| 80.0 | 22.0 | 36.0 | 190 | 4 | 3 | 1 | 0108994 | — |

## Counterbore Body - Interchangeable Pilot Type

Used to enlarge the end of a preformed hole when a flat bottom is required. The counterbore is an end cutting tool which utilizes and interchangeable pilot to align the enlarged hole being machined with the preformed hole. The 3 and 5 flute counterbore reduces chatter and improves finish.




### **4702** - Short Length

| $d_1$ Ø Inch | $l_2$ Inch | $l_1$ Inch | $d_2$ Ø Inch | # of Flutes | Pilot (p) Mounting Ø Inch | Pilot Ø min | Pilot Ø max | Pack Qty | 4702 |
|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 3/4 | 3.13/16 | 15/64 | 3 | 3/32 | 1/8 | 3/16 | 1 | 6210031 |
| 9/32 | 3/4 | 3.13/16 | 17/64 | 3 | 3/32 | 1/8 | 7/32 | 1 | 6210032 |
| 5/16 | 3/4 | 3.13/16 | 19/64 | 3 | 3/32 | 1/8 | 1/4 | 1 | 6210033 |
| 11/32 | 3/4 | 3.13/16 | 5/16 | 3 | 3/32 | 1/8 | 9/32 | 1 | 6210034 |
| 3/8 | 1“ | 4.1/16 | 5/16 | 3 | 5/32 | 3/16 | 5/16 | 1 | 6210035 |
| 13/32 | 1“ | 4.1/16 | 3/8 | 3 | 5/32 | 3/16 | 11/32 | 1 | 6210036 |
| 7/16 | 1“ | 4.1/16 | 3/8 | 3 | 5/32 | 3/16 | 3/8 | 1 | 6210037 |
| 15/32 | 1.1/4 | 4.5/16 | 7/16 | 3 | 3/16 | 3/16 | 13/32 | 1 | 6210038 |
| 1/2 | 1.1/4 | 4.5/16 | 7/16 | 3 | 3/16 | 3/16 | 7/16 | 1 | 6210039 |
| 9/16 | 1.1/4 | 4.5/16 | 1/2 | 3 | 3/16 | 3/16 | 1/2 | 1 | 6210041 |
| 19/32 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 17/32 | 1 | 6210042 |
| 5/8 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 9/16 | 1 | 6210043 |
| 11/16 | 1.1/4 | 5.1/8 | 1/2 | 3 | 3/16 | 3/16 | 5/8 | 1 | 6210045 |
| 3/4 | 1.1/2 | 5.3/8 | 1/2 | 3 | 1/4 | 5/16 | 11/16 | 1 | 6210047 |
| 25/32 | 1.1/2 | 5.3/8 | 5/8 | 3 | 1/4 | 5/16 | 23/32 | 1 | 6210048 |
| 13/16 | 1.1/2 | 5.3/8 | 5/8 | 3 | 1/4 | 5/16 | 3/4 | 1 | 6210049 |
| 27/32 | 1.1/2 | 5.3/8 | 3/4 | 3 | 1/4 | 5/16 | 25/32 | 1 | 6210050 |
| 7/8 | 1.1/2 | 5.3/8 | 3/4 | 3 | 1/4 | 5/16 | 13/16 | 1 | 6210051 |
| 1“ | 1.3/4 | 6.3/8 | 3/4 | 3 | 5/16 | 3/8 | 15/16 | 1 | 6210055 |
| 2“ | 2.1/2 | 8.3/8 | 1.1/2 | 5 | 1/2 | 9/16 | 1.15/16 | 1 | 6210065 |

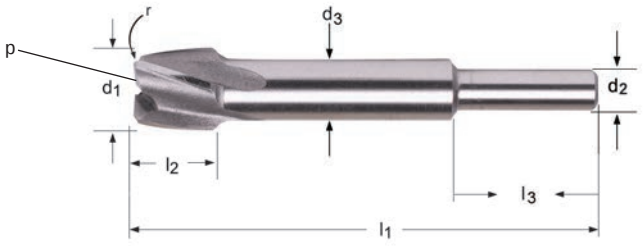
# HSS Counterbores

## Counterbore Body, Aircraft Series - Interchangeable Pilot Type

Used for the facing of bosses, and counterboring recesses for spring pockets and screw heads. Supplied with corner radius to produce the fillets necessary for this type of work. Designed for pneumatic or electric drills.

**4705** - Long Series, 3-flute

**4706** - Short Series (Aircraft) 4-flute with corner radius

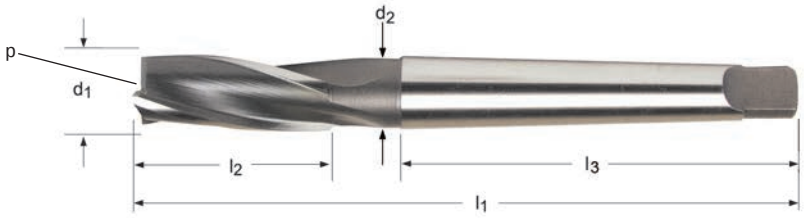



| $d_1$ Ø Inch | $l_2$ Inch | $l_1$ Inch | $d_2$ Ø Inch | $l_3$ Inch | $d_3$ Ø Inch | # of Flutes | Pilot (p) Mounting Ø Inch | Pilot Ø min | Pilot Ø max | Pack Qty | 4705 | 4706 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/4 | 1/2 | 2.3/8 | 1/4 | 1.1/8 | 15/64 | 4 | 3/32 | 1/8 | 3/16 | 1 | — | 6210137 | 1) |
| 1/4 | 3/4 | 3.13/16 | 15/64 | 3.1/16 | 15/64 | 3 | 3/32 | 1/8 | 3/16 | 1 | 6210107 | — | |
| 5/16 | 1/2 | 2.3/8 | 1/4 | 7/8 | 17/64 | 4 | 3/32 | 1/8 | 1/4 | 1 | — | 6210139 | 1) |
| 5/16 | 3/4 | 3.13/16 | 19/64 | 3.1/16 | 19/64 | 3 | 3/32 | 1/8 | 1/4 | 1 | 6210109 | — | |
| 11/32 | 1/2 | 2.3/8 | 1/4 | 7/8 | 19/64 | 4 | 3/32 | 1/8 | 9/32 | 1 | — | 6210140 | 1) |
| 3/8 | 1/2 | 2.3/8 | 1/4 | 7/8 | 5/16 | 4 | 3/32 | 3/16 | 5/16 | 1 | — | 6210141 | 2) |
| 3/8 | 3/4 | 3.13/16 | 5/16 | 3.1/16 | 5/16 | 3 | 3/32 | 3/16 | 5/16 | 1 | 6210111 | — | |
| 13/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 3/16 | 11/32 | 1 | — | 6210142 | 2) |
| 7/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 3/16 | 3/8 | 1 | — | 6210143 | 2) |
| 7/16 | 3/4 | 3.13/16 | 3/8 | 3.1/16 | 3/8 | 3 | 1/8 | 3/16 | 3/8 | 1 | 6210113 | — | |
| 15/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 5/16 | 4 | 1/8 | 1/4 | 13/32 | 1 | — | 6210144 | 2) |
| 1/2 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 7/16 | 1 | — | 6210145 | 2) |
| 1/2 | 3/4 | 3.13/16 | 7/16 | 3.1/16 | 7/16 | 3 | 1/8 | 1/4 | 7/16 | 1 | 6210115 | — | |
| 17/32 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 15/32 | 1 | — | 6210146 | 2) |
| 17/32 | 3/4 | 5.3/8 | 1/2 | 4.5/8 | 1/2 | 3 | 1/8 | 1/4 | 15/32 | 1 | 6210116 | — | |
| 9/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 3/8 | 4 | 1/8 | 1/4 | 1/2 | 1 | — | 6210147 | 2) |
| 9/16 | 3/4 | 5.3/8 | 1/2 | 4.5/8 | 1/2 | 3 | 1/8 | 1/4 | 1/2 | 1 | 6210117 | — | |
| 19/32 | 3/4 | 5.3/8 | 1/2 | 4.3/16 | 9/16 | 3 | 1/8 | 1/4 | 17/32 | 1 | 6210118 | — | |
| 5/8 | 3/4 | 5.3/8 | 1/2 | 4.3/16 | 9/16 | 3 | 1/8 | 1/4 | 9/16 | 1 | 6210119 | — | |
| 11/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 1/8 | 1/4 | 5/8 | 1 | — | 6210151 | 3) |
| 21/32 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 9/16 | 3 | 3/16 | 1/4 | 19/32 | 1 | 6210120 | — | |
| 11/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 5/8 | 3 | 3/16 | 1/4 | 5/8 | 1 | 6210121 | — | |
| 3/4 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 11/16 | 3 | 3/16 | 5/16 | 11/16 | 1 | 6210123 | — | |
| 3/4 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 11/16 | 1 | — | 6210153 | 3) |
| 25/32 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 11/16 | 3 | 3/16 | 5/16 | 23/32 | 1 | 6210124 | — | |
| 13/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 3/4 | 1 | 6210125 | — | |
| 13/16 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 3/4 | 1 | — | 6210155 | 3) |
| 7/8 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 13/16 | 1 | 6210126 | — | |
| 7/8 | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 5/16 | 13/16 | 1 | — | 6210157 | 3) |
| 15/16 | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 5/16 | 7/8 | 1 | 6210127 | — | |
| 1“ | 1.1/4 | 5.3/8 | 1/2 | 3.5/8 | 3/4 | 3 | 3/16 | 3/8 | 15/16 | 1 | 6210128 | — | |
| 1“ | 1/2 | 2.13/16 | 1/4 | 7/8 | 1/2 | 4 | 3/16 | 3/8 | 15/16 | 1 | — | 6210161 | 3) |

[1] 1/32 Corner Radius
[2] 3/64 Corner Radius
[3] 0.0550” Corner Radius

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

Short counterbore body, with taper shank for use with detachable pilots which align counterbore to existing drilled hole. 3 & 5 Flute designs for less chatter.

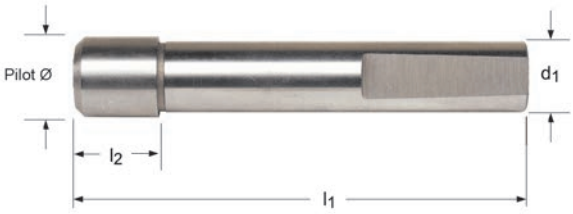



### 4703

| $d_1$ Ø Inch | $l_2$ Inch | $l_1$ Inch | MTS | $d_2$ Neck Dia. Inch | $l_3$ Shank Length Inch | # of Flutes | pilot (p) mounting Ø Inch | pilot Ø min | pilot Ø max | Pack Qty | 4703 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/2 | 1.1/4 | 4.5/16 | 1 | 29/64 | 2.9/16 | 3 | 3/16 | 1/4 | 7/16 | 1 | 6210074 |
| 11/16 | 1.1/4 | 5.1/8 | 2 | 5/8 | 3.1/8 | 3 | 3/16 | 1/4 | 5/8 | 1 | 6210080 |
| 3/4 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 11/16 | 1 | 6210082 |
| 13/16 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 3/4 | 1 | 6210084 |
| 7/8 | 1.1/2 | 5.3/8 | 2 | 21/32 | 3.1/8 | 3 | 1/4 | 5/16 | 13/16 | 1 | 6210085 |
| 15/16 | 1.1/2 | 6.1/8 | 2 | 7/8 | 3.7/8 | 3 | 1/4 | 5/16 | 7/8 | 1 | 6210086 |
| 1“ | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 15/16 | 1 | 6210087 |
| 1.1/16 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1“ | 1 | 6210088 |
| 1.1/8 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1.1/16 | 1 | 6210089 |
| 1.3/16 | 1.3/4 | 6.3/8 | 3 | 7/8 | 3.7/8 | 3 | 5/16 | 3/8 | 1.1/8 | 1 | 6210090 |
| 1.1/4 | 2“ | 6.5/8 | 3 | 7/8 | 3.7/8 | 5 | 3/8 | 7/16 | 1.3/16 | 1 | 6210091 |
| 1.3/8 | 2“ | 6.5/8 | 3 | 7/8 | 3.7/8 | 5 | 3/8 | 7/16 | 1.5/16 | 1 | 6210093 |
| 1.1/2 | 2“ | 7.7/8 | 4 | 1.3/16 | 4.7/8 | 5 | 3/8 | 7/16 | 1.7/16 | 1 | 6210094 |
| 1.5/8 | 2.1/4 | 8.1/8 | 4 | 1.3/8 | 4.7/8 | 5 | 7/16 | 1/2 | 1.9/16 | 1 | 6210095 |
| 2“ | 2.1/2 | 8.3/8 | 4 | 1.1/2 | 4.7/8 | 5 | 1/2 | 9/16 | 1.5/16 | 1 | 6210098 |
| 2.1/8 | 2.1/2 | 9.7/8 | 5 | 1.3/4 | 6.1/8 | 5 | 1/2 | 9/16 | 2.1/16 | 1 | 6210099 |

