

THE NEW VALUE FRONTIER



2015 | SOLID ROUND TOOLS CATALOG



SOLID ROUND CUTTING TOOLS

MICRO DIAMETER | SOLID CARBIDE | PRECISION ROTARY

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

ADVANCING PRODUCTIVITY

KYOCERA

ROTARY PRECISION TOOLS

Since 1987, Kyocera has designed and manufactured tight tolerance carbide cutting tools and miniature parts for a broad range of markets including the electronics, industrial, medical, automotive, and aerospace industries. We offer high-volume CNC grinding consistency in diameters from 0.0015" (38µm) to 0.500" (12.7mm), tolerances as tight as 0.000039" (.001 mm), superior surface finishes, and high performance coatings. Our history is rooted in precision micro tools. Since our inception, we continually provided the best micro tools and high performance, standard-sized rotary tools to manufacturing companies around the globe. Through our worldwide Kyocera network, we provide precision and high performance cutting tools to factories both large and small.



Our state-of-the-art manufacturing facilities in Costa Mesa, CA include over 65 Swiss-made Rollomatic, Saacke CNC grinding centers, and extensive automated optical inspection (AOI) to ensure quality and consistency. Every tool we build is CAD/CAM designed and has SPC lot traceability as our ISO 9001:2008 and 14001:2004 certifications require.

Partnering with Kyocera's solid rotary and micro tools will help with the strategic development of the entire machining process. Our business was founded on providing specially designed tooling solutions for our customers; and as we grow we continue to provide this value. We offer our customers technical support and recommendations regarding efficient tool applications, proper speeds and feeds, cutting oils, equipment selection, and overall machining process optimization. Upon implementation, we continue to work closely with our customers to further improve their machining capabilities.

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KYOCERA CUTTING TOOLS

GLOBAL FACILITIES NETWORK

NORTH AMERICA

Manufacturing Facilities



North Carolina Facility (USA)



Ohio Facility (USA)



California Facility (USA)

GLOBAL

Manufacturing Facilities



Okaya Facility (JAPAN)



Yokaichi Facility (JAPAN)



Sendai Facility (JAPAN)



Silong Facility (CHINA)



Incheon Facility (KOREA)

KYOCERA CUTTING TOOLS

GLOBAL TECHNICAL CENTERS



North American Technical Center (NC)



Sales & Technical Center (Germany)



Technical Center (BRAZIL)



Technical Center (SINGAPORE)



Technical Center (JAPAN)



Technical Center (CHINA)



Technical Center (JAPAN)



Technical Center (KOREA)



Technical Center (JAPAN)

KPTI Company Overview

Established in April 2014, KPTI unifies two of the world's leading cutting tool manufacturers, Kyocera Tycom Corporation (KTC) and the Cutting Tool Division of Kyocera Industrial Ceramics Corporation (KICC-CT).

The new company creates a combined enterprise that optimizes the strengths of both organizations and facilitates expansion of Kyocera's overall cutting tool-related business in North America. The new combined entity will unify cutting tool resources to create greater efficiencies while positioning the new organization for continued success.

Customers will benefit from a unified sales and support team offering improved customer service and an expanded portfolio of cutting tool products and solutions for the automotive, aerospace, general machining, medical, power generation, printed circuit board and steel markets.

KPTI North American Operations



Costa Mesa, CA

Wapakoneta, OH

Hendersonville, NC



Administration & Manufacturing

- Administration & Accounting Center
- Micro Tools & Round Tools Manufacturing
- Printed Circuit Board Drill Manufacturing
- Micro Tools & PCB Sales & Customer Service Center

Steel Tool Holder Manufacturing

- Indexable Drills
- Milling End Mills & Face Mills
- Boring Bars
- Turning and Grooving Holders
- API Ring Groovers

KPTI North American HQ

- Indexable Insert Manufacturing
- North American Tech Center
- North American Sales, Marketing & Customer Service Center

KPTI Manufactured Products



Steel Toolholders for Milling, Turning, Grooving, Threading and Drilling Metal



Indexable metal cutting inserts made of carbide, ceramic, cermet, Cubic Boron Nitride, and Polycrystalline diamond



Solid carbide cutting tools for tight tolerance and micro-diameter metal cutting applications

KPTI Markets Served



Automotive



Aerospace



Medical




Printed Circuit Board



Power Generation

How to Order

Kyocera Precision Tools' products are sold exclusively through our North American line of authorized distributors.



Locate a Distributor

Use our *Locate a Distributor* map at:
www.KyoceraPrecisionTools.com/locate

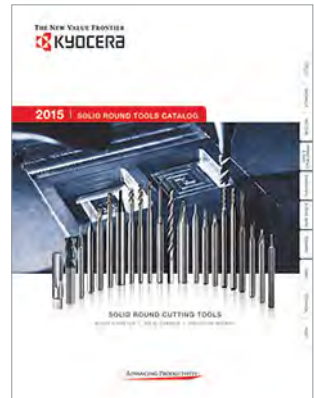
OR

CUSTOMER SERVICE
 (U.S.) **1.888.848.8449**
 (International) **001.714.428.3636**

Monday - Friday
 5:00AM - 4:30PM (PST)
 8:00AM - 7:30PM (EST)

Using the Kyocera Product Catalogs

All standard Kyocera Precision Tools Products are located in one of these four General Catalogs.



Stock Status Symbols

- Indicates that an item is **Stock Standard** and available at our Micro Tools plant in Costa Mesa, California. Stock Standard items will ship the same day if ordered by 3:30pm (PST).
- Indicates that an item is **Standard** but **NOT Stocked**. Call us for delivery.
- ◆ Indicates that an item will usually ship in **24-48 hours** depending on size, quantity, or coating requested.
- ▲ Indicates that an item is **Coming Soon** and not yet available. Call for release date information.

Authorized Distributor Ordering Guide



TO PLACE ORDERS ONLINE VISIT - <http://mykpti.kyocera.com>

In addition to placing orders, the MyKPTI distributor website allows you to view real-time product availability, check pricing, view and download product and promotional literature, watch product training videos, and more.



CUSTOMER SERVICE
 (U.S.) **1.888.848.8449**
 (International) **001.714.428.3636**

Monday - Friday
 5:00AM - 4:30PM (PST)
 8:00AM - 7:30PM (EST)

TECHNICAL SUPPORT
1.800.823.7284
OPTION 2

Monday - Friday
 4:00AM - 2:00PM (PST)
 7:00AM - 5:00PM (EST)



GENERAL INQUIRIES
cuttingtools@kyocera.com

CUSTOMER SERVICE
MIT.CS@kyocera.com

TECHNICAL CENTER
cttechs@kyocera.com

How to Read This Catalog

Use the guide below to better understand how to read the contents of each page. Pages will vary throughout but will remain close to this guide overall.

Tooling Category
Dimensions Diagram
Tool Series

MICRO DRILLS
SERIES 105

1/8" SHANK
MICRO DRILLS

0.0040" - 0.0200" DIAMETER
Mirror Surface Finishes
Single Edge Construction
Sub Micron Grain Carbide

STANDARD Flute Length

| Drill Size | D _{±0.0002} | Dimensions (in) | | | | | Uncoated | | ATIN Coated | |
|------------|----------------------|-----------------|--------|-------|-------------|--------------|----------|--------------|-------------|--|
| | | d | ℓ | L | Point Angle | Part Number | Stock | Part Number | Stock | |
| .10mm | 0.0040 | 1/8 | 0.0400 | 1 1/2 | 118° | 105-0040.040 | ● | 105-0040L040 | ● | |
| .13mm | 0.0050 | 1/8 | 0.0400 | 1 1/2 | 118° | 105-0050.040 | ● | 105-0050L040 | ● | |
| #97 | 0.0059 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0059.080 | ● | 105-0059L080 | ● | |
| #96 | 0.0063 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0063.080 | ● | 105-0063L080 | ● | |
| #95 | 0.0067 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0067.080 | ● | 105-0067L080 | ● | |
| #94 | 0.0071 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0071.100 | ● | 105-0071L100 | ● | |
| #93 | 0.0075 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0075.100 | ● | 105-0075L100 | ● | |
| #92 | 0.0079 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0079.100 | ● | 105-0079L100 | ● | |
| #91 | 0.0083 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0083.100 | ● | 105-0083L100 | ● | |
| #90 | 0.0087 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0087.100 | ● | 105-0087L100 | ● | |
| #89 | 0.0091 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0091.150 | ● | 105-0091L150 | ● | |
| #88 | 0.0095 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0095.150 | ● | 105-0095L150 | ● | |
| .25mm | 0.0098 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0098.150 | ● | 105-0098L150 | ● | |
| #87 | 0.0100 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0100.150 | ● | 105-0100L150 | ● | |
| #86 | 0.0105 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0105.150 | ● | 105-0105L150 | ● | |
| #85 | 0.0110 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0110.150 | ● | 105-0110L150 | ● | |
| #84 | 0.0115 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0115.150 | ● | 105-0115L150 | ● | |
| .30mm | 0.0118 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0118.225 | ● | 105-0118L225 | ● | |
| #83 | 0.0120 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0120.225 | ● | 105-0120L225 | ● | |
| #82 | 0.0125 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0125.225 | ● | 105-0125L225 | ● | |
| #81 | 0.0130 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0130.225 | ● | 105-0130L225 | ● | |
| #80 | 0.0135 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0135.225 | ● | 105-0135L225 | ● | |
| .35mm | 0.0138 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0138.225 | ● | 105-0138L225 | ● | |
| #79 | 0.0145 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0145.225 | ● | 105-0145L225 | ● | |
| 1/64" | 0.0156 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0156.250 | ● | 105-0156L250 | ● | |
| .40mm | 0.0157 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0157.250 | ● | 105-0157L250 | ● | |
| #78 | 0.0160 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0160.250 | ● | 105-0160L250 | ● | |
| .45mm | 0.0177 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0177.250 | ● | 105-0177L250 | ● | |
| #77 | 0.0180 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0180.250 | ● | 105-0180L250 | ● | |
| .50mm | 0.0197 | 1/8 | 0.2600 | 1 1/2 | 130° | 105-0197.260 | ● | 105-0197L260 | ● | |
| #76 | 0.0200 | 1/8 | 0.2600 | 1 1/2 | 130° | 105-0200.260 | ● | 105-0200L260 | ● | |

SERIES 105 WORKPIECE MATERIAL

| | | | | | | | | | | | | | | | | |
|----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ATIN | P | P | H | H | M | K | N | N | N | N | N | N | N | N | S | S |
| Uncoated | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

20 KYOCERA 1.888.848.8449 Pricing & Availability at KyoceraPrecisionTools.com U.S. Stock Standard: ● NOT STOCKED - Call for Delivery: ■ Coming Soon: ▲

Tool Description

Stub, Standard, or Extended Reach

Section Navigation Tabs

 DRILLS
 LONG REACH
 FLUTE TYPE
 POINT ANGLE
 POINT GEOMETRY
 COATINGS
 MATERIALS
 PRIORITY

Cutting Diameter Range & Attributes

Attribute Icons See Page 7 for Glossary

Dimensions
D : Cutting Diameter & Tolerance
d : Shank Diameter
ℓ : Length of Cut (LOC)
L : Overall Length (OAL)
L_r : Reach
r : Corner or Ball Nose Radius
A : Included Point Angle
A₂ : Side Angle

Available Stock Status
● : U.S. Stock Standard Items
■ : Non-Stock Standard Items
◆ : Ships in 24-48 Hours
▲ : Coming Soon

Applicable Workpiece Materials & Priority

Material Icon Glossary

This glossary will provide you with the material icons shown throughout the catalog. Each product will have applicable materials listed for coated and uncoated tools along with a black star to indicate the material priority.

| P | H | M | K | N | S |
|----------------------------|------------------------------------|------------------------------|------------------------------------|---------------------------------|-----------------------|
| Carbon Steel & Alloy Steel | Hardened Steel & Chilled Cast Iron | Stainless Steel & Cast Steel | Gray Cast Iron & Nodular Cast Iron | Non-Ferrous Metals & Non-Metals | Heat-Resistant Alloys |






















| | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| | | | | | | | | |
| | | | | | | | | |

Tool Attributes Icon Glossary

Below is a list of icons used to describe specific tool characterizations throughout the catalog for a quick understanding of the tool's attributes or advantages. Icons will vary based on the tool that is represented. Below are examples.

| | | | | |
|--------------------------|-----------------------|---------------------------|--------------------|-----------------------|
| Sub Micron Grain Carbide | Number of Flutes (2) | 8 Times Tool Diameter | Right-Hand Tool | Left-Hand Tool |
| 30° Helix Angle | 45° Tip Chamfer Angle | 130° Included Point Angle | Corner Radius Tool | Ball Nose Radius Tool |
| Variable Helix Angle | | | | |

TOOL SELECTION & APPLICATION GUIDE




















| TOOL TYPE | REF. PAGE | SERIES | FEATURES | SHAPE (Not Actual Tool Size) | NO. OF FLUTES | CUTTING DIAMETER RANGE |
|------------------|-----------|--|--|--|--------------------------------------|---------------------------------------|
| DRILLS | 18 19 | 080 / 081 | 1/8" & 3.00mm Shank Micro Spotting Drill |  | 2 | 0.0050" - 0.1250" 0.15mm - 3.00mm |
| | 20 | 105 | 1/8" Shank Micro Drill |  | 2 | 0.0040" - 0.1250" |
| | 26 | 155 | 1/8" Shank Inverse Diameter Micro Drill |  | 2 | 0.1260" - 0.2638" |
| | 30 31 | 160 / 165 | Inch & Metric Shank Pilot Micro Drills (Match with Series 860 / 865) |  | 2 | 0.1250" - 0.5000" 3.00mm - 12.00mm |
| | 35 | 226 | 3.00mm Shank Micro Drill |  | 2 | 0.04mm - 3.00mm |
| | 48 | 226L | 3.00mm Shank Left Hand Micro Drill |  | 2 | 0.04mm - 3.00mm |
| | 55 | 390 | 1/8" Shank Ultra Precision Micro Drill Macor® / Vespel® Drilling |  | 2 | 0.0015" - 0.0040" |
| | 56 | 392 | 1.00mm Shank Ultra Precision Micro Drill Fuel Injector Nozzle Drill |  | 2 | 0.12mm - 0.60mm |
| | 57 | 813 | 3.00mm - 4.0mm Shank Coolant Fed Micro Drill Deep Hole Drilling Priority |  | 2 | 1.50mm - 4.00mm |
| | 61 62 | 860 / 865 | Inch & Metric Shank Coolant Fed Deep Drill (Match with Series 160 / 165) |  | 2 | 0.1250" - 0.5000" 3.00mm - 12.00mm |
| | 66 | 885 | 3.00mm Shank Micro Drill for Brass |  | 1 | 0.30mm - 2.00mm |
| SQUARE END MILLS | 69 | 1610 | Standard Length 2 Flute for General Purpose Machining |  | 2 | 0.0040" - 0.3750" 0.10mm - 6.00mm |
| | 73 | 1620 | Stub Length 2 Flute for General Purpose Machining |  | 2 | 0.0040" - 0.2500" 0.10mm - 6.00mm |
| | 77 | 1640 | Extended Reach 2 Flute for Deep Reach Milling |  | 2 | 0.0100" - 0.1250" 0.40mm - 6.00mm |
| | 80 | TITAN-AX TITAN-AXM | Reinforced Shank Square End for Tough Machining Applications |  | 3 | 0.0312" - 0.2500" 1.00mm - 8.00mm |
| | 82 | 1710 | Standard Length 3 Flute for General Purpose Machining |  | 3 | 0.0100" - 0.1250" |
| | 84 | 1740 | Extended Reach 3 Flute for Deep Reach Milling |  | 3 | 0.0100" - 0.2500" |
| | 86 | 1742 | Extended Reach Stub Length for Deep Reach Milling |  | 3 | 0.0100" - 0.2500" |
| | 91 | 1810 | Standard Length 4 Flute for General Purpose Machining |  | 4 | 0.0050" - 0.2500" 0.10mm - 6.00mm |
| | 95 | 1820 | Stub Length 4 Flute for General Purpose Machining |  | 4 | 0.0050" - 0.2500" 0.10mm - 6.00mm |
| 98 | 1840 | Extended Reach 4 Flute for Deep Reach Milling |  | 4 | 0.0100" - 0.1250" 0.40mm - 6.00mm | |

TOOL SELECTION & APPLICATION GUIDE

| REF. PAGE | SERIES | COATING | WORKPIECE MATERIAL PRIORITY | | | | | | | | | | | | | | |
|-----------|-----------------------|----------|-----------------------------|---|----------------|---|-----------------|-----------|---------------------------------|---|---|---|---|---|-----------------------|---|---|
| | | | Steel | | Hardened Steel | | Stainless Steel | Cast Iron | Non-Ferrous Metals & Non-Metals | | | | | | Heat-Resistant Alloys | | |
| | | | | | | | | | | | | | | | | | |
| 18 | 080 / 081 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 19 | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 20 | 105 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 26 | 155 | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 30 | 160 / 165 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |
| 31 | | Nano | | | | | | | | | | | | | | | |
| 35 | 226 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 48 | 226L | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 55 | 390 | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 56 | 392 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |
| 57 | 813 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 61 | 860 / 865 | AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |
| 62 | | Nano | | | | | | | | | | | | | | | |
| 66 | 885 | TICN | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ★ | | | | | ☆ | ☆ |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ★ | ★ | ☆ | ☆ | ★ | | ☆ | ☆ | ☆ | ★ | ★ |
| 69 | 1610 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ★ | ☆ | ★ | ★ | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| 73 | 1620 | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |
| | | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| 77 | 1640 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |
| 80 | TITAN-AX TITAN-AXM | AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |
| 82 | 1710 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| 84 | 1740 | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |
| | | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| 86 | 1742 | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| 91 | 1810 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| 95 | 1820 | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |
| | | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| 98 | 1840 | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |
| 98 | 1840 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority Materials ☆ : Applicable Materials

TOOL SELECTION & APPLICATION GUIDE

| TOOL TYPE | REF. PAGE | SERIES | FEATURES | SHAPE (Not Actual Tool Size) | NO. OF FLUTES | CUTTING DIAMETER RANGE |
|---------------------|-------------------------|---------|---|--|--|--------------------------------------|
| BALL NOSE END MILLS | 101 | 1625 | Standard Length 2 Flute Ball Nose End Mill |  | 2 | 0.0050" - 0.2500" 0.10mm - 6.00mm |
| | 105 | 1635 | Stub Length 2 Flute Ball Nose End Mill |  | 2 | 0.0050" - 0.2500" 0.10mm - 6.00mm |
| | 108 | 1645 | Extended Reach 2 Flute Ball Nose End Mill |  | 2 | 0.0100" - 0.1250" 0.40mm - 6.00mm |
| | 111 | 1685 | Reverse Shank 2 Flute Ball Nose End Mill |  | 2 | 0.1563" - 0.7500" |
| | 112 | 16 HMS* | Ball Nose End Mill for Hard Metal Milling |  | 2 | 0.20mm - 3.00mm |
| | 113 | 16 HMR* | Extended Reach Ball Nose for Hard Metal Milling |  | 2 | 0.20mm - 3.00mm |
| | 114 | 16 RB* | Extended Reach Ball Nose for Rib Processing |  | 2 | 0.50mm - 1.50mm |
| | 115 | 1725 | Standard Length 3 Flute Ball Nose End Mill |  | 3 | 0.0100" - 0.1000" |
| | 116 | 1745 | Extended Reach 3 Flute Ball Nose End Mill |  | 3 | 0.0100" - 0.1000" |
| | 117 | 1755 | Extended Reach Stub Length Ball Nose End Mill |  | 3 | 0.0100" - 0.2500" |
| | 121 | 1825 | Standard Length 4 Flute Ball Nose End Mill |  | 4 | 0.0100" - 0.2500" 0.40mm - 6.00mm |
| | 125 | 1835 | Stub Length 4 Flute Ball Nose End Mill |  | 4 | 0.0100" - 0.2500" 0.40mm - 6.00mm |
| | 128 | 1845 | Extended Reach 4 Flute Ball Nose End Mill |  | 4 | 0.0100" - 0.2500" 0.40mm - 6.00mm |
| | CORNER RADIUS END MILLS | 131 | 1611 | Standard Length 2 Flute X-Small Corner Radius End Mill |  | 2 |
| 132 | | 1612 | Standard Length 2 Flute Small Corner Radius End Mill |  | 2 | 0.0150" - 0.2500" |
| 133 | | 1613 | Standard Length 2 Flute Standard Corner Radius End Mill |  | 2 | 0.0156" - 0.2500" |
| 134 | | 1614 | Standard Length 2 Flute Large Corner Radius End Mill |  | 2 | 0.0450" - 0.5000" |
| 134 | | 1616 | Standard Length 2 Flute X-Large Corner Radius End Mill |  | 2 | 0.0450" - 0.5000" |
| 135 | | 1617 | Standard Length 2 Flute XX-Large Corner Radius End Mill |  | 2 | 0.0938" - 0.5000" |

* High Performance End Mills.
See product page for high performance features.

TOOL SELECTION & APPLICATION GUIDE



















| REF. PAGE | SERIES | COATING | WORKPIECE MATERIAL PRIORITY | | | | | | | | | | | | | | | |
|-----------|---------|----------|-----------------------------|---|----------------|---|-----------------|-----------|---------------------------------|---|---|---|---|---|-----------------------|--|---|---|
| | | | Steel | | Hardened Steel | | Stainless Steel | Cast Iron | Non-Ferrous Metals & Non-Metals | | | | | | Heat-Resistant Alloys | | | |
| | | | | | | | | | | | | | | | | | | |
| 101 | 1625 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | | ☆ |
| 105 | 1635 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 108 | 1645 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | | ☆ |
| 111 | 1685 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 112 | 16 HMS* | AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| 113 | 16 HMR* | AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| 114 | 16 RB* | AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| 115 | 1725 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 116 | 1745 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 117 | 1755 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 121 | 1825 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 125 | 1835 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 128 | 1845 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 131 | 1611 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 132 | 1612 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 133 | 1613 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 134 | 1614 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 134 | 1616 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 135 | 1617 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |

* High Performance End Mills.

See product page for high performance features.
















★ : Priority Materials ☆ : Applicable Materials

TOOL SELECTION & APPLICATION GUIDE

| TOOL TYPE | REF. PAGE | SERIES | FEATURES | SHAPE (Not Actual Tool Size) | NO. OF FLUTES | CUTTING DIAMETER RANGE |
|-------------------------|---------------|-------------------------|--|--|--|---------------------------------------|
| CORNER RADIUS END MILLS | 135 | NEW 1618 | Standard Length 2 Flute XXX-Large Corner Radius End Mill |  | 2 | 0.0938" - 0.5000" |
| | 136 | 1703* | Standard Length 3 Flute High Helix Corner Radius End Mill |  | 3 | 1.00mm - 6.00mm |
| | 137 | TITAN-AX* TITAN-AXM* | Reinforced Shank Corner Radius for Tough Machining Applications |  | 3 | 0.0312" - 0.2500" 1.00mm - 8.00mm |
| | 140 | NEW 1743 | Extended Reach 3 Flute Small Corner Radius End Mills |  | 3 | 0.0156" - 0.2500" |
| | 141 | NEW 1744 | Extended Reach 3 Flute Standard Corner Radius End Mill |  | 3 | 0.0312" - 0.2500" |
| | 142 | NEW 1746 | Extended Reach 3 Flute Large Corner Radius End Mill |  | 3 | 0.0625" - 0.1250" |
| | 143 | 1804* | Standard Length 4 Flute High Helix Corner Radius End Mill |  | 4 | 1.00mm - 6.00mm" |
| | 144 | 1812 | Standard Length 4 Flute Small Corner Radius End Mill |  | 4 | 0.0150" - 0.2500" |
| | 145 | 1813 | Standard Length 4 Flute Standard Corner Radius End Mill |  | 4 | 0.0156" - 0.2500" |
| | 146 | NEW 1814 | Standard Length 4 Flute Large Corner Radius End Mill |  | 4 | 0.0450" - 0.2500" |
| | 146 | NEW 1816 | Standard Length 4 Flute X-Large Corner Radius End Mill |  | 4 | 0.0450" - 0.2500" |
| | 147 | 1817 | Standard Length 4 Flute XX-Large Corner Radius End Mill |  | 4 | 0.0938" - 0.2500" |
| | 147 | 1818 | Standard Length 4 Flute XXX-Large Corner Radius End Mill |  | 4 | 0.0938" - 0.2500" |
| | 148 | AP4* AP4M* | Variable Helix APOLLO End Mill for Alloy Steel, Nickel Inconel Alloys, Stainless Steel, and Carbon Steel |  | 4 | 0.1250" - 1.0000" 3.00mm - 25.00mm |
| | 150 | 1905* | Standard Length 5 Flute High Helix Corner Radius End Mill |  | 5 | 1.00mm - 6.00mm |
| | 151 | AP5* AP5M* | Variable Helix APOLLO End Mill for Alloy Steel, Nickel Inconel Alloys, Stainless Steel, and Carbon Steel |  | 5 | 0.2500" - 1.0000" 3.00mm - 25.00mm |
| | CHAMFER MILLS | 153 | CM | 1/8" Shank Chamfer Mills |  | 2 |
| 154 | | CMM | Metric Shank Chamfer Mills |  | 2, 4 | Point Angle 60°, 90°, 120° |

* High Performance End Mills.
See product page for high performance features.















TOOL SELECTION & APPLICATION GUIDE

| REF. PAGE | SERIES | COATING | WORKPIECE MATERIAL PRIORITY | | | | | | | | | | | | | | | |
|-----------|-------------------------|----------|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|
| | | | Steel | | Hardened Steel | | Stainless Steel | Cast Iron | Non-Ferrous Metals & Non-Metals | | | | | | Heat-Resistant Alloys | | | |
| | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 135 | 1618 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | |
| 136 | 1703* | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 137 | TITAN-AX* TITAN-AXM* | AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | | ★ | ★ |
| 140 | 1743 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 141 | 1744 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 142 | 1746 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |
| 143 | 1804* | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 144 | 1812 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 145 | 1813 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 146 | 1814 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 146 | 1816 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 147 | 1817 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 147 | 1818 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | | |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 148 | AP4* AP4M* | AlCrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | | ★ | ★ |
| 150 | 1905 | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | | ☆ |
| 151 | AP5* AP5M* | AlCrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | | ☆ | ☆ |
| 153 | CM | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | | ★ | | | | | ☆ | | ☆ |
| 154 | CMM | AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | | ★ | | | | | ☆ | | ☆ |

* High Performance End Mills.
See product page for high performance features.

★ : Priority Materials ☆ : Applicable Materials

TOOL SELECTION & APPLICATION GUIDE

| TOOL TYPE | REF. PAGE | SERIES | FEATURES | SHAPE (Not Actual Tool Size) | NO. OF FLUTES | CUTTING DIAMETER RANGE |
|--------------|-----------|--------|---|--|---------------|--|
| ROUTERS | 156 | 2120 | Up Cut Diamond Pattern Router Bits for CFRP, Fiberglass, and Composite Materials |  | - | 0.0312" - 0.2500" 0.80mm - 8.00mm |
| | 158 | 2121 | Down Cut Diamond Pattern Router Bits for CFRP, Fiberglass, and Composite Materials |  | - | 0.0312" - 0.2500" 0.80mm - 8.00mm |
| | 160 | 2320 | Up Cut & Down Cut Chipbreaker Pattern Router Bits for CFRP, Fiberglass, and Composite Materials |  | - | 0.0312" - 0.2500" 0.80mm - 8.00mm |
| THREAD MILLS | 162 | 98M | Single Point Micro Thread Mill |  | - | Thread Size M0.5 - M8 |
| ENGRAVERS | 210 | EGR | 2 Flute Micro Engraving Tool for General Purpose Machining |  | 2 | Point Angle 30° - 90° |
| | 211 | HR | Half Round Micro Engraving Tool for General Purpose Machining |  | - | Line Width 0.0050" - 0.0315" 0.25mm - 0.80mm |
| | 212 | SPD | Spade Micro Engraving Tool for Spotting or Chamfering |  | - | Point Angle 30° - 118° |
| BORING BARS | 214 | MBS | Standard Length Internal Diameter Profile Boring |  | - | 0.0150" - 0.2400" 0.40mm - 6.00mm |
| | 216 | MBE | Extended Reach Internal Diameter Profile Boring |  | - | 0.0150" - 0.2400" 0.40mm - 6.00mm |
| REAMERS | 220 | MR34 | 3.00mm Shank 4 Flute Micro Reamer Left-Hand Spiral / Right-Hand Cutting |  | 4 | 0.20mm - 2.40mm |
| | 228 | MR46 | 4.00mm Shank 6 Flute Micro Reamer Left-Hand Spiral / Right-Hand Cutting |  | 6 | 2.41mm - 3.90mm |
| | 231 | MR66 | 6.00mm Shank 6 Flute Micro Reamer Left-Hand Spiral / Right-Hand Cutting |  | 6 | 3.97mm - 5.90mm |
| | 232 | MR86 | 8.00mm Shank 6 Flute Micro Reamer Left-Hand Spiral / Right-Hand Cutting |  | 6 | 5.97mm - 7.90mm |
| | 233 | MR106 | 10.00mm Shank 6 Flute Micro Reamer Left-Hand Spiral / Right-Hand Cutting |  | 6 | 7.97mm - 8.03mm |



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SOLID CARBIDE SAWS NEW

3/4" - 4" Diameters
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20mm - 100mm Diameters
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|-----------|--------|----------|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|
| | | | Steel | | Hardened Steel | | Stainless Steel | Cast Iron | Non-Ferrous Metals & Non-Metals | | | | | | Heat-Resistant Alloys | | |
| | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 156 | 2120 | Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| | | DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| | | Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |
| 158 | 2121 | Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| | | DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| | | Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |
| 160 | 2320 | Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| | | DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| | | Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |
| 162 | 98M | AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | | | |
| | | Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | ★ |
| 210 | EGR | Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | ☆ | ☆ | |
| 211 | HR | Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | ☆ | ☆ | |
| 212 | SPD | Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | ☆ | ☆ | |
| 214 | MBS | AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | ☆ | ☆ | |
| | | Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | ☆ | | | |
| 216 | MBE | AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | ☆ | ☆ | |
| | | Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | ☆ | | | |
| 220 | MR34 | Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ | |
| 228 | MR46 | AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | | | | | | | ☆ | ☆ | |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 231 | MR66 | AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | | | | | | | ☆ | ☆ | |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 232 | MR86 | AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | | | | | | | ☆ | ☆ | |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| 233 | MR106 | AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | | | | | | | ☆ | ☆ | |
| | | Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority Materials ☆ : Applicable Materials

DRILLS

18 - 66

MICRO SPOTTING DRILLS 18 - 19

| | | | | |
|------------|------------------------|------------|-----------------------|----|
| SERIES 080 | 0.0050" - 0.1250" Dia. | 1/8" Shank | Micro Spotting Drills | 18 |
| SERIES 081 | 0.15mm - 3.00mm Dia. | 3mm Shank | Micro Spotting Drills | 19 |

MICRO DRILLS 20 - 56

| | | | | |
|-------------|------------------------|--------------|------------------------------|---------|
| SERIES 105 | 0.0040" - 0.1250" Dia. | 1/8" Shank | Micro Drills | 20 - 25 |
| SERIES 155 | 0.1260" - 0.2638" Dia. | 1/8" Shank | Inverse Dia. Micro Drills | 26 - 29 |
| SERIES 160 | 0.1250" - 0.5000" Dia. | Inch Shank | Pilot Drills | 30 |
| SERIES 165 | 3.00mm - 12.00mm Dia. | Metric Shank | Pilot Drills | 31 - 34 |
| SERIES 226 | 0.04mm - 3.00mm Dia. | 3mm Shank | Micro-Drills | 35 - 47 |
| SERIES 226L | 0.04mm - 3.00mm Dia. | 3mm Shank | Left-Hand Micro Drills | 48 - 54 |
| SERIES 390 | 0.0015" - 0.0040" Dia. | 1/8" Shank | Ultra Precision Micro Drills | 55 |
| SERIES 392 | 0.12mm - 0.60mm Dia. | 1mm Shank | Ultra Precision Micro Drills | 56 |

COOLANT FED DRILLS 57 - 65

| | | | | |
|------------|------------------------|-----------------|--------------------------|---------|
| SERIES 813 | 1.50mm - 4.00mm Dia. | 3mm - 4mm Shank | Coolant Fed Micro Drills | 57 - 60 |
| SERIES 860 | 0.1250" - 0.5000" Dia. | Inch Shank | Coolant Fed Deep Drills | 61 |
| SERIES 865 | 3.00mm - 12.00mm Dia. | Metric Shank | Coolant Fed Deep Drills | 62 - 65 |

DRILLS FOR BRASS 66

| | | | | |
|------------|----------------------|-----------|------------------------|----|
| SERIES 885 | 0.30mm - 2.00mm Dia. | 3mm Shank | Micro Drills for Brass | 66 |
|------------|----------------------|-----------|------------------------|----|

1/8" SHANK

MICRO SPOTTING DRILLS

0.0050" - 0.1250" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



4 Facet Point Geometry

90° Included Point Angle



Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | |
|---|-----|--------|-------|-------------|-------|---------------|-------|
| D ^{+0.0000} / _{-0.0003} | d | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.0050 | 1/8 | 0.0250 | 1 1/2 | 080-0050.90 | ● | 080-0050L90 | ● |
| 0.0100 | 1/8 | 0.0350 | 1 1/2 | 080-0100.90 | ● | 080-0100L90 | ● |
| 0.0150 | 1/8 | 0.0450 | 1 1/2 | 080-0150.90 | ● | 080-0150L90 | ● |
| 0.0200 | 1/8 | 0.0500 | 1 1/2 | 080-0200.90 | ● | 080-0200L90 | ● |
| 0.0312 | 1/8 | 0.0900 | 1 1/2 | 080-0312.90 | ● | 080-0312L90 | ● |
| 0.0625 | 1/8 | 0.2000 | 1 1/2 | 080-0625.90 | ● | 080-0625L90 | ● |
| 0.0938 | 1/8 | 0.2000 | 1 1/2 | 080-0938.90 | ● | 080-0938L90 | ● |
| 0.1250 | 1/8 | 0.2000 | 1 1/2 | 080-1250.90 | ● | 080-1250L90 | ● |

130° Included Point Angle



Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | |
|---|-----|--------|-------|--------------|-------|---------------|-------|
| D ^{+0.0000} / _{-0.0003} | d | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.0050 | 1/8 | 0.0250 | 1 1/2 | 080-0050.130 | ● | 080-0050L130 | ● |
| 0.0100 | 1/8 | 0.0350 | 1 1/2 | 080-0100.130 | ● | 080-0100L130 | ● |
| 0.0150 | 1/8 | 0.0450 | 1 1/2 | 080-0150.130 | ● | 080-0150L130 | ● |
| 0.0200 | 1/8 | 0.0500 | 1 1/2 | 080-0200.130 | ● | 080-0200L130 | ● |
| 0.0312 | 1/8 | 0.0900 | 1 1/2 | 080-0312.130 | ● | 080-0312L130 | ● |
| 0.0625 | 1/8 | 0.2000 | 1 1/2 | 080-0625.130 | ● | 080-0625L130 | ● |
| 0.0938 | 1/8 | 0.2000 | 1 1/2 | 080-0938.130 | ● | 080-0938L130 | ● |
| 0.1250 | 1/8 | 0.2000 | 1 1/2 | 080-1250.130 | ● | 080-1250L130 | ● |

SERIES 080 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

3.00mm SHANK

MICRO SPOTTING DRILLS

0.15mm - 3.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



90° Included Point Angle



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Uncoated | | AITiN Coating | |
|----------------------|-----------------|------|----|-------------|-------|---------------|-------|
| D | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| +0.000mm -0.008mm | | | | | | | |
| 0.15 | 3 | 0.65 | 38 | 081-0059.90 | ● | 081-0059L90 | ● |
| 0.25 | 3 | 0.90 | 38 | 081-0098.90 | ● | 081-0098L90 | ● |
| 0.40 | 3 | 1.15 | 38 | 081-0157.90 | ● | 081-0157L90 | ● |
| 0.50 | 3 | 1.30 | 38 | 081-0197.90 | ● | 081-0197L90 | ● |
| 1.00 | 3 | 2.30 | 38 | 081-0394.90 | ● | 081-0394L90 | ● |
| 1.50 | 3 | 5.00 | 38 | 081-0591.90 | ● | 081-0591L90 | ● |
| 2.00 | 3 | 5.00 | 38 | 081-0787.90 | ● | 081-0787L90 | ● |
| 3.00 | 3 | 5.00 | 38 | 081-1181.90 | ● | 081-1181L90 | ● |

130° Included Point Angle



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Uncoated | | AITiN Coating | |
|----------------------|-----------------|------|----|--------------|-------|---------------|-------|
| D | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| +0.000mm -0.008mm | | | | | | | |
| 0.15 | 3 | 0.65 | 38 | 081-0059.130 | ● | 081-0059L130 | ● |
| 0.25 | 3 | 0.90 | 38 | 081-0098.130 | ● | 081-0098L130 | ● |
| 0.40 | 3 | 1.15 | 38 | 081-0157.130 | ● | 081-0157L130 | ● |
| 0.50 | 3 | 1.30 | 38 | 081-0197.130 | ● | 081-0197L130 | ● |
| 1.00 | 3 | 2.30 | 38 | 081-0394.130 | ● | 081-0394L130 | ● |
| 1.50 | 3 | 5.00 | 38 | 081-0591.130 | ● | 081-0591L130 | ● |
| 2.00 | 3 | 5.00 | 38 | 081-0787.130 | ● | 081-0787L130 | ● |
| 3.00 | 3 | 5.00 | 38 | 081-1181.130 | ● | 081-1181L130 | ● |

| SERIES 081 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

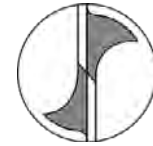
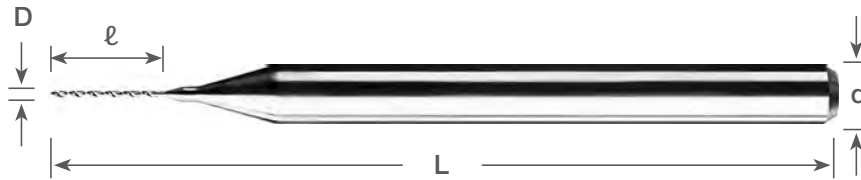
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(International) 001.714.428.3636
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1/8" SHANK

MICRO DRILLS

0.0040" - 0.0200" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



4 Facet Point Geometry



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| .10mm | 0.0040 | 1/8 | 0.0400 | 1 1/2 | 118° | 105-0040.040 | ● | 105-0040L040 | ● |
| .13mm | 0.0050 | 1/8 | 0.0400 | 1 1/2 | 118° | 105-0050.040 | ● | 105-0050L040 | ● |
| #97 | 0.0059 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0059.080 | ● | 105-0059L080 | ● |
| #96 | 0.0063 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0063.080 | ● | 105-0063L080 | ● |
| #95 | 0.0067 | 1/8 | 0.0800 | 1 1/2 | 118° | 105-0067.080 | ● | 105-0067L080 | ● |
| #94 | 0.0071 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0071.100 | ● | 105-0071L100 | ● |
| #93 | 0.0075 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0075.100 | ● | 105-0075L100 | ● |
| #92 | 0.0079 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0079.100 | ● | 105-0079L100 | ● |
| #91 | 0.0083 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0083.100 | ● | 105-0083L100 | ● |
| #90 | 0.0087 | 1/8 | 0.1000 | 1 1/2 | 118° | 105-0087.100 | ● | 105-0087L100 | ● |
| #89 | 0.0091 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0091.150 | ● | 105-0091L150 | ● |
| #88 | 0.0095 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0095.150 | ● | 105-0095L150 | ● |
| .25mm | 0.0098 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0098.150 | ● | 105-0098L150 | ● |
| #87 | 0.0100 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0100.150 | ● | 105-0100L150 | ● |
| #86 | 0.0105 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0105.150 | ● | 105-0105L150 | ● |
| #85 | 0.0110 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0110.150 | ● | 105-0110L150 | ● |
| #84 | 0.0115 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0115.150 | ● | 105-0115L150 | ● |
| .30mm | 0.0118 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0118.225 | ● | 105-0118L225 | ● |
| #83 | 0.0120 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0120.225 | ● | 105-0120L225 | ● |
| #82 | 0.0125 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0125.225 | ● | 105-0125L225 | ● |
| #81 | 0.0130 | 1/8 | 0.2250 | 1 1/2 | 118° | 105-0130.225 | ● | 105-0130L225 | ● |
| #80 | 0.0135 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0135.225 | ● | 105-0135L225 | ● |
| .35mm | 0.0138 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0138.225 | ● | 105-0138L225 | ● |
| #79 | 0.0145 | 1/8 | 0.2250 | 1 1/2 | 130° | 105-0145.225 | ● | 105-0145L225 | ● |
| 1/64" | 0.0156 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0156.250 | ● | 105-0156L250 | ● |
| .40mm | 0.0157 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0157.250 | ● | 105-0157L250 | ● |
| #78 | 0.0160 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0160.250 | ● | 105-0160L250 | ● |
| .45mm | 0.0177 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0177.250 | ● | 105-0177L250 | ● |
| #77 | 0.0180 | 1/8 | 0.2500 | 1 1/2 | 130° | 105-0180.250 | ● | 105-0180L250 | ● |
| .50mm | 0.0197 | 1/8 | 0.2600 | 1 1/2 | 130° | 105-0197.260 | ● | 105-0197L260 | ● |
| #76 | 0.0200 | 1/8 | 0.2600 | 1 1/2 | 130° | 105-0200.260 | ● | 105-0200L260 | ● |

SERIES 105 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Titanium Steel -55HRC | H Titanium Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

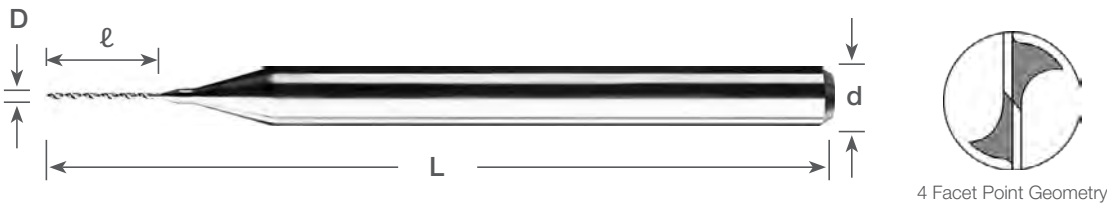
Symbol Descriptions Page 7

1/8" SHANK

MICRO DRILLS

0.0210" - 0.0430" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



4 Flute Point Geometry



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| #75 | 0.0210 | 1/8 | 0.3100 | 1 1/2 | 130° | 105-0210.310 | ● | 105-0210L310 | ● |
| .55mm | 0.0217 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0217.340 | ● | 105-0217L340 | ● |
| #74 | 0.0225 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0225.340 | ● | 105-0225L340 | ● |
| .60mm | 0.0236 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0236.340 | ● | 105-0236L340 | ● |
| #73 | 0.0240 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0240.340 | ● | 105-0240L340 | ● |
| #72 | 0.0250 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0250.340 | ● | 105-0250L340 | ● |
| .65mm | 0.0256 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0256.340 | ● | 105-0256L340 | ● |
| #71 | 0.0260 | 1/8 | 0.3400 | 1 1/2 | 130° | 105-0260.340 | ● | 105-0260L340 | ● |
| .70mm | 0.0276 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0276.400 | ● | 105-0276L400 | ● |
| #70 | 0.0280 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0280.400 | ● | 105-0280L400 | ● |
| #69 | 0.0292 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0292.400 | ● | 105-0292L400 | ● |
| .75mm | 0.0295 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0295.400 | ● | 105-0295L400 | ● |
| #68 | 0.0310 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0310.400 | ● | 105-0310L400 | ● |
| 1/32" | 0.0312 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0312.400 | ● | 105-0312L400 | ● |
| .80mm | 0.0315 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0315.400 | ● | 105-0315L400 | ● |
| #67 | 0.0320 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0320.400 | ● | 105-0320L400 | ● |
| #66 | 0.0330 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0330.400 | ● | 105-0330L400 | ● |
| .85mm | 0.0335 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0335.400 | ● | 105-0335L400 | ● |
| #65 | 0.0350 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0350.400 | ● | 105-0350L400 | ● |
| .90mm | 0.0354 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0354.400 | ● | 105-0354L400 | ● |
| #64 | 0.0360 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0360.400 | ● | 105-0360L400 | ● |
| #63 | 0.0370 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0370.400 | ● | 105-0370L400 | ● |
| .95mm | 0.0374 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0374.400 | ● | 105-0374L400 | ● |
| #62 | 0.0380 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0380.400 | ● | 105-0380L400 | ● |
| #61 | 0.0390 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0390.400 | ● | 105-0390L400 | ● |
| 1.00mm | 0.0394 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0394.400 | ● | 105-0394L400 | ● |
| #60 | 0.0400 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0400.400 | ● | 105-0400L400 | ● |
| #59 | 0.0410 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0410.400 | ● | 105-0410L400 | ● |
| 1.05mm | 0.0413 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0413.400 | ● | 105-0413L400 | ● |
| #58 | 0.0420 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0420.400 | ● | 105-0420L400 | ● |
| #57 | 0.0430 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0430.400 | ● | 105-0430L400 | ● |

| Coating | SERIES 105 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|----------|-------------------------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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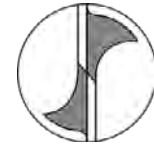
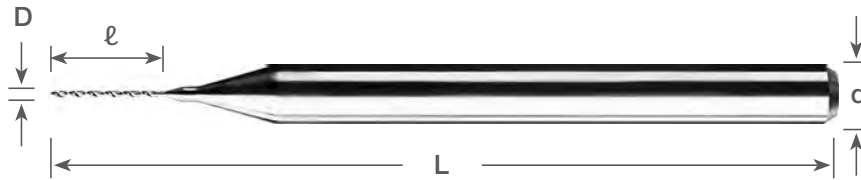
1/8" SHANK

0.0433" - 0.0768" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

MICRO DRILLS



4 Facet Point Geometry



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| 1.10mm | 0.0433 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0433.400 | ● | 105-0433L400 | ● |
| 1.12mm | 0.0440 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0440.400 | ● | 105-0440L400 | ● |
| 1.15mm | 0.0453 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0453.400 | ● | 105-0453L400 | ● |
| #56 | 0.0465 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0465.400 | ● | 105-0465L400 | ● |
| 3/64" | 0.0469 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0469.400 | ● | 105-0469L400 | ● |
| 1.20mm | 0.0472 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0472.400 | ● | 105-0472L400 | ● |
| 1.25mm | 0.0492 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0492.400 | ● | 105-0492L400 | ● |
| 1.30mm | 0.0512 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0512.400 | ● | 105-0512L400 | ● |
| #55 | 0.0520 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0520.400 | ● | 105-0520L400 | ● |
| 1.35mm | 0.0531 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0531.400 | ● | 105-0531L400 | ● |
| #54 | 0.0550 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0550.400 | ● | 105-0550L400 | ● |
| 1.40mm | 0.0551 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0551.400 | ● | 105-0551L400 | ● |
| 1.45mm | 0.0571 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0571.400 | ● | 105-0571L400 | ● |
| 1.50mm | 0.0591 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0591.400 | ● | 105-0591L400 | ● |
| #53 | 0.0595 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0595.400 | ● | 105-0595L400 | ● |
| 1.55mm | 0.0610 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0610.400 | ● | 105-0610L400 | ● |
| 1/16" | 0.0625 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0625.400 | ● | 105-0625L400 | ● |
| 1.60mm | 0.0630 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0630.400 | ● | 105-0630L400 | ● |
| #52 | 0.0635 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0635.400 | ● | 105-0635L400 | ● |
| 1.65mm | 0.0650 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0650.400 | ● | 105-0650L400 | ● |
| 1.70mm | 0.0669 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0669.400 | ● | 105-0669L400 | ● |
| #51 | 0.0670 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0670.400 | ● | 105-0670L400 | ● |
| 1.75mm | 0.0689 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0689.400 | ● | 105-0689L400 | ● |
| #50 | 0.0700 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0700.400 | ● | 105-0700L400 | ● |
| 1.80mm | 0.0709 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0709.400 | ● | 105-0709L400 | ● |
| 1.85mm | 0.0728 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0728.400 | ● | 105-0728L400 | ● |
| #49 | 0.0730 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0730.400 | ● | 105-0730L400 | ● |
| 1.90mm | 0.0748 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0748.400 | ● | 105-0748L400 | ● |
| #48 | 0.0760 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0760.400 | ● | 105-0760L400 | ● |
| 1.95mm | 0.0768 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0768.400 | ● | 105-0768L400 | ● |

SERIES 105 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

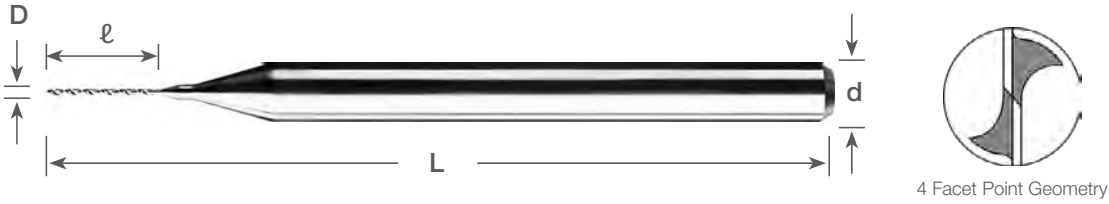
Symbol Descriptions Page 7

1/8" SHANK

MICRO DRILLS

0.0781" - 0.1083" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



4 Facet Point Geometry



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| 5/64" | 0.0781 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0781.400 | ● | 105-0781L400 | ● |
| #47 | 0.0785 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0785.400 | ● | 105-0785L400 | ● |
| 2.00mm | 0.0787 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0787.400 | ● | 105-0787L400 | ● |
| 2.05mm | 0.0807 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0807.400 | ● | 105-0807L400 | ● |
| #46 | 0.0810 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0810.400 | ● | 105-0810L400 | ● |
| #45 | 0.0820 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0820.400 | ● | 105-0820L400 | ● |
| 2.10mm | 0.0827 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0827.400 | ● | 105-0827L400 | ● |
| 2.15mm | 0.0846 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0846.400 | ● | 105-0846L400 | ● |
| #44 | 0.0860 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0860.400 | ● | 105-0860L400 | ● |
| 2.20mm | 0.0866 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0866.400 | ● | 105-0866L400 | ● |
| 2.25mm | 0.0886 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0886.400 | ● | 105-0886L400 | ● |
| #43 | 0.0890 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0890.400 | ● | 105-0890L400 | ● |
| 2.30mm | 0.0906 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0906.400 | ● | 105-0906L400 | ● |
| 2.35mm | 0.0925 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0925.400 | ● | 105-0925L400 | ● |
| #42 | 0.0935 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0935.400 | ● | 105-0935L400 | ● |
| 3/32" | 0.0938 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0938.400 | ● | 105-0938L400 | ● |
| 2.40mm | 0.0945 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0945.400 | ● | 105-0945L400 | ● |
| #41 | 0.0960 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0960.400 | ● | 105-0960L400 | ● |
| 2.45mm | 0.0965 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0965.400 | ● | 105-0965L400 | ● |
| #40 | 0.0980 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0980.400 | ● | 105-0980L400 | ● |
| 2.50mm | 0.0984 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0984.400 | ● | 105-0984L400 | ● |
| #39 | 0.0995 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-0995.400 | ● | 105-0995L400 | ● |
| 2.55mm | 0.1004 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1004.400 | ● | 105-1004L400 | ● |
| #38 | 0.1015 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1015.400 | ● | 105-1015L400 | ● |
| 2.60mm | 0.1024 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1024.400 | ● | 105-1024L400 | ● |
| #37 | 0.1040 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1040.400 | ● | 105-1040L400 | ● |
| 2.65mm | 0.1043 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1043.400 | ● | 105-1043L400 | ● |
| 2.70mm | 0.1063 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1063.400 | ● | 105-1063L400 | ● |
| #36 | 0.1065 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1065.400 | ● | 105-1065L400 | ● |
| 2.75mm | 0.1083 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1083.400 | ● | 105-1083L400 | ● |

| Coating | SERIES 105 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|----------|-------------------------------|------------------|------------------------|------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| | P Steel -50HRC | P Steel 30-40HRC | H CARBIDE Steel -55HRC | H CARBIDE Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
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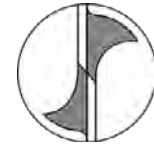
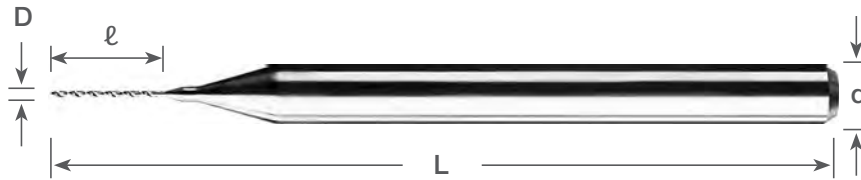
1/8" SHANK

0.1094" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

MICRO DRILLS



4 Facet Point Geometry



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| 7/64" | 0.1094 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1094.400 | ● | 105-1094L400 | ● |
| #35 | 0.1100 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1100.400 | ● | 105-1100L400 | ● |
| 2.80mm | 0.1102 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1102.400 | ● | 105-1102L400 | ● |
| #34 | 0.1110 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1110.400 | ● | 105-1110L400 | ● |
| 2.85mm | 0.1122 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1122.400 | ● | 105-1122L400 | ● |
| #33 | 0.1130 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1130.400 | ● | 105-1130L400 | ● |
| 2.90mm | 0.1142 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1142.400 | ● | 105-1142L400 | ● |
| #32 | 0.1160 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1160.400 | ● | 105-1160L400 | ● |
| 2.95mm | 0.1161 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1161.400 | ● | 105-1161L400 | ● |
| 3.00mm | 0.1181 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1181.400 | ● | 105-1181L400 | ● |
| #31 | 0.1200 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1200.400 | ● | 105-1200L400 | ● |
| 3.05mm | 0.1201 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1201.400 | ● | 105-1201L400 | ● |
| 3.10mm | 0.1220 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1220.400 | ● | 105-1220L400 | ● |
| 3.15mm | 0.1240 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1240.400 | ● | 105-1240L400 | ● |
| 1/8" | 0.1250 | 1/8 | 0.4000 | 1 1/2 | 130° | 105-1250.400 | ● | 105-1250L400 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

SERIES 105 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED Steel -55HRC | H TEMPERED Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

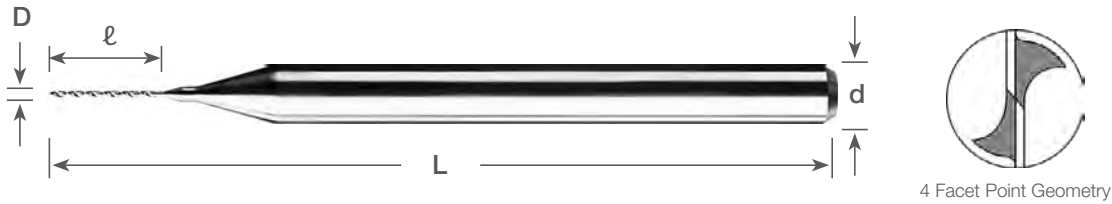
Symbol Descriptions Page 7

1/8" SHANK

MICRO DRILLS

0.0040" - 0.0200" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



4 Facet Point Geometry



Symbol Descriptions Page 7

EXTENDED Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | | AlTiN Coating | |
|------------|---|-----|--------|-------|-------------|--------------|-------|---------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock | Part Number | Stock |
| .10mm | 0.0040 | 1/8 | 0.0700 | 1 1/2 | 118° | 105-0040.070 | ● | 105-0040L070 | ● |
| .13mm | 0.0050 | 1/8 | 0.0700 | 1 1/2 | 118° | 105-0050.070 | ● | 105-0050L070 | ● |
| #97 | 0.0059 | 1/8 | 0.1200 | 1 1/2 | 118° | 105-0059.120 | ● | 105-0059L120 | ● |
| #96 | 0.0063 | 1/8 | 0.1200 | 1 1/2 | 118° | 105-0063.120 | ● | 105-0063L120 | ● |
| #95 | 0.0067 | 1/8 | 0.1200 | 1 1/2 | 118° | 105-0067.120 | ● | 105-0067L120 | ● |
| #94 | 0.0071 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0071.150 | ● | 105-0071L150 | ● |
| #93 | 0.0075 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0075.150 | ● | 105-0075L150 | ● |
| #92 | 0.0079 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0079.150 | ● | 105-0079L150 | ● |
| #91 | 0.0083 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0083.150 | ● | 105-0083L150 | ● |
| #90 | 0.0087 | 1/8 | 0.1500 | 1 1/2 | 118° | 105-0087.150 | ● | 105-0087L150 | ● |
| #89 | 0.0091 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0091.220 | ● | 105-0091L220 | ● |
| #88 | 0.0095 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0095.220 | ● | 105-0095L220 | ● |
| .25mm | 0.0098 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0098.220 | ● | 105-0098L220 | ● |
| #87 | 0.0100 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0100.220 | ● | 105-0100L220 | ● |
| #86 | 0.0105 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0105.220 | ● | 105-0105L220 | ● |
| #85 | 0.0110 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0110.220 | ● | 105-0110L220 | ● |
| #84 | 0.0115 | 1/8 | 0.2200 | 1 1/2 | 118° | 105-0115.220 | ● | 105-0115L220 | ● |
| .30mm | 0.0118 | 1/8 | 0.2800 | 1 1/2 | 118° | 105-0118.280 | ● | 105-0118L280 | ● |
| #83 | 0.0120 | 1/8 | 0.2800 | 1 1/2 | 118° | 105-0120.280 | ● | 105-0120L280 | ● |
| #82 | 0.0125 | 1/8 | 0.2800 | 1 1/2 | 118° | 105-0125.280 | ● | 105-0125L280 | ● |
| #81 | 0.0130 | 1/8 | 0.2800 | 1 1/2 | 118° | 105-0130.280 | ● | 105-0130L280 | ● |
| #80 | 0.0135 | 1/8 | 0.2800 | 1 1/2 | 130° | 105-0135.280 | ● | 105-0135L280 | ● |
| .35mm | 0.0138 | 1/8 | 0.2800 | 1 1/2 | 130° | 105-0138.280 | ● | 105-0138L280 | ● |
| #79 | 0.0145 | 1/8 | 0.2800 | 1 1/2 | 130° | 105-0145.280 | ● | 105-0145L280 | ● |
| 1/64" | 0.0156 | 1/8 | 0.2950 | 1 1/2 | 130° | 105-0156.295 | ● | 105-0156L295 | ● |
| .40mm | 0.0157 | 1/8 | 0.2950 | 1 1/2 | 130° | 105-0157.295 | ● | 105-0157L295 | ● |
| #78 | 0.0160 | 1/8 | 0.2950 | 1 1/2 | 130° | 105-0160.295 | ● | 105-0160L295 | ● |
| .45mm | 0.0177 | 1/8 | 0.2950 | 1 1/2 | 130° | 105-0177.295 | ● | 105-0177L295 | ● |
| #77 | 0.0180 | 1/8 | 0.2950 | 1 1/2 | 130° | 105-0180.295 | ● | 105-0180L295 | ● |
| .50mm | 0.0197 | 1/8 | 0.3100 | 1 1/2 | 130° | 105-0197.310 | ● | 105-0197L310 | ● |
| #76 | 0.0200 | 1/8 | 0.3100 | 1 1/2 | 130° | 105-0200.310 | ● | 105-0200L310 | ● |

| SERIES 105 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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DRILLS
 END MILLS
 ROUTERS
 THREAD MILLS & TAPS
 ENGRAVERS
 BORING BARS
 REAMERS
 SAWS
 TECHNICAL
 INDEX

1/8" SHANK

0.1260" - 0.1594" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

INVERSE DIAMETER MICRO DRILLS



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | |
|------------|---|-----|--------|-------|-------------|--------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock |
| 3.20mm | 0.1260 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1260.500 | ● |
| 3.25mm | 0.1280 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1280.500 | ● |
| #30 | 0.1285 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1285.500 | ● |
| 3.30mm | 0.1299 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1299.500 | ● |
| 3.35mm | 0.1319 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1319.500 | ● |
| 3.40mm | 0.1339 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1339.500 | ● |
| 3.45mm | 0.1358 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1358.500 | ● |
| #29 | 0.1360 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1360.500 | ● |
| 3.50mm | 0.1378 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1378.500 | ● |
| 3.55mm | 0.1398 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1398.500 | ● |
| #28 | 0.1405 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1405.500 | ● |
| 9/64" | 0.1406 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1406.500 | ● |
| 3.60mm | 0.1417 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1417.500 | ● |
| 3.65mm | 0.1437 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1437.500 | ● |
| #27 | 0.1440 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1440.500 | ● |
| 3.70mm | 0.1457 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1457.500 | ● |
| #26 | 0.1470 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1470.500 | ● |
| 3.75mm | 0.1476 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1476.500 | ● |
| #25 | 0.1495 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1495.500 | ● |
| 3.80mm | 0.1496 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1496.500 | ● |
| 3.85mm | 0.1516 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1516.500 | ● |
| #24 | 0.1520 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1520.500 | ● |
| 3.90mm | 0.1535 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1535.500 | ● |
| #23 | 0.1540 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1540.500 | ● |
| 3.95mm | 0.1555 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1555.500 | ● |
| 5/32" | 0.1562 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1562.500 | ● |
| #22 | 0.1570 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1570.500 | ● |
| 4.00mm | 0.1575 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1575.500 | ● |
| #21 | 0.1590 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1590.500 | ● |
| 4.05mm | 0.1594 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1594.500 | ● |

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INDEX

SERIES 155 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -35HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

1/8" SHANK

INVERSE DIAMETER MICRO DRILLS

0.1610" - 0.1949" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD Flute Length

Symbol Descriptions [Page 7](#)

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | |
|------------|---|-----|--------|-------|-------------|--------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | l | L | | Part Number | Stock |
| #20 | 0.1610 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1610.500 | ● |
| 4.10mm | 0.1614 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1614.500 | ● |
| 4.15mm | 0.1634 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1634.500 | ● |
| 4.20mm | 0.1654 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1654.500 | ● |
| #19 | 0.1660 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1660.500 | ● |
| 4.25mm | 0.1673 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1673.500 | ● |
| 4.30mm | 0.1693 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1693.500 | ● |
| #18 | 0.1695 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1695.500 | ● |
| 4.35mm | 0.1713 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1713.500 | ● |
| 11/64" | 0.1719 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1719.500 | ● |
| #17 | 0.1730 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1730.500 | ● |
| 4.40mm | 0.1732 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1732.500 | ● |
| 4.45mm | 0.1752 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1752.500 | ● |
| #16 | 0.1770 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1770.500 | ● |
| 4.50mm | 0.1772 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1772.500 | ● |
| 4.55mm | 0.1791 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1791.500 | ● |
| #15 | 0.1800 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1800.500 | ● |
| 4.60mm | 0.1811 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1811.500 | ● |
| #14 | 0.1820 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1820.500 | ● |
| 4.65mm | 0.1831 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1831.500 | ● |
| #13 | 0.1850 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1850.500 | ● |
| 4.70mm | 0.1850 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1850.500 | ● |
| 4.75mm | 0.1870 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1870.500 | ● |
| 3/16" | 0.1875 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1875.500 | ● |
| #12 | 0.1890 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1890.500 | ● |
| 4.80mm | 0.1890 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1890.500 | ● |
| 4.85mm | 0.1909 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1909.500 | ● |
| #11 | 0.1910 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1910.500 | ● |
| 4.90mm | 0.1929 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1929.500 | ● |
| #10 | 0.1935 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1935.500 | ● |
| 4.95mm | 0.1949 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1949.500 | ● |

| SERIES 155 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

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1/8" SHANK

0.1960" - 0.2323" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

INVERSE DIAMETER MICRO DRILLS



Symbol Descriptions [Page 7](#)

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | |
|------------|---|-----|--------|-------|-------------|--------------|-------|
| | D ^{+0.0000} _{-0.0003} | d | ℓ | L | | Part Number | Stock |
| #9 | 0.1960 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1960.500 | ● |
| 5.00mm | 0.1968 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1968.500 | ● |
| 5.05mm | 0.1988 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1988.500 | ● |
| #8 | 0.1990 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-1990.500 | ● |
| 5.10mm | 0.2008 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2008.500 | ● |
| #7 | 0.2010 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2010.500 | ● |
| 5.15mm | 0.2028 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2028.500 | ● |
| 13/64" | 0.2031 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2031.500 | ● |
| #6 | 0.2040 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2040.500 | ● |
| 5.20mm | 0.2047 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2047.500 | ● |
| #5 | 0.2055 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2055.500 | ● |
| 5.25mm | 0.2067 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2067.500 | ● |
| 5.30mm | 0.2087 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2087.500 | ● |
| #4 | 0.2090 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2090.500 | ● |
| 5.35mm | 0.2106 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2106.500 | ● |
| 5.40mm | 0.2126 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2126.500 | ● |
| #3 | 0.2130 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2130.500 | ● |
| 5.45mm | 0.2146 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2146.500 | ● |
| 5.50mm | 0.2165 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2165.500 | ● |
| 5.50mm | 0.2185 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2185.500 | ● |
| 7/32" | 0.2188 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2188.500 | ● |
| 5.60mm | 0.2205 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2205.500 | ● |
| #2 | 0.2210 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2210.500 | ● |
| 5.65mm | 0.2224 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2224.500 | ● |
| 5.70mm | 0.2244 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2244.500 | ● |
| 5.75mm | 0.2264 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2264.500 | ● |
| #1 | 0.2280 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2280.500 | ● |
| 5.80mm | 0.2283 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2283.500 | ● |
| 5.85mm | 0.2302 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2302.500 | ● |
| 5.90mm | 0.2323 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2323.500 | ● |

SERIES 155 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

1/8" SHANK

INVERSE DIAMETER MICRO DRILLS

0.2340" - 0.2638" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD Flute Length



Symbol Descriptions Page 7

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | |
|------------|-------------------------|-----|--------|-------|-------------|--------------|-------|
| | $D^{+0.0000}_{-0.0003}$ | d | l | L | | Part Number | Stock |
| A | 0.2340 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2340.500 | ● |
| 5.95mm | 0.2343 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2343.500 | ● |
| 15/64" | 0.2344 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2344.500 | ● |
| 6.00mm | 0.2362 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2362.500 | ● |
| B | 0.2380 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2380.500 | ● |
| 6.05mm | 0.2382 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2382.500 | ● |
| 6.10mm | 0.2402 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2402.500 | ● |
| C | 0.2420 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2420.500 | ● |
| 6.15mm | 0.2421 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2421.500 | ● |
| 6.20mm | 0.2441 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2441.500 | ● |
| D | 0.2460 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2460.500 | ● |
| 6.25mm | 0.2461 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2461.500 | ● |
| 6.30mm | 0.2480 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2480.500 | ● |
| 1/4" | 0.2500 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2500.500 | ● |
| 6.35mm | 0.2500 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2500.500 | ● |
| E | 0.2500 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2500.500 | ● |
| 6.40mm | 0.2520 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2520.500 | ● |
| 6.50mm | 0.2559 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2559.500 | ● |
| F | 0.2570 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2570.500 | ● |
| 6.60mm | 0.2598 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2598.500 | ● |
| G | 0.2610 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2610.500 | ● |
| 6.70mm | 0.2638 | 1/8 | 0.5000 | 1 1/2 | 130° | 155-2638.500 | ● |

| SERIES 155 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

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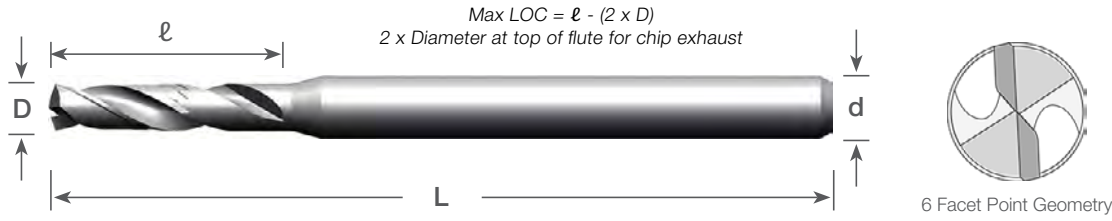
PILOT MICRO DRILLS

0.1250" - 0.5000" DIAMETER

Matched with Coolant Fed Deep Drills Product Line

Increased Positional Accuracy

Less Heat Build Up



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | Point Angle | AITiN Nano | |
|-----------------|--------|-------|-----|-------------|----------------|-------|
| D | d | ℓ | L | | Part Number | Stock |
| 0.1250 (1/8) | 0.1875 | 0.625 | 2.5 | 142° | 160-1250AG625 | ● |
| 0.1406 (9/64) | 0.1875 | 0.703 | 2.5 | 142° | 160-1406AG703 | ● |
| 0.1563 (5/32) | 0.1875 | 0.781 | 2.5 | 142° | 160-1563AG781 | ● |
| 0.1719 (11/64) | 0.1875 | 0.859 | 2.5 | 142° | 160-1719AG859 | ● |
| 0.1875 (3/16) | 0.2500 | 0.938 | 2.5 | 142° | 160-1875AG938 | ● |
| 0.2031 (13/64) | 0.2500 | 1.016 | 2.5 | 142° | 160-2031AG1016 | ● |
| 0.2188 (7/32) | 0.2500 | 1.094 | 2.5 | 142° | 160-2188AG1094 | ● |
| 0.2344 (15/64) | 0.2500 | 1.172 | 2.5 | 142° | 160-2344AG1172 | ● |
| 0.2500 (1/4) | 0.3125 | 1.250 | 3.0 | 142° | 160-2500AG1250 | ● |
| 0.2570 (F) | 0.3125 | 1.285 | 3.0 | 142° | 160-2570AG1285 | ● |
| 0.2656 (17/64) | 0.3125 | 1.328 | 3.0 | 142° | 160-2656AG1328 | ● |
| 0.2813 (9/32) | 0.3125 | 1.406 | 3.0 | 142° | 160-2813AG1406 | ● |
| 0.3125 (5/16) | 0.3750 | 1.563 | 4.0 | 142° | 160-3125AG1563 | ● |
| 0.3320 (Q) | 0.3750 | 1.660 | 4.0 | 142° | 160-3320AG1660 | ● |
| 0.3438 (11/32) | 0.3750 | 1.719 | 4.0 | 142° | 160-3438AG1719 | ● |
| 0.3750 (3/8) | 0.4375 | 1.875 | 4.5 | 142° | 160-3750AG1875 | ● |
| 0.4219 (27/64) | 0.4375 | 2.109 | 4.5 | 142° | 160-4219AG2109 | ● |
| 0.4375 (7/16) | 0.5000 | 2.188 | 5.0 | 142° | 160-4375AG2188 | ● |
| 0.4531 (29/64) | 0.5000 | 2.266 | 5.0 | 142° | 160-4531AG2266 | ● |
| 0.5000 (1/2) | 0.6250 | 2.50 | 5.0 | 142° | 160-5000AG2500 | ● |

Match with Deep Hole Coolant Drills Series 860 [Page 61](#)

Diameter Tolerance

| | | | |
|-----------------|---------------------|---------------------|---------------------|
| Diameter (D) | 0.1250" - 0.2344" | 0.2500" - 0.3750" | 0.4219" - 0.5000" |
| Tolerance + / + | +0.00016"/+0.00063" | +0.00024"/+0.00083" | +0.00028"/+0.00098" |

Shank Tolerance

| | | | |
|-----------------|---------------------|---------------------|---------------------|
| Shank Dia. (d) | 0.1250" - 0.2344" | 0.2500" - 0.3750" | 0.4219" - 0.5000" |
| Tolerance + / - | +0.00000"/-0.00032" | +0.00000"/-0.00035" | +0.00000"/-0.00043" |

SERIES 160 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -35HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

METRIC SHANK **NEW**

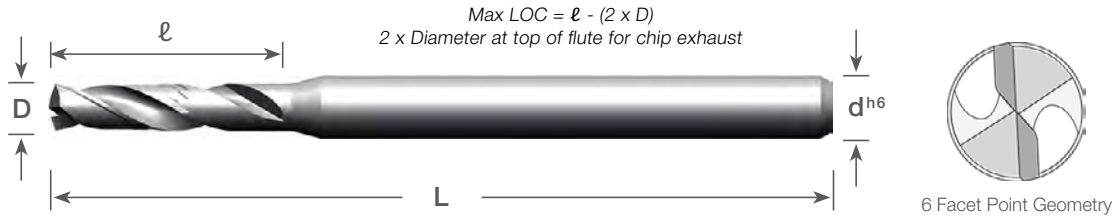
PILOT MICRO DRILLS

3.00mm - 4.10mm DIAMETER

Matched with Coolant Fed Deep Drills Product Line

Increased Positional Accuracy

Less Heat Build Up



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITiN Nano | |
|-----------------|----------|------|-----|-------------|---------------|-------|
| D^{m7} | d^{h6} | l | L | | Part Number | Stock |
| 3.00 | 4 | 15.0 | 60 | 142° | 165-1181AG591 | ● |
| 3.10 | 4 | 15.5 | 60 | 142° | 165-1220AG610 | ● |
| 3.20 | 4 | 16.0 | 60 | 142° | 165-1260AG630 | ● |
| 3.30 | 4 | 16.5 | 60 | 142° | 165-1299AG650 | ● |
| 3.40 | 4 | 17.0 | 60 | 142° | 165-1339AG669 | ● |
| 3.50 | 4 | 17.5 | 60 | 142° | 165-1378AG689 | ● |
| 3.60 | 4 | 18.0 | 60 | 142° | 165-1417AG709 | ● |
| 3.70 | 4 | 18.5 | 60 | 142° | 165-1457AG728 | ● |
| 3.80 | 4 | 19.0 | 60 | 142° | 165-1496AG748 | ● |
| 3.90 | 4 | 19.5 | 60 | 142° | 165-1535AG768 | ● |
| 4.00 | 6 | 20.0 | 70 | 142° | 165-1575AG787 | ● |
| 4.10 | 6 | 20.5 | 70 | 142° | 165-1614AG807 | ● |

Match with Deep Hole Coolant Drills **Series 865** [Page 62](#)

| SERIES 165 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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(International) 001.714.428.3636
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METRIC SHANK NEW

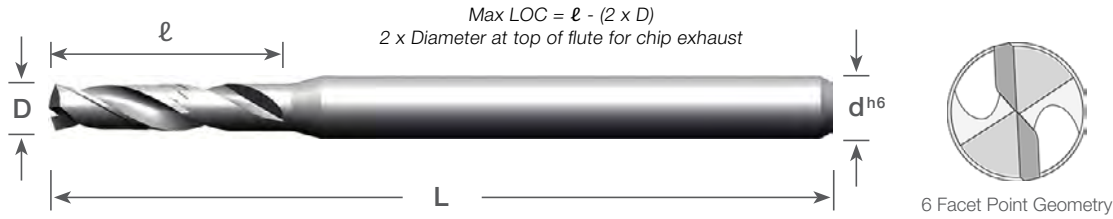
PILOT MICRO DRILLS

4.20mm - 6.80mm DIAMETER

Matched with Coolant Fed Deep Drills Product Line

Increased Positional Accuracy

Less Heat Build Up



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITiN Nano | |
|-----------------|----------|------|-----|-------------|----------------|-------|
| D^{m7} | d^{h6} | l | L | | Part Number | Stock |
| 4.20 | 6 | 21.0 | 70 | 142° | 165-1654AG827 | ● |
| 4.30 | 6 | 21.5 | 70 | 142° | 165-1693AG846 | ● |
| 4.40 | 6 | 22.0 | 70 | 142° | 165-1732AG866 | ● |
| 4.50 | 6 | 22.5 | 70 | 142° | 165-1772AG886 | ● |
| 4.60 | 6 | 23.0 | 70 | 142° | 165-1811AG906 | ● |
| 4.70 | 6 | 23.5 | 70 | 142° | 165-1850AG925 | ● |
| 4.80 | 6 | 24.0 | 70 | 142° | 165-1890AG945 | ● |
| 4.90 | 6 | 24.5 | 70 | 142° | 165-1929AG965 | ● |
| 5.00 | 6 | 25.0 | 70 | 142° | 165-1969AG984 | ● |
| 5.10 | 6 | 25.5 | 70 | 142° | 165-2008AG1004 | ● |
| 5.20 | 6 | 26.0 | 70 | 142° | 165-2047AG1024 | ● |
| 5.30 | 6 | 26.5 | 70 | 142° | 165-2087AG1043 | ● |
| 5.40 | 6 | 27.0 | 70 | 142° | 165-2126AG1063 | ● |
| 5.50 | 6 | 27.5 | 70 | 142° | 165-2165AG1083 | ● |
| 5.60 | 6 | 28.0 | 70 | 142° | 165-2205AG1102 | ● |
| 5.70 | 6 | 28.5 | 70 | 142° | 165-2244AG1122 | ● |
| 5.80 | 6 | 29.0 | 70 | 142° | 165-2283AG1142 | ● |
| 5.90 | 6 | 29.5 | 70 | 142° | 165-2323AG1161 | ● |
| 6.00 | 8 | 30.0 | 80 | 142° | 165-2362AG1181 | ● |
| 6.10 | 8 | 30.5 | 80 | 142° | 165-2402AG1201 | ● |
| 6.20 | 8 | 31.0 | 80 | 142° | 165-2441AG1220 | ● |
| 6.30 | 8 | 31.5 | 80 | 142° | 165-2480AG1240 | ● |
| 6.40 | 8 | 32.0 | 80 | 142° | 165-2520AG1260 | ● |
| 6.50 | 8 | 32.5 | 80 | 142° | 165-2559AG1280 | ● |
| 6.60 | 8 | 33.0 | 80 | 142° | 165-2598AG1299 | ● |
| 6.70 | 8 | 33.5 | 80 | 142° | 165-2638AG1319 | ● |
| 6.80 | 8 | 34.0 | 80 | 142° | 165-2677AG1339 | ● |

Match with Deep Hole Coolant Drills [Series 865](#) [Page 63](#)

| SERIES 165 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -35HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

METRIC SHANK **NEW**

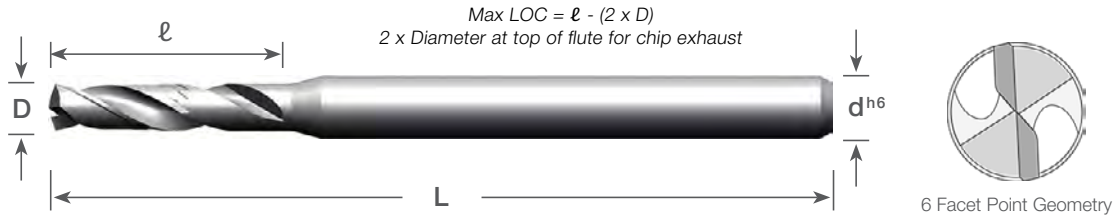
PILOT MICRO DRILLS

6.90mm - 9.50mm DIAMETER

Matched with Coolant Fed Deep Drills Product Line

Increased Positional Accuracy

Less Heat Build Up



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITiN Nano | |
|-----------------|-----------------|------|-----|-------------|----------------|-------|
| D ^{m7} | d ^{h6} | ℓ | L | | Part Number | Stock |
| 6.90 | 8 | 34.5 | 80 | 142° | 165-2717AG1358 | ● |
| 7.00 | 8 | 35.0 | 80 | 142° | 165-2756AG1378 | ● |
| 7.10 | 8 | 35.5 | 80 | 142° | 165-2795AG1398 | ● |
| 7.20 | 8 | 36.0 | 80 | 142° | 165-2835AG1417 | ● |
| 7.30 | 8 | 36.5 | 80 | 142° | 165-2874AG1437 | ● |
| 7.40 | 8 | 37.0 | 80 | 142° | 165-2913AG1457 | ● |
| 7.50 | 8 | 37.5 | 80 | 142° | 165-2953AG1476 | ● |
| 7.60 | 8 | 38.0 | 80 | 142° | 165-2992AG1496 | ● |
| 7.70 | 8 | 38.5 | 80 | 142° | 165-3031AG1516 | ● |
| 7.80 | 8 | 39.0 | 80 | 142° | 165-3071AG1535 | ● |
| 7.90 | 8 | 39.5 | 80 | 142° | 165-3110AG1555 | ● |
| 8.00 | 10 | 40.0 | 100 | 142° | 165-3150AG1575 | ● |
| 8.10 | 10 | 40.5 | 100 | 142° | 165-3189AG1594 | ● |
| 8.20 | 10 | 41.0 | 100 | 142° | 165-3228AG1614 | ● |
| 8.30 | 10 | 41.5 | 100 | 142° | 165-3268AG1634 | ● |
| 8.40 | 10 | 42.0 | 100 | 142° | 165-3307AG1654 | ● |
| 8.50 | 10 | 42.5 | 100 | 142° | 165-3346AG1673 | ● |
| 8.60 | 10 | 43.0 | 100 | 142° | 165-3386AG1693 | ● |
| 8.70 | 10 | 43.5 | 100 | 142° | 165-3425AG1713 | ● |
| 8.80 | 10 | 44.0 | 100 | 142° | 165-3465AG1732 | ● |
| 8.90 | 10 | 44.5 | 100 | 142° | 165-3504AG1752 | ● |
| 9.00 | 10 | 45.0 | 100 | 142° | 165-3543AG1772 | ● |
| 9.10 | 10 | 45.5 | 100 | 142° | 165-3583AG1791 | ● |
| 9.20 | 10 | 46.0 | 100 | 142° | 165-3622AG1811 | ● |
| 9.30 | 10 | 46.5 | 100 | 142° | 165-3661AG1831 | ● |
| 9.40 | 10 | 47.0 | 100 | 142° | 165-3701AG1850 | ● |
| 9.50 | 10 | 47.5 | 100 | 142° | 165-3740AG1870 | ● |

Match with Deep Hole Coolant Drills Series 865 [Page 64](#)

| SERIES 165 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
 ■ : NOT STOCKED - Call for Delivery

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 Pricing & Availability at KyoceraPrecisionTools.com

METRIC SHANK NEW

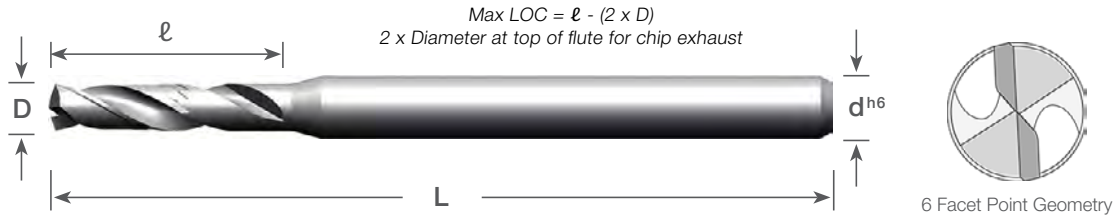
PILOT MICRO DRILLS

9.60mm - 12.00mm DIAMETER

Matched with Coolant Fed Deep Drills Product Line

Increased Positional Accuracy

Less Heat Build Up



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITIN Nano | |
|-----------------|----------|------|-----|-------------|----------------|-------|
| D^{m7} | d^{h6} | l | L | | Part Number | Stock |
| 9.60 | 10 | 48.0 | 100 | 142° | 165-3780AG1890 | ● |
| 9.70 | 10 | 48.5 | 100 | 142° | 165-3819AG1909 | ● |
| 9.80 | 10 | 49.0 | 100 | 142° | 165-3858AG1929 | ● |
| 9.90 | 10 | 49.5 | 100 | 142° | 165-3898AG1949 | ● |
| 10.00 | 12 | 50.0 | 110 | 142° | 165-3937AG1969 | ● |
| 10.10 | 12 | 50.5 | 110 | 142° | 165-3976AG1988 | ● |
| 10.20 | 12 | 51.0 | 110 | 142° | 165-4016AG2008 | ● |
| 10.30 | 12 | 51.5 | 110 | 142° | 165-4055AG2028 | ● |
| 10.40 | 12 | 52.0 | 110 | 142° | 165-4094AG2047 | ● |
| 10.50 | 12 | 52.5 | 110 | 142° | 165-4134AG2067 | ● |
| 10.60 | 12 | 53.0 | 110 | 142° | 165-4173AG2087 | ● |
| 10.70 | 12 | 53.5 | 110 | 142° | 165-4213AG2106 | ● |
| 10.80 | 12 | 54.0 | 110 | 142° | 165-4252AG2126 | ● |
| 10.90 | 12 | 54.5 | 110 | 142° | 165-4291AG2146 | ● |
| 11.00 | 12 | 55.0 | 110 | 142° | 165-4331AG2165 | ● |
| 11.10 | 12 | 55.5 | 110 | 142° | 165-4370AG2185 | ● |
| 11.20 | 12 | 56.0 | 110 | 142° | 165-4409AG2205 | ● |
| 11.30 | 12 | 56.5 | 110 | 142° | 165-4449AG2224 | ● |
| 11.40 | 12 | 57.0 | 110 | 142° | 165-4488AG2244 | ● |
| 11.50 | 12 | 57.5 | 110 | 142° | 165-4528AG2264 | ● |
| 11.60 | 12 | 58.0 | 110 | 142° | 165-4567AG2283 | ● |
| 11.70 | 12 | 58.5 | 110 | 142° | 165-4606AG2303 | ● |
| 11.80 | 12 | 59.0 | 110 | 142° | 165-4646AG2323 | ● |
| 11.90 | 12 | 59.5 | 110 | 142° | 165-4685AG2343 | ● |
| 12.00 | 14 | 60.0 | 110 | 142° | 165-4724AG2362 | ● |

Match with Deep Hole Coolant Drills **Series 865** [Page 65](#)

| SERIES 165 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -35HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

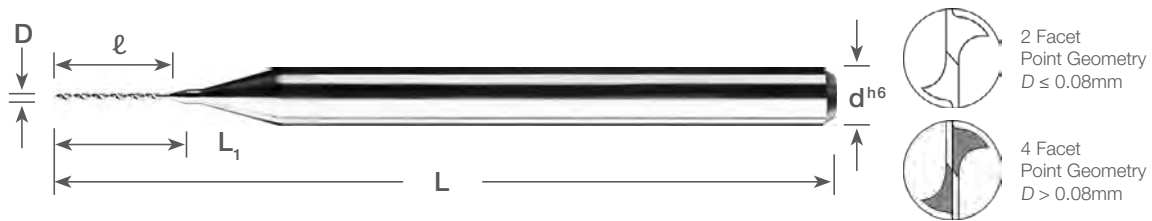
Symbol Descriptions [Page 7](#)

3.00mm SHANK

MICRO DRILLS

0.04mm - 0.33mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.04 | 3 | 0.50 | 38 | 0.50 | 226-0016.020 | ● | - | - |
| 0.05 | 3 | 0.80 | 38 | 0.80 | 226-0020.030 | ● | - | - |
| 0.06 | 3 | 0.80 | 38 | 0.80 | 226-0024.030 | ● | - | - |
| 0.07 | 3 | 1.30 | 38 | 1.30 | 226-0028.050 | ● | - | - |
| 0.08 | 3 | 1.30 | 38 | 1.30 | 226-0031.050 | ● | - | - |
| 0.09 | 3 | 1.30 | 38 | 1.30 | 226-0035.050 | ● | - | - |
| 0.10 | 3 | 1.00 | 38 | 1.20 | 226-0039.040 | ● | - | - |
| 0.11 | 3 | 1.00 | 38 | 1.20 | 226-0043.040 | ● | - | - |
| 0.12 | 3 | 1.00 | 38 | 1.20 | 226-0047.040 | ● | - | - |
| 0.13 | 3 | 1.00 | 38 | 1.20 | 226-0051.040 | ● | - | - |
| 0.14 | 3 | 1.00 | 38 | 1.20 | 226-0055.040 | ● | - | - |
| 0.15 | 3 | 2.00 | 38 | 2.20 | 226-0059.080 | ● | - | - |
| 0.16 | 3 | 2.00 | 38 | 2.20 | 226-0063.080 | ● | - | - |
| 0.17 | 3 | 2.00 | 38 | 2.20 | 226-0067.080 | ● | - | - |
| 0.18 | 3 | 2.50 | 38 | 2.70 | 226-0071.100 | ● | - | - |
| 0.19 | 3 | 2.50 | 38 | 2.70 | 226-0075.100 | ● | - | - |
| 0.20 | 3 | 2.50 | 38 | 2.70 | 226-0079.100 | ● | - | - |
| 0.21 | 3 | 2.50 | 38 | 2.70 | 226-0083.100 | ● | - | - |
| 0.22 | 3 | 2.50 | 38 | 2.70 | 226-0087.100 | ● | - | - |
| 0.23 | 3 | 3.80 | 38 | 4.00 | 226-0091.150 | ● | - | - |
| 0.24 | 3 | 3.80 | 38 | 4.00 | 226-0094.150 | ● | - | - |
| 0.25 | 3 | 3.80 | 38 | 4.00 | 226-0098.150 | ● | - | - |
| 0.26 | 3 | 3.80 | 38 | 4.00 | 226-0102.150 | ● | - | - |
| 0.27 | 3 | 3.80 | 38 | 4.00 | 226-0106.150 | ● | - | - |
| 0.28 | 3 | 3.80 | 38 | 4.00 | 226-0110.150 | ● | - | - |
| 0.29 | 3 | 3.80 | 38 | 4.00 | 226-0114.150 | ● | - | - |
| 0.30 | 3 | 5.70 | 38 | 5.90 | 226-0118.225 | ● | 226-0118L225 | ● |
| 0.31 | 3 | 5.70 | 38 | 5.90 | 226-0122.225 | ● | 226-0122L225 | ● |
| 0.32 | 3 | 5.70 | 38 | 5.90 | 226-0126.225 | ● | 226-0126L225 | ● |
| 0.33 | 3 | 5.70 | 38 | 5.90 | 226-0130.225 | ● | 226-0130L225 | ● |

| Coating | SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|----------|-------------------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| | P Steel -50HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

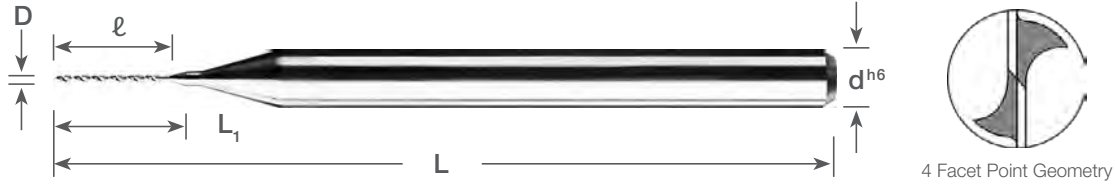
DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

3.00mm SHANK

MICRO DRILLS

0.34mm - 0.54mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.34 | 3 | 5.70 | 38 | 5.90 | 226-0134.225 | ● | 226-0134L225 | ● |
| 0.35 | 3 | 5.70 | 38 | 5.90 | 226-0138.225 | ● | 226-0138L225 | ● |
| 0.36 | 3 | 5.70 | 38 | 5.90 | 226-0142.225 | ● | 226-0142L225 | ● |
| 0.37 | 3 | 5.70 | 38 | 5.90 | 226-0146.225 | ● | 226-0146L225 | ● |
| 0.38 | 3 | 6.40 | 38 | 6.60 | 226-0150.250 | ● | 226-0150L250 | ● |
| 0.39 | 3 | 6.40 | 38 | 6.60 | 226-0154.250 | ● | 226-0154L250 | ● |
| 0.40 | 3 | 6.40 | 38 | 6.60 | 226-0157.250 | ● | 226-0157L250 | ● |
| 0.41 | 3 | 6.40 | 38 | 6.60 | 226-0161.250 | ● | 226-0161L250 | ● |
| 0.42 | 3 | 6.40 | 38 | 6.60 | 226-0165.250 | ● | 226-0165L250 | ● |
| 0.43 | 3 | 6.40 | 38 | 6.60 | 226-0169.250 | ● | 226-0169L250 | ● |
| 0.44 | 3 | 6.40 | 38 | 6.60 | 226-0173.250 | ● | 226-0173L250 | ● |
| 0.45 | 3 | 6.40 | 38 | 6.60 | 226-0177.250 | ● | 226-0177L250 | ● |
| 0.46 | 3 | 6.40 | 38 | 6.60 | 226-0181.250 | ● | 226-0181L250 | ● |
| 0.47 | 3 | 6.40 | 38 | 6.60 | 226-0185.250 | ● | 226-0185L250 | ● |
| 0.48 | 3 | 6.60 | 38 | 6.80 | 226-0189.260 | ● | 226-0189L260 | ● |
| 0.49 | 3 | 6.60 | 38 | 6.80 | 226-0193.260 | ● | 226-0193L260 | ● |
| 0.50 | 3 | 6.60 | 38 | 6.80 | 226-0197.260 | ● | 226-0197L260 | ● |
| 0.51 | 3 | 6.60 | 38 | 6.80 | 226-0201.260 | ● | 226-0201L260 | ● |
| 0.52 | 3 | 6.60 | 38 | 6.80 | 226-0205.260 | ● | 226-0205L260 | ● |
| 0.53 | 3 | 6.60 | 38 | 6.80 | 226-0209.260 | ● | 226-0209L260 | ● |
| 0.54 | 3 | 6.60 | 38 | 6.80 | 226-0213.260 | ● | 226-0213L260 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel ~30HRC | P Steel 30-40HRC | H TEMPERED Steel ~55HRC | H TEMPERED Steel ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

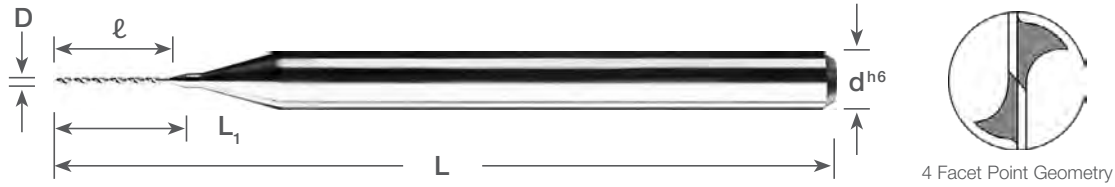
Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

0.55mm - 0.84mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AITiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.55 | 3 | 8.60 | 38 | 8.80 | 226-0217.340 | ● | 226-0217L340 | ● |
| 0.56 | 3 | 8.60 | 38 | 8.80 | 226-0220.340 | ● | 226-0220L340 | ● |
| 0.57 | 3 | 8.60 | 38 | 8.80 | 226-0224.340 | ● | 226-0224L340 | ● |
| 0.58 | 3 | 8.60 | 38 | 8.80 | 226-0228.340 | ● | 226-0228L340 | ● |
| 0.59 | 3 | 8.60 | 38 | 8.80 | 226-0232.340 | ● | 226-0232L340 | ● |
| 0.60 | 3 | 8.60 | 38 | 8.80 | 226-0236.340 | ● | 226-0236L340 | ● |
| 0.61 | 3 | 8.60 | 38 | 8.80 | 226-0240.340 | ● | 226-0240L340 | ● |
| 0.62 | 3 | 8.60 | 38 | 8.80 | 226-0244.340 | ● | 226-0244L340 | ● |
| 0.63 | 3 | 8.60 | 38 | 8.80 | 226-0248.340 | ● | 226-0248L340 | ● |
| 0.64 | 3 | 8.60 | 38 | 8.80 | 226-0252.340 | ● | 226-0252L340 | ● |
| 0.65 | 3 | 8.60 | 38 | 8.80 | 226-0256.340 | ● | 226-0256L340 | ● |
| 0.66 | 3 | 8.60 | 38 | 8.80 | 226-0260.340 | ● | 226-0260L340 | ● |
| 0.67 | 3 | 8.60 | 38 | 8.80 | 226-0264.340 | ● | 226-0264L340 | ● |
| 0.68 | 3 | 8.60 | 38 | 8.80 | 226-0268.340 | ● | 226-0268L340 | ● |
| 0.69 | 3 | 8.60 | 38 | 8.80 | 226-0272.340 | ● | 226-0272L340 | ● |
| 0.70 | 3 | 10.20 | 38 | 10.40 | 226-0276.400 | ● | 226-0276L400 | ● |
| 0.71 | 3 | 10.20 | 38 | 10.40 | 226-0280.400 | ● | 226-0280L400 | ● |
| 0.72 | 3 | 10.20 | 38 | 10.40 | 226-0283.400 | ● | 226-0283L400 | ● |
| 0.73 | 3 | 10.20 | 38 | 10.40 | 226-0287.400 | ● | 226-0287L400 | ● |
| 0.74 | 3 | 10.20 | 38 | 10.40 | 226-0291.400 | ● | 226-0291L400 | ● |
| 0.75 | 3 | 10.20 | 38 | 10.40 | 226-0295.400 | ● | 226-0295L400 | ● |
| 0.76 | 3 | 10.20 | 38 | 10.40 | 226-0299.400 | ● | 226-0299L400 | ● |
| 0.77 | 3 | 10.20 | 38 | 10.40 | 226-0303.400 | ● | 226-0303L400 | ● |
| 0.78 | 3 | 10.20 | 38 | 10.40 | 226-0307.400 | ● | 226-0307L400 | ● |
| 0.79 | 3 | 10.20 | 38 | 10.40 | 226-0311.400 | ● | 226-0311L400 | ● |
| 0.80 | 3 | 10.20 | 38 | 10.40 | 226-0315.400 | ● | 226-0315L400 | ● |
| 0.81 | 3 | 10.20 | 38 | 10.40 | 226-0319.400 | ● | 226-0319L400 | ● |
| 0.82 | 3 | 10.20 | 38 | 10.40 | 226-0323.400 | ● | 226-0323L400 | ● |
| 0.83 | 3 | 10.20 | 38 | 10.40 | 226-0327.400 | ● | 226-0327L400 | ● |
| 0.84 | 3 | 10.20 | 38 | 10.40 | 226-0331.400 | ● | 226-0331L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -50HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AITiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

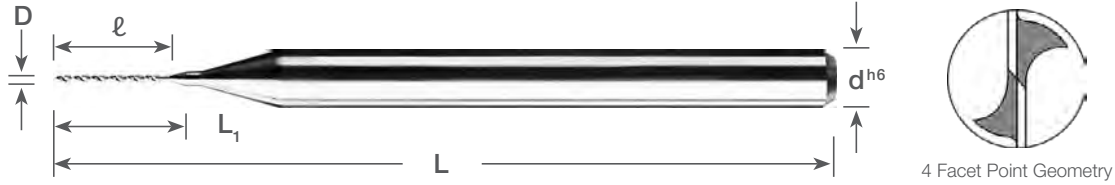
(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

3.00mm SHANK

MICRO DRILLS

0.85mm - 1.14mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.85 | 3 | 10.20 | 38 | 10.40 | 226-0335.400 | ● | 226-0335L400 | ● |
| 0.86 | 3 | 10.20 | 38 | 10.40 | 226-0339.400 | ● | 226-0339L400 | ● |
| 0.87 | 3 | 10.20 | 38 | 10.40 | 226-0343.400 | ● | 226-0343L400 | ● |
| 0.88 | 3 | 10.20 | 38 | 10.40 | 226-0346.400 | ● | 226-0346L400 | ● |
| 0.89 | 3 | 10.20 | 38 | 10.40 | 226-0350.400 | ● | 226-0350L400 | ● |
| 0.90 | 3 | 10.20 | 38 | 10.40 | 226-0354.400 | ● | 226-0354L400 | ● |
| 0.91 | 3 | 10.20 | 38 | 10.40 | 226-0358.400 | ● | 226-0358L400 | ● |
| 0.92 | 3 | 10.20 | 38 | 10.40 | 226-0362.400 | ● | 226-0362L400 | ● |
| 0.93 | 3 | 10.20 | 38 | 10.40 | 226-0366.400 | ● | 226-0366L400 | ● |
| 0.94 | 3 | 10.20 | 38 | 10.40 | 226-0370.400 | ● | 226-0370L400 | ● |
| 0.95 | 3 | 10.20 | 38 | 10.40 | 226-0374.400 | ● | 226-0374L400 | ● |
| 0.96 | 3 | 10.20 | 38 | 10.40 | 226-0378.400 | ● | 226-0378L400 | ● |
| 0.97 | 3 | 10.20 | 38 | 10.40 | 226-0382.400 | ● | 226-0382L400 | ● |
| 0.98 | 3 | 10.20 | 38 | 10.40 | 226-0386.400 | ● | 226-0386L400 | ● |
| 0.99 | 3 | 10.20 | 38 | 10.40 | 226-0390.400 | ● | 226-0390L400 | ● |
| 1.00 | 3 | 10.20 | 38 | 10.40 | 226-0394.400 | ● | 226-0394L400 | ● |
| 1.01 | 3 | 10.20 | 38 | 10.40 | 226-0398.400 | ● | 226-0398L400 | ● |
| 1.02 | 3 | 10.20 | 38 | 10.40 | 226-0402.400 | ● | 226-0402L400 | ● |
| 1.03 | 3 | 10.20 | 38 | 10.40 | 226-0406.400 | ● | 226-0406L400 | ● |
| 1.04 | 3 | 10.20 | 38 | 10.40 | 226-0409.400 | ● | 226-0409L400 | ● |
| 1.05 | 3 | 10.20 | 38 | 10.40 | 226-0413.400 | ● | 226-0413L400 | ● |
| 1.06 | 3 | 10.20 | 38 | 10.40 | 226-0417.400 | ● | 226-0417L400 | ● |
| 1.07 | 3 | 10.20 | 38 | 10.40 | 226-0421.400 | ● | 226-0421L400 | ● |
| 1.08 | 3 | 10.20 | 38 | 10.40 | 226-0425.400 | ● | 226-0425L400 | ● |
| 1.09 | 3 | 10.20 | 38 | 10.40 | 226-0429.400 | ● | 226-0429L400 | ● |
| 1.10 | 3 | 10.20 | 38 | 10.40 | 226-0433.400 | ● | 226-0433L400 | ● |
| 1.11 | 3 | 10.20 | 38 | 10.40 | 226-0437.400 | ● | 226-0437L400 | ● |
| 1.12 | 3 | 10.20 | 38 | 10.40 | 226-0441.400 | ● | 226-0441L400 | ● |
| 1.13 | 3 | 10.20 | 38 | 10.40 | 226-0445.400 | ● | 226-0445L400 | ● |
| 1.14 | 3 | 10.20 | 38 | 10.40 | 226-0449.400 | ● | 226-0449L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

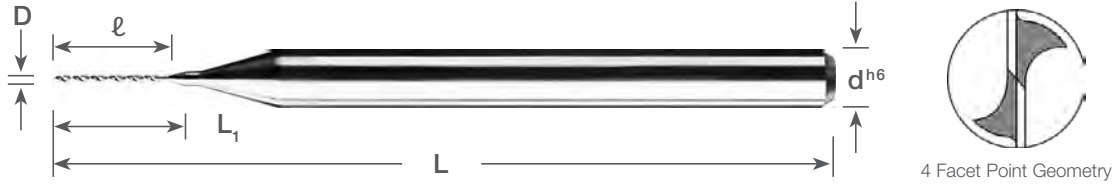
Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

1.15mm - 1.44mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AITIN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | l | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 1.15 | 3 | 10.20 | 38 | 10.40 | 226-0453.400 | ● | 226-0453L400 | ● |
| 1.16 | 3 | 10.20 | 38 | 10.40 | 226-0457.400 | ● | 226-0457L400 | ● |
| 1.17 | 3 | 10.20 | 38 | 10.40 | 226-0461.400 | ● | 226-0461L400 | ● |
| 1.18 | 3 | 10.20 | 38 | 10.40 | 226-0465.400 | ● | 226-0465L400 | ● |
| 1.19 | 3 | 10.20 | 38 | 10.40 | 226-0469.400 | ● | 226-0469L400 | ● |
| 1.20 | 3 | 10.20 | 38 | 10.40 | 226-0472.400 | ● | 226-0472L400 | ● |
| 1.21 | 3 | 10.20 | 38 | 10.40 | 226-0476.400 | ● | 226-0476L400 | ● |
| 1.22 | 3 | 10.20 | 38 | 10.40 | 226-0480.400 | ● | 226-0480L400 | ● |
| 1.23 | 3 | 10.20 | 38 | 10.40 | 226-0484.400 | ● | 226-0484L400 | ● |
| 1.24 | 3 | 10.20 | 38 | 10.40 | 226-0488.400 | ● | 226-0488L400 | ● |
| 1.25 | 3 | 10.20 | 38 | 10.40 | 226-0492.400 | ● | 226-0492L400 | ● |
| 1.26 | 3 | 10.20 | 38 | 10.40 | 226-0496.400 | ● | 226-0496L400 | ● |
| 1.27 | 3 | 10.20 | 38 | 10.40 | 226-0500.400 | ● | 226-0500L400 | ● |
| 1.28 | 3 | 10.20 | 38 | 10.40 | 226-0504.400 | ● | 226-0504L400 | ● |
| 1.29 | 3 | 10.20 | 38 | 10.40 | 226-0508.400 | ● | 226-0508L400 | ● |
| 1.30 | 3 | 10.20 | 38 | 10.40 | 226-0512.400 | ● | 226-0512L400 | ● |
| 1.31 | 3 | 10.20 | 38 | 10.40 | 226-0516.400 | ● | 226-0516L400 | ● |
| 1.32 | 3 | 10.20 | 38 | 10.40 | 226-0520.400 | ● | 226-0520L400 | ● |
| 1.33 | 3 | 10.20 | 38 | 10.40 | 226-0524.400 | ● | 226-0524L400 | ● |
| 1.34 | 3 | 10.20 | 38 | 10.40 | 226-0528.400 | ● | 226-0528L400 | ● |
| 1.35 | 3 | 10.20 | 38 | 10.40 | 226-0531.400 | ● | 226-0531L400 | ● |
| 1.36 | 3 | 10.20 | 38 | 10.40 | 226-0535.400 | ● | 226-0535L400 | ● |
| 1.37 | 3 | 10.20 | 38 | 10.40 | 226-0539.400 | ● | 226-0539L400 | ● |
| 1.38 | 3 | 10.20 | 38 | 10.40 | 226-0543.400 | ● | 226-0543L400 | ● |
| 1.39 | 3 | 10.20 | 38 | 10.40 | 226-0547.400 | ● | 226-0547L400 | ● |
| 1.40 | 3 | 10.20 | 38 | 10.40 | 226-0551.400 | ● | 226-0551L400 | ● |
| 1.41 | 3 | 10.20 | 38 | 10.40 | 226-0555.400 | ● | 226-0555L400 | ● |
| 1.42 | 3 | 10.20 | 38 | 10.40 | 226-0559.400 | ● | 226-0559L400 | ● |
| 1.43 | 3 | 10.20 | 38 | 10.40 | 226-0563.400 | ● | 226-0563L400 | ● |
| 1.44 | 3 | 10.20 | 38 | 10.40 | 226-0567.400 | ● | 226-0567L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

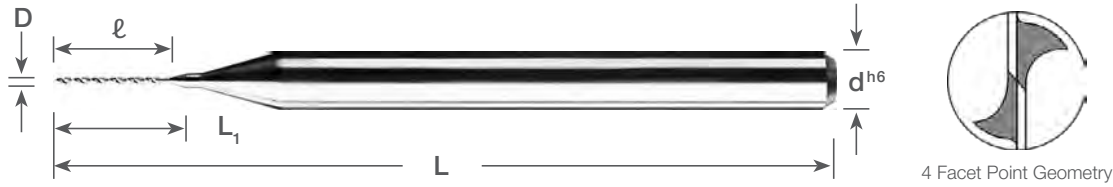
3.00mm SHANK

1.45mm - 1.74mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

MICRO DRILLS



STANDARD Flute Length



Symbol Descriptions Page 7

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 1.45 | 3 | 10.20 | 38 | 10.40 | 226-0571.400 | ● | 226-0571L400 | ● |
| 1.46 | 3 | 10.20 | 38 | 10.40 | 226-0575.400 | ● | 226-0575L400 | ● |
| 1.47 | 3 | 10.20 | 38 | 10.40 | 226-0579.400 | ● | 226-0579L400 | ● |
| 1.48 | 3 | 10.20 | 38 | 10.40 | 226-0583.400 | ● | 226-0583L400 | ● |
| 1.49 | 3 | 10.20 | 38 | 10.40 | 226-0587.400 | ● | 226-0587L400 | ● |
| 1.50 | 3 | 10.20 | 38 | 10.40 | 226-0591.400 | ● | 226-0591L400 | ● |
| 1.51 | 3 | 10.20 | 38 | 10.40 | 226-0594.400 | ● | 226-0594L400 | ● |
| 1.52 | 3 | 10.20 | 38 | 10.40 | 226-0598.400 | ● | 226-0598L400 | ● |
| 1.53 | 3 | 10.20 | 38 | 10.40 | 226-0602.400 | ● | 226-0602L400 | ● |
| 1.54 | 3 | 10.20 | 38 | 10.40 | 226-0606.400 | ● | 226-0606L400 | ● |
| 1.55 | 3 | 10.20 | 38 | 10.40 | 226-0610.400 | ● | 226-0610L400 | ● |
| 1.56 | 3 | 10.20 | 38 | 10.40 | 226-0614.400 | ● | 226-0614L400 | ● |
| 1.57 | 3 | 10.20 | 38 | 10.40 | 226-0618.400 | ● | 226-0618L400 | ● |
| 1.58 | 3 | 10.20 | 38 | 10.40 | 226-0622.400 | ● | 226-0622L400 | ● |
| 1.59 | 3 | 10.20 | 38 | 10.40 | 226-0626.400 | ● | 226-0626L400 | ● |
| 1.60 | 3 | 10.20 | 38 | 10.40 | 226-0630.400 | ● | 226-0630L400 | ● |
| 1.61 | 3 | 10.20 | 38 | 10.40 | 226-0634.400 | ● | 226-0634L400 | ● |
| 1.62 | 3 | 10.20 | 38 | 10.40 | 226-0638.400 | ● | 226-0638L400 | ● |
| 1.63 | 3 | 10.20 | 38 | 10.40 | 226-0642.400 | ● | 226-0642L400 | ● |
| 1.64 | 3 | 10.20 | 38 | 10.40 | 226-0646.400 | ● | 226-0646L400 | ● |
| 1.65 | 3 | 10.20 | 38 | 10.40 | 226-0650.400 | ● | 226-0650L400 | ● |
| 1.66 | 3 | 10.20 | 38 | 10.40 | 226-0654.400 | ● | 226-0654L400 | ● |
| 1.67 | 3 | 10.20 | 38 | 10.40 | 226-0657.400 | ● | 226-0657L400 | ● |
| 1.68 | 3 | 10.20 | 38 | 10.40 | 226-0661.400 | ● | 226-0661L400 | ● |
| 1.69 | 3 | 10.20 | 38 | 10.40 | 226-0665.400 | ● | 226-0665L400 | ● |
| 1.70 | 3 | 10.20 | 38 | 10.40 | 226-0669.400 | ● | 226-0669L400 | ● |
| 1.71 | 3 | 10.20 | 38 | 10.40 | 226-0673.400 | ● | 226-0673L400 | ● |
| 1.72 | 3 | 10.20 | 38 | 10.40 | 226-0677.400 | ● | 226-0677L400 | ● |
| 1.73 | 3 | 10.20 | 38 | 10.40 | 226-0681.400 | ● | 226-0681L400 | ● |
| 1.74 | 3 | 10.20 | 38 | 10.40 | 226-0685.400 | ● | 226-0685L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