## Counterbore Pilot, Detachable

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




### 4704

| pilot Ø Inch | $d_1$ Ø Inch | $l_2$ Inch | $l_1$ Inch | Pack Qty | 4704 |
|---|---|---|---|---|---|
| 1/8 | 3/32 | 1/8 | 1.1/4 | 1 | 3210114 |
| 5/32 | 3/32 | 3/16 | 1.5/16 | 1 | 3210115 |
| 3/16 | 3/32 | 3/16 | 1.5/16 | 1 | 3210116 |
| 7/32 | 3/32 | 1/4 | 1.3/8 | 1 | 3210117 |
| 1/4 | 3/32 | 1/4 | 1.3/8 | 1 | 3210118 |
| 1/8 | 1/8 | 1/8 | 1.7/16 | 1 | 3210249 |
| 5/32 | 1/8 | 3/16 | 1.1/2 | 1 | 3210251 |
| 3/16 | 1/8 | 3/16 | 1.1/2 | 1 | 3210255 |
| 7/32 | 1/8 | 1/4 | 1.9/16 | 1 | 3210258 |
| 1/4 | 1/8 | 1/4 | 1.9/16 | 1 | 3210259 |
| 9/32 | 1/8 | 5/16 | 1.5/8 | 1 | 3210261 |
| 5/16 | 1/8 | 5/16 | 1.5/8 | 1 | 3210262 |
| 3/8 | 1/8 | 3/8 | 1.11/16 | 1 | 3210263 |
| 7/16 | 1/8 | 7/16 | 1.3/4 | 1 | 3210264 |
| 1/2 | 1/8 | 1/2 | 1.13/16 | 1 | 3210265 |
| 3/16 | 5/32 | 3/16 | 1.9/16 | 1 | 3210119 |
| 7/32 | 5/32 | 1/4 | 1.5/8 | 1 | 3210120 |
| 1/4 | 5/32 | 1/4 | 1.5/8 | 1 | 3210121 |
| 9/32 | 5/32 | 5/16 | 1.11/16 | 1 | 3210122 |
| 5/16 | 5/32 | 5/16 | 1.11/16 | 1 | 3210123 |
| 3/8 | 5/32 | 3/8 | 1.3/4 | 1 | 3210124 |
| 3/16 | 3/16 | 1/4 | 1.7/8 | 1 | 3210281 |
| 7/32 | 3/16 | 1/4 | 1.7/8 | 1 | 3210284 |
| 1/4 | 3/16 | 1/4 | 1.7/8 | 1 | 3210125 |

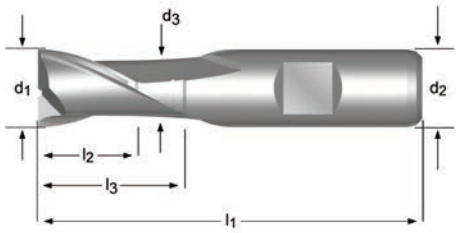
# HSS Counterbores

UNION BUTTERFIELD®

| pilot Ø Inch | $d_1$ Ø Inch | $l_2$ Inch | $l_1$ Inch | Pack Qty | 4704 |
|---|---|---|---|---|---|
| 9/32 | 3/16 | 5/16 | 1.15/16 | 1 | 3210287 |
| 5/16 | 3/16 | 5/16 | 1.15/16 | 1 | 3210126 |
| 11/32 | 3/16 | 3/8 | 2“ | 1 | 3210444 |
| 3/8 | 3/16 | 3/8 | 2“ | 1 | 3210127 |
| 13/32 | 3/16 | 7/16 | 2.1/16 | 1 | 3210445 |
| 7/16 | 3/16 | 7/16 | 2.1/16 | 1 | 3210128 |
| 15/32 | 3/16 | 1/2 | 2.1/8 | 1 | 3210446 |
| 1/2 | 3/16 | 1/2 | 2.1/8 | 1 | 3210129 |
| 9/16 | 3/16 | 9/16 | 2.3/16 | 1 | 3210130 |
| 5/8 | 3/16 | 9/16 | 2.3/16 | 1 | 3210131 |
| 13/16 | 3/16 | 13/16 | 2.7/16 | 1 | 3210296 |
| 7/8 | 3/16 | 7/8 | 2.1/2 | 1 | 3210297 |
| 1/4 | 1/4 | 1/4 | 1.11/16 | 1 | 3210300 |
| 9/32 | 1/4 | 5/16 | 1.3/4 | 1 | 3210302 |
| 5/16 | 1/4 | 5/16 | 1.3/4 | 1 | 3210132 |
| 3/8 | 1/4 | 3/8 | 1.13/16 | 1 | 3210133 |
| 7/16 | 1/4 | 7/16 | 1.7/8 | 1 | 3210134 |
| 1/2 | 1/4 | 1/2 | 1.15/16 | 1 | 3210135 |
| 17/32 | 1/4 | 9/16 | 2“ | 1 | 3210447 |
| 9/16 | 1/4 | 9/16 | 2“ | 1 | 3210136 |
| 5/8 | 1/4 | 5/8 | 2.1/16 | 1 | 3210137 |
| 11/16 | 1/4 | 11/16 | 2.1/8 | 1 | 3210138 |
| 3/4 | 1/4 | 3/4 | 2.3/16 | 1 | 3210139 |
| 13/16 | 1/4 | 7/8 | 2.5/16 | 1 | 3210140 |
| 1“ | 1/4 | 1“ | 2.7/16 | 1 | 3210314 |
| 3/8 | 5/16 | 3/8 | 2“ | 1 | 3210142 |
| 7/16 | 5/16 | 7/16 | 2.1/16 | 1 | 3210143 |
| 1/2 | 5/16 | 1/2 | 2.1/8 | 1 | 3210144 |
| 9/16 | 5/16 | 9/16 | 2.3/16 | 1 | 3210145 |
| 5/8 | 5/16 | 5/8 | 2.1/4 | 1 | 3210146 |
| 11/16 | 5/16 | 11/16 | 2.5/16 | 1 | 3210147 |
| 3/4 | 5/16 | 3/4 | 2.3/8 | 1 | 3210148 |
| 13/16 | 5/16 | 7/8 | 2.1/2 | 1 | 3210149 |
| 15/16 | 5/16 | 1“ | 2.5/8 | 1 | 3210151 |
| 1“ | 5/16 | 1“ | 2.5/8 | 1 | 3210152 |
| 7/16 | 3/8 | 7/16 | 2.5/16 | 1 | 3210155 |
| 1/2 | 3/8 | 1/2 | 2.3/8 | 1 | 3210156 |
| 9/16 | 3/8 | 9/16 | 2.7/16 | 1 | 3210157 |
| 5/8 | 3/8 | 5/8 | 2.1/2 | 1 | 3210158 |
| 11/16 | 3/8 | 11/16 | 2.9/16 | 1 | 3210159 |
| 3/4 | 3/8 | 3/4 | 2.5/8 | 1 | 3210160 |
| 13/16 | 3/8 | 7/8 | 2.3/4 | 1 | 3210161 |
| 7/8 | 3/8 | 7/8 | 2.3/4 | 1 | 3210162 |
| 15/16 | 3/8 | 1“ | 2.5/8 | 1 | 3210163 |
| 9/16 | 7/16 | 5/8 | 2.7/8 | 1 | 3210173 |
| 11/16 | 7/16 | 3/4 | 3“ | 1 | 3210175 |
| 3/4 | 7/16 | 3/4 | 3“ | 1 | 3210176 |
| 13/16 | 7/16 | 7/8 | 3.1/8 | 1 | 3210177 |
| 7/8 | 7/16 | 7/8 | 3.1/8 | 1 | 3210178 |
| 15/16 | 7/16 | 1“ | 3.1/4 | 1 | 3210179 |
| 1“ | 7/16 | 1“ | 3.1/4 | 1 | 3210180 |
| 9/16 | 1/2 | 5/8 | 3.1/8 | 1 | 3210195 |
| 1“ | 1/2 | 1“ | 3.1/2 | 1 | 3210202 |
| 1.1/2 | 1/2 | 1.1/2 | 4“ | 1 | 3210210 |

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

Powdered Metal. P9 slotting tolerance.




## C110

| $d_1$ Ø Inch | $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $l_2$ mm | $l_1$ mm | # of Flutes | $l_3$ mm | $d_3$ Ø mm | Pack Qty | C110 |
|---|---|---|---|---|---|---|---|---|---|
| | 1.00 | 6 | 2.5 | 47 | 2 | - | - | 1 | 0353165 |
| | 1.50 | 6 | 3 | 47 | 2 | - | - | 1 | 0353172 |
| 1/16 | 1.59 | 6 | 3 | 47 | 2 | - | - | 1 | 0639795 |
| | 1.80 | 6 | 4 | 48 | 2 | - | - | 1 | 0353189 |
| | 2.00 | 6 | 4 | 48 | 2 | - | - | 1 | 0353301 |
| 3/32 | 2.38 | 6 | 5 | 49 | 2 | - | - | 1 | 0639801 |
| | 2.50 | 6 | 5 | 49 | 2 | - | - | 1 | 0353318 |
| | 2.80 | 6 | 5 | 49 | 2 | - | - | 1 | 0353325 |
| | 3.00 | 6 | 5 | 49 | 2 | - | - | 1 | 0353370 |
| 1/8 | 3.18 | 6 | 6 | 50 | 2 | - | - | 1 | 0639818 |
| | 3.50 | 6 | 6 | 50 | 2 | - | - | 1 | 0353387 |
| | 3.80 | 6 | 7 | 51 | 2 | - | - | 1 | 0353394 |
| | 4.00 | 6 | 7 | 51 | 2 | - | - | 1 | 0353424 |
| | 4.50 | 6 | 7 | 51 | 2 | - | - | 1 | 0353431 |
| 3/16 | 4.76 | 6 | 8 | 52 | 2 | - | - | 1 | 0639825 |
| | 4.80 | 6 | 8 | 52 | 2 | - | - | 1 | 0353448 [1)2)] |
| | 5.00 | 6 | 8 | 52 | 2 | - | - | 1 | 0353455 |
| | 5.50 | 6 | 8 | 52 | 2 | - | - | 1 | 0353462 |
| | 5.75 | 6 | 8 | 52 | 2 | - | - | 1 | 0353479 [1)2)] |
| | 6.00 | 6 | 8 | 52 | 2 | - | - | 1 | 0353486 |
| 1/4 | 6.35 | 10 | 10 | 60 | 2 | - | - | 1 | 0639832 |
| | 6.50 | 10 | 10 | 60 | 2 | - | - | 1 | 0353493 |
| | 6.75 | 10 | 10 | 60 | 2 | - | - | 1 | 0629031 |
| | 7.00 | 10 | 10 | 60 | 2 | - | - | 1 | 0353509 |
| | 7.50 | 10 | 10 | 60 | 2 | - | - | 1 | 0353516 |
| | 7.75 | 10 | 11 | 61 | 2 | - | - | 1 | 0573495 [1)2)] |
| 5/16 | 7.94 | 10 | 11 | 61 | 2 | - | - | 1 | 0639849 |
| | 8.00 | 10 | 11 | 61 | 2 | - | - | 1 | 0353523 |
| | 8.50 | 10 | 11 | 61 | 2 | - | - | 1 | 0353530 |
| | 9.00 | 10 | 11 | 61 | 2 | - | - | 1 | 0353547 |
| | 9.50 | 10 | 11 | 61 | 2 | - | - | 1 | 0353554 |
| 3/8 | 9.52 | 10 | 13 | 63 | 2 | 22.5 | 9.5 | 1 | 0639856 |
| | 9.70 | 10 | 13 | 63 | 2 | 22.5 | 9.5 | 1 | 0573501 [1)2)] |
| | 10.00 | 10 | 13 | 63 | 2 | 22.5 | 9.5 | 1 | 0353196 |
| 13/32 | 10.32 | 12 | 13 | 70 | 2 | - | - | 1 | 0639863 |
| | 10.50 | 12 | 13 | 70 | 2 | - | - | 1 | 0353202 |
| | 11.00 | 12 | 13 | 70 | 2 | - | - | 1 | 0353219 |
| 7/16 | 11.11 | 12 | 13 | 70 | 2 | - | - | 1 | 0639870 |
| | 11.50 | 12 | 13 | 70 | 2 | - | - | 1 | 0573433 |
| | 11.70 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0573440 [1)2)] |
| | 12.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0353226 |
| | 12.50 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0573457 |
| 1/2 | 12.70 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0639887 |
| | 13.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0353233 |
| 17/32 | 13.49 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0639894 |
| | 13.70 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0573464 [1)2)] |
| | 14.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0353240 |
| 9/16 | 14.29 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0639900 |
| | 15.00 | 12 | 16 | 73 | 2 | 27.5 | 11.5 | 1 | 0353257 |
| | 15.70 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0573471 [1)2)] |
| 5/8 | 15.88 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0639917 |
| | 16.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0353264 |
| | 17.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0353271 |
| 11/16 | 17.46 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0639924 |
| | 17.70 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0628942 |
| | 18.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0353288 |
| | 19.00 | 16 | 19 | 79 | 2 | 30.5 | 15.5 | 1 | 0353295 |
| 3/4 | 19.05 | 20 | 22 | 88 | 2 | 37.5 | 18.5 | 1 | 0639931 |
| | 19.70 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 0628959 |
| | 20.00 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 0353332 |
| | 21.70 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 0628966 |
| | 22.00 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 0353349 |
| 7/8 | 22.22 | 20 | 22 | 88 | 2 | 37.5 | 19.5 | 1 | 0639948 |

[1)] Diameter tolerance h10
[2)] Slot not in P9 tolerance
[3)] Available in HSCo only

# HSS-PM 2 Flute End Mills

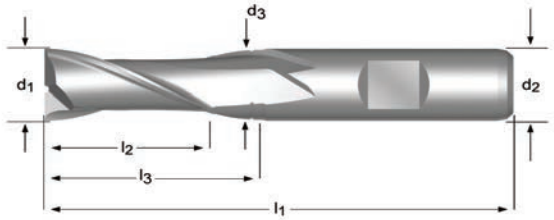
DORMER

| $d_1$ Ø Inch | $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $l_2$ mm | $l_1$ mm | # of Flutes | $l_3$ mm | $d_3$ Ø mm | Pack Qty | C110 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 24.00 | 25 | 26 | 102 | 2 | 45.5 | 23.5 | 1 | 0573488 | |
| | 24.70 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0628973 | |
| | 25.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0353356 | |
| 1“ | 25.40 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0621929 | |
| | 26.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0628980 | |
| | 28.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0353363 | |
| 1.1/8 | 28.58 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0639962 | |
| | 30.00 | 25 | 26 | 102 | 2 | 45.5 | 24.5 | 1 | 0353400 | |
| 1.1/4 | 31.75 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 0639979 | |
| | 32.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 0353417 | |
| | 35.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 0639986 | 1)3) |
| | 36.00 | 32 | 32 | 112 | 2 | 51.5 | 31.5 | 1 | 0628997 | 1)3) |
| | 40.00 | 40 | 38 | 130 | 2 | 59.5 | 39.0 | 1 | 0629000 | 1)3) |
| | 45.00 | 40 | 38 | 130 | 2 | 59.5 | 38.0 | 1 | 0629017 | 1)3) |
| | 50.00 | 50 | 45 | 147 | 2 | 66.5 | 48.0 | 1 | 0629024 | 1)3) |

[1] Diameter tolerance h10
[2] Slot not in P9 tolerance
[3] Available in HSCo only

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

Powdered Metal. P9 slotting tolerance.




## C123

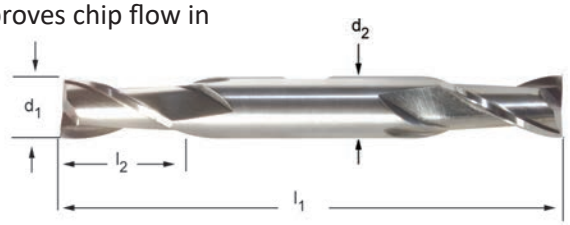
| $d_1$ Ø Inch | $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $l_2$ mm | $l_1$ mm | # of Flutes | $l_3$ mm | $d_3$ Ø mm | Pack Qty | C123 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1/16 | 1.59 | 6 | 7 | 51 | 2 | — | — | 1 | 0640012 | 1) |
| | 2.00 | 6 | 7 | 51 | 2 | — | — | 1 | 0353646 | |
| | 2.50 | 6 | 8 | 52 | 2 | — | — | 1 | 0353653 | |
| | 3.00 | 6 | 8 | 52 | 2 | — | — | 1 | 0353714 | |
| 1/8 | 3.18 | 6 | 10 | 54 | 2 | — | — | 1 | 0640029 | 1) |
| | 3.50 | 6 | 10 | 54 | 2 | — | — | 1 | 0353721 | |
| 5/32 | 3.97 | 6 | 11 | 55 | 2 | — | — | 1 | 0640036 | 1) |
| | 4.00 | 6 | 11 | 55 | 2 | — | — | 1 | 0353769 | |
| | 4.50 | 6 | 11 | 55 | 2 | — | — | 1 | 0353776 | |
| 3/16 | 4.76 | 6 | 13 | 57 | 2 | — | — | 1 | 0640043 | 1) |
| | 5.00 | 6 | 13 | 57 | 2 | — | — | 1 | 0353790 | |
| | 5.50 | 6 | 13 | 57 | 2 | — | — | 1 | 0353806 | |
| | 6.00 | 6 | 13 | 57 | 2 | — | — | 1 | 0353813 | |
| 1/4 | 6.35 | 10 | 16 | 66 | 2 | — | — | 1 | 0640050 | 1) |
| | 6.50 | 10 | 16 | 66 | 2 | — | — | 1 | 0353820 | |
| | 7.00 | 10 | 16 | 66 | 2 | — | — | 1 | 0353837 | |
| | 7.50 | 10 | 16 | 66 | 2 | — | — | 1 | 0353844 | |
| 5/16 | 7.94 | 10 | 19 | 69 | 2 | — | — | 1 | 0640067 | 1) |
| | 8.00 | 10 | 19 | 69 | 2 | — | — | 1 | 0353851 | |
| | 8.50 | 10 | 19 | 69 | 2 | — | — | 1 | 0353868 | |
| | 9.00 | 10 | 19 | 69 | 2 | — | — | 1 | 0353875 | |
| | 9.50 | 10 | 19 | 69 | 2 | — | — | 1 | 0353882 | |
| 3/8 | 9.52 | 10 | 22 | 72 | 2 | 31.5 | 9.5 | 1 | 0640074 | 1) |
| | 10.00 | 10 | 22 | 72 | 2 | 31.5 | 9.5 | 1 | 0353561 | |
| | 11.00 | 12 | 22 | 79 | 2 | — | — | 1 | 0353578 | |
| | 12.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0353585 | |
| 1/2 | 12.70 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0640081 | 1) |
| | 13.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0353592 | |
| | 14.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0353608 | |
| 9/16 | 14.29 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0640098 | 1) |
| | 15.00 | 12 | 26 | 83 | 2 | 37.5 | 11.5 | 1 | 0353615 | |
| 5/8 | 15.88 | 16 | 32 | 92 | 2 | 43.5 | 15.5 | 1 | 0640104 | 1) |
| | 16.00 | 16 | 32 | 92 | 2 | 43.5 | 15.5 | 1 | 0353622 | |
| | 18.00 | 16 | 32 | 92 | 2 | 43.5 | 15.5 | 1 | 0353639 | |
| 3/4 | 19.05 | 20 | 38 | 104 | 2 | 53.5 | 18.5 | 1 | 0640111 | 2) |
| | 20.00 | 20 | 38 | 104 | 2 | 53.5 | 19.5 | 1 | 0353660 | |
| | 22.00 | 20 | 38 | 104 | 2 | 53.5 | 19.5 | 1 | 0353677 | |
| | 25.00 | 25 | 45 | 121 | 2 | 64.5 | 24.5 | 1 | 0353691 | |
| 1“ | 25.40 | 25 | 45 | 121 | 2 | 64.5 | 24.5 | 1 | 0640128 | |
| | 30.00 | 25 | 45 | 121 | 2 | 64.5 | 24.5 | 1 | 0353738 | |
| | 32.00 | 32 | 53 | 133 | 2 | 72.5 | 31.5 | 1 | 0353745 | |
| | 36.00 | 32 | 53 | 133 | 2 | 72.5 | 31.5 | 1 | 0353752 | 3) |
| | 40.00 | 40 | 63 | 155 | 2 | 84.5 | 39.0 | 1 | 0353783 | 3) |



[1] Diameter tolerance -.0005 inches / -.0013 inches • [2] Diameter tolerance -.0005 inches / -.0015 inches • [3] Available in HSCo only

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

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

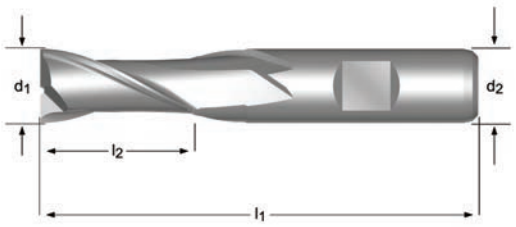



### C600

| $d_1$ 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

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




### C601

| $d_1$ 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 |

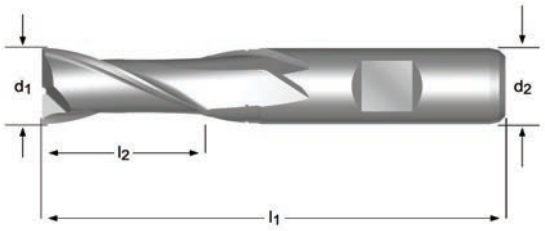
# HSS & Cobalt 2 Flute End Mills

**Continued**

| $d_1$ Ø Inch | $d_1$ decimal Inch | $l_2$ Inch | $l_1$ Inch | $d_2$ Ø Inch | # of Flutes | Pack Qty | C601 |
|---|---|---|---|---|---|---|---|
| 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 |

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

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

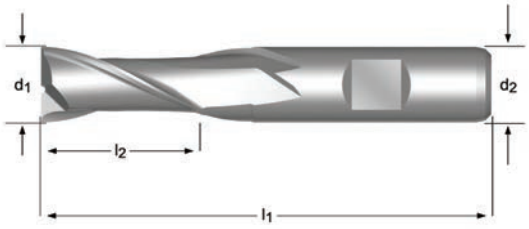



## C602

| $d_1$ 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

HSS-E, Bright finish improves chip flow in soft or non-ferrous materials.