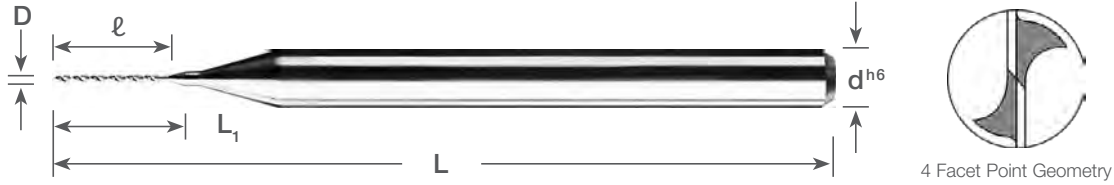
Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

1.75mm - 2.02mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|-------------------------|----------|-------|-----|-------|--------------|-------|---------------|-------|
| $D^{+0.000mm/-0.008mm}$ | d^{h6} | l | L | L_1 | Part Number | Stock | Part Number | Stock |
| 1.75 | 3 | 10.20 | 38 | 10.40 | 226-0689.400 | ● | 226-0689L400 | ● |
| 1.76 | 3 | 10.20 | 38 | 10.40 | 226-0693.400 | ● | 226-0693L400 | ● |
| 1.77 | 3 | 10.20 | 38 | 10.40 | 226-0697.400 | ● | 226-0697L400 | ● |
| 1.78 | 3 | 10.20 | 38 | 10.40 | 226-0701.400 | ● | 226-0701L400 | ● |
| 1.79 | 3 | 10.20 | 38 | 10.40 | 226-0705.400 | ● | 226-0705L400 | ● |
| 1.80 | 3 | 10.20 | 38 | 10.40 | 226-0709.400 | ● | 226-0709L400 | ● |
| 1.81 | 3 | 10.20 | 38 | 10.40 | 226-0713.400 | ● | 226-0713L400 | ● |
| 1.82 | 3 | 10.20 | 38 | 10.40 | 226-0717.400 | ● | 226-0717L400 | ● |
| 1.83 | 3 | 10.20 | 38 | 10.40 | 226-0720.400 | ● | 226-0720L400 | ● |
| 1.84 | 3 | 10.20 | 38 | 10.40 | 226-0724.400 | ● | 226-0724L400 | ● |
| 1.85 | 3 | 10.20 | 38 | 10.40 | 226-0728.400 | ● | 226-0728L400 | ● |
| 1.86 | 3 | 10.20 | 38 | 10.40 | 226-0732.400 | ● | 226-0732L400 | ● |
| 1.87 | 3 | 10.20 | 38 | 10.40 | 226-0736.400 | ● | 226-0736L400 | ● |
| 1.88 | 3 | 10.20 | 38 | 10.40 | 226-0740.400 | ● | 226-0740L400 | ● |
| 1.89 | 3 | 10.20 | 38 | 10.40 | 226-0744.400 | ● | 226-0744L400 | ● |
| 1.90 | 3 | 10.20 | 38 | 10.40 | 226-0748.400 | ● | 226-0748L400 | ● |
| 1.91 | 3 | 10.20 | 38 | 10.40 | 226-0752.400 | ● | 226-0752L400 | ● |
| 1.92 | 3 | 10.20 | 38 | 10.40 | 226-0756.400 | ● | 226-0756L400 | ● |
| 1.93 | 3 | 10.20 | 38 | 10.40 | 226-0760.400 | ● | 226-0760L400 | ● |
| 1.94 | 3 | 10.20 | 38 | 10.40 | 226-0764.400 | ● | 226-0764L400 | ● |
| 1.95 | 3 | 10.20 | 38 | 10.40 | 226-0768.400 | ● | 226-0768L400 | ● |
| 1.96 | 3 | 10.20 | 38 | 10.40 | 226-0772.400 | ● | 226-0772L400 | ● |
| 1.97 | 3 | 10.20 | 38 | 10.40 | 226-0776.400 | ● | 226-0776L400 | ● |
| 1.98 | 3 | 10.20 | 38 | 10.40 | 226-0780.400 | ● | 226-0780L400 | ● |
| 1.99 | 3 | 10.20 | 38 | 10.40 | 226-0783.400 | ● | 226-0783L400 | ● |
| 2.00 | 3 | 10.20 | 38 | 10.40 | 226-0787.400 | ● | 226-0787L400 | ● |
| 2.01 | 3 | 10.20 | 38 | 10.40 | 226-0791.400 | ● | 226-0791L400 | ● |
| 2.02 | 3 | 10.20 | 38 | 10.40 | 226-0795.400 | ● | 226-0795L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| Coating | P Steel -50HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

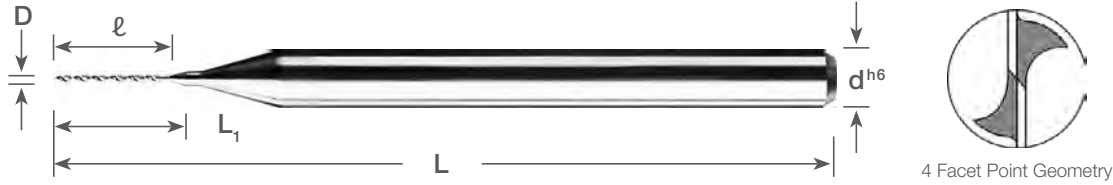
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(International) 001.714.428.3636
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3.00mm SHANK

MICRO DRILLS

2.03mm - 2.30mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | l | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 2.03 | 3 | 10.20 | 38 | 10.40 | 226-0799.400 | ● | 226-0799L400 | ● |
| 2.04 | 3 | 10.20 | 38 | 10.40 | 226-0803.400 | ● | 226-0803L400 | ● |
| 2.05 | 3 | 10.20 | 38 | 10.40 | 226-0807.400 | ● | 226-0807L400 | ● |
| 2.06 | 3 | 10.20 | 38 | 10.40 | 226-0811.400 | ● | 226-0811L400 | ● |
| 2.07 | 3 | 10.20 | 38 | 10.40 | 226-0815.400 | ● | 226-0815L400 | ● |
| 2.08 | 3 | 10.20 | 38 | 10.40 | 226-0819.400 | ● | 226-0819L400 | ● |
| 2.09 | 3 | 10.20 | 38 | 10.40 | 226-0823.400 | ● | 226-0823L400 | ● |
| 2.10 | 3 | 10.20 | 38 | 10.40 | 226-0827.400 | ● | 226-0827L400 | ● |
| 2.11 | 3 | 10.20 | 38 | 10.40 | 226-0831.400 | ● | 226-0831L400 | ● |
| 2.12 | 3 | 10.20 | 38 | 10.40 | 226-0835.400 | ● | 226-0835L400 | ● |
| 2.13 | 3 | 10.20 | 38 | 10.40 | 226-0839.400 | ● | 226-0839L400 | ● |
| 2.14 | 3 | 10.20 | 38 | 10.40 | 226-0843.400 | ● | 226-0843L400 | ● |
| 2.15 | 3 | 10.20 | 38 | 10.40 | 226-0846.400 | ● | 226-0846L400 | ● |
| 2.16 | 3 | 10.20 | 38 | 10.40 | 226-0850.400 | ● | 226-0850L400 | ● |
| 2.17 | 3 | 10.20 | 38 | 10.40 | 226-0854.400 | ● | 226-0854L400 | ● |
| 2.18 | 3 | 10.20 | 38 | 10.40 | 226-0858.400 | ● | 226-0858L400 | ● |
| 2.19 | 3 | 10.20 | 38 | 10.40 | 226-0862.400 | ● | 226-0862L400 | ● |
| 2.20 | 3 | 10.20 | 38 | 10.40 | 226-0866.400 | ● | 226-0866L400 | ● |
| 2.21 | 3 | 10.20 | 38 | 10.40 | 226-0870.400 | ● | 226-0870L400 | ● |
| 2.22 | 3 | 10.20 | 38 | 10.40 | 226-0874.400 | ● | 226-0874L400 | ● |
| 2.23 | 3 | 10.20 | 38 | 10.40 | 226-0878.400 | ● | 226-0878L400 | ● |
| 2.24 | 3 | 10.20 | 38 | 10.40 | 226-0882.400 | ● | 226-0882L400 | ● |
| 2.25 | 3 | 10.20 | 38 | 10.40 | 226-0886.400 | ● | 226-0886L400 | ● |
| 2.26 | 3 | 10.20 | 38 | 10.40 | 226-0890.400 | ● | 226-0890L400 | ● |
| 2.27 | 3 | 10.20 | 38 | 10.40 | 226-0894.400 | ● | 226-0894L400 | ● |
| 2.28 | 3 | 10.20 | 38 | 10.40 | 226-0898.400 | ● | 226-0898L400 | ● |
| 2.29 | 3 | 10.20 | 38 | 10.40 | 226-0902.400 | ● | 226-0902L400 | ● |
| 2.30 | 3 | 10.20 | 38 | 10.40 | 226-0906.400 | ● | 226-0906L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED Steel -55HRC | H TEMPERED Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

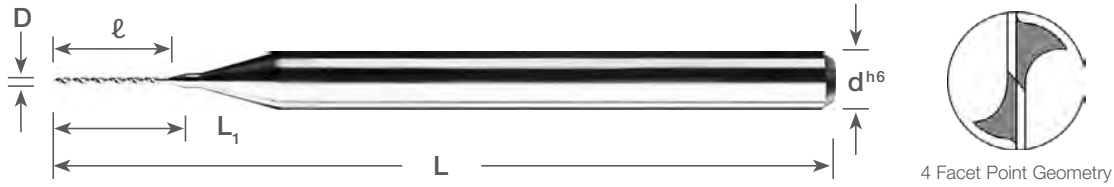
Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

2.31mm - 2.60mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AITIN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 2.31 | 3 | 10.20 | 38 | 10.40 | 226-0909.400 | ● | 226-0909L400 | ● |
| 2.32 | 3 | 10.20 | 38 | 10.40 | 226-0913.400 | ● | 226-0913L400 | ● |
| 2.33 | 3 | 10.20 | 38 | 10.40 | 226-0917.400 | ● | 226-0917L400 | ● |
| 2.34 | 3 | 10.20 | 38 | 10.40 | 226-0921.400 | ● | 226-0921L400 | ● |
| 2.35 | 3 | 10.20 | 38 | 10.40 | 226-0925.400 | ● | 226-0925L400 | ● |
| 2.36 | 3 | 10.20 | 38 | 10.40 | 226-0929.400 | ● | 226-0929L400 | ● |
| 2.37 | 3 | 10.20 | 38 | 10.40 | 226-0933.400 | ● | 226-0933L400 | ● |
| 2.38 | 3 | 10.20 | 38 | 10.40 | 226-0937.400 | ● | 226-0937L400 | ● |
| 2.39 | 3 | 10.20 | 38 | 10.40 | 226-0941.400 | ● | 226-0941L400 | ● |
| 2.40 | 3 | 10.20 | 38 | 10.40 | 226-0945.400 | ● | 226-0945L400 | ● |
| 2.41 | 3 | 10.20 | 38 | 10.40 | 226-0949.400 | ● | 226-0949L400 | ● |
| 2.42 | 3 | 10.20 | 38 | 10.40 | 226-0953.400 | ● | 226-0953L400 | ● |
| 2.43 | 3 | 10.20 | 38 | 10.40 | 226-0957.400 | ● | 226-0957L400 | ● |
| 2.44 | 3 | 10.20 | 38 | 10.40 | 226-0961.400 | ● | 226-0961L400 | ● |
| 2.45 | 3 | 10.20 | 38 | 10.40 | 226-0965.400 | ● | 226-0965L400 | ● |
| 2.46 | 3 | 10.20 | 38 | 10.40 | 226-0969.400 | ● | 226-0969L400 | ● |
| 2.47 | 3 | 10.20 | 38 | 10.40 | 226-0972.400 | ● | 226-0972L400 | ● |
| 2.48 | 3 | 10.20 | 38 | 10.40 | 226-0976.400 | ● | 226-0976L400 | ● |
| 2.49 | 3 | 10.20 | 38 | 10.40 | 226-0980.400 | ● | 226-0980L400 | ● |
| 2.50 | 3 | 10.20 | 38 | 10.40 | 226-0984.400 | ● | 226-0984L400 | ● |
| 2.51 | 3 | 10.20 | 38 | 10.40 | 226-0988.400 | ● | 226-0988L400 | ● |
| 2.52 | 3 | 10.20 | 38 | 10.40 | 226-0992.400 | ● | 226-0992L400 | ● |
| 2.53 | 3 | 10.20 | 38 | 10.40 | 226-0996.400 | ● | 226-0996L400 | ● |
| 2.54 | 3 | 10.20 | 38 | 10.40 | 226-1000.400 | ● | 226-1000L400 | ● |
| 2.55 | 3 | 10.20 | 38 | 10.40 | 226-1004.400 | ● | 226-1004L400 | ● |
| 2.56 | 3 | 10.20 | 38 | 10.40 | 226-1008.400 | ● | 226-1008L400 | ● |
| 2.57 | 3 | 10.20 | 38 | 10.40 | 226-1012.400 | ● | 226-1012L400 | ● |
| 2.58 | 3 | 10.20 | 38 | 10.40 | 226-1016.400 | ● | 226-1016L400 | ● |
| 2.59 | 3 | 10.20 | 38 | 10.40 | 226-1020.400 | ● | 226-1020L400 | ● |
| 2.60 | 3 | 10.20 | 38 | 10.40 | 226-1024.400 | ● | 226-1024L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

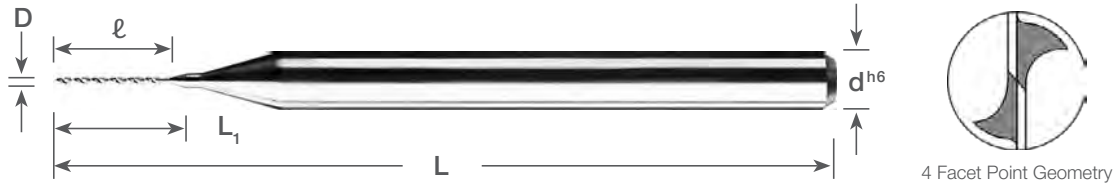
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3.00mm SHANK

MICRO DRILLS

2.61mm - 2.90mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 2.61 | 3 | 10.20 | 38 | 10.40 | 226-1028.400 | ● | 226-1028L400 | ● |
| 2.62 | 3 | 10.20 | 38 | 10.40 | 226-1031.400 | ● | 226-1031L400 | ● |
| 2.63 | 3 | 10.20 | 38 | 10.40 | 226-1035.400 | ● | 226-1035L400 | ● |
| 2.64 | 3 | 10.20 | 38 | 10.40 | 226-1039.400 | ● | 226-1039L400 | ● |
| 2.65 | 3 | 10.20 | 38 | 10.40 | 226-1043.400 | ● | 226-1043L400 | ● |
| 2.66 | 3 | 10.20 | 38 | 10.40 | 226-1047.400 | ● | 226-1047L400 | ● |
| 2.67 | 3 | 10.20 | 38 | 10.40 | 226-1051.400 | ● | 226-1051L400 | ● |
| 2.68 | 3 | 10.20 | 38 | 10.40 | 226-1055.400 | ● | 226-1055L400 | ● |
| 2.69 | 3 | 10.20 | 38 | 10.40 | 226-1059.400 | ● | 226-1059L400 | ● |
| 2.70 | 3 | 10.20 | 38 | 10.40 | 226-1063.400 | ● | 226-1063L400 | ● |
| 2.71 | 3 | 10.20 | 38 | 10.40 | 226-1067.400 | ● | 226-1067L400 | ● |
| 2.72 | 3 | 10.20 | 38 | 10.40 | 226-1071.400 | ● | 226-1071L400 | ● |
| 2.73 | 3 | 10.20 | 38 | 10.40 | 226-1075.400 | ● | 226-1075L400 | ● |
| 2.74 | 3 | 10.20 | 38 | 10.40 | 226-1079.400 | ● | 226-1079L400 | ● |
| 2.75 | 3 | 10.20 | 38 | 10.40 | 226-1083.400 | ● | 226-1083L400 | ● |
| 2.76 | 3 | 10.20 | 38 | 10.40 | 226-1087.400 | ● | 226-1087L400 | ● |
| 2.77 | 3 | 10.20 | 38 | 10.40 | 226-1091.400 | ● | 226-1091L400 | ● |
| 2.78 | 3 | 10.20 | 38 | 10.40 | 226-1094.400 | ● | 226-1094L400 | ● |
| 2.79 | 3 | 10.20 | 38 | 10.40 | 226-1098.400 | ● | 226-1098L400 | ● |
| 2.80 | 3 | 10.20 | 38 | 10.40 | 226-1102.400 | ● | 226-1102L400 | ● |
| 2.81 | 3 | 10.20 | 38 | 10.40 | 226-1106.400 | ● | 226-1106L400 | ● |
| 2.82 | 3 | 10.20 | 38 | 10.40 | 226-1110.400 | ● | 226-1110L400 | ● |
| 2.83 | 3 | 10.20 | 38 | 10.40 | 226-1114.400 | ● | 226-1114L400 | ● |
| 2.84 | 3 | 10.20 | 38 | 10.40 | 226-1118.400 | ● | 226-1118L400 | ● |
| 2.85 | 3 | 10.20 | 38 | 10.40 | 226-1122.400 | ● | 226-1122L400 | ● |
| 2.86 | 3 | 10.20 | 38 | 10.40 | 226-1126.400 | ● | 226-1126L400 | ● |
| 2.87 | 3 | 10.20 | 38 | 10.40 | 226-1130.400 | ● | 226-1130L400 | ● |
| 2.88 | 3 | 10.20 | 38 | 10.40 | 226-1134.400 | ● | 226-1134L400 | ● |
| 2.89 | 3 | 10.20 | 38 | 10.40 | 226-1138.400 | ● | 226-1138L400 | ● |
| 2.90 | 3 | 10.20 | 38 | 10.40 | 226-1142.400 | ● | 226-1142L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

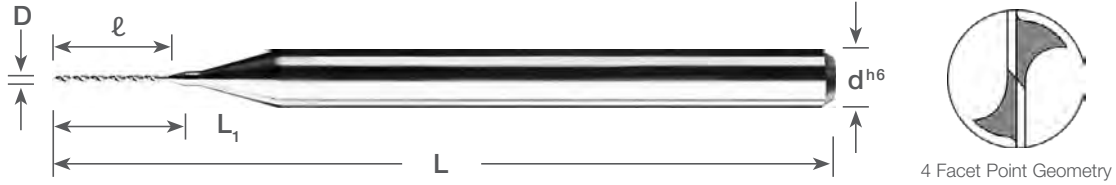
Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

2.91mm - 3.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 2.91 | 3 | 10.20 | 38 | 10.40 | 226-1146.400 | ● | 226-1146L400 | ● |
| 2.92 | 3 | 10.20 | 38 | 10.40 | 226-1150.400 | ● | 226-1150L400 | ● |
| 2.93 | 3 | 10.20 | 38 | 10.40 | 226-1154.400 | ● | 226-1154L400 | ● |
| 2.94 | 3 | 10.20 | 38 | 10.40 | 226-1157.400 | ● | 226-1157L400 | ● |
| 2.95 | 3 | 10.20 | 38 | 10.40 | 226-1161.400 | ● | 226-1161L400 | ● |
| 2.96 | 3 | 10.20 | 38 | 10.40 | 226-1165.400 | ● | 226-1165L400 | ● |
| 2.97 | 3 | 10.20 | 38 | 10.40 | 226-1169.400 | ● | 226-1169L400 | ● |
| 2.98 | 3 | 10.20 | 38 | 10.40 | 226-1173.400 | ● | 226-1173L400 | ● |
| 2.99 | 3 | 10.20 | 38 | 10.40 | 226-1177.400 | ● | 226-1177L400 | ● |
| 3.00 | 3 | 10.20 | 38 | 10.40 | 226-1181.400 | ● | 226-1181L400 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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Pricing & Availability at KyoceraPrecisionTools.com

3.00mm SHANK

MICRO DRILLS

0.75mm - 1.85mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|--------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.75 | 3 | 11.00 | 50 | 11.20 | 226-0295.433 | ● | 226-0295L433 | ● |
| 0.80 | 3 | 11.00 | 50 | 11.20 | 226-0315.433 | ● | 226-0315L433 | ● |
| 0.85 | 3 | 13.00 | 50 | 13.20 | 226-0335.512 | ● | 226-0335L512 | ● |
| 0.90 | 3 | 13.00 | 50 | 13.20 | 226-0354.512 | ● | 226-0354L512 | ● |
| 0.95 | 3 | 15.00 | 50 | 15.20 | 226-0374.591 | ● | 226-0374L591 | ● |
| 1.00 | 3 | 15.00 | 50 | 15.20 | 226-0394.591 | ● | 226-0394L591 | ● |
| 1.05 | 3 | 17.00 | 50 | 17.20 | 226-0413.670 | ● | 226-0413L670 | ● |
| 1.10 | 3 | 17.00 | 50 | 17.20 | 226-0433.670 | ● | 226-0433L670 | ● |
| 1.15 | 3 | 17.00 | 50 | 17.20 | 226-0453.670 | ● | 226-0453L670 | ● |
| 1.20 | 3 | 17.00 | 50 | 17.20 | 226-0472.670 | ● | 226-0472L670 | ● |
| 1.25 | 3 | 19.00 | 50 | 19.20 | 226-0492.749 | ● | 226-0492L749 | ● |
| 1.30 | 3 | 19.00 | 50 | 19.20 | 226-0512.749 | ● | 226-0512L749 | ● |
| 1.35 | 3 | 19.00 | 50 | 19.20 | 226-0531.749 | ● | 226-0531L749 | ● |
| 1.40 | 3 | 19.00 | 50 | 19.20 | 226-0551.749 | ● | 226-0551L749 | ● |
| 1.45 | 3 | 20.00 | 50 | 20.20 | 226-0571.788 | ● | 226-0571L788 | ● |
| 1.50 | 3 | 20.00 | 50 | 20.20 | 226-0591.788 | ● | 226-0591L788 | ● |
| 1.55 | 3 | 20.00 | 50 | 20.20 | 226-0610.788 | ● | 226-0610L788 | ● |
| 1.60 | 3 | 20.00 | 50 | 20.20 | 226-0630.788 | ● | 226-0630L788 | ● |
| 1.65 | 3 | 20.00 | 50 | 20.20 | 226-0650.788 | ● | 226-0650L788 | ● |
| 1.70 | 3 | 20.00 | 50 | 20.20 | 226-0669.788 | ● | 226-0669L788 | ● |
| 1.75 | 3 | 20.00 | 50 | 20.20 | 226-0689.788 | ● | 226-0689L788 | ● |
| 1.80 | 3 | 20.00 | 50 | 20.20 | 226-0709.788 | ● | 226-0709L788 | ● |
| 1.85 | 3 | 22.80 | 50 | 23.00 | 226-0728.898 | ● | 226-0728L898 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel ~30HRC | P Steel 30-40HRC | H TEMPERED Steel ~55HRC | H TEMPERED Steel ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

3.00mm SHANK

MICRO DRILLS

1.90mm - 3.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Flute Length

| Dimensions (mm) | | | | | Uncoated | | AITIN Coating | |
|------------------------------------|-----------------|-------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 1.90 | 3 | 22.80 | 60 | 23.00 | 226-0748.898 | ● | 226-0748L898 | ● |
| 1.95 | 3 | 23.40 | 60 | 23.60 | 226-0768.945 | ● | 226-0768L945 | ● |
| 2.00 | 3 | 24.00 | 60 | 24.20 | 226-0787.945 | ● | 226-0787L945 | ● |
| 2.05 | 3 | 24.60 | 60 | 24.80 | 226-0807.992 | ● | 226-0807L992 | ● |
| 2.10 | 3 | 25.20 | 60 | 25.40 | 226-0827.992 | ● | 226-0827L992 | ● |
| 2.15 | 3 | 25.80 | 60 | 26.00 | 226-0846.1039 | ● | 226-0846L1039 | ● |
| 2.20 | 3 | 26.40 | 60 | 26.60 | 226-0866.1039 | ● | 226-0866L1039 | ● |
| 2.25 | 3 | 27.00 | 60 | 27.20 | 226-0886.1087 | ● | 226-0886L1087 | ● |
| 2.30 | 3 | 27.60 | 60 | 27.80 | 226-0906.1087 | ● | 226-0906L1087 | ● |
| 2.35 | 3 | 28.20 | 60 | 28.40 | 226-0925.1134 | ● | 226-0925L1134 | ● |
| 2.40 | 3 | 28.80 | 60 | 29.00 | 226-0945.1134 | ● | 226-0945L1134 | ● |
| 2.45 | 3 | 29.40 | 60 | 29.60 | 226-0965.1181 | ● | 226-0965L1181 | ● |
| 2.50 | 3 | 30.00 | 60 | 30.20 | 226-0984.1181 | ● | 226-0984L1181 | ● |
| 2.55 | 3 | 30.60 | 60 | 30.80 | 226-1004.1228 | ● | 226-1004L1228 | ● |
| 2.60 | 3 | 31.20 | 60 | 31.40 | 226-1024.1228 | ● | 226-1024L1228 | ● |
| 2.65 | 3 | 31.80 | 60 | 32.00 | 226-1043.1276 | ● | 226-1043L1276 | ● |
| 2.70 | 3 | 32.40 | 60 | 32.60 | 226-1063.1276 | ● | 226-1063L1276 | ● |
| 2.75 | 3 | 33.00 | 60 | 33.20 | 226-1083.1323 | ● | 226-1083L1323 | ● |
| 2.80 | 3 | 33.60 | 60 | 33.80 | 226-1102.1323 | ● | 226-1102L1323 | ● |
| 2.85 | 3 | 34.20 | 60 | 34.40 | 226-1122.1370 | ● | 226-1122L1370 | ● |
| 2.90 | 3 | 34.80 | 60 | 35.00 | 226-1142.1370 | ● | 226-1142L1370 | ● |
| 2.95 | 3 | 35.40 | 60 | 35.60 | 226-1161.1417 | ● | 226-1161L1417 | ● |
| 3.00 | 3 | 36.00 | 60 | 36.20 | 226-1181.1417 | ● | 226-1181L1417 | ● |

| SERIES 226 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| Coating | P Steel -50HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AITIN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

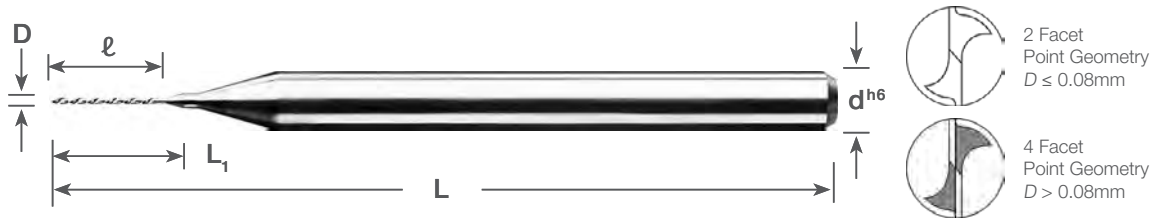
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3.00mm SHANK

LEFT HAND MICRO DRILLS

0.04mm - 0.33mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.04 | 3 | 0.50 | 38 | 0.50 | 226L-0016.020 | ■ | - | - |
| 0.05 | 3 | 0.80 | 38 | 0.80 | 226L-0020.030 | ■ | - | - |
| 0.06 | 3 | 0.80 | 38 | 0.80 | 226L-0024.030 | ■ | - | - |
| 0.07 | 3 | 1.30 | 38 | 1.30 | 226L-0028.050 | ■ | - | - |
| 0.08 | 3 | 1.30 | 38 | 1.30 | 226L-0031.050 | ■ | - | - |
| 0.09 | 3 | 1.30 | 38 | 1.30 | 226L-0035.050 | ■ | - | - |
| 0.10 | 3 | 1.00 | 38 | 1.20 | 226L-0039.040 | ■ | - | - |
| 0.11 | 3 | 1.00 | 38 | 1.20 | 226L-0043.040 | ■ | - | - |
| 0.12 | 3 | 1.00 | 38 | 1.20 | 226L-0047.040 | ■ | - | - |
| 0.13 | 3 | 1.00 | 38 | 1.20 | 226L-0051.040 | ■ | - | - |
| 0.14 | 3 | 2.00 | 38 | 2.20 | 226L-0055.080 | ■ | - | - |
| 0.15 | 3 | 2.00 | 38 | 2.20 | 226L-0059.080 | ■ | - | - |
| 0.16 | 3 | 2.00 | 38 | 2.20 | 226L-0063.080 | ■ | - | - |
| 0.17 | 3 | 2.00 | 38 | 2.20 | 226L-0067.080 | ■ | - | - |
| 0.18 | 3 | 2.50 | 38 | 2.70 | 226L-0071.100 | ■ | - | - |
| 0.19 | 3 | 2.50 | 38 | 2.70 | 226L-0075.100 | ■ | - | - |
| 0.20 | 3 | 2.50 | 38 | 2.70 | 226L-0079.100 | ■ | - | - |
| 0.21 | 3 | 2.50 | 38 | 2.70 | 226L-0083.100 | ■ | - | - |
| 0.22 | 3 | 2.50 | 38 | 2.70 | 226L-0087.100 | ■ | - | - |
| 0.23 | 3 | 3.80 | 38 | 4.00 | 226L-0091.150 | ■ | - | - |
| 0.24 | 3 | 3.80 | 38 | 4.00 | 226L-0094.150 | ■ | - | - |
| 0.25 | 3 | 3.80 | 38 | 4.00 | 226L-0098.150 | ■ | - | - |
| 0.26 | 3 | 3.80 | 38 | 4.00 | 226L-0102.150 | ■ | - | - |
| 0.27 | 3 | 3.80 | 38 | 4.00 | 226L-0106.150 | ■ | - | - |
| 0.28 | 3 | 3.80 | 38 | 4.00 | 226L-0110.150 | ■ | - | - |
| 0.29 | 3 | 3.80 | 38 | 4.00 | 226L-0114.150 | ■ | - | - |
| 0.30 | 3 | 5.70 | 38 | 5.90 | 226L-0118.225 | ■ | 226L-0118L225 | ■ |
| 0.31 | 3 | 5.70 | 38 | 5.90 | 226L-0122.225 | ■ | 226L-0122L225 | ■ |
| 0.32 | 3 | 5.70 | 38 | 5.90 | 226L-0126.225 | ■ | 226L-0126L225 | ■ |
| 0.33 | 3 | 5.70 | 38 | 5.90 | 226L-0130.225 | ■ | 226L-0130L225 | ■ |

SERIES 226L WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

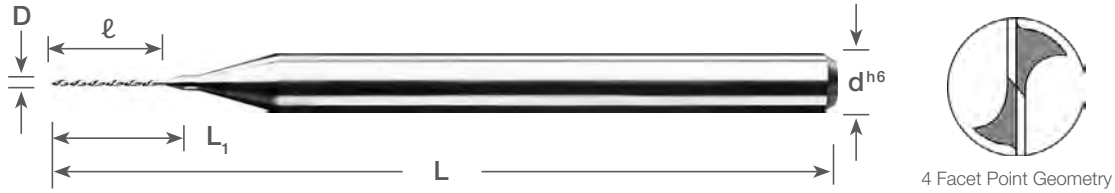
Symbol Descriptions Page 7

3.00mm SHANK

LEFT HAND MICRO DRILLS

0.34mm - 0.54mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|-------------------------|----------|------|-----|-------|---------------|-------|---------------|-------|
| $D^{+0.000mm/-0.008mm}$ | d^{h6} | l | L | L_1 | Part Number | Stock | Part Number | Stock |
| 0.34 | 3 | 5.70 | 38 | 5.90 | 226L-0134.225 | ■ | 226L-0134L225 | ■ |
| 0.35 | 3 | 5.70 | 38 | 5.90 | 226L-0138.225 | ■ | 226L-0138L225 | ■ |
| 0.36 | 3 | 5.70 | 38 | 5.90 | 226L-0142.225 | ■ | 226L-0142L225 | ■ |
| 0.37 | 3 | 5.70 | 38 | 5.90 | 226L-0146.225 | ■ | 226L-0146L225 | ■ |
| 0.38 | 3 | 6.40 | 38 | 6.60 | 226L-0150.250 | ■ | 226L-0150L250 | ■ |
| 0.39 | 3 | 6.40 | 38 | 6.60 | 226L-0154.250 | ■ | 226L-0154L250 | ■ |
| 0.40 | 3 | 6.40 | 38 | 6.60 | 226L-0157.250 | ■ | 226L-0157L250 | ■ |
| 0.41 | 3 | 6.40 | 38 | 6.60 | 226L-0161.250 | ■ | 226L-0161L250 | ■ |
| 0.42 | 3 | 6.40 | 38 | 6.60 | 226L-0165.250 | ■ | 226L-0165L250 | ■ |
| 0.43 | 3 | 6.40 | 38 | 6.60 | 226L-0169.250 | ■ | 226L-0169L250 | ■ |
| 0.44 | 3 | 6.40 | 38 | 6.60 | 226L-0173.250 | ■ | 226L-0173L250 | ■ |
| 0.45 | 3 | 6.40 | 38 | 6.60 | 226L-0177.250 | ■ | 226L-0177L250 | ■ |
| 0.46 | 3 | 6.40 | 38 | 6.60 | 226L-0181.250 | ■ | 226L-0181L250 | ■ |
| 0.47 | 3 | 6.40 | 38 | 6.60 | 226L-0185.250 | ■ | 226L-0185L250 | ■ |
| 0.48 | 3 | 6.60 | 38 | 6.80 | 226L-0189.260 | ■ | 226L-0189L260 | ■ |
| 0.49 | 3 | 6.60 | 38 | 6.80 | 226L-0193.260 | ■ | 226L-0193L260 | ■ |
| 0.50 | 3 | 6.60 | 38 | 6.80 | 226L-0197.260 | ■ | 226L-0197L260 | ■ |
| 0.51 | 3 | 6.60 | 38 | 6.80 | 226L-0201.260 | ■ | 226L-0201L260 | ■ |
| 0.52 | 3 | 6.60 | 38 | 6.80 | 226L-0205.260 | ■ | 226L-0205L260 | ■ |
| 0.53 | 3 | 6.60 | 38 | 6.80 | 226L-0209.260 | ■ | 226L-0209L260 | ■ |
| 0.54 | 3 | 6.60 | 38 | 6.80 | 226L-0213.260 | ■ | 226L-0213L260 | ■ |

| SERIES 226L WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

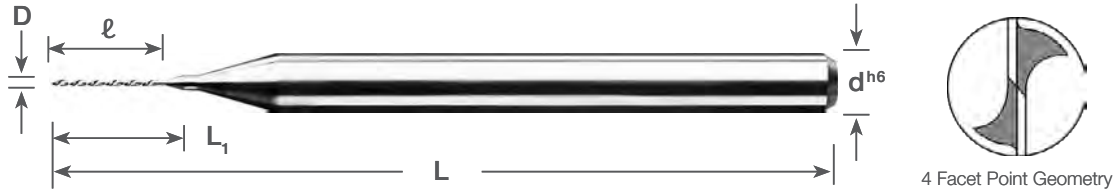
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3.00mm SHANK

LEFT HAND MICRO DRILLS

0.55mm - 0.84mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.55 | 3 | 8.60 | 38 | 8.80 | 226L-0217.340 | ■ | 226L-0217L340 | ■ |
| 0.56 | 3 | 8.60 | 38 | 8.80 | 226L-0220.340 | ■ | 226L-0220L340 | ■ |
| 0.57 | 3 | 8.60 | 38 | 8.80 | 226L-0224.340 | ■ | 226L-0224L340 | ■ |
| 0.58 | 3 | 8.60 | 38 | 8.80 | 226L-0228.340 | ■ | 226L-0228L340 | ■ |
| 0.59 | 3 | 8.60 | 38 | 8.80 | 226L-0232.340 | ■ | 226L-0232L340 | ■ |
| 0.60 | 3 | 8.60 | 38 | 8.80 | 226L-0236.340 | ■ | 226L-0236L340 | ■ |
| 0.61 | 3 | 8.60 | 38 | 8.80 | 226L-0240.340 | ■ | 226L-0240L340 | ■ |
| 0.62 | 3 | 8.60 | 38 | 8.80 | 226L-0244.340 | ■ | 226L-0244L340 | ■ |
| 0.63 | 3 | 8.60 | 38 | 8.80 | 226L-0248.340 | ■ | 226L-0248L340 | ■ |
| 0.64 | 3 | 8.60 | 38 | 8.80 | 226L-0252.340 | ■ | 226L-0252L340 | ■ |
| 0.65 | 3 | 8.60 | 38 | 8.80 | 226L-0256.340 | ■ | 226L-0256L340 | ■ |
| 0.66 | 3 | 8.60 | 38 | 8.80 | 226L-0260.340 | ■ | 226L-0260L340 | ■ |
| 0.67 | 3 | 8.60 | 38 | 8.80 | 226L-0264.340 | ■ | 226L-0264L340 | ■ |
| 0.68 | 3 | 8.60 | 38 | 8.80 | 226L-0268.340 | ■ | 226L-0268L340 | ■ |
| 0.69 | 3 | 8.60 | 38 | 8.80 | 226L-0272.340 | ■ | 226L-0272L340 | ■ |
| 0.70 | 3 | 10.20 | 38 | 10.40 | 226L-0276.400 | ■ | 226L-0276L400 | ■ |
| 0.71 | 3 | 10.20 | 38 | 10.40 | 226L-0280.400 | ■ | 226L-0280L400 | ■ |
| 0.72 | 3 | 10.20 | 38 | 10.40 | 226L-0283.400 | ■ | 226L-0283L400 | ■ |
| 0.73 | 3 | 10.20 | 38 | 10.40 | 226L-0287.400 | ■ | 226L-0287L400 | ■ |
| 0.74 | 3 | 10.20 | 38 | 10.40 | 226L-0291.400 | ■ | 226L-0291L400 | ■ |
| 0.75 | 3 | 10.20 | 38 | 10.40 | 226L-0295.400 | ■ | 226L-0295L400 | ■ |
| 0.76 | 3 | 10.20 | 38 | 10.40 | 226L-0299.400 | ■ | 226L-0299L400 | ■ |
| 0.77 | 3 | 10.20 | 38 | 10.40 | 226L-0303.400 | ■ | 226L-0303L400 | ■ |
| 0.78 | 3 | 10.20 | 38 | 10.40 | 226L-0307.400 | ■ | 226L-0307L400 | ■ |
| 0.79 | 3 | 10.20 | 38 | 10.40 | 226L-0311.400 | ■ | 226L-0311L400 | ■ |
| 0.80 | 3 | 10.20 | 38 | 10.40 | 226L-0315.400 | ■ | 226L-0315L400 | ■ |
| 0.81 | 3 | 10.20 | 38 | 10.40 | 226L-0319.400 | ■ | 226L-0319L400 | ■ |
| 0.82 | 3 | 10.20 | 38 | 10.40 | 226L-0323.400 | ■ | 226L-0323L400 | ■ |
| 0.83 | 3 | 10.20 | 38 | 10.40 | 226L-0327.400 | ■ | 226L-0327L400 | ■ |
| 0.84 | 3 | 10.20 | 38 | 10.40 | 226L-0331.400 | ■ | 226L-0331L400 | ■ |

SERIES 226L WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED Steel -55HRC | H TEMPERED Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

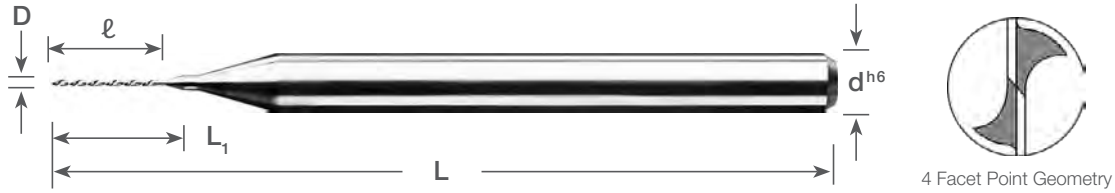
Symbol Descriptions Page 7

3.00mm SHANK

LEFT HAND MICRO DRILLS

0.85mm - 1.70mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.85 | 3 | 10.20 | 38 | 10.40 | 226L-0335.400 | ■ | 226L-0335L400 | ■ |
| 0.86 | 3 | 10.20 | 38 | 10.40 | 226L-0339.400 | ■ | 226L-0339L400 | ■ |
| 0.87 | 3 | 10.20 | 38 | 10.40 | 226L-0343.400 | ■ | 226L-0343L400 | ■ |
| 0.88 | 3 | 10.20 | 38 | 10.40 | 226L-0346.400 | ■ | 226L-0346L400 | ■ |
| 0.89 | 3 | 10.20 | 38 | 10.40 | 226L-0350.400 | ■ | 226L-0350L400 | ■ |
| 0.90 | 3 | 10.20 | 38 | 10.40 | 226L-0354.400 | ■ | 226L-0354L400 | ■ |
| 0.91 | 3 | 10.20 | 38 | 10.40 | 226L-0358.400 | ■ | 226L-0358L400 | ■ |
| 0.92 | 3 | 10.20 | 38 | 10.40 | 226L-0362.400 | ■ | 226L-0362L400 | ■ |
| 0.93 | 3 | 10.20 | 38 | 10.40 | 226L-0366.400 | ■ | 226L-0366L400 | ■ |
| 0.94 | 3 | 10.20 | 38 | 10.40 | 226L-0370.400 | ■ | 226L-0370L400 | ■ |
| 0.95 | 3 | 10.20 | 38 | 10.40 | 226L-0374.400 | ■ | 226L-0374L400 | ■ |
| 0.96 | 3 | 10.20 | 38 | 10.40 | 226L-0378.400 | ■ | 226L-0378L400 | ■ |
| 0.97 | 3 | 10.20 | 38 | 10.40 | 226L-0382.400 | ■ | 226L-0382L400 | ■ |
| 0.98 | 3 | 10.20 | 38 | 10.40 | 226L-0386.400 | ■ | 226L-0386L400 | ■ |
| 0.99 | 3 | 10.20 | 38 | 10.40 | 226L-0390.400 | ■ | 226L-0390L400 | ■ |
| 1.00 | 3 | 10.20 | 38 | 10.40 | 226L-0394.400 | ■ | 226L-0394L400 | ■ |
| 1.05 | 3 | 10.20 | 38 | 10.40 | 226L-0413.400 | ■ | 226L-0413L400 | ■ |
| 1.10 | 3 | 10.20 | 38 | 10.40 | 226L-0433.400 | ■ | 226L-0433L400 | ■ |
| 1.15 | 3 | 10.20 | 38 | 10.40 | 226L-0453.400 | ■ | 226L-0453L400 | ■ |
| 1.20 | 3 | 10.20 | 38 | 10.40 | 226L-0472.400 | ■ | 226L-0472L400 | ■ |
| 1.25 | 3 | 10.20 | 38 | 10.40 | 226L-0492.400 | ■ | 226L-0492L400 | ■ |
| 1.30 | 3 | 10.20 | 38 | 10.40 | 226L-0512.400 | ■ | 226L-0512L400 | ■ |
| 1.35 | 3 | 10.20 | 38 | 10.40 | 226L-0531.400 | ■ | 226L-0531L400 | ■ |
| 1.40 | 3 | 10.20 | 38 | 10.40 | 226L-0551.400 | ■ | 226L-0551L400 | ■ |
| 1.45 | 3 | 10.20 | 38 | 10.40 | 226L-0571.400 | ■ | 226L-0571L400 | ■ |
| 1.50 | 3 | 10.20 | 38 | 10.40 | 226L-0591.400 | ■ | 226L-0591L400 | ■ |
| 1.55 | 3 | 10.20 | 38 | 10.40 | 226L-0610.400 | ■ | 226L-0610L400 | ■ |
| 1.60 | 3 | 10.20 | 38 | 10.40 | 226L-0630.400 | ■ | 226L-0630L400 | ■ |
| 1.65 | 3 | 10.20 | 38 | 10.40 | 226L-0650.400 | ■ | 226L-0650L400 | ■ |
| 1.70 | 3 | 10.20 | 38 | 10.40 | 226L-0669.400 | ■ | 226L-0669L400 | ■ |

| SERIES 226L WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

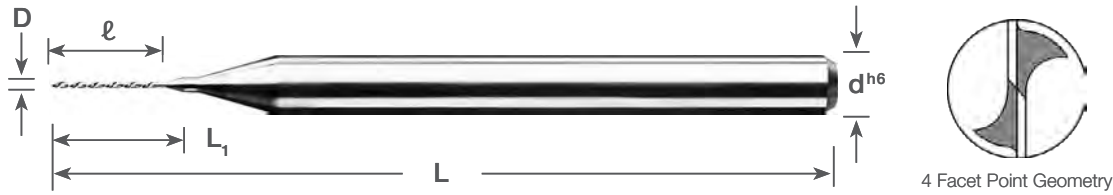
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3.00mm SHANK

LEFT HAND MICRO DRILLS

1.75mm - 3.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 1.75 | 3 | 10.20 | 38 | 10.40 | 226L-0689.400 | ■ | 226L-0689L400 | ■ |
| 1.80 | 3 | 10.20 | 38 | 10.40 | 226L-0709.400 | ■ | 226L-0709L400 | ■ |
| 1.85 | 3 | 10.20 | 38 | 10.40 | 226L-0728.400 | ■ | 226L-0728L400 | ■ |
| 1.90 | 3 | 10.20 | 38 | 10.40 | 226L-0748.400 | ■ | 226L-0748L400 | ■ |
| 1.95 | 3 | 10.20 | 38 | 10.40 | 226L-0768.400 | ■ | 226L-0768L400 | ■ |
| 2.00 | 3 | 10.20 | 38 | 10.40 | 226L-0787.400 | ■ | 226L-0787L400 | ■ |
| 2.05 | 3 | 10.20 | 38 | 10.40 | 226L-0807.400 | ■ | 226L-0807L400 | ■ |
| 2.10 | 3 | 10.20 | 38 | 10.40 | 226L-0827.400 | ■ | 226L-0827L400 | ■ |
| 2.15 | 3 | 10.20 | 38 | 10.40 | 226L-0846.400 | ■ | 226L-0846L400 | ■ |
| 2.20 | 3 | 10.20 | 38 | 10.40 | 226L-0866.400 | ■ | 226L-0866L400 | ■ |
| 2.25 | 3 | 10.20 | 38 | 10.40 | 226L-0886.400 | ■ | 226L-0886L400 | ■ |
| 2.30 | 3 | 10.20 | 38 | 10.40 | 226L-0906.400 | ■ | 226L-0906L400 | ■ |
| 2.35 | 3 | 10.20 | 38 | 10.40 | 226L-0925.400 | ■ | 226L-0925L400 | ■ |
| 2.40 | 3 | 10.20 | 38 | 10.40 | 226L-0945.400 | ■ | 226L-0945L400 | ■ |
| 2.45 | 3 | 10.20 | 38 | 10.40 | 226L-0965.400 | ■ | 226L-0965L400 | ■ |
| 2.50 | 3 | 10.20 | 38 | 10.40 | 226L-0984.400 | ■ | 226L-0984L400 | ■ |
| 2.55 | 3 | 10.20 | 38 | 10.40 | 226L-1004.400 | ■ | 226L-1004L400 | ■ |
| 2.60 | 3 | 10.20 | 38 | 10.40 | 226L-1024.400 | ■ | 226L-1024L400 | ■ |
| 2.65 | 3 | 10.20 | 38 | 10.40 | 226L-1043.400 | ■ | 226L-1043L400 | ■ |
| 2.70 | 3 | 10.20 | 38 | 10.40 | 226L-1063.400 | ■ | 226L-1063L400 | ■ |
| 2.75 | 3 | 10.20 | 38 | 10.40 | 226L-1083.400 | ■ | 226L-1083L400 | ■ |
| 2.80 | 3 | 10.20 | 38 | 10.40 | 226L-1102.400 | ■ | 226L-1102L400 | ■ |
| 2.85 | 3 | 10.20 | 38 | 10.40 | 226L-1122.400 | ■ | 226L-1122L400 | ■ |
| 2.90 | 3 | 10.20 | 38 | 10.40 | 226L-1142.400 | ■ | 226L-1142L400 | ■ |
| 2.95 | 3 | 10.20 | 38 | 10.40 | 226L-1161.400 | ■ | 226L-1161L400 | ■ |
| 3.00 | 3 | 10.20 | 38 | 10.40 | 226L-1181.400 | ■ | 226L-1181L400 | ■ |

| SERIES 226L WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel/ Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

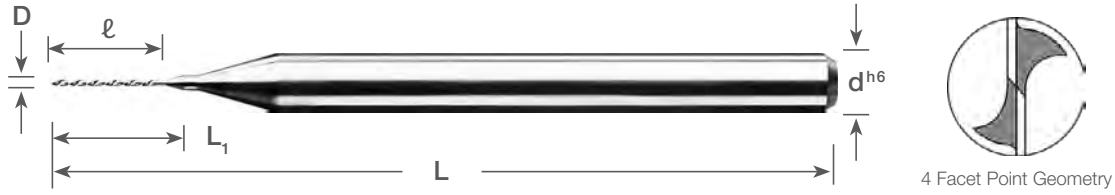
Symbol Descriptions Page 7

3.00mm SHANK

LEFT HAND MICRO DRILLS

0.75mm - 1.85mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|----------------|---------------|-------|---------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.75 | 3 | 11.00 | 50 | 11.20 | 226L-0295.433 | ■ | 226L-0295L433 | ■ |
| 0.80 | 3 | 11.00 | 50 | 11.20 | 226L-0315.433 | ■ | 226L-0315L433 | ■ |
| 0.85 | 3 | 13.00 | 50 | 13.20 | 226L-0335.512 | ■ | 226L-0335L512 | ■ |
| 0.90 | 3 | 13.00 | 50 | 13.20 | 226L-0354.512 | ■ | 226L-0354L512 | ■ |
| 0.95 | 3 | 15.00 | 50 | 15.20 | 226L-0374.591 | ■ | 226L-0374L591 | ■ |
| 1.00 | 3 | 15.00 | 50 | 15.20 | 226L-0394.591 | ■ | 226L-0394L591 | ■ |
| 1.05 | 3 | 17.00 | 50 | 17.20 | 226L-0413.670 | ■ | 226L-0413L670 | ■ |
| 1.10 | 3 | 17.00 | 50 | 17.20 | 226L-0433.670 | ■ | 226L-0433L670 | ■ |
| 1.15 | 3 | 17.00 | 50 | 17.20 | 226L-0453.670 | ■ | 226L-0453L670 | ■ |
| 1.20 | 3 | 17.00 | 50 | 17.20 | 226L-0472.670 | ■ | 226L-0472L670 | ■ |
| 1.25 | 3 | 19.00 | 50 | 19.20 | 226L-0492.749 | ■ | 226L-0492L749 | ■ |
| 1.30 | 3 | 19.00 | 50 | 19.20 | 226L-0512.749 | ■ | 226L-0512L749 | ■ |
| 1.35 | 3 | 19.00 | 50 | 19.20 | 226L-0531.749 | ■ | 226L-0531L749 | ■ |
| 1.40 | 3 | 19.00 | 50 | 19.20 | 226L-0551.749 | ■ | 226L-0551L749 | ■ |
| 1.45 | 3 | 20.00 | 50 | 20.20 | 226L-0571.788 | ■ | 226L-0571L788 | ■ |
| 1.50 | 3 | 20.00 | 50 | 20.20 | 226L-0591.788 | ■ | 226L-0591L788 | ■ |
| 1.55 | 3 | 20.00 | 50 | 20.20 | 226L-0610.788 | ■ | 226L-0610L788 | ■ |
| 1.60 | 3 | 20.00 | 50 | 20.20 | 226L-0630.788 | ■ | 226L-0630L788 | ■ |
| 1.65 | 3 | 20.00 | 50 | 20.20 | 226L-0650.788 | ■ | 226L-0650L788 | ■ |
| 1.70 | 3 | 20.00 | 50 | 20.20 | 226L-0669.788 | ■ | 226L-0669L788 | ■ |
| 1.75 | 3 | 20.00 | 50 | 20.20 | 226L-0689.788 | ■ | 226L-0689L788 | ■ |
| 1.80 | 3 | 20.00 | 50 | 20.20 | 226L-0709.788 | ■ | 226L-0709L788 | ■ |
| 1.85 | 3 | 22.80 | 50 | 23.00 | 226L-0728.898 | ■ | 226L-0728L898 | ■ |

| SERIES 226L WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -50HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

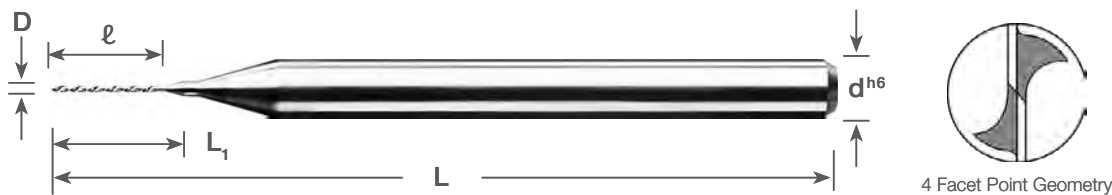
3.00mm SHANK

1.90mm - 3.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

LEFT HAND MICRO DRILLS



Symbol Descriptions Page 7

EXTENDED Flute Length

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|-----------------------------------|-----------------|-------|----|----------------|----------------|-------|----------------|-------|
| D ^{+0.000mm} -0.008mm | d ^{h6} | l | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 1.90 | 3 | 22.80 | 60 | 23.00 | 226L-0748.898 | ■ | 226L-0748L898 | ■ |
| 1.95 | 3 | 23.40 | 60 | 23.60 | 226L-0768.945 | ■ | 226L-0768L945 | ■ |
| 2.00 | 3 | 24.00 | 60 | 24.20 | 226L-0787.945 | ■ | 226L-0787L945 | ■ |
| 2.05 | 3 | 24.60 | 60 | 24.80 | 226L-0807.992 | ■ | 226L-0807L992 | ■ |
| 2.10 | 3 | 25.20 | 60 | 25.40 | 226L-0827.992 | ■ | 226L-0827L992 | ■ |
| 2.15 | 3 | 25.80 | 60 | 26.00 | 226L-0846.1039 | ■ | 226L-0846L1039 | ■ |
| 2.20 | 3 | 26.40 | 60 | 26.60 | 226L-0866.1039 | ■ | 226L-0866L1039 | ■ |
| 2.25 | 3 | 27.00 | 60 | 27.20 | 226L-0886.1087 | ■ | 226L-0886L1087 | ■ |
| 2.30 | 3 | 27.60 | 60 | 27.80 | 226L-0906.1087 | ■ | 226L-0906L1087 | ■ |
| 2.35 | 3 | 28.20 | 60 | 28.40 | 226L-0925.1134 | ■ | 226L-0925L1134 | ■ |
| 2.40 | 3 | 28.80 | 60 | 29.00 | 226L-0945.1134 | ■ | 226L-0945L1134 | ■ |
| 2.45 | 3 | 29.40 | 60 | 29.60 | 226L-0965.1181 | ■ | 226L-0965L1181 | ■ |
| 2.50 | 3 | 30.00 | 60 | 30.20 | 226L-0984.1181 | ■ | 226L-0984L1181 | ■ |
| 2.55 | 3 | 30.60 | 60 | 30.80 | 226L-1004.1228 | ■ | 226L-1004L1228 | ■ |
| 2.60 | 3 | 31.20 | 60 | 31.40 | 226L-1024.1228 | ■ | 226L-1024L1228 | ■ |
| 2.65 | 3 | 31.80 | 60 | 32.00 | 226L-1043.1276 | ■ | 226L-1043L1276 | ■ |
| 2.70 | 3 | 32.40 | 60 | 32.60 | 226L-1063.1276 | ■ | 226L-1063L1276 | ■ |
| 2.75 | 3 | 33.00 | 60 | 33.20 | 226L-1083.1323 | ■ | 226L-1083L1323 | ■ |
| 2.80 | 3 | 33.60 | 60 | 33.80 | 226L-1102.1323 | ■ | 226L-1102L1323 | ■ |
| 2.85 | 3 | 34.20 | 60 | 34.40 | 226L-1122.1370 | ■ | 226L-1122L1370 | ■ |
| 2.90 | 3 | 34.80 | 60 | 35.00 | 226L-1142.1370 | ■ | 226L-1142L1370 | ■ |
| 2.95 | 3 | 35.40 | 60 | 35.60 | 226L-1161.1417 | ■ | 226L-1161L1417 | ■ |
| 3.00 | 3 | 36.00 | 60 | 36.20 | 226L-1181.1417 | ■ | 226L-1181L1417 | ■ |

| SERIES 226L WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

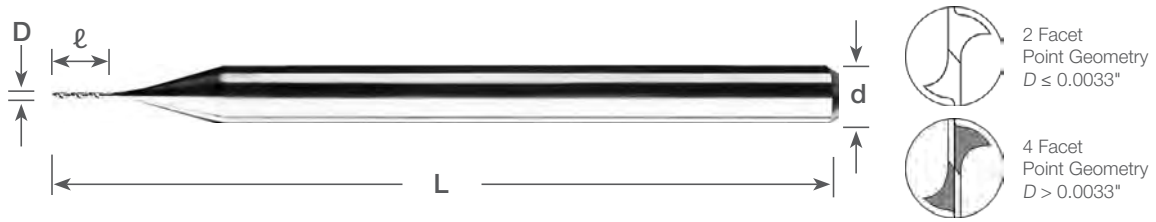
Symbol Descriptions Page 7

1/8" SHANK

ULTRA PRECISION MICRO DRILLS
MACOR® / VESPEL® DRILLING

0.0015" - 0.0040" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Flute Length

| Drill Size | Dimensions (in) | | | | Point Angle | Uncoated | |
|------------|---|-----|--------|-------|-------------|--------------|-------|
| | D ^{+0.000000} _{-0.000050} | d | ℓ | L | | Part Number | Stock |
| 0.05mm | 0.0015 | 1/8 | 0.0200 | 1 1/2 | 90° | 390-0015.020 | ● |
| | 0.0018 | 1/8 | 0.0250 | 1 1/2 | 90° | 390-0018.025 | ● |
| | 0.0020 | 1/8 | 0.0300 | 1 1/2 | 90° | 390-0020.030 | ● |
| | 0.0021 | 1/8 | 0.0300 | 1 1/2 | 90° | 390-0021.030 | ● |
| | 0.0022 | 1/8 | 0.0300 | 1 1/2 | 90° | 390-0022.030 | ● |
| 0.06mm | 0.0023 | 1/8 | 0.0300 | 1 1/2 | 90° | 390-0023.030 | ● |
| | 0.0024 | 1/8 | 0.0300 | 1 1/2 | 90° | 390-0024.030 | ● |
| | 0.0025 | 1/8 | 0.0400 | 1 1/2 | 90° | 390-0025.040 | ● |
| | 0.0026 | 1/8 | 0.0400 | 1 1/2 | 90° | 390-0026.040 | ● |
| | 0.0027 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0027.050 | ● |
| 0.07mm | 0.0028 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0028.050 | ● |
| | 0.0029 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0029.050 | ● |
| | 0.0030 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0030.050 | ● |
| .08mm | 0.0031 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0031.050 | ● |
| | 0.0032 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0032.050 | ● |
| | 0.0033 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0033.050 | ● |
| | 0.0034 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0034.050 | ● |
| 0.09mm | 0.0035 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0035.050 | ● |
| | 0.0036 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0036.050 | ● |
| | 0.0037 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0037.050 | ● |
| | 0.0038 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0038.050 | ● |
| 0.10mm | 0.0039 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0039.050 | ● |
| | 0.0040 | 1/8 | 0.0150 | 1 1/2 | 90° | 390-0040.015 | ● |
| 0.10mm | 0.0040 | 1/8 | 0.0250 | 1 1/2 | 90° | 390-0040.025 | ● |
| 0.10mm | 0.0040 | 1/8 | 0.0500 | 1 1/2 | 90° | 390-0040.050 | ● |
| 0.10mm | 0.0040 | 1/8 | 0.0600 | 1 1/2 | 130° | 390-0040.060 | ● |

| SERIES 390 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

1.00mm SHANK

ULTRA PRECISION MICRO DRILLS
FUEL INJECTOR / NOZZLE DRILLS

0.12mm - 0.60mm DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Flute Length

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|-------------------------|----------|------|-----|--------------|-------|---------------|-------|
| $D^{+0.000mm/-0.008mm}$ | d^{h6} | l | L | Part Number | Stock | Part Number | Stock |
| 0.12 | 1 | 1.45 | 25 | 392-0046.057 | ● | - | - |
| 0.14 | 1 | 1.45 | 25 | 392-0054.057 | ● | - | - |
| 0.16 | 1 | 1.45 | 25 | 392-0063.057 | ● | - | - |
| 0.18 | 1 | 1.45 | 25 | 392-0071.057 | ● | - | - |
| 0.20 | 1 | 1.45 | 25 | 392-0079.057 | ● | - | - |
| 0.25 | 1 | 1.75 | 25 | 392-0098.069 | ● | 392-0098L069 | ● |
| 0.27 | 1 | 1.75 | 25 | 392-0106.069 | ● | 392-0106L069 | ● |
| 0.29 | 1 | 3.65 | 25 | 392-0114.144 | ● | 392-0114L144 | ● |
| 0.30 | 1 | 3.65 | 25 | 392-0118.144 | ● | 392-0118L144 | ● |
| 0.31 | 1 | 3.65 | 25 | 392-0122.144 | ● | 392-0122L144 | ● |
| 0.32 | 1 | 3.65 | 25 | 392-0126.144 | ● | 392-0126L144 | ● |
| 0.34 | 1 | 3.65 | 25 | 392-0134.144 | ● | 392-0134L144 | ● |
| 0.36 | 1 | 3.65 | 25 | 392-0142.144 | ● | 392-0142L144 | ● |
| 0.38 | 1 | 3.65 | 25 | 392-0150.144 | ● | 392-0150L144 | ● |
| 0.40 | 1 | 3.65 | 25 | 392-0157.144 | ● | 392-0157L144 | ● |
| 0.42 | 1 | 3.65 | 25 | 392-0165.144 | ● | 392-0165L144 | ● |
| 0.44 | 1 | 3.65 | 25 | 392-0173.144 | ● | 392-0173L144 | ● |
| 0.46 | 1 | 3.65 | 25 | 392-0181.144 | ● | 392-0181L144 | ● |
| 0.48 | 1 | 3.65 | 25 | 392-0189.144 | ● | 392-0189L144 | ● |
| 0.50 | 1 | 3.65 | 25 | 392-0197.144 | ● | 392-0197L144 | ● |
| 0.52 | 1 | 3.65 | 25 | 392-0205.144 | ● | 392-0205L144 | ● |
| 0.54 | 1 | 3.65 | 25 | 392-0213.144 | ● | 392-0213L144 | ● |
| 0.56 | 1 | 3.65 | 25 | 392-0220.144 | ● | 392-0220L144 | ● |
| 0.58 | 1 | 3.65 | 25 | 392-0228.144 | ● | 392-0228L144 | ● |
| 0.60 | 1 | 3.65 | 25 | 392-0236.144 | ● | 392-0236L144 | ● |

| SERIES 392 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| Coating | P Steel ~30HRC | P Steel 30-40HRC | H TEMPERED STEEL ~55HRC | H TEMPERED STEEL ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ★ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

3.00mm SHANK

COOLANT FED MICRO DRILLS
DEEP HOLE DRILLING PRIORITY



1.50mm - 3.00mm DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



6 Facet Point Geometry



Symbol Descriptions [Page 7](#)

STANDARD Flute Length

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|---------------|-------|---------------|-------|
| D ^{+0.001mm -0.002mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 1.50 | 3 | 15.00 | 60 | 813-0591.591 | ● | 813-0591L591 | ● |
| 1.55 | 3 | 15.50 | 60 | 813-0610.611 | ● | 813-0610L611 | ● |
| 1.60 | 3 | 16.00 | 60 | 813-0630.630 | ● | 813-0630L630 | ● |
| 1.65 | 3 | 16.50 | 60 | 813-0650.650 | ● | 813-0650L650 | ● |
| 1.70 | 3 | 17.00 | 60 | 813-0669.670 | ● | 813-0669L670 | ● |
| 1.75 | 3 | 17.50 | 60 | 813-0689.690 | ● | 813-0689L690 | ● |
| 1.80 | 3 | 18.00 | 60 | 813-0709.709 | ● | 813-0709L709 | ● |
| 1.85 | 3 | 18.50 | 60 | 813-0728.729 | ● | 813-0728L729 | ● |
| 1.90 | 3 | 19.00 | 60 | 813-0748.749 | ● | 813-0748L749 | ● |
| 1.95 | 3 | 19.50 | 60 | 813-0768.768 | ● | 813-0768L768 | ● |
| 2.00 | 3 | 20.00 | 60 | 813-0787.788 | ● | 813-0787L788 | ● |
| 2.05 | 3 | 20.50 | 60 | 813-0807.808 | ● | 813-0807L808 | ● |
| 2.10 | 3 | 21.00 | 62 | 813-0827.827 | ● | 813-0827L827 | ● |
| 2.15 | 3 | 21.50 | 62 | 813-0846.847 | ● | 813-0846L847 | ● |
| 2.20 | 3 | 22.00 | 62 | 813-0866.867 | ● | 813-0866L867 | ● |
| 2.25 | 3 | 22.50 | 62 | 813-0886.887 | ● | 813-0886L887 | ● |
| 2.30 | 3 | 23.00 | 62 | 813-0906.906 | ● | 813-0906L906 | ● |
| 2.35 | 3 | 23.50 | 62 | 813-0925.926 | ● | 813-0925L926 | ● |
| 2.40 | 3 | 24.00 | 64 | 813-0945.946 | ● | 813-0945L946 | ● |
| 2.45 | 3 | 24.50 | 64 | 813-0965.965 | ● | 813-0965L965 | ● |
| 2.50 | 3 | 25.00 | 64 | 813-0984.985 | ● | 813-0984L985 | ● |
| 2.55 | 3 | 25.50 | 64 | 813-1004.1005 | ● | 813-1004L1005 | ● |
| 2.60 | 3 | 26.00 | 64 | 813-1024.1024 | ● | 813-1024L1024 | ● |
| 2.65 | 3 | 26.50 | 64 | 813-1043.1044 | ● | 813-1043L1044 | ● |
| 2.70 | 3 | 27.00 | 66 | 813-1063.1064 | ● | 813-1063L1064 | ● |
| 2.75 | 3 | 27.50 | 66 | 813-1083.1084 | ● | 813-1083L1084 | ● |
| 2.80 | 3 | 28.00 | 66 | 813-1102.1103 | ● | 813-1102L1103 | ● |
| 2.85 | 3 | 28.50 | 66 | 813-1122.1123 | ● | 813-1122L1123 | ● |
| 2.90 | 3 | 29.00 | 66 | 813-1142.1143 | ● | 813-1142L1143 | ● |
| 2.95 | 3 | 29.50 | 66 | 813-1161.1162 | ● | 813-1161L1162 | ● |
| 3.00 | 3 | 30.00 | 66 | 813-1181.1182 | ● | 813-1181L1182 | ● |

| SERIES 813 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
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3.00mm SHANK

COOLANT FED MICRO DRILLS
DEEP HOLE DRILLING PRIORITY



1.50mm - 3.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



6 Facet Point Geometry



Symbol Descriptions [Page 7](#)

EXTENDED Flute Length

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|-----|---------------|-------|---------------|-------|
| D ^{+0.001mm -0.010mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 1.50 | 3 | 27.00 | 77 | 813-0591.1064 | ● | 813-0591L1064 | ● |
| 1.55 | 3 | 27.90 | 77 | 813-0610.1099 | ● | 813-0610L1099 | ● |
| 1.60 | 3 | 28.80 | 77 | 813-0630.1135 | ● | 813-0630L1135 | ● |
| 1.65 | 3 | 29.70 | 77 | 813-0650.1170 | ● | 813-0650L1170 | ● |
| 1.70 | 3 | 30.60 | 77 | 813-0669.1206 | ● | 813-0669L1206 | ● |
| 1.75 | 3 | 31.50 | 77 | 813-0689.1241 | ● | 813-0689L1241 | ● |
| 1.80 | 3 | 32.40 | 84 | 813-0709.1277 | ● | 813-0709L1277 | ● |
| 1.85 | 3 | 33.30 | 84 | 813-0728.1312 | ● | 813-0728L1312 | ● |
| 1.90 | 3 | 34.20 | 84 | 813-0748.1347 | ● | 813-0748L1347 | ● |
| 1.95 | 3 | 35.10 | 84 | 813-0768.1383 | ● | 813-0768L1383 | ● |
| 2.00 | 3 | 36.00 | 84 | 813-0787.1418 | ● | 813-0787L1418 | ● |
| 2.05 | 3 | 36.90 | 84 | 813-0807.1454 | ● | 813-0807L1454 | ● |
| 2.10 | 3 | 37.80 | 91 | 813-0827.1489 | ● | 813-0827L1489 | ● |
| 2.15 | 3 | 38.70 | 91 | 813-0846.1525 | ● | 813-0846L1525 | ● |
| 2.20 | 3 | 39.60 | 91 | 813-0866.1560 | ● | 813-0866L1560 | ● |
| 2.25 | 3 | 40.50 | 91 | 813-0886.1596 | ● | 813-0886L1596 | ● |
| 2.30 | 3 | 41.40 | 91 | 813-0906.1631 | ● | 813-0906L1631 | ● |
| 2.35 | 3 | 42.30 | 91 | 813-0925.1667 | ● | 813-0925L1667 | ● |
| 2.40 | 3 | 43.20 | 91 | 813-0945.1702 | ● | 813-0945L1702 | ● |
| 2.45 | 3 | 44.10 | 91 | 813-0965.1738 | ● | 813-0965L1738 | ● |
| 2.50 | 3 | 45.00 | 91 | 813-0984.1773 | ● | 813-0984L1773 | ● |
| 2.55 | 3 | 45.90 | 91 | 813-1004.1808 | ● | 813-1004L1808 | ● |
| 2.60 | 3 | 46.80 | 91 | 813-1024.1844 | ● | 813-1024L1844 | ● |
| 2.65 | 3 | 47.70 | 91 | 813-1043.1879 | ● | 813-1043L1879 | ● |
| 2.70 | 3 | 48.60 | 104 | 813-1063.1915 | ● | 813-1063L1915 | ● |
| 2.75 | 3 | 49.50 | 104 | 813-1083.1950 | ● | 813-1083L1950 | ● |
| 2.80 | 3 | 50.40 | 104 | 813-1102.1986 | ● | 813-1102L1986 | ● |
| 2.85 | 3 | 51.30 | 104 | 813-1122.2021 | ● | 813-1122L2021 | ● |
| 2.90 | 3 | 52.20 | 104 | 813-1142.2057 | ● | 813-1142L2057 | ● |
| 2.95 | 3 | 53.10 | 104 | 813-1161.2092 | ● | 813-1161L2092 | ● |
| 3.00 | 3 | 54.00 | 104 | 813-1181.2128 | ● | 813-1181L2128 | ● |

SERIES 813 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED STEEL -55HRC | H TEMPERED STEEL -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

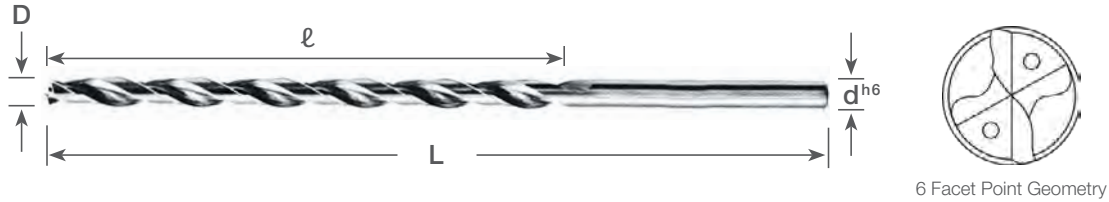
Symbol Descriptions [Page 7](#)

4.00mm SHANK

COOLANT FED MICRO DRILLS
DEEP HOLE DRILLING PRIORITY



3.05mm - 4.00mm DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|----|---------------|-------|---------------|-------|
| D ^{+0.001mm -0.002mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 3.05 | 4 | 30.50 | 70 | 813-1201.1202 | ● | 813-1201L1202 | ● |
| 3.10 | 4 | 31.00 | 70 | 813-1220.1221 | ● | 813-1220L1221 | ● |
| 3.15 | 4 | 31.50 | 70 | 813-1240.1241 | ● | 813-1240L1241 | ● |
| 3.20 | 4 | 32.00 | 70 | 813-1260.1261 | ● | 813-1260L1261 | ● |
| 3.25 | 4 | 32.50 | 70 | 813-1280.1281 | ● | 813-1280L1281 | ● |
| 3.30 | 4 | 33.00 | 70 | 813-1299.1300 | ● | 813-1299L1300 | ● |
| 3.35 | 4 | 33.50 | 70 | 813-1319.1320 | ● | 813-1319L1320 | ● |
| 3.40 | 4 | 34.00 | 70 | 813-1339.1340 | ● | 813-1339L1340 | ● |
| 3.45 | 4 | 34.50 | 70 | 813-1358.1359 | ● | 813-1358L1359 | ● |
| 3.50 | 4 | 35.00 | 70 | 813-1378.1379 | ● | 813-1378L1379 | ● |
| 3.55 | 4 | 35.50 | 70 | 813-1398.1399 | ● | 813-1398L1399 | ● |
| 3.60 | 4 | 36.00 | 70 | 813-1417.1418 | ● | 813-1417L1418 | ● |
| 3.65 | 4 | 36.50 | 76 | 813-1437.1438 | ● | 813-1437L1438 | ● |
| 3.70 | 4 | 37.00 | 76 | 813-1457.1458 | ● | 813-1457L1458 | ● |
| 3.75 | 4 | 37.50 | 76 | 813-1476.1478 | ● | 813-1476L1478 | ● |
| 3.80 | 4 | 38.00 | 76 | 813-1496.1497 | ● | 813-1496L1497 | ● |
| 3.85 | 4 | 38.50 | 76 | 813-1516.1517 | ● | 813-1516L1517 | ● |
| 3.90 | 4 | 39.00 | 76 | 813-1535.1537 | ● | 813-1535L1537 | ● |
| 3.95 | 4 | 39.50 | 76 | 813-1555.1556 | ● | 813-1555L1556 | ● |
| 4.00 | 4 | 40.00 | 76 | 813-1575.1576 | ● | 813-1575L1576 | ● |

| Coating | SERIES 813 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|----------|-------------------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| | P Steel -50HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
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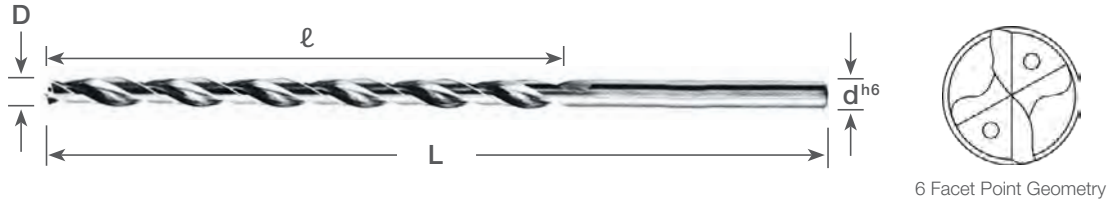
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4.00mm SHANK

COOLANT FED MICRO DRILLS
DEEP HOLE DRILLING PRIORITY



3.05mm - 4.00mm DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



6 Facet Point Geometry

EXTENDED Flute Length



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|------------------------------------|-----------------|-------|-----|---------------|-------|---------------|-------|
| D ^{+0.001mm -0.010mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 3.05 | 4 | 54.90 | 104 | 813-1201.2163 | ● | 813-1201L2163 | ● |
| 3.10 | 4 | 55.80 | 104 | 813-1220.2199 | ● | 813-1220L2199 | ● |
| 3.15 | 4 | 56.70 | 104 | 813-1240.2234 | ■ | 813-1240L2234 | ■ |
| 3.20 | 4 | 57.60 | 104 | 813-1260.2269 | ● | 813-1260L2269 | ● |
| 3.25 | 4 | 58.50 | 104 | 813-1280.2305 | ■ | 813-1280L2305 | ■ |
| 3.30 | 4 | 59.40 | 104 | 813-1299.2340 | ● | 813-1299L2340 | ● |
| 3.35 | 4 | 60.30 | 104 | 813-1319.2376 | ■ | 813-1319L2376 | ■ |
| 3.40 | 4 | 61.20 | 104 | 813-1339.2411 | ● | 813-1339L2411 | ● |
| 3.45 | 4 | 62.10 | 104 | 813-1358.2447 | ■ | 813-1358L2447 | ■ |
| 3.50 | 4 | 63.00 | 104 | 813-1378.2482 | ● | 813-1378L2482 | ● |
| 3.55 | 4 | 63.90 | 104 | 813-1398.2518 | ■ | 813-1398L2518 | ■ |
| 3.60 | 4 | 64.80 | 104 | 813-1417.2553 | ● | 813-1417L2553 | ● |
| 3.65 | 4 | 65.70 | 104 | 813-1437.2589 | ■ | 813-1437L2589 | ■ |
| 3.70 | 4 | 66.60 | 104 | 813-1457.2624 | ● | 813-1457L2624 | ● |
| 3.75 | 4 | 67.50 | 104 | 813-1476.2660 | ■ | 813-1476L2660 | ■ |
| 3.80 | 4 | 68.40 | 104 | 813-1496.2695 | ● | 813-1496L2695 | ● |
| 3.85 | 4 | 69.30 | 104 | 813-1516.2730 | ■ | 813-1516L2730 | ■ |
| 3.90 | 4 | 70.20 | 104 | 813-1535.2766 | ● | 813-1535L2766 | ● |
| 3.95 | 4 | 71.10 | 104 | 813-1555.2801 | ■ | 813-1555L2801 | ■ |
| 4.00 | 4 | 72.00 | 104 | 813-1575.2837 | ● | 813-1575L2837 | ● |

| SERIES 813 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel ~30HRC | P Steel 30-40HRC | H TEMPERED Steel ~55HRC | H TEMPERED Steel ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

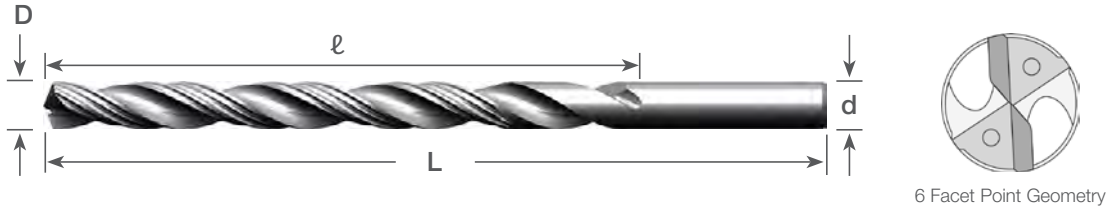
Symbol Descriptions [Page 7](#)

INCH SHANK NEW

COOLANT FED DEEP DRILLS
DEEP HOLE DRILLING PRIORITY
Excellent for Difficult-to-Cut Materials



0.1250" - 0.5000" DIAMETER
Sub Micron Grain Carbide
Superior Hole Wall Surface Finishes
Double Margin Design
Straight Through Drilling Without Pecking
Matching Pilot Drills



SERIES 860 Coolant Fed Drill



Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | Point Angle | AITiN Nano | |
|-------------------------|--------|--------|-------|-------------|----------------|-------|
| $D^{+0.0000}_{-0.0003}$ | d | ℓ | L | | Part Number | Stock |
| 0.1250 (1/8) | 0.1250 | 1.6250 | 3 1/2 | 135° | 860-1250AG1625 | ● |
| 0.1406 (9/64) | 0.1875 | 1.8280 | 4 | 135° | 860-1406AG1828 | ● |
| 0.1563 (5/32) | 0.1875 | 2.0310 | 4 | 135° | 860-1563AG2031 | ● |
| 0.1719 (11/64) | 0.1875 | 2.2340 | 4 | 135° | 860-1719AG2234 | ● |
| 0.1875 (3/16) | 0.1875 | 2.4380 | 4 1/2 | 135° | 860-1875AG2438 | ● |
| 0.2031 (13/64) | 0.2500 | 2.6410 | 4 1/2 | 135° | 860-2031AG2641 | ● |
| 0.2188 (7/32) | 0.2500 | 2.8440 | 5 | 135° | 860-2188AG2844 | ● |
| 0.2344 (15/64) | 0.2500 | 3.0470 | 5 | 135° | 860-2344AG3047 | ● |
| 0.2500 (1/4) | 0.2500 | 3.2500 | 5 | 135° | 860-2500AG3250 | ● |
| 0.2570 (F) | 0.3125 | 3.3410 | 5 1/2 | 135° | 860-2570AG3341 | ● |
| 0.2656 (17/64) | 0.3125 | 3.4530 | 5 1/2 | 135° | 860-2656AG3453 | ● |
| 0.2813 (9/32) | 0.3125 | 3.6560 | 5 1/2 | 135° | 860-2813AG3656 | ● |
| 0.3125 (5/16) | 0.3125 | 4.0630 | 6 | 135° | 860-3125AG4063 | ● |
| 0.3320 (Q) | 0.3750 | 4.3160 | 6 1/2 | 135° | 860-3320AG4316 | ● |
| 0.3438 (11/32) | 0.3750 | 4.4690 | 6 1/2 | 135° | 860-3438AG4469 | ● |
| 0.3750 (3/8) | 0.3750 | 4.8750 | 7 | 135° | 860-3750AG4875 | ● |
| 0.4219 (27/64) | 0.4375 | 5.4840 | 7 1/2 | 135° | 860-4219AG5484 | ● |
| 0.4375 (7/16) | 0.4375 | 5.6880 | 7 1/2 | 135° | 860-4375AG5688 | ● |
| 0.4531 (29/64) | 0.5000 | 5.8910 | 8 | 135° | 860-4531AG5891 | ● |
| 0.5000 (1/2) | 0.5000 | 6.5000 | 8 1/2 | 135° | 860-5000AG6500 | ● |

Match with Pilot Drills [Series 160](#) [Page 30](#)

Shank Tolerance

| Shank Dia. (d) | 0.1250" - 0.2344" | 0.2500" - 0.3750" | 0.4219" - 0.5000" |
|-----------------|---------------------|---------------------|---------------------|
| Tolerance + / - | +0.00000"/-0.00032" | +0.00000"/-0.00035" | +0.00000"/-0.00043" |

| SERIES 860 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

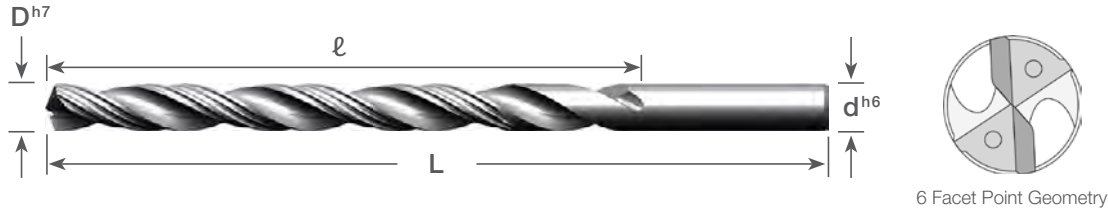
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METRIC SHANK NEW

COOLANT FED DEEP DRILLS
DEEP HOLE DRILLING PRIORITY
Excellent for Difficult-to-Cut Materials



3.00mm - 4.10mm DIAMETER
Sub Micron Grain Carbide
Superior Hole Wall Surface Finishes
Double Margin Design
Straight Through Drilling Without Pecking
Matching Pilot Drills



SERIES 865 Coolant Fed Drill



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITIN Nano | |
|-----------------|----------|------|-----|-------------|----------------|-------|
| D^{h7} | d^{h6} | l | L | | Part Number | Stock |
| 3.00 | 3 | 39.0 | 90 | 135° | 865-1181AG1535 | ● |
| 3.10 | 4 | 40.3 | 90 | 135° | 865-1220AG1587 | ● |
| 3.20 | 4 | 41.6 | 90 | 135° | 865-1260AG1638 | ● |
| 3.30 | 4 | 42.9 | 90 | 135° | 865-1299AG1689 | ● |
| 3.40 | 4 | 44.2 | 90 | 135° | 865-1339AG1740 | ● |
| 3.50 | 4 | 45.5 | 90 | 135° | 865-1378AG1791 | ● |
| 3.60 | 4 | 46.8 | 90 | 135° | 865-1417AG1843 | ● |
| 3.70 | 4 | 48.1 | 100 | 135° | 865-1457AG1894 | ● |
| 3.80 | 4 | 49.4 | 100 | 135° | 865-1496AG1945 | ● |
| 3.90 | 4 | 50.7 | 100 | 135° | 865-1535AG1996 | ● |
| 4.00 | 4 | 52.0 | 100 | 135° | 865-1575AG2047 | ● |
| 4.10 | 6 | 53.3 | 100 | 135° | 865-1614AG2098 | ● |

Match with Pilot Drills [Series 165](#) [Page 31](#)

| SERIES 865 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

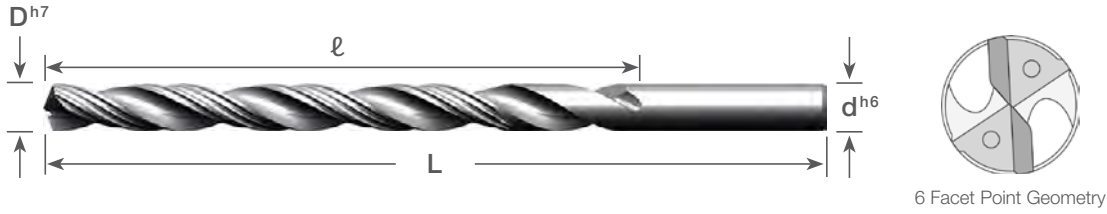
Symbol Descriptions [Page 7](#)

METRIC SHANK NEW

COOLANT FED DEEP DRILLS
DEEP HOLE DRILLING PRIORITY
Excellent for Difficult-to-Cut Materials



4.20mm - 6.80mm DIAMETER
Sub Micron Grain Carbide
Superior Hole Wall Surface Finishes
Double Margin Design
Straight Through Drilling Without Pecking
Matching Pilot Drills



SERIES 865 Coolant Fed Drill



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITiN Nano | |
|-----------------|----------|------|-----|-------------|----------------|-------|
| D^{h7} | d^{h6} | l | L | | Part Number | Stock |
| 4.20 | 6 | 54.6 | 110 | 135° | 865-1654AG2150 | ● |
| 4.30 | 6 | 55.9 | 110 | 135° | 865-1693AG2201 | ● |
| 4.40 | 6 | 57.2 | 110 | 135° | 865-1732AG2252 | ● |
| 4.50 | 6 | 58.5 | 110 | 135° | 865-1772AG2303 | ● |
| 4.60 | 6 | 59.8 | 110 | 135° | 865-1811AG2354 | ● |
| 4.70 | 6 | 61.1 | 110 | 135° | 865-1850AG2406 | ● |
| 4.80 | 6 | 62.4 | 110 | 135° | 865-1890AG2457 | ● |
| 4.90 | 6 | 63.7 | 110 | 135° | 865-1929AG2508 | ● |
| 5.00 | 6 | 65.0 | 110 | 135° | 865-1969AG2559 | ● |
| 5.10 | 6 | 66.3 | 120 | 135° | 865-2008AG2610 | ● |
| 5.20 | 6 | 67.6 | 120 | 135° | 865-2047AG2661 | ● |
| 5.30 | 6 | 68.9 | 120 | 135° | 865-2087AG2713 | ● |
| 5.40 | 6 | 70.2 | 120 | 135° | 865-2126AG2764 | ● |
| 5.50 | 6 | 71.5 | 120 | 135° | 865-2165AG2815 | ● |
| 5.60 | 6 | 72.8 | 120 | 135° | 865-2205AG2866 | ● |
| 5.70 | 6 | 74.1 | 120 | 135° | 865-2244AG2917 | ● |
| 5.80 | 6 | 75.4 | 120 | 135° | 865-2283AG2969 | ● |
| 5.90 | 6 | 76.7 | 120 | 135° | 865-2323AG3020 | ● |
| 6.00 | 6 | 78.0 | 130 | 135° | 865-2362AG3071 | ● |
| 6.10 | 8 | 79.3 | 130 | 135° | 865-2402AG3122 | ● |
| 6.20 | 8 | 80.6 | 130 | 135° | 865-2441AG3173 | ● |
| 6.30 | 8 | 81.9 | 130 | 135° | 865-2480AG3224 | ● |
| 6.40 | 8 | 83.2 | 130 | 135° | 865-2520AG3276 | ● |
| 6.50 | 8 | 84.5 | 140 | 135° | 865-2559AG3327 | ● |
| 6.60 | 8 | 85.8 | 140 | 135° | 865-2598AG3378 | ● |
| 6.70 | 8 | 87.1 | 140 | 135° | 865-2638AG3429 | ● |
| 6.80 | 8 | 88.4 | 140 | 135° | 865-2677AG3480 | ● |

Match with Pilot Drills [Series 165](#) [Page 32](#)

| SERIES 865 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

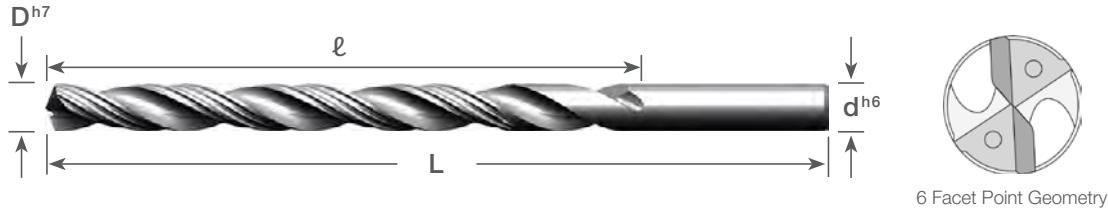
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METRIC SHANK NEW

COOLANT FED DEEP DRILLS
DEEP HOLE DRILLING PRIORITY
Excellent for Difficult-to-Cut Materials



6.90mm - 9.50mm DIAMETER
Sub Micron Grain Carbide
Superior Hole Wall Surface Finishes
Double Margin Design
Straight Through Drilling Without Pecking
Matching Pilot Drills



SERIES 865 Coolant Fed Drill



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITiN Nano | |
|-----------------|----------|-------|-----|-------------|----------------|-------|
| D^{h7} | d^{h6} | l | L | | Part Number | Stock |
| 6.90 | 8 | 89.7 | 140 | 135° | 865-2717AG3531 | ● |
| 7.00 | 8 | 91.0 | 140 | 135° | 865-2756AG3583 | ● |
| 7.10 | 8 | 92.3 | 140 | 135° | 865-2795AG3634 | ● |
| 7.20 | 8 | 93.6 | 140 | 135° | 865-2835AG3685 | ● |
| 7.30 | 8 | 94.9 | 140 | 135° | 865-2874AG3736 | ● |
| 7.40 | 8 | 96.2 | 150 | 135° | 865-2913AG3787 | ● |
| 7.50 | 8 | 97.5 | 150 | 135° | 865-2953AG3839 | ● |
| 7.60 | 8 | 98.8 | 150 | 135° | 865-2992AG3890 | ● |
| 7.70 | 8 | 100.1 | 150 | 135° | 865-3031AG3941 | ● |
| 7.80 | 8 | 101.4 | 150 | 135° | 865-3071AG3992 | ● |
| 7.90 | 8 | 102.7 | 150 | 135° | 865-3110AG4043 | ● |
| 8.00 | 8 | 104.0 | 150 | 135° | 865-3150AG4094 | ● |
| 8.10 | 10 | 105.3 | 160 | 135° | 865-3189AG4146 | ● |
| 8.20 | 10 | 106.6 | 160 | 135° | 865-3228AG4197 | ● |
| 8.30 | 10 | 107.9 | 160 | 135° | 865-3268AG4248 | ● |
| 8.40 | 10 | 109.2 | 160 | 135° | 865-3307AG4299 | ● |
| 8.50 | 10 | 110.5 | 160 | 135° | 865-3346AG4350 | ● |
| 8.60 | 10 | 111.8 | 160 | 135° | 865-3386AG4402 | ● |
| 8.70 | 10 | 113.1 | 160 | 135° | 865-3425AG4453 | ● |
| 8.80 | 10 | 114.4 | 170 | 135° | 865-3465AG4504 | ● |
| 8.90 | 10 | 115.7 | 170 | 135° | 865-3504AG4555 | ● |
| 9.00 | 10 | 117.0 | 170 | 135° | 865-3543AG4606 | ● |
| 9.10 | 10 | 118.3 | 170 | 135° | 865-3583AG4657 | ● |
| 9.20 | 10 | 119.6 | 170 | 135° | 865-3622AG4709 | ● |
| 9.30 | 10 | 120.9 | 170 | 135° | 865-3661AG4760 | ● |
| 9.40 | 10 | 122.2 | 170 | 135° | 865-3701AG4811 | ● |
| 9.50 | 10 | 123.5 | 170 | 135° | 865-3740AG4862 | ● |

Match with Pilot Drills [Series 165](#) [Page 33](#)

| Coating | SERIES 865 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|------------|-------------------------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -35HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITiN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | | ☆ | ☆ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

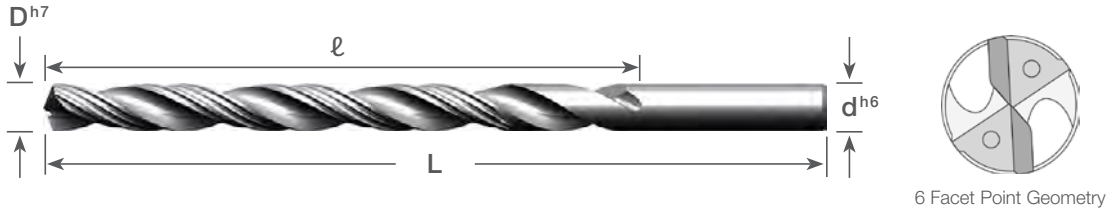
Symbol Descriptions [Page 7](#)

METRIC SHANK NEW

COOLANT FED DEEP DRILLS
DEEP HOLE DRILLING PRIORITY
Excellent for Difficult-to-Cut Materials



9.60mm - 12.00mm DIAMETER
Sub Micron Grain Carbide
Superior Hole Wall Surface Finishes
Double Margin Design
Straight Through Drilling Without Pecking
Matching Pilot Drills



SERIES 865 Coolant Fed Drill



Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | Point Angle | AITIN Nano | |
|-----------------|----------|-------|-----|-------------|----------------|-------|
| D^{h7} | d^{h6} | l | L | | Part Number | Stock |
| 9.60 | 10 | 124.8 | 180 | 135° | 865-3780AG4913 | ● |
| 9.70 | 10 | 126.1 | 180 | 135° | 865-3819AG4965 | ● |
| 9.80 | 10 | 127.4 | 180 | 135° | 865-3858AG5016 | ● |
| 9.90 | 10 | 128.7 | 180 | 135° | 865-3898AG5067 | ● |
| 10.00 | 10 | 130.0 | 180 | 135° | 865-3937AG5118 | ● |
| 10.10 | 12 | 131.3 | 180 | 135° | 865-3976AG5169 | ● |
| 10.20 | 12 | 132.6 | 190 | 135° | 865-4016AG5220 | ● |
| 10.30 | 12 | 133.9 | 190 | 135° | 865-4055AG5272 | ● |
| 10.40 | 12 | 135.2 | 190 | 135° | 865-4094AG5323 | ● |
| 10.50 | 12 | 136.5 | 190 | 135° | 865-4134AG5374 | ● |
| 10.60 | 12 | 137.8 | 190 | 135° | 865-4173AG5425 | ● |
| 10.70 | 12 | 139.1 | 190 | 135° | 865-4213AG5476 | ● |
| 10.80 | 12 | 140.4 | 190 | 135° | 865-4252AG5528 | ● |
| 10.90 | 12 | 141.7 | 190 | 135° | 865-4291AG5579 | ● |
| 11.00 | 12 | 143.0 | 200 | 135° | 865-4331AG5630 | ● |
| 11.10 | 12 | 144.3 | 200 | 135° | 865-4370AG5681 | ● |
| 11.20 | 12 | 145.6 | 200 | 135° | 865-4409AG5732 | ● |
| 11.30 | 12 | 146.9 | 200 | 135° | 865-4449AG5783 | ● |
| 11.40 | 12 | 148.2 | 200 | 135° | 865-4488AG5835 | ● |
| 11.50 | 12 | 149.5 | 200 | 135° | 865-4528AG5886 | ● |
| 11.60 | 12 | 150.8 | 200 | 135° | 865-4567AG5937 | ● |
| 11.70 | 12 | 152.1 | 200 | 135° | 865-4606AG5988 | ● |
| 11.80 | 12 | 153.4 | 200 | 135° | 865-4646AG6039 | ● |
| 11.90 | 12 | 154.7 | 210 | 135° | 865-4685AG6091 | ● |
| 12.00 | 12 | 156.0 | 210 | 135° | 865-4724AG6142 | ● |

Match with Pilot Drills **Series 165** [Page 34](#)

| SERIES 865 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN Nano | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery

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3.00mm SHANK

MICRO DRILLS FOR BRASS

0.30mm - 2.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide
Single Flute



Symbol Descriptions Page 7

STANDARD Length

| Dimensions (mm) | | | | Uncoated | | TiCN Coating | |
|------------------------------------|-----------------|------|----|--------------|-------|--------------|-------|
| D ^{+0.000mm -0.008mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.30 | 3 | 1.65 | 38 | 885-0118.065 | ● | 885-0118C065 | ● |
| 0.35 | 3 | 1.65 | 38 | 885-0138.065 | ● | 885-0138C065 | ● |
| 0.40 | 3 | 1.65 | 38 | 885-0157.065 | ● | 885-0157C065 | ● |
| 0.45 | 3 | 1.65 | 38 | 885-0177.065 | ● | 885-0177C065 | ● |
| 0.50 | 3 | 2.15 | 38 | 885-0197.085 | ● | 885-0197C085 | ● |
| 0.55 | 3 | 2.15 | 38 | 885-0217.085 | ● | 885-0217C085 | ● |
| 0.60 | 3 | 2.15 | 38 | 885-0236.085 | ● | 885-0236C085 | ● |
| 0.65 | 3 | 2.15 | 38 | 885-0256.085 | ● | 885-0256C085 | ● |
| 0.70 | 3 | 2.15 | 38 | 885-0276.085 | ● | 885-0276C085 | ● |
| 0.75 | 3 | 2.15 | 38 | 885-0295.085 | ● | 885-0295C085 | ● |
| 0.80 | 3 | 2.15 | 38 | 885-0315.085 | ● | 885-0315C085 | ● |
| 0.85 | 3 | 2.15 | 38 | 885-0335.085 | ● | 885-0335C085 | ● |
| 0.90 | 3 | 2.15 | 38 | 885-0354.085 | ● | 885-0354C085 | ● |
| 0.95 | 3 | 2.15 | 38 | 885-0374.085 | ● | 885-0374C085 | ● |
| 1.00 | 3 | 2.15 | 38 | 885-0394.085 | ● | 885-0394C085 | ● |
| 1.10 | 3 | 2.85 | 38 | 885-0433.112 | ● | 885-0433C112 | ● |
| 1.20 | 3 | 2.85 | 38 | 885-0472.112 | ● | 885-0472C112 | ● |
| 1.30 | 3 | 2.85 | 38 | 885-0512.112 | ● | 885-0512C112 | ● |
| 1.40 | 3 | 2.85 | 38 | 885-0551.112 | ● | 885-0551C112 | ● |
| 1.50 | 3 | 2.85 | 38 | 885-0591.112 | ● | 885-0591C112 | ● |
| 1.60 | 3 | 2.85 | 38 | 885-0630.112 | ● | 885-0630C112 | ● |
| 1.70 | 3 | 2.85 | 38 | 885-0669.112 | ● | 885-0669C112 | ● |
| 1.80 | 3 | 2.85 | 38 | 885-0709.112 | ● | 885-0709C112 | ● |
| 1.90 | 3 | 2.85 | 38 | 885-0748.112 | ● | 885-0748C112 | ● |
| 2.00 | 3 | 2.85 | 38 | 885-0787.112 | ● | 885-0787C112 | ● |

| SERIES 885 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H TEMPERED Steel -55HRC | H TEMPERED Steel -60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| TiCN | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | | | | | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ★ | ★ | ☆ | ☆ | ★ | | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

END MILLS

69 - 154

| SQUARE END MILLS | | | 69 - 100 |
|------------------|---------|----------------------------|----------|
| SERIES 1610 | 2 Flute | Standard Length | 69 - 72 |
| SERIES 1620 | 2 Flute | Stub Length | 73 - 76 |
| SERIES 1640 | 2 Flute | Extended Reach | 77 - 79 |
| *TITAN-AX | 3 Flute | Reinforced Shank | 80 - 81 |
| SERIES 1710 | 3 Flute | Standard Length | 82 - 83 |
| SERIES 1740 | 3 Flute | Extended Length | 84 - 85 |
| SERIES 1742 | 3 Flute | Extended Reach Stub Length | 86 - 90 |
| SERIES 1810 | 4 Flute | Standard Length | 91 - 94 |
| SERIES 1820 | 4 Flute | Stub Length | 95 - 97 |
| SERIES 1840 | 4 Flute | Extended Reach | 98 - 100 |

| BALL NOSE END MILLS | | | 101 - 130 |
|---------------------|---------|-----------------------------------|-----------|
| SERIES 1625 | 2 Flute | Standard Length | 101 - 104 |
| SERIES 1635 | 2 Flute | Stub Length | 105 - 107 |
| SERIES 1645 | 2 Flute | Extended Reach | 108 - 110 |
| SERIES 1685 | 2 Flute | Reverse Shank | 111 |
| *16 HMS | 2 Flute | Hard Metal Milling Stub Length | 112 |
| *16 HMR | 2 Flute | Hard Metal Milling Extended Reach | 113 |
| *16 RB | 2 Flute | Rib Processing Extended Reach | 114 |
| SERIES 1725 | 3 Flute | Standard Length | 115 |
| SERIES 1745 | 3 Flute | Extended Reach | 116 |
| SERIES 1755 | 3 Flute | Extended Reach Stub Length | 117 - 120 |
| SERIES 1825 | 4 Flute | Standard Length | 121 - 124 |
| SERIES 1835 | 4 Flute | Stub Length | 125 - 127 |
| SERIES 1845 | 4 Flute | Extended Reach | 128 - 130 |

| CORNER RADIUS END MILLS | | | 131 - 152 |
|-------------------------|---------|--|-----------|
| SERIES 1611 | 2 Flute | Standard Length X-Small Corner Radius | 131 |
| SERIES 1612 | 2 Flute | Standard Length Small Corner Radius | 132 |
| SERIES 1613 | 2 Flute | Standard Length Standard Corner Radius | 133 |
| SERIES 1614 | 2 Flute | Standard Length Large Corner Radius | 134 |
| SERIES 1616 | 2 Flute | Standard Length X-Large Corner Radius | 134 |
| SERIES 1617 | 2 Flute | Standard Length XX-Large Corner Radius | 135 |
| SERIES 1618 | 2 Flute | Standard Length XXX-Large Corner Radius | 135 |
| *SERIES 1703 | 3 Flute | Standard Length High Helix Corner Radius | 136 |
| *TITAN-AX | 3 Flute | Reinforced Shank | 137 - 139 |

* High Performance End Mills.
See product page for high performance features.

(Continued on Next Page)

END MILLS (CONTINUED)

69 - 154

| CORNER RADIUS END MILLS <small>(CONTINUED)</small> | | | 131 - 152 |
|---|---------|--|------------------|
| SERIES 1743 | 3 Flute | Extended Reach Small Corner Radius | 140 |
| SERIES 1744 | 3 Flute | Extended Reach Standard Corner Radius | 141 |
| SERIES 1746 | 3 Flute | Extended Reach Large Corner Radius | 142 |
| *SERIES 1804 | 4 Flute | High Helix Corner Radius Standard Length | 143 |
| SERIES 1812 | 4 Flute | Standard Length Small Corner Radius | 144 |
| SERIES 1813 | 4 Flute | Standard Length Standard Corner Radius | 145 |
| SERIES 1814 | 4 Flute | Standard Length Large Corner Radius | 146 |
| SERIES 1816 | 4 Flute | Standard Length X-Large Corner Radius | 146 |
| SERIES 1817 | 4 Flute | Standard Length XX-Large Corner Radius | 147 |
| SERIES 1818 | 4 Flute | Standard Length XXX-Large Corner Radius | 147 |
| *APOLLO AP4 | 4 Flute | Variable Helix End Mills | 148 - 149 |
| *SERIES 1905 | 5 Flute | High Helix Corner Radius Standard Length | 150 |
| *APOLLO AP5 | 5 Flute | Variable Helix End Mills | 151 - 152 |

| CHAMFER MILLS | | | 153 - 154 |
|----------------------|------------|---------------|------------------|
| SERIES CM | 1/8" Shank | Chamfer Mills | 153 |
| SERIES CMM | Metric | Chamfer Mills | 154 |

* High Performance End Mills.
See product page for high performance features.

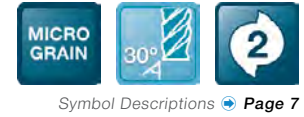
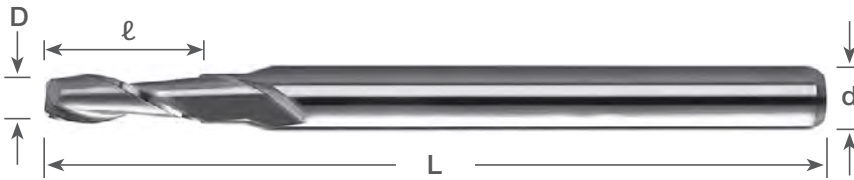
2 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0040" - 0.0310" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0040 | 1/8 | 0.012 | 1 1/2 | 1610-0040.012 | ● | 1610-0040L012 | ● | - | - |
| 0.0050 | 1/8 | 0.015 | 1 1/2 | 1610-0050.015 | ● | 1610-0050L015 | ● | - | - |
| 0.0060 | 1/8 | 0.018 | 1 1/2 | 1610-0060.018 | ● | 1610-0060L018 | ● | - | - |
| 0.0070 | 1/8 | 0.021 | 1 1/2 | 1610-0070.021 | ● | 1610-0070L021 | ● | - | - |
| 0.0080 | 1/8 | 0.024 | 1 1/2 | 1610-0080.024 | ● | 1610-0080L024 | ● | - | - |
| 0.0090 | 1/8 | 0.027 | 1 1/2 | 1610-0090.027 | ● | 1610-0090L027 | ● | - | - |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 1610-0100.030 | ● | 1610-0100L030 | ● | 1610-0100D030 | ■ |
| 0.0110 | 1/8 | 0.033 | 1 1/2 | 1610-0110.033 | ● | 1610-0110L033 | ● | - | - |
| 0.0120 | 1/8 | 0.036 | 1 1/2 | 1610-0120.036 | ● | 1610-0120L036 | ● | - | - |
| 0.0130 | 1/8 | 0.039 | 1 1/2 | 1610-0130.039 | ● | 1610-0130L039 | ● | - | - |
| 0.0140 | 1/8 | 0.042 | 1 1/2 | 1610-0140.042 | ● | 1610-0140L042 | ● | - | - |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 1610-0150.045 | ● | 1610-0150L045 | ● | 1610-0150D045 | ■ |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 1610-0156.047 | ● | 1610-0156L047 | ● | 1610-0156D047 | ■ |
| 0.0160 | 1/8 | 0.048 | 1 1/2 | 1610-0160.048 | ● | 1610-0160L048 | ● | - | - |
| 0.0170 | 1/8 | 0.051 | 1 1/2 | 1610-0170.051 | ● | 1610-0170L051 | ● | - | - |
| 0.0180 | 1/8 | 0.054 | 1 1/2 | 1610-0180.054 | ● | 1610-0180L054 | ● | - | - |
| 0.0190 | 1/8 | 0.057 | 1 1/2 | 1610-0190.057 | ● | 1610-0190L057 | ● | - | - |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 1610-0200.060 | ● | 1610-0200L060 | ● | 1610-0200D060 | ■ |
| 0.0210 | 1/8 | 0.063 | 1 1/2 | 1610-0210.063 | ● | 1610-0210L063 | ● | - | - |
| 0.0220 | 1/8 | 0.066 | 1 1/2 | 1610-0220.066 | ● | 1610-0220L066 | ● | - | - |
| 0.0230 | 1/8 | 0.069 | 1 1/2 | 1610-0230.069 | ● | 1610-0230L069 | ● | - | - |
| 0.0240 | 1/8 | 0.072 | 1 1/2 | 1610-0240.072 | ● | 1610-0240L072 | ● | - | - |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 1610-0250.075 | ● | 1610-0250L075 | ● | - | - |
| 0.0260 | 1/8 | 0.078 | 1 1/2 | 1610-0260.078 | ● | 1610-0260L078 | ● | - | - |
| 0.0270 | 1/8 | 0.081 | 1 1/2 | 1610-0270.081 | ● | 1610-0270L081 | ● | - | - |
| 0.0280 | 1/8 | 0.084 | 1 1/2 | 1610-0280.084 | ● | 1610-0280L084 | ● | - | - |
| 0.0290 | 1/8 | 0.087 | 1 1/2 | 1610-0290.087 | ● | 1610-0290L087 | ● | - | - |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 1610-0300.090 | ● | 1610-0300L090 | ● | 1610-0300D090 | ■ |
| 0.0310 | 1/8 | 0.093 | 1 1/2 | 1610-0310.093 | ● | 1610-0310L093 | ● | - | - |

| SERIES 1610 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|---------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| Coating | P Steel 30HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE

0.0312" - 0.0600" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 1610-0312.094 | ● | 1610-0312L094 | ● | 1610-0312D094 | ■ |
| 0.0320 | 1/8 | 0.096 | 1 1/2 | 1610-0320.096 | ● | 1610-0320L096 | ● | - | - |
| 0.0330 | 1/8 | 0.099 | 1 1/2 | 1610-0330.099 | ● | 1610-0330L099 | ● | - | - |
| 0.0340 | 1/8 | 0.102 | 1 1/2 | 1610-0340.102 | ● | 1610-0340L102 | ● | - | - |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 1610-0350.105 | ● | 1610-0350L105 | ● | 1610-0350D105 | ■ |
| NEW 0.0360 | 1/8 | 0.108 | 1 1/2 | 1610-0360.108 | ● | 1610-0360L108 | ● | - | - |
| NEW 0.0370 | 1/8 | 0.111 | 1 1/2 | 1610-0370.111 | ● | 1610-0370L111 | ● | - | - |
| NEW 0.0380 | 1/8 | 0.114 | 1 1/2 | 1610-0380.114 | ● | 1610-0380L114 | ● | - | - |
| NEW 0.0394 | 1/8 | 0.117 | 1 1/2 | 1610-0394.117 | ● | 1610-0394L117 | ● | 1610-0394D117 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 1610-0400.120 | ● | 1610-0400L120 | ● | 1610-0400D120 | ■ |
| NEW 0.0410 | 1/8 | 0.123 | 1 1/2 | 1610-0410.123 | ● | 1610-0410L123 | ● | - | - |
| NEW 0.0420 | 1/8 | 0.126 | 1 1/2 | 1610-0420.126 | ● | 1610-0420L126 | ● | - | - |
| NEW 0.0430 | 1/8 | 0.129 | 1 1/2 | 1610-0430.129 | ● | 1610-0430L129 | ● | - | - |
| NEW 0.0440 | 1/8 | 0.132 | 1 1/2 | 1610-0440.132 | ● | 1610-0440L132 | ● | - | - |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 1610-0450.135 | ● | 1610-0450L135 | ● | 1610-0450D135 | ■ |
| NEW 0.0460 | 1/8 | 0.138 | 1 1/2 | 1610-0460.138 | ● | 1610-0460L138 | ● | - | - |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 1610-0469.141 | ● | 1610-0469L141 | ● | 1610-0469D141 | ■ |
| NEW 0.0480 | 1/8 | 0.144 | 1 1/2 | 1610-0480.144 | ● | 1610-0480L144 | ● | - | - |
| NEW 0.0490 | 1/8 | 0.147 | 1 1/2 | 1610-0490.147 | ● | 1610-0490L147 | ● | - | - |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 1610-0500.150 | ● | 1610-0500L150 | ● | 1610-0500D150 | ■ |
| NEW 0.0510 | 1/8 | 0.153 | 1 1/2 | 1610-0510.153 | ● | 1610-0510L153 | ● | - | - |
| NEW 0.0520 | 1/8 | 0.156 | 1 1/2 | 1610-0520.156 | ● | 1610-0520L156 | ● | - | - |
| NEW 0.0530 | 1/8 | 0.159 | 1 1/2 | 1610-0530.159 | ● | 1610-0530L159 | ● | - | - |
| NEW 0.0540 | 1/8 | 0.162 | 1 1/2 | 1610-0540.162 | ● | 1610-0540L162 | ● | - | - |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 1610-0550.165 | ● | 1610-0550L165 | ● | 1610-0550D165 | ■ |
| NEW 0.0560 | 1/8 | 0.168 | 1 1/2 | 1610-0560.168 | ● | 1610-0560L168 | ● | - | - |
| NEW 0.0570 | 1/8 | 0.171 | 1 1/2 | 1610-0570.171 | ● | 1610-0570L171 | ● | - | - |
| NEW 0.0580 | 1/8 | 0.174 | 1 1/2 | 1610-0580.174 | ● | 1610-0580L174 | ● | - | - |
| NEW 0.0590 | 1/8 | 0.177 | 1 1/2 | 1610-0590.177 | ● | 1610-0590L177 | ● | - | - |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 1610-0600.180 | ● | 1610-0600L180 | ● | 1610-0600D180 | ■ |

SERIES 1610 WORKPIECE MATERIAL

| Coating | P Steel -20HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

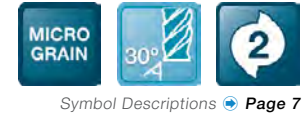
Symbol Descriptions [Page 7](#)

2 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0625" - 0.3750" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | l | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.188 | 1 1/2 | 1610-0625.188 | ● | 1610-0625L188 | ● | 1610-0625D188 | ■ |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 1610-0650.195 | ● | 1610-0650L195 | ● | 1610-0650D195 | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 1610-0700.210 | ● | 1610-0700L210 | ● | 1610-0700D210 | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 1610-0750.225 | ● | 1610-0750L225 | ● | 1610-0750D225 | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 1610-0781.234 | ● | 1610-0781L234 | ● | 1610-0781D234 | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 1610-0800.240 | ● | 1610-0800L240 | ● | 1610-0800D240 | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 1610-0850.255 | ● | 1610-0850L255 | ● | 1610-0850D255 | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 1610-0900.270 | ● | 1610-0900L270 | ● | 1610-0900D270 | ■ |
| 0.0938 (3/32) | 1/8 | 0.281 | 1 1/2 | 1610-0938.281 | ● | 1610-0938L281 | ● | 1610-0938D281 | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 1610-0950.285 | ● | 1610-0950L285 | ● | 1610-0950D285 | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 1610-1000.300 | ● | 1610-1000L300 | ● | 1610-1000D300 | ■ |
| NEW 0.1050 | 1/8 | 0.315 | 1 1/2 | 1610-1050.315 | ● | 1610-1050L315 | ● | 1610-1050D315 | ■ |
| 0.1094 (7/64) | 1/8 | 0.328 | 1 1/2 | 1610-1094.328 | ● | 1610-1094L328 | ● | 1610-1094D328 | ■ |
| NEW 0.1100 | 1/8 | 0.330 | 1 1/2 | 1610-1100.330 | ● | 1610-1100L330 | ● | 1610-1100D330 | ■ |
| NEW 0.1150 | 1/8 | 0.345 | 1 1/2 | 1610-1150.345 | ● | 1610-1150L345 | ● | 1610-1150D345 | ■ |
| NEW 0.1181 | 1/8 | 0.355 | 1 1/2 | 1610-1181.355 | ● | 1610-1181L355 | ● | 1610-1181D355 | ■ |
| NEW 0.1200 | 1/8 | 0.360 | 1 1/2 | 1610-1200.360 | ● | 1610-1200L360 | ● | 1610-1200D360 | ■ |
| 0.1250 (1/8) | 1/8 | 0.375 | 1 1/2 | 1610-1250.375 | ● | 1610-1250L375 | ● | 1610-1250D375 | ■ |
| 0.1406 (9/64) | 3/16 | 0.500 | 2 | 1610-1406.500 | ● | 1610-1406L500 | ● | 1610-1406D500 | ■ |
| NEW 0.1406 (9/64) | 3/16 | 0.562 | 2 | 1610-1406.562 | ● | 1610-1406L562 | ● | 1610-1406D562 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 1610-1562.562 | ● | 1610-1562L562 | ● | 1610-1562D562 | ■ |
| 0.1562 (5/32) | 3/16 | 0.500 | 2 | 1610-1563.500 | ● | 1610-1563L500 | ● | 1610-1563D500 | ■ |
| 0.1719 (11/64) | 3/16 | 0.563 | 2 | 1610-1719.563 | ● | 1610-1719L563 | ● | 1610-1719D563 | ■ |
| 0.1875 (3/16) | 3/16 | 0.563 | 2 | 1610-1875.563 | ● | 1610-1875L563 | ● | 1610-1875D563 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 1610-1875.625 | ● | 1610-1875L625 | ● | 1610-1875D625 | ■ |
| 0.2031 (13/64) | 1/4 | 0.625 | 2 1/2 | 1610-2031.625 | ● | 1610-2031L625 | ● | 1610-2031D625 | ■ |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 1610-2188.625 | ● | 1610-2188L625 | ● | 1610-2188D625 | ■ |
| 0.2344 (15/64) | 1/4 | 0.750 | 2 1/2 | 1610-2344.750 | ● | 1610-2344L750 | ● | 1610-2344D750 | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 1610-2500.750 | ● | 1610-2500L750 | ● | 1610-2500D750 | ■ |
| NEW 0.3125 (5/16) | 5/16 | 0.812 | 2 1/2 | 1610-3125.812 | ● | 1610-3125L812 | ● | 1610-3125D812 | ■ |
| NEW 0.3750 (3/8) | 3/8 | 1.000 | 2 1/2 | 1610-3750.1000 | ● | 1610-3750L1000 | ● | 1610-3750D1000 | ■ |

| SERIES 1610 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~50HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

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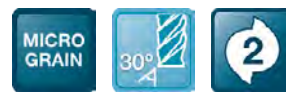
2 FLUTE

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|-------------------------|-----------------|-------|----|---------------|-------|---------------|-------|
| D +0.00mm -0.02mm | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.30 | 38 | 1610-0039.012 | ● | 1610-0039L012 | ■ |
| 0.15 | 3 | 0.45 | 38 | 1610-0059.018 | ● | 1610-0059L018 | ■ |
| 0.20 | 3 | 0.60 | 38 | 1610-0079.024 | ● | 1610-0079L024 | ■ |
| 0.25 | 3 | 0.75 | 38 | 1610-0098.029 | ● | 1610-0098L029 | ■ |
| 0.30 | 3 | 0.90 | 38 | 1610-0118.035 | ● | 1610-0118L035 | ■ |
| 0.35 | 3 | 1.05 | 38 | 1610-0138.041 | ● | 1610-0138L041 | ■ |
| 0.40 | 3 | 1.20 | 38 | 1610-0157.047 | ● | 1610-0157L047 | ■ |
| 0.45 | 3 | 1.35 | 38 | 1610-0177.053 | ● | 1610-0177L053 | ■ |
| 0.50 | 3 | 1.50 | 38 | 1610-0197.059 | ● | 1610-0197L059 | ■ |
| 0.60 | 3 | 1.80 | 38 | 1610-0236.071 | ● | 1610-0236L071 | ■ |
| 0.70 | 3 | 2.10 | 38 | 1610-0276.083 | ● | 1610-0276L083 | ■ |
| 0.80 | 3 | 2.40 | 38 | 1610-0315.095 | ● | 1610-0315L095 | ■ |
| 0.90 | 3 | 2.70 | 38 | 1610-0354.106 | ● | 1610-0354L106 | ■ |
| 1.00 | 3 | 3.00 | 38 | 1610-0394.118 | ● | 1610-0394L118 | ■ |
| 1.10 | 3 | 3.30 | 38 | 1610-0433.130 | ● | 1610-0433L130 | ■ |
| 1.20 | 3 | 3.60 | 38 | 1610-0472.142 | ● | 1610-0472L142 | ■ |
| 1.30 | 3 | 3.90 | 38 | 1610-0512.154 | ● | 1610-0512L154 | ■ |
| 1.40 | 3 | 4.20 | 38 | 1610-0551.165 | ● | 1610-0551L165 | ■ |
| 1.50 | 3 | 4.50 | 38 | 1610-0591.177 | ● | 1610-0591L177 | ■ |
| 1.60 | 3 | 4.80 | 38 | 1610-0630.189 | ● | 1610-0630L189 | ■ |
| 1.70 | 3 | 5.10 | 38 | 1610-0669.201 | ● | 1610-0669L201 | ■ |
| 1.80 | 3 | 5.40 | 38 | 1610-0709.213 | ● | 1610-0709L213 | ■ |
| 1.90 | 3 | 5.70 | 38 | 1610-0748.224 | ● | 1610-0748L224 | ■ |
| 2.00 | 3 | 6.00 | 38 | 1610-0787.236 | ● | 1610-0787L236 | ■ |
| 2.50 | 3 | 7.50 | 38 | 1610-0984.295 | ● | 1610-0984L295 | ■ |
| 2.80 | 3 | 9.00 | 38 | 1610-1102.354 | ● | 1610-1102L354 | ■ |
| 3.00 | 3 | 9.00 | 38 | 1610-1181.354 | ● | 1610-1181L354 | ■ |
| 3.50 | 4 | 10.50 | 50 | 1610-1378.413 | ● | 1610-1378L413 | ■ |
| 3.80 | 5 | 12.00 | 50 | 1610-1496.473 | ● | 1610-1496L473 | ■ |
| 4.00 | 5 | 12.00 | 50 | 1610-1575.473 | ● | 1610-1575L473 | ■ |
| 4.50 | 5 | 13.50 | 50 | 1610-1772.532 | ● | 1610-1772L532 | ■ |
| 4.80 | 5 | 15.00 | 50 | 1610-1890.590 | ● | 1610-1890L590 | ■ |
| 5.00 | 5 | 15.00 | 50 | 1610-1968.590 | ● | 1610-1968L590 | ■ |
| 5.50 | 6 | 16.50 | 50 | 1610-2165.650 | ● | 1610-2165L650 | ■ |
| 5.80 | 6 | 18.00 | 50 | 1610-2283.709 | ● | 1610-2283L709 | ■ |
| 6.00 | 6 | 18.00 | 50 | 1610-2362.709 | ● | 1610-2362L709 | ■ |

SERIES 1610 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

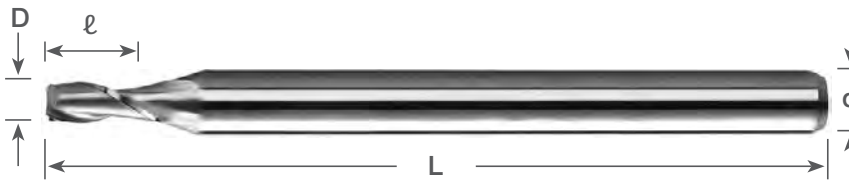
2 FLUTE

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0040" - 0.0270" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0040 | 1/8 | 0.006 | 1 1/2 | 1620-0040.006 | ● | 1620-0040L006 | ● | - | - |
| 0.0050 | 1/8 | 0.008 | 1 1/2 | 1620-0050.008 | ● | 1620-0050L008 | ● | - | - |
| 0.0060 | 1/8 | 0.009 | 1 1/2 | 1620-0060.009 | ● | 1620-0060L009 | ● | - | - |
| 0.0070 | 1/8 | 0.011 | 1 1/2 | 1620-0070.011 | ● | 1620-0070L011 | ● | - | - |
| 0.0080 | 1/8 | 0.012 | 1 1/2 | 1620-0080.012 | ● | 1620-0080L012 | ● | - | - |
| 0.0090 | 1/8 | 0.014 | 1 1/2 | 1620-0090.014 | ● | 1620-0090L014 | ● | - | - |
| 0.0100 | 1/8 | 0.015 | 1 1/2 | 1620-0100.015 | ● | 1620-0100L015 | ● | 1620-0100D015 | ■ |
| 0.0110 | 1/8 | 0.017 | 1 1/2 | 1620-0110.017 | ● | 1620-0110L017 | ● | - | - |
| 0.0120 | 1/8 | 0.018 | 1 1/2 | 1620-0120.018 | ● | 1620-0120L018 | ● | - | - |
| 0.0130 | 1/8 | 0.020 | 1 1/2 | 1620-0130.020 | ● | 1620-0130L020 | ● | - | - |
| 0.0140 | 1/8 | 0.021 | 1 1/2 | 1620-0140.021 | ● | 1620-0140L021 | ● | - | - |
| 0.0150 | 1/8 | 0.023 | 1 1/2 | 1620-0150.023 | ● | 1620-0150L023 | ● | 1620-0150D023 | ■ |
| 0.0156 (1/64) | 1/8 | 0.023 | 1 1/2 | 1620-0156.023 | ● | 1620-0156L023 | ● | 1620-0156D023 | ■ |
| 0.0160 | 1/8 | 0.024 | 1 1/2 | 1620-0160.024 | ● | 1620-0160L024 | ● | - | - |
| 0.0170 | 1/8 | 0.026 | 1 1/2 | 1620-0170.026 | ● | 1620-0170L026 | ● | - | - |
| 0.0180 | 1/8 | 0.027 | 1 1/2 | 1620-0180.027 | ● | 1620-0180L027 | ● | - | - |
| 0.0190 | 1/8 | 0.029 | 1 1/2 | 1620-0190.029 | ● | 1620-0190L029 | ● | - | - |
| 0.0200 | 1/8 | 0.030 | 1 1/2 | 1620-0200.030 | ● | 1620-0200L030 | ● | 1620-0200D030 | ■ |
| 0.0210 | 1/8 | 0.032 | 1 1/2 | 1620-0210.032 | ● | 1620-0210L032 | ● | - | - |
| 0.0220 | 1/8 | 0.033 | 1 1/2 | 1620-0220.033 | ● | 1620-0220L033 | ● | - | - |
| 0.0230 | 1/8 | 0.035 | 1 1/2 | 1620-0230.035 | ● | 1620-0230L035 | ● | - | - |
| 0.0240 | 1/8 | 0.036 | 1 1/2 | 1620-0240.036 | ● | 1620-0240L036 | ● | - | - |
| 0.0250 | 1/8 | 0.038 | 1 1/2 | 1620-0250.038 | ● | 1620-0250L038 | ● | 1620-0250D038 | ■ |
| 0.0260 | 1/8 | 0.039 | 1 1/2 | 1620-0260.039 | ● | 1620-0260L039 | ● | - | - |
| 0.0270 | 1/8 | 0.041 | 1 1/2 | 1620-0270.041 | ● | 1620-0270L041 | ● | - | - |

| SERIES 1620 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| Coating | P Steel ~20HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

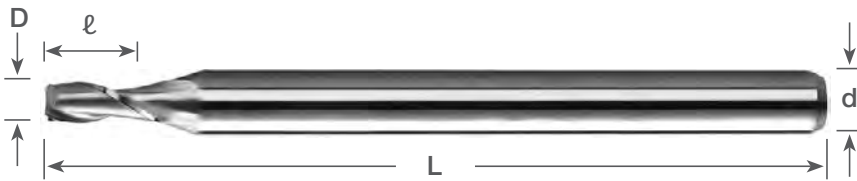
(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE

0.0280" - 0.0750" DIAMETER

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0280 | 1/8 | 0.042 | 1 1/2 | 1620-0280.042 | ● | 1620-0280L042 | ● | - | - |
| 0.0290 | 1/8 | 0.044 | 1 1/2 | 1620-0290.044 | ● | 1620-0290L044 | ● | - | - |
| 0.0300 | 1/8 | 0.045 | 1 1/2 | 1620-0300.045 | ● | 1620-0300L045 | ● | 1620-0300D045 | ■ |
| 0.0310 | 1/8 | 0.047 | 1 1/2 | 1620-0310.047 | ● | 1620-0310L047 | ● | - | - |
| 0.0312 (1/32) | 1/8 | 0.047 | 1 1/2 | 1620-0312.047 | ● | 1620-0312L047 | ● | - | - |
| 0.0320 | 1/8 | 0.048 | 1 1/2 | 1620-0320.048 | ● | 1620-0320L048 | ● | - | - |
| 0.0330 | 1/8 | 0.050 | 1 1/2 | 1620-0330.050 | ● | 1620-0330L050 | ● | - | - |
| 0.0340 | 1/8 | 0.051 | 1 1/2 | 1620-0340.051 | ● | 1620-0340L051 | ● | - | - |
| 0.0350 | 1/8 | 0.053 | 1 1/2 | 1620-0350.053 | ● | 1620-0350L053 | ● | 1620-0350D053 | ■ |
| NEW 0.0360 | 1/8 | 0.054 | 1 1/2 | 1620-0360.054 | ● | 1620-0360L054 | ● | - | - |
| NEW 0.0370 | 1/8 | 0.055 | 1 1/2 | 1620-0370.055 | ● | 1620-0370L055 | ● | - | - |
| NEW 0.0380 | 1/8 | 0.057 | 1 1/2 | 1620-0380.057 | ● | 1620-0380L057 | ● | - | - |
| NEW 0.0394 | 1/8 | 0.058 | 1 1/2 | 1620-0394.058 | ● | 1620-0394L058 | ● | 1620-0394D058 | ■ |
| 0.0400 | 1/8 | 0.060 | 1 1/2 | 1620-0400.060 | ● | 1620-0400L060 | ● | 1620-0400D060 | ■ |
| 0.0450 | 1/8 | 0.068 | 1 1/2 | 1620-0450.068 | ● | 1620-0450L068 | ● | 1620-0450D068 | ■ |
| 0.0469 (3/64) | 1/8 | 0.071 | 1 1/2 | 1620-0469.071 | ● | 1620-0469L071 | ● | 1620-0469D071 | ■ |
| 0.0470 | 1/8 | 0.071 | 1 1/2 | 1620-0470.071 | ● | 1620-0470L071 | ● | - | - |
| 0.0500 | 1/8 | 0.075 | 1 1/2 | 1620-0500.075 | ● | 1620-0500L075 | ● | 1620-0500D075 | ■ |
| NEW 0.0550 | 1/8 | 0.083 | 1 1/2 | 1620-0550.083 | ● | 1620-0550L083 | ● | - | - |
| 0.0550 | 1/8 | 0.129 | 1 1/2 | 1620-0550.129 | ● | 1620-0550L129 | ● | 1620-0550D129 | ■ |
| 0.0600 | 1/8 | 0.090 | 1 1/2 | 1620-0600.090 | ● | 1620-0600L090 | ● | 1620-0600D090 | ■ |
| 0.0625 (1/16) | 1/8 | 0.094 | 1 1/2 | 1620-0625.094 | ● | 1620-0625L094 | ● | 1620-0625D094 | ■ |
| 0.0650 | 1/8 | 0.098 | 1 1/2 | 1620-0650.098 | ● | 1620-0650L098 | ● | - | - |
| 0.0700 | 1/8 | 0.105 | 1 1/2 | 1620-0700.105 | ● | 1620-0700L105 | ● | 1620-0700D105 | ■ |
| 0.0750 | 1/8 | 0.113 | 1 1/2 | 1620-0750.113 | ● | 1620-0750L113 | ● | 1620-0750D113 | ■ |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

SERIES 1620 WORKPIECE MATERIAL

| Coating | P Steel -20HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

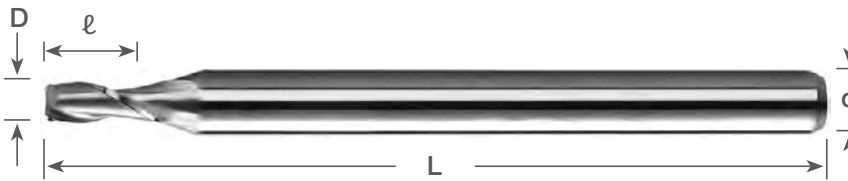
2 FLUTE

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0781" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 1620-0781.117 | ● | 1620-0781L117 | ● | 1620-0781D117 | ■ |
| 0.0800 | 1/8 | 0.120 | 1 1/2 | 1620-0800.120 | ● | 1620-0800L120 | ● | 1620-0800D120 | ■ |
| 0.0850 | 1/8 | 0.128 | 1 1/2 | 1620-0850.128 | ● | 1620-0850L128 | ● | 1620-0850D128 | ■ |
| 0.0900 | 1/8 | 0.135 | 1 1/2 | 1620-0900.135 | ● | 1620-0900L135 | ● | 1620-0900D135 | ■ |
| 0.0938 (3/32) | 1/8 | 0.141 | 1 1/2 | 1620-0938.141 | ● | 1620-0938L141 | ● | 1620-0938D141 | ■ |
| 0.0950 | 1/8 | 0.143 | 1 1/2 | 1620-0950.143 | ● | 1620-0950L143 | ● | 1620-0950D143 | ■ |
| 0.1000 | 1/8 | 0.150 | 1 1/2 | 1620-1000.150 | ● | 1620-1000L150 | ● | 1620-1000D150 | ■ |
| NEW 0.1050 | 1/8 | 0.158 | 1 1/2 | 1620-1050.158 | ● | 1620-1050L158 | ● | 1620-1050D158 | ■ |
| 0.1094 (7/64) | 1/8 | 0.164 | 1 1/2 | 1620-1094.164 | ● | 1620-1094L164 | ● | 1620-1094D164 | ■ |
| NEW 0.1100 | 1/8 | 0.165 | 1 1/2 | 1620-1100.165 | ● | 1620-1100L165 | ● | 1620-1100D165 | ■ |
| NEW 0.1150 | 1/8 | 0.173 | 1 1/2 | 1620-1150.173 | ● | 1620-1150L173 | ● | 1620-1150D173 | ■ |
| NEW 0.1181 | 1/8 | 0.355 | 1 1/2 | 1620-1181.178 | ● | 1620-1181L178 | ● | 1620-1181D178 | ■ |
| NEW 0.1200 | 1/8 | 0.180 | 1 1/2 | 1620-1200.180 | ● | 1620-1200L180 | ● | 1620-1200D180 | ■ |
| 0.1250 (1/8) | 1/8 | 0.188 | 1 1/2 | 1620-1250.188 | ● | 1620-1250L188 | ● | 1620-1250D188 | ■ |
| 0.1406 (9/64) | 3/16 | 0.313 | 2 | 1620-1406.313 | ● | 1620-1406L313 | ● | 1620-1406D313 | ■ |
| 0.1563 (5/32) | 3/16 | 0.313 | 2 | 1620-1563.313 | ● | 1620-1563L313 | ● | 1620-1563D313 | ■ |
| 0.1719 (11/64) | 3/16 | 0.375 | 2 | 1620-1719.375 | ● | 1620-1719L375 | ● | 1620-1719D375 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.312 | 2 | 1620-1875.312 | ● | 1620-1875L312 | ● | 1620-1875D312 | ■ |
| 0.1875 (3/16) | 3/16 | 0.375 | 2 | 1620-1875.375 | ● | 1620-1875L375 | ● | 1620-1875D375 | ■ |
| 0.2031 (13/64) | 1/4 | 0.438 | 2 1/2 | 1620-2031.438 | ● | 1620-2031L438 | ● | 1620-2031D438 | ■ |
| 0.2188 (7/32) | 1/4 | 0.438 | 2 1/2 | 1620-2188.438 | ● | 1620-2188L438 | ● | 1620-2188D438 | ■ |
| 0.2344 (15/64) | 1/4 | 0.500 | 2 1/2 | 1620-2344.500 | ● | 1620-2344L500 | ● | 1620-2344D500 | ■ |
| NEW 0.2500 (1/4) | 1/4 | 0.375 | 2 1/2 | 1620-2500.375 | ● | 1620-2500L375 | ● | 1620-2500D375 | ■ |
| 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | 1620-2500.500 | ● | 1620-2500L500 | ● | 1620-2500D500 | ■ |

| SERIES 1620 WORKPIECE MATERIAL | | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|---|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy | |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

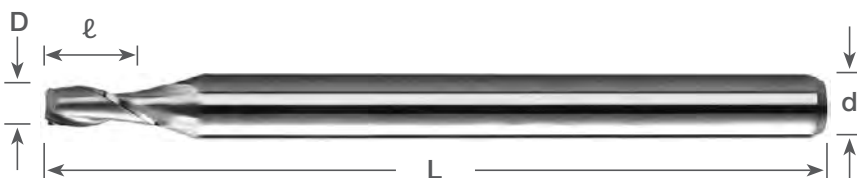
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(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STUB Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|------|----|---------------|-------|---------------|-------|
| D ^{+0.00mm} _{-0.02mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.15 | 38 | 1620-0039.006 | ● | 1620-0039L006 | ● |
| 0.15 | 3 | 0.23 | 38 | 1620-0059.009 | ● | 1620-0059L009 | ● |
| 0.20 | 3 | 0.30 | 38 | 1620-0079.012 | ● | 1620-0079L012 | ● |
| 0.25 | 3 | 0.38 | 38 | 1620-0098.015 | ● | 1620-0098L015 | ● |
| 0.30 | 3 | 0.45 | 38 | 1620-0118.018 | ● | 1620-0118L018 | ● |
| 0.35 | 3 | 0.53 | 38 | 1620-0138.021 | ● | 1620-0138L021 | ● |
| 0.40 | 3 | 0.60 | 38 | 1620-0157.024 | ● | 1620-0157L024 | ● |
| 0.45 | 3 | 0.68 | 38 | 1620-0177.027 | ● | 1620-0177L027 | ● |
| 0.50 | 3 | 0.75 | 38 | 1620-0197.030 | ● | 1620-0197L030 | ● |
| 0.60 | 3 | 0.90 | 38 | 1620-0236.035 | ● | 1620-0236L035 | ● |
| 0.70 | 3 | 1.05 | 38 | 1620-0276.041 | ● | 1620-0276L041 | ● |
| 0.80 | 3 | 1.20 | 38 | 1620-0315.047 | ● | 1620-0315L047 | ● |
| 0.90 | 3 | 1.35 | 38 | 1620-0354.053 | ● | 1620-0354L053 | ● |
| 1.00 | 3 | 1.50 | 38 | 1620-0394.059 | ● | 1620-0394L059 | ● |
| 1.10 | 3 | 1.65 | 38 | 1620-0433.065 | ● | 1620-0433L065 | ● |
| 1.20 | 3 | 1.80 | 38 | 1620-0472.071 | ● | 1620-0472L071 | ● |
| 1.30 | 3 | 2.60 | 38 | 1620-0512.102 | ● | 1620-0512L102 | ● |
| 1.40 | 3 | 2.80 | 38 | 1620-0551.110 | ● | 1620-0551L110 | ● |
| 1.50 | 3 | 2.25 | 38 | 1620-0591.089 | ● | 1620-0591L089 | ● |
| 1.60 | 3 | 3.20 | 38 | 1620-0630.126 | ● | 1620-0630L126 | ● |
| 1.70 | 3 | 3.70 | 38 | 1620-0669.146 | ● | 1620-0669L146 | ● |
| 1.80 | 3 | 3.60 | 38 | 1620-0709.142 | ● | 1620-0709L142 | ● |
| 1.90 | 3 | 3.80 | 38 | 1620-0748.150 | ● | 1620-0748L150 | ● |
| 2.00 | 3 | 3.00 | 38 | 1620-0787.118 | ● | 1620-0787L118 | ● |
| 2.50 | 3 | 3.75 | 38 | 1620-0984.148 | ● | 1620-0984L148 | ● |
| 2.80 | 3 | 4.50 | 38 | 1620-1102.177 | ● | 1620-1102L177 | ● |
| 3.00 | 3 | 4.50 | 38 | 1620-1181.177 | ● | 1620-1181L177 | ● |
| 3.50 | 4 | 5.25 | 50 | 1620-1378.207 | ● | 1620-1378L207 | ● |
| 3.80 | 5 | 6.00 | 50 | 1620-1496.236 | ● | 1620-1496L236 | ● |
| 4.00 | 5 | 6.00 | 50 | 1620-1575.236 | ● | 1620-1575L236 | ● |
| 4.50 | 5 | 6.75 | 50 | 1620-1772.266 | ● | 1620-1772L266 | ● |
| 4.80 | 5 | 7.50 | 50 | 1620-1890.295 | ● | 1620-1890L295 | ● |
| 5.00 | 5 | 7.50 | 50 | 1620-1968.295 | ● | 1620-1968L295 | ● |
| 5.50 | 6 | 8.25 | 50 | 1620-2165.325 | ● | 1620-2165L325 | ● |
| 5.80 | 6 | 9.00 | 50 | 1620-2283.354 | ● | 1620-2283L354 | ● |
| 6.00 | 6 | 9.00 | 50 | 1620-2362.354 | ● | 1620-2362L354 | ● |

SERIES 1620 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | | | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

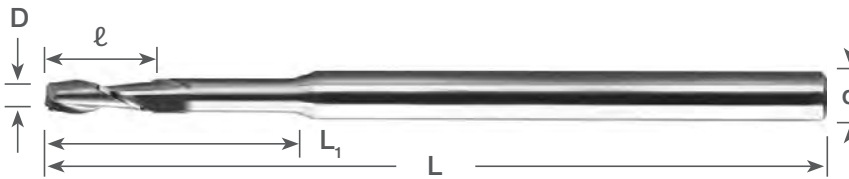
Symbol Descriptions Page 7

2 FLUTE

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

0.0100" - 0.0625" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 0.100 | 1640-0100.100 | ● | 1640-0100L100 | ● |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.150 | 1640-0150.128 | ● | 1640-0150L128 | ● |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.128 | 1640-0150.150 | ● | 1640-0150L150 | ● |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 0.120 | 1640-0156.120 | ● | 1640-0156L120 | ● |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.200 | 1640-0200.170 | ● | 1640-0200L170 | ● |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.170 | 1640-0200.200 | ● | 1640-0200L200 | ● |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.250 | 1640-0250.213 | ● | 1640-0250L213 | ● |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.213 | 1640-0250.250 | ● | 1640-0250L250 | ● |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.300 | 1640-0300.270 | ● | 1640-0300L270 | ● |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.270 | 1640-0300.300 | ● | 1640-0300L300 | ● |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 0.315 | 1640-0312.315 | ● | 1640-0312L315 | ● |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.315 | 1640-0350.315 | ● | 1640-0350L315 | ● |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.350 | 1640-0350.350 | ● | 1640-0350L350 | ● |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.360 | 1640-0400.360 | ● | 1640-0400L360 | ● |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.400 | 1640-0400.400 | ● | 1640-0400L400 | ● |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.405 | 1640-0450.405 | ● | 1640-0450L405 | ● |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.450 | 1640-0450.450 | ● | 1640-0450L450 | ● |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.390 | 1640-0469.390 | ● | 1640-0469L390 | ● |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.423 | 1640-0469.423 | ● | 1640-0469L423 | ● |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.500 | 1640-0500.500 | ● | 1640-0500L500 | ● |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.500 | 1640-0550.500 | ● | 1640-0550L500 | ● |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.500 | 1640-0600.500 | ● | 1640-0600L500 | ● |
| 0.0600 | 1/8 | 0.180 | 2 | 0.600 | 1640-0600.600 | ● | 1640-0600L600 | ● |
| 0.0625 (1/16) | 1/8 | 0.188 | 2 | 0.590 | 1640-0625.590 | ● | 1640-0625L590 | ● |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.590 | 1640-0625.590A | ● | 1640-0625L590A | ● |

| SERIES 1640 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

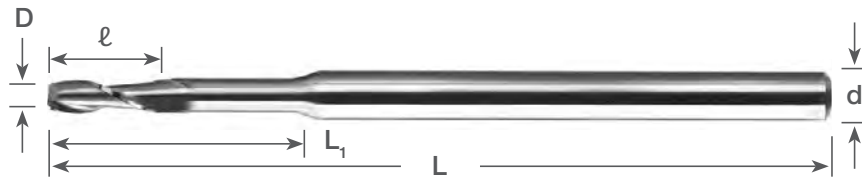
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(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE

0.0650" - 0.1250" DIAMETER

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.500 | 1640-0650.500 | ● | 1640-0650L500 | ● |
| 0.0650 | 1/8 | 0.195 | 2 | 0.600 | 1640-0650.600 | ● | 1640-0650L600 | ● |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.500 | 1640-0700.500 | ● | 1640-0700L500 | ● |
| 0.0700 | 1/8 | 0.210 | 2 | 0.700 | 1640-0700.700 | ● | 1640-0700L700 | ● |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.500 | 1640-0750.500 | ● | 1640-0750L500 | ● |
| 0.0750 | 1/8 | 0.225 | 2 | 0.700 | 1640-0750.700 | ● | 1640-0750L700 | ● |
| 0.0781 (5/64) | 1/8 | 0.234 | 2 | 0.590 | 1640-0781.590 | ● | 1640-0781L590 | ● |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.590 | 1640-0781.590A | ● | 1640-0781L590A | ● |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.500 | 1640-0800.500 | ● | 1640-0800L500 | ● |
| 0.0800 | 1/8 | 0.240 | 2 | 0.750 | 1640-0800.750 | ● | 1640-0800L750 | ● |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.500 | 1640-0850.500 | ● | 1640-0850L500 | ● |
| 0.0850 | 1/8 | 0.255 | 2 | 0.750 | 1640-0850.750 | ● | 1640-0850L750 | ● |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.625 | 1640-0900.625 | ● | 1640-0900L625 | ● |
| 0.0900 | 1/8 | 0.270 | 2 | 0.750 | 1640-0900.750 | ● | 1640-0900L750 | ● |
| 0.0938 (3/32) | 1/8 | 0.281 | 2 | 0.590 | 1640-0938.590 | ● | 1640-0938L590 | ● |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.625 | 1640-0938.625 | ● | 1640-0938L625 | ● |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.625 | 1640-0950.625 | ● | 1640-0950L625 | ● |
| 0.0950 | 1/8 | 0.285 | 2 | 0.750 | 1640-0950.750 | ● | 1640-0950L750 | ● |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.625 | 1640-1000.625 | ● | 1640-1000L625 | ● |
| 0.1000 | 1/8 | 0.300 | 2 | 0.750 | 1640-1000.750 | ● | 1640-1000L750 | ● |
| 0.1094 (7/64) | 1/8 | 0.328 | 2 | 0.590 | 1640-1094.590 | ● | 1640-1094L590 | ● |
| 0.1100 | 1/8 | 0.330 | 2 | 0.750 | 1640-1100.750 | ● | 1640-1100L750 | ● |
| 0.1250 (1/8) | 1/8 | 0.375 | 2 | 0.590 | 1640-1250.590 | ● | 1640-1250L590 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

SERIES 1640 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

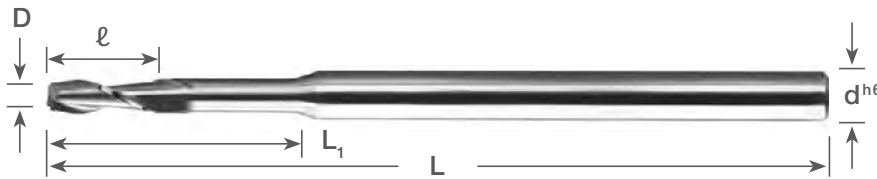
Symbol Descriptions Page 7

2 FLUTE

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



MICRO GRAIN

30°

2

Symbol Descriptions [Page 7](#)

EXTENDED Reach (Metric Sizes)

| D <small>+0.000 -0.001</small> | Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---------------------------------------|-----------------|-------|----|----------------|----------------|-------|----------------|-------|
| | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1.20 | 38 | 3 | 1640-0157.118 | ● | 1640-0157L118 | ● |
| 0.50 | 3 | 1.50 | 38 | 4 | 1640-0197.157 | ● | 1640-0197L157 | ● |
| 0.60 | 3 | 1.80 | 38 | 5 | 1640-0236.197 | ● | 1640-0236L197 | ● |
| 0.65 | 3 | 1.95 | 38 | 6 | 1640-0256.236 | ● | 1640-0256L236 | ● |
| 0.70 | 3 | 2.10 | 38 | 7 | 1640-0276.276 | ● | 1640-0276L276 | ● |
| 0.75 | 3 | 2.25 | 38 | 8 | 1640-0295.315 | ● | 1640-0295L315 | ● |
| 0.80 | 3 | 2.40 | 50 | 9 | 1640-0315.354 | ● | 1640-0315L354 | ● |
| 0.90 | 3 | 2.70 | 50 | 10 | 1640-0354.394 | ● | 1640-0354L394 | ● |
| 1.00 | 3 | 3.00 | 50 | 10 | 1640-0394.394 | ● | 1640-0394L394 | ● |
| 1.50 | 3 | 4.50 | 50 | 15 | 1640-0591.591 | ● | 1640-0591L591 | ● |
| 2.00 | 3 | 6.00 | 50 | 20 | 1640-0787.787 | ● | 1640-0787L787 | ● |
| 2.50 | 3 | 7.50 | 50 | 23 | 1640-0984.906 | ● | 1640-0984L906 | ● |
| 3.00 | 3 | 9.00 | 50 | 23 | 1640-1181.906 | ● | 1640-1181L906 | ● |
| 3.50 | 6 | 10.50 | 75 | 25 | 1640-1378.984 | ● | 1640-1378L984 | ● |
| 4.00 | 6 | 12.00 | 75 | 25 | 1640-1575.984 | ● | 1640-1575L984 | ● |
| 4.50 | 6 | 13.50 | 75 | 30 | 1640-1772.1181 | ● | 1640-1772L1181 | ● |
| 5.00 | 6 | 15.00 | 75 | 30 | 1640-1968.1181 | ● | 1640-1968L1181 | ● |
| 5.50 | 6 | 16.50 | 75 | 30 | 1640-2165.1181 | ● | 1640-2165L1181 | ● |
| 6.00 | 6 | 18.00 | 75 | 30 | 1640-2362.1181 | ● | 1640-2362L1181 | ● |

| SERIES 1640 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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TITAN-AX™

0.0312" - 0.2500" DIAMETER
1.00mm - 8.00mm DIAMETER

Variable Helix

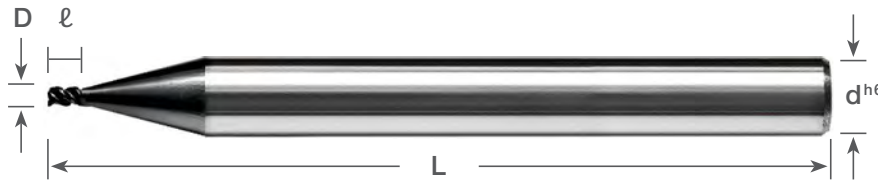
AX High Performance Coating

Increased Shank Diameter for Maximum Rigidity

Sub Micron Grain Carbide

REINFORCED SHANK
TOUGH MACHINING APPLICATIONS

Also Available in Corner Radius Styles [Page 137-139](#)



Symbol Descriptions [Page 7](#)

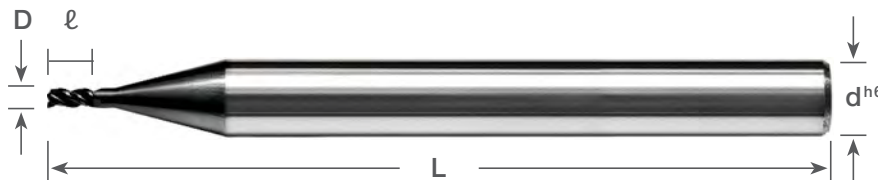
STUB Length

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | AX Coating | |
|-----------------|-----|-------|-------|-------------|-------|
| D | d | ℓ | L | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.063 | 2 1/2 | T0312O063 | ● |
| 0.0469 (3/64) | 1/4 | 0.094 | 2 1/2 | T0469O094 | ● |
| 0.0625 (1/16) | 1/4 | 0.140 | 2 1/2 | T0625O140 | ● |
| 0.0781 (5/64) | 1/4 | 0.140 | 2 1/2 | T0781O140 | ● |
| 0.0938 (3/32) | 1/4 | 0.188 | 2 1/2 | T0938O188 | ● |
| 0.1094 (7/64) | 1/4 | 0.188 | 2 1/2 | T1094O188 | ● |
| 0.1250 (1/8) | 1/4 | 0.250 | 2 1/2 | T1250O250 | ● |
| 0.1562 (5/32) | 1/4 | 0.375 | 2 1/2 | T1562O375 | ● |
| 0.1875 (3/16) | 1/4 | 0.375 | 2 1/2 | T1875O375 | ● |
| 0.2188 (7/32) | 1/4 | 0.375 | 2 1/2 | T2188O375 | ● |
| 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | T2500O500 | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | AX Coating | |
|-----------------|---|------|------|-------------|-------|
| D | d | ℓ | L | Part Number | Stock |
| 1.00 | 6 | 1.5 | 63.5 | T0394O059 | ● |
| 1.50 | 6 | 2.5 | 63.5 | T0591O098 | ● |
| 2.00 | 6 | 3.0 | 63.5 | T0787O118 | ● |
| 2.50 | 6 | 4.0 | 63.5 | T0984O157 | ● |
| 3.00 | 6 | 5.0 | 63.5 | T1181O197 | ● |
| 4.00 | 6 | 6.0 | 63.5 | T1575O236 | ● |
| 5.00 | 6 | 8.0 | 63.5 | T1969O315 | ● |
| 6.00 | 6 | 9.0 | 63.5 | T2362O354 | ● |
| 8.00 | 8 | 12.0 | 63.5 | T3150O472 | ● |



Symbol Descriptions [Page 7](#)

STANDARD Length

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | AX Coating | |
|-----------------|-----|-------|-------|-------------|-------|
| D | d | ℓ | L | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.094 | 2 1/2 | T0312O094 | ● |
| 0.0469 (3/64) | 1/4 | 0.141 | 2 1/2 | T0469O141 | ● |
| 0.0625 (1/16) | 1/4 | 0.188 | 2 1/2 | T0625O188 | ● |
| 0.0781 (5/64) | 1/4 | 0.234 | 2 1/2 | T0781O234 | ● |
| 0.0938 (3/32) | 1/4 | 0.375 | 2 1/2 | T0938O375 | ● |
| 0.1094 (7/64) | 1/4 | 0.438 | 2 1/2 | T1094O438 | ● |
| 0.1250 (1/8) | 1/4 | 0.500 | 2 1/2 | T1250O500 | ● |
| 0.1562 (5/32) | 1/4 | 0.563 | 2 1/2 | T1562O563 | ● |
| 0.1875 (3/16) | 1/4 | 0.625 | 2 1/2 | T1875O625 | ● |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | T2188O625 | ● |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | T2500O750 | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | AX Coating | |
|-----------------|---|------|------|-------------|-------|
| D | d | ℓ | L | Part Number | Stock |
| 1.00 | 6 | 3.0 | 63.5 | T0394O118 | ● |
| 1.50 | 6 | 4.5 | 63.5 | T0591O177 | ● |
| 2.00 | 6 | 6.0 | 63.5 | T0787O236 | ● |
| 2.50 | 6 | 7.5 | 63.5 | T0984O295 | ● |
| 3.00 | 6 | 9.0 | 63.5 | T1181O354 | ● |
| 4.00 | 6 | 12.0 | 63.5 | T1575O472 | ● |
| 5.00 | 6 | 15.0 | 63.5 | T1969O591 | ● |
| 6.00 | 6 | 18.0 | 63.5 | T2362O709 | ● |
| 8.00 | 8 | 24.0 | 63.5 | T3150O945 | ● |

| TITAN-AX / TITAN-AXM WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|---|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~30HRC | Steel 30~40HRC | Hardened Steel ~58HRC | Hardened Steel ~68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

TITAN-AX™

REINFORCED SHANK
LONG REACH REDUCED NECK
TOUGH MACHINING APPLICATIONS

Also Available in Corner Radius Styles [Page 137-139](#)

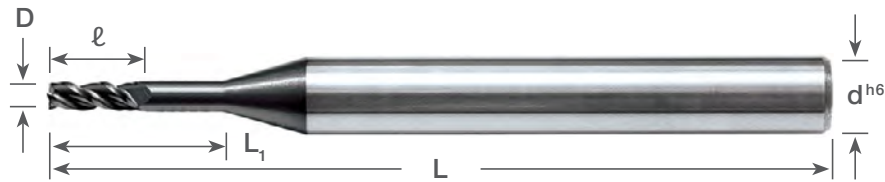
0.0312" - 0.2500" DIAMETER
1.00mm - 8.00mm DIAMETER

Variable Helix

AX High Performance Coating

Increased Shank Diameter for Maximum Rigidity

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

Extended Reach

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | | AX Coating | |
|--------------------------------|-----|-------|-------|----------------|-------------|-------|
| D ^{+0.000 -0.001} | d | ℓ | L | L ₁ | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.063 | 2 1/2 | 0.155 | T0312O063ER | ● |
| 0.0469 (3/64) | 1/4 | 0.094 | 2 1/2 | 0.230 | T0469O094ER | ● |
| 0.0625 (1/16) | 1/4 | 0.140 | 2 1/2 | 0.312 | T0625O140ER | ● |
| 0.0781 (5/64) | 1/4 | 0.140 | 2 1/2 | 0.390 | T0781O140ER | ● |
| 0.0938 (3/32) | 1/4 | 0.188 | 2 1/2 | 0.465 | T0938O188ER | ● |
| 0.1094 (7/64) | 1/4 | 0.188 | 2 1/2 | 0.545 | T1094O188ER | ● |
| 0.1250 (1/8) | 1/4 | 0.250 | 2 1/2 | 0.625 | T1250O250ER | ● |
| 0.1562 (5/32) | 1/4 | 0.375 | 2 1/2 | 0.781 | T1562O375ER | ● |
| 0.1875 (3/16) | 1/4 | 0.375 | 2 1/2 | 0.938 | T1875O375ER | ● |
| 0.2188 (7/32) | 1/4 | 0.375 | 2 1/2 | 1.093 | T2188O375ER | ● |
| 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | 1.250 | T2500O500ER | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | | AX Coating | |
|----------------------------------|-----------------|------|-----|----------------|-------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock |
| 1.00 | 6 | 3.0 | 75 | 10 | T0394O118ER | ● |
| 1.50 | 6 | 4.5 | 75 | 15 | T0591O177ER | ● |
| 2.00 | 6 | 6.0 | 75 | 20 | T0787O236ER | ● |
| 2.50 | 6 | 7.5 | 75 | 25 | T0984O295ER | ● |
| 3.00 | 6 | 9.0 | 75 | 30 | T1181O354ER | ● |
| 4.00 | 6 | 12.0 | 75 | 30 | T1575O472ER | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | T1969O591ER | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | T2362O709ER | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | T3150O945ER | ● |

| TITAN-AX / TITAN-AXM WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|---|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

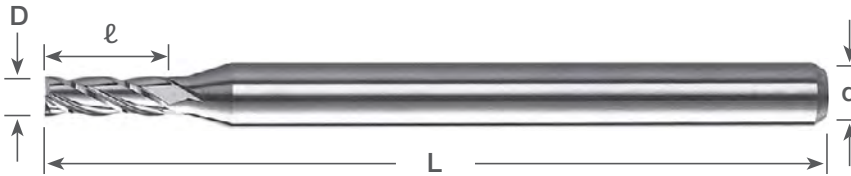
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3 FLUTE

0.0100" - 0.0500" DIAMETER

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0100 | 1/8 | 0.050 | 2 1/2 | 1710-0100.050 | ● | 1710-0100L050 | ● | 1710-0100D050 | ■ |
| NEW 0.0100 | 1/8 | 0.080 | 2 1/2 | 1710-0100.080 | ● | 1710-0100L080 | ● | 1710-0100D080 | ■ |
| 0.0150 | 1/8 | 0.075 | 2 1/2 | 1710-0150.075 | ● | 1710-0150L075 | ● | 1710-0150D075 | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.078 | 2 1/2 | 1710-0156.078 | ● | 1710-0156L078 | ● | 1710-0156D078 | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.125 | 2 1/2 | 1710-0156.125 | ● | 1710-0156L125 | ● | 1710-0156D125 | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.187 | 2 1/2 | 1710-0156.187 | ● | 1710-0156L187 | ● | 1710-0156D187 | ■ |
| 0.0200 | 1/8 | 0.100 | 2 1/2 | 1710-0200.100 | ● | 1710-0200L100 | ● | 1710-0200D100 | ■ |
| NEW 0.0200 | 1/8 | 0.160 | 2 1/2 | 1710-0200.160 | ● | 1710-0200L160 | ● | 1710-0200D160 | ■ |
| NEW 0.0200 | 1/8 | 0.250 | 2 1/2 | 1710-0200.250 | ● | 1710-0200L250 | ● | 1710-0200D250 | ■ |
| 0.0250 | 1/8 | 0.125 | 2 1/2 | 1710-0250.125 | ● | 1710-0250L125 | ● | 1710-0250D125 | ■ |
| NEW 0.0250 | 1/8 | 0.203 | 2 1/2 | 1710-0250.203 | ● | 1710-0250L203 | ● | 1710-0250D203 | ■ |
| 0.0300 | 1/8 | 0.150 | 2 1/2 | 1710-0300.150 | ● | 1710-0300L150 | ● | 1710-0300D150 | ■ |
| NEW 0.0300 | 1/8 | 0.250 | 2 1/2 | 1710-0300.250 | ● | 1710-0300L250 | ● | 1710-0300D250 | ■ |
| NEW 0.0300 | 1/8 | 0.375 | 2 1/2 | 1710-0300.375 | ● | 1710-0300L375 | ● | 1710-0300D375 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.156 | 2 1/2 | 1710-0312.156 | ● | 1710-0312L156 | ● | 1710-0312D156 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.250 | 2 1/2 | 1710-0312.250 | ● | 1710-0312L250 | ● | 1710-0312D250 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.375 | 2 1/2 | 1710-0312.375 | ● | 1710-0312L375 | ● | 1710-0312D375 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.470 | 2 1/2 | 1710-0312.470 | ● | 1710-0312L470 | ● | 1710-0312D470 | ■ |
| 0.0350 | 1/8 | 0.175 | 2 1/2 | 1710-0350.175 | ● | 1710-0350L175 | ● | 1710-0350D175 | ■ |
| NEW 0.0350 | 1/8 | 0.280 | 2 1/2 | 1710-0350.280 | ● | 1710-0350L280 | ● | 1710-0350D280 | ■ |
| 0.0400 | 1/8 | 0.200 | 2 1/2 | 1710-0400.200 | ● | 1710-0400L200 | ● | 1710-0400D200 | ■ |
| NEW 0.0400 | 1/8 | 0.325 | 2 1/2 | 1710-0400.325 | ● | 1710-0400L325 | ● | 1710-0400D325 | ■ |
| NEW 0.0400 | 1/8 | 0.480 | 2 1/2 | 1710-0400.480 | ● | 1710-0400L480 | ● | 1710-0400D480 | ■ |
| 0.0450 | 1/8 | 0.225 | 2 1/2 | 1710-0450.225 | ● | 1710-0450L225 | ● | 1710-0450D225 | ■ |
| NEW 0.0450 | 1/8 | 0.375 | 2 1/2 | 1710-0450.375 | ● | 1710-0450L375 | ● | 1710-0450D375 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.250 | 2 1/2 | 1710-0469.250 | ● | 1710-0469L250 | ● | 1710-0469D250 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.375 | 2 1/2 | 1710-0469.375 | ● | 1710-0469L375 | ● | 1710-0469D375 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.570 | 2 1/2 | 1710-0469.570 | ● | 1710-0469L570 | ● | 1710-0469D570 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.710 | 2 1/2 | 1710-0469.710 | ● | 1710-0469L710 | ● | 1710-0469D710 | ■ |
| 0.0500 | 1/8 | 0.300 | 2 1/2 | 1710-0500.300 | ● | 1710-0500L300 | ● | 1710-0500D300 | ■ |
| NEW 0.0500 | 1/8 | 0.400 | 2 1/2 | 1710-0500.400 | ● | 1710-0500L400 | ● | 1710-0500D400 | ■ |
| NEW 0.0500 | 1/8 | 0.600 | 2 1/2 | 1710-0500.600 | ● | 1710-0500L600 | ● | 1710-0500D600 | ■ |

SERIES 1710 WORKPIECE MATERIAL

| Coating | P Steel ~20HRC | P Steel 30~40HRC | H Hardened Steel ~50HRC | H Hardened Steel ~55HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

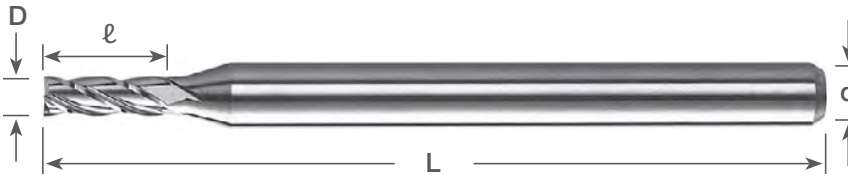
3 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0550" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0550 | 1/8 | 0.275 | 2 1/2 | 1710-0550.275 | ● | 1710-0550L275 | ● | 1710-0550D275 | ■ |
| 0.0550 | 1/8 | 0.385 | 2 1/2 | 1710-0550.385 | ● | 1710-0550L385 | ● | 1710-0550D385 | ■ |
| NEW 0.0600 | 1/8 | 0.312 | 2 1/2 | 1710-0600.312 | ● | 1710-0600L312 | ● | 1710-0600D312 | ■ |
| 0.0600 | 1/8 | 0.500 | 2 1/2 | 1710-0600.500 | ● | 1710-0600L500 | ● | 1710-0600D500 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.312 | 2 1/2 | 1710-0625.312 | ● | 1710-0625L312 | ● | 1710-0625D312 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.500 | 2 1/2 | 1710-0625.500 | ● | 1710-0625L500 | ● | 1710-0625D500 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.750 | 2 1/2 | 1710-0625.750 | ● | 1710-0625L750 | ● | 1710-0625D750 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.950 | 2 1/2 | 1710-0625.950 | ● | 1710-0625L950 | ● | 1710-0625D950 | ■ |
| 0.0650 | 1/8 | 0.500 | 2 1/2 | 1710-0650.500 | ● | 1710-0650L500 | ● | 1710-0650D500 | ■ |
| NEW 0.0700 | 1/8 | 0.375 | 2 1/2 | 1710-0700.375 | ● | 1710-0700L375 | ● | 1710-0700D375 | ■ |
| 0.0700 | 1/8 | 0.500 | 2 1/2 | 1710-0700.500 | ● | 1710-0700L500 | ● | 1710-0700D500 | ■ |
| NEW 0.0750 | 1/8 | 0.375 | 2 1/2 | 1710-0750.375 | ● | 1710-0750L375 | ● | 1710-0750D375 | ■ |
| 0.0750 | 1/8 | 0.500 | 2 1/2 | 1710-0750.500 | ● | 1710-0750L500 | ● | 1710-0750D500 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.406 | 2 1/2 | 1710-0781.406 | ● | 1710-0781L406 | ● | 1710-0781D406 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.625 | 2 1/2 | 1710-0781.625 | ● | 1710-0781L625 | ● | 1710-0781D625 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.940 | 2 1/2 | 1710-0781.940 | ● | 1710-0781L940 | ● | 1710-0781D940 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 1.187 | 2 1/2 | 1710-0781.1187 | ● | 1710-0781L1187 | ● | 1710-0781D1187 | ■ |
| NEW 0.0800 | 1/8 | 0.406 | 2 1/2 | 1710-0800.406 | ● | 1710-0800L406 | ● | 1710-0800D406 | ■ |
| 0.0800 | 1/8 | 0.750 | 2 1/2 | 1710-0800.750 | ● | 1710-0800L750 | ● | 1710-0800D750 | ■ |
| NEW 0.0850 | 1/8 | 0.425 | 2 1/2 | 1710-0850.425 | ● | 1710-0850L425 | ● | 1710-0850D425 | ■ |
| 0.0850 | 1/8 | 0.750 | 2 1/2 | 1710-0850.750 | ● | 1710-0850L750 | ● | 1710-0850D750 | ■ |
| NEW 0.0900 | 1/8 | 0.450 | 2 1/2 | 1710-0900.450 | ● | 1710-0900L450 | ● | 1710-0900D450 | ■ |
| 0.0900 | 1/8 | 0.750 | 2 1/2 | 1710-0900.750 | ● | 1710-0900L750 | ● | 1710-0900D750 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.500 | 2 1/2 | 1710-0938.500 | ● | 1710-0938L500 | ● | 1710-0938D500 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.750 | 2 1/2 | 1710-0938.750 | ● | 1710-0938L750 | ● | 1710-0938D750 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 1.125 | 2 1/2 | 1710-0938.1125 | ● | 1710-0938L1125 | ● | 1710-0938D1125 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 1.400 | 3 | 1710-0938.1400 | ● | 1710-0938L1400 | ● | 1710-0938D1400 | ■ |
| 0.0950 | 1/8 | 0.750 | 2 1/2 | 1710-0950.750 | ● | 1710-0950L750 | ● | 1710-0950D750 | ■ |
| NEW 0.1000 | 1/8 | 0.500 | 2 1/2 | 1710-1000.500 | ● | 1710-1000L500 | ● | 1710-1000D500 | ■ |
| 0.1000 | 1/8 | 0.750 | 2 1/2 | 1710-1000.750 | ● | 1710-1000L750 | ● | 1710-1000D750 | ■ |
| NEW 0.1250 (1/8) | 1/8 | 0.625 | 2 1/2 | 1710-1250.625 | ● | 1710-1250L625 | ● | 1710-1250D625 | ■ |
| NEW 0.1250 (1/8) | 1/8 | 1.000 | 2 1/2 | 1710-1250.1000 | ● | 1710-1250L1000 | ● | 1710-1250D1000 | ■ |
| NEW 0.1250 (1/8) | 1/8 | 1.500 | 3 | 1710-1250.1500 | ● | 1710-1250L1500 | ● | 1710-1250D1500 | ■ |
| NEW 0.1250 (1/8) | 1/8 | 1.875 | 3 | 1710-1250.1875 | ● | 1710-1250L1875 | ● | 1710-1250D1875 | ■ |

| SERIES 1710 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

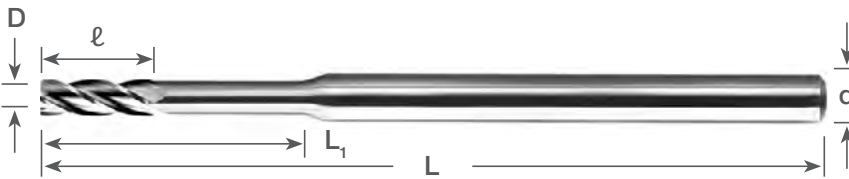
(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

3 FLUTE

0.0100" - 0.0550" DIAMETER

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| NEW | Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----|---|-----|-------|-------|----------------|---------------|-------|---------------|-------|-----------------|-------|
| | D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW | 0.0100 | 1/8 | 0.050 | 2-1/2 | 0.100 | 1740-0100.100 | ● | 1740-0100L100 | ● | 1740-0100D100 | ■ |
| | 0.0150 | 1/8 | 0.022 | 2 1/2 | 0.078 | 1740-0150.078 | ● | 1740-0150L078 | ● | 1740-0150D078 | ■ |
| | 0.0150 | 1/8 | 0.022 | 2 1/2 | 0.125 | 1740-0150.125 | ● | 1740-0150L125 | ● | 1740-0150D125 | ■ |
| | 0.0150 | 1/8 | 0.075 | 2 1/2 | 0.150 | 1740-0150.150 | ● | 1740-0150L150 | ● | 1740-0150D150 | ■ |
| NEW | 0.0156 (1/64) | 1/8 | 0.075 | 2 1/2 | 0.150 | 1740-0156.150 | ● | 1740-0156L150 | ● | 1740-0156D150 | ■ |
| | 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.100 | 1740-0200.100 | ● | 1740-0200L100 | ● | 1740-0200D100 | ■ |
| | 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.160 | 1740-0200.160 | ● | 1740-0200L160 | ● | 1740-0200D160 | ■ |
| | 0.0200 | 1/8 | 0.100 | 2 1/2 | 0.200 | 1740-0200.200 | ● | 1740-0200L200 | ● | 1740-0200D200 | ■ |
| | 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.125 | 1740-0250.125 | ● | 1740-0250L125 | ● | 1740-0250D125 | ■ |
| | 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.200 | 1740-0250.200 | ● | 1740-0250L200 | ● | 1740-0250D200 | ■ |
| | 0.0250 | 1/8 | 0.125 | 2 1/2 | 0.250 | 1740-0250.250 | ● | 1740-0250L250 | ● | 1740-0250D250 | ■ |
| | 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.156 | 1740-0300.156 | ● | 1740-0300L156 | ● | 1740-0300D156 | ■ |
| | 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.250 | 1740-0300.250 | ● | 1740-0300L250 | ● | 1740-0300D250 | ■ |
| | 0.0300 | 1/8 | 0.150 | 2 1/2 | 0.300 | 1740-0300.300 | ● | 1740-0300L300 | ● | 1740-0300D300 | ■ |
| NEW | 0.0312 (1/32) | 1/8 | 0.155 | 2 1/2 | 0.310 | 1740-0312.310 | ● | 1740-0312L310 | ● | 1740-0312D310 | ■ |
| | 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.187 | 1740-0350.187 | ● | 1740-0350L187 | ● | 1740-0350D187 | ■ |
| | 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.280 | 1740-0350.280 | ● | 1740-0350L280 | ● | 1740-0350D280 | ■ |
| | 0.0350 | 1/8 | 0.175 | 2 1/2 | 0.350 | 1740-0350.350 | ● | 1740-0350L350 | ● | 1740-0350D350 | ■ |
| | 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.200 | 1740-0400.200 | ● | 1740-0400L200 | ● | 1740-0400D200 | ■ |
| | 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.325 | 1740-0400.325 | ● | 1740-0400L325 | ● | 1740-0400D325 | ■ |
| | 0.0400 | 1/8 | 0.200 | 2 1/2 | 0.400 | 1740-0400.400 | ● | 1740-0400L400 | ● | 1740-0400D400 | ■ |
| | 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.225 | 1740-0450.225 | ● | 1740-0450L225 | ● | 1740-0450D225 | ■ |
| | 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.375 | 1740-0450.375 | ● | 1740-0450L375 | ● | 1740-0450D375 | ■ |
| | 0.0450 | 1/8 | 0.225 | 2 1/2 | 0.450 | 1740-0450.450 | ● | 1740-0450L450 | ● | 1740-0450D450 | ■ |
| NEW | 0.0469 (3/64) | 1/8 | 0.250 | 2 1/2 | 0.500 | 1740-0469.500 | ● | 1740-0469L500 | ● | 1740-0469D500 | ■ |
| | 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.250 | 1740-0500.250 | ● | 1740-0500L250 | ● | 1740-0500D250 | ■ |
| | 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.400 | 1740-0500.400 | ● | 1740-0500L400 | ● | 1740-0500D400 | ■ |
| | 0.0500 | 1/8 | 0.300 | 2 1/2 | 0.600 | 1740-0500.600 | ● | 1740-0500L600 | ● | 1740-0500D600 | ■ |
| | 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.275 | 1740-0550.275 | ● | 1740-0550L275 | ● | 1740-0550D275 | ■ |
| | 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.450 | 1740-0550.450 | ● | 1740-0550L450 | ● | 1740-0550D450 | ■ |
| | 0.0550 | 1/8 | 0.385 | 2 1/2 | 0.770 | 1740-0550.770 | ● | 1740-0550L770 | ● | 1740-0550D770 | ■ |

| SERIES 1740 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~50HRC | Hardened Steel ~55HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

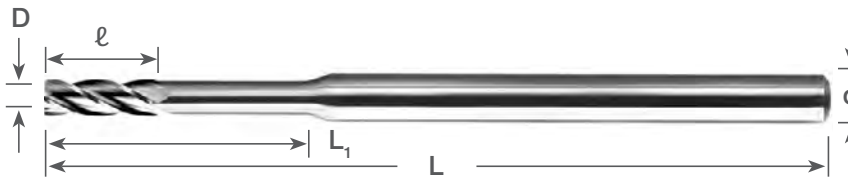
3 FLUTE

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

0.0600" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|----------------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.300 | 1740-0600.300 | ● | 1740-0600L300 | ● | 1740-0600D300 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.500 | 1740-0600.500 | ● | 1740-0600L500 | ● | 1740-0600D500 | ■ |
| 0.0600 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0600.1000 | ● | 1740-0600L1000 | ● | 1740-0600D1000 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0625.1000 | ● | 1740-0625L1000 | ● | 1740-0625D1000 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.325 | 1740-0650.325 | ● | 1740-0650L325 | ● | 1740-0650D325 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.530 | 1740-0650.530 | ● | 1740-0650L530 | ● | 1740-0650D530 | ■ |
| 0.0650 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0650.1000 | ● | 1740-0650L1000 | ● | 1740-0650D1000 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.375 | 1740-0700.375 | ● | 1740-0700L375 | ● | 1740-0700D375 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.570 | 1740-0700.570 | ● | 1740-0700L570 | ● | 1740-0700D570 | ■ |
| 0.0700 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0700.1000 | ● | 1740-0700L1000 | ● | 1740-0700D1000 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.375 | 1740-0750.375 | ● | 1740-0750L375 | ● | 1740-0750D375 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.625 | 1740-0750.625 | ● | 1740-0750L625 | ● | 1740-0750D625 | ■ |
| 0.0750 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0750.1000 | ● | 1740-0750L1000 | ● | 1740-0750D1000 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.500 | 2 1/2 | 1.000 | 1740-0781.1000 | ● | 1740-0781L1000 | ● | 1740-0781D1000 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.400 | 1740-0800.400 | ● | 1740-0800L400 | ● | 1740-0800D400 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.650 | 1740-0800.650 | ● | 1740-0800L650 | ● | 1740-0800D650 | ■ |
| 0.0800 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-0800.1250 | ● | 1740-0800L1250 | ● | 1740-0800D1250 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.425 | 1740-0850.425 | ● | 1740-0850L425 | ● | 1740-0850D425 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.700 | 1740-0850.700 | ● | 1740-0850L700 | ● | 1740-0850D700 | ■ |
| 0.0850 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-0850.1250 | ● | 1740-0850L1250 | ● | 1740-0850D1250 | ■ |
| 0.0900 | 1/8 | 0.135 | 2 1/2 | 0.450 | 1740-0900.450 | ● | 1740-0900L450 | ● | 1740-0900D450 | ■ |
| 0.0900 | 1/8 | 0.135 | 2 1/2 | 0.750 | 1740-0900.750 | ● | 1740-0900L750 | ● | 1740-0900D750 | ■ |
| 0.0900 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-0900.1250 | ● | 1740-0900L1250 | ● | 1740-0900D1250 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-0938.1250 | ● | 1740-0938L1250 | ● | 1740-0938D1250 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.500 | 1740-0950.500 | ● | 1740-0950L500 | ● | 1740-0950D500 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.750 | 1740-0950.750 | ● | 1740-0950L750 | ● | 1740-0950D750 | ■ |
| 0.0950 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-0950.1250 | ● | 1740-0950L1250 | ● | 1740-0950D1250 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.500 | 1740-1000.500 | ● | 1740-1000L500 | ● | 1740-1000D500 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.800 | 1740-1000.800 | ● | 1740-1000L800 | ● | 1740-1000D800 | ■ |
| 0.1000 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1740-1000.1250 | ● | 1740-1000L1250 | ● | 1740-1000D1250 | ■ |
| NEW 0.1250 (1/8) | 1/8 | 1.000 | 2 1/2 | 1.500 | 1740-1250.1500 | ● | 1740-1250L1500 | ● | 1740-1250D1500 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 1.125 | 3 | 1.625 | 1740-1875.1625 | ● | 1740-1875L1625 | ● | 1740-1875D1625 | ■ |
| NEW 0.2500 (1/4) | 1/4 | 1.500 | 4 | 2.000 | 1740-2500.2000 | ● | 1740-2500L2000 | ● | 1740-2500D2000 | ■ |

| SERIES 1740 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

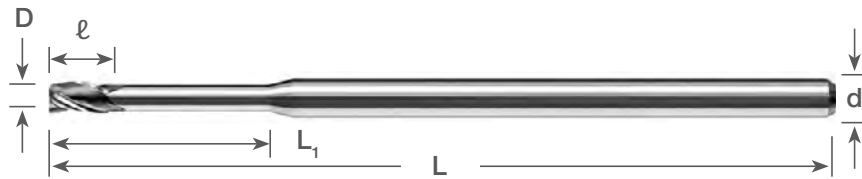
3 FLUTE NEW

0.0100" - 0.0300" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH SQUARE END MILLS
DEEP REACH MILLING



Symbol Descriptions [Page 7](#)

EXTENDED Reach STUB Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|---------------|-------|---------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.030 | 1742-0100.030 | ● | 1742-0100L030 | ● | 1742-0100D030 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.050 | 1742-0100.050 | ● | 1742-0100L050 | ● | 1742-0100D050 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.080 | 1742-0100.080 | ● | 1742-0100L080 | ● | 1742-0100D080 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.125 | 1742-0100.125 | ● | 1742-0100L125 | ● | 1742-0100D125 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.150 | 1742-0100.150 | ● | 1742-0100L150 | ● | 1742-0100D150 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.045 | 1742-0156.045 | ● | 1742-0156L045 | ● | 1742-0156D045 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.078 | 1742-0156.078 | ● | 1742-0156L078 | ● | 1742-0156D078 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.125 | 1742-0156.125 | ● | 1742-0156L125 | ● | 1742-0156D125 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.156 | 1742-0156.156 | ● | 1742-0156L156 | ● | 1742-0156D156 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.187 | 1742-0156.187 | ● | 1742-0156L187 | ● | 1742-0156D187 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.225 | 1742-0156.225 | ● | 1742-0156L225 | ● | 1742-0156D225 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.300 | 1742-0156.300 | ● | 1742-0156L300 | ● | 1742-0156D300 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.060 | 1742-0200.060 | ● | 1742-0200L060 | ● | 1742-0200D060 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.100 | 1742-0200.100 | ● | 1742-0200L100 | ● | 1742-0200D100 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.160 | 1742-0200.160 | ● | 1742-0200L160 | ● | 1742-0200D160 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.250 | 1742-0200.250 | ● | 1742-0200L250 | ● | 1742-0200D250 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.300 | 1742-0200.300 | ● | 1742-0200L300 | ● | 1742-0200D300 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.400 | 1742-0200.400 | ● | 1742-0200L400 | ● | 1742-0200D400 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.075 | 1742-0250.075 | ● | 1742-0250L075 | ● | 1742-0250D075 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.125 | 1742-0250.125 | ● | 1742-0250L125 | ● | 1742-0250D125 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.203 | 1742-0250.203 | ● | 1742-0250L203 | ● | 1742-0250D203 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.312 | 1742-0250.312 | ● | 1742-0250L312 | ● | 1742-0250D312 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.375 | 1742-0250.375 | ● | 1742-0250L375 | ● | 1742-0250D375 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.500 | 1742-0250.500 | ● | 1742-0250L500 | ● | 1742-0250D500 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.090 | 1742-0300.090 | ● | 1742-0300L090 | ● | 1742-0300D090 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.156 | 1742-0300.156 | ● | 1742-0300L156 | ● | 1742-0300D156 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.250 | 1742-0300.250 | ● | 1742-0300L250 | ● | 1742-0300D250 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.375 | 1742-0300.375 | ● | 1742-0300L375 | ● | 1742-0300D375 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.450 | 1742-0300.450 | ● | 1742-0300L450 | ● | 1742-0300D450 | ■ |

| SERIES 1742 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

3 FLUTE NEW

0.0312" - 0.0450" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

**EXTENDED REACH STUB LENGTH SQUARE END MILLS
DEEP REACH MILLING**



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|---------------|-------|---------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.093 | 1742-0312.093 | ● | 1742-0312L093 | ● | 1742-0312D093 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.156 | 1742-0312.156 | ● | 1742-0312L156 | ● | 1742-0312D156 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.250 | 1742-0312.250 | ● | 1742-0312L250 | ● | 1742-0312D250 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.312 | 1742-0312.312 | ● | 1742-0312L312 | ● | 1742-0312D312 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.375 | 1742-0312.375 | ● | 1742-0312L375 | ● | 1742-0312D375 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.470 | 1742-0312.470 | ● | 1742-0312L470 | ● | 1742-0312D470 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.565 | 1742-0312.565 | ● | 1742-0312L565 | ● | 1742-0312D565 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.625 | 1742-0312.625 | ● | 1742-0312L625 | ● | 1742-0312D625 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.775 | 1742-0312.775 | ● | 1742-0312L775 | ● | 1742-0312D775 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.105 | 1742-0350.105 | ● | 1742-0350L105 | ● | 1742-0350D105 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.187 | 1742-0350.187 | ● | 1742-0350L187 | ● | 1742-0350D187 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.281 | 1742-0350.281 | ● | 1742-0350L281 | ● | 1742-0350D281 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.425 | 1742-0350.425 | ● | 1742-0350L425 | ● | 1742-0350D425 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.525 | 1742-0350.525 | ● | 1742-0350L525 | ● | 1742-0350D525 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.700 | 1742-0350.700 | ● | 1742-0350L700 | ● | 1742-0350D700 | ■ |
| 0.0394 | 1/8 | 0.059 | 2 1/2 | 0.117 | 1742-0394.117 | ● | 1742-0394L117 | ● | 1742-0394D117 | ■ |
| 0.0394 | 1/8 | 0.059 | 2 1/2 | 0.203 | 1742-0394.203 | ● | 1742-0394L203 | ● | 1742-0394D203 | ■ |
| 0.0394 | 1/8 | 0.059 | 2 1/2 | 0.325 | 1742-0394.325 | ● | 1742-0394L325 | ● | 1742-0394D325 | ■ |
| 0.0394 | 1/8 | 0.059 | 2 1/2 | 0.480 | 1742-0394.480 | ● | 1742-0394L480 | ● | 1742-0394D480 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.120 | 1742-0400.120 | ● | 1742-0400L120 | ● | 1742-0400D120 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.203 | 1742-0400.203 | ● | 1742-0400L203 | ● | 1742-0400D203 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.325 | 1742-0400.325 | ● | 1742-0400L325 | ● | 1742-0400D325 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.480 | 1742-0400.480 | ● | 1742-0400L480 | ● | 1742-0400D480 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.600 | 1742-0400.600 | ● | 1742-0400L600 | ● | 1742-0400D600 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.800 | 1742-0400.800 | ● | 1742-0400L800 | ● | 1742-0400D800 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.135 | 1742-0450.135 | ● | 1742-0450L135 | ● | 1742-0450D135 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.225 | 1742-0450.225 | ● | 1742-0450L225 | ● | 1742-0450D225 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.375 | 1742-0450.375 | ● | 1742-0450L375 | ● | 1742-0450D375 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.550 | 1742-0450.550 | ● | 1742-0450L550 | ● | 1742-0450D550 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.680 | 1742-0450.680 | ● | 1742-0450L680 | ● | 1742-0450D680 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.900 | 1742-0450.900 | ● | 1742-0450L900 | ● | 1742-0450D900 | ■ |

| SERIES 1742 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

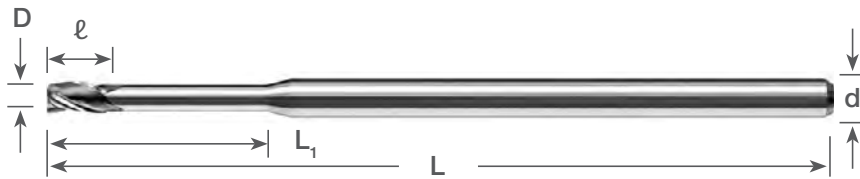
3 FLUTE NEW

0.0469" - 0.0625" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

**EXTENDED REACH STUB LENGTH SQUARE END MILLS
DEEP REACH MILLING**



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.141 | 1742-0469.141 | ● | 1742-0469L141 | ● | 1742-0469D141 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.250 | 1742-0469.250 | ● | 1742-0469L250 | ● | 1742-0469D250 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.375 | 1742-0469.375 | ● | 1742-0469L375 | ● | 1742-0469D375 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.480 | 1742-0469.480 | ● | 1742-0469L480 | ● | 1742-0469D480 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.570 | 1742-0469.570 | ● | 1742-0469L570 | ● | 1742-0469D570 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.710 | 1742-0469.710 | ● | 1742-0469L710 | ● | 1742-0469D710 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.950 | 1742-0469.950 | ● | 1742-0469L950 | ● | 1742-0469D950 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 1.187 | 1742-0469.1187 | ● | 1742-0469L1187 | ● | 1742-0469D1187 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.150 | 1742-0500.150 | ● | 1742-0500L150 | ● | 1742-0500D150 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.250 | 1742-0500.250 | ● | 1742-0500L250 | ● | 1742-0500D250 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.400 | 1742-0500.400 | ● | 1742-0500L400 | ● | 1742-0500D400 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.600 | 1742-0500.600 | ● | 1742-0500L600 | ● | 1742-0500D600 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.750 | 1742-0500.750 | ● | 1742-0500L750 | ● | 1742-0500D750 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.165 | 1742-0550.165 | ● | 1742-0550L165 | ● | 1742-0550D165 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.275 | 1742-0550.275 | ● | 1742-0550L275 | ● | 1742-0550D275 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.450 | 1742-0550.450 | ● | 1742-0550L450 | ● | 1742-0550D450 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.660 | 1742-0550.660 | ● | 1742-0550L660 | ● | 1742-0550D660 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.825 | 1742-0550.825 | ● | 1742-0550L825 | ● | 1742-0550D825 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.180 | 1742-0600.180 | ● | 1742-0600L180 | ● | 1742-0600D180 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.312 | 1742-0600.312 | ● | 1742-0600L312 | ● | 1742-0600D312 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.500 | 1742-0600.500 | ● | 1742-0600L500 | ● | 1742-0600D500 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.720 | 1742-0600.720 | ● | 1742-0600L720 | ● | 1742-0600D720 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.900 | 1742-0600.900 | ● | 1742-0600L900 | ● | 1742-0600D900 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.186 | 1742-0625.186 | ● | 1742-0625L186 | ● | 1742-0625D186 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.312 | 1742-0625.312 | ● | 1742-0625L312 | ● | 1742-0625D312 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.500 | 1742-0625.500 | ● | 1742-0625L500 | ● | 1742-0625D500 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.625 | 1742-0625.625 | ● | 1742-0625L625 | ● | 1742-0625D625 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.750 | 1742-0625.750 | ● | 1742-0625L750 | ● | 1742-0625D750 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.950 | 1742-0625.950 | ● | 1742-0625L950 | ● | 1742-0625D950 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 1.125 | 1742-0625.1125 | ● | 1742-0625L1125 | ● | 1742-0625D1125 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 1.250 | 1742-0625.1250 | ● | 1742-0625L1250 | ● | 1742-0625D1250 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 3 | 1.550 | 1742-0625.1550 | ● | 1742-0625L1550 | ● | 1742-0625D1550 | ■ |

| SERIES 1742 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

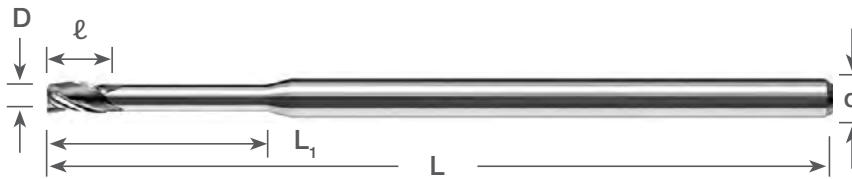
3 FLUTE NEW

0.0650" - 0.0938" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH SQUARE END MILLS
DEEP REACH MILLING



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.325 | 1742-0650.325 | ● | 1742-0650L325 | ● | 1742-0650D325 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.530 | 1742-0650.530 | ● | 1742-0650L530 | ● | 1742-0650D530 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.800 | 1742-0650.800 | ● | 1742-0650L800 | ● | 1742-0650D800 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.375 | 1742-0700.375 | ● | 1742-0700L375 | ● | 1742-0700D375 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.570 | 1742-0700.570 | ● | 1742-0700L570 | ● | 1742-0700D570 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.850 | 1742-0700.850 | ● | 1742-0700L850 | ● | 1742-0700D850 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.375 | 1742-0750.375 | ● | 1742-0750L375 | ● | 1742-0750D375 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.625 | 1742-0750.625 | ● | 1742-0750L625 | ● | 1742-0750D625 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.900 | 1742-0750.900 | ● | 1742-0750L900 | ● | 1742-0750D900 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.234 | 1742-0781.234 | ● | 1742-0781L234 | ● | 1742-0781D234 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.406 | 1742-0781.406 | ● | 1742-0781L406 | ● | 1742-0781D406 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.625 | 1742-0781.625 | ● | 1742-0781L625 | ● | 1742-0781D625 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.800 | 1742-0781.800 | ● | 1742-0781L800 | ● | 1742-0781D800 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.940 | 1742-0781.940 | ● | 1742-0781L940 | ● | 1742-0781D940 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 1.187 | 1742-0781.1187 | ● | 1742-0781L1187 | ● | 1742-0781D1187 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 3 | 1.562 | 1742-0781.1562 | ● | 1742-0781L1562 | ● | 1742-0781D1562 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 3 | 1.950 | 1742-0781.1950 | ● | 1742-0781L1950 | ● | 1742-0781D1950 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.406 | 1742-0800.406 | ● | 1742-0800L406 | ● | 1742-0800D406 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.650 | 1742-0800.650 | ● | 1742-0800L650 | ● | 1742-0800D650 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.960 | 1742-0800.960 | ● | 1742-0800L960 | ● | 1742-0800D960 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.425 | 1742-0850.425 | ● | 1742-0850L425 | ● | 1742-0850D425 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.700 | 1742-0850.700 | ● | 1742-0850L700 | ● | 1742-0850D700 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 1.020 | 1742-0850.1020 | ● | 1742-0850L1020 | ● | 1742-0850D1020 | ■ |
| 0.0900 | 1/8 | 0.135 | 2 1/2 | 0.450 | 1742-0900.450 | ● | 1742-0900L450 | ● | 1742-0900D450 | ■ |
| 0.0900 | 1/8 | 0.135 | 2 1/2 | 0.750 | 1742-0900.750 | ● | 1742-0900L750 | ● | 1742-0900D750 | ■ |
| 0.0900 | 1/8 | 0.135 | 2 1/2 | 1.080 | 1742-0900.1080 | ● | 1742-0900L1080 | ● | 1742-0900D1080 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.279 | 1742-0938.279 | ● | 1742-0938L279 | ● | 1742-0938D279 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.500 | 1742-0938.500 | ● | 1742-0938L500 | ● | 1742-0938D500 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.750 | 1742-0938.750 | ● | 1742-0938L750 | ● | 1742-0938D750 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.950 | 1742-0938.950 | ● | 1742-0938L950 | ● | 1742-0938D950 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 1.125 | 1742-0938.1125 | ● | 1742-0938L1125 | ● | 1742-0938D1125 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 3 | 1.400 | 1742-0938.1400 | ● | 1742-0938L1400 | ● | 1742-0938D1400 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 3 | 1.675 | 1742-0938.1675 | ● | 1742-0938L1675 | ● | 1742-0938D1675 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 4 | 1.875 | 1742-0938.1875 | ● | 1742-0938L1875 | ● | 1742-0938D1875 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 4 | 2.312 | 1742-0938.2312 | ● | 1742-0938L2312 | ● | 1742-0938D2312 | ■ |

| SERIES 1742 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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(International) 001.714.428.3636
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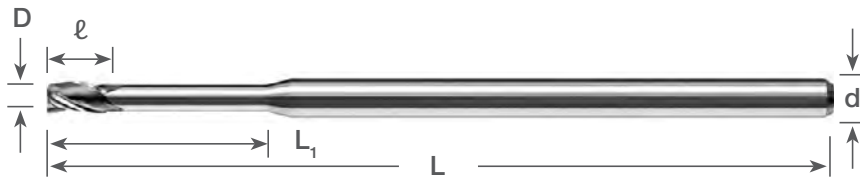
3 FLUTE NEW

0.0950" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

**EXTENDED REACH STUB LENGTH SQUARE END MILLS
DEEP REACH MILLING**



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.500 | 1742-0950.500 | ● | 1742-0950L500 | ● | 1742-0950D500 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.750 | 1742-0950.750 | ● | 1742-0950L750 | ● | 1742-0950D750 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 1.150 | 1742-0950.1150 | ● | 1742-0950L1150 | ● | 1742-0950D1150 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.500 | 1742-1000.500 | ● | 1742-1000L500 | ● | 1742-1000D500 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.800 | 1742-1000.800 | ● | 1742-1000L800 | ● | 1742-1000D800 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 1.200 | 1742-1000.1200 | ● | 1742-1000L1200 | ● | 1742-1000D1200 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 0.625 | 1742-1250.625 | ● | 1742-1250L625 | ● | 1742-1250D625 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.000 | 1742-1250.1000 | ● | 1742-1250L1000 | ● | 1742-1250D1000 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.250 | 1742-1250.1250 | ● | 1742-1250L1250 | ● | 1742-1250D1250 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.500 | 1742-1250.1500 | ● | 1742-1250L1500 | ● | 1742-1250D1500 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.875 | 1742-1250.1875 | ● | 1742-1250L1875 | ● | 1742-1250D1875 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 2.250 | 1742-1250.2250 | ● | 1742-1250L2250 | ● | 1742-1250D2250 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 2.500 | 1742-1250.2500 | ● | 1742-1250L2500 | ● | 1742-1250D2500 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 3.125 | 1742-1250.3125 | ● | 1742-1250L3125 | ● | 1742-1250D3125 | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 0.750 | 1742-1562.750 | ● | 1742-1562L750 | ● | 1742-1562D750 | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 1.250 | 1742-1562.1250 | ● | 1742-1562L1250 | ● | 1742-1562D1250 | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 4 | 1.875 | 1742-1562.1875 | ● | 1742-1562L1875 | ● | 1742-1562D1875 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.000 | 1742-1875.1000 | ● | 1742-1875L1000 | ● | 1742-1875D1000 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.500 | 1742-1875.1500 | ● | 1742-1875L1500 | ● | 1742-1875D1500 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 1.875 | 1742-1875.1875 | ● | 1742-1875L1875 | ● | 1742-1875D1875 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.250 | 1742-1875.2250 | ● | 1742-1875L2250 | ● | 1742-1875D2250 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.812 | 1742-1875.2812 | ● | 1742-1875L2812 | ● | 1742-1875D2812 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 1.250 | 1742-2500.1250 | ● | 1742-2500L1250 | ● | 1742-2500D1250 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.000 | 1742-2500.2000 | ● | 1742-2500L2000 | ● | 1742-2500D2000 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.500 | 1742-2500.2500 | ● | 1742-2500L2500 | ● | 1742-2500D2500 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.000 | 1742-2500.3000 | ● | 1742-2500L3000 | ● | 1742-2500D3000 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.750 | 1742-2500.3750 | ● | 1742-2500L3750 | ● | 1742-2500D3750 | ■ |

SERIES 1742 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

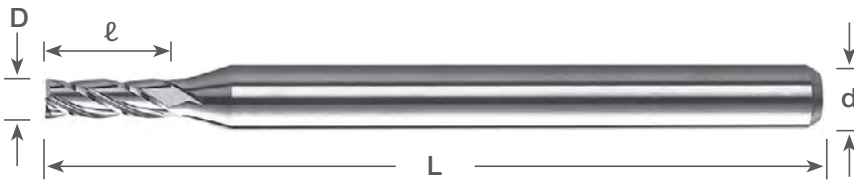
4 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0050" - 0.0340" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0050 | 1/8 | 0.015 | 1 1/2 | 1810-0050.015 | ● | 1810-0050L015 | ● | - | - |
| NEW 0.0060 | 1/8 | 0.018 | 1 1/2 | 1810-0060.018 | ● | 1810-0060L018 | ● | - | - |
| NEW 0.0070 | 1/8 | 0.021 | 1 1/2 | 1810-0070.021 | ● | 1810-0070L021 | ● | - | - |
| NEW 0.0080 | 1/8 | 0.024 | 1 1/2 | 1810-0080.024 | ● | 1810-0080L024 | ● | - | - |
| NEW 0.0090 | 1/8 | 0.027 | 1 1/2 | 1810-0090.027 | ● | 1810-0090L027 | ● | - | - |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 1810-0100.030 | ● | 1810-0100L030 | ● | 1810-0100D030 | ■ |
| NEW 0.0110 | 1/8 | 0.033 | 1 1/2 | 1810-0110.033 | ● | 1810-0110L033 | ● | - | - |
| NEW 0.0120 | 1/8 | 0.036 | 1 1/2 | 1810-0120.036 | ● | 1810-0120L036 | ● | - | - |
| NEW 0.0130 | 1/8 | 0.039 | 1 1/2 | 1810-0130.039 | ● | 1810-0130L039 | ● | - | - |
| NEW 0.0140 | 1/8 | 0.042 | 1 1/2 | 1810-0140.042 | ● | 1810-0140L042 | ● | - | - |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 1810-0150.045 | ● | 1810-0150L045 | ● | 1810-0150D045 | ■ |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 1810-0156.047 | ● | 1810-0156L047 | ● | 1810-0156D047 | ■ |
| NEW 0.0160 | 1/8 | 0.048 | 1 1/2 | 1810-0160.048 | ● | 1810-0160L048 | ● | - | - |
| NEW 0.0170 | 1/8 | 0.051 | 1 1/2 | 1810-0170.051 | ● | 1810-0170L051 | ● | - | - |
| NEW 0.0180 | 1/8 | 0.054 | 1 1/2 | 1810-0180.054 | ● | 1810-0180L054 | ● | - | - |
| NEW 0.0190 | 1/8 | 0.057 | 1 1/2 | 1810-0190.057 | ● | 1810-0190L057 | ● | - | - |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 1810-0200.060 | ● | 1810-0200L060 | ● | 1810-0200D060 | ■ |
| NEW 0.0210 | 1/8 | 0.063 | 1 1/2 | 1810-0210.063 | ● | 1810-0210L063 | ● | - | - |
| NEW 0.0220 | 1/8 | 0.066 | 1 1/2 | 1810-0220.066 | ● | 1810-0220L066 | ● | - | - |
| NEW 0.0230 | 1/8 | 0.069 | 1 1/2 | 1810-0230.069 | ● | 1810-0230L069 | ● | - | - |
| NEW 0.0240 | 1/8 | 0.072 | 1 1/2 | 1810-0240.072 | ● | 1810-0240L072 | ● | - | - |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 1810-0250.075 | ● | 1810-0250L075 | ● | 1810-0250D075 | ■ |
| NEW 0.0260 | 1/8 | 0.078 | 1 1/2 | 1810-0260.078 | ● | 1810-0260L078 | ● | - | - |
| NEW 0.0270 | 1/8 | 0.081 | 1 1/2 | 1810-0270.081 | ● | 1810-0270L081 | ● | - | - |
| NEW 0.0280 | 1/8 | 0.084 | 1 1/2 | 1810-0280.084 | ● | 1810-0280L084 | ● | - | - |
| NEW 0.0290 | 1/8 | 0.087 | 1 1/2 | 1810-0290.087 | ● | 1810-0290L087 | ● | - | - |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 1810-0300.090 | ● | 1810-0300L090 | ● | 1810-0300D090 | ■ |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 1810-0312.094 | ● | 1810-0312L094 | ● | 1810-0312D094 | ■ |
| NEW 0.0320 | 1/8 | 0.096 | 1 1/2 | 1810-0320.096 | ● | 1810-0320L096 | ● | - | - |
| NEW 0.0330 | 1/8 | 0.099 | 1 1/2 | 1810-0330.099 | ● | 1810-0330L099 | ● | - | - |
| NEW 0.0340 | 1/8 | 0.102 | 1 1/2 | 1810-0340.102 | ● | 1810-0340L102 | ● | - | - |

| SERIES 1810 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

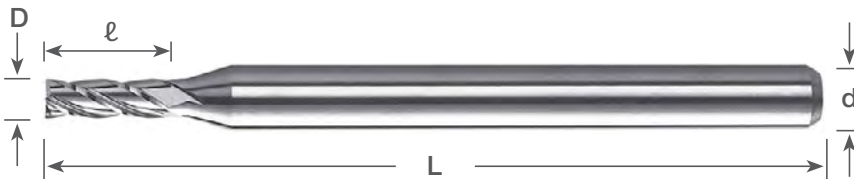
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4 FLUTE

0.0350" - 0.0781" DIAMETER

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 1810-0350.105 | ● | 1810-0350L105 | ● | 1810-0350D105 | ■ |
| NEW 0.0360 | 1/8 | 0.108 | 1 1/2 | 1810-0360.108 | ● | 1810-0360L108 | ● | - | - |
| NEW 0.0370 | 1/8 | 0.111 | 1 1/2 | 1810-0370.111 | ● | 1810-0370L111 | ● | - | - |
| NEW 0.0380 | 1/8 | 0.114 | 1 1/2 | 1810-0380.114 | ● | 1810-0380L114 | ● | - | - |
| NEW 0.0394 | 1/8 | 0.117 | 1 1/2 | 1810-0394.117 | ● | 1810-0394L117 | ● | 1810-0394D117 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 1810-0400.120 | ● | 1810-0400L120 | ● | 1810-0400D120 | ■ |
| NEW 0.0410 | 1/8 | 0.123 | 1 1/2 | 1810-0410.123 | ● | 1810-0410L123 | ● | - | - |
| NEW 0.0420 | 1/8 | 0.126 | 1 1/2 | 1810-0420.126 | ● | 1810-0420L126 | ● | - | - |
| NEW 0.0430 | 1/8 | 0.129 | 1 1/2 | 1810-0430.129 | ● | 1810-0430L129 | ● | - | - |
| NEW 0.0440 | 1/8 | 0.132 | 1 1/2 | 1810-0440.132 | ● | 1810-0440L132 | ● | - | - |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 1810-0450.135 | ● | 1810-0450L135 | ● | 1810-0450D135 | ■ |
| NEW 0.0460 | 1/8 | 0.138 | 1 1/2 | 1810-0460.138 | ● | 1810-0460L138 | ● | - | - |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 1810-0469.141 | ● | 1810-0469L141 | ● | 1810-0469D141 | ■ |
| NEW 0.0480 | 1/8 | 0.144 | 1 1/2 | 1810-0480.144 | ● | 1810-0480L144 | ● | - | - |
| NEW 0.0490 | 1/8 | 0.147 | 1 1/2 | 1810-0490.147 | ● | 1810-0490L147 | ● | - | - |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 1810-0500.150 | ● | 1810-0500L150 | ● | 1810-0500D150 | ■ |
| NEW 0.0510 | 1/8 | 0.153 | 1 1/2 | 1810-0510.153 | ● | 1810-0510L153 | ● | - | - |
| NEW 0.0520 | 1/8 | 0.156 | 1 1/2 | 1810-0520.156 | ● | 1810-0520L156 | ● | - | - |
| NEW 0.0530 | 1/8 | 0.159 | 1 1/2 | 1810-0530.159 | ● | 1810-0530L159 | ● | - | - |
| NEW 0.0540 | 1/8 | 0.162 | 1 1/2 | 1810-0540.162 | ● | 1810-0540L162 | ● | - | - |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 1810-0550.165 | ● | 1810-0550L165 | ● | 1810-0550D165 | ■ |
| NEW 0.0560 | 1/8 | 0.168 | 1 1/2 | 1810-0560.168 | ● | 1810-0560L168 | ● | - | - |
| NEW 0.0570 | 1/8 | 0.171 | 1 1/2 | 1810-0570.171 | ● | 1810-0570L171 | ● | - | - |
| NEW 0.0580 | 1/8 | 0.174 | 1 1/2 | 1810-0580.174 | ● | 1810-0580L174 | ● | - | - |
| NEW 0.0590 | 1/8 | 0.177 | 1 1/2 | 1810-0590.177 | ● | 1810-0590L177 | ● | - | - |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 1810-0600.180 | ● | 1810-0600L180 | ● | 1810-0600D180 | ■ |
| 0.0625 (1/16) | 1/8 | 0.188 | 1 1/2 | 1810-0625.188 | ● | 1810-0625L188 | ● | 1810-0625D188 | ■ |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 1810-0650.195 | ● | 1810-0650L195 | ● | 1810-0650D195 | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 1810-0700.210 | ● | 1810-0700L210 | ● | 1810-0700D210 | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 1810-0750.225 | ● | 1810-0750L225 | ● | 1810-0750D225 | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 1810-0781.234 | ● | 1810-0781L234 | ● | 1810-0781D234 | ■ |

SERIES 1810 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|---------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

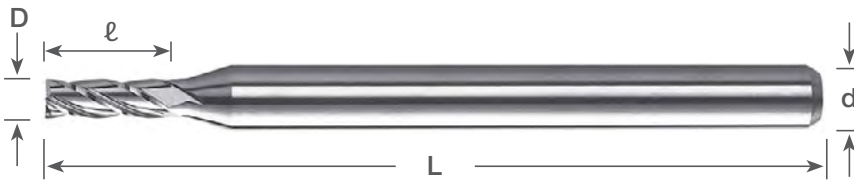
4 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0800" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 1810-0800.240 | ● | 1810-0800L240 | ● | 1810-0800D240 | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 1810-0850.255 | ● | 1810-0850L255 | ● | 1810-0850D255 | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 1810-0900.270 | ● | 1810-0900L270 | ● | 1810-0900D270 | ■ |
| 0.938 (3/32) | 1/8 | 0.281 | 1 1/2 | 1810-0938.281 | ● | 1810-0938L281 | ● | 1810-0938D281 | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 1810-0950.285 | ● | 1810-0950L285 | ● | 1810-0950D285 | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 1810-1000.300 | ● | 1810-1000L300 | ● | 1810-1000D300 | ■ |
| NEW 0.1050 | 1/8 | 0.315 | 1 1/2 | 1810-1050.315 | ● | 1810-1050L315 | ● | 1810-1050D315 | ■ |
| 0.1094 (7/64) | 1/8 | 0.328 | 1 1/2 | 1810-1094.328 | ● | 1810-1094L328 | ● | 1810-1094D328 | ■ |
| NEW 0.1100 | 1/8 | 0.330 | 1 1/2 | 1810-1100.330 | ● | 1810-1100L330 | ● | 1810-1100D330 | ■ |
| NEW 0.1150 | 1/8 | 0.345 | 1 1/2 | 1810-1150.345 | ● | 1810-1150L345 | ● | 1810-1150D345 | ■ |
| NEW 0.1181 | 1/8 | 0.355 | 1 1/2 | 1810-1181.355 | ● | 1810-1181L355 | ● | 1810-1181D355 | ■ |
| NEW 0.1200 | 1/8 | 0.360 | 1 1/2 | 1810-1200.360 | ● | 1810-1200L360 | ● | 1810-1200D360 | ■ |
| 0.1250 (1/8) | 1/8 | 0.375 | 1 1/2 | 1810-1250.375 | ● | 1810-1250L375 | ● | 1810-1250D375 | ■ |
| 0.1406 (9/64) | 3/16 | 0.500 | 2 | 1810-1406.500 | ● | 1810-1406L500 | ● | 1810-1406D500 | ■ |
| NEW 0.1406 (9/64) | 3/16 | 0.562 | 2 | 1810-1406.562 | ● | 1810-1406L562 | ● | 1810-1406D562 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 1810-1562.562 | ● | 1810-1562L562 | ● | 1810-1562D562 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 1.000 | 3 | 1810-1562.1000 | ● | 1810-1562L1000 | ● | 1810-1562D1000 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 1.875 | 4 | 1810-1562.1875 | ● | 1810-1562L1875 | ● | 1810-1562D1875 | ■ |
| 0.1563 (5/32) | 3/16 | 0.500 | 2 | 1810-1563.500 | ● | 1810-1563L500 | ● | 1810-1563D500 | ■ |
| 0.1719 (11/64) | 3/16 | 0.563 | 2 | 1810-1719.563 | ● | 1810-1719L563 | ● | 1810-1719D563 | ■ |
| 0.1875 (3/16) | 3/16 | 0.563 | 2 | 1810-1875.563 | ● | 1810-1875L563 | ● | 1810-1875D563 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 1810-1875.625 | ● | 1810-1875L625 | ● | 1810-1875D625 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 1.120 | 3 | 1810-1875.1125 | ● | 1810-1875L1125 | ● | 1810-1875D1125 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 2.250 | 4 | 1810-1875.2250 | ● | 1810-1875L2250 | ● | 1810-1875D2250 | ■ |
| 0.2031 (13/64) | 1/4 | 0.625 | 2 1/2 | 1810-2031.625 | ● | 1810-2031L625 | ● | 1810-2031D625 | ■ |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 1810-2188.625 | ● | 1810-2188L625 | ● | 1810-2188D625 | ■ |
| 0.2344 (15/64) | 1/4 | 0.750 | 2 1/2 | 1810-2344.750 | ● | 1810-2344L750 | ● | 1810-2344D750 | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 1810-2500.750 | ● | 1810-2500L750 | ● | 1810-2500D750 | ■ |
| NEW 0.2500 (1/4) | 1/4 | 1.500 | 4 | 1810-2500.1500 | ● | 1810-2500L1500 | ● | 1810-2500D1500 | ■ |
| NEW 0.2500 (1/4) | 1/4 | 3.000 | 6 | 1810-2500.3000 | ● | 1810-2500L3000 | ● | 1810-2500D3000 | ■ |

| SERIES 1810 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

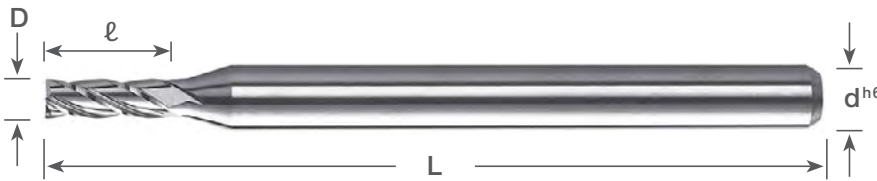
4 FLUTE

STANDARD LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|-------|----|---------------|-------|---------------|-------|
| D ^{+0.00mm} / _{-0.02mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.30 | 38 | 1810-0039.012 | ● | 1810-0039L012 | ● |
| 0.15 | 3 | 0.45 | 38 | 1810-0059.018 | ● | 1810-0059L018 | ● |
| 0.20 | 3 | 0.60 | 38 | 1810-0079.024 | ● | 1810-0079L024 | ● |
| 0.25 | 3 | 0.75 | 38 | 1810-0098.029 | ● | 1810-0098L029 | ● |
| 0.30 | 3 | 0.90 | 38 | 1810-0118.035 | ● | 1810-0118L035 | ● |
| 0.35 | 3 | 1.05 | 38 | 1810-0138.041 | ● | 1810-0138L041 | ● |
| 0.40 | 3 | 1.20 | 38 | 1810-0157.047 | ● | 1810-0157L047 | ● |
| 0.45 | 3 | 1.35 | 38 | 1810-0177.053 | ● | 1810-0177L053 | ● |
| 0.50 | 3 | 1.50 | 38 | 1810-0197.059 | ● | 1810-0197L059 | ● |
| 0.60 | 3 | 1.80 | 38 | 1810-0236.071 | ● | 1810-0236L071 | ● |
| 0.70 | 3 | 2.10 | 38 | 1810-0276.083 | ● | 1810-0276L083 | ● |
| 0.80 | 3 | 2.40 | 38 | 1810-0315.095 | ● | 1810-0315L095 | ● |
| 0.90 | 3 | 2.70 | 38 | 1810-0354.106 | ● | 1810-0354L106 | ● |
| 1.00 | 3 | 3.00 | 38 | 1810-0394.118 | ● | 1810-0394L118 | ● |
| 1.10 | 3 | 3.30 | 38 | 1810-0433.130 | ● | 1810-0433L130 | ● |
| 1.20 | 3 | 3.60 | 38 | 1810-0472.142 | ● | 1810-0472L142 | ● |
| 1.30 | 3 | 3.90 | 38 | 1810-0512.154 | ● | 1810-0512L154 | ● |
| 1.40 | 3 | 4.20 | 38 | 1810-0551.165 | ● | 1810-0551L165 | ● |
| 1.50 | 3 | 4.50 | 38 | 1810-0591.177 | ● | 1810-0591L177 | ● |
| 1.60 | 3 | 4.80 | 38 | 1810-0630.189 | ● | 1810-0630L189 | ● |
| 1.70 | 3 | 5.10 | 38 | 1810-0669.200 | ● | 1810-0669L200 | ● |
| 1.80 | 3 | 5.40 | 38 | 1810-0709.213 | ● | 1810-0709L213 | ● |
| 1.90 | 3 | 5.70 | 38 | 1810-0748.224 | ● | 1810-0748L224 | ● |
| 2.00 | 3 | 6.00 | 38 | 1810-0787.236 | ● | 1810-0787L236 | ● |
| 2.50 | 3 | 7.50 | 38 | 1810-0984.295 | ● | 1810-0984L295 | ● |
| 2.80 | 3 | 9.00 | 38 | 1810-1102.354 | ● | 1810-1102L354 | ● |
| 3.00 | 3 | 9.00 | 38 | 1810-1181.354 | ● | 1810-1181L354 | ● |
| 3.50 | 4 | 10.50 | 50 | 1810-1378.413 | ● | 1810-1378L413 | ● |
| 3.80 | 5 | 12.00 | 50 | 1810-1496.473 | ● | 1810-1496L473 | ● |
| 4.00 | 5 | 12.00 | 50 | 1810-1575.473 | ● | 1810-1575L473 | ● |
| 4.50 | 5 | 13.50 | 50 | 1810-1772.532 | ● | 1810-1772L532 | ● |
| 4.80 | 5 | 15.00 | 50 | 1810-1890.590 | ● | 1810-1890L590 | ● |
| 5.00 | 5 | 15.00 | 50 | 1810-1968.590 | ● | 1810-1968L590 | ● |
| 5.50 | 6 | 16.50 | 50 | 1810-2165.650 | ● | 1810-2165L650 | ● |
| 5.80 | 6 | 18.00 | 50 | 1810-2283.709 | ● | 1810-2283L709 | ● |
| 6.00 | 6 | 18.00 | 50 | 1810-2362.709 | ● | 1810-2362L709 | ● |

SERIES 1810 WORKPIECE MATERIAL

| Coating | P Steel 20-40HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|------------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