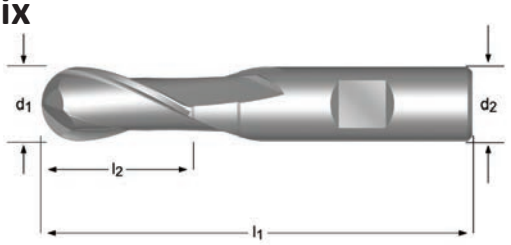



## C603

| $d_1$ 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 |

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

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

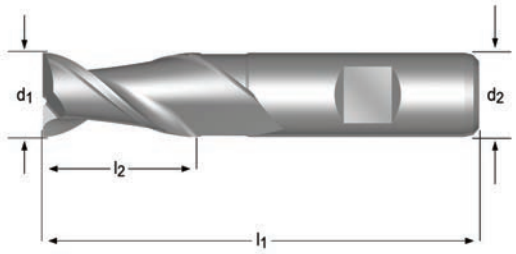



### C604

| $d_1$ 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

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

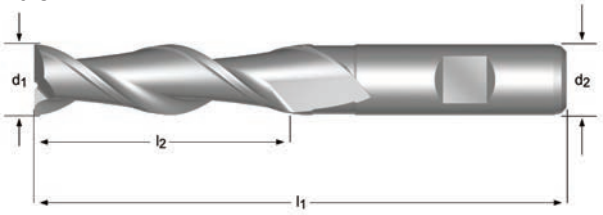



### C605

| $d_1$ 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 |
| 5/16 | 0.3125 | 3/4 | 2.1/2 | 3/8 | 2 | 1 | 7647894 |
| 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 |
| 1“ | 1.0000 | 2“ | 4.1/2 | 1“ | 2 | 1 | 7647898 |

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

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



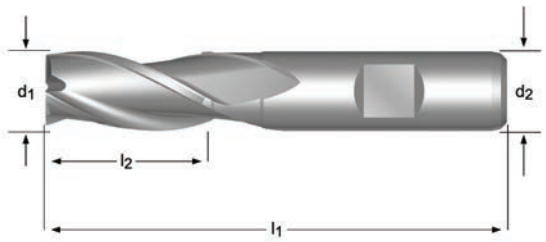

### C606

| $d_1$ 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 |

# HSS & Cobalt 3 Flute End Mills

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

HSS, 3-flute design for less chatter. Bright finish improves chip flow in soft or non-ferrous materials.

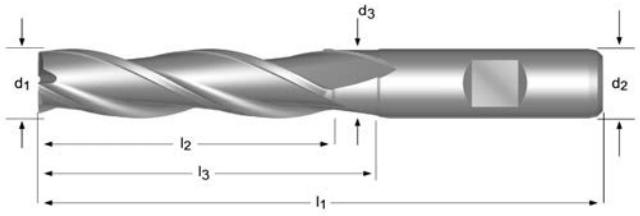



### C607

| $d_1$ 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 |

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

HSS-E (Cobalt), P9 slotting tolerance. 3 flute design provides less chatter.

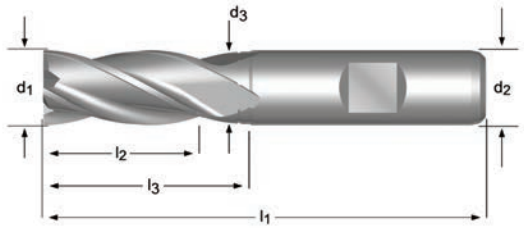



### C346

| $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $l_2$ mm | $l_1$ mm | # of Flutes | $l_3$ mm | $d_3$ Ø mm | Pack Qty | C346 |
|---|---|---|---|---|---|---|---|---|
| 3.00 | 6 | 12 | 56 | 3 | - | - | 1 | 0122297 |
| 4.00 | 6 | 19 | 63 | 3 | - | - | 1 | 0122303 |
| 5.00 | 6 | 24 | 68 | 3 | - | - | 1 | 0122310 |
| 6.00 | 6 | 24 | 68 | 3 | - | - | 1 | 0122327 |
| 7.00 | 10 | 30 | 80 | 3 | - | - | 1 | 0126325 |
| 8.00 | 10 | 38 | 88 | 3 | - | - | 1 | 0126332 |
| 9.00 | 10 | 38 | 88 | 3 | - | - | 1 | 0126349 |
| 10.00 | 10 | 45 | 95 | 3 | - | - | 1 | 0126233 |
| 11.00 | 12 | 45 | 102 | 3 | - | - | 1 | 0126240 |
| 12.00 | 12 | 53 | 110 | 3 | - | - | 1 | 0126257 |
| 13.00 | 12 | 53 | 110 | 3 | 64.5 | 11.5 | 1 | 0126264 |
| 15.00 | 12 | 53 | 110 | 3 | 64.5 | 11.5 | 1 | 0126288 |
| 16.00 | 16 | 63 | 123 | 3 | 74.5 | 15.5 | 1 | 0126295 |
| 20.00 | 20 | 75 | 141 | 3 | 90.5 | 19.5 | 1 | 0126318 |

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

HSS-E, Cobalt Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.




## C247

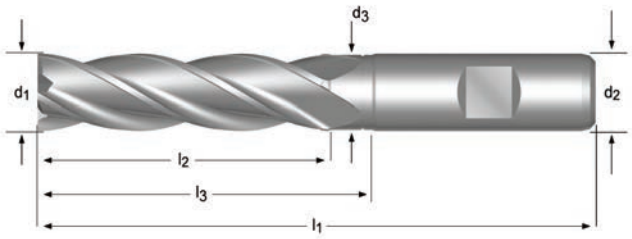
| $d_1$ Ø Inch | $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $l_2$ mm | $l_1$ mm | # of Flutes | $l_3$ mm | $d_3$ Ø mm | Pack Qty | C247 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2.00 | 6 | 7 | 51 | 4 | — | — | 1 | 0354667 | |
| | 2.50 | 6 | 8 | 52 | 4 | — | — | 1 | 0354674 | |
| | 3.00 | 6 | 8 | 52 | 4 | — | — | 1 | 0354728 | |
| 1/8 | 3.18 | 6 | 10 | 54 | 4 | — | — | 1 | 0640142 | 1) |
| | 3.50 | 6 | 10 | 54 | 4 | — | — | 1 | 0354735 | |
| | 4.00 | 6 | 11 | 55 | 4 | — | — | 1 | 0354766 | |
| | 4.50 | 6 | 11 | 55 | 4 | — | — | 1 | 0354773 | |
| 3/16 | 4.76 | 6 | 13 | 57 | 4 | — | — | 1 | 0640159 | 1) |
| | 5.00 | 6 | 13 | 57 | 4 | — | — | 1 | 0354780 | |
| | 5.50 | 6 | 13 | 57 | 4 | — | — | 1 | 0354797 | |
| | 6.00 | 6 | 13 | 57 | 4 | — | — | 1 | 0354803 | |
| 1/4 | 6.35 | 10 | 16 | 66 | 4 | — | — | 1 | 0640166 | 1) |
| | 6.50 | 10 | 16 | 66 | 4 | — | — | 1 | 0354810 | |
| | 7.00 | 10 | 16 | 66 | 4 | — | — | 1 | 0354827 | |
| | 7.50 | 10 | 16 | 66 | 4 | — | — | 1 | 0354834 | |
| 5/16 | 7.94 | 10 | 19 | 69 | 4 | — | — | 1 | 0640173 | 1) |
| | 8.00 | 10 | 19 | 69 | 4 | — | — | 1 | 0354841 | |
| | 8.50 | 10 | 19 | 69 | 4 | — | — | 1 | 0354858 | |
| | 9.00 | 10 | 19 | 69 | 4 | — | — | 1 | 0354865 | |
| | 9.50 | 10 | 19 | 69 | 4 | — | — | 1 | 0354872 | |
| 3/8 | 9.52 | 10 | 22 | 72 | 4 | 31.5 | 9.5 | 1 | 0640180 | 1) |
| | 10.00 | 10 | 22 | 72 | 4 | 31.5 | 9.5 | 1 | 0354582 | |
| | 11.00 | 12 | 22 | 79 | 4 | — | — | 1 | 0354599 | |
| | 12.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0354605 | |
| 1/2 | 12.70 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0640197 | 1) |
| | 13.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0354612 | |
| | 14.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0354629 | |
| 9/16 | 14.29 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0640203 | 1) |
| | 15.00 | 12 | 26 | 83 | 4 | 37.5 | 11.5 | 1 | 0354636 | |
| 5/8 | 15.88 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 0640210 | 1) |
| | 16.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 0354643 | |
| | 17.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 0609316 | |
| | 18.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 0354650 | |
| | 19.00 | 16 | 32 | 92 | 4 | 43.5 | 15.5 | 1 | 0609323 | |
| 3/4 | 19.05 | 20 | 38 | 104 | 4 | 53.5 | 18.5 | 1 | 0640227 | 1) |
| | 20.00 | 20 | 38 | 104 | 4 | 53.5 | 19.5 | 1 | 0354681 | |
| | 21.00 | 20 | 38 | 104 | 4 | 53.5 | 19.5 | 1 | 0609330 | |
| | 22.00 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 0354698 | |
| 7/8 | 22.22 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 0640234 | 1) |
| | 23.00 | 20 | 38 | 104 | 5 | 53.5 | 19.5 | 1 | 0609347 | |
| | 24.00 | 25 | 45 | 121 | 5 | 64.5 | 23.5 | 1 | 0609354 | |
| | 25.00 | 25 | 45 | 121 | 5 | 64.5 | 24.5 | 1 | 0354704 | |
| 1“ | 25.40 | 25 | 45 | 121 | 5 | 64.5 | 24.5 | 1 | 0640241 | 1) |
| | 26.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 0609361 | |
| | 28.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 0354711 | |
| | 30.00 | 25 | 45 | 121 | 6 | 64.5 | 24.5 | 1 | 0354742 | |
| | 32.00 | 32 | 53 | 133 | 6 | 72.5 | 31.5 | 1 | 0354759 | |
| | 36.00 | 32 | 53 | 133 | 6 | 72.5 | 31.5 | 1 | 0609378 | 2)3) |
| | 40.00 | 40 | 63 | 155 | 6 | 84.5 | 39.0 | 1 | 0609385 | 2)3) |
| | 50.00 | 50 | 75 | 177 | 8 | 96.5 | 48.0 | 1 | 0640258 | 2)3) |

[1] Diameter tolerance +.0025 inches / -.0005 inches
[2] Not center Cutting
[3] Available in HSCo only

# Multi-Flute Cobalt End Mills

## Long Length, Square End, Weldon Shank

HSS-E, Cobalt Powdered Metal. Bright finish improves chip flow in soft or non-ferrous materials.