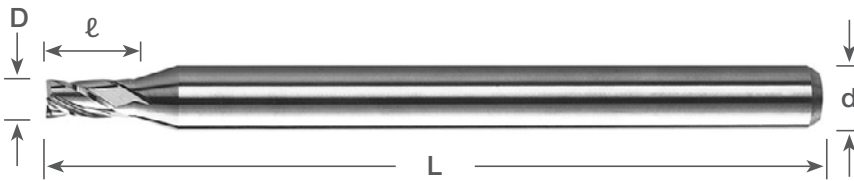
4 FLUTE

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.0050" - 0.0394" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D | d | l | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0050 | 1/8 | 0.007 | 1 1/2 | 1820-0050.007 | ● | 1820-0050L007 | ● | - | - |
| NEW 0.0060 | 1/8 | 0.009 | 1 1/2 | 1820-0060.009 | ● | 1820-0060L009 | ● | - | - |
| NEW 0.0070 | 1/8 | 0.010 | 1 1/2 | 1820-0070.010 | ● | 1820-0070L010 | ● | - | - |
| NEW 0.0080 | 1/8 | 0.012 | 1 1/2 | 1820-0080.012 | ● | 1820-0080L012 | ● | - | - |
| NEW 0.0090 | 1/8 | 0.013 | 1 1/2 | 1820-0090.013 | ● | 1820-0090L013 | ● | - | - |
| NEW 0.0100 | 1/8 | 0.015 | 1 1/2 | 1820-0100.015 | ● | 1820-0100L015 | ● | 1820-0100D015 | ■ |
| NEW 0.0110 | 1/8 | 0.016 | 1 1/2 | 1820-0110.016 | ● | 1820-0110L016 | ● | - | - |
| NEW 0.0120 | 1/8 | 0.018 | 1 1/2 | 1820-0120.018 | ● | 1820-0120L018 | ● | - | - |
| NEW 0.0130 | 1/8 | 0.019 | 1 1/2 | 1820-0130.019 | ● | 1820-0130L019 | ● | - | - |
| NEW 0.0140 | 1/8 | 0.021 | 1 1/2 | 1820-0140.021 | ● | 1820-0140L021 | ● | - | - |
| NEW 0.0156 (1/64) | 1/8 | 0.022 | 1 1/2 | 1820-0156.022 | ● | 1820-0156L022 | ● | 1820-0156D022 | ■ |
| NEW 0.0160 | 1/8 | 0.024 | 1 1/2 | 1820-0160.024 | ● | 1820-0160L024 | ● | - | - |
| NEW 0.0170 | 1/8 | 0.026 | 1 1/2 | 1820-0170.026 | ● | 1820-0170L026 | ● | - | - |
| NEW 0.0180 | 1/8 | 0.027 | 1 1/2 | 1820-0180.027 | ● | 1820-0180L027 | ● | - | - |
| NEW 0.0190 | 1/8 | 0.029 | 1 1/2 | 1820-0190.029 | ● | 1820-0190L029 | ● | - | - |
| NEW 0.0200 | 1/8 | 0.030 | 1 1/2 | 1820-0200.030 | ● | 1820-0200L030 | ● | 1820-0200D030 | ■ |
| NEW 0.0210 | 1/8 | 0.031 | 1 1/2 | 1820-0210.031 | ● | 1820-0210L031 | ● | - | - |
| NEW 0.0220 | 1/8 | 0.033 | 1 1/2 | 1820-0220.033 | ● | 1820-0220L033 | ● | - | - |
| NEW 0.0230 | 1/8 | 0.035 | 1 1/2 | 1820-0230.035 | ● | 1820-0230L035 | ● | - | - |
| NEW 0.0240 | 1/8 | 0.036 | 1 1/2 | 1820-0240.036 | ● | 1820-0240L036 | ● | - | - |
| NEW 0.0250 | 1/8 | 0.037 | 1 1/2 | 1820-0250.037 | ● | 1820-0250L037 | ● | 1820-0250D037 | ■ |
| NEW 0.0260 | 1/8 | 0.039 | 1 1/2 | 1820-0260.039 | ● | 1820-0260L039 | ● | - | - |
| NEW 0.0270 | 1/8 | 0.041 | 1 1/2 | 1820-0270.041 | ● | 1820-0270L041 | ● | - | - |
| NEW 0.0280 | 1/8 | 0.042 | 1 1/2 | 1820-0280.042 | ● | 1820-0280L042 | ● | - | - |
| NEW 0.0290 | 1/8 | 0.043 | 1 1/2 | 1820-0290.043 | ● | 1820-0290L043 | ● | - | - |
| NEW 0.0300 | 1/8 | 0.045 | 1 1/2 | 1820-0300.045 | ● | 1820-0300L045 | ● | 1820-0300D045 | ■ |
| 0.0312 (1/32) | 1/8 | 0.047 | 1 1/2 | 1820-0312.047 | ● | 1820-0312L047 | ● | - | - |
| NEW 0.0320 | 1/8 | 0.048 | 1 1/2 | 1820-0320.048 | ● | 1820-0320L048 | ● | - | - |
| NEW 0.0330 | 1/8 | 0.049 | 1 1/2 | 1820-0330.049 | ● | 1820-0330L049 | ● | - | - |
| NEW 0.0340 | 1/8 | 0.051 | 1 1/2 | 1820-0340.051 | ● | 1820-0340L051 | ● | - | - |
| NEW 0.0350 | 1/8 | 0.052 | 1 1/2 | 1820-0350.052 | ● | 1820-0350L052 | ● | 1820-0350D052 | ■ |
| NEW 0.0360 | 1/8 | 0.054 | 1 1/2 | 1820-0360.054 | ● | 1820-0360L054 | ● | - | - |
| NEW 0.0370 | 1/8 | 0.055 | 1 1/2 | 1820-0370.055 | ● | 1820-0370L055 | ● | - | - |
| NEW 0.0380 | 1/8 | 0.057 | 1 1/2 | 1820-0380.057 | ● | 1820-0380L057 | ● | - | - |
| NEW 0.0394 | 1/8 | 0.058 | 1 1/2 | 1820-0394.058 | ● | 1820-0394L058 | ● | 1820-0394D058 | ■ |

| SERIES 1820 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

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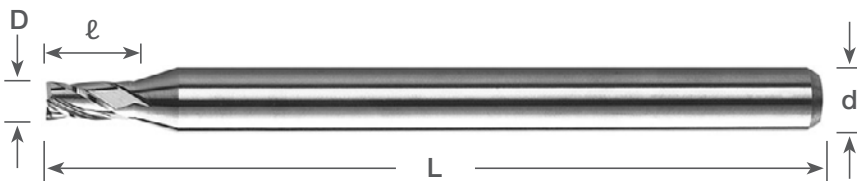
DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

4 FLUTE

0.0400" - 0.2500" DIAMETER

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

Mirror Surface Finishes
Sub Micron Grain Carbide



STUB Length (Inch Sizes)

| | Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----|---|------|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| | D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW | 0.0400 | 1/8 | 0.060 | 1 1/2 | 1820-0400.060 | ● | 1820-0400L060 | ● | 1820-0400D060 | ■ |
| NEW | 0.0450 | 1/8 | 0.067 | 1 1/2 | 1820-0450.067 | ● | 1820-0450L067 | ● | 1820-0450D067 | ■ |
| | 0.0469 (3/64) | 1/8 | 0.070 | 1 1/2 | 1820-0469.070 | ● | 1820-0469L070 | ● | 1820-0469D070 | ■ |
| NEW | 0.0500 | 1/8 | 0.075 | 1 1/2 | 1820-0500.075 | ● | 1820-0500L075 | ● | 1820-0500D075 | ■ |
| NEW | 0.0550 | 1/8 | 0.082 | 1 1/2 | 1820-0550.082 | ● | 1820-0550L082 | ● | 1820-0550D082 | ■ |
| NEW | 0.0600 | 1/8 | 0.090 | 1 1/2 | 1820-0600.090 | ● | 1820-0600L090 | ● | 1820-0600D090 | ■ |
| | 0.0625 (1/16) | 1/8 | 0.094 | 1 1/2 | 1820-0625.094 | ● | 1820-0625L094 | ● | 1820-0625D094 | ■ |
| NEW | 0.0650 | 1/8 | 0.097 | 1 1/2 | 1820-0650.097 | ● | 1820-0650L097 | ● | 1820-0650D097 | ■ |
| NEW | 0.0700 | 1/8 | 0.105 | 1 1/2 | 1820-0700.105 | ● | 1820-0700L105 | ● | 1820-0700D105 | ■ |
| NEW | 0.0750 | 1/8 | 0.112 | 1 1/2 | 1820-0750.112 | ● | 1820-0750L112 | ● | 1820-0750D112 | ■ |
| NEW | 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 1820-0781.117 | ● | 1820-0781L117 | ● | 1820-0781D117 | ■ |
| | 0.0781 (5/64) | 1/8 | 0.125 | 1 1/2 | 1820-0781.125 | ● | 1820-0781L125 | ● | 1820-0781D125 | ■ |
| NEW | 0.0800 | 1/8 | 0.120 | 1 1/2 | 1820-0800.120 | ● | 1820-0800L120 | ● | 1820-0800D120 | ■ |
| NEW | 0.0850 | 1/8 | 0.127 | 1 1/2 | 1820-0850.127 | ● | 1820-0850L127 | ● | 1820-0850D127 | ■ |
| NEW | 0.0900 | 1/8 | 0.135 | 1 1/2 | 1820-0900.135 | ● | 1820-0900L135 | ● | 1820-0900D135 | ■ |
| | 0.0938 (3/32) | 1/8 | 0.141 | 1 1/2 | 1820-0938.141 | ● | 1820-0938L141 | ● | 1820-0938D141 | ■ |
| NEW | 0.0950 | 1/8 | 0.142 | 1 1/2 | 1820-0950.142 | ● | 1820-0950L142 | ● | 1820-0950D142 | ■ |
| NEW | 0.1000 | 1/8 | 0.150 | 1 1/2 | 1820-1000.150 | ● | 1820-1000L150 | ● | 1820-1000D150 | ■ |
| NEW | 0.1050 | 1/8 | 0.158 | 1 1/2 | 1820-1050.158 | ● | 1820-1050L158 | ● | 1820-1050D158 | ■ |
| | 0.1094 (7/64) | 1/8 | 0.172 | 1 1/2 | 1820-1094.172 | ● | 1820-1094L172 | ● | 1820-1094D172 | ■ |
| NEW | 0.1100 | 1/8 | 0.165 | 1 1/2 | 1820-1100.165 | ● | 1820-1100L165 | ● | 1820-1100D165 | ■ |
| NEW | 0.1150 | 1/8 | 0.173 | 1 1/2 | 1820-1150.173 | ● | 1820-1150L173 | ● | 1820-1150D173 | ■ |
| NEW | 0.1181 | 1/8 | 0.178 | 1 1/2 | 1820-1181.178 | ● | 1820-1181L178 | ● | 1820-1181D178 | ■ |
| NEW | 0.1200 | 1/8 | 0.180 | 1 1/2 | 1820-1200.180 | ● | 1820-1200L180 | ● | 1820-1200D180 | ■ |
| | 0.1250 (1/8) | 1/8 | 0.188 | 1 1/2 | 1820-1250.188 | ● | 1820-1250L188 | ● | 1820-1250D188 | ■ |
| | 0.1406 (9/64) | 3/16 | 0.313 | 2 | 1820-1406.313 | ● | 1820-1406L313 | ● | 1820-1406D313 | ■ |
| | 0.1563 (5/32) | 3/16 | 0.234 | 2 | 1820-1563.234 | ● | 1820-1563L234 | ● | 1820-1563D234 | ■ |
| | 0.1719 (11/64) | 3/16 | 0.375 | 2 | 1820-1719.375 | ● | 1820-1719L375 | ● | 1820-1719D375 | ■ |
| NEW | 0.1875 (3/16) | 3/16 | 0.312 | 2 | 1820-1875.312 | ● | 1820-1875L312 | ● | 1820-1875D312 | ■ |
| | 0.1875 (3/16) | 3/16 | 0.375 | 2 | 1820-1875.375 | ● | 1820-1875L375 | ● | 1820-1875D375 | ■ |
| | 0.2031 (13/64) | 1/4 | 0.438 | 2 1/2 | 1820-2031.438 | ● | 1820-2031L438 | ● | 1820-2031D438 | ■ |
| | 0.2188 (7/32) | 1/4 | 0.438 | 2 1/2 | 1820-2188.438 | ● | 1820-2188L438 | ● | 1820-2188D438 | ■ |
| | 0.2344 (15/64) | 1/4 | 0.500 | 2 1/2 | 1820-2344.500 | ● | 1820-2344L500 | ● | 1820-2344D500 | ■ |
| NEW | 0.2500 (1/4) | 1/4 | 0.375 | 2 1/2 | 1820-2500.375 | ● | 1820-2500L375 | ● | 1820-2500D375 | ■ |
| | 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | 1820-2500.500 | ● | 1820-2500L500 | ● | 1820-2500D500 | ■ |

| SERIES 1820 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|---------------------------------|--|---|---|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel 20HRC | Steel $30\text{--}40\text{HRC}$ | Hardened Steel $\sim 58\text{HRC}$ | Hardened Steel $\sim 60\text{HRC}$ | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

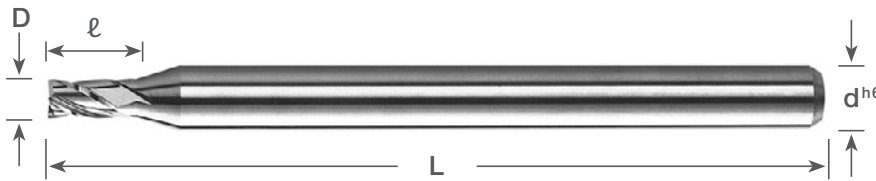
4 FLUTE

STUB LENGTH SQUARE END MILLS
GENERAL PURPOSE MACHINING

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|------|----|---------------|-------|---------------|-------|
| D ^{+0.00mm} _{-0.02mm} | d ^{h6} | l | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.15 | 38 | 1820-0039.006 | ● | 1820-0039L006 | ● |
| 0.15 | 3 | 0.23 | 38 | 1820-0059.009 | ● | 1820-0059L009 | ● |
| 0.20 | 3 | 0.30 | 38 | 1820-0079.012 | ● | 1820-0079L012 | ● |
| 0.25 | 3 | 0.38 | 38 | 1820-0098.015 | ● | 1820-0098L015 | ● |
| 0.30 | 3 | 0.45 | 38 | 1820-0118.018 | ● | 1820-0118L018 | ● |
| 0.35 | 3 | 0.53 | 38 | 1820-0138.021 | ● | 1820-0138L021 | ● |
| 0.40 | 3 | 0.60 | 38 | 1820-0157.024 | ● | 1820-0157L024 | ● |
| 0.45 | 3 | 0.68 | 38 | 1820-0177.027 | ● | 1820-0177L027 | ● |
| 0.50 | 3 | 0.75 | 38 | 1820-0197.030 | ● | 1820-0197L030 | ● |
| 0.60 | 3 | 0.90 | 38 | 1820-0236.035 | ● | 1820-0236L035 | ● |
| 0.70 | 3 | 1.05 | 38 | 1820-0276.041 | ● | 1820-0276L041 | ● |
| 0.80 | 3 | 1.20 | 38 | 1820-0315.047 | ● | 1820-0315L047 | ● |
| 0.90 | 3 | 1.35 | 38 | 1820-0354.053 | ● | 1820-0354L053 | ● |
| 1.00 | 3 | 1.50 | 38 | 1820-0394.059 | ● | 1820-0394L059 | ● |
| 1.10 | 3 | 1.50 | 38 | 1820-0433.059 | ● | 1820-0433L059 | ● |
| 1.20 | 3 | 1.50 | 38 | 1820-0472.059 | ● | 1820-0472L059 | ● |
| 1.30 | 3 | 2.25 | 38 | 1820-0512.089 | ● | 1820-0512L089 | ● |
| 1.40 | 3 | 2.25 | 38 | 1820-0551.089 | ● | 1820-0551L089 | ● |
| 1.50 | 3 | 2.25 | 38 | 1820-0591.089 | ● | 1820-0591L089 | ● |
| 1.60 | 3 | 2.25 | 38 | 1820-0630.089 | ● | 1820-0630L089 | ● |
| 1.70 | 3 | 2.25 | 38 | 1820-0669.089 | ● | 1820-0669L089 | ● |
| 1.80 | 3 | 3.00 | 38 | 1820-0709.118 | ● | 1820-0709L118 | ● |
| 1.90 | 3 | 3.00 | 38 | 1820-0748.118 | ● | 1820-0748L118 | ● |
| 2.00 | 3 | 3.00 | 38 | 1820-0787.118 | ● | 1820-0787L118 | ● |
| 2.50 | 3 | 3.75 | 38 | 1820-0984.148 | ● | 1820-0984L148 | ● |
| 2.80 | 3 | 4.50 | 38 | 1820-1102.177 | ● | 1820-1102L177 | ● |
| 3.00 | 3 | 4.50 | 38 | 1820-1181.177 | ● | 1820-1181L177 | ● |
| 3.50 | 4 | 5.25 | 50 | 1820-1378.207 | ● | 1820-1378L207 | ● |
| 3.80 | 5 | 6.00 | 50 | 1820-1496.236 | ● | 1820-1496L236 | ● |
| 4.00 | 5 | 6.00 | 50 | 1820-1575.236 | ● | 1820-1575L236 | ● |
| 4.50 | 5 | 6.75 | 50 | 1820-1772.266 | ● | 1820-1772L266 | ● |
| 4.80 | 5 | 7.50 | 50 | 1820-1890.295 | ● | 1820-1890L295 | ● |
| 5.00 | 5 | 7.50 | 50 | 1820-1968.295 | ● | 1820-1968L295 | ● |
| 5.50 | 6 | 8.25 | 50 | 1820-2165.325 | ● | 1820-2165L325 | ● |
| 5.80 | 6 | 9.00 | 50 | 1820-2283.354 | ● | 1820-2283L354 | ● |
| 6.00 | 6 | 9.00 | 50 | 1820-2362.354 | ● | 1820-2362L354 | ● |

| SERIES 1820 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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 INDEX

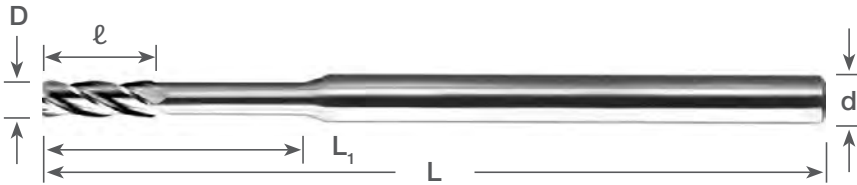
4 FLUTE

0.0100" - 0.0625" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | |
|---------------------------------------|-----|-------|-------|----------------|----------------|-------|----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 0.100 | 1840-0100.100 | ● | 1840-0100L100 | ● |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.128 | 1840-0150.128 | ● | 1840-0150L128 | ● |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.150 | 1840-0150.150 | ● | 1840-0150L150 | ● |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 0.120 | 1840-0156.120 | ● | 1840-0156L120 | ● |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.170 | 1840-0200.170 | ● | 1840-0200L170 | ● |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.200 | 1840-0200.200 | ● | 1840-0200L200 | ● |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.213 | 1840-0250.213 | ● | 1840-0250L213 | ● |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.250 | 1840-0250.250 | ● | 1840-0250L250 | ● |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.270 | 1840-0300.270 | ● | 1840-0300L270 | ● |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.300 | 1840-0300.300 | ● | 1840-0300L300 | ● |
| NEW 0.0312 (1/32) | 1/8 | 0.093 | 1 1/2 | 0.279 | 1840-0312.279 | ● | 1840-0312L279 | ● |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 0.315 | 1840-0312.315 | ● | 1840-0312L315 | ● |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.315 | 1840-0350.315 | ● | 1840-0350L315 | ● |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.350 | 1840-0350.350 | ● | 1840-0350L350 | ● |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.360 | 1840-0400.360 | ● | 1840-0400L360 | ● |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.400 | 1840-0400.400 | ● | 1840-0400L400 | ● |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.405 | 1840-0450.405 | ● | 1840-0450L405 | ● |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.450 | 1840-0450.450 | ● | 1840-0450L450 | ● |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.390 | 1840-0469.390 | ● | 1840-0469L390 | ● |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.423 | 1840-0469.423 | ● | 1840-0469L423 | ● |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.500 | 1840-0500.500 | ● | 1840-0500L500 | ● |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.500 | 1840-0550.500 | ● | 1840-0550L500 | ● |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.500 | 1840-0600.500 | ● | 1840-0600L500 | ● |
| 0.0600 | 1/8 | 0.180 | 2 | 0.600 | 1840-0600.600 | ● | 1840-0600L600 | ● |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.590 | 1840-0625.590A | ● | 1840-0625L590A | ● |
| 0.0625 (1/16) | 1/8 | 0.188 | 2 | 0.590 | 1840-0625.590 | ● | 1840-0625L590 | ● |

| SERIES 1840 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

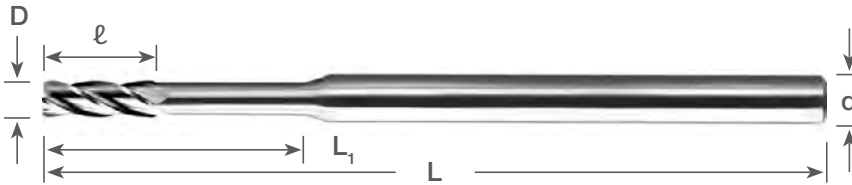
4 FLUTE

EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING

0.0650" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.500 | 1840-0650.500 | ● | 1840-0650L500 | ● |
| 0.0650 | 1/8 | 0.195 | 2 | 0.600 | 1840-0650.600 | ● | 1840-0650L600 | ● |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.500 | 1840-0700.500 | ● | 1840-0700L500 | ● |
| 0.0700 | 1/8 | 0.210 | 2 | 0.700 | 1840-0700.700 | ● | 1840-0700L700 | ● |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.500 | 1840-0750.500 | ● | 1840-0750L500 | ● |
| 0.0750 | 1/8 | 0.225 | 2 | 0.700 | 1840-0750.700 | ● | 1840-0750L700 | ● |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.590 | 1840-0781.590A | ● | 1840-0781L590A | ● |
| 0.0781 (5/64) | 1/8 | 0.234 | 2 | 0.590 | 1840-0781.590 | ● | 1840-0781L590 | ● |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.500 | 1840-0800.500 | ● | 1840-0800L500 | ● |
| 0.0800 | 1/8 | 0.240 | 2 | 0.750 | 1840-0800.750 | ● | 1840-0800L750 | ● |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.500 | 1840-0850.500 | ● | 1840-0850L500 | ● |
| 0.0850 | 1/8 | 0.255 | 2 | 0.750 | 1840-0850.750 | ● | 1840-0850L750 | ● |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.625 | 1840-0900.625 | ● | 1840-0900L625 | ● |
| 0.0900 | 1/8 | 0.270 | 2 | 0.750 | 1840-0900.750 | ● | 1840-0900L750 | ● |
| 0.0938 (3/32) | 1/8 | 0.281 | 2 | 0.590 | 1840-0938.590 | ● | 1840-0938L590 | ● |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.625 | 1840-0938.625 | ● | 1840-0938L625 | ● |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.625 | 1840-0950.625 | ● | 1840-0950L625 | ● |
| 0.0950 | 1/8 | 0.285 | 2 | 0.750 | 1840-0950.750 | ● | 1840-0950L750 | ● |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.625 | 1840-1000.625 | ● | 1840-1000L625 | ● |
| 0.1000 | 1/8 | 0.300 | 2 | 0.750 | 1840-1000.750 | ● | 1840-1000L750 | ● |
| 0.1094 (7/64) | 1/8 | 0.328 | 2 | 0.590 | 1840-1094.590 | ● | 1840-1094L590 | ● |
| 0.1100 | 1/8 | 0.330 | 2 | 0.750 | 1840-1100.750 | ● | 1840-1100L750 | ● |
| 0.1250 (1/8) | 1/8 | 0.375 | 2 | 0.590 | 1840-1250.590 | ● | 1840-1250L590 | ● |

| SERIES 1840 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
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- ▲ : Coming Soon

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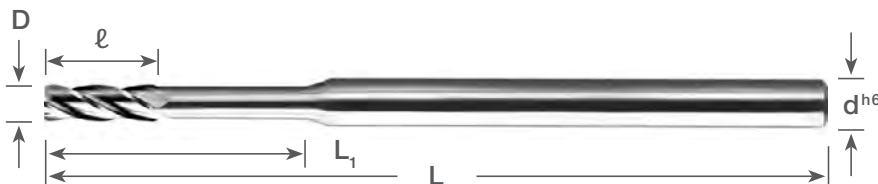
4 FLUTE

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

**EXTENDED REACH SQUARE END MILLS
DEEP REACH MILLING**



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|--------------------------------|-----------------|-------|----|----------------|----------------|-------|----------------|-------|
| D ^{+0.000 -0.001} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1.20 | 38 | 3 | 1840-0157.118 | ● | 1840-0157L118 | ● |
| 0.50 | 3 | 1.50 | 38 | 4 | 1840-0197.157 | ● | 1840-0197L157 | ● |
| 0.60 | 3 | 1.80 | 38 | 5 | 1840-0236.197 | ● | 1840-0236L197 | ● |
| 0.65 | 3 | 1.95 | 38 | 6 | 1840-0256.236 | ● | 1840-0256L236 | ● |
| 0.70 | 3 | 2.10 | 38 | 7 | 1840-0276.276 | ● | 1840-0276L276 | ● |
| 0.75 | 3 | 2.25 | 38 | 8 | 1840-0295.315 | ● | 1840-0295L315 | ● |
| 0.80 | 3 | 2.40 | 50 | 9 | 1840-0315.354 | ● | 1840-0315L354 | ● |
| 0.90 | 3 | 2.70 | 50 | 10 | 1840-0354.394 | ● | 1840-0354L394 | ● |
| 1.00 | 3 | 3.00 | 50 | 10 | 1840-0394.394 | ● | 1840-0394L394 | ● |
| 1.50 | 3 | 4.50 | 50 | 15 | 1840-0591.591 | ● | 1840-0591L591 | ● |
| 2.00 | 3 | 6.00 | 50 | 20 | 1840-0787.787 | ● | 1840-0787L787 | ● |
| 2.50 | 3 | 7.50 | 50 | 23 | 1840-0984.906 | ● | 1840-0984L906 | ● |
| 3.00 | 3 | 9.00 | 50 | 23 | 1840-1181.906 | ● | 1840-1181L906 | ● |
| 3.50 | 6 | 10.50 | 75 | 25 | 1840-1378.984 | ● | 1840-1378L984 | ● |
| 4.00 | 6 | 12.00 | 75 | 25 | 1840-1575.984 | ● | 1840-1575L984 | ● |
| 4.50 | 6 | 13.50 | 75 | 30 | 1840-1772.1181 | ● | 1840-1772L1181 | ● |
| 5.00 | 6 | 15.00 | 75 | 30 | 1840-1968.1181 | ● | 1840-1968L1181 | ● |
| 5.50 | 6 | 16.50 | 75 | 30 | 1840-2165.1181 | ● | 1840-2165L1181 | ● |
| 6.00 | 6 | 18.00 | 75 | 30 | 1840-2362.1181 | ● | 1840-2362L1181 | ● |

SERIES 1840 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

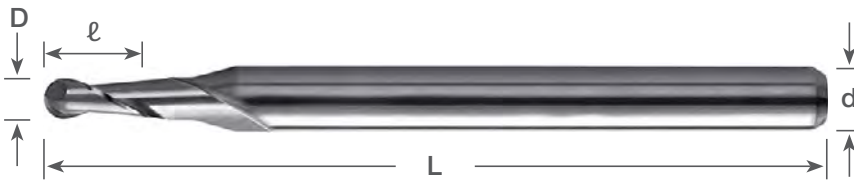
2 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.0050" - 0.0312" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | l | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0050 | 1/8 | 0.015 | 1 1/2 | 1625-0050.015 | ● | 1625-0050L015 | ● | - | - |
| NEW 0.0060 | 1/8 | 0.018 | 1 1/2 | 1625-0060.018 | ● | 1625-0060L018 | ● | - | - |
| NEW 0.0070 | 1/8 | 0.021 | 1 1/2 | 1625-0070.021 | ● | 1625-0070L021 | ● | - | - |
| NEW 0.0080 | 1/8 | 0.024 | 1 1/2 | 1625-0080.024 | ● | 1625-0080L024 | ● | - | - |
| NEW 0.0090 | 1/8 | 0.027 | 1 1/2 | 1625-0090.027 | ● | 1625-0090L027 | ● | - | - |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 1625-0100.030 | ● | 1625-0100L030 | ● | 1625-0100D030 | ■ |
| 0.0110 | 1/8 | 0.033 | 1 1/2 | 1625-0110.033 | ● | 1625-0110L033 | ● | - | - |
| 0.0120 | 1/8 | 0.036 | 1 1/2 | 1625-0120.036 | ● | 1625-0120L036 | ● | - | - |
| 0.0130 | 1/8 | 0.039 | 1 1/2 | 1625-0130.039 | ● | 1625-0130L039 | ● | - | - |
| 0.0140 | 1/8 | 0.042 | 1 1/2 | 1625-0140.042 | ● | 1625-0140L042 | ● | - | - |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 1625-0150.045 | ● | 1625-0150L045 | ● | 1625-0150D045 | ■ |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 1625-0156.047 | ● | 1625-0156L047 | ● | 1625-0156D047 | ■ |
| 0.0160 | 1/8 | 0.048 | 1 1/2 | 1625-0160.048 | ● | 1625-0160L048 | ● | - | - |
| 0.0170 | 1/8 | 0.051 | 1 1/2 | 1625-0170.051 | ● | 1625-0170L051 | ● | - | - |
| 0.0180 | 1/8 | 0.054 | 1 1/2 | 1625-0180.054 | ● | 1625-0180L054 | ● | - | - |
| 0.0190 | 1/8 | 0.057 | 1 1/2 | 1625-0190.057 | ● | 1625-0190L057 | ● | - | - |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 1625-0200.060 | ● | 1625-0200L060 | ● | 1625-0200D060 | ■ |
| 0.0210 | 1/8 | 0.063 | 1 1/2 | 1625-0210.063 | ● | 1625-0210L063 | ● | - | - |
| 0.0220 | 1/8 | 0.066 | 1 1/2 | 1625-0220.066 | ● | 1625-0220L066 | ● | - | - |
| 0.0230 | 1/8 | 0.069 | 1 1/2 | 1625-0230.069 | ● | 1625-0230L069 | ● | - | - |
| 0.0240 | 1/8 | 0.072 | 1 1/2 | 1625-0240.072 | ● | 1625-0240L072 | ● | - | - |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 1625-0250.075 | ● | 1625-0250L075 | ● | 1625-0250D075 | ■ |
| 0.0260 | 1/8 | 0.078 | 1 1/2 | 1625-0260.078 | ● | 1625-0260L078 | ● | - | - |
| 0.0270 | 1/8 | 0.081 | 1 1/2 | 1625-0270.081 | ● | 1625-0270L081 | ● | - | - |
| 0.0280 | 1/8 | 0.084 | 1 1/2 | 1625-0280.084 | ● | 1625-0280L084 | ● | - | - |
| 0.0290 | 1/8 | 0.087 | 1 1/2 | 1625-0290.087 | ● | 1625-0290L087 | ● | - | - |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 1625-0300.090 | ● | 1625-0300L090 | ● | 1625-0300D090 | ■ |
| 0.0310 | 1/8 | 0.093 | 1 1/2 | 1625-0310.093 | ● | 1625-0310L093 | ● | - | - |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 1625-0312.094 | ● | 1625-0312L094 | ● | 1625-0312D094 | ■ |

| SERIES 1625 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
 ■ : NOT STOCKED - Call for Delivery
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 INDEX

2 FLUTE

0.0320" - 0.0600" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH BALL NOSE END MILLS



STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0320 | 1/8 | 0.096 | 1 1/2 | 1625-0320.096 | ● | 1625-0320L096 | ● | - | - |
| 0.0330 | 1/8 | 0.099 | 1 1/2 | 1625-0330.099 | ● | 1625-0330L099 | ● | - | - |
| 0.0340 | 1/8 | 0.102 | 1 1/2 | 1625-0340.102 | ● | 1625-0340L102 | ● | - | - |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 1625-0350.105 | ● | 1625-0350L105 | ● | 1625-0350D105 | ■ |
| NEW 0.0360 | 1/8 | 0.108 | 1 1/2 | 1625-0360.108 | ● | 1625-0360L108 | ● | - | - |
| NEW 0.0370 | 1/8 | 0.111 | 1 1/2 | 1625-0370.111 | ● | 1625-0370L111 | ● | - | - |
| NEW 0.0380 | 1/8 | 0.114 | 1 1/2 | 1625-0380.114 | ● | 1625-0380L114 | ● | - | - |
| NEW 0.0394 | 1/8 | 0.117 | 1 1/2 | 1625-0394.117 | ● | 1625-0394L117 | ● | 1625-0394D117 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 1625-0400.120 | ● | 1625-0400L120 | ● | 1625-0400D120 | ■ |
| NEW 0.0410 | 1/8 | 0.123 | 1 1/2 | 1625-0410.123 | ● | 1625-0410L123 | ● | - | - |
| NEW 0.0420 | 1/8 | 0.126 | 1 1/2 | 1625-0420.126 | ● | 1625-0420L126 | ● | - | - |
| NEW 0.0430 | 1/8 | 0.129 | 1 1/2 | 1625-0430.129 | ● | 1625-0430L129 | ● | - | - |
| NEW 0.0440 | 1/8 | 0.132 | 1 1/2 | 1625-0440.132 | ● | 1625-0440L132 | ● | - | - |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 1625-0450.135 | ● | 1625-0450L135 | ● | 1625-0450D135 | ■ |
| NEW 0.0460 | 1/8 | 0.138 | 1 1/2 | 1625-0460.138 | ● | 1625-0460L138 | ● | - | - |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 1625-0469.141 | ● | 1625-0469L141 | ● | 1625-0469D141 | ■ |
| NEW 0.0480 | 1/8 | 0.144 | 1 1/2 | 1625-0480.144 | ● | 1625-0480L144 | ● | - | - |
| NEW 0.0490 | 1/8 | 0.147 | 1 1/2 | 1625-0490.147 | ● | 1625-0490L147 | ● | - | - |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 1625-0500.150 | ● | 1625-0500L150 | ● | 1625-0500D150 | ■ |
| NEW 0.0510 | 1/8 | 0.153 | 1 1/2 | 1625-0510.153 | ● | 1625-0510L153 | ● | - | - |
| NEW 0.0520 | 1/8 | 0.156 | 1 1/2 | 1625-0520.156 | ● | 1625-0520L156 | ● | - | - |
| NEW 0.0530 | 1/8 | 0.159 | 1 1/2 | 1625-0530.159 | ● | 1625-0530L159 | ● | - | - |
| NEW 0.0540 | 1/8 | 0.162 | 1 1/2 | 1625-0540.162 | ● | 1625-0540L162 | ● | - | - |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 1625-0550.165 | ● | 1625-0550L165 | ● | 1625-0550D165 | ■ |
| NEW 0.0560 | 1/8 | 0.168 | 1 1/2 | 1625-0560.168 | ● | 1625-0560L168 | ● | - | - |
| NEW 0.0570 | 1/8 | 0.171 | 1 1/2 | 1625-0570.171 | ● | 1625-0570L171 | ● | - | - |
| NEW 0.0580 | 1/8 | 0.174 | 1 1/2 | 1625-0580.174 | ● | 1625-0580L174 | ● | - | - |
| NEW 0.0590 | 1/8 | 0.177 | 1 1/2 | 1625-0590.177 | ● | 1625-0590L177 | ● | - | - |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 1625-0600.180 | ● | 1625-0600L180 | ● | 1625-0600D180 | ■ |

SERIES 1625 WORKPIECE MATERIAL

| Coating | P Steel -20HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

2 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.0625" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.188 | 1 1/2 | 1625-0625.188 | ● | 1625-0625L188 | ● | 1625-0625D188 | ■ |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 1625-0650.195 | ● | 1625-0650L195 | ● | 1625-0650D195 | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 1625-0700.210 | ● | 1625-0700L210 | ● | 1625-0700D210 | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 1625-0750.225 | ● | 1625-0750L225 | ● | 1625-0750D225 | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 1625-0781.234 | ● | 1625-0781L234 | ● | 1625-0781D234 | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 1625-0800.240 | ● | 1625-0800L240 | ● | 1625-0800D240 | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 1625-0850.255 | ● | 1625-0850L255 | ● | 1625-0850D255 | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 1625-0900.270 | ● | 1625-0900L270 | ● | 1625-0900D270 | ■ |
| 0.0938 (3/32) | 1/8 | 0.281 | 1 1/2 | 1625-0938.281 | ● | 1625-0938L281 | ● | 1625-0938D281 | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 1625-0950.285 | ● | 1625-0950L285 | ● | 1625-0950D285 | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 1625-1000.300 | ● | 1625-1000L300 | ● | 1625-1000D300 | ■ |
| NEW 0.1050 | 1/8 | 0.315 | 1 1/2 | 1625-1050.315 | ● | 1625-1050L315 | ● | 1625-1050D315 | ■ |
| 0.1094 (7/64) | 1/8 | 0.328 | 1 1/2 | 1625-1094.328 | ● | 1625-1094L328 | ● | 1625-1094D328 | ■ |
| NEW 0.1100 | 1/8 | 0.330 | 1 1/2 | 1625-1100.330 | ● | 1625-1100L330 | ● | 1625-1100D330 | ■ |
| NEW 0.1150 | 1/8 | 0.345 | 1 1/2 | 1625-1150.345 | ● | 1625-1150L345 | ● | 1625-1150D345 | ■ |
| NEW 0.1181 | 1/8 | 0.355 | 1 1/2 | 1625-1181.355 | ● | 1625-1181L355 | ● | 1625-1181D355 | ■ |
| NEW 0.1200 | 1/8 | 0.360 | 1 1/2 | 1625-1200.360 | ● | 1625-1200L360 | ● | 1625-1200D360 | ■ |
| 0.1250 (1/8) | 1/8 | 0.375 | 1 1/2 | 1625-1250.375 | ● | 1625-1250L375 | ● | 1625-1250D375 | ■ |
| 0.1406 (9/64) | 3/16 | 0.500 | 2 | 1625-1406.500 | ● | 1625-1406L500 | ● | 1625-1406D500 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 1625-1562.562 | ● | 1625-1562L562 | ● | 1625-1562D562 | ■ |
| 0.1563 (5/32) | 3/16 | 0.500 | 2 | 1625-1563.500 | ● | 1625-1563L500 | ● | 1625-1563D500 | ■ |
| 0.1719 (11/64) | 3/16 | 0.563 | 2 | 1625-1719.563 | ● | 1625-1719L563 | ● | 1625-1719D563 | ■ |
| 0.1875 (3/16) | 3/16 | 0.563 | 2 | 1625-1875.563 | ● | 1625-1875L563 | ● | 1625-1875D563 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 1625-1875.625 | ● | 1625-1875L625 | ● | 1625-1875D625 | ■ |
| 0.2031 (13/64) | 1/4 | 0.625 | 2 1/2 | 1625-2031.625 | ● | 1625-2031L625 | ● | 1625-2031D625 | ■ |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 1625-2188.625 | ● | 1625-2188L625 | ● | 1625-2188D625 | ■ |
| 0.2344 (15/64) | 1/4 | 0.750 | 2 1/2 | 1625-2344.750 | ● | 1625-2344L750 | ● | 1625-2344D750 | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 1625-2500.750 | ● | 1625-2500L750 | ● | 1625-2500D750 | ■ |

| SERIES 1625 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
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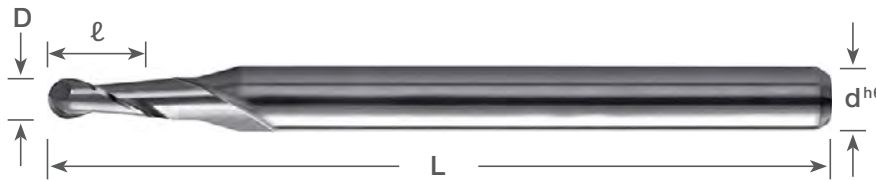
2 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|-------|----|---------------|-------|---------------|-------|
| D <small>+0.00mm -0.02mm</small> | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.30 | 38 | 1625-0039.012 | ● | 1625-0039L012 | ● |
| 0.15 | 3 | 0.45 | 38 | 1625-0059.018 | ● | 1625-0059L018 | ● |
| 0.20 | 3 | 0.60 | 38 | 1625-0079.024 | ● | 1625-0079L024 | ● |
| 0.25 | 3 | 0.75 | 38 | 1625-0098.029 | ● | 1625-0098L029 | ● |
| 0.30 | 3 | 0.90 | 38 | 1625-0118.035 | ● | 1625-0118L035 | ● |
| 0.35 | 3 | 1.05 | 38 | 1625-0138.041 | ● | 1625-0138L041 | ● |
| 0.40 | 3 | 1.20 | 38 | 1625-0157.047 | ● | 1625-0157L047 | ● |
| 0.45 | 3 | 1.35 | 38 | 1625-0177.053 | ● | 1625-0177L053 | ● |
| 0.50 | 3 | 1.50 | 38 | 1625-0197.059 | ● | 1625-0197L059 | ● |
| 0.60 | 3 | 1.80 | 38 | 1625-0236.071 | ● | 1625-0236L071 | ● |
| 0.70 | 3 | 2.10 | 38 | 1625-0276.083 | ● | 1625-0276L083 | ● |
| 0.80 | 3 | 2.40 | 38 | 1625-0315.095 | ● | 1625-0315L095 | ● |
| 0.90 | 3 | 2.70 | 38 | 1625-0354.106 | ● | 1625-0354L106 | ● |
| 1.00 | 3 | 3.00 | 38 | 1625-0394.118 | ● | 1625-0394L118 | ● |
| 1.10 | 3 | 3.30 | 38 | 1625-0433.130 | ● | 1625-0433L130 | ● |
| 1.20 | 3 | 3.60 | 38 | 1625-0472.142 | ● | 1625-0472L142 | ● |
| 1.30 | 3 | 3.90 | 38 | 1625-0512.154 | ● | 1625-0512L154 | ● |
| 1.40 | 3 | 4.20 | 38 | 1625-0551.165 | ● | 1625-0551L165 | ● |
| 1.50 | 3 | 4.50 | 38 | 1625-0591.177 | ● | 1625-0591L177 | ● |
| 1.60 | 3 | 4.80 | 38 | 1625-0630.189 | ● | 1625-0630L189 | ● |
| 1.70 | 3 | 5.10 | 38 | 1625-0669.201 | ● | 1625-0669L201 | ● |
| 1.80 | 3 | 5.40 | 38 | 1625-0709.213 | ● | 1625-0709L213 | ● |
| 1.90 | 3 | 5.70 | 38 | 1625-0748.224 | ● | 1625-0748L224 | ● |
| 2.00 | 3 | 6.00 | 38 | 1625-0787.236 | ● | 1625-0787L236 | ● |
| 2.50 | 3 | 7.50 | 38 | 1625-0984.295 | ● | 1625-0984L295 | ● |
| 3.00 | 3 | 9.00 | 38 | 1625-1181.354 | ● | 1625-1181L354 | ● |
| 3.50 | 4 | 10.50 | 50 | 1625-1378.413 | ● | 1625-1378L413 | ● |
| 4.00 | 5 | 12.00 | 50 | 1625-1575.473 | ● | 1625-1575L473 | ● |
| 4.50 | 5 | 13.50 | 50 | 1625-1772.532 | ● | 1625-1772L532 | ● |
| 5.00 | 5 | 15.00 | 50 | 1625-1968.590 | ● | 1625-1968L590 | ● |
| 5.50 | 6 | 16.50 | 50 | 1625-2165.650 | ● | 1625-2165L650 | ● |
| 6.00 | 6 | 18.00 | 50 | 1625-2362.709 | ● | 1625-2362L709 | ● |

SERIES 1625 WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

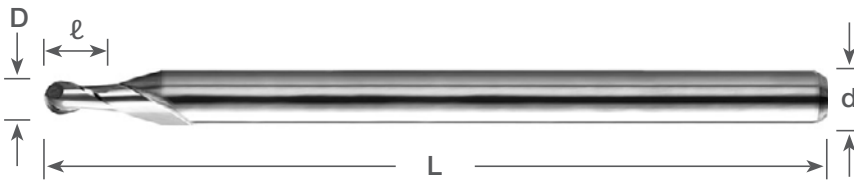
2 FLUTE

STUB LENGTH BALL NOSE END MILLS

0.0050" - 0.0350" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0050 | 1/8 | 0.007 | 1 1/2 | 1635-0050.007 | ● | 1635-0050L007 | ● | - | - |
| NEW 0.0060 | 1/8 | 0.009 | 1 1/2 | 1635-0060.009 | ● | 1635-0060L009 | ● | - | - |
| NEW 0.0070 | 1/8 | 0.010 | 1 1/2 | 1635-0070.010 | ● | 1635-0070L010 | ● | - | - |
| NEW 0.0080 | 1/8 | 0.012 | 1 1/2 | 1635-0080.012 | ● | 1635-0080L012 | ● | - | - |
| NEW 0.0090 | 1/8 | 0.013 | 1 1/2 | 1635-0090.013 | ● | 1635-0090L013 | ● | - | - |
| 0.0100 | 1/8 | 0.015 | 1 1/2 | 1635-0100.015 | ● | 1635-0100L015 | ● | 1635-0100D015 | ■ |
| 0.0110 | 1/8 | 0.016 | 1 1/2 | 1635-0110.016 | ● | 1635-0110L016 | ● | - | - |
| 0.0120 | 1/8 | 0.018 | 1 1/2 | 1635-0120.018 | ● | 1635-0120L018 | ● | - | - |
| 0.0130 | 1/8 | 0.019 | 1 1/2 | 1635-0130.019 | ● | 1635-0130L019 | ● | - | - |
| 0.0140 | 1/8 | 0.021 | 1 1/2 | 1635-0140.021 | ● | 1635-0140L021 | ● | - | - |
| 0.0150 | 1/8 | 0.023 | 1 1/2 | 1635-0150.023 | ● | 1635-0150L023 | ● | 1635-0150D023 | ■ |
| 0.0156 (1/64) | 1/8 | 0.023 | 1 1/2 | 1635-0156.023 | ● | 1635-0156L023 | ● | - | - |
| 0.0160 | 1/8 | 0.024 | 1 1/2 | 1635-0160.024 | ● | 1635-0160L024 | ● | - | - |
| 0.0170 | 1/8 | 0.025 | 1 1/2 | 1635-0170.025 | ● | 1635-0170L025 | ● | - | - |
| 0.0180 | 1/8 | 0.027 | 1 1/2 | 1635-0180.027 | ● | 1635-0180L027 | ● | - | - |
| 0.0190 | 1/8 | 0.028 | 1 1/2 | 1635-0190.028 | ● | 1635-0190L028 | ● | - | - |
| 0.0200 | 1/8 | 0.030 | 1 1/2 | 1635-0200.030 | ● | 1635-0200L030 | ● | 1635-0200D030 | ■ |
| 0.0210 | 1/8 | 0.031 | 1 1/2 | 1635-0210.031 | ● | 1635-0210L031 | ● | - | - |
| 0.0220 | 1/8 | 0.033 | 1 1/2 | 1635-0220.033 | ● | 1635-0220L033 | ● | - | - |
| 0.0230 | 1/8 | 0.034 | 1 1/2 | 1635-0230.034 | ● | 1635-0230L034 | ● | - | - |
| 0.0240 | 1/8 | 0.036 | 1 1/2 | 1635-0240.036 | ● | 1635-0240L036 | ● | - | - |
| 0.0250 | 1/8 | 0.038 | 1 1/2 | 1635-0250.038 | ● | 1635-0250L038 | ● | 1635-0250D038 | ■ |
| 0.0260 | 1/8 | 0.039 | 1 1/2 | 1635-0260.039 | ● | 1635-0260L039 | ● | - | - |
| 0.0270 | 1/8 | 0.040 | 1 1/2 | 1635-0270.040 | ● | 1635-0270L040 | ● | - | - |
| 0.0280 | 1/8 | 0.042 | 1 1/2 | 1635-0280.042 | ● | 1635-0280L042 | ● | - | - |
| 0.0290 | 1/8 | 0.043 | 1 1/2 | 1635-0290.043 | ● | 1635-0290L043 | ● | - | - |
| 0.0300 | 1/8 | 0.045 | 1 1/2 | 1635-0300.045 | ● | 1635-0300L045 | ● | 1635-0300D045 | ■ |
| 0.0310 | 1/8 | 0.047 | 1 1/2 | 1635-0310.047 | ● | 1635-0310L047 | ● | - | - |
| 0.0312 (1/32) | 1/8 | 0.047 | 1 1/2 | 1635-0312.047 | ● | 1635-0312L047 | ● | - | - |
| 0.0320 | 1/8 | 0.048 | 1 1/2 | 1635-0320.048 | ● | 1635-0320L048 | ● | - | - |
| 0.0330 | 1/8 | 0.050 | 1 1/2 | 1635-0330.050 | ● | 1635-0330L050 | ● | - | - |
| 0.0340 | 1/8 | 0.051 | 1 1/2 | 1635-0340.051 | ● | 1635-0340L051 | ● | - | - |
| 0.0350 | 1/8 | 0.053 | 1 1/2 | 1635-0350.053 | ● | 1635-0350L053 | ● | 1635-0350D053 | ■ |

| SERIES 1635 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
 ■ : NOT STOCKED - Call for Delivery
 ▲ : Coming Soon

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 (International) 001.714.428.3636
 Pricing & Availability at KyoceraPrecisionTools.com

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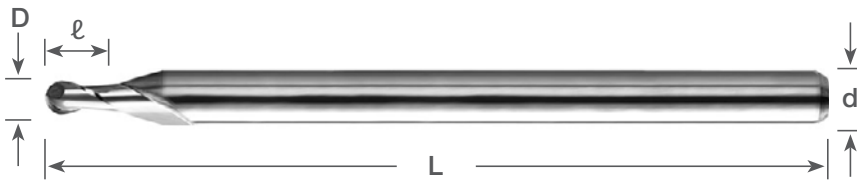
2 FLUTE

0.0360" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0360 | 1/8 | 0.054 | 1 1/2 | 1635-0360.054 | ● | 1635-0360L054 | ● | 1635-0360D054 | ■ |
| NEW 0.0370 | 1/8 | 0.055 | 1 1/2 | 1635-0370.055 | ● | 1635-0370L055 | ● | 1635-0370D055 | ■ |
| NEW 0.0380 | 1/8 | 0.057 | 1 1/2 | 1635-0380.057 | ● | 1635-0380L057 | ● | 1635-0380D057 | ■ |
| NEW 0.0394 | 1/8 | 0.058 | 1 1/2 | 1635-0394.058 | ● | 1635-0394L058 | ● | 1635-0394D058 | ■ |
| 0.0400 | 1/8 | 0.060 | 1 1/2 | 1635-0400.060 | ● | 1635-0400L060 | ● | 1635-0400D060 | ■ |
| 0.0450 | 1/8 | 0.068 | 1 1/2 | 1635-0450.068 | ● | 1635-0450L068 | ● | 1635-0450D068 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 1 1/2 | 1635-0469.070 | ● | 1635-0469L070 | ● | 1635-0469D070 | ■ |
| 0.0500 | 1/8 | 0.075 | 1 1/2 | 1635-0500.075 | ● | 1635-0500L075 | ● | 1635-0500D075 | ■ |
| 0.0550 | 1/8 | 0.083 | 1 1/2 | 1635-0550.083 | ● | 1635-0550L083 | ● | 1635-0550D083 | ■ |
| 0.0600 | 1/8 | 0.090 | 1 1/2 | 1635-0600.090 | ● | 1635-0600L090 | ● | 1635-0600D090 | ■ |
| 0.0625 (1/16) | 1/8 | 0.094 | 1 1/2 | 1635-0625.094 | ● | 1635-0625L094 | ● | 1635-0625D094 | ■ |
| 0.0650 | 1/8 | 0.098 | 1 1/2 | 1635-0650.098 | ● | 1635-0650L098 | ● | 1635-0650D098 | ■ |
| 0.0700 | 1/8 | 0.105 | 1 1/2 | 1635-0700.105 | ● | 1635-0700L105 | ● | 1635-0700D105 | ■ |
| 0.0750 | 1/8 | 0.113 | 1 1/2 | 1635-0750.113 | ● | 1635-0750L113 | ● | 1635-0750D113 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 1635-0781.117 | ● | 1635-0781L117 | ● | 1635-0781D117 | ■ |
| 0.0800 | 1/8 | 0.120 | 1 1/2 | 1635-0800.120 | ● | 1635-0800L120 | ● | 1635-0800D120 | ■ |
| 0.0850 | 1/8 | 0.128 | 1 1/2 | 1635-0850.128 | ● | 1635-0850L128 | ● | 1635-0850D128 | ■ |
| 0.0900 | 1/8 | 0.135 | 1 1/2 | 1635-0900.135 | ● | 1635-0900L135 | ● | 1635-0900D135 | ■ |
| 0.0938 (3/32) | 1/8 | 0.141 | 1 1/2 | 1635-0938.141 | ● | 1635-0938L141 | ● | 1635-0938D141 | ■ |
| 0.0950 | 1/8 | 0.143 | 1 1/2 | 1635-0950.143 | ● | 1635-0950L143 | ● | 1635-0950D143 | ■ |
| 0.1000 | 1/8 | 0.150 | 1 1/2 | 1635-1000.150 | ● | 1635-1000L150 | ● | 1635-1000D150 | ■ |
| 0.1094 (7/64) | 1/8 | 0.164 | 1 1/2 | 1635-1094.164 | ● | 1635-1094L164 | ● | 1635-1094D164 | ■ |
| NEW 0.1181 | 1/8 | 0.178 | 1 1/2 | 1635-1181.178 | ● | 1635-1181L178 | ● | 1635-1181D178 | ■ |
| 0.1250 (1/8) | 1/8 | 0.188 | 1 1/2 | 1635-1250.188 | ● | 1635-1250L188 | ● | 1635-1250D188 | ■ |
| 0.1406 (9/64) | 3/16 | 0.313 | 2 | 1635-1406.313 | ● | 1635-1406L313 | ● | 1635-1406D313 | ■ |
| 0.1563 (5/32) | 3/16 | 0.313 | 2 | 1635-1563.313 | ● | 1635-1563L313 | ● | 1635-1563D313 | ■ |
| 0.1719 (11/64) | 3/16 | 0.375 | 2 | 1635-1719.375 | ● | 1635-1719L375 | ● | 1635-1719D375 | ■ |
| 0.1875 (3/16) | 3/16 | 0.375 | 2 | 1635-1875.375 | ● | 1635-1875L375 | ● | 1635-1875D375 | ■ |
| 0.2031 (13/64) | 1/4 | 0.438 | 2 1/2 | 1635-2031.438 | ● | 1635-2031L438 | ● | 1635-2031D438 | ■ |
| 0.2188 (7/32) | 1/4 | 0.438 | 2 1/2 | 1635-2188.438 | ● | 1635-2188L438 | ● | 1635-2188D438 | ■ |
| 0.2344 (15/64) | 1/4 | 0.500 | 2 1/2 | 1635-2344.500 | ● | 1635-2344L500 | ● | 1635-2344D500 | ■ |
| 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | 1635-2500.500 | ● | 1635-2500L500 | ● | 1635-2500D500 | ■ |

SERIES 1635 WORKPIECE MATERIAL

| Coating | P [★] Steel ~20HRC | P [★] Steel 30~40HRC | H [★] Hardened Steel ~50HRC | H [★] Hardened Steel ~55HRC | M [★] Stainless Steel | K [★] Cast Iron | N [★] Aluminum | N [★] Graphite | N [★] Copper Alloy | N [★] CFRP | N [★] Plastic | N [★] Thermoset Plastic | N [★] High Density Plastic | S [★] Nickel / Cobalt | S [★] Titanium Alloy |
|----------|-----------------------------------|-------------------------------------|--|--|-----------------------------------|-----------------------------|----------------------------|----------------------------|--------------------------------|------------------------|---------------------------|-------------------------------------|--|-----------------------------------|----------------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

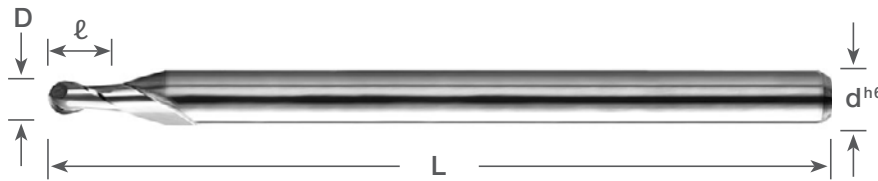
2 FLUTE

STUB LENGTH SQUARE END MILLS

0.10mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STUB Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|------|----|---------------|-------|---------------|-------|
| D ^{+0.00mm} _{-0.02mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.10 | 3 | 0.15 | 38 | 1635-0039.006 | ● | 1635-0039L006 | ● |
| 0.15 | 3 | 0.23 | 38 | 1635-0059.009 | ● | 1635-0059L009 | ● |
| 0.20 | 3 | 0.30 | 38 | 1635-0079.012 | ● | 1635-0079L012 | ● |
| 0.25 | 3 | 0.38 | 38 | 1635-0098.015 | ● | 1635-0098L015 | ● |
| 0.30 | 3 | 0.45 | 38 | 1635-0118.018 | ● | 1635-0118L018 | ● |
| 0.35 | 3 | 0.53 | 38 | 1635-0138.021 | ● | 1635-0138L021 | ● |
| 0.40 | 3 | 0.60 | 38 | 1635-0157.024 | ● | 1635-0157L024 | ● |
| 0.45 | 3 | 0.68 | 38 | 1635-0177.027 | ● | 1635-0177L027 | ● |
| 0.50 | 3 | 0.75 | 38 | 1635-0197.030 | ● | 1635-0197L030 | ● |
| 0.60 | 3 | 0.90 | 38 | 1635-0236.035 | ● | 1635-0236L035 | ● |
| 0.70 | 3 | 1.05 | 38 | 1635-0276.041 | ● | 1635-0276L041 | ● |
| 0.80 | 3 | 1.20 | 38 | 1635-0315.047 | ● | 1635-0315L047 | ● |
| 0.90 | 3 | 1.35 | 38 | 1635-0354.053 | ● | 1635-0354L053 | ● |
| 1.00 | 3 | 1.50 | 38 | 1635-0394.059 | ● | 1635-0394L059 | ● |
| 1.10 | 3 | 1.65 | 38 | 1635-0433.065 | ● | 1635-0433L065 | ● |
| 1.20 | 3 | 1.80 | 38 | 1635-0472.071 | ● | 1635-0472L071 | ● |
| 1.30 | 3 | 1.95 | 38 | 1635-0512.077 | ● | 1635-0512L077 | ● |
| 1.40 | 3 | 2.10 | 38 | 1635-0551.083 | ● | 1635-0551L083 | ● |
| 1.50 | 3 | 2.25 | 38 | 1635-0591.089 | ● | 1635-0591L089 | ● |
| 1.60 | 3 | 2.40 | 38 | 1635-0630.095 | ● | 1635-0630L095 | ● |
| 1.70 | 3 | 2.50 | 38 | 1635-0669.098 | ● | 1635-0669L098 | ● |
| 1.80 | 3 | 2.70 | 38 | 1635-0709.106 | ● | 1635-0709L106 | ● |
| 1.90 | 3 | 2.85 | 38 | 1635-0748.112 | ● | 1635-0748L112 | ● |
| 2.00 | 3 | 3.00 | 38 | 1635-0787.118 | ● | 1635-0787L118 | ● |
| 2.50 | 3 | 3.75 | 38 | 1635-0984.148 | ● | 1635-0984L148 | ● |
| 3.00 | 3 | 4.50 | 38 | 1635-1181.177 | ● | 1635-1181L177 | ● |
| 3.50 | 4 | 5.25 | 50 | 1635-1378.207 | ● | 1635-1378L207 | ● |
| 4.00 | 5 | 6.00 | 50 | 1635-1575.236 | ● | 1635-1575L236 | ● |
| 4.50 | 5 | 6.75 | 50 | 1635-1772.266 | ● | 1635-1772L266 | ● |
| 5.00 | 5 | 7.50 | 50 | 1635-1968.295 | ● | 1635-1968L295 | ● |
| 5.50 | 6 | 8.25 | 50 | 1635-2165.325 | ● | 1635-2165L325 | ● |
| 6.00 | 6 | 9.00 | 50 | 1635-2362.354 | ● | 1635-2362L354 | ● |

| SERIES 1635 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
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- ▲ : Coming Soon

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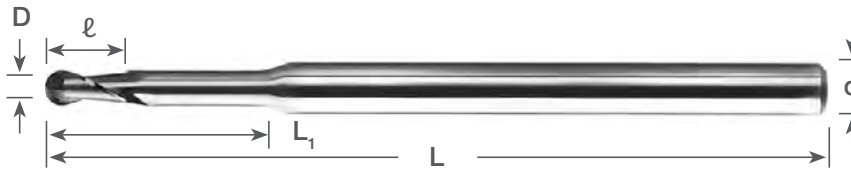
2 FLUTE

0.0100" - 0.0625" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH BALL NOSE END MILLS



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|----------------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 0.100 | 1645-0100.100 | ● | 1645-0100L100 | ● | 1645-0100D100 | ■ |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.128 | 1645-0150.128 | ● | 1645-0150L128 | ● | 1645-0150D128 | ■ |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.150 | 1645-0150.150 | ● | 1645-0150L150 | ● | 1645-0150D150 | ■ |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 0.120 | 1645-0156.120 | ● | 1645-0156L120 | ● | 1645-0156D120 | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.170 | 1645-0200.170 | ● | 1645-0200L170 | ● | 1645-0200D170 | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.200 | 1645-0200.200 | ● | 1645-0200L200 | ● | 1645-0200D200 | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.213 | 1645-0250.213 | ● | 1645-0250L213 | ● | 1645-0250D213 | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.250 | 1645-0250.250 | ● | 1645-0250L250 | ● | 1645-0250D250 | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.270 | 1645-0300.270 | ● | 1645-0300L270 | ● | 1645-0300D270 | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.300 | 1645-0300.300 | ● | 1645-0300L300 | ● | 1645-0300D300 | ■ |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 0.315 | 1645-0312.315 | ● | 1645-0312L315 | ● | 1645-0312D315 | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.315 | 1645-0350.315 | ● | 1645-0350L315 | ● | 1645-0350D315 | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.350 | 1645-0350.350 | ● | 1645-0350L350 | ● | 1645-0350D350 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.360 | 1645-0400.360 | ● | 1645-0400L360 | ● | 1645-0400D360 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.400 | 1645-0400.400 | ● | 1645-0400L400 | ● | 1645-0400D400 | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.405 | 1645-0450.405 | ● | 1645-0450L405 | ● | 1645-0450D405 | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.450 | 1645-0450.450 | ● | 1645-0450L450 | ● | 1645-0450D450 | ■ |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.390 | 1645-0469.390 | ● | 1645-0469L390 | ● | 1645-0469D390 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.423 | 1645-0469.423 | ● | 1645-0469L423 | ● | 1645-0469D423 | ■ |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.500 | 1645-0500.500 | ● | 1645-0500L500 | ● | 1645-0500D500 | ■ |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.500 | 1645-0550.500 | ● | 1645-0550L500 | ● | 1645-0550D500 | ■ |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.500 | 1645-0600.500 | ● | 1645-0600L500 | ● | 1645-0600D500 | ■ |
| 0.0600 | 1/8 | 0.180 | 2 | 0.600 | 1645-0600.600 | ● | 1645-0600L600 | ● | 1645-0600D600 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.590 | 1645-0625.590A | ● | 1645-0625L590A | ● | 1645-0625D590A | ■ |
| 0.0625 (1/16) | 1/8 | 0.188 | 2 | 0.590 | 1645-0625.590 | ● | 1645-0625L590 | ● | 1645-0625D590 | ■ |

SERIES 1645 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

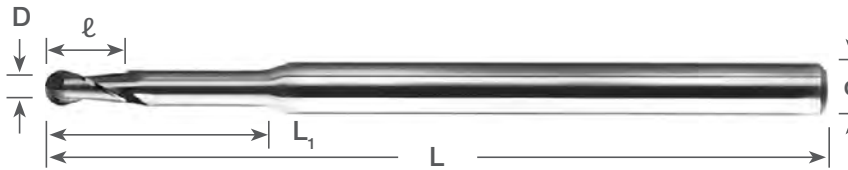
2 FLUTE

EXTENDED REACH BALL NOSE END MILLS

0.0650" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.500 | 1645-0650.500 | ● | 1645-0650L500 | ● | 1645-0650D500 | ■ |
| 0.0650 | 1/8 | 0.195 | 2 | 0.600 | 1645-0650.600 | ● | 1645-0650L600 | ● | 1645-0650D600 | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.500 | 1645-0700.500 | ● | 1645-0700L500 | ● | 1645-0700D500 | ■ |
| 0.0700 | 1/8 | 0.210 | 2 | 0.700 | 1645-0700.700 | ● | 1645-0700L700 | ● | 1645-0700D700 | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.500 | 1645-0750.500 | ● | 1645-0750L500 | ● | 1645-0750D500 | ■ |
| 0.0750 | 1/8 | 0.225 | 2 | 0.700 | 1645-0750.700 | ● | 1645-0750L700 | ● | 1645-0750D700 | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.590 | 1645-0781.590A | ● | 1645-0781L590A | ● | 1645-0781D590A | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 2 | 0.590 | 1645-0781.590 | ● | 1645-0781L590 | ● | 1645-0781D590 | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.500 | 1645-0800.500 | ● | 1645-0800L500 | ● | 1645-0800D500 | ■ |
| 0.0800 | 1/8 | 0.240 | 2 | 0.750 | 1645-0800.750 | ● | 1645-0800L750 | ● | 1645-0800D750 | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.500 | 1645-0850.500 | ● | 1645-0850L500 | ● | 1645-0850D500 | ■ |
| 0.0850 | 1/8 | 0.255 | 2 | 0.750 | 1645-0850.750 | ● | 1645-0850L750 | ● | 1645-0850D750 | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.625 | 1645-0900.625 | ● | 1645-0900L625 | ● | 1645-0900D625 | ■ |
| 0.0900 | 1/8 | 0.270 | 2 | 0.750 | 1645-0900.750 | ● | 1645-0900L750 | ● | 1645-0900D750 | ■ |
| 0.0938 (3/32) | 1/8 | 0.281 | 2 | 0.590 | 1645-0938.590 | ● | 1645-0938L590 | ● | 1645-0938D590 | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.625 | 1645-0938.625 | ● | 1645-0938L625 | ● | 1645-0938D625 | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.625 | 1645-0950.625 | ● | 1645-0950L625 | ● | 1645-0950D625 | ■ |
| 0.0950 | 1/8 | 0.285 | 2 | 0.750 | 1645-0950.750 | ● | 1645-0950L750 | ● | 1645-0950D750 | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.625 | 1645-1000.625 | ● | 1645-1000L625 | ● | 1645-1000D625 | ■ |
| 0.1000 | 1/8 | 0.300 | 2 | 0.750 | 1645-1000.750 | ● | 1645-1000L750 | ● | 1645-1000D750 | ■ |
| 0.1094 (7/64) | 1/8 | 0.328 | 2 | 0.590 | 1645-1094.590 | ● | 1645-1094L590 | ● | 1645-1094D590 | ■ |
| 0.1100 | 1/8 | 0.330 | 2 | 0.750 | 1645-1100.750 | ● | 1645-1100L750 | ● | 1645-1100D750 | ■ |
| 0.1250 (1/8) | 1/8 | 0.375 | 2 | 0.590 | 1645-1250.590 | ● | 1645-1250L590 | ● | 1645-1250D590 | ■ |

| SERIES 1645 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
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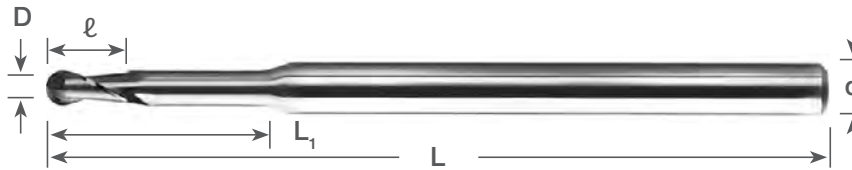
2 FLUTE

EXTENDED REACH BALL NOSE END MILLS

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|--------------------------------|-----------------|-------|----|----------------|----------------|-------|----------------|-------|
| D ^{+0.000 -0.001} | d ^{h6} | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1.20 | 38 | 3 | 1645-0157.118 | ● | 1645-0157L118 | ● |
| 0.50 | 3 | 1.50 | 38 | 4 | 1645-0197.157 | ● | 1645-0197L157 | ● |
| 0.60 | 3 | 1.80 | 38 | 5 | 1645-0236.197 | ● | 1645-0236L197 | ● |
| 0.65 | 3 | 1.95 | 38 | 6 | 1645-0256.236 | ● | 1645-0256L236 | ● |
| 0.70 | 3 | 2.10 | 38 | 7 | 1645-0276.276 | ● | 1645-0276L276 | ● |
| 0.75 | 3 | 2.25 | 38 | 8 | 1645-0295.315 | ● | 1645-0295L315 | ● |
| 0.80 | 3 | 2.40 | 50 | 9 | 1645-0315.354 | ● | 1645-0315L354 | ● |
| 0.90 | 3 | 2.70 | 50 | 10 | 1645-0354.394 | ● | 1645-0354L394 | ● |
| 1.00 | 3 | 3.00 | 50 | 10 | 1645-0394.394 | ● | 1645-0394L394 | ● |
| 1.50 | 3 | 4.50 | 50 | 15 | 1645-0591.591 | ● | 1645-0591L591 | ● |
| 2.00 | 3 | 6.00 | 50 | 20 | 1645-0787.787 | ● | 1645-0787L787 | ● |
| 2.50 | 3 | 7.50 | 50 | 23 | 1645-0984.906 | ● | 1645-0984L906 | ● |
| 3.00 | 3 | 9.00 | 50 | 23 | 1645-1181.906 | ● | 1645-1181L906 | ● |
| 3.50 | 6 | 10.50 | 75 | 25 | 1645-1378.984 | ● | 1645-1378L984 | ● |
| 4.00 | 6 | 12.00 | 75 | 25 | 1645-1575.984 | ● | 1645-1575L984 | ● |
| 4.50 | 6 | 13.50 | 75 | 30 | 1645-1772.1181 | ● | 1645-1772L1181 | ● |
| 5.00 | 6 | 15.00 | 75 | 30 | 1645-1968.1181 | ● | 1645-1968L1181 | ● |
| 5.50 | 6 | 16.50 | 75 | 30 | 1645-2165.1181 | ● | 1645-2165L1181 | ● |
| 6.00 | 6 | 18.00 | 75 | 30 | 1645-2362.1181 | ● | 1645-2362L1181 | ● |

| SERIES 1645 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

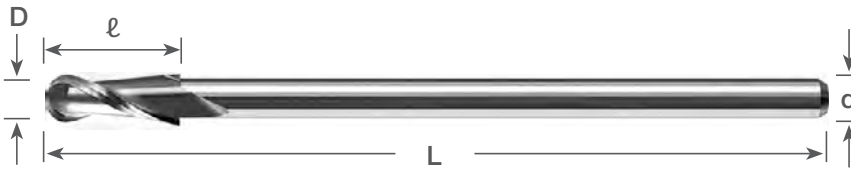
2 FLUTE NEW

REVERSE SHANK BALL NOSE END MILLS

0.1563" - 0.7500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

REVERSE Shank (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | |
|---|------|-------|-------|-----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.1563 (5/32) | 1/8 | 0.234 | 2 1/2 | 1685-1563.234A | ● | 1685-1563L234A | ● |
| 0.1875 (3/16) | 1/8 | 0.281 | 2 1/2 | 1685-1875.281A | ● | 1685-1875L281A | ● |
| 0.1875 (3/16) | 5/32 | 0.281 | 2 1/2 | 1685-1875.281B | ● | 1685-1875L281B | ● |
| 0.2500 (1/4) | 3/16 | 0.375 | 3 | 1685-2500.375A | ● | 1685-2500L375A | ● |
| 0.3125 (5/16) | 1/4 | 0.469 | 4 | 1685-3125.469A | ● | 1685-3125L469A | ● |
| 0.3750 (3/8) | 5/16 | 0.563 | 4 | 1685-3750.563A | ● | 1685-3750L563A | ● |
| 0.4375 (7/16) | 3/8 | 0.656 | 6 | 1685-4375.656A | ● | 1685-4375L656A | ● |
| 0.5000 (1/2) | 7/16 | 0.750 | 6 | 1685-5000.750A | ● | 1685-5000L750A | ● |
| 0.6250 (5/8) | 1/2 | 0.944 | 6 | 1685-6250.944A | ● | 1685-6250L944A | ● |
| 0.7500 (3/4) | 5/8 | 1.125 | 6 | 1685-7500.1125A | ● | 1685-7500L1125A | ● |

| SERIES 1685 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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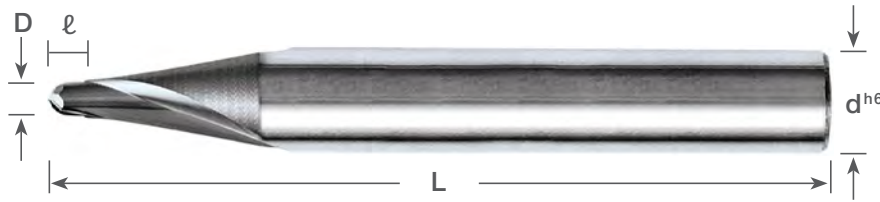
2 FLUTE

BALL NOSE END MILLS FOR HARD METAL MILLING

0.20mm - 3.00mm DIAMETER

Sub Micron Grain Carbide

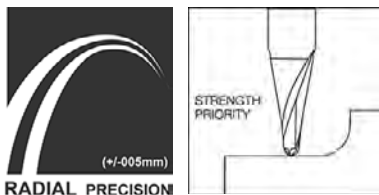
6mm Shank



Symbol Descriptions [Page 7](#)

METRIC RADIUS (r)

| Dimensions (mm) | | | | | | AX Coating | |
|---|------|-----------------|------|----|----------------|------------|--|
| D ^{+0.000mm} _{-0.005mm} | r | d ^{h6} | ℓ | L | Part Number | Stock | |
| 0.20 | 0.10 | 6 | 0.20 | 45 | 1625-0079J008S | ● | |
| 0.30 | 0.15 | 6 | 0.30 | 45 | 1625-0118J012S | ● | |
| 0.40 | 0.20 | 6 | 0.40 | 45 | 1625-0157J016S | ● | |
| 0.50 | 0.25 | 6 | 0.50 | 45 | 1625-0197J020S | ● | |
| 0.60 | 0.30 | 6 | 0.60 | 45 | 1625-0236J024S | ● | |
| 0.80 | 0.40 | 6 | 0.80 | 45 | 1625-0315J032S | ● | |
| 1.00 | 0.50 | 6 | 1.00 | 45 | 1625-0394J040S | ● | |
| 1.20 | 0.60 | 6 | 1.20 | 45 | 1625-0472J048S | ● | |
| 1.40 | 0.70 | 6 | 1.40 | 45 | 1625-0551J055S | ● | |
| 1.50 | 0.75 | 6 | 1.50 | 45 | 1625-0591J060S | ● | |
| 1.60 | 0.80 | 6 | 1.60 | 45 | 1625-0630J063S | ● | |
| 1.80 | 0.90 | 6 | 1.80 | 45 | 1625-0709J071S | ● | |
| 2.00 | 1.00 | 6 | 2.00 | 45 | 1625-0787J078S | ● | |
| 2.50 | 1.25 | 6 | 2.50 | 45 | 1625-0984J098S | ● | |
| 3.00 | 1.50 | 6 | 3.00 | 45 | 1625-1181J118S | ● | |



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TECHNICAL

INDEX

SERIES 16 HMS WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|---------|--------------------------------------|------------------------------------|--|--|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel $\geq 20\text{HRC}$ | Steel $30-40\text{HRC}$ | Hardened Steel $\ge 55\text{HRC}$ | Hardened Steel $\ge 58\text{HRC}$ | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

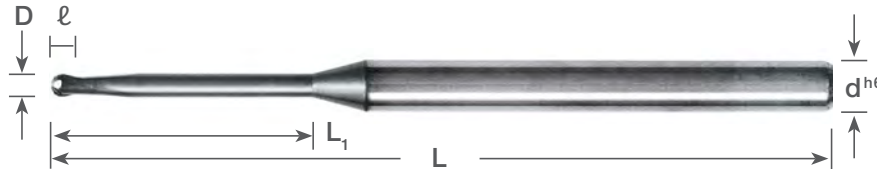
Symbol Descriptions [Page 7](#)

2 FLUTE

BALL NOSE END MILLS FOR HARD METAL MILLING

0.20mm - 3.00mm DIAMETER

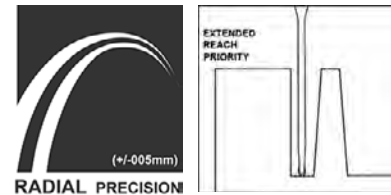
Sub Micron Grain Carbide
1 X Diameter Length of Cut
Designed for 10:1 Depth to
Diameter Aspect Ratio



Symbol Descriptions [Page 7](#)

METRIC RADIUS (r) - EXTENDED Reach

| Dimensions (mm) | | | | | | | | AX Coating | |
|---|------|-----------------|------|----|----------------|-----------------|----------------|------------|--|
| D ^{+0.000mm} / _{-0.005mm} | r | d ^{h6} | ℓ | L | L ₁ | L ₁₀ | Part Number | Stock | |
| 0.20 | 0.10 | 4 | 0.20 | 50 | 2 | 0.17 | 1625-0079J008R | ● | |
| 0.30 | 0.15 | 4 | 0.30 | 50 | 3 | 0.26 | 1625-0118J012R | ● | |
| 0.40 | 0.20 | 4 | 0.40 | 50 | 4 | 0.36 | 1625-0157J016R | ● | |
| 0.50 | 0.25 | 4 | 0.50 | 50 | 5 | 0.45 | 1625-0197J020R | ● | |
| 0.60 | 0.30 | 4 | 0.60 | 50 | 6 | 0.57 | 1625-0236J024R | ● | |
| 0.80 | 0.40 | 4 | 0.80 | 50 | 8 | 0.76 | 1625-0315J032R | ● | |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 10 | 0.95 | 1625-0394J040R | ● | |
| 1.20 | 0.60 | 4 | 1.20 | 50 | 12 | 1.14 | 1625-0472J048R | ● | |
| 1.40 | 0.70 | 4 | 1.40 | 50 | 14 | 1.33 | 1625-0551J055R | ● | |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 15 | 1.43 | 1625-0591J060R | ● | |
| 1.60 | 0.80 | 4 | 1.60 | 50 | 16 | 1.52 | 1625-0630J063R | ● | |
| 1.80 | 0.90 | 4 | 1.80 | 50 | 18 | 1.71 | 1625-0709J071R | ● | |
| 2.00 | 1.00 | 4 | 2.00 | 60 | 20 | 1.90 | 1625-0787J078R | ● | |
| 2.50 | 1.25 | 4 | 2.50 | 60 | 25 | 2.43 | 1625-0984J098R | ● | |
| 3.00 | 1.50 | 6 | 3.00 | 70 | 30 | 2.91 | 1625-1181J118R | ● | |



| SERIES 16 HMR WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|----------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE

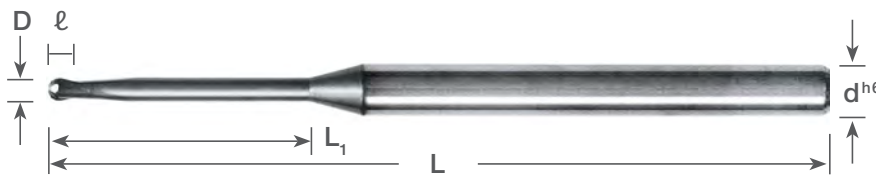
BALL NOSE END MILLS FOR RIB PROCESSING
H13, P20, A-2, D-2, S-7, M-2 upto Rc 62

0.50mm, 1.50mm Radius

Sub Micron Grain Carbide

1 X Diameter Length of Cut

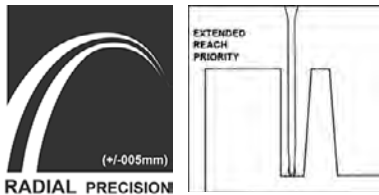
Multiple Length to Diameter Aspect Ratios



Symbol Descriptions [Page 7](#)

METRIC RADIUS (r)

| Dimensions (mm) | | | | | | AX Coating | |
|---------------------------|------|-----------------|------|----|----------------|--------------|-------|
| D +0.000mm -0.005mm | r | d ^{h6} | l | L | L ₁ | Part Number | Stock |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 2 | 16RB0394U-2 | ● |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 4 | 16RB0394U-4 | ● |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 6 | 16RB0394U-6 | ● |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 8 | 16RB0394U-8 | ● |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 10 | 16RB0394U-10 | ● |
| 1.00 | 0.50 | 4 | 1.00 | 50 | 12 | 16RB0394U-12 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 2 | 16RB0591U-2 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 4 | 16RB0591U-4 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 6 | 16RB0591U-6 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 8 | 16RB0591U-8 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 10 | 16RB0591U-10 | ● |
| 1.50 | 0.75 | 4 | 1.50 | 50 | 12 | 16RB0591U-12 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | - | 16RB0787U-2 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | 4 | 16RB0787U-4 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | 6 | 16RB0787U-6 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | 8 | 16RB0787U-8 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | 10 | 16RB0787U-10 | ● |
| 2.00 | 1.00 | 4 | 2.00 | 50 | 12 | 16RB0787U-12 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | - | 16RB1181U-2 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | 4 | 16RB1181U-4 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | 6 | 16RB1181U-6 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | 8 | 16RB1181U-8 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | 10 | 16RB1181U-10 | ● |
| 3.00 | 1.50 | 6 | 3.00 | 60 | 12 | 16RB1181U-12 | ● |



RADIAL PRECISION

| SERIES 16RB WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

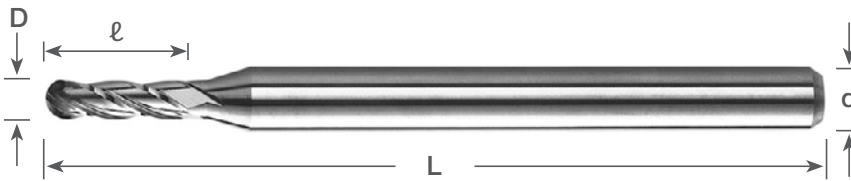
3 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.0100" - 0.1000" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0100 | 1/8 | 0.050 | 2 1/2 | 1725-0100.050 | ● | 1725-0100L050 | ● | 1725-0100D050 | ■ |
| 0.0150 | 1/8 | 0.075 | 2 1/2 | 1725-0150.075 | ● | 1725-0150L075 | ● | 1725-0150D075 | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.078 | 2-1/2 | 1725-0156.078 | ● | 1725-0156L078 | ● | 1725-0156D078 | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.125 | 2-1/2 | 1725-0156.125 | ● | 1725-0156L125 | ● | 1725-0156D125 | ■ |
| 0.0200 | 1/8 | 0.100 | 2 1/2 | 1725-0200.100 | ● | 1725-0200L100 | ● | 1725-0200D100 | ■ |
| NEW 0.0200 | 1/8 | 0.160 | 2 1/2 | 1725-0200.160 | ● | 1725-0200L160 | ● | 1725-0200D160 | ■ |
| 0.0250 | 1/8 | 0.125 | 2 1/2 | 1725-0250.125 | ● | 1725-0250L125 | ● | 1725-0250D125 | ■ |
| NEW 0.0250 | 1/8 | 0.203 | 2 1/2 | 1725-0250.203 | ● | 1725-0250L203 | ● | 1725-0250D203 | ■ |
| 0.0300 | 1/8 | 0.150 | 2 1/2 | 1725-0300.150 | ● | 1725-0300L150 | ● | 1725-0300D150 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.156 | 2-1/2 | 1725-0312.156 | ● | 1725-0312L156 | ● | 1725-0312D156 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.250 | 2-1/2 | 1725-0312.250 | ● | 1725-0312L250 | ● | 1725-0312D250 | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.375 | 2-1/2 | 1725-0312.375 | ● | 1725-0312L375 | ● | 1725-0312D375 | ■ |
| 0.0350 | 1/8 | 0.175 | 2 1/2 | 1725-0350.175 | ● | 1725-0350L175 | ● | 1725-0350D175 | ■ |
| 0.0400 | 1/8 | 0.200 | 2 1/2 | 1725-0400.200 | ● | 1725-0400L200 | ● | 1725-0400D200 | ■ |
| NEW 0.0400 | 1/8 | 0.325 | 2 1/2 | 1725-0400.325 | ● | 1725-0400L325 | ● | 1725-0400D325 | ■ |
| 0.0450 | 1/8 | 0.225 | 2 1/2 | 1725-0450.225 | ● | 1725-0450L225 | ● | 1725-0450D225 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.250 | 2-1/2 | 1725-0469.250 | ● | 1725-0469L250 | ● | 1725-0469D250 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.375 | 2-1/2 | 1725-0469.375 | ● | 1725-0469L375 | ● | 1725-0469D375 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.570 | 2-1/2 | 1725-0469.570 | ● | 1725-0469L570 | ● | 1725-0469D570 | ■ |
| 0.0500 | 1/8 | 0.300 | 2 1/2 | 1725-0500.300 | ● | 1725-0500L300 | ● | 1725-0500D300 | ■ |
| NEW 0.0500 | 1/8 | 0.400 | 2 1/2 | 1725-0500.400 | ● | 1725-0500L400 | ● | 1725-0500D400 | ■ |
| 0.0550 | 1/8 | 0.385 | 2 1/2 | 1725-0550.385 | ● | 1725-0550L385 | ● | 1725-0550D385 | ■ |
| NEW 0.0600 | 1/8 | 0.312 | 2 1/2 | 1725-0600.312 | ● | 1725-0600L312 | ● | 1725-0600D312 | ■ |
| 0.0600 | 1/8 | 0.500 | 2 1/2 | 1725-0600.500 | ● | 1725-0600L500 | ● | 1725-0600D500 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.312 | 2-1/2 | 1725-0625.312 | ● | 1725-0625L312 | ● | 1725-0625D312 | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.500 | 2-1/2 | 1725-0625.500 | ● | 1725-0625L500 | ● | 1725-0625D500 | ■ |
| 0.0650 | 1/8 | 0.500 | 2 1/2 | 1725-0650.500 | ● | 1725-0650L500 | ● | 1725-0650D500 | ■ |
| 0.0700 | 1/8 | 0.500 | 2 1/2 | 1725-0700.500 | ● | 1725-0700L500 | ● | 1725-0700D500 | ■ |
| 0.0750 | 1/8 | 0.500 | 2 1/2 | 1725-0750.500 | ● | 1725-0750L500 | ● | 1725-0750D500 | ■ |
| 0.0800 | 1/8 | 0.750 | 2 1/2 | 1725-0800.750 | ● | 1725-0800L750 | ● | 1725-0800D750 | ■ |
| 0.0850 | 1/8 | 0.750 | 2 1/2 | 1725-0850.750 | ● | 1725-0850L750 | ● | 1725-0850D750 | ■ |
| 0.0900 | 1/8 | 0.750 | 2 1/2 | 1725-0900.750 | ● | 1725-0900L750 | ● | 1725-0900D750 | ■ |
| 0.0950 | 1/8 | 0.750 | 2 1/2 | 1725-0950.750 | ● | 1725-0950L750 | ● | 1725-0950D750 | ■ |
| 0.1000 | 1/8 | 0.750 | 2 1/2 | 1725-1000.750 | ● | 1725-1000L750 | ● | 1725-1000D750 | ■ |

| SERIES 1725 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

(U.S.) 1.888.848.8449
 (International) 001.714.428.3636
 Pricing & Availability at KyoceraPrecisionTools.com

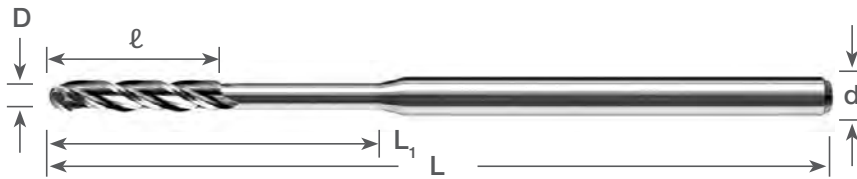
3 FLUTE

0.0100" - 0.1000" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH BALL NOSE END MILLS



Symbol Descriptions Page 7

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----------------|-----|-------|-------|----------------|----------------|-------|----------------|-------|-----------------|-------|
| D | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.050 | 2 1/2 | 0.100 | 1745-0100.100 | ● | 1745-0100L100 | ● | 1745-0100D100 | ■ |
| 0.0150 | 1/8 | 0.075 | 2 1/2 | 0.150 | 1745-0150.150 | ● | 1745-0150L150 | ● | 1745-0150D150 | ■ |
| 0.0156 (1/64) | 1/8 | 0.075 | 2 1/2 | 0.150 | 1745-0156.150 | ● | 1745-0156L150 | ● | 1745-0156D150 | ■ |
| 0.0200 | 1/8 | 0.100 | 2 1/2 | 0.200 | 1745-0200.200 | ● | 1745-0200L200 | ● | 1745-0200D200 | ■ |
| 0.0250 | 1/8 | 0.125 | 2 1/2 | 0.250 | 1745-0250.250 | ● | 1745-0250L250 | ● | 1745-0250D250 | ■ |
| 0.0300 | 1/8 | 0.150 | 2 1/2 | 0.300 | 1745-0300.300 | ● | 1745-0300L300 | ● | 1745-0300D300 | ■ |
| 0.0312 (1/32) | 1/8 | 0.155 | 2 1/2 | 0.310 | 1745-0312.310 | ● | 1745-0312L310 | ● | 1745-0312D310 | ■ |
| 0.0350 | 1/8 | 0.175 | 2 1/2 | 0.350 | 1745-0350.350 | ● | 1745-0350L350 | ● | 1745-0350D350 | ■ |
| 0.0400 | 1/8 | 0.200 | 2 1/2 | 0.400 | 1745-0400.400 | ● | 1745-0400L400 | ● | 1745-0400D400 | ■ |
| 0.0450 | 1/8 | 0.225 | 2 1/2 | 0.450 | 1745-0450.450 | ● | 1745-0450L450 | ● | 1745-0450D450 | ■ |
| 0.0469 (3/64) | 1/8 | 0.250 | 2 1/2 | 0.500 | 1745-0469.500 | ● | 1745-0469L500 | ● | 1745-0469D500 | ■ |
| 0.0500 | 1/8 | 0.300 | 2 1/2 | 0.600 | 1745-0500.600 | ● | 1745-0500L600 | ● | 1745-0500D600 | ■ |
| 0.0550 | 1/8 | 0.385 | 2 1/2 | 0.770 | 1745-0550.770 | ● | 1745-0550L770 | ● | 1745-0550D770 | ■ |
| 0.0600 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0600.1000 | ● | 1745-0600L1000 | ● | 1745-0600D1000 | ■ |
| 0.0625 (1/16) | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0625.1000 | ● | 1745-0625L1000 | ● | 1745-0625D1000 | ■ |
| 0.0650 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0650.1000 | ● | 1745-0650L1000 | ● | 1745-0650D1000 | ■ |
| 0.0700 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0700.1000 | ● | 1745-0700L1000 | ● | 1745-0700D1000 | ■ |
| 0.0750 | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0750.1000 | ● | 1745-0750L1000 | ● | 1745-0750D1000 | ■ |
| 0.0781 (5/64) | 1/8 | 0.500 | 2 1/2 | 1.000 | 1745-0781.1000 | ● | 1745-0781L1000 | ● | 1745-0781D1000 | ■ |
| 0.0800 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-0800.1250 | ● | 1745-0800L1250 | ● | 1745-0800D1250 | ■ |
| 0.0850 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-0850.1250 | ● | 1745-0850L1250 | ● | 1745-0850D1250 | ■ |
| 0.0900 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-0900.1250 | ● | 1745-0900L1250 | ● | 1745-0900D1250 | ■ |
| 0.0938 (3/32) | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-0938.1250 | ● | 1745-0938L1250 | ● | 1745-0938D1250 | ■ |
| 0.0950 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-0950.1250 | ● | 1745-0950L1250 | ● | 1745-0950D1250 | ■ |
| 0.1000 | 1/8 | 0.750 | 2 1/2 | 1.250 | 1745-1000.1250 | ● | 1745-1000L1250 | ● | 1745-1000D1250 | ■ |

SERIES 1745 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

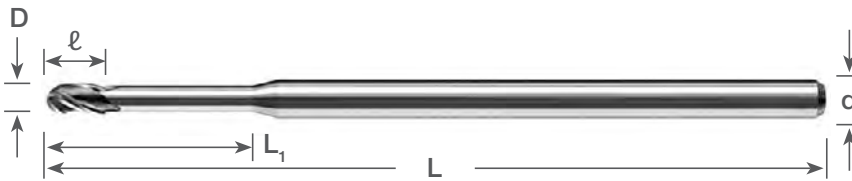
3 FLUTE NEW

0.0100" - 0.0312" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|---------------|-------|---------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.050 | 1755-0100.050 | ● | 1755-0100L050 | ● | 1755-0100D050 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.080 | 1755-0100.080 | ● | 1755-0100L080 | ● | 1755-0100D080 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.125 | 1755-0100.125 | ● | 1755-0100L125 | ● | 1755-0100D125 | ■ |
| 0.0100 | 1/8 | 0.015 | 2 1/2 | 0.150 | 1755-0100.150 | ● | 1755-0100L150 | ● | 1755-0100D150 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.045 | 1755-0156.045 | ● | 1755-0156L045 | ● | 1755-0156D045 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.078 | 1755-0156.078 | ● | 1755-0156L078 | ● | 1755-0156D078 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.125 | 1755-0156.125 | ● | 1755-0156L125 | ● | 1755-0156D125 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.156 | 1755-0156.156 | ● | 1755-0156L156 | ● | 1755-0156D156 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.187 | 1755-0156.187 | ● | 1755-0156L187 | ● | 1755-0156D187 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.225 | 1755-0156.225 | ● | 1755-0156L225 | ● | 1755-0156D225 | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2 1/2 | 0.300 | 1755-0156.300 | ● | 1755-0156L300 | ● | 1755-0156D300 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.100 | 1755-0200.100 | ● | 1755-0200L100 | ● | 1755-0200D100 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.160 | 1755-0200.160 | ● | 1755-0200L160 | ● | 1755-0200D160 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.250 | 1755-0200.250 | ● | 1755-0200L250 | ● | 1755-0200D250 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.300 | 1755-0200.300 | ● | 1755-0200L300 | ● | 1755-0200D300 | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.400 | 1755-0200.400 | ● | 1755-0200L400 | ● | 1755-0200D400 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.125 | 1755-0250.125 | ● | 1755-0250L125 | ● | 1755-0250D125 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.203 | 1755-0250.203 | ● | 1755-0250L203 | ● | 1755-0250D203 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.312 | 1755-0250.312 | ● | 1755-0250L312 | ● | 1755-0250D312 | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.375 | 1755-0250.375 | ● | 1755-0250L375 | ● | 1755-0250D375 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.156 | 1755-0300.156 | ● | 1755-0300L156 | ● | 1755-0300D156 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.250 | 1755-0300.250 | ● | 1755-0300L250 | ● | 1755-0300D250 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.375 | 1755-0300.375 | ● | 1755-0300L375 | ● | 1755-0300D375 | ■ |
| 0.0300 | 1/8 | 0.045 | 2 1/2 | 0.450 | 1755-0300.450 | ● | 1755-0300L450 | ● | 1755-0300D450 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.093 | 1755-0312.093 | ● | 1755-0312L093 | ● | 1755-0312D093 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.156 | 1755-0312.156 | ● | 1755-0312L156 | ● | 1755-0312D156 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.250 | 1755-0312.250 | ● | 1755-0312L250 | ● | 1755-0312D250 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.312 | 1755-0312.312 | ● | 1755-0312L312 | ● | 1755-0312D312 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.375 | 1755-0312.375 | ● | 1755-0312L375 | ● | 1755-0312D375 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.470 | 1755-0312.470 | ● | 1755-0312L470 | ● | 1755-0312D470 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.565 | 1755-0312.565 | ● | 1755-0312L565 | ● | 1755-0312D565 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.625 | 1755-0312.625 | ● | 1755-0312L625 | ● | 1755-0312D625 | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.775 | 1755-0312.775 | ● | 1755-0312L775 | ● | 1755-0312D775 | ■ |

| SERIES 1755 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
 ■ : NOT STOCKED - Call for Delivery
 ▲ : Coming Soon

DRILLS
 END MILLS
 ROUTERS
 THREAD MILLS & TAPS
 ENGRAVERS
 BORING BARS
 REAMERS
 SAWS
 TECHNICAL
 INDEX

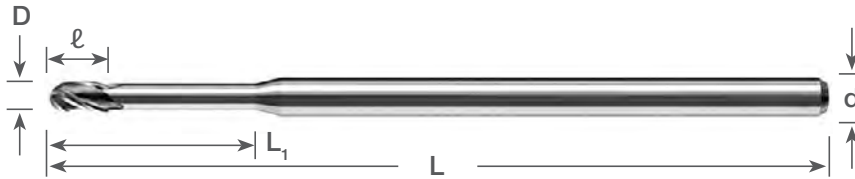
3 FLUTE NEW

0.0350" - 0.0600" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.187 | 1755-0350.187 | ● | 1755-0350L187 | ● | 1755-0350D187 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.281 | 1755-0350.281 | ● | 1755-0350L281 | ● | 1755-0350D281 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.425 | 1755-0350.425 | ● | 1755-0350L425 | ● | 1755-0350D425 | ■ |
| 0.0350 | 1/8 | 0.052 | 2 1/2 | 0.525 | 1755-0350.525 | ● | 1755-0350L525 | ● | 1755-0350D525 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.203 | 1755-0400.203 | ● | 1755-0400L203 | ● | 1755-0400D203 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.325 | 1755-0400.325 | ● | 1755-0400L325 | ● | 1755-0400D325 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.480 | 1755-0400.480 | ● | 1755-0400L480 | ● | 1755-0400D480 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.600 | 1755-0400.600 | ● | 1755-0400L600 | ● | 1755-0400D600 | ■ |
| 0.0400 | 1/8 | 0.060 | 2 1/2 | 0.800 | 1755-0400.800 | ● | 1755-0400L800 | ● | 1755-0400D800 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.225 | 1755-0450.225 | ● | 1755-0450L225 | ● | 1755-0450D225 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.375 | 1755-0450.375 | ● | 1755-0450L375 | ● | 1755-0450D375 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.550 | 1755-0450.550 | ● | 1755-0450L550 | ● | 1755-0450D550 | ■ |
| 0.0450 | 1/8 | 0.067 | 2 1/2 | 0.680 | 1755-0450.680 | ● | 1755-0450L680 | ● | 1755-0450D680 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.141 | 1755-0469.141 | ● | 1755-0469L141 | ● | 1755-0469D141 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.250 | 1755-0469.250 | ● | 1755-0469L250 | ● | 1755-0469D250 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.375 | 1755-0469.375 | ● | 1755-0469L375 | ● | 1755-0469D375 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.480 | 1755-0469.480 | ● | 1755-0469L480 | ● | 1755-0469D480 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.570 | 1755-0469.570 | ● | 1755-0469L570 | ● | 1755-0469D570 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.710 | 1755-0469.710 | ● | 1755-0469L710 | ● | 1755-0469D710 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.950 | 1755-0469.950 | ● | 1755-0469L950 | ● | 1755-0469D950 | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 1.187 | 1755-0469.1187 | ● | 1755-0469L1187 | ● | 1755-0469D1187 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.250 | 1755-0500.250 | ● | 1755-0500L250 | ● | 1755-0500D250 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.400 | 1755-0500.400 | ● | 1755-0500L400 | ● | 1755-0500D400 | ■ |
| 0.0500 | 1/8 | 0.075 | 2 1/2 | 0.600 | 1755-0500.600 | ● | 1755-0500L600 | ● | 1755-0500D600 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.275 | 1755-0550.275 | ● | 1755-0550L275 | ● | 1755-0550D275 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.450 | 1755-0550.450 | ● | 1755-0550L450 | ● | 1755-0550D450 | ■ |
| 0.0550 | 1/8 | 0.082 | 2 1/2 | 0.660 | 1755-0550.660 | ● | 1755-0550L660 | ● | 1755-0550D660 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.312 | 1755-0600.312 | ● | 1755-0600L312 | ● | 1755-0600D312 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.500 | 1755-0600.500 | ● | 1755-0600L500 | ● | 1755-0600D500 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.720 | 1755-0600.720 | ● | 1755-0600L720 | ● | 1755-0600D720 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 0.900 | 1755-0600.900 | ● | 1755-0600L900 | ● | 1755-0600D900 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 1.080 | 1755-0600.1080 | ● | 1755-0600L1080 | ● | 1755-0600D1080 | ■ |
| 0.0600 | 1/8 | 0.090 | 2 1/2 | 1.260 | 1755-0600.1260 | ● | 1755-0600L1260 | ● | 1755-0600D1260 | ■ |

SERIES 1755 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel $30\text{--}40\text{HRC}$ | H Hardened Steel $48\text{--}55\text{HRC}$ | H Hardened Steel 58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|-----------------------------------|--|---|--|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

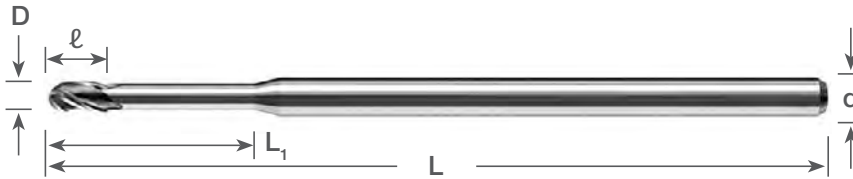
3 FLUTE NEW

0.0625" - 0.0900" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.186 | 1755-0625.186 | ● | 1755-0625L186 | ● | 1755-0625D186 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.312 | 1755-0625.312 | ● | 1755-0625L312 | ● | 1755-0625D312 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.500 | 1755-0625.500 | ● | 1755-0625L500 | ● | 1755-0625D500 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.625 | 1755-0625.625 | ● | 1755-0625L625 | ● | 1755-0625D625 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.750 | 1755-0625.750 | ● | 1755-0625L750 | ● | 1755-0625D750 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.950 | 1755-0625.950 | ● | 1755-0625L950 | ● | 1755-0625D950 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 1.125 | 1755-0625.1125 | ● | 1755-0625L1125 | ● | 1755-0625D1125 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 1.250 | 1755-0625.1250 | ● | 1755-0625L1250 | ● | 1755-0625D1250 | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 3 | 1.550 | 1755-0625.1550 | ● | 1755-0625L1550 | ● | 1755-0625D1550 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.325 | 1755-0650.325 | ● | 1755-0650L325 | ● | 1755-0650D325 | ■ |
| 0.0650 | 1/8 | 0.097 | 2 1/2 | 0.530 | 1755-0650.530 | ● | 1755-0650L530 | ● | 1755-0650D530 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.375 | 1755-0700.375 | ● | 1755-0700L375 | ● | 1755-0700D375 | ■ |
| 0.0700 | 1/8 | 0.105 | 2 1/2 | 0.570 | 1755-0700.570 | ● | 1755-0700L570 | ● | 1755-0700D570 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.375 | 1755-0750.375 | ● | 1755-0750L375 | ● | 1755-0750D375 | ■ |
| 0.0750 | 1/8 | 0.112 | 2 1/2 | 0.625 | 1755-0750.625 | ● | 1755-0750L625 | ● | 1755-0750D625 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.234 | 1755-0781.234 | ● | 1755-0781L234 | ● | 1755-0781D234 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.406 | 1755-0781.406 | ● | 1755-0781L406 | ● | 1755-0781D406 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.625 | 1755-0781.625 | ● | 1755-0781L625 | ● | 1755-0781D625 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.800 | 1755-0781.800 | ● | 1755-0781L800 | ● | 1755-0781D800 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.940 | 1755-0781.940 | ● | 1755-0781L940 | ● | 1755-0781D940 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 1.187 | 1755-0781.1187 | ● | 1755-0781L1187 | ● | 1755-0781D1187 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 3 | 1.562 | 1755-0781.1562 | ● | 1755-0781L1562 | ● | 1755-0781D1562 | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 3 | 1.950 | 1755-0781.1950 | ● | 1755-0781L1950 | ● | 1755-0781D1950 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.406 | 1755-0800.406 | ● | 1755-0800L406 | ● | 1755-0800D406 | ■ |
| 0.0800 | 1/8 | 0.120 | 2 1/2 | 0.650 | 1755-0800.650 | ● | 1755-0800L650 | ● | 1755-0800D650 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.425 | 1755-0850.425 | ● | 1755-0850L425 | ● | 1755-0850D425 | ■ |
| 0.0850 | 1/8 | 0.127 | 2 1/2 | 0.700 | 1755-0850.700 | ● | 1755-0850L700 | ● | 1755-0850D700 | ■ |
| 0.0900 | 1/8 | 0.120 | 2 1/2 | 0.450 | 1755-0900.450 | ● | 1755-0900L450 | ● | 1755-0900D450 | ■ |
| 0.0900 | 1/8 | 0.120 | 2 1/2 | 0.750 | 1755-0900.750 | ● | 1755-0900L750 | ● | 1755-0900D750 | ■ |

| SERIES 1755 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

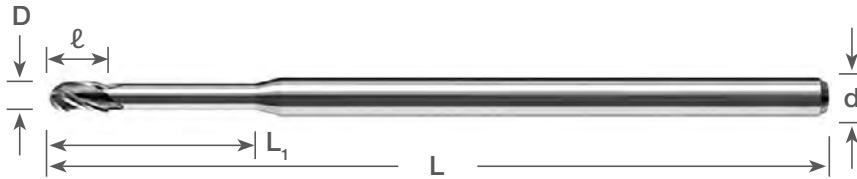
3 FLUTE NEW

0.0938" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

EXTENDED Reach **STUB** Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|----------------|----------------|-------|----------------|-------|--|-------|
| D <small>+0.000 -0.001</small> | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.279 | 1755-0938.279 | ● | 1755-0938L279 | ● | 1755-0938D279 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.500 | 1755-0938.500 | ● | 1755-0938L500 | ● | 1755-0938D500 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.750 | 1755-0938.750 | ● | 1755-0938L750 | ● | 1755-0938D750 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.950 | 1755-0938.950 | ● | 1755-0938L950 | ● | 1755-0938D950 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 1.125 | 1755-0938.1125 | ● | 1755-0938L1125 | ● | 1755-0938D1125 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 3 | 1.400 | 1755-0938.1400 | ● | 1755-0938L1400 | ● | 1755-0938D1400 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 3 | 1.675 | 1755-0938.1675 | ● | 1755-0938L1675 | ● | 1755-0938D1675 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 4 | 1.875 | 1755-0938.1875 | ● | 1755-0938L1875 | ● | 1755-0938D1875 | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 4 | 2.312 | 1755-0938.2312 | ● | 1755-0938L2312 | ● | 1755-0938D2312 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.500 | 1755-0950.500 | ● | 1755-0950L500 | ● | 1755-0950D500 | ■ |
| 0.0950 | 1/8 | 0.142 | 2 1/2 | 0.750 | 1755-0950.750 | ● | 1755-0950L750 | ● | 1755-0950D750 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.500 | 1755-1000.500 | ● | 1755-1000L500 | ● | 1755-1000D500 | ■ |
| 0.1000 | 1/8 | 0.150 | 2 1/2 | 0.800 | 1755-1000.800 | ● | 1755-1000L800 | ● | 1755-1000D800 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 0.625 | 1755-1250.625 | ● | 1755-1250L625 | ● | 1755-1250D625 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.000 | 1755-1250.1000 | ● | 1755-1250L1000 | ● | 1755-1250D1000 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.250 | 1755-1250.1250 | ● | 1755-1250L1250 | ● | 1755-1250D1250 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.500 | 1755-1250.1500 | ● | 1755-1250L1500 | ● | 1755-1250D1500 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.875 | 1755-1250.1875 | ● | 1755-1250L1875 | ● | 1755-1250D1875 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 2.250 | 1755-1250.2250 | ● | 1755-1250L2250 | ● | 1755-1250D2250 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 2.500 | 1755-1250.2500 | ● | 1755-1250L2500 | ● | 1755-1250D2500 | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 4 | 3.125 | 1755-1250.3125 | ● | 1755-1250L3125 | ● | 1755-1250D3125 | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 0.750 | 1755-1562.750 | ● | 1755-1562L750 | ● | 1755-1562D750 | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 1.250 | 1755-1562.1250 | ● | 1755-1562L1250 | ● | 1755-1562D1250 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.000 | 1755-1875.1000 | ● | 1755-1875L1000 | ● | 1755-1875D1000 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.500 | 1755-1875.1500 | ● | 1755-1875L1500 | ● | 1755-1875D1500 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 1.875 | 1755-1875.1875 | ● | 1755-1875L1875 | ● | 1755-1875D1875 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.250 | 1755-1875.2250 | ● | 1755-1875L2250 | ● | 1755-1875D2250 | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.812 | 1755-1875.2812 | ● | 1755-1875L2812 | ● | 1755-1875D2812 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 1.250 | 1755-2500.1250 | ● | 1755-2500L1250 | ● | 1755-2500D1250 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.000 | 1755-2500.2000 | ● | 1755-2500L2000 | ● | 1755-2500D2000 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.500 | 1755-2500.2500 | ● | 1755-2500L2500 | ● | 1755-2500D2500 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.000 | 1755-2500.3000 | ● | 1755-2500L3000 | ● | 1755-2500D3000 | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.750 | 1755-2500.3750 | ● | 1755-2500L3750 | ● | 1755-2500D3750 | ■ |

SERIES 1755 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~60HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|---------------------|------------------------|-------------------------------|-------------------------------|-------------------------|-------------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

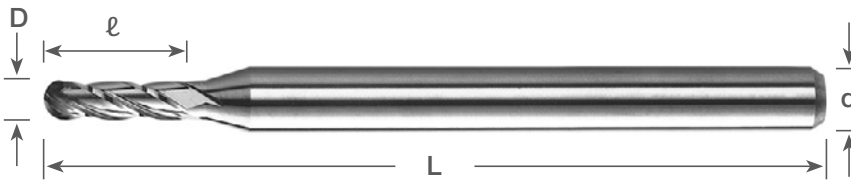
4 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.0100" - 0.0360" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0100 | 1/8 | 0.030 | 1 1/2 | 1825-0100.030 | ● | 1825-0100L030 | ● | 1825-0100D030 | ■ |
| NEW 0.0110 | 1/8 | 0.033 | 1 1/2 | 1825-0110.033 | ● | 1825-0110L033 | ● | - | - |
| NEW 0.0120 | 1/8 | 0.036 | 1 1/2 | 1825-0120.036 | ● | 1825-0120L036 | ● | - | - |
| NEW 0.0130 | 1/8 | 0.039 | 1 1/2 | 1825-0130.039 | ● | 1825-0130L039 | ● | - | - |
| NEW 0.0140 | 1/8 | 0.042 | 1 1/2 | 1825-0140.042 | ● | 1825-0140L042 | ● | - | - |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 1825-0156.047 | ● | 1825-0156L047 | ● | 1825-0156D047 | ■ |
| NEW 0.0160 | 1/8 | 0.048 | 1 1/2 | 1825-0160.048 | ● | 1825-0160L048 | ● | - | - |
| NEW 0.0170 | 1/8 | 0.051 | 1 1/2 | 1825-0170.051 | ● | 1825-0170L051 | ● | - | - |
| NEW 0.0180 | 1/8 | 0.054 | 1 1/2 | 1825-0180.054 | ● | 1825-0180L054 | ● | - | - |
| NEW 0.0190 | 1/8 | 0.057 | 1 1/2 | 1825-0190.057 | ● | 1825-0190L057 | ● | - | - |
| NEW 0.0200 | 1/8 | 0.060 | 1 1/2 | 1825-0200.060 | ● | 1825-0200L060 | ● | 1825-0200D060 | ■ |
| NEW 0.0210 | 1/8 | 0.063 | 1 1/2 | 1825-0210.063 | ● | 1825-0210L063 | ● | - | - |
| NEW 0.0220 | 1/8 | 0.066 | 1 1/2 | 1825-0220.066 | ● | 1825-0220L066 | ● | - | - |
| NEW 0.0230 | 1/8 | 0.069 | 1 1/2 | 1825-0230.069 | ● | 1825-0230L069 | ● | - | - |
| NEW 0.0240 | 1/8 | 0.072 | 1 1/2 | 1825-0240.072 | ● | 1825-0240L072 | ● | - | - |
| NEW 0.0250 | 1/8 | 0.075 | 1 1/2 | 1825-0250.075 | ● | 1825-0250L075 | ● | 1825-0250D075 | ■ |
| NEW 0.0260 | 1/8 | 0.078 | 1 1/2 | 1825-0260.078 | ● | 1825-0260L078 | ● | - | - |
| NEW 0.0270 | 1/8 | 0.081 | 1 1/2 | 1825-0270.081 | ● | 1825-0270L081 | ● | - | - |
| NEW 0.0280 | 1/8 | 0.084 | 1 1/2 | 1825-0280.084 | ● | 1825-0280L084 | ● | - | - |
| NEW 0.0290 | 1/8 | 0.087 | 1 1/2 | 1825-0290.087 | ● | 1825-0290L087 | ● | - | - |
| NEW 0.0300 | 1/8 | 0.090 | 1 1/2 | 1825-0300.090 | ● | 1825-0300L090 | ● | 1825-0300D090 | ■ |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 1825-0312.094 | ● | 1825-0312L094 | ● | 1825-0312D094 | ■ |
| NEW 0.0320 | 1/8 | 0.096 | 1 1/2 | 1825-0320.096 | ● | 1825-0320L096 | ● | - | - |
| NEW 0.0330 | 1/8 | 0.099 | 1 1/2 | 1825-0330.099 | ● | 1825-0330L099 | ● | - | - |
| NEW 0.0340 | 1/8 | 0.102 | 1 1/2 | 1825-0340.102 | ● | 1825-0340L102 | ● | - | - |
| NEW 0.0350 | 1/8 | 0.105 | 1 1/2 | 1825-0350.105 | ● | 1825-0350L105 | ● | 1825-0350D105 | ■ |
| NEW 0.0360 | 1/8 | 0.108 | 1 1/2 | 1825-0360.108 | ● | 1825-0360L108 | ● | - | - |

| SERIES 1825 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

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▲ : Coming Soon

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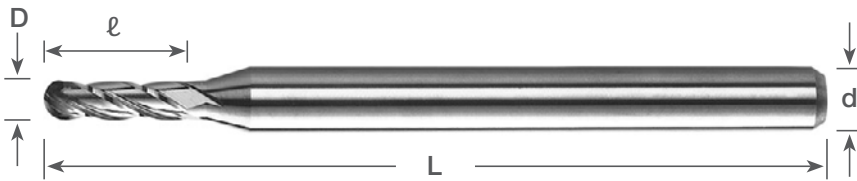
4 FLUTE

0.0370" - 0.0650" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| | Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----|---------------------------------------|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| | D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW | 0.0370 | 1/8 | 0.111 | 1 1/2 | 1825-0370.111 | ● | 1825-0370L111 | ● | - | - |
| NEW | 0.0380 | 1/8 | 0.114 | 1 1/2 | 1825-0380.114 | ● | 1825-0380L114 | ● | - | - |
| NEW | 0.0394 | 1/8 | 0.117 | 1 1/2 | 1825-0394.117 | ● | 1825-0394L117 | ● | 1825-0394D117 | ■ |
| NEW | 0.0400 | 1/8 | 0.120 | 1 1/2 | 1825-0400.120 | ● | 1825-0400L120 | ● | 1825-0400D120 | ■ |
| NEW | 0.0410 | 1/8 | 0.123 | 1 1/2 | 1825-0410.123 | ● | 1825-0410L123 | ● | - | - |
| NEW | 0.0420 | 1/8 | 0.126 | 1 1/2 | 1825-0420.126 | ● | 1825-0420L126 | ● | - | - |
| NEW | 0.0430 | 1/8 | 0.129 | 1 1/2 | 1825-0430.129 | ● | 1825-0430L129 | ● | - | - |
| NEW | 0.0440 | 1/8 | 0.132 | 1 1/2 | 1825-0440.132 | ● | 1825-0440L132 | ● | - | - |
| NEW | 0.0450 | 1/8 | 0.135 | 1 1/2 | 1825-0450.135 | ● | 1825-0450L135 | ● | 1825-0450D135 | ■ |
| NEW | 0.0460 | 1/8 | 0.138 | 1 1/2 | 1825-0460.138 | ● | 1825-0460L138 | ● | - | - |
| | 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 1825-0469.141 | ● | 1825-0469L141 | ● | 1825-0469D141 | ■ |
| NEW | 0.0480 | 1/8 | 0.144 | 1 1/2 | 1825-0480.144 | ● | 1825-0480L144 | ● | - | - |
| NEW | 0.0490 | 1/8 | 0.147 | 1 1/2 | 1825-0490.147 | ● | 1825-0490L147 | ● | - | - |
| NEW | 0.0500 | 1/8 | 0.150 | 1 1/2 | 1825-0500.150 | ● | 1825-0500L150 | ● | 1825-0500D150 | ■ |
| NEW | 0.0510 | 1/8 | 0.153 | 1 1/2 | 1825-0510.153 | ● | 1825-0510L153 | ● | - | - |
| NEW | 0.0520 | 1/8 | 0.156 | 1 1/2 | 1825-0520.156 | ● | 1825-0520L156 | ● | - | - |
| NEW | 0.0530 | 1/8 | 0.159 | 1 1/2 | 1825-0530.159 | ● | 1825-0530L159 | ● | - | - |
| NEW | 0.0540 | 1/8 | 0.162 | 1 1/2 | 1825-0540.162 | ● | 1825-0540L162 | ● | - | - |
| NEW | 0.0550 | 1/8 | 0.165 | 1 1/2 | 1825-0550.165 | ● | 1825-0550L165 | ● | 1825-0550D165 | ■ |
| NEW | 0.0560 | 1/8 | 0.168 | 1 1/2 | 1825-0560.168 | ● | 1825-0560L168 | ● | - | - |
| NEW | 0.0570 | 1/8 | 0.171 | 1 1/2 | 1825-0570.171 | ● | 1825-0570L171 | ● | - | - |
| NEW | 0.0580 | 1/8 | 0.174 | 1 1/2 | 1825-0580.174 | ● | 1825-0580L174 | ● | - | - |
| NEW | 0.0590 | 1/8 | 0.177 | 1 1/2 | 1825-0590.177 | ● | 1825-0590L177 | ● | - | - |
| NEW | 0.0600 | 1/8 | 0.180 | 1 1/2 | 1825-0600.180 | ● | 1825-0600L180 | ● | 1825-0600D180 | ■ |
| | 0.0625 (1/16) | 1/8 | 0.188 | 1 1/2 | 1825-0625.188 | ● | 1825-0625L188 | ● | 1825-0625D188 | ■ |
| NEW | 0.0650 | 1/8 | 0.195 | 1 1/2 | 1825-0650.195 | ● | 1825-0650L195 | ● | - | - |

SERIES 1825 WORKPIECE MATERIAL

| Coating | P Steel ~20HRC | P Steel 30~40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

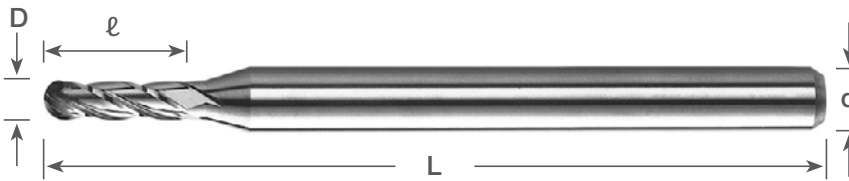
4 FLUTE

STANDARD LENGTH BALL NOSE END MILLS

0.0700" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0700 | 1/8 | 0.210 | 1 1/2 | 1825-0700.210 | ● | 1825-0700L210 | ● | 1825-0700D210 | ■ |
| NEW 0.0750 | 1/8 | 0.225 | 1 1/2 | 1825-0750.225 | ● | 1825-0750L225 | ● | 1825-0750D225 | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 1825-0781.234 | ● | 1825-0781L234 | ● | 1825-0781D234 | ■ |
| NEW 0.0800 | 1/8 | 0.240 | 1 1/2 | 1825-0800.240 | ● | 1825-0800L240 | ● | 1825-0800D240 | ■ |
| NEW 0.0850 | 1/8 | 0.255 | 1 1/2 | 1825-0850.255 | ● | 1825-0850L255 | ● | 1825-0850D255 | ■ |
| NEW 0.0900 | 1/8 | 0.270 | 1 1/2 | 1825-0900.270 | ● | 1825-0900L270 | ● | 1825-0900D270 | ■ |
| 0.0938 (3/32) | 1/8 | 0.281 | 1 1/2 | 1825-0938.281 | ● | 1825-0938L281 | ● | 1825-0938D281 | ■ |
| NEW 0.0950 | 1/8 | 0.285 | 1 1/2 | 1825-0950.285 | ● | 1825-0950L285 | ● | 1825-0950D285 | ■ |
| NEW 0.1000 | 1/8 | 0.300 | 1 1/2 | 1825-1000.300 | ● | 1825-1000L300 | ● | 1825-1000D300 | ■ |
| NEW 0.1050 | 1/8 | 0.315 | 1 1/2 | 1825-1050.315 | ● | 1825-1050L315 | ● | 1825-1050D315 | ■ |
| 0.1094 (7/64) | 1/8 | 0.328 | 1 1/2 | 1825-1094.328 | ● | 1825-1094L328 | ● | 1825-1094D328 | ■ |
| NEW 0.1100 | 1/8 | 0.330 | 1 1/2 | 1825-1100.330 | ● | 1825-1100L330 | ● | 1825-1100D330 | ■ |
| NEW 0.1150 | 1/8 | 0.345 | 1 1/2 | 1825-1150.345 | ● | 1825-1150L345 | ● | 1825-1150D345 | ■ |
| NEW 0.1181 | 1/8 | 0.355 | 1 1/2 | 1825-1181.355 | ● | 1825-1181L355 | ● | 1825-1181D355 | ■ |
| NEW 0.1200 | 1/8 | 0.360 | 1 1/2 | 1825-1200.360 | ● | 1825-1200L360 | ● | 1825-1200D360 | ■ |
| 0.1250 (1/8) | 1/8 | 0.375 | 1 1/2 | 1825-1250.375 | ● | 1825-1250L375 | ● | 1825-1250D375 | ■ |
| 0.1406 (9/64) | 3/16 | 0.500 | 2 | 1825-1406.500 | ● | 1825-1406L500 | ● | 1825-1406D500 | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 1825-1562.562 | ● | 1825-1562L562 | ● | 1825-1562D562 | ■ |
| 0.1563 (5/32) | 3/16 | 0.500 | 2 | 1825-1563.500 | ● | 1825-1563L500 | ● | 1825-1563D500 | ■ |
| 0.1719 (11/64) | 3/16 | 0.563 | 2 | 1825-1719.563 | ● | 1825-1719L563 | ● | 1825-1719D563 | ■ |
| 0.1875 (3/16) | 3/16 | 0.563 | 2 | 1825-1875.563 | ● | 1825-1875L563 | ● | 1825-1875D563 | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 1825-1875.625 | ● | 1825-1875L625 | ● | 1825-1875D625 | ■ |
| 0.2031 (13/64) | 1/4 | 0.625 | 2 1/2 | 1825-2031.625 | ● | 1825-2031L625 | ● | 1825-2031D625 | ■ |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 1825-2188.625 | ● | 1825-2188L625 | ● | 1825-2188D625 | ■ |
| 0.2344 (15/64) | 1/4 | 0.750 | 2 1/2 | 1825-2344.750 | ● | 1825-2344L750 | ● | 1825-2344D750 | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 1825-2500.750 | ● | 1825-2500L750 | ● | 1825-2500D750 | ■ |

| SERIES 1825 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

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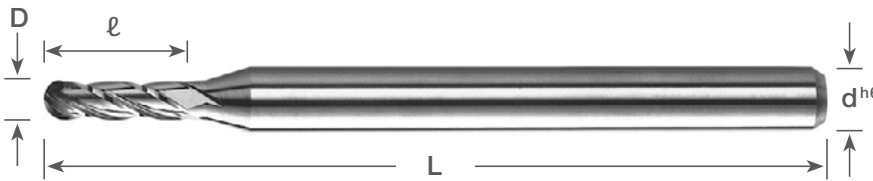
4 FLUTE

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH BALL NOSE END MILLS



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|-------|----|---------------|-------|---------------|-------|
| D <small>+0.00mm -0.02mm</small> | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1.20 | 38 | 1825-0157.047 | ● | 1825-0157L047 | ● |
| 0.45 | 3 | 1.35 | 38 | 1825-0177.053 | ● | 1825-0177L053 | ● |
| 0.50 | 3 | 1.50 | 38 | 1825-0197.059 | ● | 1825-0197L059 | ● |
| 0.60 | 3 | 1.80 | 38 | 1825-0236.071 | ● | 1825-0236L071 | ● |
| 0.70 | 3 | 2.10 | 38 | 1825-0276.083 | ● | 1825-0276L083 | ● |
| 0.80 | 3 | 2.40 | 38 | 1825-0315.095 | ● | 1825-0315L095 | ● |
| 0.90 | 3 | 2.70 | 38 | 1825-0354.106 | ● | 1825-0354L106 | ● |
| 1.00 | 3 | 3.00 | 38 | 1825-0394.118 | ● | 1825-0394L118 | ● |
| 1.10 | 3 | 3.30 | 38 | 1825-0433.130 | ● | 1825-0433L130 | ● |
| 1.20 | 3 | 3.60 | 38 | 1825-0472.142 | ● | 1825-0472L142 | ● |
| 1.30 | 3 | 3.90 | 38 | 1825-0512.154 | ● | 1825-0512L154 | ● |
| 1.40 | 3 | 4.20 | 38 | 1825-0551.165 | ● | 1825-0551L165 | ● |
| 1.50 | 3 | 4.50 | 38 | 1825-0591.177 | ● | 1825-0591L177 | ● |
| 1.60 | 3 | 4.80 | 38 | 1825-0630.189 | ● | 1825-0630L189 | ● |
| 1.70 | 3 | 5.10 | 38 | 1825-0669.200 | ● | 1825-0669L200 | ● |
| 1.80 | 3 | 5.40 | 38 | 1825-0709.213 | ● | 1825-0709L213 | ● |
| 1.90 | 3 | 5.70 | 38 | 1825-0748.224 | ● | 1825-0748L224 | ● |
| 2.00 | 3 | 6.00 | 38 | 1825-0787.236 | ● | 1825-0787L236 | ● |
| 2.50 | 3 | 7.50 | 38 | 1825-0984.295 | ● | 1825-0984L295 | ● |
| 3.00 | 3 | 9.00 | 38 | 1825-1181.354 | ● | 1825-1181L354 | ● |
| 3.50 | 4 | 10.50 | 50 | 1825-1378.413 | ● | 1825-1378L413 | ● |
| 4.00 | 5 | 12.00 | 50 | 1825-1575.473 | ● | 1825-1575L473 | ● |
| 4.50 | 5 | 13.50 | 50 | 1825-1772.532 | ● | 1825-1772L532 | ● |
| 5.00 | 5 | 15.00 | 50 | 1825-1968.590 | ● | 1825-1968L590 | ● |
| 5.50 | 6 | 16.50 | 50 | 1825-2165.650 | ● | 1825-2165L650 | ● |
| 6.00 | 6 | 18.00 | 50 | 1825-2362.709 | ● | 1825-2362L709 | ● |

| SERIES 1825 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------------------------------|--|---|---|---|-------------------------------|------------------------------|------------------------------|--------------------------------------|--------------------------|-----------------------------|---|--|---|--|
| Coating | P <small>Steel -30HRC</small> | P <small>Steel 30-40HRC</small> | H <small>Hardened Steel -55HRC</small> | H <small>Hardened Steel -68HRC</small> | M <small>Stainless Steel</small> | K <small>Cast Iron</small> | N <small>Aluminum</small> | N <small>Graphite</small> | N <small>Copper Alloy</small> | N <small>CFRP</small> | N <small>Plastic</small> | N <small>Thermoset Plastic</small> | N <small>High Density Plastic</small> | S <small>Nickel / Cobalt</small> | S <small>Titanium Alloy</small> |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

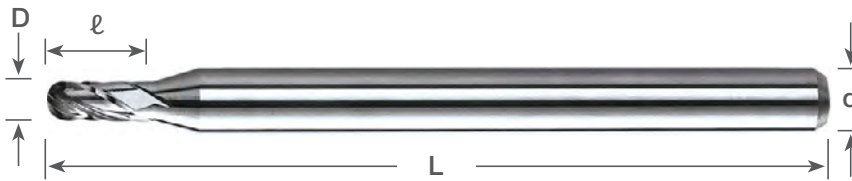
4 FLUTE

STUB LENGTH BALL NOSE END MILLS

0.0100" - 0.0394" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions Page 7

STUB Length (Inch Sizes)

| Dimensions (in) | | | | Uncoated | | AITIN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0100 | 1/8 | 0.015 | 1 1/2 | 1835-0100.015 | ● | 1835-0100L015 | ● | 1835-0100D015 | ■ |
| NEW 0.0110 | 1/8 | 0.016 | 1 1/2 | 1835-0110.016 | ● | 1835-0110L016 | ● | 1835-0110D016 | ■ |
| NEW 0.0120 | 1/8 | 0.018 | 1 1/2 | 1835-0120.018 | ● | 1835-0120L018 | ● | 1835-0120D018 | ■ |
| NEW 0.0130 | 1/8 | 0.019 | 1 1/2 | 1835-0130.019 | ● | 1835-0130L019 | ● | 1835-0130D019 | ■ |
| NEW 0.0140 | 1/8 | 0.021 | 1 1/2 | 1835-0140.021 | ● | 1835-0140L021 | ● | 1835-0140D021 | ■ |
| 0.0156 (1/64) | 1/8 | 0.023 | 1 1/2 | 1835-0156.023 | ● | 1835-0156L023 | ● | 1835-0156D023 | ■ |
| NEW 0.0160 | 1/8 | 0.024 | 1 1/2 | 1835-0160.024 | ● | 1835-0160L024 | ● | 1835-0160D024 | ■ |
| NEW 0.0170 | 1/8 | 0.026 | 1 1/2 | 1835-0170.026 | ● | 1835-0170L026 | ● | 1835-0170D026 | ■ |
| NEW 0.0180 | 1/8 | 0.027 | 1 1/2 | 1835-0180.027 | ● | 1835-0180L027 | ● | 1835-0180D027 | ■ |
| NEW 0.0190 | 1/8 | 0.029 | 1 1/2 | 1835-0190.029 | ● | 1835-0190L029 | ● | 1835-0190D029 | ■ |
| NEW 0.0200 | 1/8 | 0.030 | 1 1/2 | 1835-0200.030 | ● | 1835-0200L030 | ● | 1835-0200D030 | ■ |
| NEW 0.0210 | 1/8 | 0.031 | 1 1/2 | 1835-0210.031 | ● | 1835-0210L031 | ● | 1835-0210D031 | ■ |
| NEW 0.0220 | 1/8 | 0.033 | 1 1/2 | 1835-0220.033 | ● | 1835-0220L033 | ● | 1835-0220D033 | ■ |
| NEW 0.0230 | 1/8 | 0.035 | 1 1/2 | 1835-0230.035 | ● | 1835-0230L035 | ● | 1835-0230D035 | ■ |
| NEW 0.0240 | 1/8 | 0.036 | 1 1/2 | 1835-0240.036 | ● | 1835-0240L036 | ● | 1835-0240D036 | ■ |
| NEW 0.0250 | 1/8 | 0.037 | 1 1/2 | 1835-0250.037 | ● | 1835-0250L037 | ● | 1835-0250D037 | ■ |
| NEW 0.0260 | 1/8 | 0.039 | 1 1/2 | 1835-0260.039 | ● | 1835-0260L039 | ● | 1835-0260D039 | ■ |
| NEW 0.0270 | 1/8 | 0.041 | 1 1/2 | 1835-0270.041 | ● | 1835-0270L041 | ● | 1835-0270D041 | ■ |
| NEW 0.0280 | 1/8 | 0.042 | 1 1/2 | 1835-0280.042 | ● | 1835-0280L042 | ● | 1835-0280D042 | ■ |
| NEW 0.0290 | 1/8 | 0.043 | 1 1/2 | 1835-0290.043 | ● | 1835-0290L043 | ● | 1835-0290D043 | ■ |
| NEW 0.0300 | 1/8 | 0.045 | 1 1/2 | 1835-0300.045 | ● | 1835-0300L045 | ● | 1835-0300D045 | ■ |
| 0.0312 (1/32) | 1/8 | 0.047 | 1 1/2 | 1835-0312.047 | ● | 1835-0312L047 | ● | 1835-0312D047 | ■ |
| NEW 0.0320 | 1/8 | 0.048 | 1 1/2 | 1835-0320.048 | ● | 1835-0320L048 | ● | 1835-0320D048 | ■ |
| NEW 0.0330 | 1/8 | 0.049 | 1 1/2 | 1835-0330.049 | ● | 1835-0330L049 | ● | 1835-0330D049 | ■ |
| NEW 0.0340 | 1/8 | 0.051 | 1 1/2 | 1835-0340.051 | ● | 1835-0340L051 | ● | 1835-0340D051 | ■ |
| NEW 0.0350 | 1/8 | 0.052 | 1 1/2 | 1835-0350.052 | ● | 1835-0350L052 | ● | 1835-0350D052 | ■ |
| NEW 0.0360 | 1/8 | 0.054 | 1 1/2 | 1835-0360.054 | ● | 1835-0360L054 | ● | 1835-0360D054 | ■ |
| NEW 0.0370 | 1/8 | 0.055 | 1 1/2 | 1835-0370.055 | ● | 1835-0370L055 | ● | 1835-0370D055 | ■ |
| NEW 0.0380 | 1/8 | 0.057 | 1 1/2 | 1835-0380.057 | ● | 1835-0380L057 | ● | 1835-0380D057 | ■ |
| NEW 0.0394 | 1/8 | 0.058 | 1 1/2 | 1835-0394.058 | ● | 1835-0394L058 | ● | 1835-0394D058 | ■ |

| SERIES 1835 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AITIN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

● : U.S. Stock Standard
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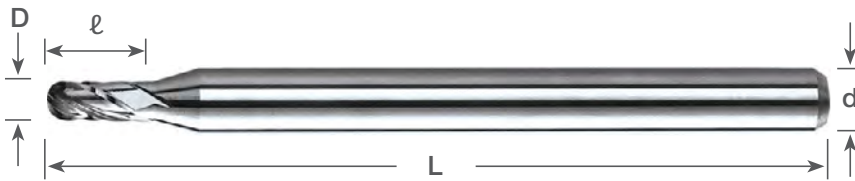
4 FLUTE

0.0400" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STUB LENGTH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

STUB Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-------------------|------|-------|-------|---------------|----------|---------------|---------------|---------------|-----------------|--|
| D | d | l | L | Part Number | Stock | Part Number | Stock | Part Number | Stock | |
| NEW 0.0400 | 1/8 | 0.060 | 1 1/2 | 1835-0400.060 | ● | 1835-0400L060 | ● | 1835-0400D060 | ■ | |
| NEW 0.0450 | 1/8 | 0.067 | 1 1/2 | 1835-0450.067 | ● | 1835-0450L067 | ● | 1835-0450D067 | ■ | |
| 0.0469 (3/64) | 1/8 | 0.070 | 1 1/2 | 1835-0469.070 | ● | 1835-0469L070 | ● | 1835-0469D070 | ■ | |
| NEW 0.0500 | 1/8 | 0.075 | 1 1/2 | 1835-0500.075 | ● | 1835-0500L075 | ● | 1835-0500D075 | ■ | |
| NEW 0.0550 | 1/8 | 0.082 | 1 1/2 | 1835-0550.082 | ● | 1835-0550L082 | ● | 1835-0550D082 | ■ | |
| NEW 0.0600 | 1/8 | 0.090 | 1 1/2 | 1835-0600.090 | ● | 1835-0600L090 | ● | 1835-0600D090 | ■ | |
| 0.0625 (1/16) | 1/8 | 0.094 | 1 1/2 | 1835-0625.094 | ● | 1835-0625L094 | ● | 1835-0625D094 | ■ | |
| NEW 0.0650 | 1/8 | 0.097 | 1 1/2 | 1835-0650.097 | ● | 1835-0650L097 | ● | 1835-0650D097 | ■ | |
| NEW 0.0700 | 1/8 | 0.105 | 1 1/2 | 1835-0700.105 | ● | 1835-0700L105 | ● | 1835-0700D105 | ■ | |
| NEW 0.0750 | 1/8 | 0.112 | 1 1/2 | 1835-0750.112 | ● | 1835-0750L112 | ● | 1835-0750D112 | ■ | |
| 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 1835-0781.117 | ● | 1835-0781L117 | ● | 1835-0781D117 | ■ | |
| NEW 0.0800 | 1/8 | 0.120 | 1 1/2 | 1835-0800.120 | ● | 1835-0800L120 | ● | 1835-0800D120 | ■ | |
| NEW 0.0850 | 1/8 | 0.127 | 1 1/2 | 1835-0850.127 | ● | 1835-0850L127 | ● | 1835-0850D127 | ■ | |
| NEW 0.0900 | 1/8 | 0.135 | 1 1/2 | 1835-0900.135 | ● | 1835-0900L135 | ● | 1835-0900D135 | ■ | |
| 0.0938 (3/32) | 1/8 | 0.141 | 1 1/2 | 1835-0938.141 | ● | 1835-0938L141 | ● | 1835-0938D141 | ■ | |
| NEW 0.0950 | 1/8 | 0.142 | 1 1/2 | 1835-0950.142 | ● | 1835-0950L142 | ● | 1835-0950D142 | ■ | |
| NEW 0.1000 | 1/8 | 0.150 | 1 1/2 | 1835-1000.150 | ● | 1835-1000L150 | ● | 1835-1000D150 | ■ | |
| 0.1094 (7/64) | 1/8 | 0.164 | 1 1/2 | 1835-1094.164 | ● | 1835-1094L164 | ● | 1835-1094D164 | ■ | |
| NEW 0.1181 | 1/8 | 0.178 | 1 1/2 | 1835-1181.178 | ● | 1835-1181L178 | ● | 1835-1181D178 | ■ | |
| 0.1250 (1/8) | 1/8 | 0.188 | 1 1/2 | 1835-1250.188 | ● | 1835-1250L188 | ● | 1835-1250D188 | ■ | |
| 0.1406 (9/64) | 3/16 | 0.211 | 2 | 1835-1406.211 | ● | 1835-1406L211 | ● | 1835-1406D211 | ■ | |
| 0.1563 (5/32) | 3/16 | 0.234 | 2 | 1835-1563.234 | ● | 1835-1563L234 | ● | 1835-1563D234 | ■ | |
| 0.1719 (11/64) | 3/16 | 0.258 | 2 | 1835-1719.258 | ● | 1835-1719L258 | ● | 1835-1719D258 | ■ | |
| 0.1875 (3/16) | 3/16 | 0.281 | 2 | 1835-1875.281 | ● | 1835-1875L281 | ● | 1835-1875D281 | ■ | |
| NEW 0.1875 (3/16) | 3/16 | 0.312 | 2 | 1835-1875.312 | ● | 1835-1875L312 | ● | 1835-1875D312 | ■ | |
| 0.2031 (13/64) | 1/4 | 0.305 | 2 1/2 | 1835-2031.305 | ● | 1835-2031L305 | ● | 1835-2031D305 | ■ | |
| 0.2188 (7/32) | 1/4 | 0.328 | 2 1/2 | 1835-2188.328 | ● | 1835-2188L328 | ● | 1835-2188D328 | ■ | |
| 0.2344 (15/64) | 1/4 | 0.352 | 2 1/2 | 1835-2344.352 | ● | 1835-2344L352 | ● | 1835-2344D352 | ■ | |
| 0.2500 (1/4) | 1/4 | 0.375 | 2 1/2 | 1835-2500.375 | ● | 1835-2500L375 | ● | 1835-2500D375 | ■ | |

SERIES 1835 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~50HRC | Hardened Steel ~55HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

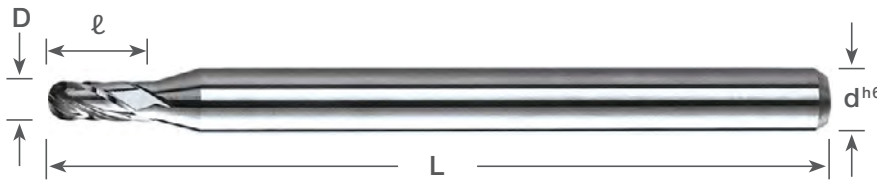
4 FLUTE

STUB LENGTH BALL NOSE END MILLS

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STUB Length (Metric Sizes)

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|------|----|---------------|-------|---------------|-------|
| D ^{+0.00mm} _{-0.02mm} | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 0.60 | 38 | 1835-0157.024 | ● | 1835-0157L024 | ● |
| 0.45 | 3 | 0.68 | 38 | 1835-0177.027 | ● | 1835-0177L027 | ● |
| 0.50 | 3 | 0.75 | 38 | 1835-0197.030 | ● | 1835-0197L030 | ● |
| 0.60 | 3 | 0.90 | 38 | 1835-0236.035 | ● | 1835-0236L035 | ● |
| 0.70 | 3 | 1.05 | 38 | 1835-0276.041 | ● | 1835-0276L041 | ● |
| 0.80 | 3 | 1.20 | 38 | 1835-0315.047 | ● | 1835-0315L047 | ● |
| 0.90 | 3 | 1.35 | 38 | 1835-0354.053 | ● | 1835-0354L053 | ● |
| 1.00 | 3 | 1.50 | 38 | 1835-0394.059 | ● | 1835-0394L059 | ● |
| 1.50 | 3 | 2.25 | 38 | 1835-0591.089 | ● | 1835-0591L089 | ● |
| 2.00 | 3 | 3.00 | 38 | 1835-0787.118 | ● | 1835-0787L118 | ● |
| 2.50 | 3 | 3.75 | 38 | 1835-0984.148 | ● | 1835-0984L148 | ● |
| 3.00 | 3 | 4.50 | 38 | 1835-1181.177 | ● | 1835-1181L177 | ● |
| 3.50 | 4 | 5.25 | 50 | 1835-1378.207 | ● | 1835-1378L207 | ● |
| 4.00 | 5 | 6.00 | 50 | 1835-1575.236 | ● | 1835-1575L236 | ● |
| 4.50 | 5 | 6.75 | 50 | 1835-1772.266 | ● | 1835-1772L266 | ● |
| 5.00 | 5 | 7.50 | 50 | 1835-1968.295 | ● | 1835-1968L295 | ● |
| 5.50 | 6 | 8.25 | 50 | 1835-2165.325 | ● | 1835-2165L325 | ● |
| 6.00 | 6 | 9.00 | 50 | 1835-2362.354 | ● | 1835-2362L354 | ● |

| SERIES 1835 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | | | | | | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
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 ▲ : Coming Soon

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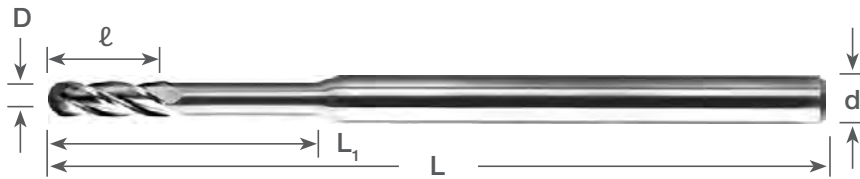
4 FLUTE

0.0100" - 0.0600" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH BALL NOSE END MILLS



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|---------------|-------|---------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW 0.0100 | 1/8 | 0.030 | 1 1/2 | 0.080 | 1845-0100.080 | ● | 1845-0100L080 | ● | 1845-0100D080 | ■ |
| 0.0100 | 1/8 | 0.030 | 1 1/2 | 0.100 | 1845-0100.100 | ● | 1845-0100L100 | ● | 1845-0100D100 | ■ |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.128 | 1845-0150.128 | ● | 1845-0150L128 | ● | 1845-0150D128 | ■ |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.150 | 1845-0150.150 | ● | 1845-0150L150 | ● | 1845-0150D150 | ■ |
| 0.0156 (1/64) | 1/8 | 0.047 | 1 1/2 | 0.120 | 1845-0156.120 | ● | 1845-0156L120 | ● | 1845-0156D120 | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.170 | 1845-0200.170 | ● | 1845-0200L170 | ● | 1845-0200D170 | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.200 | 1845-0200.200 | ● | 1845-0200L200 | ● | 1845-0200D200 | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.213 | 1845-0250.213 | ● | 1845-0250L213 | ● | 1845-0250D213 | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.250 | 1845-0250.250 | ● | 1845-0250L250 | ● | 1845-0250D250 | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.270 | 1845-0300.270 | ● | 1845-0300L270 | ● | 1845-0300D270 | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.300 | 1845-0300.300 | ● | 1845-0300L300 | ● | 1845-0300D300 | ■ |
| 0.0312 (1/32) | 1/8 | 0.094 | 1 1/2 | 0.315 | 1845-0312.315 | ● | 1845-0312L315 | ● | 1845-0312D315 | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.315 | 1845-0350.315 | ● | 1845-0350L315 | ● | 1845-0350D315 | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.350 | 1845-0350.350 | ● | 1845-0350L350 | ● | 1845-0350D350 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.360 | 1845-0400.360 | ● | 1845-0400L360 | ● | 1845-0400D360 | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.400 | 1845-0400.400 | ● | 1845-0400L400 | ● | 1845-0400D400 | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.405 | 1845-0450.405 | ● | 1845-0450L405 | ● | 1845-0450D405 | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.450 | 1845-0450.450 | ● | 1845-0450L450 | ● | 1845-0450D450 | ■ |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.390 | 1845-0469.390 | ● | 1845-0469L390 | ● | 1845-0469D390 | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.423 | 1845-0469.423 | ● | 1845-0469L423 | ● | 1845-0469D423 | ■ |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.500 | 1845-0500.500 | ● | 1845-0500L500 | ● | 1845-0500D500 | ■ |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.500 | 1845-0550.500 | ● | 1845-0550L500 | ● | 1845-0550D500 | ■ |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.500 | 1845-0600.500 | ● | 1845-0600L500 | ● | 1845-0600D500 | ■ |
| 0.0600 | 1/8 | 0.180 | 2 | 0.600 | 1845-0600.600 | ● | 1845-0600L600 | ● | 1845-0600D600 | ■ |

SERIES 1845 WORKPIECE MATERIAL

| Coating | P Steel ~20HRC | P Steel 30~40HRC | H Hardened Steel ~50HRC | H Hardened Steel ~55HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

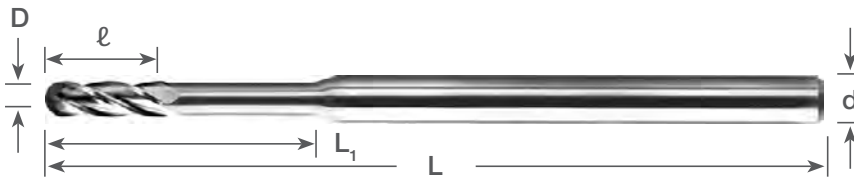
4 FLUTE

EXTENDED REACH BALL NOSE END MILLS

0.0625" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|-----|-------|-------|----------------|----------------|----------|----------------|---------------|----------------|-----------------|--|
| D ^{+0.000} _{-0.001} | d | ℓ | L | L ₁ | Part Number | Stock | Part Number | Stock | Part Number | Stock | |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.590 | 1845-0625.590A | ● | 1845-0625L590A | ● | 1845-0625D590A | ■ | |
| 0.0625 (1/16) | 1/8 | 0.188 | 2 | 0.590 | 1845-0625.590 | ● | 1845-0625L590 | ● | 1845-0625D590 | ■ | |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.500 | 1845-0650.500 | ● | 1845-0650L500 | ● | 1845-0650D500 | ■ | |
| 0.0650 | 1/8 | 0.195 | 2 | 0.600 | 1845-0650.600 | ● | 1845-0650L600 | ● | 1845-0650D600 | ■ | |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.500 | 1845-0700.500 | ● | 1845-0700L500 | ● | 1845-0700D500 | ■ | |
| 0.0700 | 1/8 | 0.210 | 2 | 0.700 | 1845-0700.700 | ● | 1845-0700L700 | ● | 1845-0700D700 | ■ | |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.500 | 1845-0750.500 | ● | 1845-0750L500 | ● | 1845-0750D500 | ■ | |
| 0.0750 | 1/8 | 0.225 | 2 | 0.700 | 1845-0750.700 | ● | 1845-0750L700 | ● | 1845-0750D700 | ■ | |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.590 | 1845-0781.590A | ● | 1845-0781L590A | ● | 1845-0781D590A | ■ | |
| 0.0781 (5/64) | 1/8 | 0.234 | 2 | 0.590 | 1845-0781.590 | ● | 1845-0781L590 | ● | 1845-0781D590 | ■ | |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.500 | 1845-0800.500 | ● | 1845-0800L500 | ● | 1845-0800D500 | ■ | |
| 0.0800 | 1/8 | 0.240 | 2 | 0.750 | 1845-0800.750 | ● | 1845-0800L750 | ● | 1845-0800D750 | ■ | |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.500 | 1845-0850.500 | ● | 1845-0850L500 | ● | 1845-0850D500 | ■ | |
| 0.0850 | 1/8 | 0.255 | 2 | 0.750 | 1845-0850.750 | ● | 1845-0850L750 | ● | 1845-0850D750 | ■ | |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.625 | 1845-0900.625 | ● | 1845-0900L625 | ● | 1845-0900D625 | ■ | |
| 0.0900 | 1/8 | 0.270 | 2 | 0.750 | 1845-0900.750 | ● | 1845-0900L750 | ● | 1845-0900D750 | ■ | |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.625 | 1845-0938.625 | ● | 1845-0938L625 | ● | 1845-0938D625 | ■ | |
| 0.0938 (3/32) | 1/8 | 0.281 | 2 | 0.590 | 1845-0938.590 | ● | 1845-0938L590 | ● | 1845-0938D590 | ■ | |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.625 | 1845-0950.625 | ● | 1845-0950L625 | ● | 1845-0950D625 | ■ | |
| 0.0950 | 1/8 | 0.285 | 2 | 0.750 | 1845-0950.750 | ● | 1845-0950L750 | ● | 1845-0950D750 | ■ | |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.625 | 1845-1000.625 | ● | 1845-1000L625 | ● | 1845-1000D625 | ■ | |
| 0.1000 | 1/8 | 0.300 | 2 | 0.750 | 1845-1000.750 | ● | 1845-1000L750 | ● | 1845-1000D750 | ■ | |
| 0.1094 (7/64) | 1/8 | 0.328 | 2 | 0.590 | 1845-1094.590 | ● | 1845-1094L590 | ● | 1845-1094D590 | ■ | |
| 0.1100 | 1/8 | 0.330 | 2 | 0.750 | 1845-1100.750 | ● | 1845-1100L750 | ● | 1845-1100D750 | ■ | |
| 0.1250 (1/8) | 1/8 | 0.375 | 2 | 0.590 | 1845-1250.590 | ● | 1845-1250L590 | ● | 1845-1250D590 | ■ | |

| SERIES 1845 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

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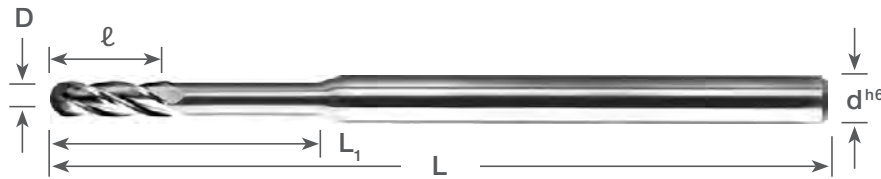
4 FLUTE

EXTENDED REACH BALL NOSE END MILLS

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

EXTENDED Reach (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|--------------------------------|-----------------|-------|----|----------------|----------------|-------|----------------|-------|
| D ^{+0.000 -0.001} | d ^{h6} | l | L | L ₁ | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1.20 | 38 | 3 | 1845-0157.118 | ● | 1845-0157L118 | ● |
| 0.50 | 3 | 1.50 | 38 | 4 | 1845-0197.157 | ● | 1845-0197L157 | ● |
| 0.60 | 3 | 1.80 | 38 | 5 | 1845-0236.197 | ● | 1845-0236L197 | ● |
| 0.65 | 3 | 1.95 | 38 | 6 | 1845-0256.236 | ● | 1845-0256L236 | ● |
| 0.70 | 3 | 2.10 | 38 | 7 | 1845-0276.276 | ● | 1845-0276L276 | ● |
| 0.75 | 3 | 2.25 | 38 | 8 | 1845-0295.315 | ● | 1845-0295L315 | ● |
| 0.80 | 3 | 2.40 | 50 | 9 | 1845-0315.354 | ● | 1845-0315L354 | ● |
| 0.90 | 3 | 2.70 | 50 | 10 | 1845-0354.394 | ● | 1845-0354L394 | ● |
| 1.00 | 3 | 3.00 | 50 | 10 | 1845-0394.394 | ● | 1845-0394L394 | ● |
| 1.50 | 3 | 4.50 | 50 | 15 | 1845-0591.591 | ● | 1845-0591L591 | ● |
| 2.00 | 3 | 6.00 | 50 | 20 | 1845-0787.787 | ● | 1845-0787L787 | ● |
| 2.50 | 3 | 7.50 | 50 | 23 | 1845-0984.906 | ● | 1845-0984L906 | ● |
| 3.00 | 3 | 9.00 | 50 | 23 | 1845-1181.906 | ● | 1845-1181L906 | ● |
| 3.50 | 6 | 10.50 | 75 | 25 | 1845-1378.984 | ● | 1845-1378L984 | ● |
| 4.00 | 6 | 12.00 | 75 | 25 | 1845-1575.984 | ● | 1845-1575L984 | ● |
| 4.50 | 6 | 13.50 | 75 | 30 | 1845-1772.1181 | ● | 1845-1772L1181 | ● |
| 5.00 | 6 | 15.00 | 75 | 30 | 1845-1968.1181 | ● | 1845-1968L1181 | ● |
| 5.50 | 6 | 16.50 | 75 | 30 | 1845-2165.1181 | ● | 1845-2165L1181 | ● |
| 6.00 | 6 | 18.00 | 75 | 30 | 1845-2362.1181 | ● | 1845-2362L1181 | ● |

| SERIES 1845 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

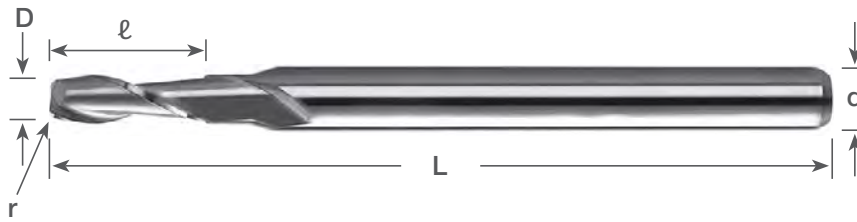
★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

2 FLUTE NEW

STANDARD LENGTH
X-SMALL CORNER RADIUS END MILLS

0.0500" - 0.1000" DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

X-SMALL Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----------------|-----|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.005 | 1611-0500.150CR | ● | 1611-0500L150CR | ● | 1611-0500D150CR | ■ |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.005 | 1611-0600.180CR | ● | 1611-0600L180CR | ● | 1611-0600D180CR | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.005 | 1611-0700.210CR | ● | 1611-0700L210CR | ● | 1611-0700D210CR | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.005 | 1611-0800.240CR | ● | 1611-0800L240CR | ● | 1611-0800D240CR | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.005 | 1611-0900.270CR | ● | 1611-0900L270CR | ● | 1611-0900D270CR | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.005 | 1611-1000.300CR | ● | 1611-1000L300CR | ● | 1611-1000D300CR | ■ |

Corner Radius Tolerance

| | |
|--------------|-------------------|
| Diameter (D) | 0.0500" - 0.1000" |
| + / - | 0.0015" |

| SERIES 1611 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

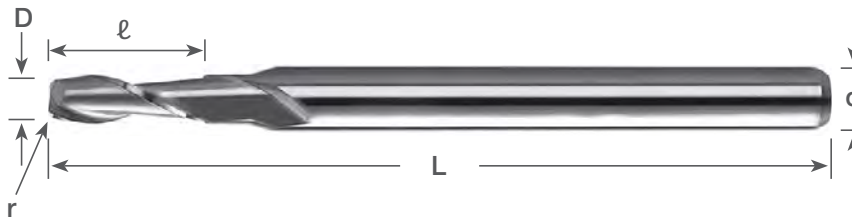
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2 FLUTE

STANDARD LENGTH
SMALL CORNER RADIUS END MILLS

0.0150" - 0.2500" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

SMALL Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-------------------|------|-------|-------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| D | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.003 | 1612-0150.045CR | ● | 1612-0150L045CR | ● | 1612-0150D045CR | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.045 | 1 1/2 | 0.003 | 1612-0156.045CR | ● | 1612-0156L045CR | ● | 1612-0156D045CR | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.005 | 1612-0200.060CR | ● | 1612-0200L060CR | ● | 1612-0200D060CR | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.005 | 1612-0250.075CR | ● | 1612-0250L075CR | ● | 1612-0250D075CR | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.005 | 1612-0300.090CR | ● | 1612-0300L090CR | ● | 1612-0300D090CR | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.093 | 1 1/2 | 0.005 | 1612-0312.093CR | ● | 1612-0312L093CR | ● | 1612-0312D093CR | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.005 | 1612-0350.105CR | ● | 1612-0350L105CR | ● | 1612-0350D105CR | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.005 | 1612-0400.120CR | ● | 1612-0400L120CR | ● | 1612-0400D120CR | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.005 | 1612-0450.135CR | ● | 1612-0450L135CR | ● | 1612-0450D135CR | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.005 | 1612-0469.141CR | ● | 1612-0469L141CR | ● | 1612-0469D141CR | ■ |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.010 | 1612-0500.150CR | ● | 1612-0500L150CR | ● | 1612-0500D150CR | ■ |
| NEW 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.005 | 1612-0550.165CR | ● | 1612-0550L165CR | ● | 1612-0550D165CR | ■ |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.010 | 1612-0600.180CR | ● | 1612-0600L180CR | ● | 1612-0600D180CR | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.005 | 1612-0625.186CR | ● | 1612-0625L186CR | ● | 1612-0625D186CR | ■ |
| NEW 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.005 | 1612-0650.195CR | ● | 1612-0650L195CR | ● | 1612-0650D195CR | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.010 | 1612-0700.210CR | ● | 1612-0700L210CR | ● | 1612-0700D210CR | ■ |
| NEW 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.005 | 1612-0750.225CR | ● | 1612-0750L225CR | ● | 1612-0750D225CR | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.005 | 1612-0781.234CR | ● | 1612-0781L234CR | ● | 1612-0781D234CR | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.010 | 1612-0800.240CR | ● | 1612-0800L240CR | ● | 1612-0800D240CR | ■ |
| NEW 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.005 | 1612-0850.255CR | ● | 1612-0850L255CR | ● | 1612-0850D255CR | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.010 | 1612-0900.270CR | ● | 1612-0900L270CR | ● | 1612-0900D270CR | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.005 | 1612-0938.279CR | ● | 1612-0938L279CR | ● | 1612-0938D279CR | ■ |
| NEW 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.005 | 1612-0950.285CR | ● | 1612-0950L285CR | ● | 1612-0950D285CR | ■ |
| 0.1000 | 1/8 | 0.30 | 1 1/2 | 0.010 | 1612-1000.300CR | ● | 1612-1000L300CR | ● | 1612-1000D300CR | ■ |
| NEW 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.005 | 1612-1250.500CR | ● | 1612-1250L500CR | ● | 1612-1250D500CR | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.010 | 1612-1562.562CR | ● | 1612-1562L562CR | ● | 1612-1562D562CR | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.010 | 1612-1875.625CR | ● | 1612-1875L625CR | ● | 1612-1875D625CR | ■ |
| NEW 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.010 | 1612-2500.750CR | ● | 1612-2500L750CR | ● | 1612-2500D750CR | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0150" - 0.0350" | 0.0400" - 0.1000" | 0.1250" - 0.1875" | 0.2500" |
|--------------|-------------------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

SERIES 1612 WORKPIECE MATERIAL

| Coating | P Steel ~20HRC | P Steel 30~40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

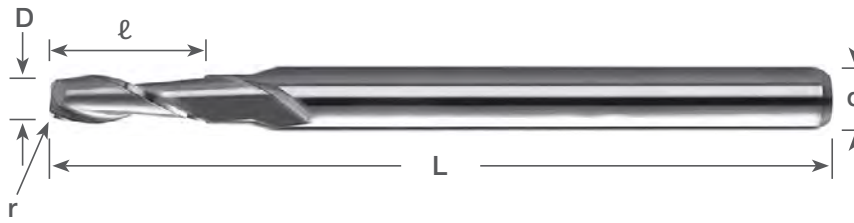
Symbol Descriptions [Page 7](#)

2 FLUTE

STANDARD LENGTH
STANDARD CORNER RADIUS END MILLS

0.0156" - 0.2500" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Corner Radius STANDARD Length (Inch Sizes)

| | Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-----|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| | D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| NEW | 0.0156 (1/64) | 1/8 | 0.045 | 1 1/2 | 0.005 | 1613-0156.045CR | ● | 1613-0156L045CR | ● | 1613-0156D045CR | ■ |
| NEW | 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.010 | 1613-0300.090CR | ● | 1613-0300L090CR | ● | 1613-0300D090CR | ■ |
| NEW | 0.0312 (1/32) | 1/8 | 0.093 | 1 1/2 | 0.010 | 1613-0312.093CR | ● | 1613-0312L093CR | ● | 1613-0312D093CR | ■ |
| NEW | 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.010 | 1613-0350.105CR | ● | 1613-0350L105CR | ● | 1613-0350D105CR | ■ |
| | 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.010 | 1613-0400.120CR | ● | 1613-0400L120CR | ● | 1613-0400D120CR | ■ |
| | 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.010 | 1613-0450.135CR | ● | 1613-0450L135CR | ● | 1613-0450D135CR | ■ |
| NEW | 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.010 | 1613-0469.141CR | ● | 1613-0469L141CR | ● | 1613-0469D141CR | ■ |
| | 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.015 | 1613-0500.150CR | ● | 1613-0500L150CR | ● | 1613-0500D150CR | ■ |
| NEW | 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.010 | 1613-0550.165CR | ● | 1613-0550L165CR | ● | 1613-0550D165CR | ■ |
| | 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.015 | 1613-0600.180CR | ● | 1613-0600L180CR | ● | 1613-0600D180CR | ■ |
| NEW | 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.010 | 1613-0625.186CR | ● | 1613-0625L186CR | ● | 1613-0625D186CR | ■ |
| NEW | 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.010 | 1613-0650.195CR | ● | 1613-0650L195CR | ● | 1613-0650D195CR | ■ |
| | 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.015 | 1613-0700.210CR | ● | 1613-0700L210CR | ● | 1613-0700D210CR | ■ |
| NEW | 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.010 | 1613-0750.225CR | ● | 1613-0750L225CR | ● | 1613-0750D225CR | ■ |
| NEW | 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.010 | 1613-0781.234CR | ● | 1613-0781L234CR | ● | 1613-0781D234CR | ■ |
| | 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.015 | 1613-0800.240CR | ● | 1613-0800L240CR | ● | 1613-0800D240CR | ■ |
| NEW | 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.010 | 1613-0850.255CR | ● | 1613-0850L255CR | ● | 1613-0850D255CR | ■ |
| | 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.015 | 1613-0900.270CR | ● | 1613-0900L270CR | ● | 1613-0900D270CR | ■ |
| NEW | 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.010 | 1613-0938.279CR | ● | 1613-0938L279CR | ● | 1613-0938D279CR | ■ |
| NEW | 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.010 | 1613-0950.285CR | ● | 1613-0950L285CR | ● | 1613-0950D285CR | ■ |
| | 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.015 | 1613-1000.300CR | ● | 1613-1000L300CR | ● | 1613-1000D300CR | ■ |
| NEW | 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.010 | 1613-1250.500CR | ● | 1613-1250L500CR | ● | 1613-1250D500CR | ■ |
| NEW | 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.015 | 1613-1562.562CR | ● | 1613-1562L562CR | ● | 1613-1562D562CR | ■ |
| NEW | 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.015 | 1613-1875.625CR | ● | 1613-1875L625CR | ● | 1613-1875D625CR | ■ |
| NEW | 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.015 | 1613-2500.750CR | ● | 1613-2500L750CR | ● | 1613-2500D750CR | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0156" - 0.0350" | 0.0400" - 0.1000" | 0.1250" - 0.1875" | 0.2500" |
|--------------|-------------------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

| SERIES 1613 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel 30-38HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

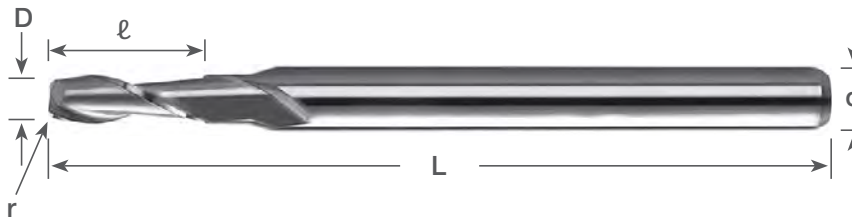
(U.S.) 1.888.848.8449
(International) 001.714.428.3636
Pricing & Availability at KyoceraPrecisionTools.com

2 FLUTE NEW

0.0450" - 0.5000" DIAMETER

STANDARD LENGTH
LARGE / X-LARGE CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.015 | 1614-0450.135CR | ● | 1614-0450L135CR | ● | 1614-0450D135CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.015 | 1614-0469.141CR | ● | 1614-0469L141CR | ● | 1614-0469D141CR | ■ |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.015 | 1614-0550.165CR | ● | 1614-0550L165CR | ● | 1614-0550D165CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.015 | 1614-0625.186CR | ● | 1614-0625L186CR | ● | 1614-0625D186CR | ■ |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.015 | 1614-0650.195CR | ● | 1614-0650L195CR | ● | 1614-0650D195CR | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.015 | 1614-0750.225CR | ● | 1614-0750L225CR | ● | 1614-0750D225CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.015 | 1614-0781.234CR | ● | 1614-0781L234CR | ● | 1614-0781D234CR | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.015 | 1614-0850.255CR | ● | 1614-0850L255CR | ● | 1614-0850D255CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.015 | 1614-0938.279CR | ● | 1614-0938L279CR | ● | 1614-0938D279CR | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.015 | 1614-0950.285CR | ● | 1614-0950L285CR | ● | 1614-0950D285CR | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.015 | 1614-1000.300CR | ● | 1614-1000L300CR | ● | 1614-1000D300CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.015 | 1614-1250.500CR | ● | 1614-1250L500CR | ● | 1614-1250D500CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.020 | 1614-1875.625CR | ● | 1614-1875L625CR | ● | 1614-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.020 | 1614-2500.750CR | ● | 1614-2500L750CR | ● | 1614-2500D750CR | ■ |

X-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.020 | 1616-0625.186CR | ● | 1616-0625L186CR | ● | 1616-0625D186CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.020 | 1616-0781.234CR | ● | 1616-0781L234CR | ● | 1616-0781D234CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.020 | 1616-0938.279CR | ● | 1616-0938L279CR | ● | 1616-0938D279CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.020 | 1616-1250.500CR | ● | 1616-1250L500CR | ● | 1616-1250D500CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.030 | 1616-1875.625CR | ● | 1616-1875L625CR | ● | 1616-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.030 | 1616-2500.750CR | ● | 1616-2500L750CR | ● | 1616-2500D750CR | ■ |
| 0.3750 (3/8) | 3/8 | 1.000 | 2 1/2 | 0.030 | 1616-3750.1000C | ● | 1616-3750L1000C | ● | 1616-3750D1000C | ■ |
| 0.5000 (1/2) | 1/2 | 1.000 | 3 | 0.030 | 1616-5000.1000C | ● | 1616-5000L1000C | ● | 1616-5000D1000C | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0450" - 0.1000" | 0.1250" - 0.1875" | 0.2500" - 0.5000" |
|--------------|-------------------|-------------------|-------------------|
| + / - | 0.0015" | 0.0020" | 0.0030" |

SERIES 1614 / 1616 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel $30\text{--}40\text{HRC}$ | H Hardened Steel $\sim 55\text{HRC}$ | H Hardened Steel $\sim 65\text{HRC}$ | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|-----------------------------------|--|---|---|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

2 FLUTE NEW

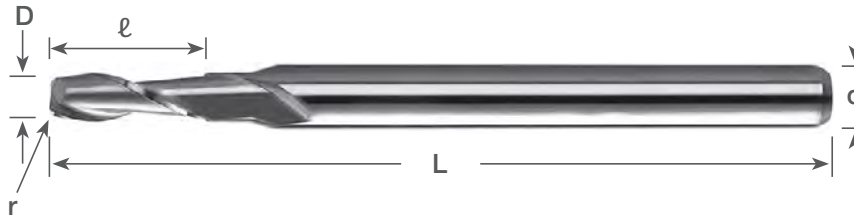
0.0938" - 0.5000" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

STANDARD LENGTH

XX-LARGE / XXX-LARGE CORNER RADIUS END MILLS



Symbol Descriptions [Page 7](#)

XX-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.030 | 1617-0938.279CR | ● | 1617-0938L279CR | ● | 1617-0938D279CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.030 | 1617-1250.500CR | ● | 1617-1250L500CR | ● | 1617-1250D500CR | ■ |
| 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.030 | 1617-1562.562CR | ● | 1617-1562L562CR | ● | 1617-1562D562CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.045 | 1617-1875.625CR | ● | 1617-1875L625CR | ● | 1617-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.045 | 1617-2500.750CR | ● | 1617-2500L750CR | ● | 1617-2500D750CR | ■ |

XXX-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.060 | 1618-1875.625CR | ● | 1618-1875L625CR | ● | - | - |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.060 | 1618-2500.750CR | ● | 1618-2500L750CR | ● | 1618-2500D750CR | ■ |
| 0.3750 (3/8) | 3/8 | 1.000 | 2 1/2 | 0.060 | 1618-3750.1000C | ● | 1618-3750L1000C | ● | - | - |
| 0.5000 (1/2) | 1/2 | 1.000 | 3 | 0.060 | 1618-5000.1000C | ● | 1618-5000L1000C | ● | - | - |

Corner Radius Tolerance

| Diameter (D) | 0.0938" | 0.1250" - 0.1875" | 0.2500" - 0.5000" |
|--------------|---------|-------------------|-------------------|
| + / - | 0.0015" | 0.0020" | 0.0030" |

| SERIES 1617 / 1618 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|---------------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
 ■ : NOT STOCKED - Call for Delivery
 ▲ : Coming Soon

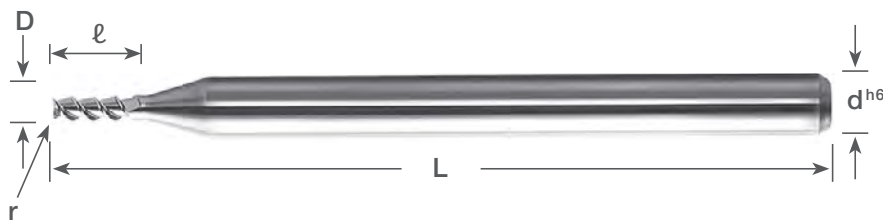
(U.S.) 1.888.848.8449
 (International) 001.714.428.3636
 Pricing & Availability at KyoceraPrecisionTools.com

3 FLUTE

STANDARD LENGTH HIGH HELIX CORNER RADIUS END MILLS

1.00mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

HIGH HELIX Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|--------------------------------|-----------------|------|----|------|----------------|-------|----------------|-------|
| D ^{+0.000 -0.001} | d ^{h6} | ℓ | L | r | Part Number | Stock | Part Number | Stock |
| 1.00 | 3 | 3.0 | 38 | 0.10 | 1703-0394.118R | ● | 1703-0394L118R | ● |
| 1.50 | 3 | 4.5 | 38 | 0.15 | 1703-0591.177R | ● | 1703-0591L177R | ● |
| 2.00 | 3 | 6.0 | 38 | 0.20 | 1703-0787.236R | ● | 1703-0787L236R | ● |
| 2.50 | 3 | 7.5 | 38 | 0.25 | 1703-0984.295R | ● | 1703-0984L295R | ● |
| 3.00 | 3 | 9.0 | 38 | 0.30 | 1703-1181.354R | ● | 1703-1181L354R | ● |
| 3.50 | 6 | 12.0 | 50 | 0.35 | 1703-1378.472R | ● | 1703-1378L472R | ● |
| 4.00 | 5 | 12.0 | 50 | 0.40 | 1703-1575.473R | ● | 1703-1575L473R | ● |
| 4.50 | 6 | 15.0 | 50 | 0.45 | 1703-1772.591R | ● | 1703-1772L591R | ● |
| 5.00 | 5 | 15.0 | 50 | 0.50 | 1703-1968.590R | ● | 1703-1968L590R | ● |
| 5.50 | 6 | 18.0 | 50 | 0.55 | 1703-2165.709R | ● | 1703-2165L709R | ● |
| 6.00 | 6 | 18.0 | 50 | 0.60 | 1703-2362.709R | ● | 1703-2362L709R | ● |

Corner Radius Tolerance

| | |
|--------------|-----------------|
| Diameter (D) | 1.00mm - 6.00mm |
| + / - | 0.03mm |

| SERIES 1703 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

TITAN-AX™

REINFORCED SHANK

Also Available in Square End Styles [Page 80-81](#)

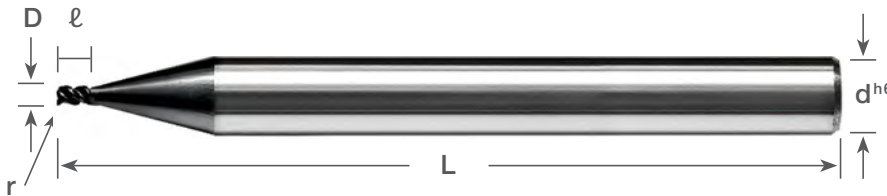
0.0312" - 0.2500" DIAMETER
1.00mm - 8.00mm DIAMETER

Variable Helix

AX High Performance Coating

Increased Shank Diameter for Maximum Rigidity

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STUB Length

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | | AX Coating | |
|--------------------------------|-----|-------|-------|-------|-------------|-------|
| D ^{+0.000 -0.001} | d | ℓ | L | r | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.063 | 2 1/2 | 0.006 | T0312O063CR | ● |
| 0.0469 (3/64) | 1/4 | 0.094 | 2 1/2 | 0.010 | T0469O094CR | ● |
| 0.0625 (1/16) | 1/4 | 0.140 | 2 1/2 | 0.010 | T0625O140CR | ● |
| 0.0781 (5/64) | 1/4 | 0.140 | 2 1/2 | 0.010 | T0781O140CR | ● |
| 0.0938 (3/32) | 1/4 | 0.188 | 2 1/2 | 0.010 | T0938O188CR | ● |
| 0.1094 (7/64) | 1/4 | 0.188 | 2 1/2 | 0.010 | T1094O188CR | ● |
| 0.1250 (1/8) | 1/4 | 0.250 | 2 1/2 | 0.015 | T1250O250CR | ● |
| 0.1562 (5/32) | 1/4 | 0.375 | 2 1/2 | 0.015 | T1562O375CR | ● |
| 0.1875 (3/16) | 1/4 | 0.375 | 2 1/2 | 0.015 | T1875O375CR | ● |
| 0.2188 (7/32) | 1/4 | 0.375 | 2 1/2 | 0.015 | T2188O375CR | ● |
| 0.2500 (1/4) | 1/4 | 0.500 | 2 1/2 | 0.015 | T2500O500CR | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | | AX Coating | |
|----------------------------------|-----------------|------|------|------|--------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | r | Part Number | Stock |
| 1.00 | 6 | 1.5 | 63.5 | 0.10 | T0394O059CR1 | ● |
| 1.00 | 6 | 1.5 | 63.5 | 0.20 | T0394O059CR2 | ● |
| 1.00 | 6 | 1.5 | 63.5 | 0.30 | T0394O059CR3 | ● |
| 1.50 | 6 | 2.5 | 63.5 | 0.10 | T0591O098CR1 | ● |
| 1.50 | 6 | 2.5 | 63.5 | 0.20 | T0591O098CR2 | ● |
| 1.50 | 6 | 2.5 | 63.5 | 0.30 | T0591O098CR3 | ● |
| 1.50 | 6 | 2.5 | 63.5 | 0.50 | T0591O098CR4 | ● |
| 2.00 | 6 | 3.0 | 63.5 | 0.20 | T0787O118CR1 | ● |
| 2.00 | 6 | 3.0 | 63.5 | 0.30 | T0787O118CR2 | ● |
| 2.00 | 6 | 3.0 | 63.5 | 0.50 | T0787O118CR3 | ● |
| 2.50 | 6 | 4.0 | 63.5 | 0.20 | T0984O157CR1 | ● |
| 2.50 | 6 | 4.0 | 63.5 | 0.30 | T0984O157CR2 | ● |
| 2.50 | 6 | 4.0 | 63.5 | 0.50 | T0984O157CR3 | ● |
| 3.00 | 6 | 5.0 | 63.5 | 0.20 | T1181O197CR1 | ● |
| 3.00 | 6 | 5.0 | 63.5 | 0.30 | T1181O197CR2 | ● |
| 3.00 | 6 | 5.0 | 63.5 | 0.50 | T1181O197CR3 | ● |
| 3.00 | 6 | 5.0 | 63.5 | 1.00 | T1181O197CR4 | ● |
| 4.00 | 6 | 6.0 | 63.5 | 0.20 | T1575O236CR1 | ● |
| 4.00 | 6 | 6.0 | 63.5 | 0.30 | T1575O236CR2 | ● |
| 4.00 | 6 | 6.0 | 63.5 | 0.50 | T1575O236CR3 | ● |
| 4.00 | 6 | 6.0 | 63.5 | 1.00 | T1575O236CR4 | ● |
| 5.00 | 6 | 8.0 | 63.5 | 0.20 | T1969O315CR1 | ● |
| 5.00 | 6 | 8.0 | 63.5 | 0.30 | T1969O315CR2 | ● |
| 5.00 | 6 | 8.0 | 63.5 | 0.50 | T1969O315CR3 | ● |
| 5.00 | 6 | 8.0 | 63.5 | 1.00 | T1969O315CR4 | ● |
| 5.00 | 6 | 8.0 | 63.5 | 1.50 | T1969O315CR5 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 0.20 | T2362O354CR1 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 0.30 | T2362O354CR2 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 0.50 | T2362O354CR3 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 1.00 | T2362O354CR4 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 1.50 | T2362O354CR5 | ● |
| 6.00 | 6 | 9.0 | 63.5 | 2.00 | T2362O354CR6 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 0.20 | T3150O472CR1 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 0.30 | T3150O472CR2 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 0.50 | T3150O472CR3 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 1.00 | T3150O472CR4 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 1.50 | T3150O472CR5 | ● |
| 8.00 | 8 | 12.0 | 63.5 | 2.00 | T3150O472CR6 | ● |

Corner Radius Tolerance

| Diameter (D) | 0.0312" - 0.2500" | 1.00mm - 8.00mm |
|--------------|-------------------|-----------------|
| + / - | 0.0020" | 0.05mm |

TITAN-AX / TITAN-AXM WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|---------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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ENGRAVERS
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REAMERS
SAWS
TECHNICAL
INDEX

TITAN-AX™

REINFORCED SHANK

Also Available in Square End Styles [Page 80-81](#)

0.0312" - 0.2500" DIAMETER
1.00mm - 8.00mm DIAMETER

Variable Helix

AX High Performance Coating

Increased Shank Diameter for Maximum Rigidity

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Length

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | | AX Coating | |
|--------------------------------|-----|-------|-------|-------|-------------|-------|
| D ^{+0.000 -0.001} | d | ℓ | L | r | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.094 | 2 1/2 | 0.006 | T0312O094CR | ● |
| 0.0469 (3/64) | 1/4 | 0.141 | 2 1/2 | 0.010 | T0469O141CR | ● |
| 0.0625 (1/16) | 1/4 | 0.188 | 2 1/2 | 0.010 | T0625O188CR | ● |
| 0.0781 (5/64) | 1/4 | 0.234 | 2 1/2 | 0.010 | T0781O234CR | ● |
| 0.0938 (3/32) | 1/4 | 0.375 | 2 1/2 | 0.010 | T0938O375CR | ● |
| 0.1094 (7/64) | 1/4 | 0.438 | 2 1/2 | 0.010 | T1094O438CR | ● |
| 0.1250 (1/8) | 1/4 | 0.500 | 2 1/2 | 0.015 | T1250O500CR | ● |
| 0.1562 (5/32) | 1/4 | 0.563 | 2 1/2 | 0.015 | T1562O563CR | ● |
| 0.1875 (3/16) | 1/4 | 0.625 | 2 1/2 | 0.015 | T1875O625CR | ● |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 0.015 | T2188O625CR | ● |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.015 | T2500O750CR | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | | AX Coating | |
|----------------------------------|-----------------|------|------|------|--------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | r | Part Number | Stock |
| 1.00 | 6 | 3.0 | 63.5 | 0.10 | T0394O118CR1 | ● |
| 1.00 | 6 | 3.0 | 63.5 | 0.20 | T0394O118CR2 | ● |
| 1.00 | 6 | 3.0 | 63.5 | 0.30 | T0394O118CR3 | ● |
| 1.50 | 6 | 4.5 | 63.5 | 0.10 | T0591O177CR1 | ● |
| 1.50 | 6 | 4.5 | 63.5 | 0.20 | T0591O177CR2 | ● |
| 1.50 | 6 | 4.5 | 63.5 | 0.30 | T0591O177CR3 | ● |
| 1.50 | 6 | 4.5 | 63.5 | 0.50 | T0591O177CR4 | ● |
| 2.00 | 6 | 6.0 | 63.5 | 0.20 | T0787O236CR1 | ● |
| 2.00 | 6 | 6.0 | 63.5 | 0.30 | T0787O236CR2 | ● |
| 2.00 | 6 | 6.0 | 63.5 | 0.50 | T0787O236CR3 | ● |
| 2.50 | 6 | 7.5 | 63.5 | 0.20 | T0984O295CR1 | ● |
| 2.50 | 6 | 7.5 | 63.5 | 0.30 | T0984O295CR2 | ● |
| 2.50 | 6 | 7.5 | 63.5 | 0.50 | T0984O295CR3 | ● |
| 3.00 | 6 | 9.0 | 63.5 | 0.20 | T1181O354CR1 | ● |
| 3.00 | 6 | 9.0 | 63.5 | 0.30 | T1181O354CR2 | ● |
| 3.00 | 6 | 9.0 | 63.5 | 0.50 | T1181O354CR3 | ● |
| 3.00 | 6 | 9.0 | 63.5 | 1.00 | T1181O354CR4 | ● |
| 4.00 | 6 | 12.0 | 63.5 | 0.20 | T1575O472CR1 | ● |
| 4.00 | 6 | 12.0 | 63.5 | 0.30 | T1575O472CR2 | ● |
| 4.00 | 6 | 12.0 | 63.5 | 0.50 | T1575O472CR3 | ● |
| 4.00 | 6 | 12.0 | 63.5 | 1.00 | T1575O472CR4 | ● |
| 5.00 | 6 | 15.0 | 63.5 | 0.20 | T1969O591CR1 | ● |
| 5.00 | 6 | 15.0 | 63.5 | 0.30 | T1969O591CR2 | ● |
| 5.00 | 6 | 15.0 | 63.5 | 0.50 | T1969O591CR3 | ● |
| 5.00 | 6 | 15.0 | 63.5 | 1.00 | T1969O591CR4 | ● |
| 5.00 | 6 | 15.0 | 63.5 | 1.50 | T1969O591CR5 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 0.20 | T2362O709CR1 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 0.30 | T2362O709CR2 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 0.50 | T2362O709CR3 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 1.00 | T2362O709CR4 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 1.50 | T2362O709CR5 | ● |
| 6.00 | 6 | 18.0 | 63.5 | 2.00 | T2362O709CR6 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 0.20 | T3150O945CR1 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 0.30 | T3150O945CR2 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 0.50 | T3150O945CR3 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 1.00 | T3150O945CR4 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 1.50 | T3150O945CR5 | ● |
| 8.00 | 8 | 24.0 | 63.5 | 2.00 | T3150O945CR6 | ● |

Corner Radius Tolerance

| Diameter (D) | 0.0312" - 0.2500" | 1.00mm - 8.00mm |
|--------------|-------------------|-----------------|
| + / - | 0.0020" | 0.05mm |

TITAN-AX / TITAN-AXM WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|---------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

TITAN-AX™

REINFORCED SHANK
LONG REACH REDUCED NECK

Also Available in Square End Styles [Page 80-81](#)

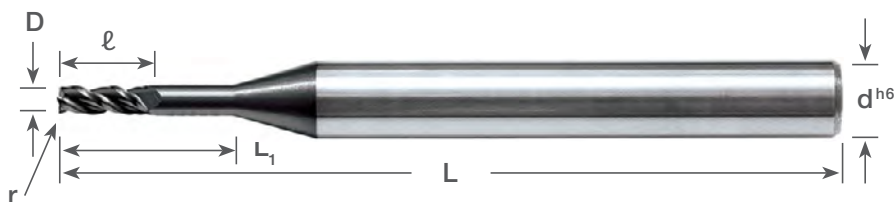
0.0312" - 0.2500" DIAMETER
1.00mm - 8.00mm DIAMETER

Variable Helix

AX High Performance Coating

Increased Shank Diameter for Maximum Rigidity

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

Extended Reach

TITAN-AX (Inch Sizes)

| Dimensions (in) | | | | | | AX Coating | |
|--------------------------------|-----|-------|-------|----------------|-------|--------------|-------|
| D ^{+0.000 -0.001} | d | ℓ | L | L ₁ | r | Part Number | Stock |
| 0.0312 (1/32) | 1/4 | 0.094 | 2 1/2 | 0.155 | 0.006 | T0312O094ERC | ● |
| 0.0469 (3/64) | 1/4 | 0.141 | 2 1/2 | 0.230 | 0.010 | T0469O141ERC | ● |
| 0.0625 (1/16) | 1/4 | 0.188 | 2 1/2 | 0.312 | 0.010 | T0625O188ERC | ● |
| 0.0781 (5/64) | 1/4 | 0.234 | 2 1/2 | 0.390 | 0.010 | T0781O234ERC | ● |
| 0.0938 (3/32) | 1/4 | 0.375 | 2 1/2 | 0.465 | 0.010 | T0938O375ERC | ● |
| 0.1094 (7/64) | 1/4 | 0.438 | 2 1/2 | 0.545 | 0.010 | T1094O438ERC | ● |
| 0.1250 (1/8) | 1/4 | 0.500 | 2 1/2 | 0.625 | 0.015 | T1250O500ERC | ● |
| 0.1562 (5/32) | 1/4 | 0.563 | 2 1/2 | 0.781 | 0.015 | T1562O563ERC | ● |
| 0.1875 (3/16) | 1/4 | 0.625 | 2 1/2 | 0.938 | 0.015 | T1875O625ERC | ● |
| 0.2188 (7/32) | 1/4 | 0.625 | 2 1/2 | 1.093 | 0.015 | T2188O625ERC | ● |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 1.250 | 0.015 | T2500O750ERC | ● |

TITAN-AXM (Metric Sizes)

| Dimensions (mm) | | | | | | AX Coating | |
|----------------------------------|-----------------|------|-----|----------------|------|---------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | L ₁ | r | Part Number | Stock |
| 1.00 | 6 | 3.0 | 75 | 10 | 0.10 | T0394O118ECR1 | ● |
| 1.00 | 6 | 3.0 | 75 | 10 | 0.20 | T0394O118ECR2 | ● |
| 1.00 | 6 | 3.0 | 75 | 10 | 0.30 | T0394O118ECR3 | ● |
| 1.50 | 6 | 4.5 | 75 | 15 | 0.10 | T0591O177ECR1 | ● |
| 1.50 | 6 | 4.5 | 75 | 15 | 0.20 | T0591O177ECR2 | ● |
| 1.50 | 6 | 4.5 | 75 | 15 | 0.30 | T0591O177ECR3 | ● |
| 1.50 | 6 | 4.5 | 75 | 15 | 0.50 | T0591O177ECR4 | ● |
| 2.00 | 6 | 6.0 | 75 | 20 | 0.20 | T0787O236ECR1 | ● |
| 2.00 | 6 | 6.0 | 75 | 20 | 0.30 | T0787O236ECR2 | ● |
| 2.00 | 6 | 6.0 | 75 | 20 | 0.50 | T0787O236ECR3 | ● |
| 2.50 | 6 | 7.5 | 75 | 25 | 0.20 | T0984O295ECR1 | ● |
| 2.50 | 6 | 7.5 | 75 | 25 | 0.30 | T0984O295ECR2 | ● |
| 2.50 | 6 | 7.5 | 75 | 25 | 0.50 | T0984O295ECR3 | ● |
| 3.00 | 6 | 9.0 | 75 | 30 | 0.20 | T1181O354ECR1 | ● |
| 3.00 | 6 | 9.0 | 75 | 30 | 0.30 | T1181O354ECR2 | ● |
| 3.00 | 6 | 9.0 | 75 | 30 | 0.50 | T1181O354ECR3 | ● |
| 3.00 | 6 | 9.0 | 75 | 30 | 1.00 | T1181O354ECR4 | ● |
| 4.00 | 6 | 12.0 | 75 | 30 | 0.20 | T1575O472ECR1 | ● |
| 4.00 | 6 | 12.0 | 75 | 30 | 0.30 | T1575O472ECR2 | ● |
| 4.00 | 6 | 12.0 | 75 | 30 | 0.50 | T1575O472ECR3 | ● |
| 4.00 | 6 | 12.0 | 75 | 30 | 1.00 | T1575O472ECR4 | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | 0.20 | T1969O591ECR1 | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | 0.30 | T1969O591ECR2 | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | 0.50 | T1969O591ECR3 | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | 1.00 | T1969O591ECR4 | ● |
| 5.00 | 6 | 15.0 | 75 | 40 | 1.50 | T1969O591ECR5 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 0.20 | T2362O709ECR1 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 0.30 | T2362O709ECR2 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 0.50 | T2362O709ECR3 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 1.00 | T2362O709ECR4 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 1.50 | T2362O709ECR5 | ● |
| 6.00 | 6 | 18.0 | 75 | 45 | 2.00 | T2362O709ECR6 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 0.20 | T3150O945ECR1 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 0.30 | T3150O945ECR2 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 0.50 | T3150O945ECR3 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 1.00 | T3150O945ECR4 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 1.50 | T3150O945ECR5 | ● |
| 8.00 | 8 | 24.0 | 100 | 50 | 2.00 | T3150O945ECR6 | ● |

Corner Radius Tolerance

| Diameter (D) | 0.0312" - 0.2500" | 1.00mm - 8.00mm |
|--------------|-------------------|-----------------|
| + / - | 0.0020" | 0.05mm |

TITAN-AX / TITAN-AXM WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
|---------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AX | ☆ | ☆ | ★ | ★ | ☆ | ☆ | | | | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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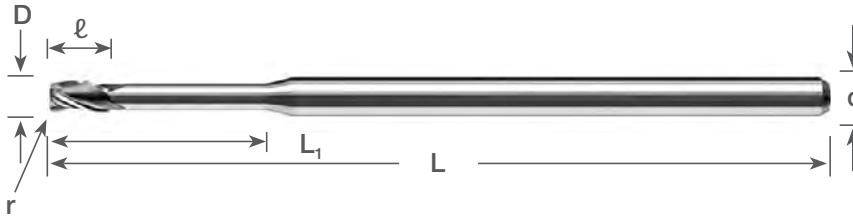
3 FLUTE NEW

0.0156" - 0.2500" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH
SMALL CORNER RADIUS END MILLS



Symbol Descriptions [Page 7](#)

SMALL Corner Radius EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | | Uncoated | | AlTiN Coating | | DLC Coating NEW | |
|---|------|-------|-------|----------------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0156 (1/64) | 1/8 | 0.022 | 2.5 | 0.078 | 0.003 | 1743-0156.078CR | ● | 1743-0156L078CR | ● | 1743-0156D078CR | ■ |
| 0.0156 (1/64) | 1/8 | 0.022 | 2.5 | 0.125 | 0.003 | 1743-0156.125CR | ● | 1743-0156L125CR | ● | 1743-0156D125CR | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.100 | 0.005 | 1743-0200.100CR | ● | 1743-0200L100CR | ● | 1743-0200D100CR | ■ |
| 0.0200 | 1/8 | 0.030 | 2 1/2 | 0.160 | 0.005 | 1743-0200.160CR | ● | 1743-0200L160CR | ● | 1743-0200D160CR | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.125 | 0.005 | 1743-0250.125CR | ● | 1743-0250L125CR | ● | 1743-0250D125CR | ■ |
| 0.0250 | 1/8 | 0.037 | 2 1/2 | 0.203 | 0.005 | 1743-0250.203CR | ● | 1743-0250L203CR | ● | 1743-0250D203CR | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2.5 | 0.156 | 0.005 | 1743-0312.156CR | ● | 1743-0312L156CR | ● | 1743-0312D156CR | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2.5 | 0.250 | 0.005 | 1743-0312.250CR | ● | 1743-0312L250CR | ● | 1743-0312D250CR | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2.5 | 0.375 | 0.005 | 1743-0312.375CR | ● | 1743-0312L375CR | ● | 1743-0312D375CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2.5 | 0.250 | 0.005 | 1743-0469.250CR | ● | 1743-0469L250CR | ● | 1743-0469D250CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2.5 | 0.375 | 0.005 | 1743-0469.375CR | ● | 1743-0469L375CR | ● | 1743-0469D375CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2.5 | 0.570 | 0.005 | 1743-0469.570CR | ● | 1743-0469L570CR | ● | 1743-0469D570CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2.5 | 0.312 | 0.005 | 1743-0625.312CR | ● | 1743-0625L312CR | ● | 1743-0625D312CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2.5 | 0.500 | 0.005 | 1743-0625.500CR | ● | 1743-0625L500CR | ● | 1743-0625D500CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2.5 | 0.750 | 0.005 | 1743-0625.750CR | ● | 1743-0625L750CR | ● | 1743-0625D750CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2.5 | 0.406 | 0.005 | 1743-0781.406CR | ● | 1743-0781L406CR | ● | 1743-0781D406CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2.5 | 0.625 | 0.005 | 1743-0781.625CR | ● | 1743-0781L625CR | ● | 1743-0781D625CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2.5 | 0.940 | 0.005 | 1743-0781.940CR | ● | 1743-0781L940CR | ● | 1743-0781D940CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2.5 | 0.500 | 0.005 | 1743-0938.500CR | ● | 1743-0938L500CR | ● | 1743-0938D500CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2.5 | 0.750 | 0.005 | 1743-0938.750CR | ● | 1743-0938L750CR | ● | 1743-0938D750CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2.5 | 1.125 | 0.005 | 1743-0938.1125C | ● | 1743-0938L1125C | ● | 1743-0938D1125C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2.5 | 0.625 | 0.010 | 1743-1250.625CR | ● | 1743-1250L625CR | ● | 1743-1250D625CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2.5 | 1.000 | 0.010 | 1743-1250.1000C | ● | 1743-1250L1000C | ● | 1743-1250D1000C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.500 | 0.010 | 1743-1250.1500C | ● | 1743-1250L1500C | ● | 1743-1250D1500C | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 0.750 | 0.010 | 1743-1562.750CR | ● | 1743-1562L750CR | ● | 1743-1562D750CR | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 1.250 | 0.010 | 1743-1562.1250C | ● | 1743-1562L1250C | ● | 1743-1562D1250C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.000 | 0.015 | 1743-1875.1000C | ● | 1743-1875L1000C | ● | 1743-1875D1000C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.500 | 0.015 | 1743-1875.1500C | ● | 1743-1875L1500C | ● | 1743-1875D1500C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.250 | 0.015 | 1743-1875.2250C | ● | 1743-1875L2250C | ● | 1743-1875D2250C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 1.250 | 0.015 | 1743-2500.1250C | ● | 1743-2500L1250C | ● | 1743-2500D1250C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.000 | 0.015 | 1743-2500.2000C | ● | 1743-2500L2000C | ● | 1743-2500D2000C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.000 | 0.015 | 1743-2500.3000C | ● | 1743-2500L3000C | ● | 1743-2500D3000C | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0156" - 0.0312" | 0.0469" - 0.0938" | 0.1250" - 0.1875" | 0.2500" |
|--------------|-------------------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

SERIES 1743 WORKPIECE MATERIAL

| Coating | P Steel $\geq 20\text{HRC}$ | P Steel $30\text{--}40\text{HRC}$ | H Hardened Steel $\ge 55\text{HRC}$ | H Hardened Steel $\ge 58\text{HRC}$ | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|--|--|--|--|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

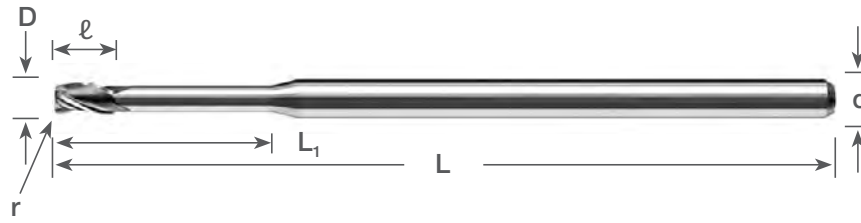
Symbol Descriptions [Page 7](#)

3 FLUTE NEW

0.0312" - 0.2500" DIAMETER

EXTENDED REACH
STANDARD CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

STANDARD Corner Radius EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | | Uncoated | | AlTiN Coating | | DLC Coating NEW | |
|---------------------------------------|------|-------|-------|----------------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | L ₁ | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.156 | 0.010 | 1744-0312.156CR | ● | 1744-0312L156CR | ● | 1744-0312D156CR | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.250 | 0.010 | 1744-0312.250CR | ● | 1744-0312L250CR | ● | 1744-0312D250CR | ■ |
| 0.0312 (1/32) | 1/8 | 0.046 | 2 1/2 | 0.375 | 0.010 | 1744-0312.375CR | ● | 1744-0312L375CR | ● | 1744-0312D375CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.250 | 0.010 | 1744-0469.250CR | ● | 1744-0469L250CR | ● | 1744-0469D250CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.375 | 0.010 | 1744-0469.375CR | ● | 1744-0469L375CR | ● | 1744-0469D375CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.070 | 2 1/2 | 0.570 | 0.010 | 1744-0469.570CR | ● | 1744-0469L570CR | ● | 1744-0469D570CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.312 | 0.010 | 1744-0625.312CR | ● | 1744-0625L312CR | ● | 1744-0625D312CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.500 | 0.010 | 1744-0625.500CR | ● | 1744-0625L500CR | ● | 1744-0625D500CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.750 | 0.010 | 1744-0625.750CR | ● | 1744-0625L750CR | ● | 1744-0625D750CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.406 | 0.010 | 1744-0781.406CR | ● | 1744-0781L406CR | ● | 1744-0781D406CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.625 | 0.010 | 1744-0781.625CR | ● | 1744-0781L625CR | ● | 1744-0781D625CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.940 | 0.010 | 1744-0781.940CR | ● | 1744-0781L940CR | ● | 1744-0781D940CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.500 | 0.010 | 1744-0938.500CR | ● | 1744-0938L500CR | ● | 1744-0938D500CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.750 | 0.010 | 1744-0938.750CR | ● | 1744-0938L750CR | ● | 1744-0938D750CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 1.125 | 0.010 | 1744-0938.1125C | ● | 1744-0938L1125C | ● | 1744-0938D1125C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 0.625 | 0.015 | 1744-1250.625CR | ● | 1744-1250L625CR | ● | 1744-1250D625CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.000 | 0.015 | 1744-1250.1000C | ● | 1744-1250L1000C | ● | 1744-1250D1000C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.500 | 0.015 | 1744-1250.1500C | ● | 1744-1250L1500C | ● | 1744-1250D1500C | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 0.750 | 0.015 | 1744-1562.750CR | ● | 1744-1562L750CR | ● | 1744-1562D750CR | ■ |
| 0.1562 (5/32) | 3/16 | 0.234 | 3 | 1.250 | 0.015 | 1744-1562.1250C | ● | 1744-1562L1250C | ● | 1744-1562D1250C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.000 | 0.030 | 1744-1875.1000C | ● | 1744-1875L1000C | ● | 1744-1875D1000C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 3 | 1.500 | 0.030 | 1744-1875.1500C | ● | 1744-1875L1500C | ● | 1744-1875D1500C | ■ |
| 0.1875 (3/16) | 3/16 | 0.281 | 4 | 2.250 | 0.030 | 1744-1875.2250C | ● | 1744-1875L2250C | ● | 1744-1875D2250C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 1.250 | 0.030 | 1744-2500.1250C | ● | 1744-2500L1250C | ● | 1744-2500D1250C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 4 | 2.000 | 0.030 | 1744-2500.2000C | ● | 1744-2500L2000C | ● | 1744-2500D2000C | ■ |
| 0.2500 (1/4) | 1/4 | 0.375 | 6 | 3.000 | 0.030 | 1744-2500.3000C | ● | 1744-2500L3000C | ● | 1744-2500D3000C | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0312" | 0.0469" - 0.0938" | 0.1250" - 0.1875" | 0.2500" |
|--------------|---------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

| SERIES 1744 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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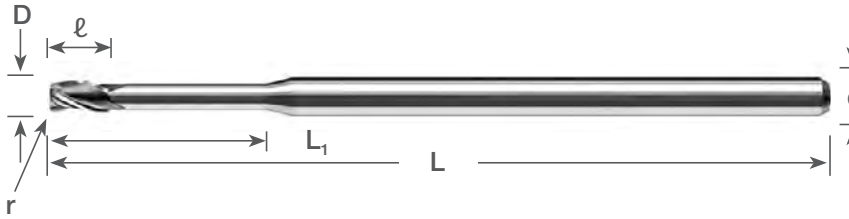
3 FLUTE NEW

0.0625" - 0.1250" DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

EXTENDED REACH LARGE CORNER RADIUS END MILLS



Symbol Descriptions [Page 7](#)

LARGE Corner Radius EXTENDED Reach (Inch Sizes)

| Dimensions (in) | | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|-----|-------|-------|----------------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | L ₁ | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.312 | 0.015 | 1746-0625.312CR | ● | 1746-0625L312CR | ● | 1746-0625D312CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.500 | 0.015 | 1746-0625.500CR | ● | 1746-0625L500CR | ● | 1746-0625D500CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 2 1/2 | 0.750 | 0.015 | 1746-0625.750CR | ● | 1746-0625L750CR | ● | 1746-0625D750CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.406 | 0.015 | 1746-0781.406CR | ● | 1746-0781L406CR | ● | 1746-0781D406CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.625 | 0.015 | 1746-0781.625CR | ● | 1746-0781L625CR | ● | 1746-0781D625CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 2 1/2 | 0.940 | 0.015 | 1746-0781.940CR | ● | 1746-0781L940CR | ● | 1746-0781D940CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.500 | 0.015 | 1746-0938.500CR | ● | 1746-0938L500CR | ● | 1746-0938D500CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 0.750 | 0.015 | 1746-0938.750CR | ● | 1746-0938L750CR | ● | 1746-0938D750CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.139 | 2 1/2 | 1.125 | 0.015 | 1746-0938.1125C | ● | 1746-0938L1125C | ● | 1746-0938D1125C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 0.625 | 0.030 | 1746-1250.625CR | ● | 1746-1250L625CR | ● | 1746-1250D625CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 2 1/2 | 1.000 | 0.030 | 1746-1250.1000C | ● | 1746-1250L1000C | ● | 1746-1250D1000C | ■ |
| 0.1250 (1/8) | 1/8 | 0.187 | 3 | 1.500 | 0.030 | 1746-1250.1500C | ● | 1746-1250L1500C | ● | 1746-1250D1500C | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0625" - 0.0938" | 0.1250" |
|--------------|-------------------|---------|
| + / - | 0.0015" | 0.0020" |

SERIES 1746 WORKPIECE MATERIAL

| Coating | P Steel ~20HRC | P Steel 30~40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ★ | ☆ | ★ | ★ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

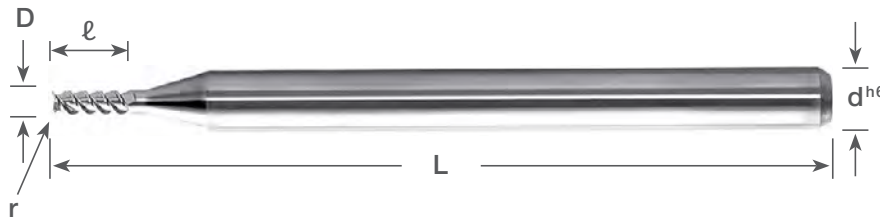
Symbol Descriptions [Page 7](#)

4 FLUTE

STANDARD LENGTH HIGH HELIX CORNER RADIUS END MILLS

1.00mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

HIGH HELIX Corner Radius STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|----------------------------------|-----------------|------|----|------|----------------|-------|----------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | r | Part Number | Stock | Part Number | Stock |
| 1.00 | 3 | 3.0 | 38 | 0.10 | 1804-0394.118R | ● | 1804-0394L118R | ● |
| 1.50 | 3 | 4.5 | 38 | 0.15 | 1804-0591.177R | ● | 1804-0591L177R | ● |
| 2.00 | 3 | 6.0 | 38 | 0.20 | 1804-0787.236R | ● | 1804-0787L236R | ● |
| 2.50 | 3 | 7.5 | 38 | 0.25 | 1804-0984.295R | ● | 1804-0984L295R | ● |
| 3.00 | 3 | 9.0 | 38 | 0.30 | 1804-1181.354R | ● | 1804-1181L354R | ● |
| 3.50 | 6 | 12.0 | 50 | 0.35 | 1804-1378.473R | ● | 1804-1378L473R | ● |
| 4.00 | 5 | 12.0 | 50 | 0.40 | 1804-1575.473R | ● | 1804-1575L473R | ● |
| 4.50 | 6 | 15.0 | 50 | 0.45 | 1804-1772.590R | ● | 1804-1772L590R | ● |
| 5.00 | 5 | 15.0 | 50 | 0.50 | 1804-1968.590R | ● | 1804-1968L590R | ● |
| 5.50 | 6 | 18.0 | 50 | 0.55 | 1804-2165.709R | ● | 1804-2165L709R | ● |
| 6.00 | 6 | 18.0 | 50 | 0.60 | 1804-2362.709R | ● | 1804-2362L709R | ● |

Corner Radius Tolerance

| Diameter (D) | 1.00mm - 6.00mm |
|--------------|-----------------|
| + / - | 0.03mm |

| SERIES 1804 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

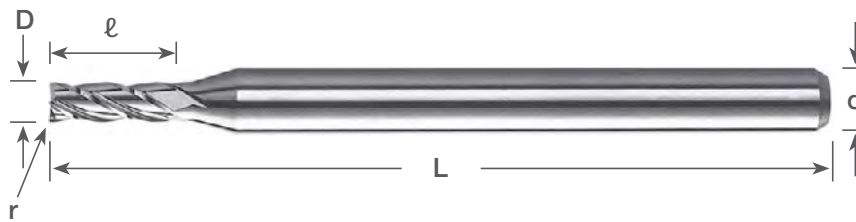
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4 FLUTE

0.0150" - 0.2500" DIAMETER

STANDARD LENGTH
SMALL CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

SMALL Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---------------------------------------|------|-------|-------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| D ^{+0.000} _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0150 | 1/8 | 0.045 | 1 1/2 | 0.003 | 1812-0150.045CR | ● | 1812-0150L045CR | ● | 1812-0150D045CR | ■ |
| NEW 0.0156 (1/64) | 1/8 | 0.045 | 1 1/2 | 0.003 | 1812-0156.045CR | ● | 1812-0156L045CR | ● | 1812-0156D045CR | ■ |
| NEW 0.0200 | 1/8 | 0.030 | 1 1/2 | 0.005 | 1812-0200.030CR | ● | 1812-0200L030CR | ● | 1812-0200D030CR | ■ |
| 0.0200 | 1/8 | 0.060 | 1 1/2 | 0.005 | 1812-0200.060CR | ● | 1812-0200L060CR | ● | 1812-0200D060CR | ■ |
| NEW 0.0250 | 1/8 | 0.038 | 1 1/2 | 0.005 | 1812-0250.038CR | ● | 1812-0250L038CR | ● | 1812-0250D038CR | ■ |
| 0.0250 | 1/8 | 0.075 | 1 1/2 | 0.005 | 1812-0250.075CR | ● | 1812-0250L075CR | ● | 1812-0250D075CR | ■ |
| 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.005 | 1812-0300.090CR | ● | 1812-0300L090CR | ● | 1812-0300D090CR | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.047 | 1 1/2 | 0.005 | 1812-0312.047CR | ● | 1812-0312L047CR | ● | 1812-0312D047CR | ■ |
| NEW 0.0312 (1/32) | 1/8 | 0.093 | 1 1/2 | 0.005 | 1812-0312.093CR | ● | 1812-0312L093CR | ● | 1812-0312D093CR | ■ |
| 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.005 | 1812-0350.105CR | ● | 1812-0350L105CR | ● | 1812-0350D105CR | ■ |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.005 | 1812-0400.120CR | ● | 1812-0400L120CR | ● | 1812-0400D120CR | ■ |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.005 | 1812-0450.135CR | ● | 1812-0450L135CR | ● | 1812-0450D135CR | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.071 | 1 1/2 | 0.005 | 1812-0469.071CR | ● | 1812-0469L071CR | ● | 1812-0469D071CR | ■ |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.005 | 1812-0469.141CR | ● | 1812-0469L141CR | ● | 1812-0469D141CR | ■ |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.010 | 1812-0500.150CR | ● | 1812-0500L150CR | ● | 1812-0500D150CR | ■ |
| NEW 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.005 | 1812-0550.165CR | ● | 1812-0550L165CR | ● | 1812-0550D165CR | ■ |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.010 | 1812-0600.180CR | ● | 1812-0600L180CR | ● | 1812-0600D180CR | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.093 | 1 1/2 | 0.005 | 1812-0625.093CR | ● | 1812-0625L093CR | ● | 1812-0625D093CR | ■ |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.005 | 1812-0625.186CR | ● | 1812-0625L186CR | ● | 1812-0625D186CR | ■ |
| NEW 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.005 | 1812-0650.195CR | ● | 1812-0650L195CR | ● | 1812-0650D195CR | ■ |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.010 | 1812-0700.210CR | ● | 1812-0700L210CR | ● | 1812-0700D210CR | ■ |
| NEW 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.005 | 1812-0750.225CR | ● | 1812-0750L225CR | ● | 1812-0750D225CR | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 0.005 | 1812-0781.117CR | ● | 1812-0781L117CR | ● | 1812-0781D117CR | ■ |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.005 | 1812-0781.234CR | ● | 1812-0781L234CR | ● | 1812-0781D234CR | ■ |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.010 | 1812-0800.240CR | ● | 1812-0800L240CR | ● | 1812-0800D240CR | ■ |
| NEW 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.005 | 1812-0850.255CR | ● | 1812-0850L255CR | ● | 1812-0850D255CR | ■ |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.010 | 1812-0900.270CR | ● | 1812-0900L270CR | ● | 1812-0900D270CR | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.140 | 1 1/2 | 0.005 | 1812-0938.140CR | ● | 1812-0938L140CR | ● | 1812-0938D140CR | ■ |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.005 | 1812-0938.279CR | ● | 1812-0938L279CR | ● | 1812-0938D279CR | ■ |
| NEW 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.005 | 1812-0950.285CR | ● | 1812-0950L285CR | ● | 1812-0950D285CR | ■ |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.010 | 1812-1000.300CR | ● | 1812-1000L300CR | ● | 1812-1000D300CR | ■ |
| NEW 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.005 | 1812-1250.500CR | ● | 1812-1250L500CR | ● | 1812-1250D500CR | ■ |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.010 | 1812-1562.562CR | ● | 1812-1562L562CR | ● | 1812-1562D562CR | ■ |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.010 | 1812-1875.625CR | ● | 1812-1875L625CR | ● | 1812-1875D625CR | ■ |
| NEW 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.010 | 1812-2500.750CR | ● | 1812-2500L750CR | ● | 1812-2500D750CR | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0150" - 0.0350" | 0.0400" - 0.1000" | 0.1250" - 0.1875" | 0.2500" |
|--------------|-------------------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

SERIES 1812 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel 30-40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~65HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|---------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

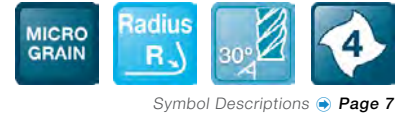
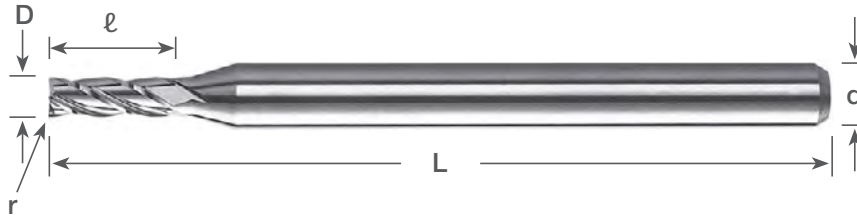
Symbol Descriptions Page 7

4 FLUTE

0.0156" - 0.2500" DIAMETER

STANDARD LENGTH
STANDARD CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|-------------------|------|-------|-------|-------|-----------------|----------|-----------------|---------------|-----------------|-----------------|--|
| D | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock | |
| NEW 0.0156 (1/64) | 1/8 | 0.045 | 1 1/2 | 0.005 | 1813-0156.045CR | ● | 1813-0156L045CR | ● | 1813-0156D045CR | ■ | |
| NEW 0.0300 | 1/8 | 0.090 | 1 1/2 | 0.010 | 1813-0300.090CR | ● | 1813-0300L090CR | ● | 1813-0300D090CR | ■ | |
| NEW 0.0312 (1/32) | 1/8 | 0.093 | 1 1/2 | 0.010 | 1813-0312.093CR | ● | 1813-0312L093CR | ● | 1813-0312D093CR | ■ | |
| NEW 0.0350 | 1/8 | 0.105 | 1 1/2 | 0.010 | 1813-0350.105CR | ● | 1813-0350L105CR | ● | 1813-0350D105CR | ■ | |
| 0.0400 | 1/8 | 0.120 | 1 1/2 | 0.010 | 1813-0400.120CR | ● | 1813-0400L120CR | ● | 1813-0400D120CR | ■ | |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.010 | 1813-0450.135CR | ● | 1813-0450L135CR | ● | 1813-0450D135CR | ■ | |
| NEW 0.0469 (3/64) | 1/8 | 0.071 | 1 1/2 | 0.010 | 1813-0469.071CR | ● | 1813-0469L071CR | ● | 1813-0469D071CR | ■ | |
| NEW 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.010 | 1813-0469.141CR | ● | 1813-0469L141CR | ● | 1813-0469D141CR | ■ | |
| 0.0500 | 1/8 | 0.150 | 1 1/2 | 0.015 | 1813-0500.150CR | ● | 1813-0500L150CR | ● | 1813-0500D150CR | ■ | |
| NEW 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.010 | 1813-0550.165CR | ● | 1813-0550L165CR | ● | 1813-0550D165CR | ■ | |
| 0.0600 | 1/8 | 0.180 | 1 1/2 | 0.015 | 1813-0600.180CR | ● | 1813-0600L180CR | ● | 1813-0600D180CR | ■ | |
| NEW 0.0625 (1/16) | 1/8 | 0.093 | 1 1/2 | 0.010 | 1813-0625.093CR | ● | 1813-0625L093CR | ● | 1813-0625D093CR | ■ | |
| NEW 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.010 | 1813-0625.186CR | ● | 1813-0625L186CR | ● | 1813-0625D186CR | ■ | |
| NEW 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.010 | 1813-0650.195CR | ● | 1813-0650L195CR | ● | 1813-0650D195CR | ■ | |
| 0.0700 | 1/8 | 0.210 | 1 1/2 | 0.015 | 1813-0700.210CR | ● | 1813-0700L210CR | ● | 1813-0700D210CR | ■ | |
| NEW 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.010 | 1813-0750.225CR | ● | 1813-0750L225CR | ● | 1813-0750D225CR | ■ | |
| NEW 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 0.010 | 1813-0781.117CR | ● | 1813-0781L117CR | ● | 1813-0781D117CR | ■ | |
| NEW 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.010 | 1813-0781.234CR | ● | 1813-0781L234CR | ● | 1813-0781D234CR | ■ | |
| 0.0800 | 1/8 | 0.240 | 1 1/2 | 0.015 | 1813-0800.240CR | ● | 1813-0800L240CR | ● | 1813-0800D240CR | ■ | |
| NEW 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.010 | 1813-0850.255CR | ● | 1813-0850L255CR | ● | 1813-0850D255CR | ■ | |
| 0.0900 | 1/8 | 0.270 | 1 1/2 | 0.015 | 1813-0900.270CR | ● | 1813-0900L270CR | ● | 1813-0900D270CR | ■ | |
| NEW 0.0938 (3/32) | 1/8 | 0.140 | 1 1/2 | 0.010 | 1813-0938.140CR | ● | 1813-0938L140CR | ● | 1813-0938D140CR | ■ | |
| NEW 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.010 | 1813-0938.279CR | ● | 1813-0938L279CR | ● | 1813-0938D279CR | ■ | |
| NEW 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.010 | 1813-0950.285CR | ● | 1813-0950L285CR | ● | 1813-0950D285CR | ■ | |
| 0.1000 | 1/8 | 0.300 | 1 1/2 | 0.015 | 1813-1000.300CR | ● | 1813-1000L300CR | ● | 1813-1000D300CR | ■ | |
| NEW 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.010 | 1813-1250.500CR | ● | 1813-1250L500CR | ● | 1813-1250D500CR | ■ | |
| NEW 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.015 | 1813-1562.562CR | ● | 1813-1562L562CR | ● | 1813-1562D562CR | ■ | |
| NEW 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.015 | 1813-1875.625CR | ● | 1813-1875L625CR | ● | 1813-1875D625CR | ■ | |
| NEW 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.015 | 1813-2500.750CR | ● | 1813-2500L750CR | ● | 1813-2500D750CR | ■ | |

Corner Radius Tolerance

| Diameter (D) | 0.0150" - 0.0350" | 0.0400" - 0.1000" | 0.1250" - 0.1875" | 0.2500" |
|--------------|-------------------|-------------------|-------------------|---------|
| + / - | 0.0010" | 0.0015" | 0.0020" | 0.0030" |

SERIES 1813 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

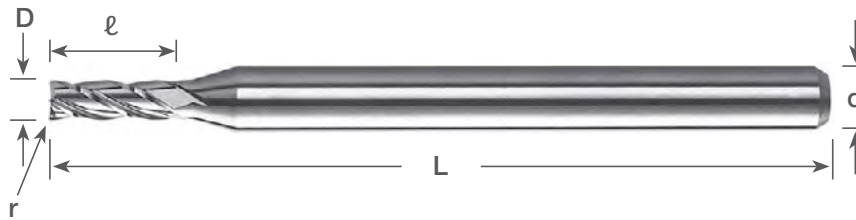
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4 FLUTE NEW