## C273

| $d_1$ Ø Inch | $d_1$ Ø mm | $d_2$ Ø$h_6$ mm | $d_3$ Ø mm | $l_2$ mm | $l_1$ mm | $l_3$ mm | # of Flutes | Pack Qty | C273 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2.00 | 6 | — | 10 | 54 | — | 4 | 1 | 0354964 | |
| | 2.50 | 6 | — | 12 | 56 | — | 4 | 1 | 0354971 | |
| | 3.00 | 6 | — | 12 | 56 | — | 4 | 1 | 0355022 | |
| 1/8 | 3.18 | 6 | — | 15 | 59 | — | 4 | 1 | 0640265 | 1) |
| | 3.50 | 6 | — | 15 | 59 | — | 4 | 1 | 0355039 | |
| | 4.00 | 6 | — | 19 | 63 | — | 4 | 1 | 0355060 | |
| | 4.50 | 6 | — | 19 | 63 | — | 4 | 1 | 0355077 | |
| 3/16 | 4.76 | 6 | — | 24 | 68 | — | 4 | 1 | 0640272 | 1) |
| | 5.00 | 6 | — | 24 | 68 | — | 4 | 1 | 0355084 | |
| | 5.50 | 6 | — | 24 | 68 | — | 4 | 1 | 0355091 | |
| | 6.00 | 6 | — | 24 | 68 | — | 4 | 1 | 0355107 | |
| 1/4 | 6.35 | 10 | — | 30 | 80 | — | 4 | 1 | 0640289 | 1) |
| | 7.00 | 10 | — | 30 | 80 | — | 4 | 1 | 0355114 | |
| | 8.00 | 10 | — | 38 | 88 | — | 4 | 1 | 0355121 | |
| | 9.00 | 10 | — | 38 | 88 | — | 4 | 1 | 0355138 | |
| 3/8 | 9.52 | 10 | 9.5 | 45 | 95 | 54.5 | 4 | 1 | 0640296 | 1) |
| | 10.00 | 10 | 9.5 | 45 | 95 | 54.5 | 4 | 1 | 0354889 | |
| | 11.00 | 12 | — | 45 | 102 | — | 4 | 1 | 0354896 | |
| | 12.00 | 12 | 11.5 | 53 | 110 | 64.5 | 4 | 1 | 0354902 | |
| 1/2 | 12.70 | 12 | 11.5 | 53 | 110 | 64.5 | 4 | 1 | 0640302 | 1) |
| | 13.00 | 12 | 11.5 | 53 | 110 | 64.5 | 4 | 1 | 0354919 | |
| | 14.00 | 12 | 11.5 | 53 | 110 | 64.5 | 4 | 1 | 0354926 | |
| | 15.00 | 12 | 11.5 | 53 | 110 | 64.5 | 4 | 1 | 0354933 | |
| 5/8 | 15.88 | 16 | 15.5 | 63 | 123 | 74.5 | 4 | 1 | 0640319 | 1) |
| | 16.00 | 16 | 15.5 | 63 | 123 | 74.5 | 4 | 1 | 0354940 | |
| | 18.00 | 16 | 15.5 | 63 | 123 | 74.5 | 4 | 1 | 0354957 | |
| 3/4 | 19.05 | 20 | 18.5 | 75 | 141 | 90.5 | 4 | 1 | 0640326 | 1) |
| | 20.00 | 20 | 19.5 | 75 | 141 | 90.5 | 4 | 1 | 0354988 | |
| | 22.00 | 20 | 19.5 | 75 | 141 | 90.5 | 5 | 1 | 0354995 | |
| | 25.00 | 25 | 24.5 | 90 | 166 | 109.5 | 5 | 1 | 0355008 | |
| 1“ | 25.40 | 25 | 24.5 | 90 | 166 | 109.5 | 5 | 1 | 0640340 | 1) |
| | 28.00 | 25 | 24.5 | 90 | 166 | 109.5 | 6 | 1 | 0355015 | |
| | 30.00 | 25 | 24.5 | 90 | 166 | 109.5 | 6 | 1 | 0355046 | |
| | 32.00 | 32 | 31.5 | 106 | 186 | 125.5 | 6 | 1 | 0355053 | |
| | 40.00 | 40 | 39.0 | 125 | 217 | 146.5 | 6 | 1 | 0609309 | 2)3) |

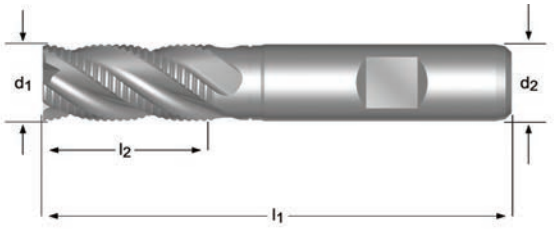
[1] Diameter tolerance +.0025 inches / -.0005 inches • [2] Available in HSCo only • [3] Not Center Cutting

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

HSS-E (Cobalt), Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers.

**C608** Bright finish

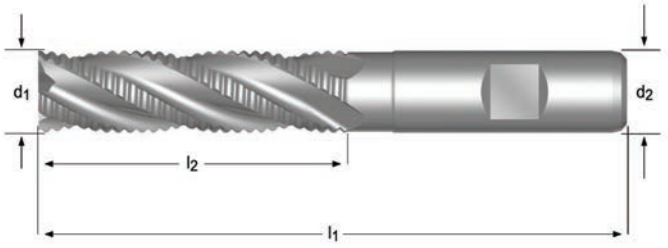
**C609** TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.




| $d_1$ 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 |

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

HSS-E (Cobalt), Roughing, Fine Profile, provides a stronger edge and runs longer than conventional coarse profile roughers. Bright finish.




### C613

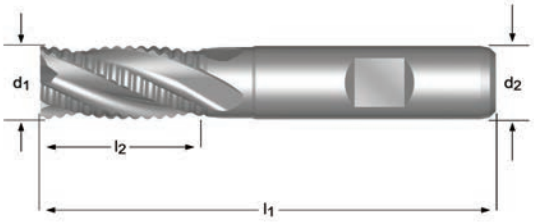
| $d_1$ Ø Inch | $d_1$ decimal Inch | $l_2$ Inch | $l_1$ Inch | $d_2$ Ø Inch | # of Flutes | Pack Qty | C613 |
|---|---|---|---|---|---|---|---|
| 1/4 | 0.2500 | 1.1/4 | 3.1/8 | 3/8 | 4 | 1 | 7647961 |
| 3/8 | 0.3750 | 1.1/2 | 3.1/4 | 3/8 | 4 | 1 | 7647962 |
| 1/2 | 0.5000 | 2“ | 4“ | 1/2 | 4 | 1 | 7647963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

# Multi-Flute Cobalt End Mills

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

**C610** HSS-E (Cobalt), Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.

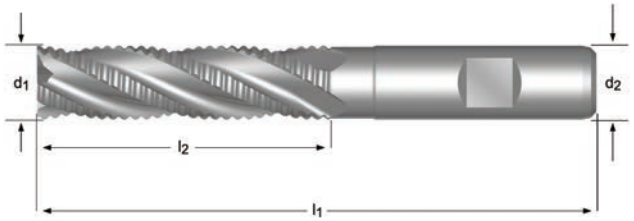
**C611** HSS-E (Cobalt), TiCN coating lowers the coefficient of friction and improves wear resistance on the end mill.




| $d_1$ 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

HSS-E (Cobalt), Roughing, Coarse Profile, for maximum metal removal in one pass. Bright finish.

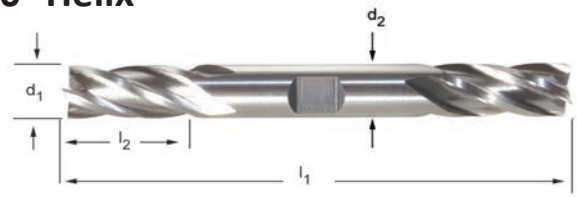



## C612

| $d_1$ 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 |

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

HSS-E (Cobalt), Double end provides two cutting ends in one tool. Bright finish improves chip flow in soft or non-ferrous materials.

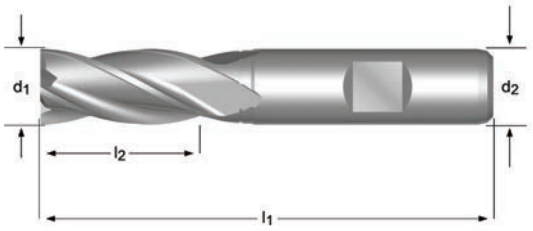



### C614

| $d_1$ 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 |

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

HSS-E (Cobalt), Bright finish improves chip flow in soft or non-ferrous materials.

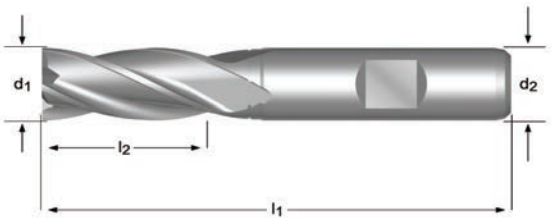



### C615

| $d_1$ 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

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

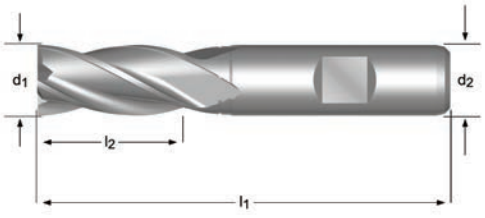



### C617

| $d_1$ 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 |

## Long Length, Square End, Weldon Shank

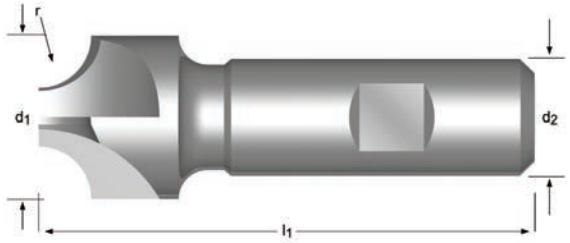
HSS-E (Cobalt) finishing style for high strength heat resistant materials, stainless and alloy steels, super alloys, and titanium alloys.




### C618

| $d_1$ 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 |

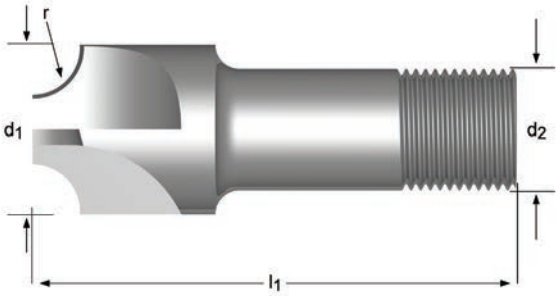
HSS-E (Cobalt), Corner rounding for cutting external radius on part. Bright finish improves chip flow in soft non-ferrous materials. Metric radius sizes on common metric shanks with Weldon Flats.




## C700

| r | $d_1$ Ø | $d_2$ Ø$h_6$ | $l_1$ | | C700 |
|---|---|---|---|---|---|
| mm | mm | mm | mm | z | |
| 1.00 | 10 | 10 | 60 | 4 | C7001.0 |
| 1.50 | 10 | 10 | 60 | 4 | C7001.5 |
| 2.00 | 10 | 10 | 60 | 4 | C7002.0 |
| 2.50 | 10 | 10 | 60 | 4 | C7002.5 |
| 3.00 | 12 | 12 | 60 | 4 | C7003.0 |
| 3.50 | 12 | 12 | 60 | 4 | C7003.5 |
| 4.00 | 15 | 12 | 60 | 4 | C7004.0 |
| 5.00 | 18 | 16 | 70 | 4 | C7005.0 |
| 6.00 | 21 | 16 | 70 | 4 | C7006.0 |
| 7.00 | 24 | 16 | 70 | 4 | C7007.0 |
| 8.00 | 24 | 16 | 70 | 4 | C7008.0 |
| 9.00 | 28 | 20 | 85 | 4 | C7009.0 |
| 10.00 | 28 | 20 | 85 | 4 | C70010.0 |
| 12.00 | 35 | 20 | 100 | 4 | C70012.0 |
| 12.50 | 35 | 20 | 100 | 4 | C70012.5 |
| 14.00 | 42 | 25 | 100 | 4 | C70014.0 |
| 15.00 | 48 | 25 | 105 | 5 | C70015.0 |
| 16.00 | 48 | 25 | 105 | 5 | C70016.0 |
| 20.00 | 60 | 32 | 115 | 6 | C70020.0 |

HSS, Corner rounding for cutting external radius on part. Bright finish improves chip flow in soft non-ferrous materials. Fractional radius sizes on std. Inch size cylindrical shanks with threaded ends. Cylindrical shank can be used in std. chucks or threaded portion can be used in "Autolock Chuck" system which has mating internal threads for extra rigidity.