0.0450" - 0.2500" DIAMETER

STANDARD LENGTH
LARGE / X-LARGE CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0450 | 1/8 | 0.135 | 1 1/2 | 0.015 | 1814-0450.135CR | ● | 1814-0450L135CR | ● | 1814-0450D135CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.071 | 1 1/2 | 0.015 | 1814-0469.071CR | ● | 1814-0469L071CR | ● | 1814-0469D071CR | ■ |
| 0.0469 (3/64) | 1/8 | 0.141 | 1 1/2 | 0.015 | 1814-0469.141CR | ● | 1814-0469L141CR | ● | 1814-0469D141CR | ■ |
| 0.0550 | 1/8 | 0.165 | 1 1/2 | 0.015 | 1814-0550.165CR | ● | 1814-0550L165CR | ● | 1814-0550D165CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.093 | 1 1/2 | 0.015 | 1814-0625.093CR | ● | 1814-0625L093CR | ● | 1814-0625D093CR | ■ |
| 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.015 | 1814-0625.186CR | ● | 1814-0625L186CR | ● | 1814-0625D186CR | ■ |
| 0.0650 | 1/8 | 0.195 | 1 1/2 | 0.015 | 1814-0650.195CR | ● | 1814-0650L195CR | ● | 1814-0650D195CR | ■ |
| 0.0750 | 1/8 | 0.225 | 1 1/2 | 0.015 | 1814-0750.225CR | ● | 1814-0750L225CR | ● | 1814-0750D225CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.117 | 1 1/2 | 0.015 | 1814-0781.117CR | ● | 1814-0781L117CR | ● | 1814-0781D117CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.234 | 1 1/2 | 0.015 | 1814-0781.234CR | ● | 1814-0781L234CR | ● | 1814-0781D234CR | ■ |
| 0.0850 | 1/8 | 0.255 | 1 1/2 | 0.015 | 1814-0850.255CR | ● | 1814-0850L255CR | ● | 1814-0850D255CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.140 | 1 1/2 | 0.015 | 1814-0938.140CR | ● | 1814-0938L140CR | ● | 1814-0938D140CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.015 | 1814-0938.279CR | ● | 1814-0938L279CR | ● | 1814-0938D279CR | ■ |
| 0.0950 | 1/8 | 0.285 | 1 1/2 | 0.015 | 1814-0950.285CR | ● | 1814-0950L285CR | ● | 1814-0950D285CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.015 | 1814-1250.500CR | ● | 1814-1250L500CR | ● | 1814-1250D500CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.020 | 1814-1875.625CR | ● | 1814-1875L625CR | ● | 1814-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.020 | 1814-2500.750CR | ● | 1814-2500L750CR | ● | 1814-2500D750CR | ■ |

X-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|--|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0625 (1/16) | 1/8 | 0.186 | 1 1/2 | 0.020 | 1816-0625.186CR | ● | 1816-0625L186CR | ● | 1816-0625D186CR | ■ |
| 0.0781 (5/64) | 1/8 | 0.150 | 1 1/2 | 0.020 | 1816-0781.234CR | ● | 1816-0781L234CR | ● | 1816-0781D234CR | ■ |
| 0.0938 (3/32) | 1/8 | 0.140 | 1 1/2 | 0.020 | 1816-0938.140CR | ● | 1816-0938L140CR | ● | 1816-0938D140CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.020 | 1816-1250.500CR | ● | 1816-1250L500CR | ● | 1816-1250D500CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.030 | 1816-1875.625CR | ● | 1816-1875L625CR | ● | 1816-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.030 | 1816-2500.750CR | ● | 1816-2500L750CR | ● | 1816-2500D750CR | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0450" - 0.0950" | 0.1250" - 0.1875" | 0.2500" - 0.5000" |
|--------------|-------------------|-------------------|-------------------|
| + / - | 0.0015" | 0.0020" | 0.0030" |

SERIES 1814 / 1816 WORKPIECE MATERIAL

| Coating | P Steel 20HRC | P Steel 30-40HRC | H Hardened Steel ~58HRC | H Hardened Steel ~62HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|---------------|------------------|-------------------------|-------------------------|-------------------|-------------|------------|------------|----------------|--------|-----------|---------------------|------------------------|-------------------|------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

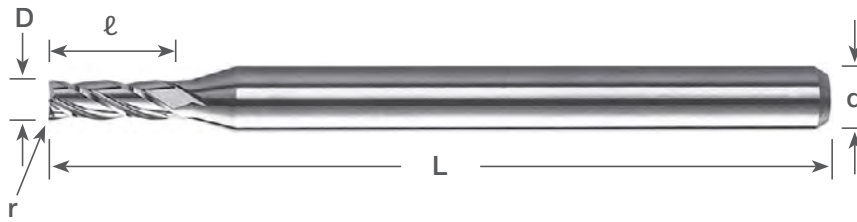
★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

4 FLUTE

STANDARD LENGTH
XX-LARGE / XXX-LARGE CORNER RADIUS END MILLS

0.0938" - 0.2500" DIAMETER
Mirror Surface Finishes
Sub Micron Grain Carbide



MICRO GRAIN

Radius R

30°

4

Symbol Descriptions [Page 7](#)

XX-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.0938 (3/32) | 1/8 | 0.279 | 1 1/2 | 0.030 | 1817-0938.279CR | ● | 1817-0938L279CR | ● | 1817-0938D279CR | ■ |
| 0.1250 (1/8) | 1/8 | 0.500 | 1 1/2 | 0.030 | 1817-1250.500CR | ● | 1817-1250L500CR | ● | 1817-1250D500CR | ■ |
| 0.1562 (5/32) | 3/16 | 0.562 | 2 | 0.030 | 1817-1562.562CR | ● | 1817-1562L562CR | ● | 1817-1562D562CR | ■ |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.045 | 1817-1875.625CR | ● | 1817-1875L625CR | ● | 1817-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.045 | 1817-2500.750CR | ● | 1817-2500L750CR | ● | 1817-2500D750CR | ■ |

XXX-LARGE Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | Uncoated | | AlTiN Coating | | NEW DLC Coating | |
|---|------|-------|-------|-------|-----------------|-------|-----------------|-------|-----------------|-------|
| D ^{+0.000} / _{-0.001} | d | ℓ | L | r | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.1875 (3/16) | 3/16 | 0.625 | 2 | 0.060 | 1818-1875.625CR | ● | 1818-1875L625CR | ● | 1818-1875D625CR | ■ |
| 0.2500 (1/4) | 1/4 | 0.750 | 2 1/2 | 0.060 | 1818-2500.750CR | ● | 1818-2500L750CR | ● | 1818-2500D750CR | ■ |

Corner Radius Tolerance

| Diameter (D) | 0.0938" | 0.1250" - 0.1875" | 0.2500" |
|--------------|---------|-------------------|---------|
| + / - | 0.0015" | 0.0020" | 0.0030" |

SERIES 1817 / 1818 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | | | | | ☆ | ☆ |
| DLC | | | | | | | ☆ | ★ | ☆ | ★ | ★ | ★ | | | |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

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 THREAD MILLS & TAPS
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 BORING BARS
 REAMERS
 SAWS
 TECHNICAL
 INDEX

4 FLUTE APOLLO

0.1250" - 1.0000" DIAMETER

Variable Helix

Unequal Flutes to Reduce Chatter

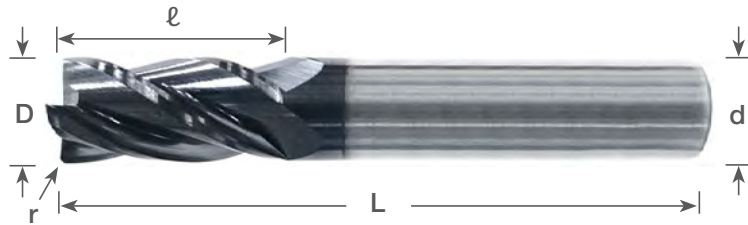
Can be used as a rougher or a finishing tool

VARIABLE HELIX END MILLS

Excellent for Alloy Steel, Nickel Inconel Alloys, Stainless Steel, and Carbon Steel

Excellent for Alloy Steel, Nickel Steel, Stainless Steel, and Carbon Steel

AlCrN Coating



Symbol Descriptions [Page 7](#)

STUB Length (Inch Sizes)

| Dimensions (in) | | | | | | AlCrN Coating | |
|-----------------|------|-----|-------|---------------|---------------|---------------|--|
| D | d | ℓ | L | r | Part Number | Stock | |
| 0.2500 (1/4) | 1/4 | 1/2 | 2 | 0.015 - 0.020 | AP4-2500.500 | ● | |
| 0.3125 (5/16) | 5/16 | 1/2 | 2 | 0.015 - 0.020 | AP4-3125.500 | ● | |
| 0.3750 (3/8) | 3/8 | 5/8 | 2 | 0.015 - 0.020 | AP4-3750.625 | ● | |
| 0.2500 (1/2) | 1/2 | 5/8 | 2-1/2 | 0.025 - 0.030 | AP4-5000.625 | ● | |
| 0.6250 (5/8) | 5/8 | 3/4 | 3 | 0.030 - 0.035 | AP4-6250.750 | ● | |
| 0.7500 (3/4) | 3/4 | 1 | 3 | 0.030 - 0.035 | AP4-7500.1000 | ● | |

STANDARD Length (Inch Sizes)

| Dimensions (in) | | | | | | AlCrN Coating | |
|-----------------|------|-------|-------|---------------|----------------|---------------|--|
| D | d | ℓ | L | r | Part Number | Stock | |
| 0.1250 (1/8) | 1/8 | 1/2 | 1-1/2 | 0.010 - 0.015 | AP4-1250.500 | ● | |
| 0.1875 (3/16) | 3/16 | 5/8 | 2 | 0.015 - 0.020 | AP4-1875.625 | ● | |
| 0.2500 (1/4) | 1/4 | 3/4 | 2-1/2 | 0.015 - 0.020 | AP4-2500.750 | ● | |
| 0.3125 (5/16) | 5/16 | 13/16 | 2-1/2 | 0.015 - 0.020 | AP4-3125.813 | ● | |
| 0.3750 (3/8) | 3/8 | 1 | 2-1/2 | 0.015 - 0.020 | AP4-3750.1000 | ● | |
| 0.4375 (7/16) | 7/16 | 1 | 2-3/4 | 0.015 - 0.020 | AP4-4375.1000 | ● | |
| 0.5000 (1/2) | 1/2 | 1 | 3 | 0.025 - 0.030 | AP4-5000.1000 | ● | |
| 0.6250 (5/8) | 5/8 | 1-1/4 | 3-1/2 | 0.030 - 0.035 | AP4-6250.1250 | ● | |
| 0.7500 (3/4) | 3/4 | 1-1/2 | 4 | 0.030 - 0.035 | AP4-7500.1500 | ● | |
| 1.0000 (1) | 1 | 1-1/2 | 4 | 0.030 - 0.035 | AP4-10000.1500 | ● | |

LONG Length (Inch Sizes)

| Dimensions (in) | | | | | | AlCrN Coating | |
|-----------------|------|-------|---|---------------|---------------|---------------|--|
| D | d | ℓ | L | r | Part Number | Stock | |
| 0.2500 (1/4) | 1/4 | 1-1/8 | 3 | 0.015 - 0.020 | AP4-2500.1125 | ● | |
| 0.3125 (5/16) | 5/16 | 1-1/8 | 3 | 0.015 - 0.020 | AP4-3125.1125 | ● | |
| 0.3750 (3/8) | 3/8 | 1-1/8 | 3 | 0.015 - 0.020 | AP4-3750.1125 | ● | |
| 0.5000 (1/2) | 1/2 | 2 | 4 | 0.025 - 0.030 | AP4-5000.2000 | ● | |
| 0.6250 (5/8) | 5/8 | 2-1/4 | 5 | 0.030 - 0.035 | AP4-6250.2250 | ● | |
| 0.7500 (3/4) | 3/4 | 2-1/4 | 5 | 0.030 - 0.035 | AP4-7500.2250 | ● | |

Cutting Diameter Tolerances

1/8 - 1/4 = +0.0000/-0.0012
 >1/4 - 3/8 = +0.0000/-0.0016
 >3/8 - 1 = +0.0000/-0.0020

Shank Diameter Tolerances

1/8 - 3/8 = +0.0001/-0.0003
 >3/8 - 1 = +0.0001/-0.0004

Corner Radius Tolerances

All = +0.0000/-0.0020

| SERIES AP4 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | | | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~55HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlCrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

4 FLUTE APOLLO

3mm - 25mm DIAMETER

Variable Helix

Unequal Flutes to Reduce Chatter

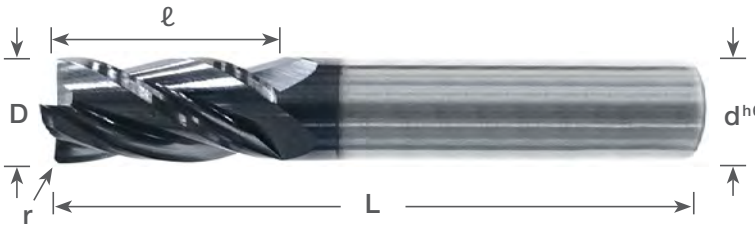
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VARIABLE HELIX END MILLS

Excellent for Alloy Steel, Nickel Inconel Alloys, Stainless Steel, and Carbon Steel

Excellent for Alloy Steel, Nickel Steel, Stainless Steel, and Carbon Steel

AICrN Coating



Symbol Descriptions [Page 7](#)

STUB Length (Metric Sizes)

| Dimensions (mm) | | | | | | AICrN Coating | |
|-----------------|----------|-----|-----|-----|---------------|---------------|--|
| D^{h10} | d^{h6} | l | L | r | Part Number | Stock | |
| 3 | 3 | 6 | 38 | 0.4 | AP4M-1181.236 | ● | |
| 6 | 6 | 10 | 50 | 0.4 | AP4M-2362.394 | ● | |
| 8 | 8 | 12 | 50 | 0.4 | AP4M-3150.472 | ● | |
| 10 | 10 | 12 | 50 | 0.4 | AP4M-3937.787 | ● | |
| 12 | 12 | 16 | 63 | 0.7 | AP4M-4724.630 | ● | |
| 16 | 16 | 20 | 89 | 0.7 | AP4M-6299.787 | ● | |
| 20 | 20 | 22 | 101 | 0.7 | AP4M-7874.866 | ● | |

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | | AICrN Coating | |
|-----------------|----------|-----|-----|-----|-----------------|---------------|--|
| D^{h10} | d^{h6} | l | L | r | Part Number | Stock | |
| 4 | 4 | 14 | 51 | 0.4 | AP4M-1575.551 | ● | |
| 6 | 6 | 20 | 63 | 0.4 | AP4M-2362.787 | ● | |
| 8 | 8 | 20 | 63 | 0.4 | AP4M-3150.787 | ● | |
| 10 | 10 | 25 | 70 | 0.4 | AP4M-3937.984 | ● | |
| 12 | 12 | 25 | 76 | 0.6 | AP4M-4724.984 | ● | |
| 16 | 16 | 32 | 89 | 0.7 | AP4M-6299.1260 | ● | |
| 20 | 20 | 38 | 100 | 0.7 | AP4M-7874.1496 | ● | |
| 25 | 25 | 38 | 100 | 0.7 | AP4M-10000.1496 | ● | |

LONG Length (Metric Sizes)

| Dimensions (mm) | | | | | | AICrN Coating | |
|-----------------|----------|-----|-----|-----|-----------------|---------------|--|
| D^{h10} | d^{h6} | l | L | r | Part Number | Stock | |
| 6 | 6 | 25 | 75 | 0.4 | AP4M-2362.984 | ● | |
| 8 | 8 | 25 | 75 | 0.4 | AP4M-3150.984 | ● | |
| 10 | 10 | 30 | 75 | 0.4 | AP4M-3937.1181 | ● | |
| 12 | 12 | 50 | 100 | 0.6 | AP4M-4724.1969 | ● | |
| 14 | 14 | 50 | 125 | 0.6 | AP4M-5511.1969 | ● | |
| 16 | 16 | 50 | 125 | 0.7 | AP4M-6299.1969 | ● | |
| 18 | 18 | 50 | 125 | 0.7 | AP4M-7087.1969 | ● | |
| 20 | 20 | 50 | 125 | 0.8 | AP4M-7874.1969 | ● | |
| 25 | 25 | 50 | 125 | 0.8 | AP4M-10000.1969 | ● | |

| SERIES AP4M WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AICrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

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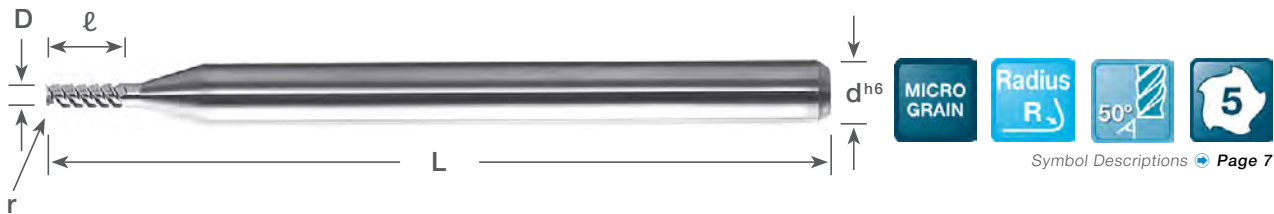
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5 FLUTE

1.00mm - 6.00mm DIAMETER

STANDARD LENGTH
HIGH HELIX CORNER RADIUS END MILLS

Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions Page 7

HIGH HELIX Corner Radius STANDARD Length (Inch Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|----------------------------------|-----------------|-------|----|------|----------------|-------|----------------|-------|
| D ^{+0.00mm -0.02mm} | d ^{h6} | ℓ | L | r | Part Number | Stock | Part Number | Stock |
| 1.00 | 3 | 3.00 | 38 | 0.10 | 1905-0394.118R | ● | 1905-0394L118R | ● |
| 1.50 | 3 | 4.50 | 38 | 0.15 | 1905-0591.177R | ● | 1905-0591L177R | ● |
| 2.00 | 3 | 6.00 | 38 | 0.20 | 1905-0787.236R | ● | 1905-0787L236R | ● |
| 2.50 | 3 | 7.50 | 38 | 0.25 | 1905-0984.295R | ● | 1905-0984L295R | ● |
| 3.00 | 3 | 9.00 | 38 | 0.30 | 1905-1181.354R | ● | 1905-1181L354R | ● |
| 3.50 | 6 | 12.00 | 50 | 0.35 | 1905-1378.473R | ● | 1905-1378L473R | ● |
| 4.00 | 5 | 12.00 | 50 | 0.40 | 1905-1575.473R | ● | 1905-1575L473R | ● |
| 4.50 | 6 | 15.00 | 50 | 0.45 | 1905-1772.590R | ● | 1905-1772L590R | ● |
| 5.00 | 5 | 15.00 | 50 | 0.50 | 1905-1968.590R | ● | 1905-1968L590R | ● |
| 5.50 | 6 | 15.00 | 50 | 0.55 | 1905-2165.709R | ● | 1905-2165L709R | ● |
| 6.00 | 6 | 18.00 | 50 | 0.60 | 1905-2362.709R | ● | 1905-2362L709R | ● |

Corner Radius Tolerance

| | |
|--------------|-----------------|
| Diameter (D) | 1.00mm - 6.00mm |
| + / - | 0.03mm |

| SERIES 1905 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | | | | | | | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

5 FLUTE APOLLO

VARIABLE HELIX END MILLS

0.2500" - 1.0000" DIAMETER

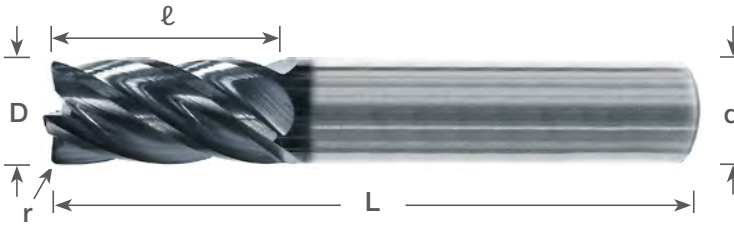
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Excellent for Alloy Steel, Nickel Steel, Stainless Steel, and Carbon Steel

AICrN Coating



Symbol Descriptions [Page 7](#)

STANDARD Length (Inch Sizes)

| D | Dimensions (inch) | | | | | AICrN Coating | |
|--------------|-------------------|-------|-------|-------------|----------------|---------------|--|
| | d | l | L | r | Part Number | Stock | |
| 0.2500 (1/4) | 1/4 | 3/4 | 2-1/2 | .015 - .020 | AP5-2500.750 | ● | |
| 0.3750 (3/8) | 3/8 | 1 | 2-1/2 | .015 - .020 | AP5-3750.1000 | ● | |
| 0.5000 (1/2) | 1/2 | 1 | 3 | .025 - .030 | AP5-5000.1000 | ● | |
| 0.6250 (5/8) | 5/8 | 1-1/4 | 3-1/2 | .030 - .035 | AP5-6250.1250 | ● | |
| 0.7500 (3/4) | 3/4 | 1-1/2 | 4 | .030 - .035 | AP5-7500.1500 | ● | |
| 1.0000 (1) | 1 | 1-1/2 | 4 | .030 - .035 | AP5-10000.1500 | ● | |

| Cutting Diameter Tolerances | Shank Diameter Tolerances | Corner Radius Tolerances |
|------------------------------|-----------------------------|--------------------------|
| 1/8 - 1/4 = +0.0000/-0.0012 | 1/8 - 3/8 = +0.0001/-0.0003 | All = +0.0000/-0.0020 |
| >1/4 - 3/8 = +0.0000/-0.0016 | >3/8 - 1 = +0.0001/-0.0004 | |
| >3/8 - 1 = +0.0000/-0.0020 | | |

| SERIES AP5 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|-------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -20HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -60HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel/ Cobalt | Titanium Alloy |
| AICrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

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4.00mm - 25.00mm DIAMETER

Variable Helix

Unequal Flutes to Reduce Chatter

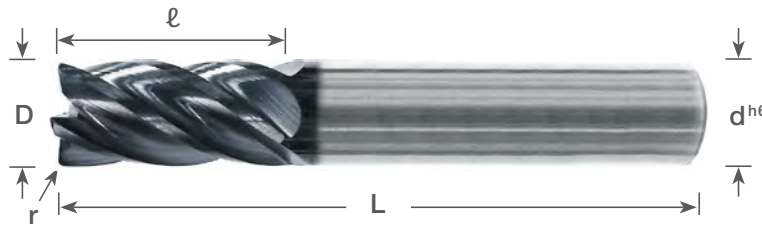
Can be used as a rougher or a finishing tool

Excellent for Alloy Steel, Nickel Steel, Stainless Steel, and Carbon Steel

AlCrN Coating

5 FLUTE APOLLO

VARIABLE HELIX END MILLS



Symbol Descriptions [Page 7](#)

STANDARD Length (Metric Sizes)

| D^{h10} | Dimensions (mm) | | | | | AlCrN Coating | |
|-----------|-----------------|-----|-----|-----|-----------------|---------------|--|
| | d^{h6} | l | L | r | Part Number | Stock | |
| 4 | 4 | 14 | 51 | 0.4 | AP5M-1575.551 | ● | |
| 6 | 6 | 20 | 63 | 0.4 | AP5M-2362.787 | ● | |
| 8 | 8 | 20 | 63 | 0.4 | AP5M-3150.787 | ● | |
| 10 | 10 | 25 | 70 | 0.4 | AP5M-3937.984 | ● | |
| 12 | 12 | 25 | 76 | 0.6 | AP5M-4724.984 | ● | |
| 16 | 16 | 32 | 89 | 0.7 | AP5M-6299.1260 | ● | |
| 20 | 20 | 38 | 100 | 0.7 | AP5M-7874.1496 | ● | |
| 25 | 25 | 38 | 100 | 0.7 | AP5M-10000.1496 | ● | |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

SERIES AP5M WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|---------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~30HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlCrN | ☆ | ☆ | ★ | ★ | ★ | ☆ | | | ☆ | | | | | ☆ | ☆ |

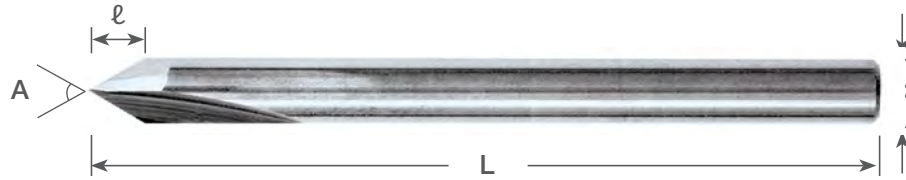
★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

1/8" SHANK

CHAMFER MILLS

30° - 120° ANGLES
Mirror Surface Finishes
Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

30° - 120° Angles

| Included Angle A (+/- 1°) | Side Angle (+/- 1°) | Dimensions (inch) | | | Uncoated | | AlTiN Coating | |
|---------------------------|---------------------|-------------------|-----|-------|-------------|-------|---------------|-------|
| | | ℓ | d | L | Part Number | Stock | Part Number | Stock |
| 30° | 15° | 0.230 | 1/8 | 1 1/2 | CM-030.230 | ● | CM-030L230 | ● |
| 45° | 22.5° | 0.150 | 1/8 | 1 1/2 | CM-045.150 | ● | CM-045L150 | ● |
| 50° | 25° | 0.130 | 1/8 | 1 1/2 | CM-050.130 | ● | CM-050L130 | ● |
| 60° | 30° | 0.105 | 1/8 | 1 1/2 | CM-060.105 | ● | CM-060L105 | ● |
| 82° | 41° | 0.070 | 1/8 | 1 1/2 | CM-082.070 | ● | CM-082L070 | ● |
| 90° | 45° | 0.060 | 1/8 | 1 1/2 | CM-090.060 | ● | CM-090L060 | ● |
| 100° | 50° | 0.050 | 1/8 | 1 1/2 | CM-100.050 | ● | CM-100L050 | ● |
| 118° | 59° | 0.036 | 1/8 | 1 1/2 | CM-118.036 | ● | CM-118L036 | ● |
| 120° | 60° | 0.035 | 1/8 | 1 1/2 | CM-120.035 | ● | CM-120L035 | ● |

| SERIES CM WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

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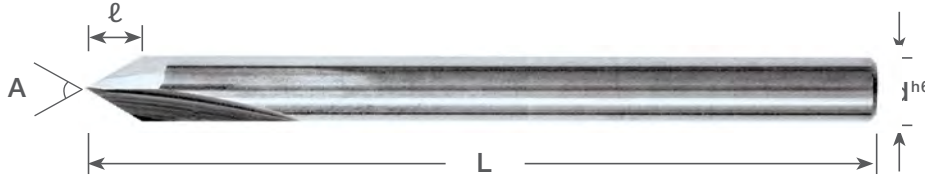
METRIC SHANK

CHAMFER MILLS

60°, 90°, 120° ANGLES

Mirror Surface Finishes

Sub Micron Grain Carbide



Symbol Descriptions [Page 7](#)

60° Angle

| Included Angle A (+/- 1°) | Side Angle (+/- 1°) | Dimensions (mm) | | | Uncoated | | AlTiN Coating | |
|------------------------------|------------------------|-----------------|-----------------|----|--------------|-------|---------------|-------|
| | | ℓ | d ^{h6} | L | Part Number | Stock | Part Number | Stock |
| 60° | 15° | 2.5 | 3.00 | 38 | CMM-1181.060 | ● | CMM-1181L060 | ● |
| 60° | 15° | 5.2 | 6.00 | 50 | CMM-2362.060 | ● | CMM-2362L060 | ● |
| 60° | 15° | 6.9 | 8.00 | 59 | CMM-3150.060 | ● | CMM-3150L060 | ● |
| 60° | 15° | 8.6 | 10.00 | 60 | CMM-3937.060 | ● | CMM-3937L060 | ● |
| 60° | 15° | 10.3 | 12.00 | 70 | CMM-4724.060 | ● | CMM-4724L060 | ● |

90° Angle

| Included Angle A (+/- 1°) | Side Angle (+/- 1°) | Dimensions (mm) | | | Uncoated | | AlTiN Coating | |
|------------------------------|------------------------|-----------------|-----------------|----|--------------|-------|---------------|-------|
| | | ℓ | d ^{h6} | L | Part Number | Stock | Part Number | Stock |
| 90° | 45° | 1.5 | 3.00 | 38 | CMM-1181.090 | ● | CMM-1181L090 | ● |
| 90° | 45° | 3.0 | 6.00 | 50 | CMM-2362.090 | ● | CMM-2362L090 | ● |
| 90° | 45° | 4.0 | 8.00 | 59 | CMM-3150.090 | ● | CMM-3150L090 | ● |
| 90° | 45° | 5.0 | 10.00 | 60 | CMM-3937.090 | ● | CMM-3937L090 | ● |
| 90° | 45° | 6.0 | 12.00 | 70 | CMM-4724.090 | ● | CMM-4724L090 | ● |

120° Angle

| Included Angle A (+/- 1°) | Side Angle (+/- 1°) | Dimensions (mm) | | | Uncoated | | AlTiN Coating | |
|------------------------------|------------------------|-----------------|-----------------|----|--------------|-------|---------------|-------|
| | | ℓ | d ^{h6} | L | Part Number | Stock | Part Number | Stock |
| 120° | 60° | 0.8 | 3.00 | 38 | CMM-1181.120 | ● | CMM-1181L120 | ● |
| 120° | 60° | 1.7 | 6.00 | 50 | CMM-2362.120 | ● | CMM-2362L120 | ● |
| 120° | 60° | 2.3 | 8.00 | 59 | CMM-3150.120 | ● | CMM-3150L120 | ● |
| 120° | 60° | 2.8 | 10.00 | 60 | CMM-3937.120 | ● | CMM-3937L120 | ● |
| 120° | 60° | 3.4 | 12.00 | 70 | CMM-4724.120 | ● | CMM-4724L120 | ● |

| SERIES CMM WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ★ | | | | | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | | ★ | | | | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

ROUTERS

156 - 160

DIAMOND PATTERN ROUTERS

156 - 159

| | | | |
|-------------|----------------------|----------|-----|
| SERIES 2120 | 1/32" - 1/4" Dia. | Up Cut | 156 |
| SERIES 2120 | 0.80mm - 8.00mm Dia. | Up Cut | 157 |
| SERIES 2121 | 1/32" - 1/4" Dia. | Down Cut | 158 |
| SERIES 2121 | 0.80mm - 8.00mm Dia. | Down Cut | 159 |

CHIPBREAKER PATTERN ROUTERS

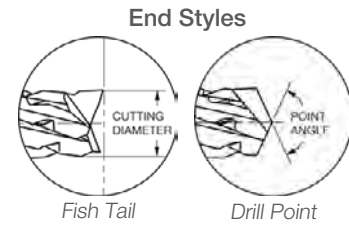
160

| | | | |
|-------------|----------------------|--------|-----|
| SERIES 2320 | 1/32" - 1/8" Dia. | Up Cut | 160 |
| SERIES 2320 | 0.80mm - 8.00mm Dia. | Up Cut | 160 |

UP CUT

DIAMOND PATTERN ROUTER BITS
CFRP, FIBERGLASS, AND COMPOSITE MATERIALS

1/32" - 1/4" DIAMETER
Sub Micron Grain Carbide
Chips Exhausted Upwards
DLC is Amorphous Diamond



UP CUT (Inch Sizes)

Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|------|-------|-------|-------------|-----------------|-------|-----------------|-------|-----------------|-------|
| D | d | ℓ | L | End Style | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2120-0312.255F | ● | 2120-0312D255F | ● | 2120-0312V255F | ● |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2120-0312.255D | ● | 2120-0312D255D | ● | 2120-0312V255D | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2120-0469.255F | ● | 2120-0469D255F | ● | 2120-0469V255F | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2120-0469.255D | ● | 2120-0469D255D | ● | 2120-0469V255D | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2120-0625.255F | ● | 2120-0625D255F | ● | 2120-0625V255F | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2120-0625.255D | ● | 2120-0625D255D | ● | 2120-0625V255D | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Fish Tail | 2120-0938.395F | ● | 2120-0938D395F | ● | 2120-0938V395F | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Drill Point | 2120-0938.395D | ● | 2120-0938D395D | ● | 2120-0938V395D | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Fish Tail | 2120-1250.500F | ● | 2120-1250D500F | ● | 2120-1250V500F | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Drill Point | 2120-1250.500D | ● | 2120-1250D500D | ● | 2120-1250V500D | ● |
| 3/16 | 3/16 | 0.625 | 2 | Fish Tail | 2120-1875.2625F | ● | 2120-1875D2625F | ● | 2120-1875V2625F | ● |
| 3/16 | 3/16 | 0.625 | 2 | Drill Point | 2120-1875.2625D | ● | 2120-1875D2625D | ● | 2120-1875V2625D | ● |
| 1/4 | 1/4 | 0.750 | 2 | Fish Tail | 2120-2500.2750F | ● | 2120-2500D2750F | ● | 2120-2500V2750F | ● |
| 1/4 | 1/4 | 0.750 | 2 | Drill Point | 2120-2500.2750D | ● | 2120-2500D2750D | ● | 2120-2500V2750D | ● |
| 1/4 | 1/4 | 0.750 | 2 1/2 | Fish Tail | 2120-2500.3750F | ● | 2120-2500D3750F | ● | 2120-2500V3750F | ● |
| 1/4 | 1/4 | 0.750 | 2 1/2 | Drill Point | 2120-2500.3750D | ● | 2120-2500D3750D | ● | 2120-2500V3750D | ● |
| 1/4 | 1/4 | 1.000 | 3 | Fish Tail | 2120-2500.4100F | ● | 2120-2500D4100F | ● | 2120-2500V4100F | ● |
| 1/4 | 1/4 | 1.000 | 3 | Drill Point | 2120-2500.4100D | ● | 2120-2500D4100D | ● | 2120-2500V4100D | ● |

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

| SERIES 2120 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|-------------------------|----------------|---------------|---------------|----------------------|-----------|--------------|---------------------------|------------------------------|-------------------------|------------------------|
| Coating | P Steel -20HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| CVD Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

UP CUT

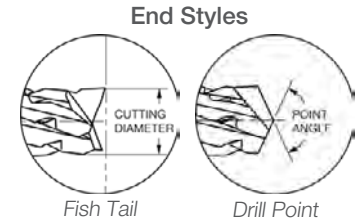
DIAMOND PATTERN ROUTER BITS
CFRP, FIBERGLASS, AND COMPOSITE MATERIALS

0.80mm - 8.00mm DIAMETER

Sub Micron Grain Carbide

Chips Exhausted Upwards

DLC is Amorphous Diamond



UP CUT (Metric Sizes)

Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|-----------------|----|----|-------------|----------------|-------|----------------|-------|----------------|-------|
| D | d ^{h6} | ℓ | L | | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.80 | 3 | 4 | 38 | Fish Tail | 2120-0315.157F | ● | 2120-0315D157F | ● | 2120-0315V157F | ● |
| 0.80 | 3 | 4 | 38 | Drill Point | 2120-0315.157D | ● | 2120-0315D157D | ● | 2120-0315V157D | ● |
| 1.00 | 3 | 5 | 38 | Fish Tail | 2120-0394.197F | ● | 2120-0394D197F | ● | 2120-0394V197F | ● |
| 1.00 | 3 | 5 | 38 | Drill Point | 2120-0394.197D | ● | 2120-0394D197D | ● | 2120-0394V197D | ● |
| 1.50 | 3 | 8 | 38 | Fish Tail | 2120-0591.315F | ● | 2120-0591D315F | ● | 2120-0591V315F | ● |
| 1.50 | 3 | 8 | 38 | Drill Point | 2120-0591.315D | ● | 2120-0591D315D | ● | 2120-0591V315D | ● |
| 2.00 | 3 | 9 | 38 | Fish Tail | 2120-0787.354F | ● | 2120-0787D354F | ● | 2120-0787V354F | ● |
| 2.00 | 3 | 9 | 38 | Drill Point | 2120-0787.354D | ● | 2120-0787D354D | ● | 2120-0787V354D | ● |
| 3.00 | 3 | 12 | 38 | Fish Tail | 2120-1181.472F | ● | 2120-1181D472F | ● | 2120-1181V472F | ● |
| 3.00 | 3 | 12 | 38 | Drill Point | 2120-1181.472D | ● | 2120-1181D472D | ● | 2120-1181V472D | ● |
| 4.00 | 4 | 15 | 40 | Fish Tail | 2120-1575.591F | ● | 2120-1575D591F | ● | 2120-1575V591F | ● |
| 4.00 | 4 | 15 | 40 | Drill Point | 2120-1575.591D | ● | 2120-1575D591D | ● | 2120-1575V591D | ● |
| 5.00 | 5 | 20 | 50 | Fish Tail | 2120-1968.787F | ● | 2120-1968D787F | ● | 2120-1968V787F | ● |
| 5.00 | 5 | 20 | 50 | Drill Point | 2120-1968.787D | ● | 2120-1968D787D | ● | 2120-1968V787D | ● |
| 6.00 | 6 | 20 | 50 | Fish Tail | 2120-2362.787F | ● | 2120-2362D787F | ● | 2120-2362V787F | ● |
| 6.00 | 6 | 20 | 50 | Drill Point | 2120-2362.787D | ● | 2120-2362D787D | ● | 2120-2362V787D | ● |
| 8.00 | 8 | 25 | 63 | Fish Tail | 2120-3150.984F | ● | 2120-3150D984F | ● | 2120-3150V984F | ● |
| 8.00 | 8 | 25 | 63 | Drill Point | 2120-3150.984D | ● | 2120-3150D984D | ● | 2120-3150V984D | ● |

| Coating | SERIES 2120 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|-------------|--------------------------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| CVD Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

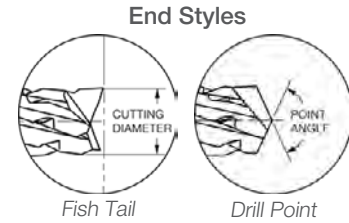
● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
▲ : Coming Soon

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

DOWN CUT

DIAMOND PATTERN ROUTER BITS
CFRP, FIBERGLASS, AND COMPOSITE MATERIALS

1/32" - 1/4" DIAMETER
Sub Micron Grain Carbide
Chips Exhausted Downwards
DLC is Amorphous Diamond



DOWN CUT (Inch Sizes)

Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|------|-------|-------|-------------|-----------------|-------|-----------------|-------|-----------------|-------|
| D | d | ℓ | L | | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2121-0312.255F | ● | 2121-0312D255F | ● | 2121-0312V255F | ● |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2121-0312.255D | ● | 2121-0312D255D | ● | 2121-0312V255D | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2121-0469.255F | ● | 2121-0469D255F | ● | 2121-0469V255F | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2121-0469.255D | ● | 2121-0469D255D | ● | 2121-0469V255D | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2121-0625.255F | ● | 2121-0625D255F | ● | 2121-0625V255F | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2121-0625.255D | ● | 2121-0625D255D | ● | 2121-0625V255D | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Fish Tail | 2121-0938.395F | ● | 2121-0938D395F | ● | 2121-0938V395F | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Drill Point | 2121-0938.395D | ● | 2121-0938D395D | ● | 2121-0938V395D | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Fish Tail | 2121-1250.500F | ● | 2121-1250D500F | ● | 2121-1250V500F | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Drill Point | 2121-1250.500D | ● | 2121-1250D500D | ● | 2121-1250V500D | ● |
| 3/16 | 3/16 | 0.625 | 2 | Fish Tail | 2121-1875.2625F | ● | 2121-1875D2625F | ● | 2121-1875V2625F | ● |
| 3/16 | 3/16 | 0.625 | 2 | Drill Point | 2121-1875.2625D | ● | 2121-1875D2625D | ● | 2121-1875V2625D | ● |
| 1/4 | 1/4 | 0.750 | 2 | Fish Tail | 2121-2500.2750F | ● | 2121-2500D2750F | ● | 2121-2500V2750F | ● |
| 1/4 | 1/4 | 0.750 | 2 | Drill Point | 2121-2500.2750D | ● | 2121-2500D2750D | ● | 2121-2500V2750D | ● |
| 1/4 | 1/4 | 0.750 | 2 1/2 | Fish Tail | 2121-2500.3750F | ● | 2121-2500D3750F | ● | 2121-2500V3750F | ● |
| 1/4 | 1/4 | 0.750 | 2 1/2 | Drill Point | 2121-2500.3750D | ● | 2121-2500D3750D | ● | 2121-2500V3750D | ● |
| 1/4 | 1/4 | 1.000 | 3 | Fish Tail | 2121-2500.4100F | ● | 2121-2500D4100F | ● | 2121-2500V4100F | ● |
| 1/4 | 1/4 | 1.000 | 3 | Drill Point | 2121-2500.4100D | ● | 2121-2500D4100D | ● | 2121-2500V4100D | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

| SERIES 2121 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| Coating | P Steel ~30HRC | P Steel 30~40HRC | H Hardened Steel ~55HRC | H Hardened Steel ~58HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
| CVD Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |

★ : Priority ☆ : Applicable Materials

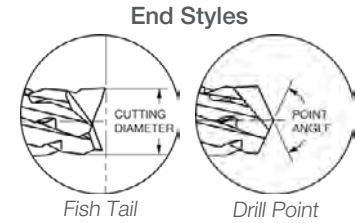
Symbol Descriptions [Page 7](#)

DOWN CUT

DIAMOND PATTERN ROUTER BITS
CFRP, FIBERGLASS, AND COMPOSITE MATERIALS

0.80mm - 8.00mm DIAMETER

Sub Micron Grain Carbide
Chips Exhausted Downwards
DLC is Amorphous Diamond



DOWN CUT (Metric Sizes)

Symbol Descriptions [Page 7](#)

| Dimensions (mm) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|-----------------|----|----|-------------|----------------|-------|----------------|-------|----------------|-------|
| D | d ^{h6} | ℓ | L | | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.80 | 3 | 4 | 38 | Fish Tail | 2121-0315.157F | ● | 2121-0315D157F | ● | 2121-0315V157F | ● |
| 0.80 | 3 | 4 | 38 | Drill Point | 2121-0315.157D | ● | 2121-0315D157D | ● | 2121-0315V157D | ● |
| 1.00 | 3 | 5 | 38 | Fish Tail | 2121-0394.197F | ● | 2121-0394D197F | ● | 2121-0394V197F | ● |
| 1.00 | 3 | 5 | 38 | Drill Point | 2121-0394.197D | ● | 2121-0394D197D | ● | 2121-0394V197D | ● |
| 1.50 | 3 | 8 | 38 | Fish Tail | 2121-0591.315F | ● | 2121-0591D315F | ● | 2121-0591V315F | ● |
| 1.50 | 3 | 8 | 38 | Drill Point | 2121-0591.315D | ● | 2121-0591D315D | ● | 2121-0591V315D | ● |
| 2.00 | 3 | 9 | 38 | Fish Tail | 2121-0787.354F | ● | 2121-0787D354F | ● | 2121-0787V354F | ● |
| 2.00 | 3 | 9 | 38 | Drill Point | 2121-0787.354D | ● | 2121-0787D354D | ● | 2121-0787V354D | ● |
| 3.00 | 3 | 12 | 38 | Fish Tail | 2121-1181.472F | ● | 2121-1181D472F | ● | 2121-1181V472F | ● |
| 3.00 | 3 | 12 | 38 | Drill Point | 2121-1181.472D | ● | 2121-1181D472D | ● | 2121-1181V472D | ● |
| 4.00 | 4 | 15 | 40 | Fish Tail | 2121-1575.591F | ● | 2121-1575D591F | ● | 2121-1575V591F | ● |
| 4.00 | 4 | 15 | 40 | Drill Point | 2121-1575.591D | ● | 2121-1575D591D | ● | 2121-1575V591D | ● |
| 5.00 | 5 | 20 | 50 | Fish Tail | 2121-1968.787F | ● | 2121-1968D787F | ● | 2121-1968V787F | ● |
| 5.00 | 5 | 20 | 50 | Drill Point | 2121-1968.787D | ● | 2121-1968D787D | ● | 2121-1968V787D | ● |
| 6.00 | 6 | 20 | 50 | Fish Tail | 2121-2362.787F | ● | 2121-2362D787F | ● | 2121-2362V787F | ● |
| 6.00 | 6 | 20 | 50 | Drill Point | 2121-2362.787D | ● | 2121-2362D787D | ● | 2121-2362V787D | ● |
| 8.00 | 8 | 25 | 63 | Fish Tail | 2121-3150.984F | ● | 2121-3150D984F | ● | 2121-3150V984F | ● |
| 8.00 | 8 | 25 | 63 | Drill Point | 2121-3150.984D | ● | 2121-3150D984D | ● | 2121-3150V984D | ● |

| Coating | SERIES 2121 WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|-------------|--------------------------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| CVD Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

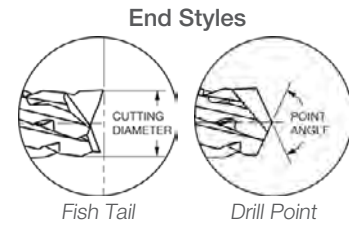
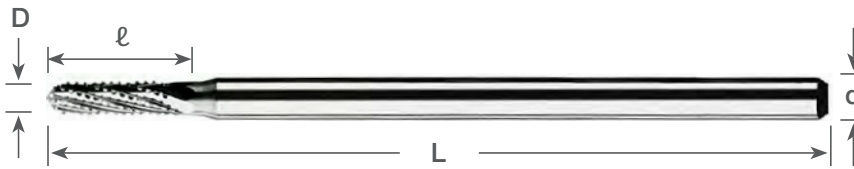
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DRILLS
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 ENGRAVERS
 BORING BARS
 REAMERS
 SAWS
 TECHNICAL
 INDEX

UP CUT

CHIPBREAKER PATTERN ROUTER BITS
CFRP, FIBERGLASS, AND COMPOSITE MATERIALS

1/32" - 1/8" DIAMETER
0.80mm - 8.00mm DIAMETER
Sub Micron Grain Carbide
Chips Exhausted Upwards
For Finer Part Edge Finishes
DLC is Amorphous Diamond



UP CUT (Inch Sizes)

Symbol Descriptions [Page 7](#)

| Dimensions (in) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|-----|-------|-------|-------------|----------------|-------|----------------|-------|----------------|-------|
| D | d | ℓ | L | | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2320-0312.255F | ● | 2320-0312D255F | ● | 2320-0312V255F | ● |
| 1/32 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2320-0312.255D | ● | 2320-0312D255D | ● | 2320-0312V255D | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2320-0469.255F | ● | 2320-0469D255F | ● | 2320-0469V255F | ● |
| 3/64 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2320-0469.255D | ● | 2320-0469D255D | ● | 2320-0469V255D | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Fish Tail | 2320-0625.255F | ● | 2320-0625D255F | ● | 2320-0625V255F | ● |
| 1/16 | 1/8 | 0.255 | 1 1/2 | Drill Point | 2320-0625.255D | ● | 2320-0625D255D | ● | 2320-0625V255D | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Fish Tail | 2320-0938.395F | ● | 2320-0938D395F | ● | 2320-0938V395F | ● |
| 3/32 | 1/8 | 0.395 | 1 1/2 | Drill Point | 2320-0938.395D | ● | 2320-0938D395D | ● | 2320-0938V395D | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Fish Tail | 2320-1250.500F | ● | 2320-1250D500F | ● | 2320-1250V500F | ● |
| 1/8 | 1/8 | 0.500 | 1 1/2 | Drill Point | 2320-1250.500D | ● | 2320-1250D500D | ● | 2320-1250V500D | ● |

UP CUT (Metric Sizes)

| Dimensions (mm) | | | | End Style | Uncoated | | DLC Coating | | CVD Diamond | |
|-----------------|-----------------|----|----|-------------|----------------|-------|----------------|-------|----------------|-------|
| D | d ^{h6} | ℓ | L | | Part Number | Stock | Part Number | Stock | Part Number | Stock |
| 0.80 | 3 | 4 | 38 | Fish Tail | 2320-0315.157F | ● | 2320-0315D157F | ● | 2320-0315V157F | ● |
| 0.80 | 3 | 4 | 38 | Drill Point | 2320-0315.157D | ● | 2320-0315D157D | ● | 2320-0315V157D | ● |
| 1.00 | 3 | 5 | 38 | Fish Tail | 2320-0394.197F | ● | 2320-0394D197F | ● | 2320-0394V197F | ● |
| 1.00 | 3 | 5 | 38 | Drill Point | 2320-0394.197D | ● | 2320-0394D197D | ● | 2320-0394V197D | ● |
| 1.50 | 3 | 8 | 38 | Fish Tail | 2320-0591.315F | ● | 2320-0591D315F | ● | 2320-0591V315F | ● |
| 1.50 | 3 | 8 | 38 | Drill Point | 2320-0591.315D | ● | 2320-0591D315D | ● | 2320-0591V315D | ● |
| 2.00 | 3 | 9 | 38 | Fish Tail | 2320-0787.354F | ● | 2320-0787D354F | ● | 2320-0787V354F | ● |
| 2.00 | 3 | 9 | 38 | Drill Point | 2320-0787.354D | ● | 2320-0787D354D | ● | 2320-0787V354D | ● |
| 3.00 | 3 | 12 | 38 | Fish Tail | 2320-1181.472F | ● | 2320-1181D472F | ● | 2320-1181V472F | ● |
| 3.00 | 3 | 12 | 38 | Drill Point | 2320-1181.472D | ● | 2320-1181D472D | ● | 2320-1181V472D | ● |
| 4.00 | 4 | 15 | 40 | Fish Tail | 2320-1575.591F | ● | 2320-1575D591F | ● | 2320-1575V591F | ● |
| 4.00 | 4 | 15 | 40 | Drill Point | 2320-1575.591D | ● | 2320-1575D591D | ● | 2320-1575V591D | ● |
| 5.00 | 5 | 20 | 50 | Fish Tail | 2320-1968.787F | ● | 2320-1968D787F | ● | 2320-1968V787F | ● |
| 5.00 | 5 | 20 | 50 | Drill Point | 2320-1968.787D | ● | 2320-1968D787D | ● | 2320-1968V787D | ● |
| 6.00 | 6 | 20 | 50 | Fish Tail | 2320-2362.787F | ● | 2320-2362D787F | ● | 2320-2362V787F | ● |
| 6.00 | 6 | 20 | 50 | Drill Point | 2320-2362.787D | ● | 2320-2362D787D | ● | 2320-2362V787D | ● |
| 8.00 | 8 | 25 | 63 | Fish Tail | 2320-3150.984F | ● | 2320-3150D984F | ● | 2320-3150V984F | ● |
| 8.00 | 8 | 25 | 63 | Drill Point | 2320-3150.984D | ● | 2320-3150D984D | ● | 2320-3150V984D | ● |

| SERIES 2320 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| CVD Diamond | | | | | | | ☆ | ★ | | ★ | | | | | |
| DLC | | | | | | | ☆ | ☆ | | ☆ | | | | | |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

THREAD MILLS & TAPS

162 - 207

| | |
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STANDARD LENGTH

MICRO THREAD MILLS
SINGLE POINT THREAD MILLING

M0.5 - M8 THREADS

Mirror Surface Finishes

Sub Micron Grain Carbide

Excellent for Titanium Dental Implants



STANDARD Length

Symbol Descriptions [Page 7](#)

| Metric Thread | Number of Flutes | Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|---------------|------------------|-----------------|-----------------|-------|----|-----------------|-------|-----------------|-------|
| | | D | d ^{h6} | ℓ | L | Part Number | Stock | Part Number | Stock |
| M0.5 X 0.125 | 2 | 0.30 | 3 | 1.00 | 38 | 98M05-0125.2FA1 | ● | 98M05-0125L2FA1 | ● |
| M0.6 X 0.15 | 2 | 0.37 | 3 | 1.00 | 38 | 98M06-0150.2FA1 | ● | 98M06-0150L2FA1 | ● |
| M0.7 X 0.175 | 2 | 0.45 | 3 | 2.00 | 38 | 98M07-0175.2FA1 | ● | 98M07-0175L2FA1 | ● |
| M0.8 X 0.20 | 2 | 0.51 | 3 | 2.00 | 38 | 98M08-0200.2FA1 | ● | 98M08-0200L2FA1 | ● |
| M0.9 X 0.25 | 2 | 0.58 | 3 | 2.00 | 38 | 98M09-0225.2FA1 | ● | 98M09-0225L2FA1 | ● |
| M1.0 X 0.25 | 2 | 0.65 | 3 | 5.00 | 38 | 98M10-0250.2FA1 | ● | 98M10-0250L2FA1 | ● |
| M1.1 X 0.25 | 4 | 0.75 | 3 | 5.00 | 38 | 98M11-0250.4FA1 | ● | 98M11-0250L4FA1 | ● |
| M1.2 X 0.25 | 4 | 0.85 | 3 | 5.00 | 38 | 98M12-0250.4FA1 | ● | 98M12-0250L4FA1 | ● |
| M1.4 X 0.30 | 4 | 1.00 | 3 | 5.00 | 38 | 98M14-0300.4FA1 | ● | 98M14-0300L4FA1 | ● |
| M1.6 X 0.35 | 4 | 1.15 | 3 | 7.00 | 38 | 98M16-0350.4FA1 | ● | 98M16-0350L4FA1 | ● |
| M1.8 X 0.35 | 4 | 1.35 | 3 | 7.00 | 38 | 98M18-0350.4FA1 | ● | 98M18-0350L4FA1 | ● |
| M2.0 X 0.40 | 4 | 1.50 | 3 | 7.00 | 38 | 98M20-0400.4FA1 | ● | 98M20-0400L4FA1 | ● |
| M2.5 X 0.45 | 4 | 1.95 | 4 | 9.40 | 50 | 98M25-0450.4FB1 | ● | 98M25-0450L4FB1 | ● |
| M3 X 0.5 | 4 | 2.40 | 4 | 9.40 | 50 | 98M30-0500.4FB1 | ● | 98M30-0500L4FB1 | ● |
| M3.5 X 0.6 | 4 | 2.80 | 4 | 9.40 | 50 | 98M35-0600.4FB1 | ● | 98M35-0600L4FB1 | ● |
| M4 X 0.7 | 4 | 3.10 | 6 | 12.70 | 64 | 98M40-0700.4FB1 | ● | 98M40-0700L4FB1 | ● |
| M5 X 0.8 | 4 | 3.85 | 6 | 12.70 | 64 | 98M50-0800.4FB1 | ● | 98M50-0800L4FB1 | ● |
| M6 X 1 | 4 | 4.65 | 6 | 12.70 | 64 | 98M60-1000.4FB1 | ● | 98M60-1000L4FB1 | ● |
| M8 X 1.25 | 4 | 5.95 | 6 | 12.70 | 64 | 98M80-1250.4FB1 | ● | 98M80-1250L4FB1 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

| SERIES 98M WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | | ☆ | ★ | ☆ | ☆ | ☆ | | ★ |
| Uncoated | | | | | | | ☆ | | ★ | ★ | ☆ | ☆ | ☆ | | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)



SPECIAL TAPS

PAGES 164 - 207

DRILLS

END MILLS

ROUTERS

THREAD MILLS
& TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

TAP STYLE GUIDE



HAND TAP #1

These standard style taps have straight flutes of a number specified as either standard or optional. Hand taps are for general purpose applications such as production tapping or hand tapping operations. Taper, plug and bottoming styles provide versatility in tough materials, blind and through holes.



SPIRAL POINT TAP #2

As to general physical dimensions, spiral point taps are identical with the standard hand tap. However, the spiral point tap has the cutting face of the first few threads cut at a predetermined angle relative to the tap's axis angle to force the evacuation of chips ahead of the cutting action. This feature, plus the excellent shearing action of the flute, make spiral pointed taps ideal for production tapping of through holes. Typically, this type of tap has a shallower flute passage than conventional taps. This gives the spiral point tap more cross-sectional area, which means greater strength, allows higher tapping speeds, and requires less power to drive.



S.T.I. TAP #3

S.T.I. (Screw Thread Insert) Taps are special taps for helical coil wire screw thread inserts, which provide positive means for protecting and strengthening tapped threads in any material. These STI taps are correctly sized to produce an internal thread that accommodates a helical coil wire screw thread insert. The insert, in turn, will accept a screw thread of the nominal size and pitch at final assembly. Screw thread inserts provide stronger tapped threads (stronger assemblies) due to a more balanced distribution of loads throughout the length of thread engagement.



HAND TAP



SPIRAL POINT TAP

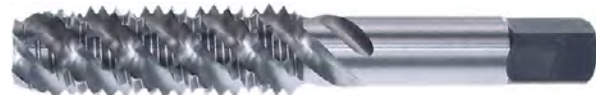
EXTENSION TAP #4

These taps are made to conventional tap dimensions, except that they have an extended shank to tap hard to reach or holes that are inaccessible with standard length taps. Thread length, shank diameter, and shank square are made to standard specifications listed on **Page 198**. Extension taps are available in both hand and spiral point styles, and in small shank style.



THREAD FORMING TAP #5

These taps have no flutes except as optionally designed with one or more lubrication grooves. The thread form is lobed so there is a finite number of points contacting the work. This tap does not cut metal, so it is 'chipless', and consequently will not cause a chip problem. The tool forms the thread by extrusion, thus thread size can be closely maintained. The fluteless design allows high quality threads, faster tapping speeds, higher production, and generates no chips which simplifies tapping of blind bottoming holes (threads can be formed the full depth of the hole).



SPIRAL FLUTED TAP #6

These taps, as the name implies, are made with spiral flutes instead of straight flutes. This spiral fluting feature aids in drawing chips out of a hole, or serves to bridge a gap inside the hole such as a keyway or cross-hole. Commonly available in slow spiral (25-30° helix angle) or fast spiral (45-60°).



SMALL SHANK EXTENSION TAP #7

These taps are made to conventional tap dimensions, except that they have an extended shank to tap hard to reach inaccessible holes. Thread length and shank square are made to standard specifications listed on **Page 198**. These taps are designed with a smaller shank diameter. Extension taps are available in both hand and spiral point styles, and in small shank style.



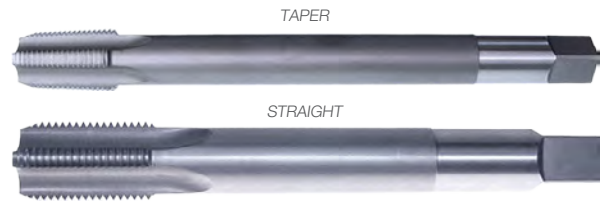
PIPE TAP #8

These taps are for producing standard straight or tapered pipe threads in a wide range of pipe connections. Manufactured with the appropriate design variations to cut specified pipe thread forms.



PIPE INTERRUPTED THREAD TAP #9

These taps are for producing standard tapered pipe threads in a wide range of pipe connections. Manufactured with the appropriate design variations to cut specified pipe thread forms. Thread length, shank diameter, and square are made to standard specifications listed on **Page 204** (Standard Pipe Tap Dimensions). These pipe taps feature interrupted threads which have an odd number of lands with alternate teeth in the thread helix removed. The removal of every other tooth helps to break the chip and allows a greater supply of lubrication to reach the cutting teeth, reducing the incidence of torn threads. Ideal for pipe tapping non-ferrous metals, low carbon steel, as well as titanium and high hardness alloys.



PIPE EXTENSION TAP #10

These taps are for producing standard straight or tapered pipe threads in a wide range of pipe connections. Manufactured with the appropriate design variations to cut specified pipe thread forms. These extension pipe taps have an extended shank to tap hard to reach or inaccessible holes. Thread length, shank diameter, and shank square are made to standard specifications listed on **Page 204** (Standard Pipe Tap Dimensions).



PIPE EXTENSION INTERRUPTED THREAD TAP #11

These taps are for producing standard tapered pipe threads in a wide range of pipe connections. Manufactured with the appropriate design variations to cut specified pipe thread forms. These extension pipe taps have an extended shank to tap hard to reach or inaccessible holes. Thread length, shank diameter, and square are made to standard specifications listed on **Page 204** (Standard Pipe Tap Dimensions). These pipe extension taps feature interrupted threads which have an odd number of lands with alternate teeth in the thread helix removed. The removal of every other tooth helps to break the chip and allows a greater supply of lubrication to reach the cutting teeth, reducing the incidence of torn threads. Ideal for pipe tapping non-ferrous metals, low carbon steel, as well as titanium and high hardness alloys.



ACME THREAD TAP #12

Acme screw threads were devised to allow rotary and transversing motion on machines; and are also used in jacks, valves, presses and other mechanisms where heavy loads are encountered. The acme thread is characterized by a 29° included angle. Acme taps typically require specialized engineering and design due to the nature and severity of cut required in producing Acme threads.

TAPS BY SIZE

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|

| | | | | | | | | |
|--|---|---|---|-------|---|---|---|-------------------|
| #2-56 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .0689" | | | | | | | | |
| SPIRAL POINT | 4 | - | 2 | 14010 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT | 5 | - | 2 | 14011 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT +.003 | 7 | - | 2 | 14012 | ◆ | - | - | See Page 164 (#2) |

| | | | | | | | | |
|--|----|---------|---|-------|---|-------|---|-------------------|
| #4-40 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .0878" | | | | | | | | |
| SPIRAL POINT | 3 | - | 2 | 14013 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT | 4 | - | 2 | 14014 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT | 5 | - | 2 | 14015 | ◆ | - | - | See Page 164 (#2) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14016 | ◆ | - | - | See Page 164 (#2) |
| STI HAND TAP | 1 | 3B | 3 | 14017 | ◆ | 14018 | ◆ | See Page 164 (#3) |

| | | | | | | | | |
|--|----|---------|---|-------|---|---|---|-------------------|
| #5-40 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .1008" | | | | | | | | |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14019 | ◆ | - | - | See Page 164 (#2) |

| | | | | | | | | |
|--|----|---------|---|-------|---|-------|---|-------------------|
| #6-32 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .1077" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 2B | 2 | 14020 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 3 | 14021 | ◆ | 14022 | ◆ | See Page 164 (#1) |
| +.003 SPIRAL POINT | 7 | - | 2 | 14023 | ◆ | - | - | See Page 164 (#2) |
| +.005 HAND TAP | 11 | PLATING | 3 | 14024 | ◆ | 14025 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14026 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT SPIRAL POINT | 3 | 2B | 2 | 14027 | ◆ | - | - | See Page 164 (#4) |

| | | | | | | | | |
|---|---|----|---|-------|---|-------|---|-------------------|
| #6-48 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .118" | | | | | | | | |
| HAND TAP | 2 | 3B | 3 | 14028 | ◆ | 14029 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 2 | 3B | 2 | 14030 | ◆ | - | - | See Page 164 (#2) |

| | | | | | | | | |
|---|----|---------|---|-------|---|-------|---|-------------------|
| #8-32 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .1337" THREAD FORMING TAP at 65% Thread = .1502" | | | | | | | | |
| +.003 HAND TAP | 7 | - | 4 | 14031 | ◆ | 14032 | ◆ | See Page 164 (#1) |
| +.003 SPIRAL POINT | 7 | - | 2 | 14033 | ◆ | - | - | See Page 164 (#2) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14034 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT SPIRAL POINT | 3 | 2B | 2 | 14035 | ◆ | - | - | See Page 164 (#4) |
| THREAD FORMING TAP | 3 | 3B | 0 | 14036 | ◆ | 14037 | ◆ | See Page 164 (#5) |
| THREAD FORMING TAP | 5 | 2B | 0 | 14038 | ◆ | 14039 | ◆ | See Page 164 (#5) |

| | | | | | | | | |
|--|---|----|---|-------|---|-------|---|-------------------|
| #8-40 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .1398" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14040 | ◆ | 14041 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 2 | 3B | 2 | 14042 | ◆ | - | - | See Page 164 (#2) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|

#10-24 NC

Recommended Hole Size based on 75% Thread = .149"

| | | | | | | | | |
|---------------------|----|---------|---|-------|---|-------|---|-------------------|
| SPIRAL POINT | 5 | - | 2 | 14043 | ◆ | - | - | See Page 164 (#2) |
| + .003 SPIRAL POINT | 7 | - | 2 | 14044 | ◆ | - | - | See Page 164 (#2) |
| + .005 HAND TAP | 11 | PLATING | 4 | 14045 | ◆ | 14046 | ◆ | See Page 164 (#1) |
| + .005 SPIRAL POINT | 11 | PLATING | 2 | 14047 | ◆ | - | - | See Page 164 (#2) |
| 4" EXT SPIRAL POINT | 3 | 3B | 2 | 14048 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14049 | ◆ | 14050 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 3B | 2 | 14051 | ◆ | - | - | See Page 164 (#4) |
| THREAD FORMING TAP | 10 | PLATING | 0 | 14052 | ◆ | 14053 | ◆ | See Page 164 (#5) |

#10-32 NF

Recommended Hole Size based on 75% Thread = .1597"

| | | | | | | | | |
|---------------------|----|---------|---|-------|---|-------|---|-------------------|
| L.H. SPIRAL POINT | 3 | 2B | 2 | 14054 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 4 | - | 4 | 14055 | ◆ | 14056 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 4 | - | 2 | 14057 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14058 | ◆ | 14059 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | - | 2 | 14060 | ◆ | - | - | See Page 164 (#2) |
| + .003 HAND TAP | 7 | - | 4 | 14061 | ◆ | 14062 | ◆ | See Page 164 (#1) |
| + .003 SPIRAL POINT | 7 | - | 2 | 14063 | ◆ | - | - | See Page 164 (#2) |
| + .005 SPIRAL POINT | 11 | PLATING | 2 | 14064 | ◆ | - | - | See Page 164 (#2) |
| 4" EXT SPIRAL POINT | 3 | 2B | 2 | 14065 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT HAND TAP | 3 | 2B | 4 | 14066 | ◆ | 14067 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 2B | 2 | 14068 | ◆ | - | - | See Page 164 (#4) |
| STI HAND TAP | 2 | 3B | 3 | 14069 | ◆ | 14070 | ◆ | See Page 164 (#3) |

#10-36 NS

Recommended Hole Size based on 75% Thread = .163"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 2 | 3B | 4 | 14071 | ◆ | 14072 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

#10-40 NS

Recommended Hole Size based on 75% Thread = .1658"

| | | | | | | | | |
|--------------|---|----|---|-------|---|---|---|-------------------|
| SPIRAL POINT | 2 | 3B | 2 | 14073 | ◆ | - | - | See Page 164 (#2) |
|--------------|---|----|---|-------|---|---|---|-------------------|

#10-48 NS

Recommended Hole Size based on 75% Thread = .1700"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 2 | 3B | 4 | 14074 | ◆ | 14075 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

#10-56 NS

Recommended Hole Size based on 75% Thread = .1729"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 2 | 3B | 4 | 14076 | ◆ | 14077 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

.210-36 NS

Recommended Hole Size based on 75% Thread = .183"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 4 | 14078 | ◆ | 14079 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

#12-32 NEF

Recommended Hole Size based on 75% Thread = .1857"

| | | | | | | | | |
|--------------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 4 | 14080 | ◆ | 14081 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 2 | 14082 | ◆ | - | - | See Page 164 (#2) |

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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
| #14-24 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .201" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14083 | ◆ | 14084 | ◆ | See Page 164 (#1) |
| 1/16"-27 PIPE TAP NPSI NPSF NPT/F NPS | | | | | | | | |
| Recommended Hole Size: NPT/NPTF = .246" | | | | | | | | |
| NPT/F INT. THD | - | - | 5 | 14085 | ◆ | - | - | See Page 165 (#9) |
| NPT/F 4" EXT TAPER | - | - | 4 | 14086 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT TAPER | - | - | 4 | 14087 | ◆ | - | - | See Page 165 (#10) |
| 1/8"-27 PIPE TAP NPSI NPSF NPT/F NPS | | | | | | | | |
| Recommended Hole Size: NPT/NPTF = .332" NPSF/NPSI = .3438" | | | | | | | | |
| NPT/F 4" EXT TAPER | - | - | 4 | 14088 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT TAPER | - | - | 4 | 14089 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT INT THD TAPER | - | - | 5 | 14090 | ◆ | - | - | See Page 165 (#11) |
| NPSF EXT x 6" | - | - | 4 | 14091 | ◆ | - | - | See Page 165 (#10) |
| NPSI STRAIGHT | - | - | 4 | 14092 | ◆ | - | - | See Page 165 (#8) |
| 1/8"-28 55° WHITWORTH PIPE | | | | | | | | |
| Recommended Hole Size BSPT = .3281" / BSPP = .3438" | | | | | | | | |
| BSPT TAPER - MODIFIED | - | - | 4 | 14093 | ◆ | 14094 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - MODIFIED | - | - | 4 | 14095 | ◆ | 14096 | ◆ | See Page 165 (#8) |
| 1/4"-18 PIPE TAP NPSI NPSF NPT/F NPS | | | | | | | | |
| Recommended Hole Size: NPT/NPTF = .4375" NPSF / NPSI = .4375" | | | | | | | | |
| NPT/F 6" EXT TAPER | - | - | 4 | 14097 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT INT THD TAPER | - | - | 5 | 14098 | ◆ | - | - | See Page 165 (#11) |
| NPT/F 8" EXT TAPER | - | - | 4 | 14099 | ◆ | - | - | See Page 165 (#10) |
| NPSF EXT x 6" | - | - | 4 | 14100 | ◆ | - | - | See Page 165 (#10) |
| 1/4"-19 55° WHITWORTH PIPE | | | | | | | | |
| Recommended Hole Size: BSPT = .4375" / BSPP = .4531" | | | | | | | | |
| BSPT TAPER - MODIFIED | - | - | 4 | 14101 | ◆ | 14102 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - MODIFIED | - | - | 4 | 14103 | ◆ | 14104 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - FULL FORM | - | - | 4 | 14105 | ◆ | - | - | See Page 165 (#8) |
| 1/4"-20 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2015" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 2 | 14106 | ◆ | - | - | See Page 164 (#2) |
| +.003 HAND TAP | 7 | - | 4 | 14107 | ◆ | 14108 | ◆ | See Page 164 (#1) |
| +.003 SPIRAL POINT | 7 | - | 2 | 14109 | ◆ | - | - | See Page 164 (#2) |
| +.005 HAND TAP | 11 | PLATING | 4 | 14110 | ◆ | 14111 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14112 | ◆ | - | - | See Page 164 (#2) |
| 4" EXT SP PT SM SHK | 3 | 3B | 2 | 14113 | ◆ | - | - | See Page 165 (#7) |
| 4" EXT SPIRAL POINT | 3 | 3B | 2 | 14114 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14115 | ◆ | 14116 | ◆ | See Page 164 (#4) |
| 6" EXT SM SHK HAND | 3 | 3B | 4 | 14117 | ◆ | 14118 | ◆ | See Page 165 (#7) |
| 6" EXT SPIRAL POINT | 3 | 3B | 2 | 14119 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT SP PT SM SHK | 3 | 3B | 2 | 14120 | ◆ | - | - | See Page 165 (#7) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| 1/4"-24 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .209" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14121 | ◆ | 14122 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 2 | 14123 | ◆ | - | - | See Page 164 (#2) |
| 1/4"-28 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2153" THREAD FORMING TAP at 65% Thread = .2342" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 2 | 14124 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14125 | ◆ | 14126 | ◆ | See Page 164 (#1) |
| +.003 HAND TAP | 7 | - | 4 | 14127 | ◆ | 14128 | ◆ | See Page 164 (#1) |
| +.003 SPIRAL POINT | 7 | - | 2 | 14129 | ◆ | - | - | See Page 164 (#2) |
| +.005 HAND TAP | 11 | PLATING | 4 | 14130 | ◆ | 14131 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14132 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14133 | ◆ | 14134 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 3B | 2 | 14135 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT SP PT SM SHK | 3 | 3B | 2 | 14136 | ◆ | - | - | See Page 165 (#7) |
| THREAD FORMING TAP | 6 | 2B | 0 | 14137 | ◆ | 14138 | ◆ | See Page 164 (#5) |
| 1/4"-32 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2197" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14139 | ◆ | 14140 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 2 | 14141 | ◆ | - | - | See Page 164 (#2) |
| 1/4"-36 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2230" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14142 | ◆ | 14143 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 2 | 3B | 2 | 14144 | ◆ | - | - | See Page 164 (#2) |
| 1/4"-40 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2258" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14145 | ◆ | 14146 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 2 | 3B | 3 | 14147 | ◆ | - | - | See Page 164 (#2) |
| 1/4"-48 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .230" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14148 | ◆ | 14149 | ◆ | See Page 164 (#1) |
| 1/4"-80 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2379" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14150 | ◆ | 14151 | ◆ | See Page 164 (#1) |
| 5/16"-18 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2589" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 2 | 14152 | ◆ | - | - | See Page 164 (#2) |
| +.005 SPIRAL POINT | 11 | PLATING | 2 | 14153 | ◆ | - | - | See Page 164 (#2) |
| 4" EXT SPIRAL POINT | 3 | 3B | 2 | 14154 | ◆ | - | - | See Page 164 (#4) |
| 4" EXT SP PT SM SHK | 3 | 3B | 2 | 14155 | ◆ | - | - | See Page 165 (#7) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14156 | ◆ | 14157 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 3B | 2 | 14158 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT SP PT SM SHK | 3 | 3B | 2 | 14159 | ◆ | - | - | See Page 165 (#7) |

◆ : Usually Ships in 24-48 Hours
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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| 5/16"-20 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .264" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14160 | ◆ | 14161 | ◆ | See Page 164 (#1) |
| 5/16"-24 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2715" for STI = .3281" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 2 | 14162 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14163 | ◆ | 14164 | ◆ | See Page 164 (#1) |
| 6" EXT SP PT SM SHK | 3 | 3B | 2 | 14165 | ◆ | - | - | See Page 165 (#7) |
| STI SPIRAL POINT | 2 | 3B | 3 | 14166 | ◆ | - | - | See Page 164 (#3) |
| 5/16"-32 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .2822" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14167 | ◆ | 14168 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 2 | 14169 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14170 | ◆ | 14171 | ◆ | See Page 164 (#1) |
| 3/8"-16 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3144" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 3 | 14172 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT | 3 | 3B | 2 | 14173 | ◆ | - | - | See Page 164 (#2) |
| +.005 SPIRAL POINT | 11 | PLATING | 3 | 14174 | ◆ | - | - | See Page 164 (#2) |
| 4" EXT SP PT SM SHK | 3 | 3B | 3 | 14175 | ◆ | - | - | See Page 165 (#7) |
| 4" EXT SPIRAL POINT | 3 | 3B | 3 | 14176 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14177 | ◆ | 14178 | ◆ | See Page 164 (#4) |
| 6" EXT SM SHANK | 3 | 3B | 4 | 14179 | ◆ | 14180 | ◆ | See Page 165 (#7) |
| 6" EXT SPIRAL POINT | 3 | 3B | 3 | 14181 | ◆ | - | - | See Page 164 (#4) |
| 6" EXT SP PT SM SHK | 3 | 3B | 3 | 14182 | ◆ | - | - | See Page 165 (#7) |
| 6" EXT SPIRAL POINT | 5 | 2B | 3 | 14183 | ◆ | - | - | See Page 164 (#4) |
| 3/8"-18 PIPE TAP | | | | | | | | |
| Recommended Hole Size: NPT = .5625" / NPTF = .5781" NPSF/NPSI = .5781" | | | | | | | | |
| NPT/F 6" EXT TAPER | - | - | 4 | 14184 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT INT THD TAPER | - | - | 5 | 14185 | ◆ | - | - | See Page 165 (#11) |
| NPSF 6" EXTENSION | - | - | 4 | 14186 | ◆ | - | - | See Page 165 (#10) |
| 3/8"-19 55° WHITWORTH PIPE | | | | | | | | |
| Recommended Hole Size: BSPT = .5781" / BSPP = .5938" | | | | | | | | |
| BSPT TAPER - MODIFIED | - | - | 4 | 14187 | ◆ | 14188 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - MODIFIED | - | - | 4 | 14189 | ◆ | 14190 | ◆ | See Page 165 (#8) |
| BSPT TAPER - FULL FORM | - | - | 4 | 14191 | ◆ | - | - | See Page 165 (#8) |
| 3/8"-20 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3265" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14192 | ◆ | 14193 | ◆ | See Page 164 (#1) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
| 3/8"-24 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3340" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 3 | 14194 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14195 | ◆ | 14196 | ◆ | See Page 164 (#1) |
| +.003 SPIRAL POINT | 7 | - | 3 | 14197 | ◆ | - | - | See Page 164 (#2) |
| +.005 HAND TAP | 11 | PLATING | 4 | 14198 | ◆ | 14199 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 3 | 14200 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14201 | ◆ | 14202 | ◆ | See Page 164 (#4) |
| 3/8"-27 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .339" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14203 | ◆ | 14204 | ◆ | See Page 164 (#1) |
| 3/8"-32 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3447" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14205 | ◆ | 14206 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 3 | 14207 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | - | 4 | 14208 | ◆ | 14209 | ◆ | See Page 164 (#1) |
| 3/8"-40 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3508" | | | | | | | | |
| HAND TAP | 2 | 3B | 4 | 14210 | ◆ | 14211 | ◆ | See Page 164 (#1) |
| 7/16"-24 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .3965" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14212 | ◆ | 14213 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 2B | 4 | 14214 | ◆ | 14215 | ◆ | See Page 164 (#1) |
| 7/16"-32 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .4072" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14216 | ◆ | 14217 | ◆ | See Page 164 (#1) |
| 15/32"-32 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .4384" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14218 | ◆ | 14219 | ◆ | See Page 164 (#1) |
| 1/2"-10 ACME | | | | | | | | |
| Recommended Hole Size = .4000" | | | | | | | | |
| L.H. HAND TAP | - | 2G | 4 | 14220 | ◆ | - | - | See Page 165 (#12) |
| 1/2"-13 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .4251" | | | | | | | | |
| L.H. SPIRAL POINT | 3 | 3B | 3 | 14221 | ◆ | - | - | See Page 164 (#2) |
| +.005 HAND TAP | 11 | PLATING | 4 | 14222 | ◆ | 14223 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 3 | 14224 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14225 | ◆ | 14226 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 3B | 3 | 14227 | ◆ | - | - | See Page 164 (#4) |

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

DRILLS
END MILLS
ROUTERS
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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|

1/2"-14 PIPE TAP NPSI NPSF NPT/F NPS

Recommended Hole Size based on 75% Thread = .703"
NPSF/NPSI = .7188"

| | | | | | | | | |
|----------------------------|---|---|---|-------|---|---|---|--------------------|
| NPT/F LEFT HAND TAPER | - | - | 4 | 14228 | ◆ | - | - | See Page 165 (#8) |
| NPT/F 6" EXT TAPER | - | - | 4 | 14229 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT INT THD TAPER | - | - | 5 | 14230 | ◆ | - | - | See Page 165 (#11) |
| NPSF EXT x 6" | - | - | 4 | 14231 | ◆ | - | - | See Page 165 (#10) |

1/2"-14 55° WHITWORTH PIPE

Recommended Hole Size: BSPT = .7188" / BSPP = .7344"

| | | | | | | | | |
|---------------------------|---|---|---|-------|---|-------|---|-------------------|
| BSPT TAPER - MODIFIED | - | - | 4 | 14232 | ◆ | 14233 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - MODIFIED | - | - | 4 | 14234 | ◆ | 14235 | ◆ | See Page 165 (#8) |
| BSPP PARALLEL - FULL FORM | - | - | 4 | 14236 | ◆ | - | - | See Page 165 (#8) |

1/2"-20 NF

Recommended Hole Size based on 75% Thread = .4515"

| | | | | | | | | |
|--------------------|----|---------|---|-------|---|-------|---|-------------------|
| L.H. HAND TAP | 3 | 3B | 4 | 14237 | ◆ | 14238 | ◆ | See Page 164 (#1) |
| L.H. SPIRAL POINT | 3 | 3B | 3 | 14239 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | 2B | 4 | - | - | 14240 | ◆ | See Page 164 (#1) |
| +.003 HAND TAP | 7 | - | 4 | 14241 | ◆ | 14242 | ◆ | See Page 164 (#1) |
| +.005 HAND TAP | 11 | PLATING | 4 | 14243 | ◆ | 14244 | ◆ | See Page 164 (#1) |
| +.005 SPIRAL POINT | 11 | PLATING | 3 | 14245 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14246 | ◆ | 14247 | ◆ | See Page 164 (#4) |

1/2"-24 NS

Recommended Hole Size based on 75% Thread = .459"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 4 | 14248 | ◆ | 14249 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

1/2"-28 NEF

Recommended Hole Size based on 75% Thread = .4653"

| | | | | | | | | |
|--------------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 4 | 14250 | ◆ | 14251 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 3B | 3 | 14252 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 5 | 2B | 4 | 14253 | ◆ | 14254 | ◆ | See Page 164 (#1) |

1/2"-32 NS

Recommended Hole Size based on 75% Thread = .4697"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 6 | 14255 | ◆ | 14256 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

9/16"-12 NC

Recommended Hole Size based on 75% Thread = .4817"

| | | | | | | | | |
|--------------|---|----|---|-------|---|---|---|-------------------|
| SPIRAL POINT | 3 | 3B | 3 | 14257 | ◆ | - | - | See Page 164 (#2) |
|--------------|---|----|---|-------|---|---|---|-------------------|

9/16"-18 NF

Recommended Hole Size based on 75% Thread = .5089"

| | | | | | | | | |
|--------------|---|----|---|-------|---|---|---|-------------------|
| SPIRAL POINT | 3 | 3B | 3 | 14258 | ◆ | - | - | See Page 164 (#2) |
|--------------|---|----|---|-------|---|---|---|-------------------|

9/16"-20 NS

Recommended Hole Size based on 75% Thread = .514"

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 3B | 4 | 14259 | ◆ | 14260 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

DRILLS

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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
| 9/16"-24 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5215" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14261 | ◆ | 14262 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 2B | 4 | 14263 | ◆ | 14264 | ◆ | See Page 164 (#1) |
| 9/16"-32 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5322" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14265 | ◆ | 14266 | ◆ | See Page 164 (#1) |
| 5/8"-11 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5365" | | | | | | | | |
| + .005 SPIRAL POINT | 11 | PLATING | 3 | 14267 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14268 | ◆ | 14269 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 3 | 3B | 3 | 14270 | ◆ | - | - | See Page 164 (#4) |
| 8" EXT HAND TAP | 3 | 3B | 4 | 14271 | ◆ | 14272 | ◆ | See Page 164 (#4) |
| 5/8"-18 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5714" | | | | | | | | |
| + .005 HAND TAP | 11 | PLATING | 4 | 14273 | ◆ | 14274 | ◆ | See Page 164 (#4) |
| 5/8"-20 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5765" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14275 | ◆ | 14276 | ◆ | See Page 164 (#1) |
| 5/8"-24 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5840" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14277 | ◆ | 14278 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 2B | 6 | 14279 | ◆ | 14280 | ◆ | See Page 164 (#1) |
| 5/8"-32 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .5947" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14281 | ◆ | 14282 | ◆ | See Page 164 (#1) |
| 11/16"-18 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .6339" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14283 | ◆ | 14284 | ◆ | See Page 164 (#1) |
| 3/4"-10 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .6526" | | | | | | | | |
| L.H. HAND TAP | 3 | 3B | 4 | 14285 | ◆ | 14286 | ◆ | See Page 164 (#1) |
| + .005 HAND TAP | 11 | PLATING | 4 | 14287 | ◆ | 14288 | ◆ | See Page 164 (#1) |
| + .005 SPIRAL POINT | 11 | PLATING | 3 | 14289 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 3 | 3B | 4 | 14290 | ◆ | 14291 | ◆ | See Page 164 (#4) |
| 6" EXT SP PT | 3 | 3B | 3 | 14292 | ◆ | - | - | See Page 164 (#4) |
| 8" EXT HAND TAP | 3 | 3B | 4 | 14293 | ◆ | 14294 | ◆ | See Page 164 (#4) |
| 3/4"-14 PIPE TAP NPSI NPSF NPT/F NPS | | | | | | | | |
| Recommended Hole Size: NPT = .9063" / NPTF = .9219" | | | | | | | | |
| NPT/F LEFT HAND TAPER | - | - | 5 | 14295 | ◆ | - | - | See Page 165 (#8) |
| NPT/F 6" EXT TAPER | - | - | 5 | 14296 | ◆ | - | - | See Page 165 (#10) |
| NPT/F 6" EXT INT THD TAPER | - | - | 5 | 14297 | ◆ | - | - | See Page 165 (#11) |

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
| 3/4"-14 55° WHITWORTH PIPE | | | | | | | | |
| Recommended Hole Size: BSPT = .938" / BSPP = .965" | | | | | | | | |
| BSPP PARALLEL - MODIFIED | - | - | 5 | 14298 | ◆ | 14299 | ◆ | See Page 165 (#8) |
| 3/4"-16 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .6894" THREAD FORMING TAP at 65% Thread = .7224" | | | | | | | | |
| + .003 HAND TAP | 7 | - | 4 | 14300 | ◆ | 14301 | ◆ | See Page 164 (#1) |
| THREAD FORMING TAP | 7 | 3B | 0 | 14302 | ◆ | 14303 | ◆ | See Page 164 (#5) |
| 3/4"-20 NEF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .7015" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14304 | ◆ | 14305 | ◆ | See Page 164 (#1) |
| 3/4"-24 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .709" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14306 | ◆ | 14307 | ◆ | See Page 164 (#1) |
| .800"-36 A.M.O. MOD. WHITWORTH | | | | | | | | |
| Recommended Hole Size Thread = .7644" | | | | | | | | |
| HAND TAP | 2 | - | 6 | 14308 | ◆ | 14309 | ◆ | See Page 164 (#1) |
| 7/8"-9 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .7667" | | | | | | | | |
| SPIRAL POINT | 4 | 3B | 3 | 14310 | ◆ | - | - | See Page 164 (#2) |
| + .005 HAND TAP | 11 | PLATING | 4 | 14311 | ◆ | 14312 | ◆ | See Page 164 (#1) |
| 8" EXT HAND TAP | 4 | 3B | 4 | 14313 | ◆ | 14314 | ◆ | See Page 164 (#4) |
| 7/8"-14 NF | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .8056" | | | | | | | | |
| HAND TAP | 6 | 2B | 4 | 14315 | ◆ | 14316 | ◆ | See Page 164 (#1) |
| 7/8"-18 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .8214" | | | | | | | | |
| HAND TAP | 3 | 3B | 4 | 14317 | ◆ | 14318 | ◆ | See Page 164 (#1) |
| 15/16"-16 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .8769" | | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14319 | ◆ | 14320 | ◆ | See Page 164 (#1) |
| 1"-8 NC | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .8781" | | | | | | | | |
| L.H. HAND TAP | 4 | 3B | 4 | 14321 | ◆ | 14322 | ◆ | See Page 164 (#1) |
| + .005 HAND TAP | 11 | PLATING | 4 | 14323 | ◆ | 14324 | ◆ | See Page 164 (#1) |
| + .010 HAND TAP | 21 | - | 4 | 14325 | ◆ | 14326 | ◆ | See Page 164 (#1) |
| 8" EXT HAND TAP | 4 | 3B | 4 | 14327 | ◆ | 14328 | ◆ | See Page 164 (#4) |
| 10" EXT HAND TAP | 4 | 3B | 4 | 14329 | ◆ | 14330 | ◆ | See Page 164 (#4) |
| 1"-14 NS | | | | | | | | |
| Recommended Hole Size based on 75% Thread = .9306" | | | | | | | | |
| SPIRAL POINT | 4 | 3B | 3 | 14331 | ◆ | - | - | See Page 164 (#2) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|----------------------|--|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| 1"-16 NS | Recommended Hole Size based on 75% Thread = .9394" | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14332 | ◆ | 14333 | ◆ | See Page 164 (#1) |
| 1"-18 NS | Recommended Hole Size based on 75% Thread = .9464" | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14334 | ◆ | 14335 | ◆ | See Page 164 (#1) |
| 1"-20 NEF | Recommended Hole Size based on 75% Thread = .9515" | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14336 | ◆ | 14337 | ◆ | See Page 164 (#1) |
| 1"-32 NS | Recommended Hole Size based on 75% Thread = .9817" | | | | | | | |
| HAND TAP | 3 | 3B | 6 | 14338 | ◆ | 14339 | ◆ | See Page 164 (#1) |
| 1 1/16"-12 NS | Recommended Hole Size based on 75% Thread = .9817" | | | | | | | |
| HAND TAP | 4 | - | 4 | 14340 | ◆ | 14341 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 3B | 4 | 14342 | ◆ | 14343 | ◆ | See Page 164 (#1) |
| HAND TAP | 7 | 2B | 4 | 14344 | ◆ | 14345 | ◆ | See Page 164 (#1) |
| 1 3/16"-12 NS | Recommended Hole Size based on 75% Thread = 1.106" | | | | | | | |
| HAND TAP | 5 | 3B | 6 | 14346 | ◆ | 14347 | ◆ | See Page 164 (#1) |
| 1 1/4"-7 NC | Recommended Hole Size based on 75% Thread = 1.110" | | | | | | | |
| SPIRAL POINT | 4 | 3B | 3 | 14348 | ◆ | - | - | See Page 164 (#2) |
| 10" EXTENSION | 4 | 3B | 4 | 14349 | ◆ | 14350 | ◆ | See Page 164 (#4) |
| 12" EXTENSION | 4 | 3B | 4 | 14351 | ◆ | 14352 | ◆ | See Page 164 (#4) |
| 1 1/4"-20 NS | Recommended Hole Size based on 75% Thread = 1.201" | | | | | | | |
| HAND TAP | 4 | 3B | 6 | 14353 | ◆ | 14354 | ◆ | See Page 164 (#1) |
| 1 5/16"-12 NS | Recommended Hole Size based on 75% Thread = 1.232" | | | | | | | |
| HAND TAP | 5 | 3B | 6 | 14355 | ◆ | 14356 | ◆ | See Page 164 (#1) |
| 1 1/2"-6 NC | Recommended Hole Size based on 75% Thread = 1.337" | | | | | | | |
| 10" EXTENSION | 4 | 3B | 4 | 14357 | ◆ | 14358 | ◆ | See Page 164 (#4) |
| 1 5/8"-12 NS | Recommended Hole Size based on 75% Thread = 1.544" | | | | | | | |
| HAND TAP | 4 | 3B | 6 | 14359 | ◆ | 14360 | ◆ | See Page 164 (#1) |

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◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

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 THREAD MILLS & TAPS
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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| M1.6 x 0.35 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 1.25mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 2 | 14361 | ◆ | - | - | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 0 | 14362 | ◆ | - | - | See Page 164 (#2) |
| M1.8 x 0.35 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 1.45mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 2 | 14363 | ◆ | 14364 | ◆ | See Page 164 (#1) |
| M2 x 0.4 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 1.6mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 3 | 14365 | ◆ | 14366 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 2 | 14367 | ◆ | - | - | See Page 164 (#2) |
| M2.2 x 0.45 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 1.75mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 3 | 14368 | ◆ | 14369 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 2 | 14370 | ◆ | - | - | See Page 164 (#2) |
| M2.5 x 0.45 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 2.05mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 3 | 14371 | ◆ | 14372 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 2 | 14373 | ◆ | - | - | See Page 164 (#2) |
| M3 x 0.5 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 2.5mm</i> | | | | | | | | |
| HAND TAP | 3 | 6H | 3 | 14374 | ◆ | 14375 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 2 | 14376 | ◆ | - | - | See Page 164 (#2) |
| +0.076mm SPIRAL POINT | 7 | - | 2 | 14377 | ◆ | - | - | See Page 164 (#2) |
| M4 x 0.75 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 3.25mm</i> | | | | | | | | |
| HAND TAP | 4 | 6H | 4 | 14378 | ◆ | 14379 | ◆ | See Page 164 (#1) |
| M4 x 0.7 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 3.3mm</i> | | | | | | | | |
| HAND TAP | 4 | 6H | 4 | 14380 | ◆ | 14381 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 4 | 6H | 2 | 14382 | ◆ | - | ◆ | See Page 164 (#2) |
| HAND TAP | 2 | 4H | 4 | 14383 | ◆ | 14384 | ◆ | See Page 164 (#1) |
| +0.076mm SPIRAL POINT | 7 | - | 2 | 14385 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 4 | 6H | 4 | 14386 | ◆ | 14387 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 4 | 6H | 2 | 14388 | ◆ | - | - | See Page 164 (#4) |
| +0.127mm HAND TAP | 11 | PLATING | 4 | 14389 | ◆ | 14390 | ◆ | See Page 164 (#1) |
| M5 x 0.8 | | | | | | | | |
| <i>Recommended Hole Size Based on 75% Thread = 4.2mm</i> | | | | | | | | |
| HAND TAP | 4 | 6H | 4 | 14391 | ◆ | 14392 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 4 | 6H | 2 | 14393 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 2 | 4H | 4 | 14394 | ◆ | 14395 | ◆ | See Page 164 (#1) |
| REGULAR SPIRAL FLUTE | 4 | 6H | 2 | 14396 | ◆ | 14397 | ◆ | See Page 164 (#6) |
| +0.076mm SPIRAL POINT | 7 | - | 2 | 14398 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT SPIRAL POINT | 4 | 6H | 2 | 14399 | ◆ | - | - | See Page 164 (#4) |
| +0.127mm SPIRAL POINT | 11 | PLATING | 2 | 14400 | ◆ | - | - | See Page 164 (#2) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
|--------------------|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|

M5 x 0.5

Recommended Hole Size Based on 75% Thread = 4.5mm

| | | | | | | | | |
|--------------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 6H | 4 | 14401 | ◆ | 14402 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 6H | 2 | 14403 | ◆ | - | - | See Page 164 (#2) |

M6 x 1.0

Recommended Hole Size Based on 75% Thread = 5mm
THREAD FORMING TAP at 65% Thread = 5.56mm

| | | | | | | | | |
|-----------------------|----|---------|---|-------|---|-------|---|-------------------|
| HAND TAP | 5 | 6H | 4 | 14404 | ◆ | 14405 | ◆ | See Page 164 (#1) |
| HAND TAP | 3 | 4H | 4 | 14406 | ◆ | 14407 | ◆ | See Page 164 (#1) |
| L.H. HAND TAP | 5 | 6H | 4 | 14408 | ◆ | 14409 | ◆ | See Page 164 (#1) |
| 6" EXT HAND TAP | 5 | 6H | 4 | 14410 | ◆ | 14411 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 5 | 6H | 2 | 14412 | ◆ | - | - | See Page 164 (#4) |
| + .127mm HAND TAP | 11 | PLATING | 4 | 14413 | ◆ | 14414 | ◆ | See Page 164 (#1) |
| + .127mm SPIRAL POINT | 11 | PLATING | 2 | 14415 | ◆ | - | - | See Page 164 (#2) |
| THREAD FORMING TAP | 8 | 6H | 0 | 14416 | ◆ | 14417 | ◆ | See Page 164 (#5) |

M6 x 0.75

Recommended Hole Size Based on 75% Thread = 5.25mm

| | | | | | | | | |
|--------------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 4H | 4 | 14418 | ◆ | 14419 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 4H | 2 | 14420 | ◆ | - | - | See Page 164 (#2) |

M6 x 0.5

Recommended Hole Size Based on 75% Thread = 5.5mm

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 3 | 6H | 4 | 14421 | ◆ | 14422 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

M8 x 1.25

Recommended Hole Size Based on 75% Thread = 6.75mm

| | | | | | | | | |
|-----------------------|----|---------|---|-------|---|-------|---|-------------------|
| HAND TAP | 5 | 6H | 4 | 14423 | ◆ | 14424 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 2 | 14425 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 3 | 4H | 4 | 14426 | ◆ | 14427 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 4H | 2 | 14428 | ◆ | - | - | See Page 164 (#2) |
| FAST SPIRAL FLUTE | 5 | 6H | 3 | 14429 | ◆ | 14430 | ◆ | See Page 164 (#6) |
| L.H. HAND TAP | 5 | 6H | 4 | 14431 | ◆ | 14432 | ◆ | See Page 164 (#1) |
| 6" EXT HAND TAP | 5 | 6H | 4 | 14433 | ◆ | 14434 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 5 | 6H | 2 | 14435 | ◆ | - | - | See Page 164 (#4) |
| + .127mm SPIRAL POINT | 11 | PLATING | 2 | 14436 | ◆ | - | - | See Page 164 (#2) |

M8 x 1.0

Recommended Hole Size Based on 75% Thread = 7mm
THREAD FORMING TAP at 65% Thread = 7.56mm

| | | | | | | | | |
|--------------------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 5 | 6H | 4 | 14437 | ◆ | 14438 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 2 | 14439 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 3 | 4H | 4 | 14440 | ◆ | 14441 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 3 | 4H | 2 | 14442 | ◆ | - | - | See Page 164 (#2) |
| THREAD FORMING TAP | 8 | 6H | 0 | 14443 | ◆ | 14444 | ◆ | See Page 164 (#5) |

M8 x 0.75

Recommended Hole Size Based on 75% Thread = 7.25mm

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 5 | 6H | 4 | 14445 | ◆ | 14446 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

M8 x 0.5

Recommended Hole Size Based on 75% Thread = 7.5mm

| | | | | | | | | |
|----------|---|----|---|-------|---|-------|---|-------------------|
| HAND TAP | 4 | 6H | 4 | 14447 | ◆ | 14448 | ◆ | See Page 164 (#1) |
|----------|---|----|---|-------|---|-------|---|-------------------|

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|----------------------|
| M9 x 1.25 Recommended Hole Size Based on 75% Thread = 7.75mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14449 | ◆ | 14450 | ◆ | See Page 164 (#1) |
| M9 x 1.0 Recommended Hole Size Based on 75% Thread = 8mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14451 | ◆ | 14452 | ◆ | See Page 164 (#1) |
| M10 x 1.5 Recommended Hole Size Based on 75% Thread = 8.5mm THREAD FORMING TAP at 65% Thread = 9.34mm | | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14453 | ◆ | 14454 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 6 | 6H | 3 | 14455 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 3 | 4H | 4 | 14456 | ◆ | 14457 | ◆ | See Page 164 (#1) |
| FAST SPIRAL FLUTE | 6 | 6H | 3 | 14458 | ◆ | 14459 | ◆ | See Page 164 (#6) |
| L.H. HAND TAP | 6 | 6H | 4 | 14460 | ◆ | 14461 | ◆ | See Page 164 (#1) |
| 6" EXT HAND .323 SHK | 6 | 6H | 4 | 14462 | ◆ | 14463 | ◆ | See Page 165 (#7) |
| 6" EXT SP PT .323 SHK | 6 | 6H | 3 | 14464 | ◆ | - | - | See Page 165 (#7) |
| 6" EXT HAND TAP | 6 | 6H | 4 | 14465 | ◆ | 14466 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 6 | 6H | 3 | 14467 | ◆ | - | - | See Page 164 (#4) |
| +.127mm SPIRAL POINT | 11 | PLATING | 3 | 14468 | ◆ | - | - | See Page 164 (#2) |
| THREAD FORMING TAP | 10 | 6H | 0 | 14469 | ◆ | 14470 | ◆ | See Page 164 (#5) |
| M10 x 1.25 Recommended Hole Size Based on 75% Thread = 8.75mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14471 | ◆ | 14472 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 3 | 14473 | ◆ | - | - | See Page 164 (#2) |
| +.127mm SPIRAL POINT | 11 | PLATING | 3 | 14474 | ◆ | - | - | See Page 164 (#2) |
| M10 x 1.0 Recommended Hole Size Based on 75% Thread = 9mm | | | | | | | | |
| SPARK PL HAND | 3 | - | 4 | 14475 | ◆ | 14476 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 6H | 4 | 14477 | ◆ | 14478 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 3 | 14479 | ◆ | - | - | See Page 164 (#2) |
| M11 x 1.5 Recommended Hole Size Based on 75% Thread = 9.5mm | | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14480 | ◆ | 14481 | ◆ | See Page 164 (#1) |
| M11 x 1.0 Recommended Hole Size Based on 75% Thread = 10mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14482 | ◆ | 14483 | ◆ | See Page 164 (#1) |
| M12 x 1.75 Recommended Hole Size Based on 75% Thread = 10.25mm | | | | | | | | |
| SPIRAL POINT | 6 | 6H | 3 | 14484 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 3 | 4H | 4 | 14485 | ◆ | 14486 | ◆ | See Page 164 (#1) |
| L.H. HAND TAP | 6 | 6H | 4 | 14487 | ◆ | 14488 | ◆ | See Page 164 (#1) |
| 6" EXT HAND TAP | 6 | 6H | 4 | 14489 | ◆ | 14490 | ◆ | See Page 164 (#4) |
| 6" EXT SP PT | 6 | 6H | 3 | 14491 | ◆ | - | - | See Page 164 (#4) |
| +.127mm SPIRAL POINT | 11 | PLATING | 3 | 14492 | ◆ | - | - | See Page 164 (#2) |

| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|---|-----|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| M12 x 1.5 Recommended Hole Size Based on 75% Thread = 10.50mm | | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14493 | ◆ | 14494 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 6 | 6H | 3 | 14495 | ◆ | - | - | See Page 164 (#2) |
| M12 x 1.25 Recommended Hole Size Based on 75% Thread = 10.75mm THREAD FORMING TAP at 65% Thread = 11.45mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14496 | ◆ | 14497 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 3 | 14498 | ◆ | - | - | See Page 164 (#2) |
| THREAD FORMING TAP | 10 | 6H | 0 | 14499 | ◆ | 14500 | ◆ | See Page 164 (#5) |
| M12 x 1.0 Recommended Hole Size Based on 75% Thread = 11mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14501 | ◆ | 14502 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 5 | 6H | 3 | 14503 | ◆ | - | - | See Page 164 (#2) |
| M14 x 2.0 THREAD FORMING TAP at 65% Thread = 13.13mm | | | | | | | | |
| THREAD FORMING TAP | 12 | 6H | 0 | 14504 | ◆ | 14505 | ◆ | See Page 164 (#5) |
| M14 x 1.5 Recommended Hole Size Based on 75% Thread = 12.5mm | | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14506 | ◆ | 14507 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 6 | 6H | 3 | 14508 | ◆ | - | - | See Page 164 (#2) |
| HAND TAP | 3 | 4H | 4 | 14509 | ◆ | 14510 | ◆ | See Page 164 (#1) |
| M14 x 1.25 Recommended Hole Size Based on 75% Thread = 12.75mm | | | | | | | | |
| SPARK PL HAND | 4 | - | 4 | 14511 | ◆ | 14512 | ◆ | See Page 164 (#1) |
| M14 x 1.0 Recommended Hole Size Based on 75% Thread = 13mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14513 | ◆ | 14514 | ◆ | See Page 164 (#1) |
| M16 x 2.0 Recommended Hole Size Based on 75% Thread = 14mm | | | | | | | | |
| SPIRAL POINT | 7 | 6H | 3 | 14515 | ◆ | - | - | See Page 164 (#2) |
| SPIRAL POINT | 4 | 4H | 3 | 14516 | ◆ | - | - | See Page 164 (#2) |
| L.H. HAND TAP | 7 | 6H | 4 | 14517 | ◆ | 14518 | ◆ | See Page 164 (#1) |
| 6" EXT HAND TAP | 7 | 6H | 4 | 14519 | ◆ | 14520 | ◆ | See Page 164 (#4) |
| 6" EXT SPIRAL POINT | 7 | 6H | 3 | 14521 | ◆ | - | - | See Page 164 (#4) |
| +.127mm HAND TAP | 11 | PLATING | 4 | 14522 | ◆ | 14523 | ◆ | See Page 164 (#1) |
| +.127mm SPIRAL POINT | 11 | PLATING | 3 | 14524 | ◆ | - | - | See Page 164 (#2) |
| M16 x 1.5 Recommended Hole Size Based on 75% Thread = 14.5mm | | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14525 | ◆ | 14526 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 6 | 6H | 3 | 14527 | ◆ | - | - | See Page 164 (#2) |
| M16 x 1.0 Recommended Hole Size Based on 75% Thread = 15mm | | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14528 | ◆ | 14529 | ◆ | See Page 164 (#1) |

◆ : Usually Ships in 24-48 Hours
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| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|---|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| M18 x 1.5 | <i>Recommended Hole Size Based on 75% Thread = 16.5mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14530 | ◆ | 14531 | ◆ | See Page 164 (#1) |
| L.H. HAND TAP | 6 | 6H | 4 | 14532 | ◆ | 14533 | ◆ | See Page 164 (#1) |
| M18 x 1.0 | <i>Recommended Hole Size Based on 75% Thread = 17mm</i> | | | | | | | |
| HAND TAP | 5 | 6H | 4 | 14534 | ◆ | 14535 | ◆ | See Page 164 (#1) |
| M20 x 2.5 | <i>Recommended Hole Size Based on 75% Thread = 17.5mm</i> | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14536 | ◆ | 14537 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 7 | 6H | 3 | 14538 | ◆ | - | - | See Page 164 (#2) |
| 6" EXT HAND TAP | 7 | 6H | 4 | 14539 | ◆ | 14540 | ◆ | See Page 164 (#4) |
| M20 x 1.5 | <i>Recommended Hole Size Based on 75% Thread = 18.5mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14541 | ◆ | 14542 | ◆ | See Page 164 (#1) |
| M20 x 1.0 | <i>Recommended Hole Size Based on 75% Thread = 19mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14543 | ◆ | 14544 | ◆ | See Page 164 (#1) |
| M22 x 2.5 | <i>Recommended Hole Size Based on 75% Thread = 19.5mm</i> | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14545 | ◆ | 14546 | ◆ | See Page 164 (#1) |
| M22 x 1.5 | <i>Recommended Hole Size Based on 75% Thread = 20.5mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14547 | ◆ | 14548 | ◆ | See Page 164 (#1) |
| M24 x 3.0 | <i>Recommended Hole Size Based on 75% Thread = 21mm</i> | | | | | | | |
| HAND TAP | 8 | 6H | 4 | 14549 | ◆ | 14550 | ◆ | See Page 164 (#1) |
| SPIRAL POINT | 8 | 6H | 3 | 14551 | ◆ | - | - | See Page 164 (#2) |
| M24 x 2.0 | <i>Recommended Hole Size Based on 75% Thread = 22mm</i> | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14552 | ◆ | 14553 | ◆ | See Page 164 (#1) |
| M24 x 1.5 | <i>Recommended Hole Size Based on 75% Thread = 22.5mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 4 | 14554 | ◆ | 14555 | ◆ | See Page 164 (#1) |
| M26 x 1.5 | <i>Recommended Hole Size Based on 75% Thread = 24.5mm</i> | | | | | | | |
| HAND TAP | 6 | 6H | 6 | 14556 | ◆ | 14557 | ◆ | See Page 164 (#1) |
| M27 x 3.0 | <i>Recommended Hole Size Based on 75% Thread = 24mm</i> | | | | | | | |
| HAND TAP | 8 | 6H | 4 | 14558 | ◆ | 14559 | ◆ | See Page 164 (#1) |

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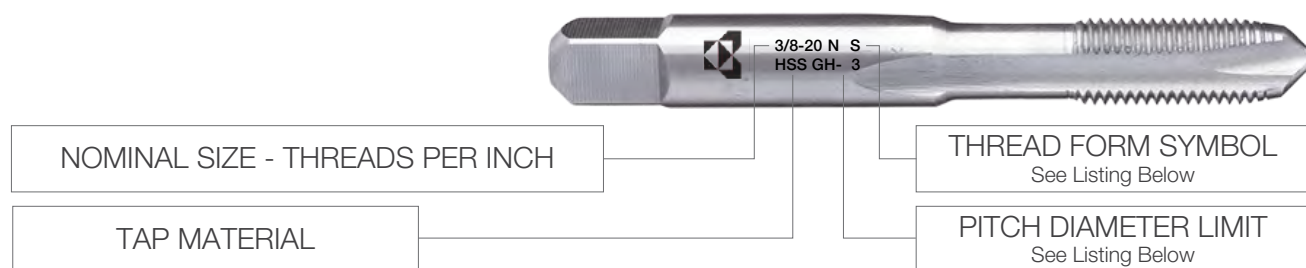
| SIZE / DESCRIPTION | GH# | Class of Fit | No. of Flutes | EDP Number Plug | Stock | EDP Number Bottom | Stock | Style Page 164 - 165 |
|--------------------|--|--------------|---------------|-----------------|-------|-------------------|-------|-------------------------|
| M27 x 2.0 | Recommended Hole Size Based on 75% Thread = 25mm | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14560 | ◆ | 14561 | ◆ | See Page 164 (#1) |
| M30 x 3.5 | Recommended Hole Size Based on 75% Thread = 26.5mm | | | | | | | |
| HAND TAP | 9 | 6H | 4 | 14562 | ◆ | 14563 | ◆ | See Page 164 (#1) |
| M30 x 2.0 | Recommended Hole Size Based on 75% Thread = 28mm | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14564 | ◆ | 14565 | ◆ | See Page 164 (#1) |
| HAND TAP | 5 | 4H | 4 | 14566 | ◆ | 14567 | ◆ | See Page 164 (#1) |
| M30 x 1.5 | Recommended Hole Size Based on 75% Thread = 28.5mm | | | | | | | |
| HAND TAP | 6 | 6H | 6 | 14568 | ◆ | 14569 | ◆ | See Page 164 (#1) |
| M33 x 2.0 | Recommended Hole Size Based on 75% Thread = 31mm | | | | | | | |
| HAND TAP | 7 | 6H | 4 | 14570 | ◆ | 14571 | ◆ | See Page 164 (#1) |
| M35 x 1.5 | Recommended Hole Size Based on 75% Thread = 33.5mm | | | | | | | |
| HAND TAP | 6 | 6H | 6 | 14572 | ◆ | 14573 | ◆ | See Page 164 (#1) |
| M36 x 2.0 | Recommended Hole Size Based on 75% Thread = 34mm | | | | | | | |
| HAND TAP | 7 | 6H | 6 | 14574 | ◆ | 14575 | ◆ | See Page 164 (#1) |
| M36 x 1.5 | Recommended Hole Size Based on 75% Thread = 34.5mm | | | | | | | |
| HAND TAP | 6 | 6H | 6 | 14576 | ◆ | 14577 | ◆ | See Page 164 (#1) |
| M40 x 1.5 | Recommended Hole Size Based on 75% Thread = 38.5mm | | | | | | | |
| HAND TAP | 6 | 6H | 6 | 14578 | ◆ | 14579 | ◆ | See Page 164 (#1) |
| M42 x 4.5 | Recommended Hole Size Based on 75% Thread = 37.5mm | | | | | | | |
| HAND TAP | 10 | 6H | 6 | 14580 | ◆ | 14581 | ◆ | See Page 164 (#1) |

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STANDARD SYSTEM OF TAP MARKING

Taps, dies and other types of threading tools are marked according to the Standard System of Marking Ground Thread Taps. Tools are marked with the nominal size, number of threads per inch (pitch), and the appropriate thread form symbol and pitch diameter symbol. Symbols typically used are listed.



PITCH DIAMETER LIMIT SYMBOLS

All standard ground thread taps are marked with the letter “G” to designate Ground Thread. The letter G will be followed by the letter “H” to designate above basic; or the letter “L” to designate below basic. The number following H or L signifies the number of .0005” steps above or below the basic pitch diameter. For instance, the tap pictured above is a 3/8” dia. tap with 20 threads per inch (pitch), and has a NS (American National Special Thread) thread form. The tap is made from High Speed Steel, and the GH-3 pitch diameter limit symbol indicates a Ground Thread tap with pitch diameter limits .0010 to .0015 over basic.

Pitch Diameter Limits for taps to 1” diameter inclusive:

- L1 = Basic to Basic minus .0005
- H1 = Basic to Basic plus .0005
- H2 = Basic plus .0005 to Basic plus .0010
- H3 = Basic plus .0010 to Basic plus .0015
- H4 = Basic plus .0015 to Basic plus .0020
- H5 = Basic plus .0020 to Basic plus .0025
- H6 = Basic plus .0025 to Basic plus .0030

Taps larger than 1” dia. are ground to a .0010” tolerance on the pitch diameter and are, for example, H4 (Basic plus .0010” to Basic plus .0020”).

THREAD FORM SYMBOLS

| | | | |
|--------|---|-----------|---|
| ACME-C | Acme Thread-Centralizing | NPTF | Dryseal American National Standard Taper Pipe Thread |
| ACME-G | Acme Thread-General Purpose | NPTR | American National Standard Taper Pipe Thread for Railing Joints (Tap marked NPT) |
| AMO | American Standard Microscope Objective Thread | NS | American National Thread-Special |
| ANPT | Aeronautical National Form Taper Pipe Thread (Ground thread tap marked NPT) | PG | Panzer Gewinde |
| BA | British Association Standard Thread | PTF | Dryseal SAE Short Taper Pipe Thread |
| BSF | British Standard Fine Thread Series | SGT | Special Gas Taper Thread |
| BSP | British Standard Pipe | SPL-PTF | Dryseal Special Taper Pipe Thread |
| BSPP | British Standard Pipe (Parallel) Thread | STI | Special Thread for Helical Coil Wire Screw Thread Inserts |
| BSPT | British Standard Taper Pipe Thread | Stub Acme | Stub Acme Thread |
| BSW | British Standard Whitworth Coarse Thread Series | *UN | Unified Constant Pitch Thread Series |
| M | Metric ScrewThread Series | *UNC | Unified Coarse Thread Series |
| N | American National 8, 12 and 16 Thread Series (8N, 12N, 16N) | *UNEF | Unified Extra Fine Thread Series |
| NBUTT | American Buttress Screw Thread | *UNF | Unified Fine Thread Series |
| NC | American National Coarse Thread Series | UNJ** | Unified Thread Series with a 0.15011P to 0.18042P Controlled Root Radius on External Thread only. |
| NEF | American National Extra Fine Thread Series | UNJC | Unified Coarse Thread Series with a 0.15011P to 0.18042P Controlled Root Radius on External Thread only. |
| NF | American National Fine Thread Series | UNJF | Unified Fine Thread Series with a 0.15011P to 0.18042P Controlled Root Radius on External Thread only. |
| NGO | National Gas Outlet Thread | UNM | Unified Miniature Thread Series |
| NGT | National Gas Taper Thread (see “SGT”) | UNR | Unified Constant Pitch Thread Series with a 0.108P to 0.144P Controlled Root Radius; Ext. thread only. |
| NH | American National Hose Coupling and Fire Hose Coupling Threads | UNRC | Unified Coarse Thread Series with a 0.108P to 0.144P Controlled Root Radius; Ext. thread only. |
| NPS | For tap marking only (See NPSC, NPSM) | UNRF | Unified Fine Thread Series with a 0.108P to 0.144P Controlled Root Radius; External thread only. |
| NPSC | American National Standard Straight Pipe Thread in Pipe Couplings (Tap marked NPS) | *UNS | Unified Thread-Special |
| NPSF | Dryseal American National Standard Fuel Internal Straight Pipe Thread | V | A 60° “V” thread with Truncated Crest and Root. The theoretical “V” Form is usually flattened to the user’s specifications. |
| NPSH | American National Standard Straight Pipe Thread for Hose Couplings | WHIT | British Standard Whitworth Special Thread |
| NPSI | Dryseal American National Standard Intermediate Internal Straight Pipe Thread | | |
| NPSL | American National Standard Straight Pipe Thread for Loose Fitting Mechanical Joints with Locknuts | | |
| NPSM | American National Standard Straight Pipe Threads for Free-Fitting Mechanical Joints for Fixtures (Tap marked NPS) | | |
| NPT | American National Standard Taper Pipe Thread (See ANPT, NPTR) | | |

*Taps are not marked with “U” but with the symbol for the corresponding American Standard thread form with which it is compatible.
 ** See page 183 for additional information on UNJ taps.

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INCH SCREW THREADS - UNJ PROFILE

Controlled Root Radius with Increased Minor Diameter

The UNJ thread standard (ASME B1.15) defines a system of threads for highly stressed applications requiring high fatigue strength. It was derived from a military specification (MIL-S-8879). MIL-S-8879 was primarily thought of and used for aerospace fastener and threaded component applications. Due to the increase in both its use and types of applications, the American Society of Mechanical Engineers developed and published ASME B1.15 in 1995.

Form. UNJ screw threads are of the same form as Unified Screw Threads to ASME/ANSI B1.1 except:

External threads: the root has a maximum and minimum prescribed continuous radius, and is not merely rounded due to tool wear.

Internal threads: the minor diameter is increased to accommodate the maximum root radius of the external thread. There is no radius requirement for either the crest or the root of the internal thread.

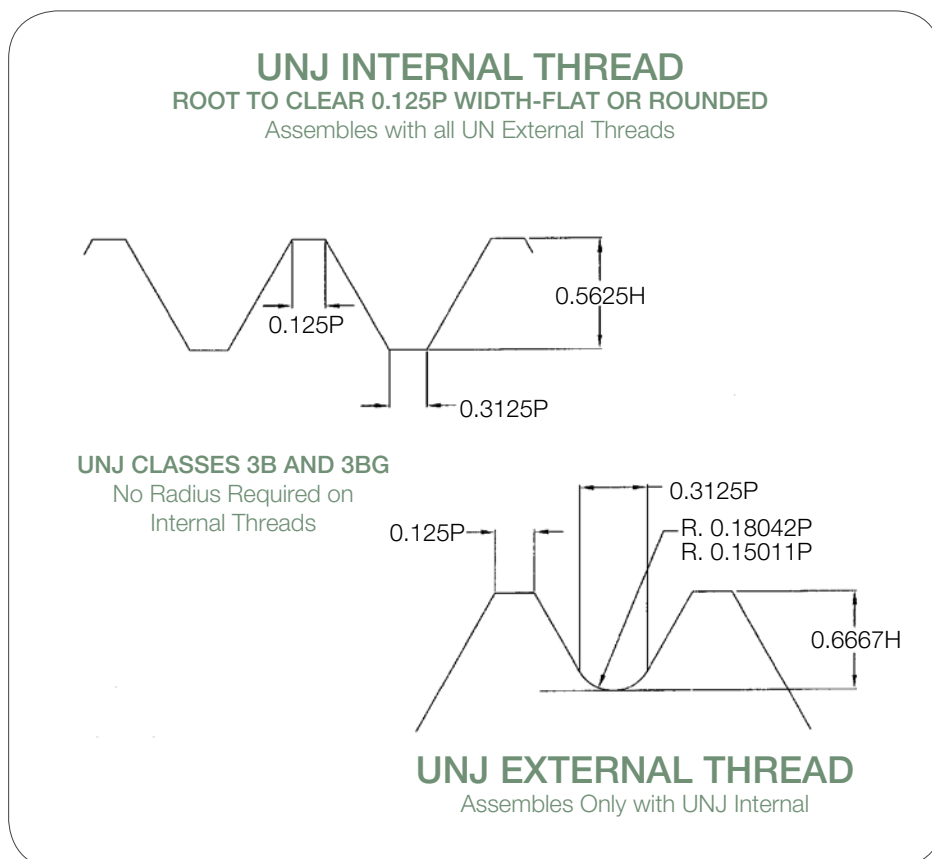
Designation. UNJ product threads are identified by the letter “J” in the thread symbol, and a thread class symbol including an “A” for external threads or a “B” for internal threads.

Use of Unified Tooling. Many of the UNJ thread form characteristics are the same as for UN threads. Therefore, some of the tooling used to produce one form can be used to produce the other.

External UNJ threads must be produced with a prescribed root radius; therefore, standard Unified Screw Thread (UN) tooling may not be used.

Internal UNJ threads are not required to have a root radius; therefore, ground thread taps designed to produce Unified Screw Threads of the proper class of fit may be used. The letter “J” need not be marked on the tap. The larger product minor diameter of the UNJ internal thread requires the use of a larger tap drill than is used when producing Unified Screw Threads.

- UNJ Thread Form: Unified Thread Series with a 0.15011P to 0.18042P controlled root radius on external thread only. (As defined by MIL-S-8879C)
- UNJ internal threads do not require radius; only external thread requires radius on root.
- UNJ external thread assembles only with UNJ internal thread.
- UNJ tap is standard 2B or 3B class of fit.

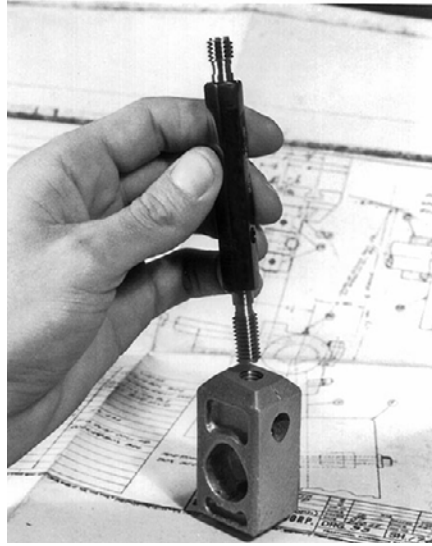


CLASS OF FIT / CLASSES OF THREADS / TAP SIZE

CLASSES OF THREADS AND TAP SIZE:

There is a direct relationship between the size of a tap and the size of the thread that it cuts. Size refers to pitch diameter and its relationship to the class of fit required. If two threaded parts are assembled, the looseness or tightness of the fit is determined by contact on the flanks of the threads only. This contact is controlled by the pitch diameters of each part.

CLASSES OF THREAD: When threaded parts are mated, the two parts must assemble with a degree of tightness dictated by the use of the fastener. In addition, the internal thread must be large enough to allow the external thread to enter it for the required length of engagement. A system of thread classes, each representing a comparative degree of tightness, has been established and universally adopted, to provide manufacturers and users of threaded products with a common language of specification. The thread classes designate minimum and maximum pitch diameters for internal and external threads. It is important to remember that classes of thread actually represents manufacturing tolerances. The closer the tolerance required, the higher the cost involved in producing the parts. Therefore, designers and engineers should always try to select the class of thread with the widest permissible tolerance.



TAP SIZE: Due to material variability and machining conditions, taps rarely cut their own size. The thread size produced is usually larger, but can be smaller due to shrinkage. Tap manufacturers realized that to tap a specified class of thread, several different ground thread tap limits would be required. These limits represent small, defined variations in tap size. A numbering system was developed to designate each series of limits, but these limit numbers are not to be confused with the classes of threads. Ground thread tap limits are designated by the letter H (high) above basic pitch diameter, or L (low) below basic pitch diameter, and these numbers establish

the tolerance range in relation to basic pitch diameter. As an example, in sizes 1" and smaller, an H1 tap has a tolerance range of from basic to .0005" over basic; an H2 tap from .0005" over basic to .001" over basic, (see **Chart 1A** on this page). In addition, metric threads are also designated in much the same way. The thread tap limits are designated by the letter D (ground, high) above basic pitch diameter, or U (ground, low) below basic pitch diameter. As an example, in sizes M25 and smaller, a D1 tap has a size of .0005" over basic to tap max. P.D.; a D2 tap has a size of .001" over basic to tap max. P.D., (see **Chart 1B**). The Tables on **pages 191-193** list recommended limit numbers for different classes of thread. Several different limit numbers are available for each diameter and pitch combination. Consequently, it is possible to select the "H" or "L" limit, or the "D" or "U" limit most suitable for the required tapping operation. Please contact our Customer Service Dept. for questions regarding tap limits and their relation to classes of fit.

CHART 1A

Pitch Diameter Limits for taps to 1" diameter inclusive:

- L1 = Basic to Basic minus 0.0005
- H1 = Basic to Basic plus 0.0005
- H2 = Basic plus 0.0005 to Basic plus 0.0010
- H3 = Basic plus 0.0010 to Basic plus 0.0015
- H4 = Basic plus 0.0015 to Basic plus 0.0020
- H5 = Basic plus 0.0020 to Basic plus 0.0025
- H6 = Basic plus 0.0025 to Basic plus 0.0030

Taps larger than 1" dia. are ground to a 0.0010" tolerance on the pitch diameter and are, for example, H4 (Basic plus 0.0010" to Basic plus 0.0020").

CHART 1B

Pitch Diameter Limits for taps to 1" diameter inclusive:

(Metric taps generally have more manufacturing tolerance than 0.0005 to the minus side.)

- U1 = Basic minus 0.0005 = min. tap P.D.
- D1 = Basic plus 0.0005 = max. tap P.D.
- D2 = Basic plus 0.0010 = max. tap P.D.
- D3 = Basic plus 0.0015 = max. tap P.D.
- D4 = Basic plus 0.0020 = max. tap P.D.
- D5 = Basic plus 0.0025 = max. tap P.D.
- D6 = Basic plus 0.0030 = max. tap P.D.

CLASS OF FIT / CLASSES OF THREADS / TAP SIZE (cont.)

On Charts 2A and 2B (below), examples of the relationship of Class of Fit to various tap limit sizes is shown for both Imperial and Metric sizes. In chart 2A, using a 1/4"-20NC or UNC thread size, it is obvious that an H5 limit (+.0025" over basic pitch diameter) can be used to cut the tightest class of thread in most

machining situations, as can the H1 limit (+.0005" over basic P.D.). However, tool wear would force the discarding of the H1 tap long before the H5 would be worn to an undersize condition. **The rule is obvious: always select the largest "H" limit possible to achieve proper class of fit, and maximum tool life.**

CHART 2A COMPARISON OF PITCH DIAMETER LIMITS TO CLASS OF FIT

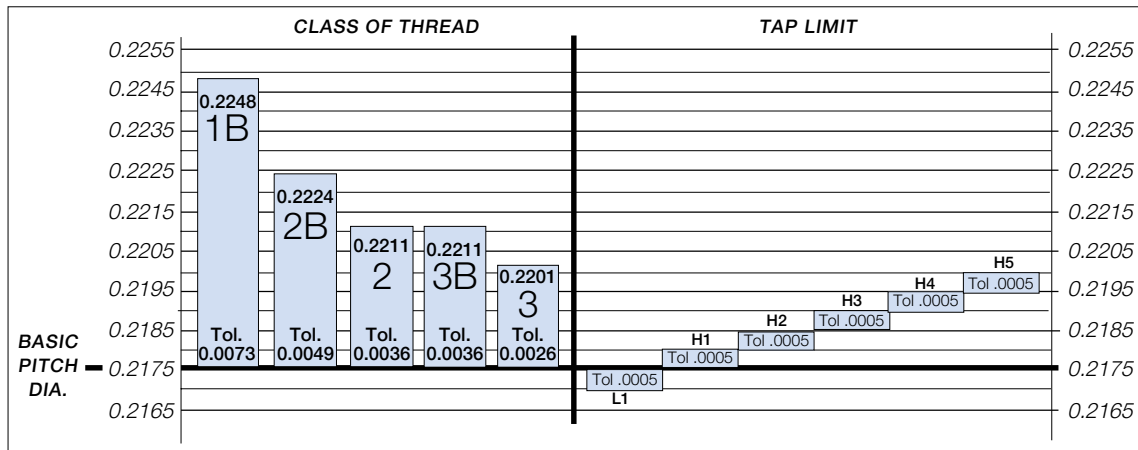
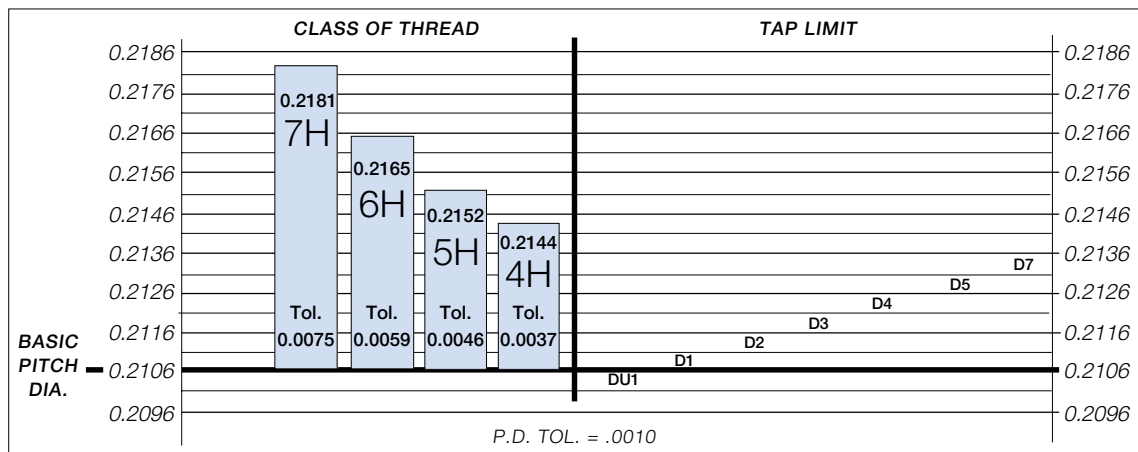


Chart 2B shows the same relationship with a metric thread. Using a M6 X 1.0, it is obvious that a D5 limit (+.0025" over basic pitch diameter) can be used to cut the standard class of thread in most machining situations, as can the D1 limit (+.0005" over basic P.D.).

However, tool wear would force the discarding of the D1 tap long before the D5 would be worn to an undersize condition. **The rule is obvious: always select the largest "D" limit possible to achieve proper class of fit, and maximum tool life.**

CHART 2B COMPARISON OF PITCH DIAMETER LIMITS TO CLASS OF FIT

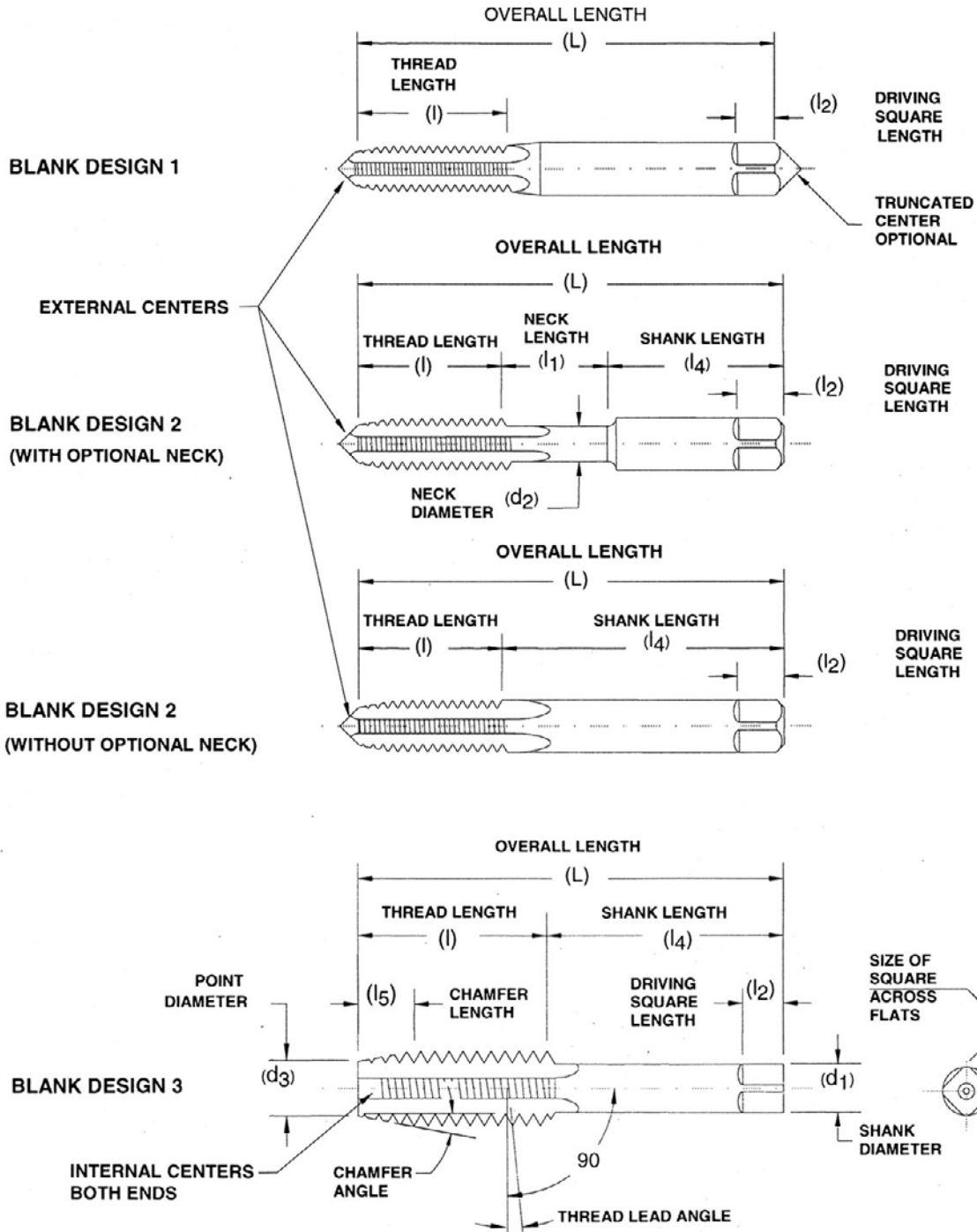
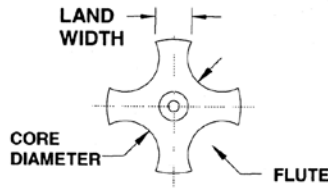


SCREW THREAD CLASSES OVERVIEW

Screw thread classes are distinguished from each other by the amount of tolerance and allowance. Class 1A and Class 1B: The combination of Class 1A for external threads and Class 1B for internal threads is intended to cover the manufacture of threaded parts where quick and easy assembly is necessary or desired, and an allowance is provided to permit ready assembly. Class 2A and Class 2B: The combination of Class 2A for external threads and Class 2B for internal threads designed for screws, bolts and nuts, is also suitable for a variety of other applications. A similar allowance is provided

which minimizes galling and seizure encountered in assembly and use. It also accommodates, to a limited extent, plating, finishes or coatings. Class 3A and 3B: The combination of Class 3A for external threads and Class 3B for internal threads is provided for those applications where closeness of fit and accuracy of lead and angle of thread are important. These threads are obtained consistently only by use of high quality production equipment supported by a very efficient system of gauging and inspection. No allowance is provided.

ILLUSTRATION OF TERMS APPLYING TO TAPS



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THREAD MILLS & TAPS

ENGRAVERS

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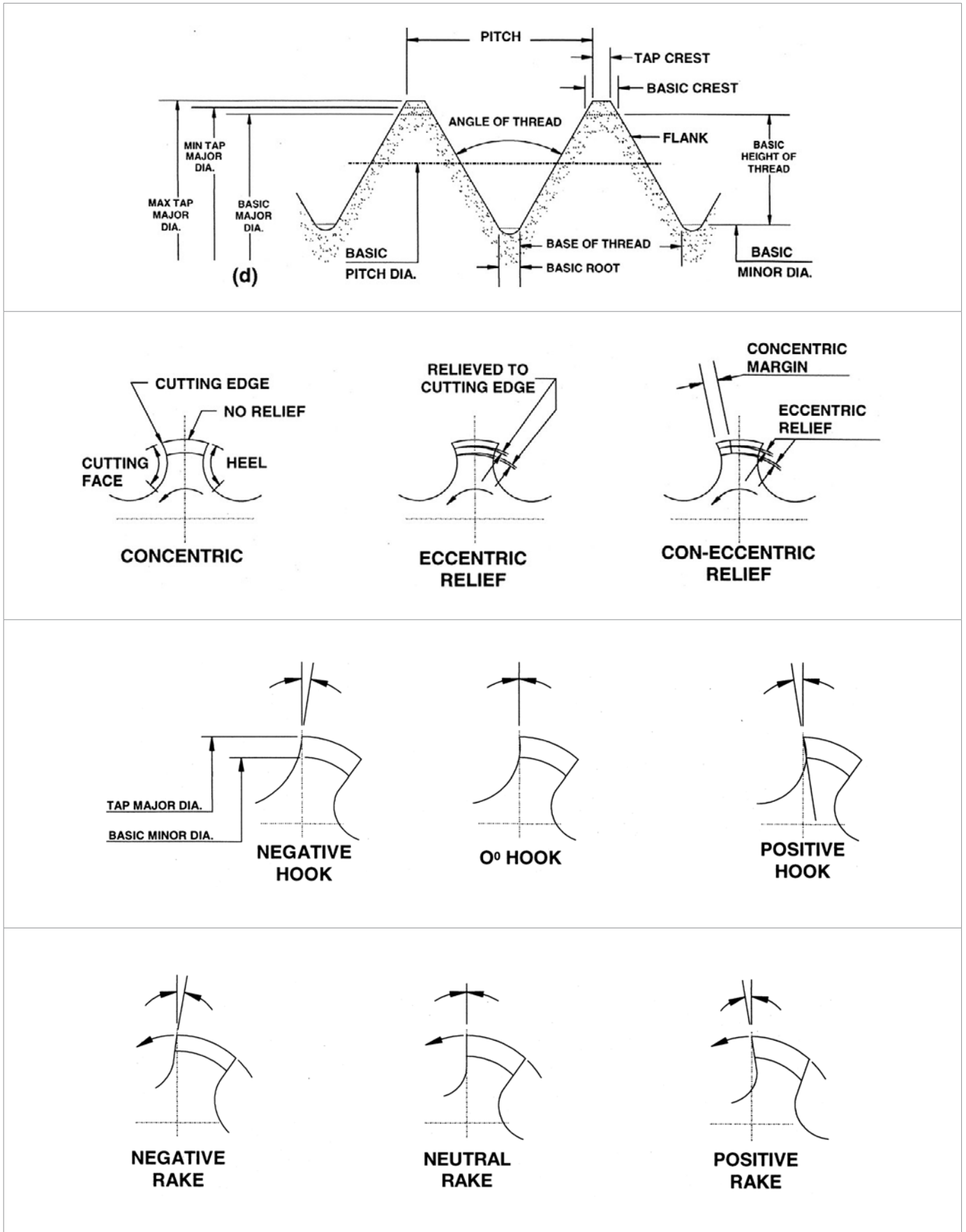
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ILLUSTRATION OF TERMS APPLYING TO TAPS (cont.)



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DEFINITION OF TERMS APPLYING TO TAPS

ALLOWANCE

Minimum clearance between two mating parts; the prescribed variations from the basic size.

ANGLE OF THREAD

The angle included between the sides of the thread measured in an axial plane.

AXIS

The imaginary straight line that forms the longitudinal center line of the tool or threaded part.

BACK TAPER

A gradual decrease in the diameter of the thread form on a tap from the chamfered end of the land towards the back which creates a slight radial relief in the threads.

BASE OF THREAD

The bottom section of the thread; the greatest section between the two adjacent roots.

BASIC SIZE

The theoretical or nominal standard size from which all variations are derived by application of allowances and tolerances.

CHAMFER

The tapering of the threads at the front end of each land of a tap by cutting away and relieving the crest of the first few teeth to distribute the cutting action over several teeth; Taper taps are chamfered 7-10 threads; plug taps are chamfered 3-5 threads; bottoming taps are chamfered 1-2 threads; taper pipe taps are chamfered 2-3.5 threads.

CHAMFER RELIEF

The gradual decrease in land height from cutting edge to heel on the chamfered portion, to provide clearance for the cutting action as the tap advances.

CREST

The top surface joining the two sides or flanks of the thread; the crest of an external thread is at its major diameter, while the crest of an internal thread is at its minor diameter.

CUTTING FACE

The leading side of the land in the direction of cutting rotation on which the chip forms.

FLUTE

The longitudinal channels formed in a tap to create cutting edges on the thread profile, and to provide chip spaces and cutting fluid passages.

HEEL

The edge of the land opposite the cutting edge.

HEIGHT OF THREAD

The distance, measured radially, between the crest and the base of a thread.

HELIX ANGLE

The angle made by the advance of the thread as it wraps around an imaginary cylinder.

HOOK

The undercut on the face of the teeth.

HOOK ANGLE

The inclination of a concave cutting face, usually specified either as Chordal Hook or Tangential Hook.

Chordal Hook Angle: The angle between the chord passing through the root and crest of a thread form at the cutting face, and a radial line through the crest at the cutting edge.

Tangential Hook Angle: The angle between a line tangent to a hook cutting face at the cutting edge and a radial line to the same point.

INTERRUPTED THREAD TAP

A tap having an odd number of lands with alternate teeth along the thread helix removed. In some cases alternate teeth are removed only for a portion of the thread length.

LAND

The part of the tap body which remains after the flutes are cut, and on which the threads are finally ground. The threaded section between the flutes of a tap.

LEAD

The axial distance a tap will advance along its axis in one complete turn. On a single start, the lead and the pitch are identical; on a double start, the lead is twice the pitch.

MAJOR DIAMETER

Commonly known as the "outside diameter." It is the largest diameter of the thread.

MINOR DIAMETER

Commonly known as the "root diameter." It is the smallest diameter of the thread.

PERCENT OF THREAD

One-half the difference between the basic major diameter and the actual minor diameter of an internal thread, divided by the basic thread height, expressed as a percentage.

PITCH

The distance from any point on a screw thread to a corresponding point on the next thread, measured parallel to the axis and on the same side of the axis. The pitch equals one divided by the number of threads per inch.

DEFINITION OF TERMS APPLYING TO TAPS (cont.)

PITCH DIAMETER

On a straight thread, the pitch diameter is the diameter of the imaginary co-axial cylinder...the surface of which would pass through the thread profiles at such points as to make the width of the groove equal to one-half of the basic pitch. On a perfect thread this occurs at the point where the widths of the thread and groove are equal. On a taper thread, the pitch diameter at a given position on the thread axis is the diameter of the pitch cone at that position.

RAKE

The angular relationship of the straight cutting face of a tooth with respect to a radial line through the crest of the tooth at the cutting edge. Positive rake means that the crest of the cutting face is angularly ahead of the balance of the cutting face of the tooth. Negative rake means that the crest of the cutting face is angularly behind the balance of the cutting face of the tooth. Zero rake means that the cutting face is directly on a radial line.

RELIEF (or Thread Relief)

The removal of metal from behind the cutting edge to provide clearance and reduce friction between the part being threaded and the threaded land.

ROOT

The bottom surface joining the sides of two adjacent threads, and is identical with or immediately adjacent to the cylinder or cone from which the thread projects.

SPIRAL FLUTE

A flute with uniform axial lead in a spiral path around the axis of a tap.

SPIRAL POINT

The angular fluting in the cutting face of the land at the chamfered end; formed at an angle with respect to the tap axis of opposite hand to that of rotation. Its length is usually greater than the chamfer length and its angle with respect to the tap axis is usually made great enough to direct the chips ahead of the taps cutting action.

STRAIGHT FLUTE

A flute that forms a cutting edge lying in an axial plane.

TOLERANCE

In producing a tap to given specifications, tolerance is: (a.) the total permissible variation of a size; (b.) the difference between the limits of size.

CHAMFERS FOR THREAD CUTTING TAPS

The tap chamfer is the tapering of the threads to distribute cutting action over several teeth. The type of hole to be tapped has much to do with the chamfer style of that tap that's best suited. Some holes go all the way through; some, while not through-holes, are relatively deep; some are quite shallow (a little deeper than diameter). Each of these three kinds of holes - through, deep-bottoming blind, and shallow bottoming - has a tap chamfer best suited to threading requirements.



TAPER TAPS

This style, with a **7-10 thread chamfer**, has the longest chamfer of the three to distribute action over the maximum number of teeth; and the taper also acts as a guide in starting the cutting action in the hole. Taper style taps start the thread square with the workpiece. Taper taps are commonly used in through holes and in materials where a tapered guide is necessary.

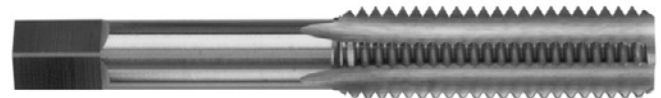


PLUG TAPS

This style, with a **3-5 thread chamfer**, is most widely used in through holes and where there is sufficient room at the bottom in blind holes.

SEMI (or Modified) BOTTOMING TAPS

This style, with a **2 to 2.5 thread chamfer**, should be used whenever possible in difficult material applications in blind holes, when threads are not required to the bottom of the hole.



BOTTOMING TAPS

This style, designed with a **1 to 2 thread chamfer**, is made with just enough chamfer for starting in the hole; as the name implies, it is designed to thread blind holes to the bottom.

NOTE: Taper, plug and bottoming taps as a set, in a given size (for example: 1/4-20 NC) are identical as to size, length and vital measurements; the difference is in the chamfered threaded portion at the point. As a rule, such taps when used by and are furnished in sets of three of a given size... namely, taper, plug and bottoming (and should be used in that order).

THREAD FORMING TAPS DATA

THREAD FORMING TAP ENTRY LENGTHS:

Entry taper length is measured on the full diameter of the thread forming lobes and is the axial distance from the entry diameter position to the theoretical intersection of tap major diameter and entry taper angle.

Whenever entry taper length is specified in terms of number of threads, this length is measured in number of pitches (p).

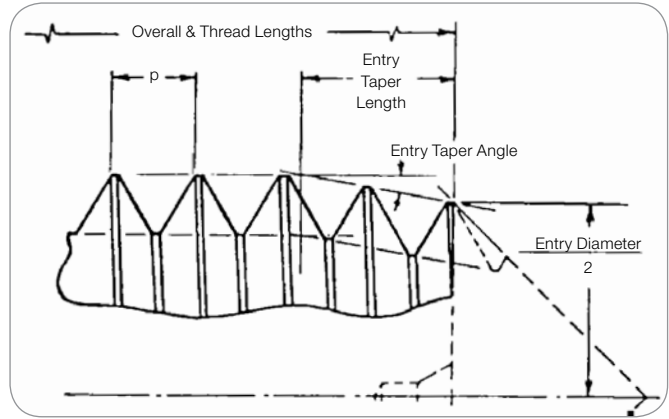
BOTTOMING LENGTH = 1-1/2 to 2-1/2 PITCHES

PLUG LENGTH = 3 to 5 PITCHES

The chamfer on BOTTOM taps is approximately 2 threads long and requires a drilled hole depth 3-4 pitches beyond the full thread required. When a controlled maximum chamfer shorter than 2 threads is required, an additional charge will apply. We will not guarantee the performance of taps with the shorter chamfer.

Entry diameter, measured at the thread crest nearest the front of the tap, is an appropriate amount smaller than the diameter of the hole drilled for tapping. See below for tap/drill size formulas, and formulas to determine maximum and minimum drill hole sizes for appropriate percent of thread.

TAPPING SPEEDS: Form taps operate most efficiently at spindle speeds 1-1/2 to 2 times faster than those recommended for conventional cutting taps, especially in softer materials and/or with fine pitch form taps. As higher



speeds are attained, adequate lubrication is essential for prolonged tap life and thread quality.

LUBRICATION: Since it is more important to 'lubricate' the cold-forming tap than to 'cool' the tap, form taps should be used with conventional lubricating cutting oils or EP (extreme pressure) rated oil...soluble oils and similar coolants are not recommended.

PRE-TAPPED HOLE SIZE: cold forming taps require a larger pre-tapped hole size than conventional cutting taps. To insure a properly tapped (cold formed) hole, adhere to the following:

FORMULA FOR TAP / DRILL SIZES FOR DECIMAL / INCH FORM TAPS:

$$\text{HOLE SIZE} = \text{Basic Tap O.D.} - \left(\frac{0.0068 \times \% \text{ of Thread}^*}{\text{Threads per Inch}} \right)$$

For example:

To determine drill size for a 1/4-20 thread forming tap at 65% of thread: $0.250 - \left(\frac{0.0068 \times 65}{20} \right) = 0.2279$

* Use whole number for % of thread...for 65%, use 65 (not 0.65).

FORMULA FOR TAP / DRILL SIZES FOR METRIC FORM TAPS:

$$\text{HOLE SIZE (mm)} = \text{Basic Tap O.D.(mm)} - \left(\frac{\% \text{ of Thread} \times \text{mm Pitch}}{147.06} \right)$$

* Use whole number for % of thread...for 65%, use 65 (not .65).

There is no true method of predicting percent of thread that will be obtained when tapping with forming taps due to the many variables involved. As a starting point, however, 55% for maximum drill size and 75% for minimum drill size can be used as a guide. Any desired percent of thread can be approximated by using drill sizes in between. To determine theoretical maximum and minimum drill sizes (for average operating conditions), see formulas below.

For UNIFIED INCH Threads:

Max. Drill Size = Basic Major Diameter - $\frac{3}{8N}$
Min. Drill Size = Basic Major Diameter - $\frac{1}{2N}$

N = T.P.I. (Threads per Inch)

For 60° Metric Threads:

Max. Drill Size = Basic Major Diameter - 0.375P
Min. Drill Size = Basic Major Diameter - 0.5P

P = Pitch

Note: For Basic Major Diameter and Pitch, use millimeter value to obtain drill size in mm. To convert mm to inch value, divide by 25.4:

$$\frac{\text{mm Value}}{25.4} = \text{Inch Value}$$

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TAP RECOMMENDATIONS FOR CLASSES OF THREAD

Unified and American National Screw Threads

| Nominal Size | T.P.I. NC UNC | T.P.I. NF UNF | Recommended Tap for Class of Thread | | | | Pitch Diameter Limits for Class of Thread | | | | |
|--------------|---------------|---------------|-------------------------------------|---------|----------|----------|---|--------------|--------------|---------------|---------------|
| | | | Class 2 | Class 3 | Class 2B | Class 3B | Min. All Classes (Basic) | Max. Class 2 | Max. Class 3 | Max. Class 2B | Max. Class 3B |
| 0 | - | 80 | GH1 | GH1 | GH2 | GH1 | 0.0519 | 0.0536 | 0.0532 | 0.0542 | 0.0536 |
| 1 | 64 | - | GH1 | GH1 | GH2 | GH1 | 0.0629 | 0.0648 | 0.0643 | 0.0655 | 0.0648 |
| 1 | - | 72 | GH1 | GH1 | GH2 | GH1 | 0.0640 | 0.0658 | 0.0653 | 0.0665 | 0.0659 |
| 2 | 56 | - | GH1 | GH1 | GH2 | GH1 | 0.0744 | 0.0764 | 0.0759 | 0.0772 | 0.0765 |
| 2 | - | 64 | GH1 | GH1 | GH2 | GH1 | 0.0759 | 0.0778 | 0.0773 | 0.0786 | 0.0779 |
| 3 | 48 | - | GH1 | GH1 | GH2 | GH1 | 0.0855 | 0.0877 | 0.0871 | 0.0885 | 0.0877 |
| 3 | - | 56 | GH1 | GH1 | GH2 | GH1 | 0.0874 | 0.0894 | 0.0889 | 0.0902 | 0.0895 |
| 4 | 40 | - | GH2 | GH1 | GH2 | GH2 | 0.0958 | 0.0982 | 0.0975 | 0.0991 | 0.0982 |
| 4 | - | 48 | GH1 | GH1 | GH2 | GH1 | 0.0985 | 0.1007 | 0.1001 | 0.1016 | 0.1008 |
| 5 | 40 | - | GH2 | GH1 | GH2 | GH2 | 0.1088 | 0.1112 | 0.1105 | 0.1121 | 0.1113 |
| 5 | - | 44 | GH1 | GH1 | GH2 | GH1 | 0.1102 | 0.1125 | 0.1118 | 0.1134 | 0.1126 |
| 6 | 32 | - | GH2 | GH1 | GH3 | GH2 | 0.1177 | 0.1204 | 0.1196 | 0.1214 | 0.1204 |
| 6 | - | 40 | GH2 | GH1 | GH2 | GH2 | 0.1218 | 0.1242 | 0.1235 | 0.1252 | 0.1243 |
| 8 | 32 | - | GH2 | GH1 | GH3 | GH2 | 0.1437 | 0.1464 | 0.1456 | 0.1475 | 0.1465 |
| 8 | - | 36 | GH2 | GH1 | GH2 | GH2 | 0.1460 | 0.1485 | 0.1478 | 0.1496 | 0.1487 |
| 10 | 24 | - | GH3 | GH1 | GH3 | GH3 | 0.1629 | 0.1662 | 0.1653 | 0.1672 | 0.1661 |
| 10 | - | 32 | GH2 | GH1 | GH3 | GH2 | 0.1697 | 0.1724 | 0.1716 | 0.1736 | 0.1726 |
| 12 | 24 | - | GH3 | GH1 | GH3 | GH3 | 0.1889 | 0.1922 | 0.1913 | 0.1933 | 0.1922 |
| 12 | - | 28 | GH3 | GH1 | GH3 | GH3 | 0.1928 | 0.1959 | 0.1950 | 0.1970 | 0.1959 |
| 1/4 | 20 | - | GH3 | GH2 | GH5 | GH3 | 0.2175 | 0.2211 | 0.2201 | 0.2223 | 0.2211 |
| 1/4 | - | 28 | GH3 | GH1 | GH4 | GH3 | 0.2268 | 0.2299 | 0.2290 | 0.2311 | 0.2300 |
| 5/16 | 18 | - | GH3 | GH2 | GH5 | GH3 | 0.2764 | 0.2805 | 0.2794 | 0.2817 | 0.2803 |
| 5/16 | - | 24 | GH3 | GH1 | GH4 | GH3 | 0.2854 | 0.2887 | 0.2878 | 0.2902 | 0.2890 |
| 3/8 | 16 | - | GH3 | GH2 | GH5 | GH3 | 0.3344 | 0.3389 | 0.3376 | 0.3401 | 0.3387 |
| 3/8 | - | 24 | GH3 | GH1 | GH4 | GH3 | 0.3479 | 0.3512 | 0.3503 | 0.3528 | 0.3516 |
| 7/16 | 14 | - | GH5 | GH3 | GH5 | GH3 | 0.3911 | 0.3960 | 0.3947 | 0.3972 | 0.3957 |
| 7/16 | - | 20 | GH3 | GH1 | GH5 | GH3 | 0.4050 | 0.4086 | 0.4076 | 0.4104 | 0.4091 |
| 1/2 | 13 | - | GH5 | GH3 | GH5 | GH3 | 0.4500 | 0.4552 | 0.4537 | 0.4565 | 0.4548 |
| 1/2 | - | 20 | GH3 | GH1 | GH5 | GH3 | 0.4675 | 0.4711 | 0.4701 | 0.4731 | 0.4717 |
| 9/16 | 12 | - | GH5 | GH3 | GH5 | GH3 | 0.5084 | 0.5140 | 0.5124 | 0.5152 | 0.5135 |
| 9/16 | - | 18 | GH3 | GH2 | GH5 | GH3 | 0.5264 | 0.5305 | 0.5294 | 0.5323 | 0.5308 |
| 5/8 | 11 | - | GH5 | GH3 | GH5 | GH3 | 0.5660 | 0.5719 | 0.5702 | 0.5732 | 0.5714 |
| 5/8 | - | 18 | GH3 | GH2 | GH5 | GH3 | 0.5889 | 0.5930 | 0.5919 | 0.5949 | 0.5934 |
| 3/4 | 10 | - | GH5 | GH3 | GH5 | GH3 | 0.6850 | 0.6914 | 0.6895 | 0.6927 | 0.6907 |
| 3/4 | - | 16 | GH3 | GH2 | GH5 | GH3 | 0.7094 | 0.7139 | 0.7126 | 0.7159 | 0.7143 |
| 7/8 | 9 | - | GH6 | GH4 | GH6 | GH4 | 0.8028 | 0.8098 | 0.8077 | 0.8110 | 0.8089 |
| 7/8 | - | 14 | GH4 | GH2 | GH6 | GH4 | 0.8286 | 0.8335 | 0.8322 | 0.8356 | 0.8339 |
| 1 | 8 | - | GH6 | GH4 | GH6 | GH4 | 0.9188 | 0.9264 | 0.9242 | 0.9276 | 0.9254 |
| 1 | - | 12 | GH4 | GH2 | GH6 | GH4 | 0.9459 | 0.9515 | 0.9499 | 0.9535 | 0.9516 |
| 1 | - | 14* | GH4 | GH2 | GH6 | GH4 | 0.9536 | 0.9585 | 0.9572 | 0.9609 | 0.9590 |
| 1-1/8 | 7 | - | GH8 | GH4 | GH8 | GH4 | 1.0322 | 1.0407 | 1.0381 | 1.0416 | 1.0393 |
| 1-1/8 | - | 12 | GH4 | GH4 | GH6 | GH4 | 1.0709 | 1.0765 | 1.0749 | 1.0787 | 1.0768 |
| 1-1/4 | 7 | - | GH8 | GH4 | GH8 | GH4 | 1.1572 | 1.1657 | 1.1631 | 1.1668 | 1.1644 |
| 1-1/4 | - | 12 | GH4 | GH4 | GH6 | GH4 | 1.1959 | 1.2015 | 1.1999 | 1.2039 | 1.2019 |
| 1-3/8 | 6 | - | GH8 | GH4 | GH8 | GH4 | 1.2667 | 1.2768 | 1.2738 | 1.2771 | 1.2745 |
| 1-3/8 | - | 12 | GH4 | GH4 | GH6 | GH4 | 1.3209 | 1.3265 | 1.3249 | 1.3291 | 1.327 |
| 1-1/2 | 6 | - | GH8 | GH4 | GH8 | GH4 | 1.3917 | 1.4018 | 1.3988 | 1.4022 | 1.3996 |
| 1-1/2 | - | 12 | GH4 | GH4 | GH6 | GH4 | 1.4459 | 1.4515 | 1.4499 | 1.4542 | 1.4522 |

*UN

These are general tap recommendations to produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, please consult the factory.

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METRIC TAP RECOMMENDATIONS FOR CLASSES OF THREAD (ISO)

| Size mm | Pitch mm | Recommended Tap for Class of Thread | | Pitch Diameter Limits for Class of Thread | | |
|------------|-------------|--|----|--|------------|------------|
| | | 4H | 6H | Min. (Basic) | Max. 4H | Max. 6H |
| M1.5 | 0.35 | D1 | D2 | 1.273 | 1.326 | 1.358 |
| M1.6 | 0.35 | D1 | D3 | 1.373 | 1.426 | 1.458 |
| M1.8 | 0.35 | D1 | D3 | 1.573 | 1.626 | 1.658 |
| M2 | 0.45 | D1 | D2 | 1.708 | 1.768 | 1.803 |
| M2 | 0.40 | D1 | D3 | 1.740 | 1.796 | 1.830 |
| M2.2 | 0.45 | D1 | D3 | 1.908 | 1.968 | 2.003 |
| M2.3 | 0.40 | D1 | D2 | 2.040 | 2.096 | 2.130 |
| M2.5 | 0.45 | D1 | D3 | 2.208 | 2.268 | 2.303 |
| M2.6 | 0.45 | D1 | D2 | 2.308 | 2.368 | 2.403 |
| M3 | 0.60 | D1 | D2 | 2.610 | 2.681 | 2.722 |
| M3 | 0.50 | D1 | D3 | 2.675 | 2.738 | 2.775 |
| M3.5 | 0.60 | D1 | D4 | 3.110 | 3.181 | 3.222 |
| M4 | 0.75 | D2 | D3 | 3.513 | 3.588 | 3.631 |
| M4 | 0.70 | D2 | D4 | 3.545 | 3.620 | 3.663 |
| M4.5 | 0.75 | D2 | D4 | 4.013 | 4.088 | 4.131 |
| M5 | 1.00 | D2 | D3 | 4.350 | 4.440 | 4.490 |
| M5 | 0.90 | D2 | D3 | 4.415 | 4.501 | 4.549 |
| M5 | 0.80 | D2 | D4 | 4.480 | 4.560 | 4.605 |
| M5.5 | 0.90 | D2 | D3 | 4.915 | 5.002 | 5.050 |
| M6 | 1.00 | D3 | D5 | 5.350 | 5.445 | 5.500 |
| M6 | 0.75 | D3 | D4 | 5.513 | 5.598 | 5.645 |
| M7 | 1.00 | D3 | D5 | 6.350 | 6.445 | 6.500 |
| M7 | 0.75 | D2 | D4 | 6.513 | 6.598 | 6.645 |
| M8 | 1.25 | D3 | D5 | 7.188 | 7.288 | 7.348 |
| M8 | 1.00 | D3 | D5 | 7.350 | 7.445 | 7.500 |
| M9 | 1.25 | D3 | D5 | 8.188 | 8.288 | 8.348 |
| M9 | 1.00 | D3 | D5 | 8.350 | 8.445 | 8.500 |
| M10 | 1.50 | D3 | D6 | 9.026 | 9.138 | 9.206 |
| M10 | 1.25 | D3 | D5 | 9.188 | 9.288 | 9.348 |
| M10 | 1.00 | D3 | D5 | 9.350 | 9.445 | 9.500 |
| M11 | 1.50 | D3 | D5 | 10.026 | 10.138 | 10.206 |
| M12 | 1.75 | D3 | D6 | 10.863 | 10.988 | 11.063 |
| M12 | 1.50 | D3 | D6 | 11.026 | 11.144 | 11.216 |
| M12 | 1.25 | D3 | D5 | 11.188 | 11.300 | 11.368 |
| M14 | 2.00 | D3 | D7 | 12.701 | 12.833 | 12.913 |
| M14 | 1.50 | D3 | D6 | 13.026 | 13.144 | 13.216 |
| M14 | 1.25 | D3 | D5 | 13.188 | 13.300 | 13.368 |

These are general tap recommendations to produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, please consult the factory.

METRIC TAP RECOMMENDATIONS FOR CLASSES OF THREAD

(ISO) Cont.

| Size mm | Pitch mm | Recommended Tap for Class of Thread | | Pitch Diameter Limits for Class of Thread | | |
|------------|-------------|--|----|--|------------|------------|
| | | 4H | 6H | Min. (Basic) | Max. 4H | Max. 6H |
| M16 | 2.00 | D4 | D7 | 14.701 | 14.833 | 14.913 |
| M16 | 1.50 | D3 | D6 | 15.026 | 15.144 | 15.216 |
| M17 | 1.50 | D3 | D5 | 16.026 | 16.144 | 16.216 |
| M18 | 2.50 | D4 | D7 | 16.376 | 16.516 | 16.600 |
| M18 | 2.00 | D4 | D6 | 16.701 | 16.833 | 16.913 |
| M18 | 1.50 | D3 | D6 | 17.026 | 17.144 | 17.216 |
| M19 | 2.50 | D4 | D6 | 17.376 | 17.516 | 17.600 |
| M20 | 2.50 | D4 | D7 | 18.376 | 18.516 | 18.600 |
| M20 | 2.00 | D4 | D6 | 18.701 | 18.833 | 18.913 |
| M20 | 1.50 | D3 | D6 | 19.026 | 19.144 | 19.216 |
| M22 | 2.50 | D4 | D7 | 20.376 | 20.516 | 20.600 |
| M22 | 2.00 | D4 | D6 | 20.701 | 20.833 | 20.913 |
| M22 | 1.50 | D3 | D6 | 21.026 | 21.144 | 21.216 |
| M24 | 3.00 | D4 | D8 | 22.051 | 22.221 | 22.316 |
| M24 | 2.00 | D4 | D7 | 22.701 | 22.841 | 22.925 |
| M24 | 1.50 | D3 | D5 | 23.026 | 23.151 | 23.226 |
| M25 | 2.00 | D4 | D7 | 23.701 | 23.841 | 23.925 |
| M25 | 1.50 | D3 | D5 | 24.026 | 24.151 | 24.226 |
| M26 | 3.00 | D5 | D8 | 24.051 | 24.221 | 24.316 |
| M27 | 3.00 | D5 | D8 | 25.051 | 25.221 | 25.316 |
| M27 | 2.00 | D5 | D7 | 25.701 | 25.841 | 25.925 |
| M28 | 3.00 | D5 | D8 | 26.051 | 26.221 | 26.316 |
| M28 | 2.00 | D5 | D7 | 26.701 | 26.841 | 26.925 |
| M30 | 3.50 | D5 | D9 | 27.727 | 27.907 | 28.007 |
| M30 | 3.00 | D5 | D8 | 28.051 | 28.221 | 28.316 |
| M30 | 2.00 | D5 | D7 | 28.701 | 28.841 | 28.925 |
| M32 | 3.50 | D5 | D9 | 29.727 | 29.907 | 30.007 |
| M32 | 2.00 | D5 | D7 | 30.701 | 30.841 | 30.925 |
| M33 | 3.50 | D5 | D9 | 30.727 | 30.907 | 31.007 |
| M33 | 3.00 | D5 | D8 | 31.051 | 31.221 | 31.316 |
| M33 | 2.00 | D5 | D7 | 31.701 | 31.841 | 31.925 |
| M34 | 3.50 | D5 | D9 | 31.727 | 31.907 | 32.007 |
| M36 | 4.00 | D5 | D9 | 33.402 | 33.592 | 33.702 |
| M36 | 3.00 | D5 | D8 | 34.051 | 34.221 | 34.316 |
| M36 | 2.00 | D5 | D7 | 34.701 | 34.841 | 34.925 |
| M38 | 4.00 | D5 | D9 | 35.402 | 35.592 | 35.702 |
| M39 | 4.00 | D6 | D9 | 36.402 | 36.592 | 36.702 |
| M39 | 3.00 | D6 | D8 | 37.051 | 37.221 | 37.316 |
| M39 | 2.00 | D6 | D7 | 37.701 | 37.841 | 37.925 |

These are general tap recommendations to produce the Class of Thread indicated in average materials when used with reasonable care. However, if the tap specified does not give a satisfactory gage fit in the work, please consult the factory.

FORMULA FOR TAP / DRILL SIZES
(INCH)

METHOD 1

$$\text{Drilled Hole Size (in.)} = \text{Basic Major Dia. of Thread (in.)} - \frac{.013 \times \% \text{ of Full Thread}^*}{\# \text{ of Threads per Inch (T.P.I.)}$$

* Use whole number for % of thread...for 65%, use 65 (not .65).

METHOD 2

$$\text{Nominal O.D.} - (\text{Dbl. Thread Depth} \times \% \text{ of Full Thread}) = \text{Drilled Hole Size}$$

EXAMPLE: To find the hole size for obtaining 75% of thread in a 1/4-20 tapped hole, follow first column down to 20 threads, then across to 75% of thread. This figure (0.0485), when subtracted from the 0.250 diameter, is 0.2015, which is the required diameter of hole. See equation:

$$0.2500 - 0.0485 = 0.2015$$

To figure whether or not pitch is too coarse for diameter:

$$(\text{Double thread depth}) \times 3 = x$$

x = the smallest diameter possible for that T.P.I.

| Threads per Inch | Double Thread Depth | 50% Thread | 55% Thread | 60% Thread | 65% Thread | 70% Thread | 75% Thread | 80% Thread | 85% Thread |
|------------------|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 6 | 0.21651 | 0.1083 | 0.1192 | 0.1300 | 0.1408 | 0.1517 | 0.1625 | 0.1733 | 0.1842 |
| 7 | 0.18558 | 0.0929 | 0.1021 | 0.1114 | 0.1207 | 0.1300 | 0.1393 | 0.1486 | 0.1579 |
| 8 | 0.16238 | 0.0813 | 0.0894 | 0.0975 | 0.1056 | 0.1138 | 0.1219 | 0.1300 | 0.1381 |
| 9 | 0.14434 | 0.0722 | 0.0794 | 0.0866 | 0.0939 | 0.1011 | 0.1083 | 0.1156 | 0.1228 |
| 10 | 0.12990 | 0.0649 | 0.0714 | 0.0779 | 0.0844 | 0.0909 | 0.0974 | 0.1039 | 0.1105 |
| 11 | 0.11809 | 0.0590 | 0.0649 | 0.0708 | 0.0767 | 0.0826 | 0.0885 | 0.0944 | 0.1005 |
| 12 | 0.10825 | 0.0541 | 0.0595 | 0.0649 | 0.0702 | 0.0755 | 0.0808 | 0.0861 | 0.0921 |
| 13 | 0.09992 | 0.0499 | 0.0549 | 0.0599 | 0.0649 | 0.0699 | 0.0749 | 0.0799 | 0.0850 |
| 14 | 0.09278 | 0.0464 | 0.0510 | 0.0556 | 0.0602 | 0.0648 | 0.0694 | 0.0740 | 0.0789 |
| 16 | 0.08119 | 0.0406 | 0.0446 | 0.0486 | 0.0526 | 0.0566 | 0.0606 | 0.0646 | 0.0691 |
| 18 | 0.07217 | 0.0361 | 0.0396 | 0.0431 | 0.0466 | 0.0501 | 0.0536 | 0.0571 | 0.0614 |
| 20 | 0.06495 | 0.0325 | 0.0357 | 0.0389 | 0.0421 | 0.0453 | 0.0485 | 0.0517 | 0.0553 |
| 24 | 0.05412 | 0.0270 | 0.0298 | 0.0326 | 0.0354 | 0.0382 | 0.0410 | 0.0438 | 0.0460 |
| 27 | 0.04811 | 0.0240 | 0.0264 | 0.0288 | 0.0312 | 0.0336 | 0.0360 | 0.0384 | 0.0409 |
| 28 | 0.04639 | 0.0232 | 0.0254 | 0.0276 | 0.0298 | 0.0324 | 0.0347 | 0.0370 | 0.0395 |
| 30 | 0.04330 | 0.0216 | 0.0238 | 0.0260 | 0.0282 | 0.0304 | 0.0326 | 0.0348 | 0.0368 |
| 32 | 0.04059 | 0.0203 | 0.0223 | 0.0243 | 0.0263 | 0.0283 | 0.0303 | 0.0323 | 0.0345 |
| 36 | 0.03608 | 0.0180 | 0.0198 | 0.0216 | 0.0234 | 0.0252 | 0.0270 | 0.0288 | 0.0307 |
| 40 | 0.03247 | 0.0162 | 0.0178 | 0.0194 | 0.0210 | 0.0226 | 0.0242 | 0.0258 | 0.0276 |
| 44 | 0.02952 | 0.0147 | 0.0162 | 0.0177 | 0.0192 | 0.0207 | 0.0222 | 0.0237 | 0.0251 |
| 48 | 0.02706 | 0.0135 | 0.0148 | 0.0161 | 0.0174 | 0.0187 | 0.0200 | 0.0213 | 0.0230 |
| 56 | 0.02319 | 0.0116 | 0.0127 | 0.0138 | 0.0149 | 0.0160 | 0.0171 | 0.0182 | 0.0197 |
| 64 | 0.02029 | 0.0101 | 0.0111 | 0.0121 | 0.0131 | 0.0141 | 0.0151 | 0.0161 | 0.0173 |
| 72 | 0.01804 | 0.0090 | 0.0099 | 0.0107 | 0.0115 | 0.0123 | 0.0131 | 0.0139 | 0.0153 |
| 80 | 0.01623 | 0.0081 | 0.0089 | 0.0097 | 0.0105 | 0.0113 | 0.0121 | 0.0129 | 0.0138 |

Figures in table show amount to subtract from O.D. of screw to obtain specific percentages of thread. Select nearest size commercial stock drill.

FORMULA FOR TAP / DRILL SIZES
(METRIC)

METHOD 1

$$\text{Drilled Hole Size (mm)} = \text{Basic Major Dia. of Thread (mm)} - \frac{\% \text{ of Full Thread} \times \text{mm Pitch}}{76.98}$$

* Use whole number for % of thread...for 65%, use 65 (not .65).

METHOD 2

$$\text{Nominal O.D.} - (\text{Dbl. Thread Depth} \times \% \text{ of Full Thread}) = \text{Drilled Hole Size}$$

EXAMPLE: To find the hole size for obtaining 75% of thread in a (M6) 6mm x 1.00 tapped hole, follow first column down to 1.00 threads, then across to 75% of thread. This figure (0.9743), when subtracted from 6mm diameter, is 5.0257, which is the required diameter of hole. See equation:

$$M6 - (1.2990 \times 75) = (6 - 0.9743) = 5.0257\text{mm}$$

To figure whether or not pitch is too coarse for diameter:

$$(\text{Double thread depth}) \times 3 = x$$

x = the smallest diameter possible for that T.P.I.

NOTE: All numbers are shown in millimeters (mm). To convert metric values to inches, divide by 25.4

| mm Pitch | Double Thread Depth | 50% Thread | 55% Thread | 60% Thread | 65% Thread | 70% Thread | 75% Thread | 80% Thread | 85% Thread |
|----------|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 4.00 | 5.19630 | 2.5982 | 2.8580 | 3.1178 | 3.3776 | 3.6374 | 3.8972 | 4.1570 | 4.4169 |
| 3.50 | 4.54660 | 2.2733 | 2.5006 | 2.7280 | 2.9553 | 3.1826 | 3.4100 | 3.6373 | 3.8646 |
| 3.00 | 3.89690 | 1.9485 | 2.1433 | 2.3381 | 2.5330 | 2.7278 | 2.9227 | 3.1175 | 3.3124 |
| 2.50 | 3.24760 | 1.6238 | 1.7862 | 1.9486 | 2.1109 | 2.2733 | 2.4357 | 2.5981 | 2.7605 |
| 2.00 | 2.59790 | 1.2990 | 1.4288 | 1.5587 | 1.6886 | 1.8185 | 1.9484 | 2.0783 | 2.2082 |
| 1.75 | 2.27330 | 1.1367 | 1.2503 | 1.3640 | 1.4776 | 1.5913 | 1.7050 | 1.8186 | 1.9323 |
| 1.50 | 1.94870 | 0.9744 | 1.0718 | 1.1692 | 1.2667 | 1.3641 | 1.4615 | 1.5590 | 1.6564 |
| 1.25 | 1.62360 | 0.8118 | 0.8930 | 0.9742 | 1.0553 | 1.1365 | 1.2177 | 1.2989 | 1.3801 |
| 1.00 | 1.29900 | 0.6495 | 0.7145 | 0.7794 | 0.8444 | 0.9093 | 0.9743 | 1.0392 | 1.1042 |
| 0.90 | 1.16870 | 0.5844 | 0.6428 | 0.7012 | 0.7597 | 0.8181 | 0.8765 | 0.9350 | 0.9934 |
| 0.80 | 1.03940 | 0.5197 | 0.5717 | 0.6236 | 0.6756 | 0.7276 | 0.7796 | 0.8315 | 0.8835 |
| 0.75 | 0.97430 | 0.4871 | 0.5359 | 0.5846 | 0.6333 | 0.6820 | 0.7307 | 0.7794 | 0.8282 |
| 0.70 | 0.90930 | 0.4547 | 0.5001 | 0.5456 | 0.5910 | 0.6365 | 0.6820 | 0.7274 | 0.7729 |
| 0.60 | 0.77930 | 0.3897 | 0.4286 | 0.4676 | 0.5065 | 0.5455 | 0.5845 | 0.6234 | 0.6624 |
| 0.50 | 0.64210 | 0.3211 | 0.3532 | 0.3853 | 0.4174 | 0.4495 | 0.4816 | 0.5137 | 0.5458 |
| 0.45 | 0.58470 | 0.2924 | 0.3216 | 0.3508 | 0.3801 | 0.4093 | 0.4385 | 0.4678 | 0.4970 |
| 0.40 | 0.51970 | 0.2599 | 0.2858 | 0.3118 | 0.3378 | 0.3638 | 0.3898 | 0.4158 | 0.4417 |
| 0.35 | 0.45470 | 0.2274 | 0.2501 | 0.2728 | 0.2956 | 0.3183 | 0.3410 | 0.3638 | 0.3865 |
| 0.30 | 0.38960 | 0.1948 | 0.2143 | 0.2338 | 0.2532 | 0.2727 | 0.2922 | 0.3117 | 0.3312 |
| 0.25 | 0.32460 | 0.1663 | 0.1785 | 0.1948 | 0.2110 | 0.2272 | 0.2434 | 0.2597 | 0.2759 |

Figures in table show amount to subtract from O.D. of screw to obtain specific percentages of thread. Select nearest size commercial stock drill.

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

**MATERIAL HOOK OR RAKE ANGLES,
SUGGESTED SURFACE TREATMENTS,
CUTTING FLUIDS & CUTTING SPEEDS**
(Starting Recommendations Only)

| Material To Be Tapped | Hook or Rake Angle | Suggested Surface Treatment** | Lubricant / Coolant | Speed / SFM |
|---|-----------------------|-------------------------------|----------------------------------|-------------|
| ALUMINUM (WROUGHT) | 12° - 15° HOOK | TiN, TiCN | Soluble, Light Base, or Lard Oil | 90 - 150 |
| ALUMINUM DIE CASTING | 8° - 10° HOOK | TiN, TiCN, CrN, TiAlN+WC/C | Soluble or Lard Oil | 65 - 75 |
| ALUMINUM BRONZE | 0° - 3° RAKE | N, TiN | Mineral Oil w/Lard, or Light Oil | 20 - 60 |
| BAKELITE (HARD PLASTIC) | 0° - 3° RAKE | TiCN | Dry or Air Jet | 25 - 40 |
| BERYLLIUM COPPER | 12° - 14° HOOK | TiAlN+WC/C, CrN, N | Soluble Light Base Oil | 50 - 90 |
| BRASS | 0° - 3° RAKE | None, TiCN | Soluble Light Base Oil | 100 - 200 |
| BRONZE (FREE-MACHINING) | 2° - 6° HOOK | None, TiCN, N | Soluble Light Base Oil | 80 - 150 |
| CAST BRASS | 2° - 5° RAKE | N, TiCN | Soluble Light Base Oil | 100 - 200 |
| CAST IRON (GRAY) | 0° - 3° RAKE | N, TiCN | Dry or Soluble Oil | 20 - 80 |
| COPPER | 18° HOOK | TiAlN+WC/C, CrN | Soluble Light Base Oil | 80 - 150 |
| COPPER - NICKEL | 12° HOOK | N, TiCN | Soluble Light Base Oil | 10 - 20 |
| DELTRIN | 5° - 8° HOOK | TiAlN+WC/C, TiN, N | Dry, Air Jet, or Water Soluble | 65 - 100 |
| DUCTILE IRON | 3° - 6° HOOK | N+O, TiN, TiCN | Soluble or Sulphur Based Oils | 30 - 50 |
| DURALUMIN | 12° - 14° HOOK | TiAlN+WC/C, CrN | Soluble or Lard Oil | 50 - 90 |
| FERRO-TIC | 0° - 3° NEG RAKE | None | Anti-Seize Compound | 8 - 20 |
| FIBERGLASS | 0° - 3° RAKE | TiCN | Dry or Air Jet | 25 - 40 |
| HASTELLOY | 12° - 15° HOOK | CrN | Sulphur Based Oils | 8 - 20 |
| INCONEL | 12° - 15° HOOK | N, CrN | Sulphur Based Oils | 8 - 20 |
| MAGNESIUM | 18° - 20° HOOK (MUST) | CrN | Soluble Light Base Oil | 100 - 150 |
| MALLEABLE IRON | 3° RAKE | N+O, TiN, TiCN | Soluble or Sulphur Based Oils | 30 - 50 |
| MANGANESE | 0° - 3° RAKE | TiCN | Sulphur Based Oils | 8 - 20 |
| MANGANESE BRONZE | 0° - 3° RAKE | N, TiCN | Soluble Light Base Oil | 20 - 60 |
| MOLYBDENUM | 12° - 14° HOOK | N, TiN, TiCN | Sulphur Based Oils | 20 - 45 |
| MONEL | 12° - 15° HOOK | N, TiCN | Sulphur Based Oils | 8 - 20 |
| NAVAL BRASS | 0° - 3° RAKE | N | Soluble Light Base Oil | 100 - 200 |
| NAVAL BRONZE | 2° - 6° HOOK | None, TiCN | Soluble Light Base Oil | 80 - 150 |
| NICKEL SILVER | 0° - 3° RAKE | N, TiCN | Sulphur Based Oils | 20 - 60 |
| NICKEL (PURE) | 12° - 15° HOOK | N, TiCN | Soluble Light Base Oil | 5 - 25 |
| NITRALLOY | 0° RAKE | N, TiCN | Sulphur Based Oils | 8 - 20 |
| NITRONIC (*NO GUARANTEE) | 12° - 14° POS RAKE | N, TiN, TiCN | Sulphur Based Oils | 8 - 20 |
| NYLON | 5° - 8° HOOK | N, TiN | Dry, Air Jet or Water Soluble | 65 - 100 |
| PLASTICS: | | | | |
| THERMOPLASTIC (SOFT) | 5° - 8° HOOK | N, TiN | Dry, Air Jet or Water Soluble | 65 - 100 |
| ABS, DELTRIN, NYLON, PVC, etc. | | | | |
| THERMOSETTING (HARD) | 0° - 3° RAKE | TiCN | Dry or Air Jet | 25 - 40 |
| BAKELITE, L AMINATES, PHENOLIC, POLYESTERS, etc. | | | | |
| POWDERED METAL (Sintered) | 0° RAKE | TiCN | Soluble Light Base Oil | 25 - 80 |
| RUBBER, HARD | 0° - 3° RAKE | None | Dry | 50 - 200 |
| SILICON BRONZE | 0° - 3° RAKE | N, TiCN | Soluble Light Base Oil | 20 - 60 |
| STEEL: | | | | |
| CARBON STEEL | 10° - 12° HOOK | O, N, TiN | Sulphur Based Oils | 40 - 90 |
| COLD-ROLLED STEEL (1018, etc.) | 10° - 12° HOOK | O, N, TiN | Sulphur Based Oils | 40 - 90 |
| FORGED | 10° - 12° HOOK | O, N, TiN | Sulphur Based Oils | 20 - 50 |
| LEADED (12L14, etc.) | 12° HOOK | O, N, TiN | Sulphur Based Oils | 40 - 90 |
| STAINLESS: | | | | |
| FREE MACHINING | 12° - 14° HOOK | N, TiN, TiCN | Sulphur Based Oils | 20 - 40 |
| PRECIP. HARDENING | 12° - 14° HOOK | N, TiN, TiCN | Sulphur Based Oils | 8 - 20 |
| TOOL STEEL | 12° - 14° HOOK | N, TiN, TiCN | Sulphur Based Oils | 20 - 50 |
| TITANIUM | 15° - 20° HOOK | O, N, CrN | Sulphur Based Oils | 20 - 50 |
| TUNGSTEN | 5° RAKE | TiN | Sulphur Based Oils | 8 - 20 |
| TURCITE (SOFT PLASTIC) | 5° - 8° HOOK | N, TiN | Dry, Air Jet or Water Soluble | 65 - 100 |
| ZAMAK (ZINC DIE CAST) | 10° - 12° RAKE | TiCN, TiN, CrN, TiAlN+WC/C | Soluble Light Base Oil | 50 - 200 |
| ZINC | 10° - 12° RAKE | TiCN, TiN, CrN, TiAlN+WC/C | Soluble Light Base Oil | 50 - 200 |

* If problems are encountered when tapping nitronic (or any other material), please consult Tool Designers.

** See page 206 for definitions of tool coating abbreviations.

SPEEDS & FEEDS FOR TAPS
(Use Only as Suggested Starting R.P.M.)

MACHINE SCREW AND FRACTIONAL SIZES

Table with columns: Inch Tap Size (UNC/UNF), Inch Taper Pipe Taps (NPT/NPTF), and Surface Feet per Minute (SFM) / Revolutions per Minute (RPM) for various sizes from 0 to 2 inches.

METRIC SIZES

Table with columns: Metric Tap Size, Decimal Equivalent Size, and Surface Feet per Minute (SFM) / Revolutions per Minute (RPM) for various metric sizes from M1 to M30.

Factors to be Considered when Determining Tapping Speeds:

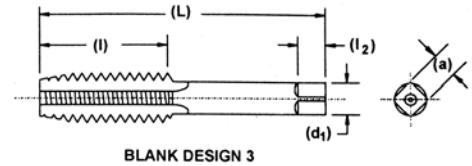
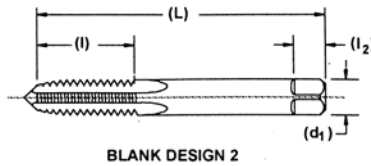
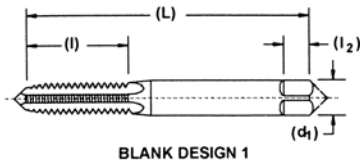
- Material to be tapped
Depth of hole
Length of chamfer on tap
Pitch of thread
Percentage of full thread to be cut
Lubrication
Machine equipment and rigidity
Horizontal or vertical tapping

Speeds & Feeds Equations
INCH: S.F.M. = 0.26 X R.P.M. X TOOL DIAMETER
METRIC: M/MIN. = (pi X TOOL DIA. X R.P.M.) / 1000

STANDARD TAP DIMENSIONS / GROUND THREAD

(Ref. USCTI Table 302)

General Dimensions



| Nominal Diameter Range - Inches | | Machine Screw Size No. | | Nominal Fractional Diameter Inches | Nominal Metric Diameter Millimeters, (in) | Blank Design No. | Tap Dimensions - Inches | | | | |
|---------------------------------|-------|------------------------|----------|------------------------------------|---|------------------|-------------------------|-----------------|------------------------------|---------------------------|------------------|
| | | | | | | | Overall Length L | Thread Length l | Square Length l ₂ | Shank Dia. d ₁ | Size of Square a |
| 0.052 | 0.065 | 0 | (0.0600) | - | M 1.6 (0.0630) | 1 | 1.63 | 0.31 | 0.19 | 0.1410 | 0.1100 |
| 0.065 | 0.078 | 1 | (0.0730) | - | M1.8 (0.0709) | 1 | 1.69 | 0.38 | 0.19 | 0.1410 | 0.1100 |
| 0.078 | 0.091 | 2 | (0.0860) | - | M2 (0.0787), M2.2 (0.0866) | 1 | 1.75 | 0.44 | 0.19 | 0.1410 | 0.1100 |
| 0.091 | 0.104 | 3 | (0.0990) | - | M2.5 (0.0984) | 1 | 1.81 | 0.50 | 0.19 | 0.1410 | 0.1100 |
| 0.104 | 0.117 | 4 | (0.1120) | - | - | 1 | 1.88 | 0.56 | 0.19 | 0.1410 | 0.1100 |
| 0.117 | 0.130 | 5 | (0.1250) | - | M3 (0.1181) | 1 | 1.94 | 0.63 | 0.19 | 0.1410 | 0.1100 |
| 0.130 | 0.145 | 6 | (0.1380) | - | M3.5 (0.1378) | 1 | 2.00 | 0.69 | 0.19 | 0.1410 | 0.1100 |
| 0.145 | 0.171 | 8 | (0.1640) | - | M4 (0.1575) | 1 | 2.13 | 0.75 | 0.25 | 0.1680 | 0.1310 |
| 0.171 | 0.197 | 10 | (0.1900) | - | M4.5 (0.1772), M5 (0.1969) | 1 | 2.38 | 0.88 | 0.25 | 0.1940 | 0.1520 |
| 0.197 | 0.223 | 12 | (0.2160) | - | - | 1 | 2.38 | 0.94 | 0.28 | 0.2200 | 0.1650 |
| 0.223 | 0.260 | - | | 1/4 (0.2500) | M6 (0.2362) | 2 | 2.50 | 1.00 | 0.31 | 0.2550 | 0.1910 |
| 0.260 | 0.323 | - | | 5/16 (0.3125) | M7 (0.2756), M8 (0.3150) | 2 | 2.72 | 1.13 | 0.38 | 0.3180 | 0.2380 |
| 0.323 | 0.395 | - | | 3/8 (0.3750) | M10 (0.3937) | 2 | 2.94 | 1.25 | 0.44 | 0.3810 | 0.2860 |
| 0.395 | 0.448 | - | | 7/16 (0.4375) | - | 3 | 3.16 | 1.44 | 0.41 | 0.3230 | 0.2420 |
| 0.448 | 0.510 | - | | 1/2 (0.5000) | M12 (0.4724) | 3 | 3.38 | 1.66 | 0.44 | 0.3670 | 0.2750 |
| 0.510 | 0.573 | - | | 9/16 (0.5625) | M14 (0.5512) | 3 | 3.59 | 1.66 | 0.50 | 0.4290 | 0.3220 |
| 0.573 | 0.635 | - | | 5/8 (0.6250) | M16 (0.6299) | 3 | 3.81 | 1.81 | 0.56 | 0.4800 | 0.3600 |
| 0.635 | 0.709 | - | | 11/16 (0.6875) | M18 (0.7087) | 3 | 4.03 | 1.81 | 0.63 | 0.5420 | 0.4060 |
| 0.709 | 0.760 | - | | 3/4 (0.7500) | - | 3 | 4.25 | 2.00 | 0.69 | 0.5900 | 0.4420 |
| 0.760 | 0.823 | - | | 13/16 (0.8125) | M20 (0.7874) | 3 | 4.47 | 2.00 | 0.69 | 0.6520 | 0.4890 |
| 0.823 | 0.885 | - | | 7/8 (0.8750) | M22 (0.8661) | 3 | 4.69 | 2.22 | 0.75 | 0.6970 | 0.5230 |
| 0.885 | 0.948 | - | | 15/16 (0.9375) | M24 (0.9449) | 3 | 4.91 | 2.22 | 0.75 | 0.7600 | 0.5700 |
| 0.948 | 1.010 | - | | 1 (1.0000) | M25 (0.9843) | 3 | 5.13 | 2.50 | 0.81 | 0.8000 | 0.6000 |
| 1.010 | 1.073 | - | | 1-1/16 (1.0625) | M27 (1.0630) | 3 | 5.13 | 2.50 | 0.88 | 0.8960 | 0.6720 |
| 1.073 | 1.135 | - | | 1-1/8 (1.1250) | - | 3 | 5.44 | 2.56 | 0.88 | 0.8960 | 0.6720 |
| 1.135 | 1.198 | - | | 1-3/16 (1.1875) | M30 (1.1811) | 3 | 5.44 | 2.56 | 1.00 | 1.0210 | 0.7660 |
| 1.198 | 1.260 | - | | 1-1/4 (1.2500) | - | 3 | 5.75 | 2.56 | 1.00 | 1.0210 | 0.7660 |
| 1.260 | 1.323 | - | | 1-5/16 (1.3125) | M33 (1.2992) | 3 | 5.75 | 2.56 | 1.06 | 1.1080 | 0.8310 |
| 1.323 | 1.385 | - | | 1-3/8 (1.3750) | - | 3 | 6.06 | 3.00 | 1.06 | 1.1080 | 0.8310 |
| 1.385 | 1.448 | - | | 1-7/16 (1.4375) | M36 (1.4173) | 3 | 6.06 | 3.00 | 1.13 | 1.2330 | 0.9250 |
| 1.448 | 1.510 | - | | 1-1/2 (1.5000) | - | 3 | 6.38 | 3.00 | 1.13 | 1.2330 | 0.9250 |
| 1.510 | 1.635 | - | | 1-5/8 (1.6250) | M39 (1.5354) | 3 | 6.69 | 3.19 | 1.13 | 1.3050 | 0.9790 |
| 1.635 | 1.760 | - | | 1-3/4 (1.7500) | M42 (1.6535) | 3 | 7.00 | 3.19 | 1.25 | 1.4300 | 1.0720 |
| 1.760 | 1.885 | - | | 1-7/8 (1.8750) | - | 3 | 7.31 | 3.56 | 1.25 | 1.5190 | 1.1390 |
| 1.885 | 2.010 | - | | 2 (2.0000) | M48 (1.8898) | 3 | 7.63 | 3.56 | 1.38 | 1.6440 | 1.2330 |

(Continued on Next Page)

STANDARD TAP DIMENSIONS / GROUND THREAD (Cont.)

(Ref. USCTI Table 302)

General Dimensions

| Nominal Diameter Range - Inches | | Nominal Fractional Diameter Inches | Nominal Metric Diameter Millimeters, (in) | Blank Design No. | Tap Dimensions - Inches | | | | |
|---------------------------------|-----------|------------------------------------|---|------------------|-------------------------|-----------------|------------------------------|---------------------------|------------------|
| | | | | | Overall Length L | Thread Length l | Square Length l ₂ | Shank Dia. d ₁ | Size of Square a |
| Over | To (Inc.) | | | | | | | | |
| 2.010 | 2.135 | 2 1/8 (2.1250) | - | 3 | 8.00 | 3.56 | 1.38 | 1.7690 | 1.3270 |
| 2.135 | 2.260 | 2 1/4 (2.2500) | M56 (2.2047) | 3 | 8.25 | 3.56 | 1.44 | 1.8940 | 1.4200 |
| 2.260 | 2.385 | 2 3/8 (2.3750) | - | 3 | 8.50 | 4.00 | 1.44 | 2.0190 | 1.5140 |
| 2.385 | 2.510 | 2 1/2 (2.5000) | - | 3 | 8.75 | 4.00 | 1.50 | 2.1000 | 1.5750 |
| 2.510 | 2.635 | 2 5/8 (2.6250) | M64 (2.5197) | 3 | 8.75 | 4.00 | 1.50 | 2.2250 | 1.6690 |
| 2.635 | 2.760 | 2 3/4 (2.7500) | - | 3 | 9.25 | 4.00 | 1.56 | 2.3500 | 1.7620 |
| 2.760 | 2.885 | 2 7/8 (2.8750) | M72 (2.8346) | 3 | 9.25 | 4.00 | 1.56 | 2.4750 | 1.8560 |
| 2.885 | 3.010 | 3 (3.0000) | - | 3 | 9.75 | 4.56 | 1.63 | 2.5430 | 1.9070 |
| 3.010 | 3.135 | 3 1/8 (3.1250) | - | 3 | 9.75 | 4.56 | 1.63 | 2.6680 | 2.0010 |
| 3.135 | 3.260 | 3 1/4 (3.2500) | M80 (3.1496) | 3 | 10.00 | 4.56 | 1.75 | 2.7930 | 2.0950 |
| 3.260 | 3.385 | 3 3/8 (3.3750) | - | 3 | 10.00 | 4.56 | 1.75 | 2.8830 | 2.1620 |
| 3.385 | 3.510 | 3 1/2 (3.5000) | - | 3 | 10.25 | 4.94 | 2.00 | 3.0080 | 2.2560 |
| 3.510 | 3.635 | 3 5/8 (3.6250) | M90 (3.5433) | 3 | 10.25 | 4.94 | 2.00 | 3.1330 | 2.3500 |
| 3.635 | 3.760 | 3 3/4 (3.7500) | - | 3 | 10.50 | 5.31 | 2.13 | 3.2170 | 2.4130 |
| 3.760 | 3.885 | 3 7/8 (3.8750) | - | 3 | 10.50 | 5.31 | 2.13 | 3.3420 | 2.5060 |
| 3.885 | 4.010 | 4 (4.0000) | M100 (3.9370) | 3 | 10.75 | 5.31 | 2.25 | 3.4670 | 2.6000 |

SPECIAL TAPS

Unless otherwise specified:

Special taps over 1.010" to 1.510" diameter inclusive, having 14 or more threads per inch or 1.75 millimeter pitch and finer, and sizes over 1.510" diameter with 10 or more threads per inch or 2.5 millimeter pitch and finer, are made to general dimensions shown in Table 303 (USCTI).

Special tap thread limits are determined by using the formulas shown in Table 331 (USCTI) for Unified Inch Screw Threads and Table 341 (USCTI) for Metric M-Profile Screw Threads.

NOTES

Tap sizes 0.395" and smaller have an external center on the thread end (may be removed on bottoming taps). Sizes 0.223" and smaller have an external center on the shank end. Sizes 0.224" thru 0.395" have truncated partial cone centers on the shank end (length of cone approx. 1/4 of diameter of shank). Sizes over 0.395" have internal centers on both the thread and shank ends.

For standard thread limits and tolerances for Unified Inch Screw Threads see table 327 (USCTI) and for Metric Threads see Table 337 (USCTI).

For eccentricity tolerances of tap elements see Table 317 (USCTI).

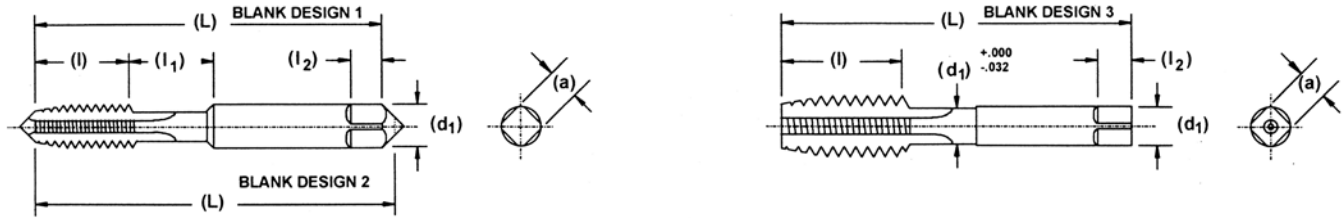
| Element | Nominal Diameter Range - Inches | | Direction | Tolerance (in) |
|------------------------------------|---------------------------------|-----------|---------------|----------------|
| | Over | To (Inc.) | | |
| Length Overall - L | 0.0520 | 1.0100 | Plus or Minus | 0.0310 |
| | 1.0100 | 4.0100 | Plus or Minus | 0.0630 |
| Length of Thread - l | 0.0520 | 0.2230 | Plus or Minus | 0.0470 |
| | 0.2230 | 0.5100 | Plus or Minus | 0.0630 |
| | 0.5100 | 1.5100 | Plus or Minus | 0.0940 |
| Length of Square - l ₂ | 0.0520 | 1.0100 | Plus or Minus | 0.0310 |
| | 1.0100 | 4.0100 | Plus or Minus | 0.0630 |
| | 0.0520 | 1.0100 | Plus or Minus | 0.0310 |
| Diameter of Shank - d ₁ | 0.0520 | 0.2230 | Minus | 0.0015 |
| | 0.2230 | 0.6350 | Minus | 0.0015 |
| | 0.6350 | 1.0100 | Minus | 0.0020 |
| | 1.0100 | 1.5100 | Minus | 0.0020 |
| | 1.5100 | 2.0100 | Minus | 0.0030 |
| | 2.0100 | 4.0100 | Minus | 0.0030 |
| Size of Square - a | 0.0520 | 0.5100 | Minus | 0.0040 |
| | 0.5100 | 1.0100 | Minus | 0.0060 |
| | 1.0100 | 2.0100 | Minus | 0.0080 |
| | 2.0100 | 4.0100 | Minus | 0.0100 |

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OPTIONAL NECK AND SHORTENED THREAD LENGTH

Tap Dimensions, Ground Thread

(Ref. USCTI Table 302-A)



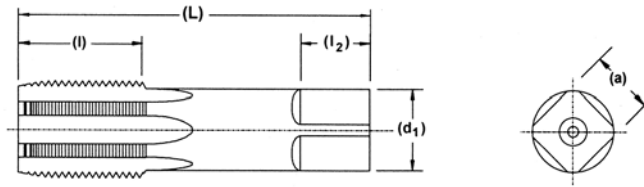
| Nominal Diameter Range - Inches | | Machine Screw Size No. | | Nominal Fractional Diameter Inches | Nominal Metric Diameter Millimeters, (in) | Blank Design No. | Tap Dimensions - Inches | | | | | |
|---------------------------------|-----------------|------------------------|----------------|------------------------------------|---|------------------|-------------------------|-----------------|------------------------------|------------------------------|---------------------------|------------------|
| | | | | | | | Overall Length L | Thread Length l | Thread Length l ₁ | Square Length l ₂ | Shank Dia. d ₁ | Size of Square a |
| Over 0.104 | To (Inc.) 0.117 | 4 | (0.1120) | - | - | 1 | 1.88 | 0.31 | 0.25 | 0.19 | 0.1410 | 0.1100 |
| 0.117 | 0.130 | 5 | (0.1250) | - | M3 (0.1181) | 1 | 1.94 | 0.31 | 0.31 | 0.19 | 0.1410 | 0.1100 |
| 0.130 | 0.145 | 6 | (0.1380) | - | M3.5 (0.1378) | 1 | 2.00 | 0.38 | 0.31 | 0.19 | 0.1410 | 0.1100 |
| 0.145 | 0.171 | 8 | (0.1640) | - | M4 (0.1575) | 1 | 2.13 | 0.38 | 0.38 | 0.25 | 0.1680 | 0.1310 |
| 0.171 | 0.197 | 10 | (0.1900) | - | M4.5 (0.1772), M5 (0.1969) | 1 | 2.38 | 0.50 | 0.38 | 0.25 | 0.1940 | 0.1520 |
| 0.197 | 0.223 | 12 | (0.2160) | - | - | 1 | 2.38 | 0.50 | 0.44 | 0.28 | 0.2200 | 0.1650 |
| 0.223 | 0.260 | - | 1/4 (0.2500) | 1/4 (0.2500) | M6 (0.2362) | 2 | 2.50 | 0.63 | 0.38 | 0.31 | 0.2550 | 0.1910 |
| 0.260 | 0.323 | - | 5/16 (0.3125) | 5/16 (0.3125) | M7 (0.2756), M8 (0.3150) | 2 | 2.72 | 0.69 | 0.44 | 0.38 | 0.3180 | 0.2380 |
| 0.323 | 0.395 | - | 3/8 (0.3750) | 3/8 (0.3750) | M10 (0.3937) | 2 | 2.94 | 0.75 | 0.50 | 0.44 | 0.3810 | 0.2860 |
| 0.395 | 0.448 | - | 7/16 (0.4375) | 7/16 (0.4375) | - | 3 | 3.16 | 0.88 | - | 0.41 | 0.3230 | 0.2420 |
| 0.448 | 0.510 | - | 1/2 (0.5000) | 1/2 (0.5000) | M12 (0.4724) | 3 | 3.38 | 0.94 | - | 0.44 | 0.3670 | 0.2750 |
| 0.510 | 0.573 | - | 9/16 (0.5625) | 9/16 (0.5625) | M14 (0.5512) | 3 | 3.59 | 1.00 | - | 0.50 | 0.4290 | 0.3220 |
| 0.573 | 0.635 | - | 5/8 (0.6250) | 5/8 (0.6250) | M16 (0.6299) | 3 | 3.81 | 1.09 | - | 0.56 | 0.4800 | 0.3600 |
| 0.635 | 0.709 | - | 11/16 (0.6875) | 11/16 (0.6875) | M18 (0.7087) | 3 | 4.03 | 1.09 | - | 0.63 | 0.5420 | 0.4060 |
| 0.709 | 0.760 | - | 3/4 (0.7500) | 3/4 (0.7500) | - | 3 | 4.25 | 1.22 | - | 0.69 | 0.5900 | 0.4420 |
| 0.760 | 0.823 | - | 13/16 (0.8125) | 13/16 (0.8125) | M20 (0.7874) | 3 | 4.47 | 1.22 | - | 0.69 | 0.6520 | 0.4890 |
| 0.823 | 0.885 | - | 7/8 (0.8750) | 7/8 (0.8750) | M22 (0.8661) | 3 | 4.69 | 1.34 | - | 0.75 | 0.6970 | 0.5230 |
| 0.885 | 0.948 | - | 15/16 (0.9375) | 15/16 (0.9375) | M24 (0.9449) | 3 | 4.91 | 1.34 | - | 0.75 | 0.7600 | 0.5700 |
| 0.948 | 1.010 | - | 1 (1.0000) | 1 (1.0000) | M25 (0.9843) | 3 | 5.13 | 1.50 | - | 0.81 | 0.8000 | 0.6000 |

NOTES

1. Thread Length "l" is based on a length of 12 pitches of the UNC thread series.
2. Thread Length "l" is a minimum value and has no tolerance.
3. When Thread Length "l" is added to Neck Length "l₁" the total shall be no less than the minimum Table 302 Thread Length "l".
4. Unless otherwise specified, all tolerances are in accordance with Table 302.
5. For eccentricity tolerances, see Table 317.

SPECIAL FINE PITCH TAPS / SHORT SERIES

Tap Dimensions, Ground Thread
(Ref. USCTI Table 303)



Unless otherwise specified, special taps 1.010" to 1.510" diameter inclusive, having 14 or more threads per inch or 1.75mm pitch and finer, and sizes over 1.510" diameter with 10 or more threads per inch, or 2.5mm pitch and finer, will be made to the general dimensions shown below:

| Nominal Diameter Range - Inches | | Nominal Fractional Diameter Inches | Nominal Metric Diameter Millimeters, (in) | Tap Dimensions - Inches | | | | |
|---------------------------------|-----------|------------------------------------|---|-------------------------|-----------------|------------------------------|---------------------------|------------------|
| Over | To (Inc.) | | | Overall Length L | Thread Length l | Square Length l ₂ | Shank Dia. d ₁ | Size of Square a |
| 1.010 | 1.073 | 1 1/16 | M27 | 4.00 | 1.50 | 0.88 | 0.8960 | 0.6720 |
| 1.073 | 1.135 | 1 1/8 | - | 4.00 | 1.50 | 0.88 | 0.8960 | 0.6720 |
| 1.135 | 1.198 | 1 3/16 | M30 | 4.00 | 1.50 | 1.00 | 1.0210 | 0.7660 |
| 1.198 | 1.260 | 1 1/4 | - | 4.00 | 1.50 | 1.00 | 1.0210 | 0.7660 |
| 1.260 | 1.323 | 1 5/16 | M33 | 4.00 | 1.50 | 1.00 | 1.1080 | 0.8310 |
| 1.323 | 1.385 | 1 3/8 | - | 4.00 | 1.50 | 1.00 | 1.1080 | 0.8310 |
| 1.385 | 1.448 | 1 7/16 | M36 | 4.00 | 1.50 | 1.00 | 1.2330 | 0.9250 |
| 1.448 | 1.510 | 1 1/2 | - | 4.00 | 1.50 | 1.00 | 1.2330 | 0.9250 |
| 1.510 | 1.635 | 1 5/8 | M39 | 5.00 | 2.00 | 1.13 | 1.3050 | 0.9790 |
| 1.635 | 1.760 | 1 3/4 | M42 | 5.00 | 2.00 | 1.25 | 1.4300 | 1.0720 |
| 1.760 | 1.885 | 1 7/8 | - | 5.00 | 2.00 | 1.25 | 1.5190 | 1.1390 |
| 1.885 | 2.010 | 2 | M48 | 5.00 | 2.00 | 1.38 | 1.6440 | 1.2330 |
| 2.010 | 2.135 | 2 1/8 | - | 5.25 | 2.00 | 1.38 | 1.7690 | 1.3270 |
| 2.135 | 2.260 | 2 1/4 | M56 | 5.25 | 2.00 | 1.44 | 1.8940 | 1.4200 |
| 2.260 | 2.385 | 2 3/8 | - | 5.25 | 2.00 | 1.44 | 2.0190 | 1.5140 |
| 2.385 | 2.510 | 2 1/2 | - | 5.25 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 2.510 | 2.635 | 2 5/8 | M64 | 5.50 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 2.635 | 2.760 | 2 3/4 | - | 5.50 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 2.760 | 2.885 | 2 7/8 | M72 | 5.50 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 2.885 | 3.010 | 3 | - | 5.50 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 3.010 | 3.135 | 3 1/8 | - | 5.75 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 3.135 | 3.260 | 3 1/4 | M80 | 5.75 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 3.260 | 3.385 | 3 3/8 | - | 5.75 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 3.385 | 3.510 | 3 1/2 | - | 5.75 | 2.00 | 1.50 | 2.1000 | 1.5750 |
| 3.510 | 3.635 | 3 5/8 | M90 | 6.00 | 2.00 | 1.75 | 2.1000 | 1.5750 |
| 3.635 | 3.760 | 3 3/4 | - | 6.00 | 2.00 | 1.75 | 2.1000 | 1.5750 |
| 3.760 | 3.885 | 3 7/8 | - | 6.00 | 2.00 | 1.75 | 2.1000 | 1.5750 |
| 3.885 | 4.010 | 4 | M100 | 6.00 | 2.00 | 1.75 | 2.1000 | 1.5750 |

NOTES

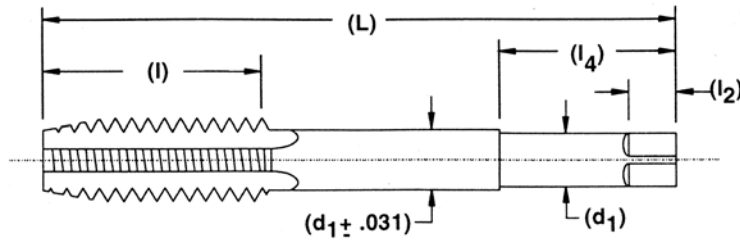
- For tolerances see Table 302.
- For standard thread limits and tolerances for Unified Inch Screw Threads see Table 327A.
- For standard thread limits and tolerances for Metric Threads see Tables 337 and 341.
- For eccentricity tolerances of tap elements see Table 317.

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THREAD MILLS & TAPS
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SPECIAL EXTENSION TAPS

Ground Thread

(Ref. USCTI Table 303-A)



Unless otherwise specified, special extension taps will be furnished with dimensions and tolerances as shown for Machine Screw and Fractional taps in Tables 302 and 303, and for Pipe taps in Table 311.

Exceptions:

1. Types of centers are optional with manufacturer.
2. Tolerances on shank diameter d_1 for l_4 length as shown in the following table.
3. Shank eccentricity tolerance in Table 317 applies only to the l_4 length shown in the following table.
4. Length of Close Tolerance Shank, (L_4) is minimum.

| Nominal Tap Size | | Thread Length l | Shank Dia. d_1 | Square Length l_2 | Size of Square | Ground Shank Length l_4 |
|------------------|---------------|-------------------|------------------|---------------------|----------------|---------------------------|
| Fractional | Machine Screw | | | | | |
| - | 6 | 0.688 | 0.141 | 0.188 | 0.110 | 1.13 |
| - | 8 | 0.750 | 0.168 | 0.250 | 0.131 | 1.25 |
| - | 10 - 12 | 0.875 | 0.194 | 0.250 | 0.152 | 1.38 |
| 1/4 | 14 | 1.000 | 0.255 | 0.313 | 0.191 | 1.50 |
| 1/4* | - | 1.000 | 0.185 | 0.250 | 0.138 | Full Length |
| 5/16 | - | 1.130 | 0.318 | 0.375 | 0.238 | 1.56 |
| 5/16* | - | 1.130 | 0.240 | 0.281 | 0.180 | Full Length |
| 3/8 | - | 1.250 | 0.381 | 0.438 | 0.286 | 1.63 |
| 3/8* | - | 1.250 | 0.275 | 0.375 | 0.206 | Full Length |
| 7/16 | - | 1.440 | 0.323 | 0.406 | 0.242 | 1.69 |
| 1/2 | - | 1.660 | 0.367 | 0.438 | 0.275 | 1.69 |
| 9/16 | - | 1.660 | 0.429 | 0.500 | 0.322 | 1.88 |
| 5/8 | - | 1.810 | 0.480 | 0.563 | 0.360 | 2.00 |
| 3/4 | - | 2.000 | 0.590 | 0.688 | 0.442 | 2.25 |
| 7/8 | - | 2.220 | 0.697 | 0.750 | 0.523 | 2.50 |
| 1 | - | 2.500 | 0.800 | 0.813 | 0.600 | 2.63 |
| 1-1/8 | - | 2.560 | 0.896 | 0.875 | 0.672 | 2.75 |
| 1-1/4 | - | 2.560 | 1.021 | 1.000 | 0.766 | 2.88 |
| 1-3/8 | - | 3.000 | 1.108 | 1.063 | 0.831 | 3.00 |
| 1-1/2 | - | 3.000 | 1.233 | 1.125 | 0.925 | 3.00 |

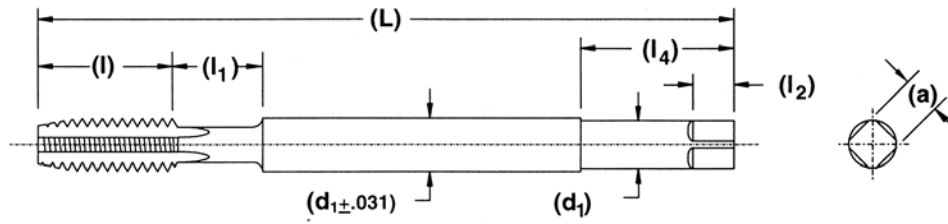
* Small Shank

Tolerances
for Shank Diameter, d_1 and l_4 length

| Size Range | | Direction | Tolerance (in) |
|----------------------|---------------|-----------|----------------|
| Fractional | Machine Screw | | |
| 1/4 to 5/8 incl. | 0 - 14 incl. | Minus | 0.003 |
| 11/16 to 1-1/2 incl. | | Minus | 0.004 |

PULLEY TAP DIMENSIONS

Tap Dimensions, Ground Thread
(Ref. USCTI Table 310)



| Nominal Fractional Diameter Inches | Tap Dimensions - Inches | | | | | | |
|------------------------------------|-------------------------|-------------------|-------------------|---------------------|--|------------------|--------------------|
| | Overall Length L | Thread Length l | Neck Length l_1 | Square Length l_2 | Length of Shank Close Tol. Section l_4 | Shank Dia. d_1 | Size of Square a |
| 1/4 (.2500) | 6,8 | 1.00 | 0.38 | 0.31 | 1.50 | 0.2550 | 0.1910 |
| 5/16 (.3125) | 6,8 | 1.13 | 0.38 | 0.38 | 1.56 | 0.3180 | 0.2380 |
| 3/8 (.3750) | 6, 8, 10 | 1.25 | 0.38 | 0.44 | 1.63 | 0.3810 | 0.2860 |
| 7/16 (.4375) | 6,8 | 1.44 | 0.44 | 0.50 | 1.69 | 0.4440 | 0.3330 |
| 1/2 (.5000) | 6, 8, 10, 12 | 1.66 | 0.50 | 0.56 | 1.69 | 0.5070 | 0.3800 |
| 5/8 (.6250) | 6, 8, 10, 12 | 1.81 | 0.63 | 0.69 | 2.00 | 0.6330 | 0.4750 |
| 3/4 (.7500) | 10, 12 | 2.00 | 0.75 | 0.75 | 2.25 | 0.7590 | 0.5690 |

Tolerances

| Element | Size Range | Direction | Tolerance |
|--------------------------------------|-----------------|---------------|--------------|
| Overall Length - L | 1/4 to 3/4 inc. | Plus or Minus | 0.063 |
| Thread Length - l | 1/4 to 3/4 inc. | Plus or Minus | 0.063 |
| Neck Length - l_1 | 1/4 to 3/4 inc. | See Note - 1 | See Note - 1 |
| Square Length - l_2 | 1/4 to 3/4 inc. | Plus or Minus | 0.031 |
| Length of Shank (close tol.) - l_4 | 1/4 to 3/4 inc. | See Note - 2 | See Note - 2 |
| Shank Diameter - d_1 | 1/4 to 3/4 inc. | Minus | 0.005 |
| Size of Square - a | 1/4 to 1/2 inc. | Minus | 0.004 |
| | 5/8 to 3/4 inc. | Minus | 0.006 |

NOTES

1. l_1 , (Neck Length); neck and its length is optional with manufacturer.
2. l_4 , (Length of Close Tolerance Shank) is minimum length which is held to eccentricity tolerances per Table 317.

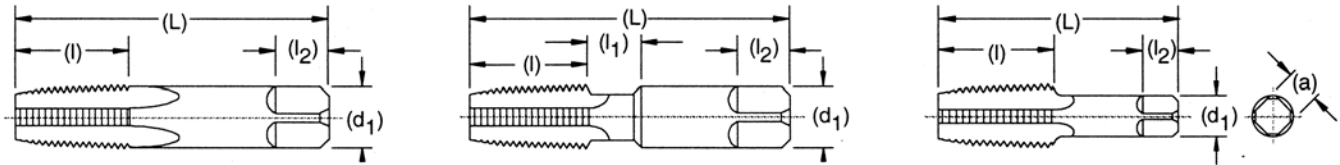
GENERAL NOTES

- a. These taps have an internal center in the thread end.
- b. These taps are made to the H3 limits shown in Table 327.
- c. For eccentricity tolerances of taps elements see Table 317.
- d. d_1 , (Shank diameter) is approximately the same as the maximum major diameter for that size.
- e. a , (Size of Square) is equal to $.75 \times d_1$ to the nearest .001 inch.

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STANDARD PIPE TAP / STRAIGHT & TAPER

Ground Thread
(Ref. USCTI Table 311)



Tap Dimensions - Inches

| Nominal Size Inches | Overall Length L | Thread Length l | Square Length l ₂ | Shank Dia. d ₁ | Size of Square a | Optional Neck Length l ₁ |
|---------------------|------------------|-----------------|------------------------------|---------------------------|------------------|-------------------------------------|
| 1/16 | 2.13 | 0.69 | 0.38 | 0.3125 | 0.2340 | 0.3750 |
| 1/8* | 2.13 | 0.75 | 0.38 | 0.3125 | 0.2340 | - |
| 1/8 | 2.13 | 0.75 | 0.38 | 0.4375 | 0.3280 | 0.3750 |
| 1/4 | 2.44 | 1.06 | 0.44 | 0.5625 | 0.4210 | 0.3750 |
| 3/8 | 2.56 | 1.06 | 0.50 | 0.7000 | 0.5310 | 0.3750 |
| 1/2 | 3.13 | 1.38 | 0.63 | 0.6875 | 0.5150 | - |
| 3/4 | 3.25 | 1.38 | 0.69 | 0.9063 | 0.6790 | - |
| 1 | 3.75 | 1.75 | 0.81 | 1.1250 | 0.8430 | - |
| 1-1/4 | 4.00 | 1.75 | 0.94 | 1.3125 | 0.9840 | - |
| 1-1/2 | 4.25 | 1.75 | 1.00 | 1.5000 | 1.1250 | - |
| 2 | 4.50 | 1.75 | 1.13 | 1.8750 | 1.4060 | - |
| 2-1/2 | 5.50 | 2.56 | 1.25 | 2.2500 | 1.6870 | - |
| 3 | 6.00 | 2.63 | 1.38 | 2.6250 | 1.9680 | - |
| 3-1/2 | 6.50 | 2.69 | 1.50 | 2.8125 | 2.1080 | - |
| 4 | 6.75 | 2.75 | 1.56 | 3.0000 | 2.2500 | - |

* Small Shank

Tolerances

| Element | Size Range | Direction | Tolerance |
|---------------------------------|------------------|---------------|-----------|
| Overall Length - L | 1/16 to 3/4 inc. | Plus or Minus | 0.0310 |
| | 1 to 4 inc. | Plus or Minus | 0.0630 |
| Thread Length - l | 1/16 to 3/4 inc. | Plus or Minus | 0.0630 |
| | 1 to 1-1/4 inc. | Plus or Minus | 0.0940 |
| | 1-1/2 to 4 | Plus or Minus | 0.1250 |
| Square Length - l ₂ | 1/16 to 3/4 inc. | Plus or Minus | 0.0310 |
| | 1 to 4 inc. | Plus or Minus | 0.0630 |
| Shank Diameter - d ₁ | 1/16 to 1/8 | Minus | 0.0015 |
| | 1/4 to 1 inc. | Minus | 0.0020 |
| | 1-1/4 to 4 inc. | Minus | 0.0030 |
| Size of Square - a | 1/16 to 1/8 | Minus | 0.0040 |
| | 1/4 to 3/4 inc. | Minus | 0.0060 |
| | 1 to 4 inc. | Minus | 0.0080 |

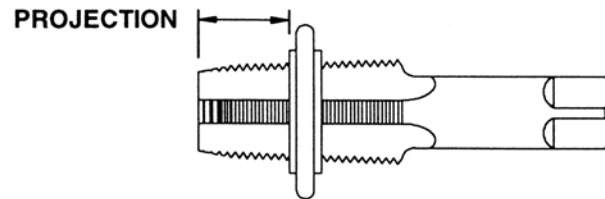
NOTE: For thread limits and tolerances see USCTI Tables 335, 335A and 338. For eccentricity tolerances of taps see Table 317.

TAPER PIPE TAP / THREAD LIMITS

Ground Thread

(Ref. USCTI Table 338)

- American National Standard Taper Pipe Thread Form (NPT)
- Aeronautical National Taper Pipe Thread Form (ANPT)
- Dryseal American National Standard Taper Pipe Thread Form (NPTF)



| Tap Thread Limits | | | | | | | |
|---------------------|------------------|--------------------|-----------------------------|-----------------------|--------|-----------------------|-----------------------------------|
| Nominal Size Inches | Threads Per Inch | Projection* Inches | Projection Tolerance + or - | Taper Per Foot Limits | | Length L ₁ | Tap Drill Size ** NPT, ANPT, NPTF |
| | | | | MIN | MAX | | |
| 1/16 | 27 | 0.3120 | 0.0630 | 0.7190 | 0.7810 | 0.1600 | C |
| 1/8 | 27 | 0.3120 | 0.0630 | 0.7190 | 0.7810 | 0.1615 | Q |
| 1/4 | 18 | 0.4590 | 0.0630 | 0.7190 | 0.7810 | 0.2278 | 7/16 |
| 3/8 | 18 | 0.4540 | 0.0630 | 0.7190 | 0.7810 | 0.2400 | 9/16 |
| 1/2 | 14 | 0.5790 | 0.0630 | 0.7190 | 0.7810 | 0.3200 | 45/64 |
| 3/4 | 14 | 0.5650 | 0.0630 | 0.7190 | 0.7810 | 0.3390 | 29/32 |
| 1 | 11-1/2 | 0.6780 | 0.0940 | 0.7190 | 0.7810 | 0.4000 | 1-9/64 |
| 1-1/4 | 11-1/2 | 0.6860 | 0.0940 | 0.7190 | 0.7810 | 0.4200 | 1-31/64 |
| 1-1/2 | 11-1/2 | 0.6990 | 0.0940 | 0.7190 | 0.7810 | 0.4200 | 1-23/32 |
| 2 | 11-1/2 | 0.6670 | 0.0940 | 0.7190 | 0.7810 | 0.4360 | 2-3/16 |
| 2-1/2 | 8 | 0.9250 | 0.0940 | 0.7340 | 0.7810 | 0.6820 | 2-39/64 |
| 3 | 8 | 0.9250 | 0.0940 | 0.7340 | 0.7810 | 0.7660 | 3-15/64 |
| 3-1/2 | 8 | 0.9380 | 0.1250 | 0.7340 | 0.7810 | 0.8210 | - |
| 4 | 8 | 0.9500 | 0.1250 | 0.7340 | 0.7810 | 0.8440 | - |

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

A maximum lead deviation of plus or minus .0005" within any two threads not farther than 1" is permitted.