## C710

| r | $d_1$ Ø | $d_2$ Ø$h_8$ | $d_2$ Ø | $l_1$ | | C710 |
|---|---|---|---|---|---|---|
| Inch | Inch | Inch | mm | mm | z | |
| 1/16 | 3/8 | 3/8 | 9.53 | 60.5 | 4 | C7101/16 |
| 1/8 | 1/2 | 1/2 | 12.70 | 60.5 | 4 | C7101/8 |
| 5/32 | 9/16 | 1/2 | 12.70 | 60.5 | 4 | C7105/32 |
| 3/16 | 5/8 | 5/8 | 15.88 | 60.5 | 4 | C7103/16 |
| 1/4 | 7/8 | 5/8 | 15.88 | 63.5 | 4 | C7101/4 |
| 3/8 | 1.1/16 | 1“ | 25.40 | 76.0 | 4 | C7103/8 |
| 1/2 | 1.3/8 | 1“ | 25.40 | 82.5 | 4 | C7101/2 |

# Rotary Burr Nomenclature

| Position 1 | |
|---|---|
| Shape | |
| Code | Description |
| SA | Cylinder Without End Cut |
| SB | Cylinder With End Cut |
| SC | Cylinder With Ball Nose |
| SD | Ball |
| SE | Oval |
| SF | Tree - Radius End |
| SG | Tree - Pointed End |
| SH | Flame |
| SJ | 60° Cone |
| SK | 90° Cone |
| SL | Taper - Radius End |
| SM | Taper - Pointed End |
| SN | Inverted Cone |
| FGR | Fiber Glass Router |
| PDM | Piloted Die Mill |
| SET | Plastic Box Set |

| Position 2 | | |
|---|---|---|
| Cutting Diameter | | |
| Code | Description | |
| | Fractional | Decimal |
| 04 | 1/16" | 0.0625 |
| 03 | 3/32" | 0.0938 |
| 02 | 1/8" | 0.1250 |
| 01 | 3/16" | 0.1875 |
| 10 | 1/4" | 0.2500 |
| 20 | 5/16" | 0.3125 |
| 30 | 3/8" | 0.3750 |
| 40 | 7/16" | 0.4375 |
| 50 | 1/2" | 0.5000 |
| 60 | 5/8" | 0.6250 |
| 70 | 3/4" | 0.7500 |
| 80 | 7/8" | 0.8750 |
| 90 | 1" | 1.0000 |

| Position 3 | |
|---|---|
| Length-of-Cut | |
| Code | Description |
| S | Short |
| - | Regular |
| M | Medium |
| L | Long |
| X | Extra Long |

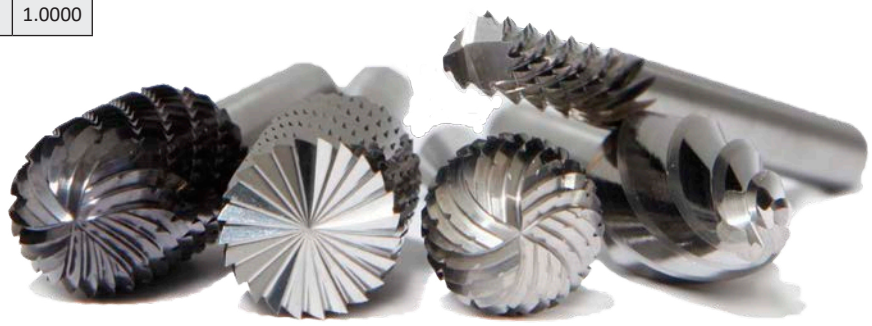
| Position 4 | |
|---|---|
| Cut Type | |
| Code | Description |
| DC | Double Cut |
| FM | Aluminum Cut |

| End Type | |
|---|---|
| Code | Description |
| A | Plainend |
| B | Burrend |
| C | Millend |
| D | Drillend |

| Position 5 | |
|---|---|
| Over-All-Length | |
| Code | Description |
| S | Short |
| - | Regular |
| M | Medium |
| L | Long |
| X | Extra Long |

| | |
|---|---|
| 8 | 8 pc. Set |
| 12 | 12 pc. Set |

| Position 6 | |
|---|---|
| Shank Diameter | |
| Code | Description |
| R | Reduced |
| - | Standard |
| H | Heavy Duty |



## Features & Benefits

- **The combination of premium grade materials for both the shank and head, with precise production process, results in the creation of a consistent and secure program of tools.**
- **Material specific designs offer up to 50% higher metal removal rates over standard carbide burrs.**

## Solid Carbide Construction

- Provides rigidity and strength
- Resulting in improved tool life
- Ground to $h_6$ tolerance for accurate holding
- Prevents bending and reduces vibrations

## Brazed Construction

- Toughness results in improved tool life
- Hardened steel shanks ground to +0.0000/-0.0005”
- Special brazing elements provide excellent braze
- strength and impact strength, able to withstand high cutting forces
- Able to withstand higher temperatures during operation without failing

## SA-DC



- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SA-04DC | 1/16 | 1/8 | 1/4 | 1.1/2 | 7466184 | 2) |
| SA-03DC | 3/32 | 1/8 | 7/16 | 1.1/2 | 7466185 | 2) |
| SA-02DC | 1/8 | 1/8 | 9/16 | 1.1/2 | 7466186 | 2) |
| SA-02DC-M | 1/8 | 1/8 | 9/16 | 2 | 7466187 | 2) |
| SA-02DC-L | 1/8 | 1/8 | 9/16 | 3 | 7466188 | 2) |
| SA-01DC-H | 3/16 | 1/4 | 5/8 | 2 | 7466189 | 2) |
| SA-10SDC | 1/4 | 1/8 | 1/2 | 2 | 7466210 | 1) 3) |
| SA-10DC | 1/4 | 1/4 | 5/8 | 2 | 7466211 | 2) |
| SA-10LDC | 1/4 | 1/4 | 1 | 2 | 7466212 | 2) |
| SA-20DC | 5/16 | 1/4 | 3/4 | 2.1/2 | 7466213 | 1) 3) |
| SA-30DC | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466214 | 1) 3) |
| SA-30DCX | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466215 | 1) 3) |
| SA-50DC | 1/2 | 1/4 | 1 | 2.3/4 | 7466216 | 1) 3) |
| SA-50DCX | 1/2 | 1/4 | 1 | 7 | 7466217 | 1) 3) |
| SA-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466218 | 1) 3) |
| SA-70SDC-S | 3/4 | 1/4 | 3/4 | 2.1/2 | 7466219 | 1) 3) |
| SA-70DC | 3/4 | 1/4 | 1 | 2.3/4 | 7466220 | 1) 3) |
| SA-90DC | 1 | 1/4 | 1 | 2.3/4 | 7466221 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SA-FM



- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SA-10FM | 1/4 | 1/4 | 5/8 | 2 | 7466222 | 2) |
| SA-30FM | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466223 | 1) 3) |
| SA-50FM | 1/2 | 1/4 | 1 | 2.3/4 | 7466224 | 1) 3) |
| SA-60FM | 5/8 | 1/4 | 1 | 2.3/4 | 7466225 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Cylinder with Endcut

## SB-DC



- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SB-02DC | 1/8 | 1/8 | 9/16 | 1.1/2 | 7466226 | 2) |
| SB-02DC-M | 1/8 | 1/8 | 9/16 | 2 | 7466227 | 2) |
| SB-10SDC-L | 1/4 | 1/8 | 3/16 | 1.11/16 | 7466228 | 1) 3) |
| SB-02DC-H | 1/8 | 1/4 | 5/8 | 2 | 7466229 | 2) |
| SB-10DC | 1/4 | 1/4 | 5/8 | 2 | 7466230 | 2) |
| SB-20DC | 5/16 | 1/4 | 3/4 | 2.1/2 | 7466231 | 1) 3) |
| SB-30DC | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466232 | 1) 3) |
| SB-30MDC-M | 3/8 | 1/4 | 1 | 2.3/4 | 7466233 | 1) 3) |
| SB-30DC-X | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466234 | 1) 3) |
| SB-40DC | 7/16 | 1/4 | 1 | 2.3/4 | 7466235 | 1) 3) |
| SB-50DC | 1/2 | 1/4 | 1 | 2.3/4 | 7466236 | 1) 3) |
| SB-50DC-X | 1/2 | 1/4 | 1 | 7 | 7466237 | 1) 3) |
| SB-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466238 | 1) 3) |
| SB-70DC | 3/4 | 1/4 | 1 | 2.3/4 | 7466239 | 1) 3) |
| SB-90DC | 1 | 1/4 | 1 | 2.3/4 | 7466240 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SB-FM



- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SB-10FM | 1/4 | 1/4 | 5/8 | 2 | 7466241 | 1) 3) |
| SB-30FM | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466242 | 2) |
| SB-50FM | 1/2 | 1/4 | 1 | 2.3/4 | 7466243 | 2) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SC-DC



- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SC-03DC | 3/32 | 1/8 | 7/16 | 1.1/2 | 7466244 | 2) |
| SC-02DC | 1/8 | 1/8 | 9/16 | 1.1/2 | 7466245 | 2) |
| SC-02DC-M | 1/8 | 1/8 | 9/16 | 2 | 7466246 | 2) |
| SC-02DC-L | 1/8 | 1/8 | 9/16 | 3 | 7466247 | 2) |
| SC-02MDC | 1/8 | 1/4 | 5/8 | 2 | 7466248 | 2) |
| SC-01DC | 3/16 | 1/4 | 5/8 | 2 | 7466249 | 2) |
| SC-10SDC | 1/4 | 1/8 | 1/2 | 2 | 7466250 | 2) |
| SC-10DC | 1/4 | 1/4 | 5/8 | 2 | 7466251 | 2) |
| SC-10LDC | 1/4 | 1/4 | 1 | 2 | 7466252 | 2) |
| SC-20DC | 5/16 | 1/4 | 3/4 | 2.1/2 | 7466253 | 1) 3) |
| SC-30DC | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466254 | 1) 3) |
| SC-30DC-X | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466255 | 1) 3) |
| SC-40DC | 7/16 | 1/4 | 1 | 2.3/4 | 7466256 | 1) 3) |
| SC-50DC | 1/2 | 1/4 | 1 | 2.3/4 | 7466257 | 1) 3) |
| SC-50DC-X | 1/2 | 1/4 | 1 | 7 | 7466258 | 1) 3) |
| SC-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466259 | 1) 3) |
| SC-60DC-X | 5/8 | 1/4 | 1 | 7 | 7466260 | 1) 3) |
| SC-70DC | 3/4 | 1/4 | 1 | 2.3/4 | 7466261 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SC-FM



- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SC-10SFM-R | 1/4 | 1/8 | 1/2 | 2 | 7466262 | 1) 3) |
| SC-10FM | 1/4 | 1/4 | 5/8 | 2 | 7466263 | 2) |
| SC-30FM | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466264 | 1) 3) |
| SC-40FM | 7/16 | 1/4 | 1 | 2.3/4 | 7466265 | 1) 3) |
| SC-50FM | 1/2 | 1/4 | 1 | 2.3/4 | 7466266 | 1) 3) |
| SC-50FM-X | 1/2 | 1/4 | 1 | 7 | 7466267 | 1) 3) |
| SC-70FM | 3/4 | 1/4 | 1 | 2.3/4 | 7466268 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Ball

## SD-DC



- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SD-03DC | 3/32 | 1/8 | 3/32 | 1.1/2 | 7466269 | 2) |
| SD-02DC | 1/8 | 1/8 | 1/8 | 1.1/2 | 7466270 | 2) |
| SD-02DC-M | 1/8 | 1/8 | 1/8 | 2 | 7466271 | 2) |
| SD-02DC-L | 1/8 | 1/8 | 1/8 | 3 | 7466272 | 2) |
| SD-02SDC | 1/8 | 1/4 | 3/32 | 2 | 7466273 | 2) |
| SD-02LDC | 1/8 | 1/4 | 3/32 | 2 | 7466274 | 2) |
| SD-01DC | 3/16 | 1/4 | 1/8 | 2 | 7466275 | 2) |
| SD-10DC-R | 1/4 | 1/8 | 7/32 | 1.3/4 | 7466276 | 1) 3) |
| SD-10DC | 1/4 | 1/4 | 7/32 | 2 | 7466277 | 2) |
| SD-10DC-L | 1/4 | 1/4 | 7/32 | 6 | 7466278 | 2) |
| SD-10DC-X | 1/4 | 1/4 | 7/32 | 6.3/4 | 7466279 | 2) |
| SD-20DC | 5/16 | 1/4 | 1/4 | 2.1/16 | 7466280 | 1) 3) |
| SD-30DC | 3/8 | 1/4 | 5/16 | 2.1/8 | 7466281 | 1) 3) |
| SD-30DC-X | 3/8 | 1/4 | 5/16 | 6.3/8 | 7466282 | 1) 3) |
| SD-50DC | 1/2 | 1/4 | 7/16 | 2.1/4 | 7466283 | 1) 3) |
| SD-50DC-X | 1/2 | 1/4 | 7/16 | 6.1/2 | 7466284 | 1) 3) |
| SD-60DC | 5/8 | 1/4 | 9/16 | 2.5/16 | 7466285 | 1) 3) |
| SD-70DC | 3/4 | 1/4 | 11/16 | 2.1/2 | 7466286 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SD-FM



- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SD-10FM | 1/4 | 1/4 | 7/32 | 2 | 7466287 | 2) |
| SD-30FM | 3/8 | 1/4 | 5/16 | 2.1/8 | 7466288 | 1) 3) |
| SD-50FM | 1/2 | 1/4 | 7/16 | 2.1/4 | 7466289 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SE-DC



- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SE-02DC | 1/8 | 1/8 | 7/32 | 1.1/2 | 7466290 | 2) |
| SE-10DC-R | 1/4 | 1/8 | 3/8 | 1.3/4 | 7466291 | 1) 3) |
| SE-10DC | 1/4 | 1/4 | 3/8 | 2 | 7466292 | 2) |
| SE-10DC-X | 1/4 | 1/4 | 3/8 | 6.3/4 | 7466293 | 2) |
| SE-30DC | 3/8 | 1/4 | 5/8 | 2.3/8 | 7466294 | 1) 3) |
| SE-30DC-X | 3/8 | 1/4 | 5/8 | 6.5/8 | 7466295 | 1) 3) |
| SE-50DC | 1/2 | 1/4 | 7/8 | 2.5/8 | 7466296 | 1) 3) |
| SE-50DC-X | 1/2 | 1/4 | 7/8 | 6.7/8 | 7466297 | 1) 3) |
| SE-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466298 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SE-FM



- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics

| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SE-30FM | 3/8 | 1/4 | 5/8 | 2.3/8 | 7466287 | 1) 3) |
| SE-30FM-X | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466288 | 1) 3) |
| SE-50FM | 1/2 | 1/4 | 7/8 | 2.5/8 | 7466289 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Ball Nosed Tree

## SF-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SF-02DC | 1/8 | 1/8 | 1/4 | 1.1/2 | 7466302 | 2) |
| SF-02LDC | 1/8 | 1/8 | 1/2 | 1.1/2 | 7466303 | 2) |
| SF-10DC-R | 1/4 | 1/8 | 1/2 | 2 | 7466304 | 1) 3) |
| SF-10DC | 1/4 | 1/4 | 5/8 | 2 | 7466305 | 2) |
| SF-10DC-X | 1/4 | 1/4 | 5/8 | 6.3/4 | 7466306 | 2) |
| SF-30DC | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466307 | 1) 3) |
| SF-30DC-X | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466308 | 1) 3) |
| SF-40DC | 7/16 | 1/4 | 1 | 2.3/4 | 7466309 | 1) 3) |
| SF-50DC | 1/2 | 1/4 | 1 | 2.3/4 | 7466310 | 1) 3) |
| SF-50DC-X | 1/2 | 1/4 | 1 | 7 | 7466311 | 1) 3) |
| SF-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466312 | 1) 3) |
| SF-70DC | 3/4 | 1/4 | 1 | 2.3/4 | 7466313 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SF-FM

- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SF-10FM-R | 1/4 | 1/8 | 1/2 | 2 | 7466314 | 1) 3) |
| SF-10FM | 1/4 | 1/4 | 5/8 | 2 | 7466315 | 2) |
| SF-30FM | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466316 | 1) 3) |
| SF-50FM | 1/2 | 1/4 | 1 | 2.3/4 | 7466317 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SG-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SG-02DC | 1/8 | 1/8 | 1/4 | 1.1/2 | 7466318 | 2) |
| SG-02MDC | 1/8 | 1/8 | 3/8 | 1.1/2 | 7466319 | 2) |
| SG-02LDC | 1/8 | 1/8 | 1/2 | 1.1/2 | 7466320 | 2) |
| SG-10DC-R | 1/4 | 1/8 | 1/2 | 2 | 7466321 | 1) 3) |
| SG-10DC | 1/4 | 1/4 | 5/8 | 2 | 7466322 | 2) |
| SG-20DC | 5/16 | 1/4 | 3/4 | 2.1/2 | 7466323 | 1) 3) |
| SG-30DC | 3/8 | 1/4 | 3/4 | 2.1/2 | 7466324 | 1) 3) |
| SG-30DC-X | 3/8 | 1/4 | 3/4 | 6.3/4 | 7466325 | 1) 3) |
| SG-50SDC | 1/2 | 1/4 | 3/4 | 2.1/2 | 7466326 | 1) 3) |
| SG-50DC | 1/2 | 1/4 | 1 | 2.3/4 | 7466327 | 1) 3) |
| SG-50DC-X | 1/2 | 1/4 | 1 | 7 | 7466328 | 1) 3) |
| SG-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 7466329 | 1) 3) |
| SG-70DC | 3/4 | 1/4 | 1 | 2.3/4 | 7466330 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Flame

## SH-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | EDP# | |
|---|---|---|---|---|---|---|
| SH-02DC | 1/8 | 1/8 | 1/4 | 1.1/2 | 7466331 | 2) |
| SH-10DC | 1/4 | 1/4 | 1/2 | 2 | 7466332 | 2) |
| SH-20DC | 5/16 | 1/4 | 3/4 | 2.1/2 | 7466333 | 1) 3) |
| SH-50DC | 1/2 | 1/4 | 1.1/4 | 3 | 7466334 | 1) 3) |
| SH-60DC | 5/8 | 1/4 | 1.7/16 | 3.3/16 | 7466335 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - 60° Countersink

## SJ-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SJ-02DC | 1/8 | 1/8 | 3/32 | 1.1/2 | 60° | 7466336 | 2) |
| SJ-10DC | 1/4 | 1/4 | 3/16 | 2 | 60° | 7466337 | 2) |
| SJ-30DC | 3/8 | 1/4 | 5/16 | 2.1/16 | 60° | 7466338 | 1) 3) |
| SJ-50DC | 1/2 | 1/4 | 7/16 | 2.3/16 | 60° | 7466339 | 1) 3) |
| SJ-60DC | 5/8 | 1/4 | 9/16 | 2.5/16 | 60° | 7466340 | 1) 3) |

1) Brazed Construction
2) Shank tolerance h6
3) Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - 90° Countersink

## SK-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SK-02DC | 1/8 | 1/8 | 3/32 | 1.1/2 | 90° | 7466341 | 2) |
| SK-10DC | 1/4 | 1/4 | 3/16 | 2 | 90° | 7466342 | 2) |
| SK-30DC | 3/8 | 1/4 | 5/16 | 2.1/16 | 90° | 7466343 | 1) 3) |
| SK-50DC | 1/2 | 1/4 | 7/16 | 2.3/16 | 90° | 7466344 | 1) 3) |
| SK-60DC | 5/8 | 1/4 | 9/16 | 2.5/16 | 90° | 7466345 | 1) 3) |

1) Brazed Construction
2) Shank tolerance h6
3) Shank tolerance +0.0000 / -0.0005“

## SL-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SL-02SDC | 1/8 | 1/8 | 3/8 | 1.1/2 | 8° | 7466346 | 2) |
| SL-02DC | 1/8 | 1/8 | 1/2 | 1.1/2 | 8° | 7466347 | 2) |
| SL-10DC | 1/4 | 1/4 | 5/8 | 2 | 14° | 7466348 | 2) |
| SL-20DC | 5/16 | 1/4 | 7/8 | 2.5/8 | 14° | 7466349 | 1) 3) |
| SL-30DC | 3/8 | 1/4 | 1.1/16 | 2.13/16 | 14° | 7466350 | 1) 3) |
| SL-30DC-X | 3/8 | 1/4 | 1.1/16 | 7.1/16 | 14° | 7466351 | 1) 3) |
| SL-40DC | 1/2 | 1/4 | 1.1/8 | 2.7/8 | 14° | 7466352 | 1) 3) |
| SL-40DC-X | 1/2 | 1/4 | 1.1/8 | 7.1/8 | 14° | 7466353 | 1) 3) |
| SL-50DC | 5/8 | 1/4 | 1.3/16 | 2.15/16 | 14° | 7466354 | 1) 3) |
| SL-60DC | 5/8 | 1/4 | 1.5/16 | 3.1/16 | 14° | 7466355 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

## SL-FM

- Solid Carbide or Brazed Construction
- Bright finish
- Aluminum cut for non-ferrous materials including plastics



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SL-30FM | 3/8 | 1/4 | 1.1/16 | 2.13/16 | 14° | 7466356 | 1) 3) |
| SL-40FM | 1/2 | 1/4 | 1.1/8 | 2.7/8 | 14° | 7466357 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Cone

## SM-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SM-02SDC | 1/8 | 1/8 | 11/32 | 1.1/2 | 12° | 7466358 | 2) |
| SM-02DC | 1/8 | 1/8 | 7/16 | 1.1/2 | 14° | 7466359 | 2) |
| SM-02LDC | 1/8 | 1/8 | 5/8 | 1.1/2 | 7° | 7466360 | 2) |
| SM-02LDC-M | 1/8 | 1/8 | 5/8 | 2 | 7° | 7466361 | 2) |
| SM-02LDC-L | 1/8 | 1/8 | 5/8 | 3 | 7° | 7466362 | 2) |
| SM-10DC-R | 1/4 | 1/8 | 1/2 | 2.1/8 | 22° | 7466363 | 1) 3) |
| SM-10DC | 1/4 | 1/4 | 1/2 | 2 | 22° | 7466364 | 2) |
| SM-10MDC | 1/4 | 1/4 | 3/4 | 2 | 14° | 7466365 | 1) 3) |
| SM-10LDC | 1/4 | 1/4 | 1 | 2 | 12° | 7466366 | 1) 3) |
| SM-10XDC | 1/4 | 1/4 | 1.1/4 | 2 | 10° | 7466367 | 1) 3) |
| SM-30DC | 3/8 | 1/4 | 5/8 | 2.1/2 | 28° | 7466368 | 1) 3) |
| SM-50DC | 1/2 | 1/4 | 7/8 | 2.5/8 | 28° | 7466369 | 1) 3) |
| SM-60DC | 5/8 | 1/4 | 1 | 2.3/4 | 31° | 7466370 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - Inverted Cone

## SN-DC

- Solid Carbide or Brazed Construction
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | Included Angle | EDP# | |
|---|---|---|---|---|---|---|---|
| SN-02DC | 1/8 | 1/8 | 3/16 | 1.1/2 | 10° | 7466371 | 2) |
| SN-10SDC | 1/4 | 1/8 | 1/4 | 1.3/4 | 10° | 7466372 | 1) 3) |
| SN-10DC | 1/4 | 1/4 | 5/16 | 2 | 10° | 7466373 | 2) |
| SN-30DC | 3/8 | 1/4 | 3/8 | 2.1/8 | 13° | 7466374 | 1) 3) |
| SN-50DC | 1/2 | 1/4 | 1/2 | 2.1/4 | 28° | 7466375 | 1) 3) |
| SN-60DC | 5/8 | 1/4 | 3/4 | 2.1/2 | 18° | 7466376 | 1) 3) |

[1] Brazed Construction
[2] Shank tolerance h6
[3] Shank tolerance +0.0000 / -0.0005“

# Rotary Burr - For Bolt Removal

A specially designed range of burrs to prepare the surface of broken bolts to improve drill location and prevent damaging the threaded hole and component.



## P100

- Solid Carbide or Brazed Construction
- Plain cylinder with end cut

| Ecode | Cutting Diameter Metric | Shank Diameter Metric | Length of Cut Metric | Overall Length Metric |  | EDP# |
|---|---|---|---|---|---|---|
| P1004.9 | 4.90 | 6 | 20 | 50 | 1/4-20, 24, 28, M6 | 7806111 |
| P1006.4 | 6.40 | 6 | 5 | 50 | 5/16-18, 24, 32, M8 | 7806112 |
| P1007.8 | 7.80 | 6 | 19 | 65 | 3/8-16, 24, M10 | 7806113 |
| P1009.3 | 9.30 | 6 | 19 | 65 | 7/16-14, 20, M12 | 7806114 |
| P10010.7 | 10.70 | 6 | 25 | 70 | 1/2-13, 20, M14 | 7806115 |

## P101

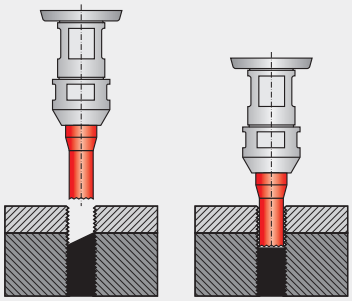


- Solid Carbide or Brazed Construction
- 150° Countersink

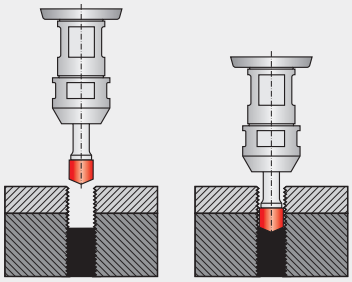
| Ecode | Cutting Diameter Metric | Shank Diameter Metric | Length of Cut Metric | Overall Length Metric |  | EDP# |
|---|---|---|---|---|---|---|
| P1014.9 | 4.90 | 6 | 20 | 50 | 1/4-20, 24, 28, M6 | 7806116 |
| P1016.4 | 6.40 | 6 | 5 | 50 | 5/16-18, 24, 32, M8 | 7806117 |
| P1017.8 | 7.80 | 6 | 5 | 50 | 3/8-16, 24, M10 | 7806118 |
| P1019.3 | 9.30 | 6 | 5 | 50 | 7/16-14, 20, M12 | 7806119 |
| P10110.7 | 10.70 | 6 | 5 | 50 | 1/2-13, 20, M14 | 7806120 |

## OPERATIONS

1



2



## CUT STYLES

**PLAIN CYLINDER WITH END CUT**



**150° COUNTERSINK**



# Diamond Cut Router - Plain End

## FGR-A

- Solid Carbide
- Bright finish
- GRP cut for fiberglass and composite materials



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | FGR-A EDP# | |
|---|---|---|---|---|---|---|
| FGR-10A | 1/4 | 1/4 | 3/4 | 2.1/2 | 7466377 | 1) |
| FGR-10A-L | 1/4 | 1/4 | 1 | 3 | 7466378 | 1) |
| FGR-30A | 3/8 | 3/8 | 1 | 2.1/2 | 7466379 | 1) |

1) Shank tolerance h6

# Diamond Cut Router - Burr End

## FGR-B

- Solid Carbide
- Bright finish
- End Cut
- GRP cut for fiberglass and composite materials



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | FGR-B EDP# | |
|---|---|---|---|---|---|---|
| FGR-10B | 1/4 | 1/4 | 3/4 | 2 | 7466380 | 1) |
| FGR-10B-L | 1/4 | 1/4 | 1 | 3 | 7466381 | 1) |
| FGR-30B | 3/8 | 3/8 | 1 | 2.1/2 | 7466382 | 1) |
| FGR-50B | 1/2 | 1/2 | 1 | 3 | 7466383 | 1) |

1) Shank tolerance h6

# Diamond Cut Router - End Mill Cut

## FGR-C

- Solid Carbide
- Bright finish
- GRP cut for fiberglass and composite materials



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | FGR-C EDP# | |
|---|---|---|---|---|---|---|
| FGR-02C | 1/8 | 1/8 | 1/2 | 1.1/2 | 7466384 | 1) |
| FGR-10C | 1/4 | 1/4 | 1 | 2.1/2 | 7466385 | 1) |
| FGR-10C-L | 1/4 | 1/4 | 1 | 3 | 7466386 | 1) |

1) Shank tolerance h6

# Diamond Cut Router - 135° Drill Point

## FGR-D

- Solid Carbide
- Bright finish
- GRP cut for fiberglass and composite materials



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | FGR-D EDP# | |
|---|---|---|---|---|---|---|
| FGR-10LD-L | 1/4 | 1/4 | 1 | 3 | 7466387 | 1) |
| FGR-10MD-L | 1/4 | 1/4 | 3/4 | 3 | 7466388 | 1) |
| FGR-10XD-L | 1/4 | 1/4 | 1.1/2 | 3 | 7466389 | 1) |

1) Shank tolerance h6

# Piloted Die Mill

## PDM-DC

- Solid Carbide
- Bright finish
- Double cut for general purpose use



| Ecode | Cutting Diameter Inch | Shank Diameter Inch | Length of Cut Inch | Overall Length Inch | PDM-DC EDP# | |
|---|---|---|---|---|---|---|
| PDM-02DC | 1/8 | 1/8 | 1 | 3 | 7466390 | 1) |
| PDM-01DC | 3/16 | 3/16 | 2 | 3 | 7466391 | 1) |
| PDM-10DC | 1/4 | 1/4 | 1.1/4 | 3 | 7466392 | 1) |

1) Shank tolerance h6

# Rotary Burr Set

## SET-DC-12



- 12 pc set
- Double cut for general purpose use
- Extra small diameter - edp# 7466393
- Medium diameter - edp# 7466394

| Styles in Set | Pieces in Set | Ecodes in Set | SET-DC-12 EDP# |
|---|---|---|---|
| SA-DC (2) + SC-DC (2) + SD-DC + SE-DC + SF-DC + SG-DC + SH-DC + SJ-DC + SL-DC + SN-DC | 12 | SA-03DC + SA-02DC + SC-03DC + SC-02DC + SD-02DC + SE-02DC + SF-02DC + SG-02DC + SH-02DC + SJ-02DC + SL-02DC + SN-02DC | 7466393 |
| SA-DC + SC-DC + SD-DC + SE-DC + SF-DC + SG-DC + SH-DC + SJ-DC + SK-DC + SL-DC + SM-DC + SN-DC | 12 | SA-10DC + SC-10DC + SD-10DC + SE-10DC + SF-10DC + SG-10DC + SH-10DC + SJ-10DC + SK-10DC + SL-10DC + SM-10DC + SN-10DC | 7466394 |

## SET-DC-8



- 8 pc set
- Double cut for general purpose use
- Medium / Large diameter

| Styles in Set | Pieces in Set | Ecodes in Set | SET-DC-8 EDP# |
|---|---|---|---|
| SA-DC + SC-DC (2) + SD-DC + SF-DC(2) + SG-DC + SL-DC | 8 | SA-50DC + SC-30DC + SC-50DC + SD-50DC + SF-30DC + SF-50DC + SG-30DC + SL-40DC | 7466395 |

## SET-FM-8



- 8 pc set
- Aluminum cut for non-ferrous materials including plastics
- Medium / Large diameter

| Styles in Set | Pieces in Set | Ecodes in Set | SET-FM-8 EDP# |
|---|---|---|---|
| SA-FM (2) + SC-FM + SD-FM (2) + SF-FM(2) + SL-FM | 8 | SA-10FM + SA-50FM + SC-50FM + SD-10FM + SD-50FM + SF-10FM + SF-50FM + SL-40FM | 7466396 |

# Recommended Speed (RPM) for Burrs

The following RPM chart holds general and approximate recommendations.
Variations to achieve desired results may be necessary.
Long shank burrs should be used at reduced speeds.
25% - 33% of normal speed is suggested.

| Burr Diameter | RPM |
|---|---|
| 1/8" Solid Carbide | 45,000-50,000 |
| 3/16" Solid Carbide | 35,000-40,000 |
| 3/16" Carbide Head Brazed to 1/8" Steel Shank | 30,000-35,000 |
| 1/4" Solid Carbide | 30,000-35,000 |
| 1/4" Carbide Head Brazed to 1/8" Steel Shank | 25,000-30,000 |
| 5/16" Carbide Head Brazed to 1/4" Steel Shank | 25,000-30,000 |
| 3/8" Carbide Head Brazed to 1/4" Steel Shank | 25,000-30,000 |
| 7/16" Carbide Head Brazed to 1/4" Steel Shank | 20,000-25,000 |
| 1/2" Carbide Head Brazed to 1/4" Steel Shank | 20,000-25,000 |
| 5/8" Carbide Head Brazed to 1/4" Steel Shank | 15,000-20,000 |
| 3/4" Carbide Head Brazed to 1/4" Steel Shank | 15,000-20,000 |
| 1" Carbide Head Brazed to 1/4" Steel Shank | 12,000-18,000 |

# Rotary Burr Troubleshooting

**Carbide Burrs - Troubleshooting**

| | Excessive Force | Heat from Rubbing Shank | Dull Flutes | Seized/Against Workpiece | Tool Dropped | Poor Location in Collet | Worn Handpiece Bearings | Bent Shank | Poor Working Stability | Use Coarser Geometry | Use Finer Geometry | Use Double Cut or Chip Breaker Geometry | Soft Material - Lighten Feed | Increase RPMs | Decrease RPMs | Avoid Diamond Cut | Use Anti-stick compound | Faster Feed Rate | Slower Feed | Abrasive Material | Poor Set-up | Failure to Support/Engage Prior to RPM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Braze Failure | X | X | X | X | X | | | | | | | | | | | | | | | | | |
| Carbide Fracture | | | | X | X | | | | X | | | | | | | | | | | | | |
| Chipping | | | | X | X | | | | X | | | | | X | | | | | | | | |
| Handpiece Vibration | | | | | | | | | | | | | | X | X | | | X | X | | X | |
| Lack of Available Hand-piece RPMs | | | | | | | | | | | | X | | X | | | | | | | | |
| Plugging | | | | | | | | | | X | | | X | | | | X | | | | | |
| Poor Hand Control | | | | | | X | X | X | X | | X | X | | | | | | | | | X | |
| Poor Tool Life | | X | X | | | X | X | X | X | | | | | X | X | X | | X | X | X | X | |
| Poor Workpiece Finish | | | | | | X | X | X | X | | X | | | X | X | | | X | | | X | |
| Severely Bent Shanks of Long Series Burrs | | | | | | | | | | | | | | | | | | | | | X | X |
| Work Hardening of Workpiece | X | | X | | | | | | | X | | X | | | X | | | | X | | | |

# Semi-Special and Made-to-Order Taps

UNION BUTTERFIELD®

Dormer Pramet offers a unique value to your production process with the FlashTap service. Sold under the Union Butterfield brand, you have a selection of semi-special tap products that are quickly and reliably delivered in as fast as 24 hours to help solve your tap delivery requirements. Our expertise gives you optimal customer service at the lowest possible price.

FLASHTAP Service

## SEMI-SPECIAL TAPS

- Machine Screw Sizes (0 - #14)
- Fractional Sizes (1/8" - 4")

| Styles | Styles |
|---|---|
| Hand Taps - Straight Flute | Oversized Hand Taps |
| Spiral Point Taps | Spiral Flute Taps |
| Left-Hand Hand Taps | Double Lead Hand Taps |
| Oversized Spiral Point Taps | 55° Modified Whitworth Pipe |

- Metric Sizes (M1.5 - M100)
- Carried in classes 6H and 4H

| Styles | Styles |
|---|---|
| Hand Taps - Straight Flute | Oversized Spiral Point Taps |
| Spiral Point Taps | Oversized Hand Taps |
| Left-Hand Hand Taps | |

## MADE-TO-ORDER TAPS

| Styles | Styles |
|---|---|
| Tables 302,303 and 311 | Spiral Flute #3 - 1" |
| Straight Flute #0 - 1" | Pipe (Straight or Taper) |
| Straight Flute 1-1/16" - 2-1/2" | Thread Forming |

### SURFACE TREATMENTS AND COATINGS:

All taps are standard bright finish

- Additional cost & delivery time will apply to items that are Steam Oxide, Bronze Oxide & Nitride
- Additional cost & delivery time will apply to items that are coated. TiN, TiCn, ZrN & TiAlN



Most semi-special taps are shipped within 24 to 48 hours of receipt of order. Full special “Made-to-Order” taps are also quoted upon request. Email your requests to cs@dormerpramet.com

# SIMPLY RELIABLE

As a professional you can judge the quality of work by just looking at the chip. Our chip is a clean and uncomplicated shape that in itself tells a story. It is a clear and consistent signal and that's why we use it as a symbol for being **Simply Reliable**.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