ECCENTRICITY TOLERANCES OF TAP ELEMENTS

When Tested on Dead Centers
(Ref. USCTI Table 317)

Applicable to Tables 302, 303, 303A, and 311

| Element | Size Range | | | Ground Thread | |
|---------------------------------------|--------------------|------------|--------------------|---------------|---------|
| | Inch & Mach. Screw | Pipe | Metric | Eccentricity | t.i.v.* |
| Square (at central point) | #0 - 1/2 | 1/16 - 1/8 | M1.6 - M12 | 0.0030 | 0.0060 |
| | Over 1/2 Thru 4 | 1/4 - 4 | Over M12 Thru M100 | 0.0040 | 0.0080 |
| Shank | #0 - 5/16 | 1/16 | M1.6 - M8 | 0.0005 | 0.0010 |
| | Over 5/16 Thru 4 | 1/8 - 4 | Over M8 Thru M100 | 0.0008 | 0.0016 |
| Major Diameter | #0 - 5/16 | 1/16 | M1.6 - M8 | 0.0005 | 0.0010 |
| | Over 5/16 Thru 4 | 1/8 - 4 | Over M8 Thru M100 | 0.0008 | 0.0016 |
| Pitch Diameter (at first full thread) | #0 - 1/2 | 1/16 | M1.6 - M8 | 0.0005 | 0.0010 |
| | Over 1/2 Thru 4 | 1/8 - 4 | Over M8 Thru M100 | 0.0008 | 0.0016 |
| Chamfer ** | #0 - 1/2 | 1/16 - 1/8 | M1.6 - M12 | 0.0010 | 0.0020 |
| | Over 1/2 Thru 4 | 1/4 - 4 | Over M12 Thru M100 | 0.0015 | 0.0030 |

* t.i.v. = Total indicator variation. Figures are given for both eccentricity and total indicator variation to avoid misunderstanding.

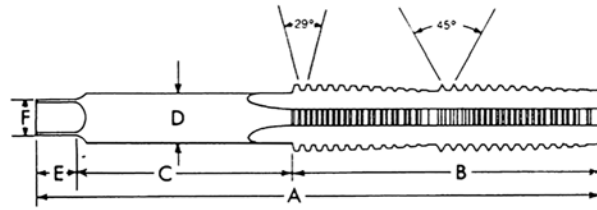
** Chamfer should preferably be inspected by light projection to avoid errors due to indicator contact points dropping into the grooves.

COATING ABBREVIATIONS

See **Page 196** for Coating Recommendations

| | | | |
|---------------|---------------------------|---------------|---------------------------|
| CrN: | Chromium Nitride | TiAlN: | Titanium Aluminum Nitride |
| N: | Nitride | TiCN: | Titanium Carbonitride |
| N + O: | Nitride + Oxide | TiN: | Titanium Nitride |
| O: | Stream Oxide | WC/C: | Tungsten Carbide / Carbon |
| AlCrN | Aluminum Chromium Nitride | DLC: | Diamond-like Carbon |

TANDEM ACME TAP DIMENSIONS



| Size & Pitch | Overall Length A | Thread Length B | Round Shank | | Square | | Maximum Depth of Nut | |
|--------------|------------------|-----------------|-------------|------------|----------|----------------|----------------------|-------------------|
| | | | Length C | Diameter D | Length E | Across Flats F | Bronze & Steel | Brass & Cast Iron |
| 1/4-16 | 3 | 13/4 | 1 | 0.185 | 1/4 | 0.138 | 1/2 | 3/4 |
| 5/16-14 | 3 13/32 | 17/8 | 1 1/4 | 0.220 | 9/32 | 0.165 | 5/8 | 7/8 |
| 3/8-12 | 4 1/16 | 21/8 | 15/8 | 0.255 | 5/16 | 0.191 | 5/8 | 1 |
| 1/2-10 | 5 | 2 9/16 | 2 | 0.367 | 7/16 | 0.275 | 1 | 1 1/2 |
| 5/8-8 | 6 1/4 | 3 3/16 | 2 1/2 | 0.480 | 9/16 | 0.360 | 1 1/4 | 1 7/8 |
| 3/4-6 | 7 15/16 | 4 5/16 | 3 | 0.542 | 5/8 | 0.406 | 1 1/2 | 2 1/4 |
| 7/8-6 | 8 5/8 | 4 3/8 | 3 1/2 | 0.697 | 3/4 | 0.523 | 1 3/4 | 2 5/8 |
| 1-5 | 10 1/8 | 5 1/4 | 4 | 0.697 | 3/4 | 0.523 | 2 | 3 |
| 1 1/8-5 | 10 3/4 | 5 1/4 | 4 1/2 | 0.800 | 13/16 | 0.600 | 2 1/4 | 3 3/8 |
| 1 1/4-5 | 11 1/8 | 5 1/4 | 4 3/4 | 0.896 | 7/8 | 0.672 | 2 1/2 | 3 3/4 |
| 1 3/8-4 | 12 1/4 | 5 7/8 | 5 1/8 | 1.108 | 1 1/4 | 0.831 | 2 3/4 | 4 1/8 |
| 1 1/2-4 | 12 5/8 | 5 7/8 | 5 1/2 | 1.233 | 1 1/4 | 0.925 | 3 | 4 1/2 |
| 1 3/4-4 | 13 3/8 | 5 7/8 | 6 1/4 | 1.430 | 1 1/4 | 1.072 | 3 1/2 | 5 |
| 2-4 | 14 7/8 | 6 1/2 | 7 | 1.644 | 1 3/8 | 1.233 | 4 | 6 |

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

- INDEX
- TECHNICAL
- SAWS
- REAMERS
- BORING BARS
- ENGRAVERS
- THREAD MILLS & TAPS
- ROUTERS
- END MILLS
- DRILLS

ENGRAVERS

210 - 212

MICRO ENGRAVING TOOLS 210

| | | | |
|------------|---------|------------------|-----|
| SERIES EGR | 2 Flute | 30° - 90° Angles | 210 |
|------------|---------|------------------|-----|

MICRO HALF ROUND ENGRAVING TOOLS 211

| | | | |
|-----------|---------|------------------------------|-----|
| SERIES HR | 1 Flute | 0.005" - 0.0315" Line Widths | 211 |
|-----------|---------|------------------------------|-----|

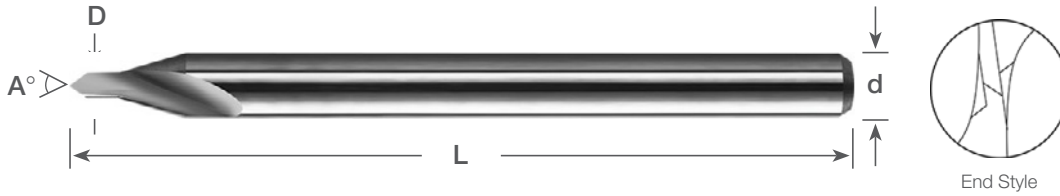
MICRO SPADE TOOLS 212

| | | | |
|------------|---------|-------------------|-----|
| SERIES SPD | 2 Flute | 30° - 118° Angles | 212 |
|------------|---------|-------------------|-----|

2 FLUTE

MICRO ENGRAVING TOOLS FOR GENERAL PURPOSE ENGRAVING

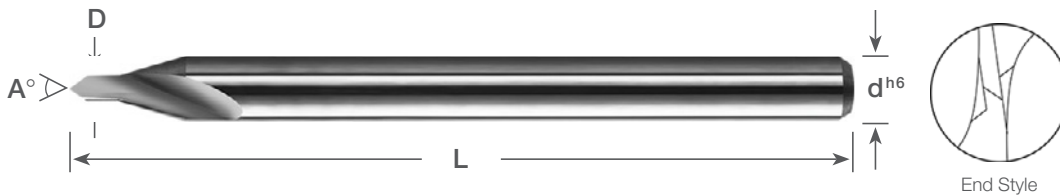
30° - 90° ANGLES
 Complete Diameter Selection
 Mirror Surface Finishes
 Sub Micron Grain Carbide



1/8" Shank

Symbol Descriptions [Page 7](#)

| A° $\begin{smallmatrix} +1^\circ \\ -1^\circ \end{smallmatrix}$ | Dimensions (in) | | | Uncoated | |
|---|-----------------|-----|-------|-------------|-------|
| | D | d | L | Part Number | Stock |
| 30° | 0.050 | 1/8 | 1 1/2 | EGR1250-030 | ● |
| 60° | 0.050 | 1/8 | 1 1/2 | EGR1250-060 | ● |
| 90° | 0.050 | 1/8 | 1 1/2 | EGR1250-090 | ● |



3.00mm Shank

Symbol Descriptions [Page 7](#)

| A° $\begin{smallmatrix} +1^\circ \\ -1^\circ \end{smallmatrix}$ | Dimensions (mm) | | | Uncoated | |
|---|-----------------|-----------------|----|-------------|-------|
| | D | d ^{h6} | L | Part Number | Stock |
| 30° | 1.27 | 3 | 38 | EGR1181-030 | ● |
| 60° | 1.27 | 3 | 38 | EGR1181-060 | ● |
| 90° | 1.27 | 3 | 38 | EGR1181-090 | ● |

SERIES EGR WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | | ☆ | ☆ |

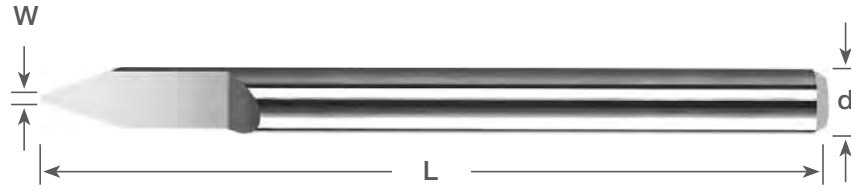
★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

HALF ROUND

MICRO ENGRAVING TOOLS FOR
GENERAL PURPOSE ENGRAVING

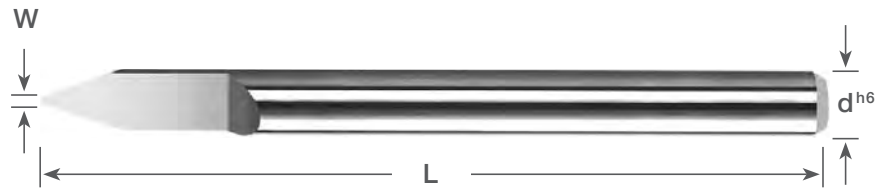
0.0050" - 0.0315" LINE WIDTHS
0.25mm - 0.80mm LINE WIDTHS
Complete Diameter Selection
Mirror Surface Finishes
Sub Micron Grain Carbide



1/8" Shank

Symbol Descriptions [Page 7](#)

| Letter Height | Dimensions (in) | | | Uncoated | |
|---------------|---|-----|-------|--------------|-------|
| | W ^{+0.0004"} _{-0.0004"} | d | L | Part Number | Stock |
| 1/16 | 0.005 | 1/8 | 1 1/2 | HR125SSS005A | ● |
| 3/32 | 0.010 | 1/8 | 1 1/2 | HR125SSS010A | ● |
| 1/8 | 0.015 | 1/8 | 1 1/2 | HR125SSS015A | ● |
| 3/16 | 0.020 | 1/8 | 1 1/2 | HR125SSS020A | ● |
| 7/32 | 0.025 | 1/8 | 1 1/2 | HR125SSS025A | ● |



3.00mm Shank

Symbol Descriptions [Page 7](#)

| Letter Height | Dimensions (mm) | | | Uncoated | |
|---------------|---|-----------------|----|--------------|-------|
| | W ^{+0.010mm} _{-0.010mm} | d ^{h6} | L | Part Number | Stock |
| 2.40 | 0.25 | 3 | 38 | HR118SSS025A | ● |
| 2.75 | 0.30 | 3 | 38 | HR118SSS030A | ● |
| 3.10 | 0.35 | 3 | 38 | HR118SSS035A | ● |
| 3.45 | 0.40 | 3 | 38 | HR118SSS040A | ● |
| 3.80 | 0.45 | 3 | 38 | HR118SSS045A | ● |
| 4.75 | 0.50 | 3 | 38 | HR118SSS050A | ● |
| 5.50 | 0.60 | 3 | 38 | HR118SSS060A | ● |
| 6.25 | 0.70 | 3 | 38 | HR118SSS070A | ● |
| 7.00 | 0.80 | 3 | 38 | HR118SSS080A | ● |

| SERIES HR WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|------------------------------|-----------------|--------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

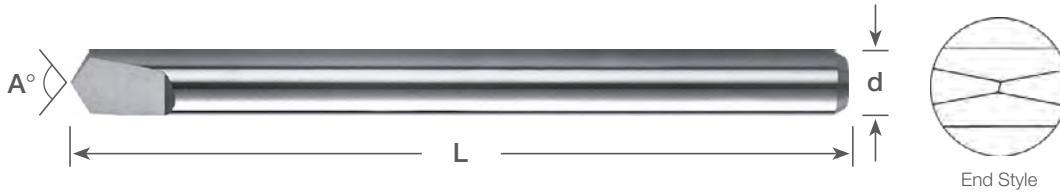
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(International) 001.714.428.3636
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ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

SPADE

MICRO ENGRAVING TOOLS FOR SPOTTING OR CHAMFERING

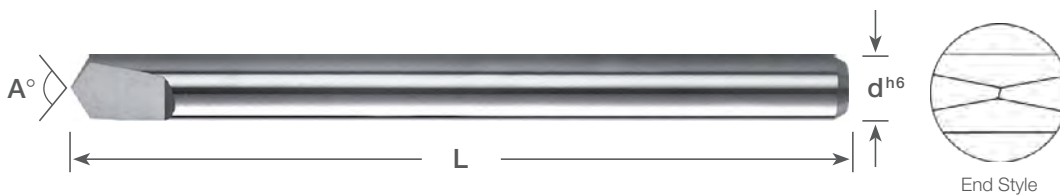
30° - 118° ANGLES
Mirror Surface Finishes
Sub Micron Grain Carbide



1/8" Shank

Symbol Descriptions [Page 7](#)

| A° ^{+1°} / _{-1°} | Dimensions (in) | | Uncoated | |
|------------------------------------|-----------------|-------|-------------|-------|
| | d | L | Part Number | Stock |
| 30° | 1/8 | 1 1/2 | SPD1250-030 | ● |
| 45° | 1/8 | 1 1/2 | SPD1250-045 | ● |
| 60° | 1/8 | 1 1/2 | SPD1250-060 | ● |
| 90° | 1/8 | 1 1/2 | SPD1250-090 | ● |
| 118° | 1/8 | 1 1/2 | SPD1250-118 | ● |



3.00mm Shank

Symbol Descriptions [Page 7](#)

| A° ^{+1°} / _{-1°} | Dimensions (mm) | | Uncoated | |
|------------------------------------|-----------------|----|-------------|-------|
| | d ^{h6} | L | Part Number | Stock |
| 30° | 3 | 38 | SPD1181-030 | ● |
| 45° | 3 | 38 | SPD1181-045 | ● |
| 60° | 3 | 38 | SPD1181-060 | ● |
| 90° | 3 | 38 | SPD1181-090 | ● |
| 118° | 3 | 38 | SPD1181-118 | ● |

| SERIES SPD WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ☆ | ☆ | ☆ | | ☆ | ☆ | ☆ | ☆ | | | | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

BORING BARS

214 - 217

| MICRO BORING BARS | | | 214 - 217 |
|-------------------|------------------------|-----------------|-----------|
| SERIES MBS | 0.0150" - 0.2400" Dia. | Standard Length | 214 |
| SERIES MBS | 0.40mm - 6.00mm Dia. | Standard Length | 215 |
| SERIES MBE | 0.0150" - 0.2400" Dia. | Extended Length | 216 |
| SERIES MBE | 0.40mm - 6.00mm Dia. | Extended Length | 217 |

* Custom Boring Bars and Groove Tools available upon request.

STANDARD LENGTH

INTERNAL DIAMETER PROFILE BORING

0.0150" - 0.2400" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD LENGTH (Inch Sizes)

Symbol Descriptions [Page 7](#)

| D ^{+0.0000} -0.0025 | Dimensions (in) | | | Uncoated | | AlTiN Coating | |
|---------------------------------|-----------------|----------------|-------|---------------|-------|---------------|-------|
| | d | L ₁ | L | Part Number | Stock | Part Number | Stock |
| 0.0150 | 1/8 | 0.030 | 1 1/2 | MBS-0150.030 | ● | MBS-0150L030 | ● |
| 0.0200 | 1/8 | 0.030 | 1 1/2 | MBS-0200.030 | ● | MBS-0200L030 | ● |
| 0.0250 | 1/8 | 0.050 | 1 1/2 | MBS-0250.050 | ● | MBS-0250L050 | ● |
| 0.0300 | 1/8 | 0.050 | 1 1/2 | MBS-0300.050 | ● | MBS-0300L050 | ● |
| 0.0350 | 1/8 | 0.050 | 1 1/2 | MBS-0350.050 | ● | MBS-0350L050 | ● |
| 0.0400 | 1/8 | 0.050 | 1 1/2 | MBS-0400.050 | ● | MBS-0400L050 | ● |
| 0.0450 | 1/8 | 0.100 | 1 1/2 | MBS-0450.100 | ● | MBS-0450L100 | ● |
| 0.0500 | 1/8 | 0.100 | 1 1/2 | MBS-0500.100 | ● | MBS-0500L100 | ● |
| 0.0550 | 1/8 | 0.100 | 1 1/2 | MBS-0550.100 | ● | MBS-0550L100 | ● |
| 0.0600 | 1/8 | 0.100 | 1 1/2 | MBS-0600.100 | ● | MBS-0600L100 | ● |
| 0.0800 | 1/8 | 0.250 | 1 1/2 | MBS-0800.250 | ● | MBS-0800L250 | ● |
| 0.1000 | 1/8 | 0.375 | 1 1/2 | MBS-1000.375 | ● | MBS-1000L375 | ● |
| 0.1100 | 1/8 | 0.500 | 1 1/2 | MBS-1100.500 | ● | MBS-1100L500 | ● |
| 0.1200 | 3/16 | 0.600 | 2 | MBS-1200.600 | ● | MBS-1200L600 | ● |
| 0.1400 | 3/16 | 0.700 | 2 | MBS-1400.700 | ● | MBS-1400L700 | ● |
| 0.1600 | 3/16 | 0.800 | 2 1/2 | MBS-1600.800 | ● | MBS-1600L800 | ● |
| 0.1800 | 1/4 | 0.900 | 2 1/2 | MBS-1800.900 | ● | MBS-1800L900 | ● |
| 0.2000 | 1/4 | 1.000 | 3 | MBS-2000.1000 | ● | MBS-2000L1000 | ● |
| 0.2200 | 1/4 | 1.250 | 3 | MBS-2200.1250 | ● | MBS-2200L1250 | ● |
| 0.2400 | 1/4 | 1.500 | 3 | MBS-2400.1500 | ● | MBS-2400L1500 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

SERIES MBS WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | ☆ | ☆ | ☆ |
| Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

STANDARD LENGTH

INTERNAL DIAMETER PROFILE BORING

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



STANDARD LENGTH (Metric Sizes)

Symbol Descriptions Page 7

| Dimensions (mm) | | | | Uncoated | | AlTiN Coating | |
|-----------------------|----------|-------|-----|---------------|-------|---------------|-------|
| $D^{+0.00}_{-0.06mm}$ | d^{h6} | L_1 | L | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 1 | 38 | MBS-0157.039 | ● | MBS-0157L039 | ● |
| 0.50 | 3 | 1 | 38 | MBS-0197.039 | ● | MBS-0197L039 | ● |
| 0.60 | 3 | 1.3 | 38 | MBS-0236.051 | ● | MBS-0236L051 | ● |
| 0.70 | 3 | 1.3 | 38 | MBS-0276.051 | ● | MBS-0276L051 | ● |
| 0.80 | 3 | 1.3 | 38 | MBS-0315.051 | ● | MBS-0315L051 | ● |
| 0.90 | 3 | 1.3 | 38 | MBS-0354.051 | ● | MBS-0354L051 | ● |
| 1.00 | 3 | 2.5 | 38 | MBS-0394.098 | ● | MBS-0394L098 | ● |
| 1.10 | 3 | 2.5 | 38 | MBS-0433.098 | ● | MBS-0433L098 | ● |
| 1.20 | 3 | 2.5 | 38 | MBS-0472.098 | ● | MBS-0472L098 | ● |
| 1.30 | 3 | 2.5 | 38 | MBS-0512.098 | ● | MBS-0512L098 | ● |
| 1.50 | 3 | 6 | 38 | MBS-0591.236 | ● | MBS-0591L236 | ● |
| 1.70 | 3 | 7 | 38 | MBS-0669.276 | ● | MBS-0669L276 | ● |
| 2.00 | 3 | 8 | 38 | MBS-0787.315 | ● | MBS-0787L315 | ● |
| 3.00 | 5 | 15 | 50 | MBS-1181.591 | ● | MBS-1181L591 | ● |
| 3.50 | 5 | 20 | 50 | MBS-1378.787 | ● | MBS-1378L787 | ● |
| 4.00 | 5 | 22 | 50 | MBS-1575.866 | ● | MBS-1575L866 | ● |
| 4.50 | 8 | 23 | 65 | MBS-1772.906 | ● | MBS-1772L906 | ● |
| 5.00 | 8 | 25 | 65 | MBS-1969.984 | ● | MBS-1969L984 | ● |
| 5.50 | 8 | 27 | 65 | MBS-2165.1063 | ● | MBS-2165L1063 | ● |
| 6.00 | 8 | 29 | 65 | MBS-2362.1142 | ● | MBS-2362L1142 | ● |

| SERIES MBS WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|-------------------------------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | | ☆ | ☆ |
| Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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EXTENDED REACH

INTERNAL DIAMETER PROFILE BORING

0.0150" - 0.2400" DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



EXTENDED REACH (Inch Sizes)

Symbol Descriptions [Page 7](#)

| D ^{+0.0000} -0.0025 | Dimensions (in) | | | Uncoated | | AlTiN Coating | |
|---------------------------------|-----------------|----------------|-------|---------------|-------|---------------|-------|
| | d | L ₁ | L | Part Number | Stock | Part Number | Stock |
| 0.0150 | 1/8 | 0.075 | 1 1/2 | MBE-0150.075 | ● | MBE-0150L075 | ● |
| 0.0200 | 1/8 | 0.075 | 1 1/2 | MBE-0200.075 | ● | MBE-0200L075 | ● |
| 0.0250 | 1/8 | 0.125 | 1 1/2 | MBE-0250.125 | ● | MBE-0250L125 | ● |
| 0.0300 | 1/8 | 0.125 | 1 1/2 | MBE-0300.125 | ● | MBE-0300L125 | ● |
| 0.0350 | 1/8 | 0.125 | 1 1/2 | MBE-0350.125 | ● | MBE-0350L125 | ● |
| 0.0400 | 1/8 | 0.125 | 1 1/2 | MBE-0400.125 | ● | MBE-0400L125 | ● |
| 0.0450 | 1/8 | 0.250 | 1 1/2 | MBE-0450.250 | ● | MBE-0450L250 | ● |
| 0.0500 | 1/8 | 0.250 | 1 1/2 | MBE-0500.250 | ● | MBE-0500L250 | ● |
| 0.0550 | 1/8 | 0.250 | 1 1/2 | MBE-0550.250 | ● | MBE-0550L250 | ● |
| 0.0600 | 1/8 | 0.250 | 1 1/2 | MBE-0600.250 | ● | MBE-0600L250 | ● |
| 0.0800 | 1/8 | 0.500 | 1 1/2 | MBE-0800.500 | ● | MBE-0800L500 | ● |
| 0.1000 | 1/8 | 0.600 | 1 1/2 | MBE-1000.600 | ● | MBE-1000L600 | ● |
| 0.1100 | 1/8 | 0.700 | 1 1/2 | MBE-1100.700 | ● | MBE-1100L700 | ● |
| 0.1200 | 3/16 | 0.850 | 2 | MBE-1200.850 | ● | MBE-1200L850 | ● |
| 0.1400 | 3/16 | 0.900 | 2 | MBE-1400.900 | ● | MBE-1400L900 | ● |
| 0.1600 | 3/16 | 1.100 | 2 1/2 | MBE-1600.1100 | ● | MBE-1600L1100 | ● |
| 0.1800 | 1/4 | 1.250 | 2 1/2 | MBE-1800.1250 | ● | MBE-1800L1250 | ● |
| 0.2000 | 1/4 | 1.400 | 3 | MBE-2000.1400 | ● | MBE-2000L1400 | ● |
| 0.2200 | 1/4 | 1.500 | 3 | MBE-2200.1500 | ● | MBE-2200L1500 | ● |
| 0.2400 | 1/4 | 1.750 | 3 | MBE-2400.1750 | ● | MBE-2400L1750 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

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SERIES MBE WORKPIECE MATERIAL

| Coating | P Steel -30HRC | P Steel 30-40HRC | H Hardened Steel -55HRC | H Hardened Steel -68HRC | M Stainless Steel | K Cast Iron | N Aluminum | N Graphite | N Copper Alloy | N CFRP | N Plastic | N Thermoset Plastic | N High Density Plastic | S Nickel / Cobalt | S Titanium Alloy |
|----------|----------------------|------------------------|-------------------------------|-------------------------------|----------------------|----------------|---------------|---------------|-------------------|-----------|--------------|------------------------|---------------------------|----------------------|---------------------|
| AlTiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | ☆ | | | | ☆ | ☆ | ☆ |
| Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | ☆ | | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

EXTENDED REACH

INTERNAL DIAMETER PROFILE BORING

0.40mm - 6.00mm DIAMETER

Mirror Surface Finishes
Sub Micron Grain Carbide



EXTENDED REACH (Metric Sizes)

Symbol Descriptions Page 7

| D ^{+0.0000} _{-0.0025} | Dimensions (mm) | | | Uncoated | | AlTiN Coating | |
|---|-----------------|----------------|----|---------------|-------|---------------|-------|
| | d ^{h6} | L ₁ | L | Part Number | Stock | Part Number | Stock |
| 0.40 | 3 | 2 | 38 | MBE-0157.079 | ● | MBE-0157L079 | ● |
| 0.50 | 3 | 2 | 38 | MBE-0197.079 | ● | MBE-0197L079 | ● |
| 0.60 | 3 | 3 | 38 | MBE-0236.118 | ● | MBE-0236L118 | ● |
| 0.70 | 3 | 3 | 38 | MBE-0276.118 | ● | MBE-0276L118 | ● |
| 0.80 | 3 | 3 | 38 | MBE-0315.118 | ● | MBE-0315L118 | ● |
| 0.90 | 3 | 3 | 38 | MBE-0354.118 | ● | MBE-0354L118 | ● |
| 1.00 | 3 | 5 | 38 | MBE-0394.197 | ● | MBE-0394L197 | ● |
| 1.10 | 3 | 5 | 38 | MBE-0433.197 | ● | MBE-0433L197 | ● |
| 1.20 | 3 | 5 | 38 | MBE-0472.197 | ● | MBE-0472L197 | ● |
| 1.30 | 3 | 5 | 38 | MBE-0512.197 | ● | MBE-0512L197 | ● |
| 1.50 | 3 | 10 | 38 | MBE-0591.394 | ● | MBE-0591L394 | ● |
| 1.70 | 3 | 10 | 38 | MBE-0669.394 | ● | MBE-0669L394 | ● |
| 2.00 | 3 | 10 | 38 | MBE-0787.394 | ● | MBE-0787L394 | ● |
| 3.00 | 5 | 20 | 50 | MBE-1181.787 | ● | MBE-1181L787 | ● |
| 3.50 | 5 | 25 | 50 | MBE-1378.984 | ● | MBE-1378L984 | ● |
| 4.00 | 5 | 27 | 50 | MBE-1575.1063 | ● | MBE-1575L1063 | ● |
| 4.50 | 8 | 32 | 65 | MBE-1772.1260 | ● | MBE-1772L1260 | ● |
| 5.00 | 8 | 32 | 65 | MBE-1969.1260 | ● | MBE-1969L1260 | ● |
| 5.50 | 8 | 32 | 65 | MBE-2165.1260 | ● | MBE-2165L1260 | ● |
| 6.00 | 8 | 35 | 65 | MBE-2362.1378 | ● | MBE-2362L1378 | ● |

| Coating | SERIES MBE WORKPIECE MATERIAL | | | | | | | | | | | | | | |
|----------|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| AITiN | ★ | ★ | ★ | ☆ | ☆ | ☆ | | | | ☆ | | | | ☆ | ☆ |
| Uncoated | ★ | ★ | ★ | ☆ | ☆ | | ☆ | | ☆ | | | | ☆ | | |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

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REAMERS

220 - 233

3.00MM SHANK MICRO REAMERS 220 - 227

| | | | |
|-------------|----------------------|---------|-----|
| SERIES MR34 | 0.20mm - 0.49mm Dia. | 4 Flute | 220 |
| | 0.50mm - 0.79mm Dia. | 4 Flute | 221 |
| | 0.80mm - 1.09mm Dia. | 4 Flute | 222 |
| | 1.10mm - 1.39mm Dia. | 4 Flute | 223 |
| | 1.40mm - 1.69mm Dia. | 4 Flute | 224 |
| | 1.70mm - 1.99mm Dia. | 4 Flute | 225 |
| | 2.00mm - 2.19mm Dia. | 4 Flute | 226 |
| | 2.20mm - 2.40mm Dia. | 4 Flute | 227 |

4.00MM SHANK MICRO REAMERS 228 - 230

| | | | |
|-------------|----------------------|---------|-----|
| SERIES MR46 | 2.41mm - 2.72mm Dia. | 6 Flute | 228 |
| | 2.73mm - 3.10mm Dia. | 6 Flute | 229 |
| | 3.20mm - 3.90mm Dia. | 6 Flute | 230 |

6.00MM SHANK MICRO REAMERS 231

| | | | |
|-------------|----------------------|---------|-----|
| SERIES MR66 | 3.97mm - 5.90mm Dia. | 6 Flute | 231 |
|-------------|----------------------|---------|-----|

8.00MM SHANK MICRO REAMERS 232

| | | | |
|-------------|----------------------|---------|-----|
| SERIES MR86 | 5.97mm - 7.90mm Dia. | 6 Flute | 232 |
|-------------|----------------------|---------|-----|

10.00MM SHANK MICRO REAMERS 233

| | | | |
|--------------|----------------------|---------|-----|
| SERIES MR106 | 7.97mm - 8.03mm Dia. | 6 Flute | 233 |
|--------------|----------------------|---------|-----|

3.00mm SHANK

4 FLUTE MICRO REAMERS

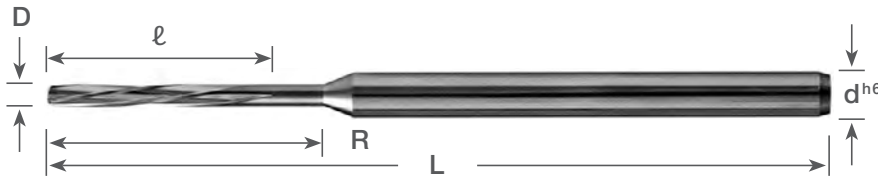
0.20mm - 0.49mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|------|----|---|---------------|-------|
| D ^{+0.003mm} / _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock |
| 0.20 | 3 | 1.50 | 50 | 3 | MR34-0079.059 | ● |
| 0.21 | 3 | 1.50 | 50 | 3 | MR34-0083.059 | ● |
| 0.22 | 3 | 1.50 | 50 | 3 | MR34-0087.059 | ● |
| 0.23 | 3 | 1.50 | 50 | 3 | MR34-0091.059 | ● |
| 0.24 | 3 | 1.50 | 50 | 3 | MR34-0094.059 | ● |
| 0.25 | 3 | 1.50 | 50 | 3 | MR34-0098.059 | ● |
| 0.26 | 3 | 1.50 | 50 | 3 | MR34-0102.059 | ● |
| 0.27 | 3 | 1.50 | 50 | 3 | MR34-0106.059 | ● |
| 0.28 | 3 | 1.50 | 50 | 3 | MR34-0110.059 | ● |
| 0.29 | 3 | 1.50 | 50 | 3 | MR34-0114.059 | ● |
| 0.30 | 3 | 2.00 | 50 | 4 | MR34-0118.079 | ● |
| 0.31 | 3 | 2.00 | 50 | 4 | MR34-0122.079 | ● |
| 0.32 | 3 | 2.00 | 50 | 4 | MR34-0126.079 | ● |
| 0.33 | 3 | 2.00 | 50 | 4 | MR34-0130.079 | ● |
| 0.34 | 3 | 2.00 | 50 | 4 | MR34-0134.079 | ● |
| 0.35 | 3 | 2.00 | 50 | 4 | MR34-0138.079 | ● |
| 0.36 | 3 | 2.00 | 50 | 4 | MR34-0142.079 | ● |
| 0.37 | 3 | 2.00 | 50 | 4 | MR34-0146.079 | ● |
| 0.38 | 3 | 2.00 | 50 | 4 | MR34-0150.079 | ● |
| 0.39 | 3 | 2.00 | 50 | 4 | MR34-0154.079 | ● |
| 0.40 | 3 | 2.50 | 50 | 5 | MR34-0157.099 | ● |
| 0.41 | 3 | 2.50 | 50 | 5 | MR34-0161.099 | ● |
| 0.42 | 3 | 2.50 | 50 | 5 | MR34-0165.099 | ● |
| 0.43 | 3 | 2.50 | 50 | 5 | MR34-0169.099 | ● |
| 0.44 | 3 | 2.50 | 50 | 5 | MR34-0173.099 | ● |
| 0.45 | 3 | 2.50 | 50 | 5 | MR34-0177.099 | ● |
| 0.46 | 3 | 2.50 | 50 | 5 | MR34-0181.099 | ● |
| 0.47 | 3 | 2.50 | 50 | 5 | MR34-0185.099 | ● |
| 0.48 | 3 | 2.50 | 50 | 5 | MR34-0189.099 | ● |
| 0.49 | 3 | 2.50 | 50 | 5 | MR34-0193.099 | ● |

SERIES MR34 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

3.00mm SHANK

4 FLUTE MICRO REAMERS

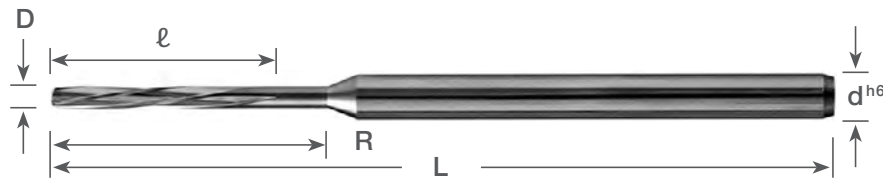
0.50mm - 0.79mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|---|----|----|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock |
| 0.50 | 3 | 3 | 50 | 6 | MR34-0197.118 | ● |
| 0.51 | 3 | 3 | 50 | 6 | MR34-0201.118 | ● |
| 0.52 | 3 | 3 | 50 | 6 | MR34-0205.118 | ● |
| 0.53 | 3 | 3 | 50 | 6 | MR34-0209.118 | ● |
| 0.54 | 3 | 3 | 50 | 6 | MR34-0213.118 | ● |
| 0.55 | 3 | 3 | 50 | 6 | MR34-0216.118 | ● |
| 0.56 | 3 | 3 | 50 | 6 | MR34-0220.118 | ● |
| 0.57 | 3 | 3 | 50 | 6 | MR34-0224.118 | ● |
| 0.58 | 3 | 3 | 50 | 6 | MR34-0228.118 | ● |
| 0.59 | 3 | 3 | 50 | 6 | MR34-0232.118 | ● |
| 0.60 | 3 | 7 | 50 | 18 | MR34-0236.281 | ● |
| 0.61 | 3 | 7 | 50 | 18 | MR34-0240.281 | ● |
| 0.62 | 3 | 7 | 50 | 18 | MR34-0244.281 | ● |
| 0.63 | 3 | 7 | 50 | 18 | MR34-0248.281 | ● |
| 0.64 | 3 | 7 | 50 | 18 | MR34-0252.281 | ● |
| 0.65 | 3 | 7 | 50 | 18 | MR34-0256.281 | ● |
| 0.66 | 3 | 7 | 50 | 18 | MR34-0260.281 | ● |
| 0.67 | 3 | 7 | 50 | 18 | MR34-0264.281 | ● |
| 0.68 | 3 | 7 | 50 | 18 | MR34-0268.281 | ● |
| 0.69 | 3 | 7 | 50 | 18 | MR34-0272.281 | ● |
| 0.70 | 3 | 7 | 50 | 18 | MR34-0276.281 | ● |
| 0.71 | 3 | 7 | 50 | 18 | MR34-0279.281 | ● |
| 0.72 | 3 | 7 | 50 | 18 | MR34-0283.281 | ● |
| 0.73 | 3 | 7 | 50 | 18 | MR34-0287.281 | ● |
| 0.74 | 3 | 7 | 50 | 18 | MR34-0291.281 | ● |
| 0.75 | 3 | 7 | 50 | 18 | MR34-0295.281 | ● |
| 0.76 | 3 | 7 | 50 | 18 | MR34-0299.281 | ● |
| 0.77 | 3 | 7 | 50 | 18 | MR34-0303.281 | ● |
| 0.78 | 3 | 7 | 50 | 18 | MR34-0307.281 | ● |
| 0.79 | 3 | 7 | 50 | 18 | MR34-0311.281 | ● |

| SERIES MR34 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

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3.00mm SHANK

4 FLUTE MICRO REAMERS

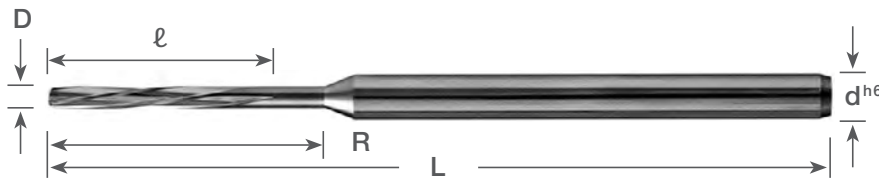
0.80mm - 1.09mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|----|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock |
| 0.80 | 3 | 7 | 50 | 18 | MR34-0315.281 | ● |
| 0.81 | 3 | 7 | 50 | 18 | MR34-0319.281 | ● |
| 0.82 | 3 | 7 | 50 | 18 | MR34-0323.281 | ● |
| 0.83 | 3 | 7 | 50 | 18 | MR34-0327.281 | ● |
| 0.84 | 3 | 7 | 50 | 18 | MR34-0331.281 | ● |
| 0.85 | 3 | 7 | 50 | 18 | MR34-0335.281 | ● |
| 0.86 | 3 | 7 | 50 | 18 | MR34-0338.281 | ● |
| 0.87 | 3 | 7 | 50 | 18 | MR34-0342.281 | ● |
| 0.88 | 3 | 7 | 50 | 18 | MR34-0346.281 | ● |
| 0.89 | 3 | 7 | 50 | 18 | MR34-0350.281 | ● |
| 0.90 | 3 | 7 | 50 | 18 | MR34-0354.281 | ● |
| 0.91 | 3 | 7 | 50 | 18 | MR34-0358.281 | ● |
| 0.92 | 3 | 7 | 50 | 18 | MR34-0362.281 | ● |
| 0.93 | 3 | 7 | 50 | 18 | MR34-0366.281 | ● |
| 0.94 | 3 | 7 | 50 | 18 | MR34-0370.281 | ● |
| 0.95 | 3 | 7 | 50 | 18 | MR34-0374.281 | ● |
| 0.96 | 3 | 7 | 50 | 18 | MR34-0378.281 | ● |
| 0.97 | 3 | 7 | 50 | 18 | MR34-0382.281 | ● |
| 0.98 | 3 | 7 | 50 | 18 | MR34-0386.281 | ● |
| 0.99 | 3 | 7 | 50 | 18 | MR34-0390.281 | ● |
| 1.00 | 3 | 7 | 50 | 18 | MR34-0394.281 | ● |
| 1.01 | 3 | 7 | 50 | 18 | MR34-0398.281 | ● |
| 1.02 | 3 | 7 | 50 | 18 | MR34-0401.281 | ● |
| 1.03 | 3 | 7 | 50 | 18 | MR34-0405.281 | ● |
| 1.04 | 3 | 7 | 50 | 18 | MR34-0409.281 | ● |
| 1.05 | 3 | 7 | 50 | 18 | MR34-0413.281 | ● |
| 1.06 | 3 | 10 | 50 | 18 | MR34-0417.406 | ● |
| 1.07 | 3 | 10 | 50 | 18 | MR34-0421.406 | ● |
| 1.08 | 3 | 10 | 50 | 18 | MR34-0425.406 | ● |
| 1.09 | 3 | 10 | 50 | 18 | MR34-0429.406 | ● |

SERIES MR34 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

3.00mm SHANK

4 FLUTE MICRO REAMERS

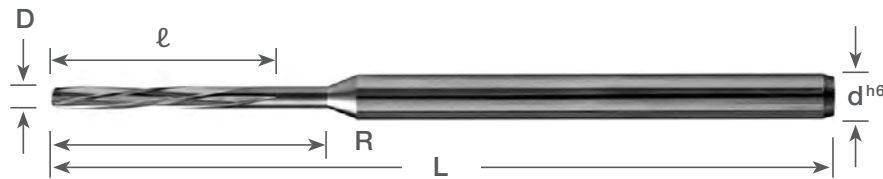
1.10mm - 1.39mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|----|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock |
| 1.10 | 3 | 10 | 50 | 18 | MR34-0433.406 | ● |
| 1.11 | 3 | 10 | 50 | 18 | MR34-0437.406 | ● |
| 1.12 | 3 | 10 | 50 | 18 | MR34-0441.406 | ● |
| 1.13 | 3 | 10 | 50 | 18 | MR34-0445.406 | ● |
| 1.14 | 3 | 10 | 50 | 18 | MR34-0449.406 | ● |
| 1.15 | 3 | 10 | 50 | 18 | MR34-0453.406 | ● |
| 1.16 | 3 | 10 | 50 | 18 | MR34-0457.406 | ● |
| 1.17 | 3 | 10 | 50 | 18 | MR34-0461.406 | ● |
| 1.18 | 3 | 10 | 50 | 18 | MR34-0464.406 | ● |
| 1.19 | 3 | 10 | 50 | 18 | MR34-0468.406 | ● |
| 1.20 | 3 | 10 | 50 | 18 | MR34-0472.406 | ● |
| 1.21 | 3 | 10 | 50 | 18 | MR34-0476.406 | ● |
| 1.22 | 3 | 10 | 50 | 18 | MR34-0480.406 | ● |
| 1.23 | 3 | 10 | 50 | 18 | MR34-0484.406 | ● |
| 1.24 | 3 | 10 | 50 | 18 | MR34-0488.406 | ● |
| 1.25 | 3 | 10 | 50 | 18 | MR34-0492.406 | ● |
| 1.26 | 3 | 10 | 50 | 18 | MR34-0496.406 | ● |
| 1.27 | 3 | 10 | 50 | 18 | MR34-0500.406 | ● |
| 1.28 | 3 | 10 | 50 | 18 | MR34-0504.406 | ● |
| 1.29 | 3 | 10 | 50 | 18 | MR34-0508.406 | ● |
| 1.30 | 3 | 10 | 50 | 18 | MR34-0512.406 | ● |
| 1.31 | 3 | 10 | 50 | 18 | MR34-0516.406 | ● |
| 1.32 | 3 | 10 | 50 | 18 | MR34-0520.406 | ● |
| 1.33 | 3 | 10 | 50 | 18 | MR34-0523.406 | ● |
| 1.34 | 3 | 10 | 50 | 18 | MR34-0527.406 | ● |
| 1.35 | 3 | 10 | 50 | 18 | MR34-0531.406 | ● |
| 1.36 | 3 | 10 | 50 | 18 | MR34-0535.406 | ● |
| 1.37 | 3 | 10 | 50 | 18 | MR34-0539.406 | ● |
| 1.38 | 3 | 10 | 50 | 18 | MR34-0543.406 | ● |
| 1.39 | 3 | 10 | 50 | 18 | MR34-0547.406 | ● |

| SERIES MR34 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|--------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
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3.00mm SHANK

4 FLUTE MICRO REAMERS

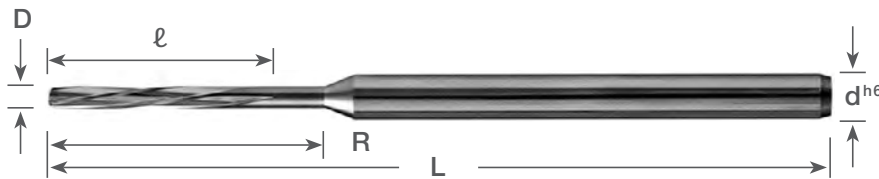
1.40mm - 1.69mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|----|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock |
| 1.40 | 3 | 10 | 50 | 18 | MR34-0551.406 | ● |
| 1.41 | 3 | 10 | 50 | 18 | MR34-0555.406 | ● |
| 1.42 | 3 | 10 | 50 | 18 | MR34-0559.406 | ● |
| 1.43 | 3 | 10 | 50 | 18 | MR34-0563.406 | ● |
| 1.44 | 3 | 10 | 50 | 18 | MR34-0567.406 | ● |
| 1.45 | 3 | 10 | 50 | 18 | MR34-0571.406 | ● |
| 1.46 | 3 | 10 | 50 | 18 | MR34-0575.406 | ● |
| 1.47 | 3 | 10 | 50 | 18 | MR34-0579.406 | ● |
| 1.48 | 3 | 10 | 50 | 18 | MR34-0583.406 | ● |
| 1.49 | 3 | 10 | 50 | 18 | MR34-0586.406 | ● |
| 1.50 | 3 | 10 | 50 | 18 | MR34-0590.406 | ● |
| 1.51 | 3 | 10 | 50 | 18 | MR34-0594.406 | ● |
| 1.52 | 3 | 10 | 50 | 18 | MR34-0598.406 | ● |
| 1.53 | 3 | 10 | 50 | 18 | MR34-0602.406 | ● |
| 1.54 | 3 | 10 | 50 | 18 | MR34-0606.406 | ● |
| 1.55 | 3 | 10 | 50 | 18 | MR34-0610.406 | ● |
| 1.56 | 3 | 10 | 50 | 18 | MR34-0614.406 | ● |
| 1.57 | 3 | 10 | 50 | 18 | MR34-0618.406 | ● |
| 1.58 | 3 | 10 | 50 | 18 | MR34-0622.406 | ● |
| 1.59 | 3 | 10 | 50 | 18 | MR34-0626.406 | ● |
| 1.60 | 3 | 10 | 50 | 18 | MR34-0630.406 | ● |
| 1.61 | 3 | 10 | 50 | 18 | MR34-0634.406 | ● |
| 1.62 | 3 | 10 | 50 | 18 | MR34-0638.406 | ● |
| 1.63 | 3 | 10 | 50 | 18 | MR34-0642.406 | ● |
| 1.64 | 3 | 10 | 50 | 18 | MR34-0646.406 | ● |
| 1.65 | 3 | 10 | 50 | 18 | MR34-0649.406 | ● |
| 1.66 | 3 | 10 | 50 | 18 | MR34-0653.406 | ● |
| 1.67 | 3 | 10 | 50 | 18 | MR34-0657.406 | ● |
| 1.68 | 3 | 10 | 50 | 18 | MR34-0661.406 | ● |
| 1.69 | 3 | 10 | 50 | 18 | MR34-0665.406 | ● |

SERIES MR34 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | N | S | S |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

3.00mm SHANK

4 FLUTE MICRO REAMERS

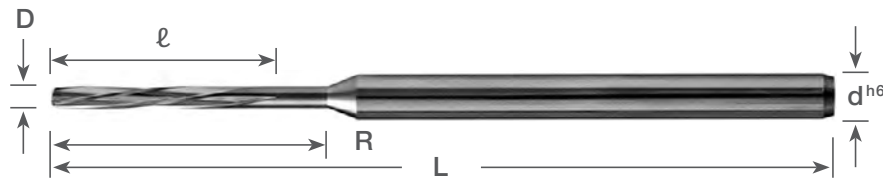
1.70mm - 1.99mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|-------|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock |
| 1.70 | 3 | 10 | 50 | 18.00 | MR34-0669.406 | ● |
| 1.71 | 3 | 10 | 50 | 18.00 | MR34-0673.406 | ● |
| 1.72 | 3 | 10 | 50 | 18.00 | MR34-0677.406 | ● |
| 1.73 | 3 | 10 | 50 | 18.00 | MR34-0681.406 | ● |
| 1.74 | 3 | 10 | 50 | 18.00 | MR34-0685.406 | ● |
| 1.75 | 3 | 10 | 50 | 18.00 | MR34-0689.406 | ● |
| 1.76 | 3 | 10 | 50 | 18.00 | MR34-0693.406 | ● |
| 1.77 | 3 | 10 | 50 | 18.00 | MR34-0697.406 | ● |
| 1.78 | 3 | 10 | 50 | 18.00 | MR34-0701.406 | ● |
| 1.79 | 3 | 10 | 50 | 18.00 | MR34-0705.406 | ● |
| 1.80 | 3 | 10 | 50 | 18.00 | MR34-0708.406 | ● |
| 1.81 | 3 | 10 | 50 | 18.00 | MR34-0712.406 | ● |
| 1.82 | 3 | 10 | 50 | 18.00 | MR34-0716.406 | ● |
| 1.83 | 3 | 10 | 50 | 18.00 | MR34-0720.406 | ● |
| 1.84 | 3 | 10 | 50 | 18.00 | MR34-0724.406 | ● |
| 1.85 | 3 | 10 | 50 | 18.00 | MR34-0728.406 | ● |
| 1.86 | 3 | 10 | 50 | 18.00 | MR34-0732.406 | ● |
| 1.87 | 3 | 10 | 50 | 18.00 | MR34-0736.406 | ● |
| 1.88 | 3 | 10 | 50 | 18.00 | MR34-0740.406 | ● |
| 1.89 | 3 | 10 | 50 | 18.00 | MR34-0744.406 | ● |
| 1.90 | 3 | 10 | 50 | 18.00 | MR34-0748.406 | ● |
| 1.91 | 3 | 10 | 50 | 18.00 | MR34-0752.406 | ● |
| 1.92 | 3 | 10 | 50 | 18.00 | MR34-0756.406 | ● |
| 1.93 | 3 | 10 | 50 | 18.00 | MR34-0760.406 | ● |
| 1.94 | 3 | 10 | 50 | 18.00 | MR34-0764.406 | ● |
| 1.95 | 3 | 10 | 50 | 18.00 | MR34-0768.406 | ● |
| 1.96 | 3 | 11 | 50 | 20.50 | MR34-0771.438 | ● |
| 1.97 | 3 | 11 | 50 | 20.50 | MR34-0775.438 | ● |
| 1.98 | 3 | 11 | 50 | 20.50 | MR34-0779.438 | ● |
| 1.99 | 3 | 11 | 50 | 20.50 | MR34-0783.438 | ● |

| SERIES MR34 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|--------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-~40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

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3.00mm SHANK

4 FLUTE MICRO REAMERS

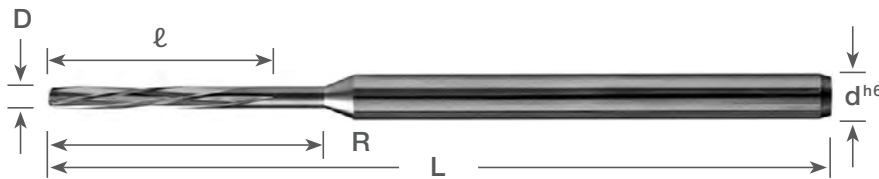
2.00mm - 2.19mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions [Page 7](#)

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|-------|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock |
| 2.00 | 3 | 11 | 50 | 20.50 | MR34-0787.438 | ● |
| 2.01 | 3 | 11 | 50 | 20.50 | MR34-0791.438 | ● |
| 2.02 | 3 | 11 | 50 | 20.50 | MR34-0795.438 | ● |
| 2.03 | 3 | 11 | 50 | 20.50 | MR34-0799.438 | ● |
| 2.04 | 3 | 11 | 50 | 20.50 | MR34-0803.438 | ● |
| 2.05 | 3 | 11 | 50 | 20.50 | MR34-0807.438 | ● |
| 2.06 | 3 | 11 | 50 | 20.50 | MR34-0811.438 | ● |
| 2.07 | 3 | 11 | 50 | 20.50 | MR34-0815.438 | ● |
| 2.08 | 3 | 11 | 50 | 20.50 | MR34-0819.438 | ● |
| 2.09 | 3 | 11 | 50 | 20.50 | MR34-0823.438 | ● |
| 2.10 | 3 | 11 | 50 | 20.50 | MR34-0827.438 | ● |
| 2.11 | 3 | 11 | 50 | 20.50 | MR34-0830.438 | ● |
| 2.12 | 3 | 11 | 50 | 20.50 | MR34-0835.438 | ● |
| 2.13 | 3 | 11 | 50 | 20.50 | MR34-0838.438 | ● |
| 2.14 | 3 | 11 | 50 | 20.50 | MR34-0843.438 | ● |
| 2.15 | 3 | 11 | 50 | 20.50 | MR34-0846.438 | ● |
| 2.16 | 3 | 11 | 50 | 20.50 | MR34-0850.438 | ● |
| 2.17 | 3 | 11 | 50 | 20.50 | MR34-0854.438 | ● |
| 2.18 | 3 | 11 | 50 | 20.50 | MR34-0858.438 | ● |
| 2.19 | 3 | 11 | 50 | 20.50 | MR34-0862.438 | ● |

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SERIES MR34 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|--------------|----------------|-----------------------|-----------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~65HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

3.00mm SHANK

4 FLUTE MICRO REAMERS

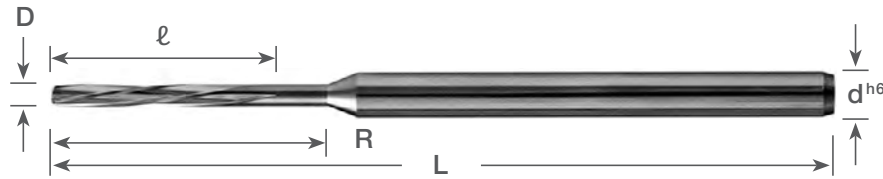
2.20mm - 2.40mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|-------|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock |
| 2.20 | 3 | 11 | 50 | 20.50 | MR34-0866.438 | ● |
| 2.21 | 3 | 11 | 50 | 20.50 | MR34-0870.438 | ● |
| 2.22 | 3 | 11 | 50 | 20.50 | MR34-0874.438 | ● |
| 2.23 | 3 | 11 | 50 | 20.50 | MR34-0878.438 | ● |
| 2.24 | 3 | 11 | 50 | 20.50 | MR34-0882.438 | ● |
| 2.25 | 3 | 11 | 50 | 20.50 | MR34-0886.438 | ● |
| 2.26 | 3 | 11 | 50 | 20.50 | MR34-0890.438 | ● |
| 2.27 | 3 | 11 | 50 | 20.50 | MR34-0894.438 | ● |
| 2.28 | 3 | 11 | 50 | 20.50 | MR34-0896.438 | ● |
| 2.29 | 3 | 11 | 50 | 20.50 | MR34-0901.438 | ● |
| 2.30 | 3 | 11 | 50 | 20.50 | MR34-0906.438 | ● |
| 2.31 | 3 | 11 | 50 | 20.50 | MR34-0909.438 | ● |
| 2.32 | 3 | 11 | 50 | 20.50 | MR34-0913.438 | ● |
| 2.33 | 3 | 11 | 50 | 20.50 | MR34-0917.438 | ● |
| 2.34 | 3 | 11 | 50 | 20.50 | MR34-0921.438 | ● |
| 2.35 | 3 | 11 | 50 | 20.50 | MR34-0925.438 | ● |
| 2.36 | 3 | 11 | 50 | 20.50 | MR34-0929.438 | ● |
| 2.37 | 3 | 11 | 50 | 20.50 | MR34-0933.438 | ● |
| 2.38 | 3 | 11 | 50 | 20.50 | MR34-0937.438 | ● |
| 2.39 | 3 | 11 | 50 | 20.50 | MR34-0941.438 | ● |
| 2.40 | 3 | 11 | 50 | 20.50 | MR34-0945.438 | ● |

| SERIES MR34 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
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4.00mm SHANK

6 FLUTE MICRO REAMERS

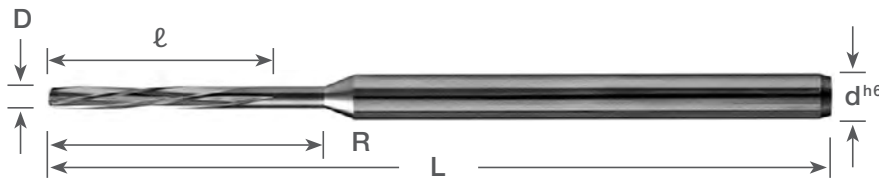
2.41mm - 2.72mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|----|---------------|-------|
| D ^{+0.003mm} / _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock |
| 2.41 | 4 | 14 | 75 | 51 | MR46-0949.563 | ● |
| 2.42 | 4 | 14 | 75 | 51 | MR46-0953.563 | ● |
| 2.43 | 4 | 14 | 75 | 51 | MR46-0957.563 | ● |
| 2.44 | 4 | 14 | 75 | 51 | MR46-0960.563 | ● |
| 2.45 | 4 | 14 | 75 | 51 | MR46-0965.563 | ● |
| 2.46 | 4 | 14 | 75 | 51 | MR46-0968.563 | ● |
| 2.47 | 4 | 14 | 75 | 51 | MR46-0972.563 | ● |
| 2.48 | 4 | 14 | 75 | 51 | MR46-0976.563 | ● |
| 2.49 | 4 | 14 | 75 | 51 | MR46-0980.563 | ● |
| 2.50 | 4 | 14 | 75 | 51 | MR46-0984.563 | ● |
| 2.51 | 4 | 14 | 75 | 51 | MR46-0988.563 | ● |
| 2.52 | 4 | 14 | 75 | 51 | MR46-0992.563 | ● |
| 2.53 | 4 | 14 | 75 | 51 | MR46-0996.563 | ● |
| 2.54 | 4 | 14 | 75 | 51 | MR46-1000.563 | ● |
| 2.55 | 4 | 14 | 75 | 51 | MR46-1004.563 | ● |
| 2.56 | 4 | 14 | 75 | 51 | MR46-1008.563 | ● |
| 2.57 | 4 | 14 | 75 | 51 | MR46-1012.563 | ● |
| 2.58 | 4 | 14 | 75 | 51 | MR46-1015.563 | ● |
| 2.59 | 4 | 14 | 75 | 51 | MR46-1019.563 | ● |
| 2.60 | 4 | 14 | 75 | 51 | MR46-1024.563 | ● |
| 2.61 | 4 | 14 | 75 | 51 | MR46-1028.563 | ● |
| 2.62 | 4 | 14 | 75 | 51 | MR46-1031.563 | ● |
| 2.63 | 4 | 14 | 75 | 51 | MR46-1035.563 | ● |
| 2.64 | 4 | 14 | 75 | 51 | MR46-1039.563 | ● |
| 2.65 | 4 | 14 | 75 | 51 | MR46-1043.563 | ● |
| 2.66 | 4 | 14 | 75 | 51 | MR46-1047.563 | ● |
| 2.67 | 4 | 14 | 75 | 51 | MR46-1051.563 | ● |
| 2.68 | 4 | 14 | 75 | 51 | MR46-1055.563 | ● |
| 2.69 | 4 | 14 | 75 | 51 | MR46-1059.563 | ● |
| 2.70 | 4 | 14 | 75 | 51 | MR46-1063.563 | ● |
| 2.71 | 4 | 14 | 75 | 51 | MR46-1067.563 | ● |
| 2.72 | 4 | 14 | 75 | 51 | MR46-1071.563 | ● |

SERIES MR46 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

4.00mm SHANK

6 FLUTE MICRO REAMERS

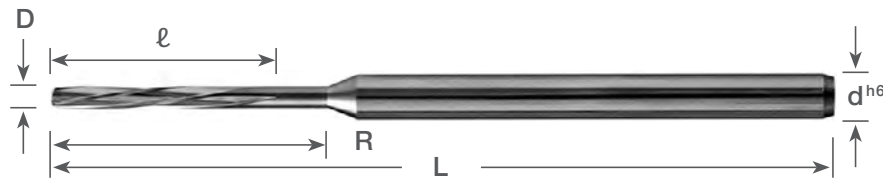
2.73mm - 3.10mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | |
|---|-----------------|----|----|----|---------------|-------|
| D ^{+0.003mm} / _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock |
| 2.73 | 4 | 14 | 75 | 51 | MR46-1075.563 | ● |
| 2.74 | 4 | 14 | 75 | 51 | MR46-1078.563 | ● |
| 2.75 | 4 | 14 | 75 | 51 | MR46-1083.563 | ● |
| 2.76 | 4 | 14 | 75 | 51 | MR46-1087.563 | ● |
| 2.77 | 4 | 14 | 75 | 51 | MR46-1090.563 | ● |
| 2.78 | 4 | 14 | 75 | 51 | MR46-1094.563 | ● |
| 2.79 | 4 | 14 | 75 | 51 | MR46-1098.563 | ● |
| 2.80 | 4 | 14 | 75 | 51 | MR46-1102.563 | ● |
| 2.81 | 4 | 14 | 75 | 51 | MR46-1106.563 | ● |
| 2.82 | 4 | 14 | 75 | 51 | MR46-1110.563 | ● |
| 2.83 | 4 | 14 | 75 | 51 | MR46-1114.563 | ● |
| 2.84 | 4 | 14 | 75 | 51 | MR46-1118.563 | ● |
| 2.85 | 4 | 14 | 75 | 51 | MR46-1122.563 | ● |
| 2.87 | 4 | 14 | 75 | 51 | MR46-1130.563 | ● |
| 2.88 | 4 | 14 | 75 | 51 | MR46-1134.563 | ● |
| 2.89 | 4 | 14 | 75 | 51 | MR46-1138.563 | ● |
| 2.90 | 4 | 14 | 75 | 51 | MR46-1141.563 | ● |
| 2.91 | 4 | 14 | 75 | 51 | MR46-1146.563 | ● |
| 2.92 | 4 | 14 | 75 | 51 | MR46-1149.563 | ● |
| 2.93 | 4 | 14 | 75 | 51 | MR46-1154.563 | ● |
| 2.94 | 4 | 14 | 75 | 51 | MR46-1157.563 | ● |
| 2.95 | 4 | 16 | 75 | 51 | MR46-1161.625 | ● |
| 2.96 | 4 | 16 | 75 | 51 | MR46-1164.625 | ● |
| 2.97 | 4 | 16 | 75 | 51 | MR46-1169.625 | ● |
| 2.98 | 4 | 16 | 75 | 51 | MR46-1173.625 | ● |
| 2.99 | 4 | 16 | 75 | 51 | MR46-1177.625 | ● |
| 3.00 | 4 | 16 | 75 | 51 | MR46-1181.625 | ● |
| 3.01 | 4 | 16 | 75 | 51 | MR46-1185.625 | ● |
| 3.02 | 4 | 16 | 75 | 51 | MR46-1189.625 | ● |
| 3.03 | 4 | 16 | 75 | 51 | MR46-1193.625 | ● |
| 3.05 | 4 | 16 | 75 | 51 | MR46-1200.625 | ● |
| 3.10 | 4 | 16 | 75 | 51 | MR46-1220.625 | ● |

| SERIES MR46 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|-----------------|-----------|----------|----------|--------------|------|---------|-------------------|----------------------|-----------------|----------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | S | S | | |
| | Steel ~20HRC | Steel 30-40HRC | Hardened Steel ~55HRC | Hardened Steel ~58HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| Uncoated | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ★ | ★ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
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4.00mm SHANK

6 FLUTE MICRO REAMERS

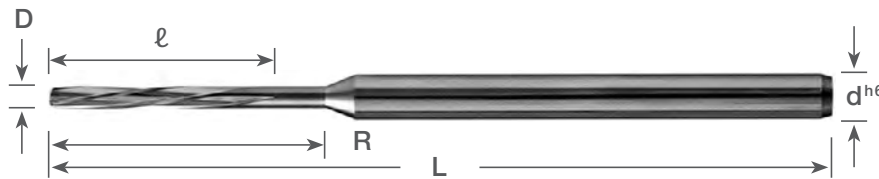
3.20mm - 3.90mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions [Page 7](#)

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|----|----|----|---------------|-------|---------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | l | L | R | Part Number | Stock | Part Number | Stock |
| 3.20 | 4 | 17 | 64 | 36 | MR46-1260.669 | ● | MR46-1260L669 | ● |
| 3.30 | 4 | 17 | 64 | 36 | MR46-1299.669 | ● | MR46-1299L669 | ● |
| 3.40 | 4 | 17 | 64 | 36 | MR46-1339.669 | ● | MR46-1339L669 | ● |
| 3.50 | 4 | 17 | 64 | 36 | MR46-1378.669 | ● | MR46-1378L669 | ● |
| 3.60 | 4 | 17 | 64 | 36 | MR46-1417.669 | ● | MR46-1417L669 | ● |
| 3.70 | 4 | 17 | 64 | 36 | MR46-1457.669 | ● | MR46-1457L669 | ● |
| 3.80 | 4 | 17 | 64 | 36 | MR46-1496.669 | ● | MR46-1496L669 | ● |
| 3.90 | 4 | 17 | 64 | 36 | MR46-1535.669 | ● | MR46-1535L669 | ● |

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

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SERIES MR46 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|--------------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

6.00mm SHANK

6 FLUTE MICRO REAMERS

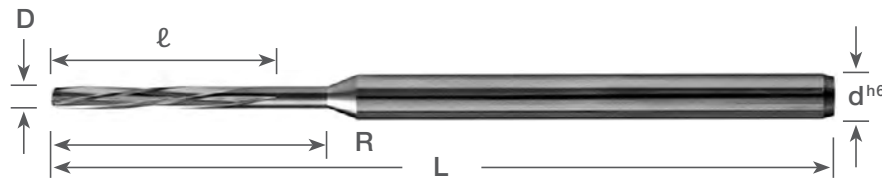
3.97mm - 5.90mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|----|----|----|----------------|-------|----------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock | Part Number | Stock |
| 3.97 | 6 | 21 | 77 | 45 | MR66-1563.827 | ● | MR66-1563L827 | ● |
| 3.98 | 6 | 21 | 77 | 45 | MR66-1567.827 | ● | MR66-1567L827 | ● |
| 3.99 | 6 | 21 | 77 | 45 | MR66-1571.827 | ● | MR66-1571L827 | ● |
| 4.00 | 6 | 21 | 77 | 45 | MR66-1575.827 | ● | MR66-1575L827 | ● |
| 4.01 | 6 | 21 | 77 | 45 | MR66-1579.827 | ● | MR66-1579L827 | ● |
| 4.02 | 6 | 21 | 77 | 45 | MR66-1583.827 | ● | MR66-1583L827 | ● |
| 4.03 | 6 | 21 | 77 | 45 | MR66-1587.827 | ● | MR66-1587L827 | ● |
| 4.10 | 6 | 21 | 77 | 45 | MR66-1614.827 | ● | MR66-1614L827 | ● |
| 4.20 | 6 | 21 | 77 | 45 | MR66-1654.827 | ● | MR66-1654L827 | ● |
| 4.30 | 6 | 21 | 77 | 45 | MR66-1693.827 | ● | MR66-1693L827 | ● |
| 4.40 | 6 | 21 | 77 | 45 | MR66-1732.827 | ● | MR66-1732L827 | ● |
| 4.50 | 6 | 21 | 77 | 45 | MR66-1772.827 | ● | MR66-1772L827 | ● |
| 4.60 | 6 | 21 | 77 | 45 | MR66-1811.827 | ● | MR66-1811L827 | ● |
| 4.70 | 6 | 21 | 77 | 45 | MR66-1850.827 | ● | MR66-1850L827 | ● |
| 4.80 | 6 | 21 | 77 | 45 | MR66-1890.827 | ● | MR66-1890L827 | ● |
| 4.90 | 6 | 21 | 77 | 45 | MR66-1929.827 | ● | MR66-1929L827 | ● |
| 4.97 | 6 | 26 | 93 | 59 | MR66-1957.1024 | ● | MR66-1957L1024 | ● |
| 4.98 | 6 | 26 | 93 | 59 | MR66-1961.1024 | ● | MR66-1961L1024 | ● |
| 4.99 | 6 | 26 | 93 | 59 | MR66-1965.1024 | ● | MR66-1965L1024 | ● |
| 5.00 | 6 | 26 | 93 | 59 | MR66-1968.1024 | ● | MR66-1968L1024 | ● |
| 5.01 | 6 | 26 | 93 | 59 | MR66-1972.1024 | ● | MR66-1972L1024 | ● |
| 5.02 | 6 | 26 | 93 | 59 | MR66-1976.1024 | ● | MR66-1976L1024 | ● |
| 5.03 | 6 | 26 | 93 | 59 | MR66-1980.1024 | ● | MR66-1980L1024 | ● |
| 5.10 | 6 | 26 | 93 | 59 | MR66-2008.1024 | ● | MR66-2008L1024 | ● |
| 5.20 | 6 | 26 | 93 | 59 | MR66-2047.1024 | ● | MR66-2047L1024 | ● |
| 5.30 | 6 | 26 | 93 | 59 | MR66-2087.1024 | ● | MR66-2087L1024 | ● |
| 5.40 | 6 | 26 | 93 | 59 | MR66-2126.1024 | ● | MR66-2126L1024 | ● |
| 5.50 | 6 | 26 | 93 | 59 | MR66-2165.1024 | ● | MR66-2165L1024 | ● |
| 5.60 | 6 | 26 | 93 | 59 | MR66-2205.1024 | ● | MR66-2205L1024 | ● |
| 5.70 | 6 | 26 | 93 | 59 | MR66-2244.1024 | ● | MR66-2244L1024 | ● |
| 5.80 | 6 | 26 | 93 | 59 | MR66-2283.1024 | ● | MR66-2283L1024 | ● |
| 5.90 | 6 | 26 | 93 | 59 | MR66-2323.1024 | ● | MR66-2323L1024 | ● |

| SERIES MR66 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|--------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

- : U.S. Stock Standard
- : NOT STOCKED - Call for Delivery
- ▲ : Coming Soon

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8.00mm SHANK

6 FLUTE MICRO REAMERS

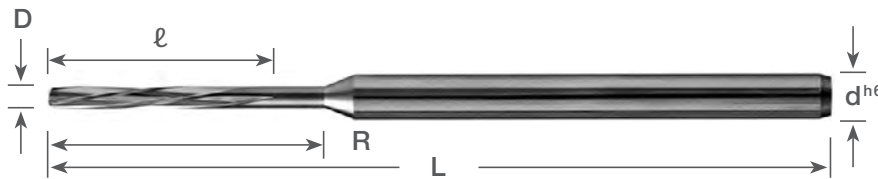
5.97mm - 7.90mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting

For Reaming Through Holes



Symbol Descriptions Page 7

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|-----------------|-----------------|----|-----|----|----------------|-------|----------------|-------|
| D | d ^{h6} | ℓ | L | R | Part Number | Stock | Part Number | Stock |
| 5.97 | 8 | 26 | 93 | 59 | MR86-2350.1024 | ● | MR86-2350L1024 | ● |
| 5.98 | 8 | 26 | 93 | 59 | MR86-2354.1024 | ● | MR86-2354L1024 | ● |
| 5.99 | 8 | 26 | 93 | 59 | MR86-2358.1024 | ● | MR86-2358L1024 | ● |
| 6.00 | 8 | 26 | 93 | 59 | MR86-2362.1024 | ● | MR86-2362L1024 | ● |
| 6.01 | 8 | 26 | 93 | 59 | MR86-2366.1024 | ● | MR86-2366L1024 | ● |
| 6.02 | 8 | 26 | 93 | 59 | MR86-2370.1024 | ● | MR86-2370L1024 | ● |
| 6.03 | 8 | 26 | 93 | 59 | MR86-2374.1024 | ● | MR86-2374L1024 | ● |
| 6.10 | 8 | 26 | 93 | 59 | MR86-2402.1024 | ● | MR86-2402L1024 | ● |
| 6.20 | 8 | 26 | 93 | 59 | MR86-2441.1024 | ● | MR86-2441L1024 | ● |
| 6.30 | 8 | 26 | 93 | 59 | MR86-2480.1024 | ● | MR86-2480L1024 | ● |
| 6.40 | 8 | 26 | 93 | 59 | MR86-2520.1024 | ● | MR86-2520L1024 | ● |
| 6.50 | 8 | 26 | 93 | 59 | MR86-2559.1024 | ● | MR86-2559L1024 | ● |
| 6.60 | 8 | 26 | 93 | 59 | MR86-2598.1024 | ● | MR86-2598L1024 | ● |
| 6.70 | 8 | 26 | 93 | 59 | MR86-2638.1024 | ● | MR86-2638L1024 | ● |
| 6.80 | 8 | 26 | 93 | 59 | MR86-2677.1024 | ● | MR86-2677L1024 | ● |
| 6.90 | 8 | 26 | 93 | 59 | MR86-2717.1024 | ● | MR86-2717L1024 | ● |
| 6.97 | 8 | 31 | 109 | 69 | MR86-2744.1220 | ● | MR86-2744L1220 | ● |
| 6.98 | 8 | 31 | 109 | 69 | MR86-2748.1220 | ● | MR86-2748L1220 | ● |
| 6.99 | 8 | 31 | 109 | 69 | MR86-2752.1220 | ● | MR86-2752L1220 | ● |
| 7.00 | 8 | 31 | 109 | 69 | MR86-2756.1220 | ● | MR86-2756L1220 | ● |
| 7.01 | 8 | 31 | 109 | 69 | MR86-2760.1220 | ● | MR86-2760L1220 | ● |
| 7.02 | 8 | 31 | 109 | 69 | MR86-2764.1220 | ● | MR86-2764L1220 | ● |
| 7.03 | 8 | 31 | 109 | 69 | MR86-2768.1220 | ● | MR86-2768L1220 | ● |
| 7.10 | 8 | 31 | 109 | 69 | MR86-2795.1220 | ● | MR86-2795L1220 | ● |
| 7.20 | 8 | 31 | 109 | 69 | MR86-2835.1220 | ● | MR86-2835L1220 | ● |
| 7.30 | 8 | 31 | 109 | 69 | MR86-2874.1220 | ● | MR86-2874L1220 | ● |
| 7.40 | 8 | 31 | 109 | 69 | MR86-2913.1220 | ● | MR86-2913L1220 | ● |
| 7.50 | 8 | 31 | 109 | 69 | MR86-2953.1220 | ● | MR86-2953L1220 | ● |
| 7.60 | 8 | 31 | 109 | 69 | MR86-2992.1220 | ● | MR86-2992L1220 | ● |
| 7.70 | 8 | 31 | 109 | 69 | MR86-3031.1220 | ● | MR86-3031L1220 | ● |
| 7.80 | 8 | 31 | 109 | 69 | MR86-3071.1220 | ● | MR86-3071L1220 | ● |
| 7.90 | 8 | 31 | 109 | 69 | MR86-3110.1220 | ● | MR86-3110L1220 | ● |

SERIES MR86 WORKPIECE MATERIAL

| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
|----------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions Page 7

10.00mm SHANK

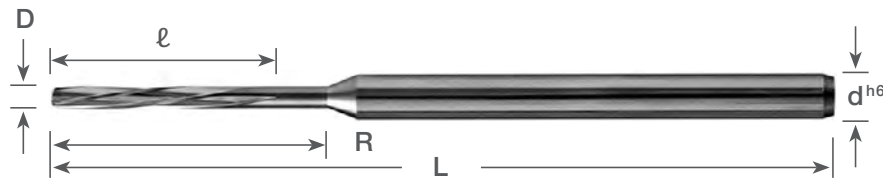
6 FLUTE MICRO REAMERS

7.97mm - 8.03mm DIAMETER

Mirror Surface Finishes

Sub Micron Grain Carbide

Left Hand Spiral, Right Hand Cutting
For Reaming Through Holes



Symbol Descriptions [Page 7](#)

STANDARD Length (Metric Sizes)

| Dimensions (mm) | | | | | Uncoated | | AlTiN Coating | |
|---|-----------------|----|-----|----|-----------------|-------|-----------------|-------|
| D ^{+0.003mm} _{-0.000mm} | d ^{h6} | ℓ | L | R | Part Number | Stock | Part Number | Stock |
| 7.97 | 10 | 33 | 133 | 75 | MR106-3138.1299 | ● | MR106-3138L1299 | ● |
| 7.98 | 10 | 33 | 133 | 75 | MR106-3142.1299 | ● | MR106-3142L1299 | ● |
| 7.99 | 10 | 33 | 133 | 75 | MR106-3146.1299 | ● | MR106-3146L1299 | ● |
| 8.00 | 10 | 33 | 133 | 75 | MR106-3150.1299 | ● | MR106-3150L1299 | ● |
| 8.01 | 10 | 33 | 133 | 75 | MR106-3154.1299 | ● | MR106-3154L1299 | ● |
| 8.02 | 10 | 33 | 133 | 75 | MR106-3157.1299 | ● | MR106-3157L1299 | ● |
| 8.03 | 10 | 33 | 133 | 75 | MR106-3161.1299 | ● | MR106-3161L1299 | ● |

DRILLS
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| SERIES MR106 WORKPIECE MATERIAL | | | | | | | | | | | | | | | |
|---------------------------------|-----------------|-------------------|--------------------------|--------------------------|--------------------|-----------|----------|----------|-----------------|------|---------|----------------------|-------------------------|--------------------|-------------------|
| Coating | P | P | H | H | M | K | N | N | N | N | N | N | S | S | |
| | Steel -30HRC | Steel 30-40HRC | Hardened Steel -55HRC | Hardened Steel -68HRC | Stainless Steel | Cast Iron | Aluminum | Graphite | Copper Alloy | CFRP | Plastic | Thermoset Plastic | High Density Plastic | Nickel / Cobalt | Titanium Alloy |
| AlTiN | ★ | ★ | ★ | ★ | ★ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |
| Uncoated | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ | ☆ |

★ : Priority ☆ : Applicable Materials

Symbol Descriptions [Page 7](#)

● : U.S. Stock Standard
■ : NOT STOCKED - Call for Delivery
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| | | |
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24-HOUR SERVICE!

Inch & Metric Sizes!



✓ **24-HOUR SHIPMENT** of premium quality SOLID CARBIDE “*THIN SAWS*”

- Diameter Range - INCH: 3/4” through 4” • METRIC: 20mm through 100mm
- Thickness Range - INCH: 0.008” through 0.250” • METRIC: .20mm through 6.35mm
- Arbor hole sizes - INCH: 1/4”, 5/16”, 3/8”, 1/2”, 5/8”, 7/8”, 1”
METRIC: 5mm, 8mm, 10mm, 13mm, 16mm, 22mm
- Tolerances - INCH: +0.0005”/ -0.0000” on ID and thickness; O.D. tolerance = +0.005”/-0.000”
METRIC: +0.013mm/ -0.0000mm on ID and thickness; O.D. tolerance = +0.13mm/-0.000mm

- ✓ Up to 6-pieces in 24-hours.
- ✓ Unsurpassed accuracy and tolerances provide consistent, dependable performance.
- ✓ Standard square tooth configurations available.
- ✓ Technical expertise to solve difficult or unusual sawing, slitting, slotting and cutting operations.
- ✓ For Special Applications, see “**Saws Test Application Data Sheet**” and Contact us at **1.888.848.8449** to request a quote.
- ✓ Our tool designers will be pleased to assist with your specific needs.

SAWS TEST APPLICATION DATA SHEET

Kyocera Sales Rep.: _____
Customer Name: _____ Date: ____/____/____
City/State: _____ Distributor: _____
Phone: _____ Fax: _____ E-Mail: _____
Contact: _____ Title: _____ Extn.: _____

GENERAL INFORMATION

(Application) B/P or Job # _____
 SC C-Tipped H.S.S. Saw Dia. _____ Saw Width _____ Tolerance _____
Arbor Hole Dia. _____ # Teeth _____ Special Tooth Form _____
Keyway (Y/N) _____ Keyway Dimension _____ Hub (Y/N) _____
Hub Dimension: Dia. _____ Thickness _____ Rake Angle _____
Positive / Negative _____ Surface Treatment _____
Unique Job Details _____

JOB APPLICATION

Operation _____ Slot Width _____ Tolerance _____
Depth of Cut _____ Tolerance _____ Material _____
Hardness _____ Machine Tool _____ Condition _____
Speed _____ Feed _____ Coolant Type _____ Mix _____
Are saws ganged? (Y/N) _____ If yes, tolerance required _____
Form to be generated _____ (Sketch or B/P helpful)

COMPETITION

Brand Name _____ Price (\$) _____
Delivery _____ Annual Usage _____
Current performance info. or problem _____
Criteria for successful test _____

TEST EVALUATION

PO# _____ Date _____ Dist. PO# _____
Results _____
Were you present for test? Y/N _____ Comments _____

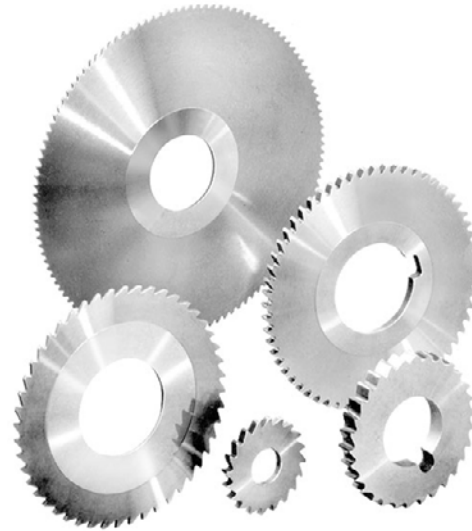
FEATURES AND BENEFITS

Solid Carbide Saws

**SOLID CARBIDE
THIN SAWS & CUTTERS**

Designed and manufactured to your exact specifications.

- Solid Carbide Saws as THIN as .0020"
- As THICK as 1.000"
- O.D.'s to 7.5"
- Tolerances to: +.0005"
 -.0000"
- Modified and Special Saws available, with tighter tolerances when required.



→← .006" WIDTH
+.0005"
-.0000"

EXTREME THINNESS

Our solid carbide saws can be manufactured as thin as .0020" (a human hair is about .0040" thick!). This extreme miniaturization is made possible through our numerous years of experience, a dedicated team of saw-makers unparalleled the world over, and our service-oriented approach to meeting your cutting tool requirements. We're prepared to work with you on your specific saw application.



EXTREME PRECISION AND MINIATURIZATION

The miniature saw shown at left has an O.D. of .5000" with 24 precision teeth. We take pride in producing saws with precision and tolerances unexcelled by any other manufacturer. We will provide saws with any degree of precision and tolerance required by your job application.

DRILLS

END MILLS

ROUTERS

THREAD MILLS & TAPS

ENGRAVERS

BORING BARS

REAMERS

SAWS

TECHNICAL

INDEX

FEATURES AND BENEFITS

Solid Carbide Saws



Our cutters are manufactured with dish towards the arbor hole to avoid dragging in the cut, thereby reducing side friction. This feature is especially helpful in deep cuts, cutting copper, certain plastics and where parts tend to compress on the saw blade from cutting pressures.

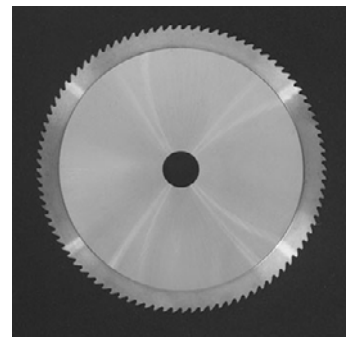
Our solid carbide saws excel in overcoming the abrasive action encountered in individual and gang slotting of tough steels, cast irons and exotic non-ferrous and non-metallic materials such as fiberglass, epoxies and composites.

Use of solid carbide saws permits a far greater number of teeth in a given saw size than is possible with carbide tipped saws. A greater number of teeth allows reduced chip load, higher speeds and feeds, and improved quality of the finished cut.

Titanium Nitride (TiN) coating and other surface treatments can be added to all cutters for superior cutting performance and finish, providing up to 8 times increase in tool life in many materials.

Cutters with an O.D. of 2" or larger are stocked with standard hubs and keyways to give you the highest performance. Cutters may be ordered without hubs or keyways.

Timely shipment of your tooling is of paramount importance because we believe that customer satisfaction is our most important goal. We realize that we can gain the highest degree of customer confidence by manufacturing and shipping only the best saws and cutters available.



Our precision solid carbide saws provide the ultimate combination of:

- Maximum cutting speeds for minimum cost per unit of production and maximum output;
- Maximum tool life (up to 100 times the life of high speed steel), giving dramatic savings in machine downtime, regrinding and tool costs;
- Maximum precision and finish of cut (generally burr-free);
- Maximum precision of saw tolerances; $+ .0005" / - .0000"$ on thickness, and $+ .005" / - .000"$ outside diameter.

(Tighter tolerances are available as specials.)

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

| Standard Tolerances | Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock |
|---|---------------|----------------------|---------------|-------------------|-------------|--------------|-------------------|-------|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | |
| Saw Dia. +0.005" -0.000" | 3/4 | 1/4 | 1/32 | 0.0313 | 0.795 | 18 | SC075002500031-18 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 18 | SC075002500047-18 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 18 | SC075002500063-18 | ◆ |
| Arbor Hole Size +0.0005" -0.0000" | 1 | 3/8 | - | 0.0080 | 0.203 | 20 | SC100003750008-20 | ◆ |
| | | | - | 0.0100 | 0.254 | 20 | SC100003750010-20 | ◆ |
| | | | - | 0.0120 | 0.305 | 20 | SC100003750012-20 | ◆ |
| | | | - | 0.0140 | 0.356 | 20 | SC100003750014-20 | ◆ |
| | | | 1/64 | 0.0156 | 0.396 | 20 | SC100003750015-20 | ◆ |
| | | | - | 0.0180 | 0.457 | 20 | SC100003750018-20 | ◆ |
| Side Run-Out < 0.0005" | 1 | 3/8 | - | 0.0200 | 0.508 | 20 | SC100003750020-20 | ◆ |
| | | | - | 0.0230 | 0.584 | 20 | SC100003750023-20 | ◆ |
| | | | - | 0.0250 | 0.635 | 20 | SC100003750025-20 | ◆ |
| Thickness +0.0005" -0.0000" | 1 | 3/8 | - | 0.0280 | 0.711 | 20 | SC100003750028-20 | ◆ |
| | | | - | 0.0300 | 0.762 | 20 | SC100003750030-20 | ◆ |
| | | | 1/32 | 0.0313 | 0.795 | 20 | SC100003750031-20 | ◆ |
| | | | - | 0.0350 | 0.889 | 20 | SC100003750035-20 | ◆ |
| | | | - | 0.0394 | 1.000 | 20 | SC100003750039-20 | ◆ |
| | | | - | 0.0400 | 1.016 | 20 | SC100003750040-20 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 20 | SC100003750047-20 | ◆ |
| | | | - | 0.0500 | 1.270 | 20 | SC100003750050-20 | ◆ |
| | | | - | 0.0510 | 1.295 | 20 | SC100003750051-20 | ◆ |
| | | | - | 0.0600 | 1.524 | 20 | SC100003750060-20 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 20 | SC100003750063-20 | ◆ |
| | | | - | 0.0700 | 1.778 | 20 | SC100003750070-20 | ◆ |
| | | | 5/64 | 0.0781 | 1.984 | 20 | SC100003750078-20 | ◆ |
| | | | - | 0.0787 | 2.000 | 20 | SC100003750079-20 | ◆ |
| | | | - | 0.0800 | 2.032 | 20 | SC100003750080-20 | ◆ |
| | | | - | 0.0900 | 2.286 | 20 | SC100003750090-20 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 20 | SC100003750094-20 | ◆ |
| | | | - | 0.1000 | 2.540 | 20 | SC100003750100-20 | ◆ |
| | | | - | 0.1100 | 2.794 | 20 | SC100003750110-20 | ◆ |
| | | | - | 0.1181 | 3.000 | 20 | SC100003750118-20 | ◆ |
| | | | - | 0.1200 | 3.048 | 20 | SC100003750120-20 | ◆ |
| 1/8 | 0.1250 | 3.175 | 20 | SC100003750125-20 | ◆ | | | |
| - | 0.1300 | 3.302 | 20 | SC100003750130-20 | ◆ | | | |
| - | 0.1400 | 3.556 | 20 | SC100003750140-20 | ◆ | | | |
| - | 0.1500 | 3.810 | 20 | SC100003750150-20 | ◆ | | | |
| 5/32 | 0.1563 | 3.970 | 20 | SC100003750156-20 | ◆ | | | |
| - | 0.1575 | 4.001 | 20 | SC100003750158-20 | ◆ | | | |
| - | 0.1600 | 4.064 | 20 | SC100003750160-20 | ◆ | | | |
| - | 0.1700 | 4.318 | 20 | SC100003750170-20 | ◆ | | | |
| - | 0.1800 | 4.572 | 20 | SC100003750180-20 | ◆ | | | |
| 3/16 | 0.1875 | 4.763 | 20 | SC100003750188-20 | ◆ | | | |
| - | 0.1900 | 4.826 | 20 | SC100003750190-20 | ◆ | | | |
| - | 0.1969 | 5.000 | 20 | SC100003750197-20 | ◆ | | | |
| - | 0.2000 | 5.080 | 20 | SC100003750200-20 | ◆ | | | |
| - | 0.2100 | 5.334 | 20 | SC100003750210-20 | ◆ | | | |
| 7/32 | 0.2188 | 5.558 | 20 | SC100003750219-20 | ◆ | | | |
| - | 0.2200 | 5.588 | 20 | SC100003750220-20 | ◆ | | | |
| - | 0.2300 | 5.842 | 20 | SC100003750230-20 | ◆ | | | |
| - | 0.2362 | 6.000 | 20 | SC100003750236-20 | ◆ | | | |
| - | 0.2400 | 6.096 | 20 | SC100003750240-20 | ◆ | | | |
| 1/4 | 0.2500 | 6.350 | 20 | SC100003750250-20 | ◆ | | | |

Recommended cutting conditions [Page 253](#)

| Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances |
|---------------|----------------------|---------------|--------------|-------------|--------------|-------------------|-------|---|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | |
| 1-1/4 | 5/16 | 1/32 | 0.0313 | 0.795 | 24 | SC125003130031-24 | ◆ | Saw Dia. +0.005" -0.000" Arbor Hole Size +0.0005" -0.0000" Side Run-Out < 0.0005" Thickness +0.0005" -0.0000" |
| | | 3/64 | 0.0469 | 1.191 | 24 | SC125003130047-24 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 24 | SC125003130063-24 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 24 | SC125003130094-24 | ◆ | |
| | | 1/8 | 0.1250 | 3.175 | 24 | SC125003130125-24 | ◆ | |
| | 1/2 | 1/32 | 0.0313 | 0.795 | 24 | SC125005000031-24 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 24 | SC125005000047-24 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 24 | SC125005000063-24 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 24 | SC125005000094-24 | ◆ | |
| | | 1/8 | 0.1250 | 0.318 | 24 | SC125005000125-24 | ◆ | |
| 1-1/2 | 1/2 | 1/32 | 0.0313 | 0.795 | 32 | SC150005000031-32 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 32 | SC150005000047-32 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 32 | SC150005000063-32 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 32 | SC150005000094-32 | ◆ | |
| | | 1/8 | 0.1250 | 3.175 | 32 | SC150005000125-32 | ◆ | |
| 1-3/4 | 1/2 | 1/32 | 0.0313 | 0.795 | 36 | SC175005000031-36 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 36 | SC175005000047-36 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 36 | SC175005000063-36 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 36 | SC175006250031-36 | ◆ | |
| | 5/8 | 3/64 | 0.0469 | 1.191 | 36 | SC175006250047-36 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 36 | SC175006250063-36 | ◆ | |
| | | 1/32 | 0.0313 | 0.795 | 36 | SC175008750031-36 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 36 | SC175008750047-36 | ◆ | |
| | 7/8 | 1/16 | 0.0625 | 1.588 | 36 | SC175008750063-36 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 36 | SC175008750094-36 | ◆ | |
| | | 1/8 | 0.1250 | 3.175 | 36 | SC175008750125-36 | ◆ | |
| | | - | 0.0080 | 0.203 | 36 | SC200005000008-36 | ◆ | |
| | | - | 0.0100 | 0.254 | 36 | SC200005000010-36 | ◆ | |
| | | - | 0.0120 | 0.305 | 36 | SC200005000012-36 | ◆ | |
| 2 | 1/2 | - | 0.0140 | 0.356 | 36 | SC200005000014-36 | ◆ | |
| | | 1/64 | 0.0156 | 0.396 | 36 | SC200005000015-36 | ◆ | |
| | | - | 0.0180 | 0.457 | 36 | SC200005000018-36 | ◆ | |
| | | - | 0.0200 | 0.508 | 36 | SC200005000020-36 | ◆ | |
| | | - | 0.0230 | 0.584 | 36 | SC200005000023-36 | ◆ | |
| | | - | 0.0250 | 0.635 | 36 | SC200005000025-36 | ◆ | |
| | | - | 0.0280 | 0.711 | 36 | SC200005000028-36 | ◆ | |
| | | - | 0.0300 | 0.762 | 36 | SC200005000030-36 | ◆ | |
| | | 1/32 | 0.0313 | 0.795 | 36 | SC200005000031-36 | ◆ | |
| | | - | 0.0350 | 0.889 | 36 | SC200005000035-36 | ◆ | |
| | | - | 0.0394 | 1.001 | 36 | SC200005000039-36 | ◆ | |
| | | - | 0.0400 | 1.016 | 36 | SC200005000040-36 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 36 | SC200005000047-36 | ◆ | |
| | | - | 0.0500 | 1.270 | 36 | SC200005000050-36 | ◆ | |
| | | - | 0.0510 | 1.295 | 36 | SC200005000051-36 | ◆ | |
| | | - | 0.0600 | 1.524 | 36 | SC200005000060-36 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 36 | SC200005000063-36 | ◆ | |
| | | - | 0.0700 | 1.778 | 36 | SC200005000070-36 | ◆ | |
| | | 5/64 | 0.0781 | 1.984 | 36 | SC200005000078-36 | ◆ | |
| | | - | 0.0787 | 1.999 | 36 | SC200005000079-36 | ◆ | |
| | | - | 0.0800 | 2.032 | 36 | SC200005000080-36 | ◆ | |
| | | - | 0.0900 | 2.286 | 36 | SC200005000090-36 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 36 | SC200005000094-36 | ◆ | |
| | | - | 0.1000 | 2.540 | 36 | SC200005000100-36 | ◆ | |

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- SAWS
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- INDEX

| Standard Tolerances | Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock |
|--------------------------------|---------------|----------------------|---|-------------------|-------------------|--------------|-------------------|-------|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | |
| Saw Dia. +0.005" -0.000" | 2 | 1/2 | - | 0.1100 | 2.794 | 36 | SC200005000110-36 | ◆ |
| | | | - | 0.1181 | 3.000 | 36 | SC200005000118-36 | ◆ |
| | | | - | 0.1200 | 3.048 | 36 | SC200005000120-36 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 36 | SC200005000125-36 | ◆ |
| | | | - | 0.1300 | 3.302 | 36 | SC200005000130-36 | ◆ |
| | | | - | 0.1400 | 3.556 | 36 | SC200005000140-36 | ◆ |
| | | | - | 0.1500 | 3.810 | 36 | SC200005000150-36 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 36 | SC200005000156-36 | ◆ |
| | | | - | 0.1575 | 4.000 | 36 | SC200005000158-36 | ◆ |
| | | | - | 0.1600 | 4.064 | 36 | SC200005000160-36 | ◆ |
| | | | - | 0.1700 | 4.318 | 36 | SC200005000170-36 | ◆ |
| | | | - | 0.1800 | 4.572 | 36 | SC200005000180-36 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 36 | SC200005000188-36 | ◆ |
| | | | - | 0.1900 | 4.826 | 36 | SC200005000190-36 | ◆ |
| | | | - | 0.1969 | 5.000 | 36 | SC200005000197-36 | ◆ |
| | | | Arbor Hole Size +0.0005" -0.0000" | 2 | 1/2 | - | 0.2000 | 5.080 |
| - | 0.2100 | 5.334 | | | | 36 | SC200005000210-36 | ◆ |
| 7/32 | 0.2188 | 5.556 | | | | 36 | SC200005000219-36 | ◆ |
| - | 0.2200 | 5.588 | | | | 36 | SC200005000220-36 | ◆ |
| - | 0.2300 | 5.842 | | | | 36 | SC200005000230-36 | ◆ |
| - | 0.2362 | 6.000 | | | | 36 | SC200005000236-36 | ◆ |
| - | 0.2400 | 6.096 | | | | 36 | SC200005000240-36 | ◆ |
| 1/4 | 0.2500 | 6.350 | | | | 36 | SC200005000250-36 | ◆ |
| 1/16 | 0.0625 | 1.588 | | | | 24 | SC200010000063-24 | ◆ |
| 3/32 | 0.0938 | 2.381 | | | | 24 | SC200010000094-24 | ◆ |
| 1/8 | 0.1250 | 3.175 | | | | 24 | SC200010000125-24 | ◆ |
| 1/32 | 0.0313 | 0.794 | | | | 36 | SC200010000031-36 | ◆ |
| 3/64 | 0.0469 | 1.191 | | | | 36 | SC200010000047-36 | ◆ |
| 1/16 | 0.0625 | 1.588 | | | | 36 | SC200010000063-36 | ◆ |
| 3/32 | 0.0938 | 2.381 | | | | 36 | SC200010000094-36 | ◆ |
| 1/8 | 0.1250 | 3.175 | | | | 36 | SC200010000125-36 | ◆ |
| 3/16 | 0.1875 | 4.763 | 36 | SC200010000188-36 | ◆ | | | |
| 1/4 | 0.2500 | 6.350 | 36 | SC200010000250-36 | ◆ | | | |
| Side Run-Out < 0.0005" | 2 | 1/2 | 1/16 | 0.0625 | 1.588 | 48 | SC200010000063-48 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 48 | SC200010000094-48 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 48 | SC200010000125-48 | ◆ |
| | | | 1/32 | 0.0313 | 0.794 | 40 | SC225005000031-40 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 40 | SC225005000047-40 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 40 | SC225005000063-40 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 40 | SC225005000094-40 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 40 | SC225005000125-40 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 40 | SC225005000156-40 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 28 | SC225006250063-28 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 28 | SC225006250094-28 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 28 | SC225006250125-28 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 56 | SC225006250063-56 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 56 | SC225006250094-56 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 56 | SC225006250125-56 | ◆ |
| | | | Thickness +0.0005" -0.0000" | 2-1/4 | 1/2 | 1/32 | 0.0313 | 0.794 |
| 3/64 | 0.0469 | 1.191 | | | | 40 | SC225010000047-40 | ◆ |
| 1/16 | 0.0625 | 1.588 | | | | 40 | SC225010000063-40 | ◆ |
| 3/32 | 0.0938 | 2.381 | | | | 40 | SC225010000094-40 | ◆ |
| 1/8 | 0.1250 | 3.175 | | | | 40 | SC225010000125-40 | ◆ |
| 5/32 | 0.1563 | 3.969 | | | | 40 | SC225010000156-40 | ◆ |
| 5/8 | 1/16 | 0.0625 | | | 1.588 | 28 | SC225006250063-28 | ◆ |
| | 3/32 | 0.0938 | | | 2.381 | 28 | SC225006250094-28 | ◆ |
| | 1/8 | 0.1250 | | | 3.175 | 28 | SC225006250125-28 | ◆ |
| | 1/16 | 0.0625 | | | 1.588 | 56 | SC225006250063-56 | ◆ |
| | 3/32 | 0.0938 | | | 2.381 | 56 | SC225006250094-56 | ◆ |
| | 1/8 | 0.1250 | | | 3.175 | 56 | SC225006250125-56 | ◆ |
| 1 | 1/32 | 0.0313 | | | 0.794 | 40 | SC225010000031-40 | ◆ |
| | 3/64 | 0.0469 | | | 1.191 | 40 | SC225010000047-40 | ◆ |
| | 1/16 | 0.0625 | | | 1.588 | 40 | SC225010000063-40 | ◆ |
| | 3/32 | 0.0938 | | | 2.381 | 40 | SC225010000094-40 | ◆ |
| | 1/8 | 0.1250 | 3.175 | 40 | SC225010000125-40 | ◆ | | |
| | 5/32 | 0.1563 | 3.969 | 40 | SC225010000156-40 | ◆ | | |

Recommended cutting conditions [Page 253](#)

| Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances |
|---------------|----------------------|---------------|--------------|-------------------|-------------------|-------------------|-------|---|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | |
| 2-1/2 | 5/8 | - | 0.0080 | 0.203 | 48 | SC250006250008-48 | ◆ | Saw Dia. +0.005" -0.000" |
| | | - | 0.0100 | 0.254 | 48 | SC250006250010-48 | ◆ | |
| | | - | 0.0120 | 0.305 | 48 | SC250006250012-48 | ◆ | |
| | | - | 0.0140 | 0.356 | 48 | SC250006250014-48 | ◆ | |
| | | 1/64 | 0.0156 | 0.397 | 48 | SC250006250015-48 | ◆ | Arbor Hole Size +0.0005" -0.0000" |
| | | - | 0.0180 | 0.457 | 48 | SC250006250018-48 | ◆ | |
| | | - | 0.0200 | 0.508 | 48 | SC250006250020-48 | ◆ | |
| | | - | 0.0230 | 0.584 | 48 | SC250006250023-48 | ◆ | |
| | | - | 0.0250 | 0.635 | 48 | SC250006250025-48 | ◆ | Side Run-Out < 0.0005" |
| | | - | 0.0280 | 0.711 | 48 | SC250006250028-48 | ◆ | |
| | | 1/32 | 0.0300 | 0.762 | 48 | SC250006250030-48 | ◆ | |
| | | - | 0.0313 | 0.794 | 48 | SC250006250031-48 | ◆ | |
| | | - | 0.0350 | 0.889 | 48 | SC250006250035-48 | ◆ | Thickness +0.0005" -0.0000" |
| | | - | 0.0394 | 1.000 | 48 | SC250006250039-48 | ◆ | |
| | | - | 0.0400 | 1.016 | 48 | SC250006250040-48 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 48 | SC250006250047-48 | ◆ | |
| | | - | 0.0500 | 1.270 | 48 | SC250006250050-48 | ◆ | |
| | | - | 0.0510 | 1.295 | 48 | SC250006250051-48 | ◆ | |
| | | - | 0.0600 | 1.524 | 48 | SC250006250060-48 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 48 | SC250006250063-48 | ◆ | |
| | | - | 0.0700 | 1.778 | 48 | SC250006250070-48 | ◆ | |
| | | 5/64 | 0.0781 | 1.984 | 48 | SC250006250078-48 | ◆ | |
| | | - | 0.0787 | 2.000 | 48 | SC250006250079-48 | ◆ | |
| | | - | 0.0800 | 2.032 | 48 | SC250006250080-48 | ◆ | |
| | | - | 0.0900 | 2.286 | 48 | SC250006250090-48 | ◆ | |
| | | 3/32 | 0.0938 | 2.381 | 48 | SC250006250094-48 | ◆ | |
| | | - | 0.1000 | 2.540 | 48 | SC250006250100-48 | ◆ | |
| | | - | 0.1100 | 2.794 | 48 | SC250006250110-48 | ◆ | |
| | | - | 0.1181 | 3.000 | 48 | SC250006250118-48 | ◆ | |
| | | - | 0.1200 | 3.048 | 48 | SC250006250120-48 | ◆ | |
| | | 1/8 | 0.1250 | 3.175 | 48 | SC250006250125-48 | ◆ | |
| | | - | 0.1300 | 3.302 | 48 | SC250006250130-48 | ◆ | |
| | - | 0.1400 | 3.556 | 48 | SC250006250140-48 | ◆ | | |
| | - | 0.1500 | 3.810 | 48 | SC250006250150-48 | ◆ | | |
| | 5/32 | 0.1563 | 3.969 | 48 | SC250006250156-48 | ◆ | | |
| | - | 0.1575 | 4.000 | 48 | SC250006250158-48 | ◆ | | |
| | - | 0.1600 | 4.064 | 48 | SC250006250160-48 | ◆ | | |
| | - | 0.1700 | 4.318 | 48 | SC250006250170-48 | ◆ | | |
| | - | 0.1800 | 4.572 | 48 | SC250006250180-48 | ◆ | | |
| | 3/16 | 0.1875 | 4.763 | 48 | SC250006250188-48 | ◆ | | |
| | - | 0.1900 | 4.826 | 48 | SC250006250190-48 | ◆ | | |
| | - | 0.1969 | 5.000 | 48 | SC250006250197-48 | ◆ | | |
| | - | 0.2000 | 5.080 | 48 | SC250006250200-48 | ◆ | | |
| | - | 0.2100 | 5.334 | 48 | SC250006250210-48 | ◆ | | |
| | 7/32 | 0.2188 | 5.556 | 48 | SC250006250219-48 | ◆ | | |
| | - | 0.2200 | 5.588 | 48 | SC250006250220-48 | ◆ | | |
| | - | 0.2300 | 5.842 | 48 | SC250006250230-48 | ◆ | | |
| | - | 0.2362 | 6.000 | 48 | SC250006250236-48 | ◆ | | |
| - | 0.2400 | 6.096 | 48 | SC250006250240-48 | ◆ | | | |
| 1/4 | 0.2500 | 6.350 | 48 | SC250006250250-48 | ◆ | | | |
| 1 | 1/16 | 0.0625 | 1.588 | 28 | SC250010000063-28 | ◆ | | |
| | 3/32 | 0.0938 | 2.381 | 28 | SC250010000094-28 | ◆ | | |
| | 1/8 | 0.1250 | 3.175 | 28 | SC250010000125-28 | ◆ | | |
| | 5/32 | 0.1563 | 3.969 | 28 | SC250010000156-28 | ◆ | | |

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- INDEX

| Standard Tolerances | Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock |
|---|---------------|----------------------|---------------|-------------------|-------------|--------------|-------------------|-------|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | |
| Saw Dia. +0.005" -0.000" | 2-1/2 | 1 | 1/32 | 0.0313 | 0.794 | 48 | SC250010000031-48 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 48 | SC250010000047-48 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 48 | SC250010000063-48 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 48 | SC250010000094-48 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 48 | SC250010000125-48 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 48 | SC250010000156-48 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 48 | SC250010000188-48 | ◆ |
| | | | 1/4 | 0.2500 | 6.350 | 48 | SC250010000250-48 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 56 | SC250010000063-56 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 56 | SC250010000094-56 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 56 | SC250010000125-56 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 56 | SC250010000156-56 | ◆ |
| Arbor Hole Size +0.0005" -0.0000" | 2-1/2 | 1 | 1/16 | 0.0625 | 1.588 | 30 | SC275010000063-30 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 30 | SC275010000094-30 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 30 | SC275010000125-30 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 30 | SC275010000156-30 | ◆ |
| | | | - | 0.0080 | 0.203 | 60 | SC275010000008-60 | ◆ |
| | | | - | 0.0100 | 0.254 | 60 | SC275010000010-60 | ◆ |
| | | | - | 0.0120 | 0.305 | 60 | SC275010000012-60 | ◆ |
| | | | - | 0.0140 | 0.356 | 60 | SC275010000014-60 | ◆ |
| | | | 1/64 | 0.0156 | 0.397 | 60 | SC275010000015-60 | ◆ |
| | | | - | 0.0180 | 0.457 | 60 | SC275010000018-60 | ◆ |
| | | | - | 0.0200 | 0.508 | 60 | SC275010000020-60 | ◆ |
| | | | - | 0.0230 | 0.584 | 60 | SC275010000023-60 | ◆ |
| Side Run-Out < 0.0005" | 2-1/2 | 1 | - | 0.0250 | 0.635 | 60 | SC275010000025-60 | ◆ |
| | | | - | 0.0280 | 0.711 | 60 | SC275010000028-60 | ◆ |
| | | | - | 0.0300 | 0.762 | 60 | SC275010000030-60 | ◆ |
| | | | 1/32 | 0.0313 | 0.794 | 60 | SC275010000031-60 | ◆ |
| | | | - | 0.0350 | 0.889 | 60 | SC275010000035-60 | ◆ |
| | | | - | 0.0394 | 1.000 | 60 | SC275010000039-60 | ◆ |
| | | | - | 0.0400 | 1.016 | 60 | SC275010000040-60 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 60 | SC275010000047-60 | ◆ |
| | | | - | 0.0500 | 1.270 | 60 | SC275010000050-60 | ◆ |
| | | | - | 0.0510 | 1.295 | 60 | SC275010000051-60 | ◆ |
| | | | - | 0.0600 | 1.524 | 60 | SC275010000060-60 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 60 | SC275010000063-60 | ◆ |
| Thickness +0.0005" -0.0000" | 2-3/4 | 1 | - | 0.0700 | 1.778 | 60 | SC275010000070-60 | ◆ |
| | | | 5/64 | 0.0781 | 1.984 | 60 | SC275010000078-60 | ◆ |
| | | | - | 0.0787 | 2.000 | 60 | SC275010000079-60 | ◆ |
| | | | - | 0.0800 | 2.032 | 60 | SC275010000080-60 | ◆ |
| | | | - | 0.0900 | 2.286 | 60 | SC275010000090-60 | ◆ |
| | | | 3/32 | 0.0938 | 2.381 | 60 | SC275010000094-60 | ◆ |
| | | | - | 0.1000 | 2.540 | 60 | SC275010000100-60 | ◆ |
| | | | - | 0.1100 | 2.794 | 60 | SC275010000110-60 | ◆ |
| | | | - | 0.1181 | 3.000 | 60 | SC275010000118-60 | ◆ |
| | | | - | 0.1200 | 3.048 | 60 | SC275010000120-60 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 60 | SC275010000125-60 | ◆ |
| | | | - | 0.1300 | 3.302 | 60 | SC275010000130-60 | ◆ |
| - | 0.1400 | 3.556 | 60 | SC275010000140-60 | ◆ | | | |
| - | 0.1500 | 3.810 | 60 | SC275010000150-60 | ◆ | | | |
| 5/32 | 0.1563 | 3.969 | 60 | SC275010000156-60 | ◆ | | | |
| - | 0.1575 | 4.000 | 60 | SC275010000158-60 | ◆ | | | |
| - | 0.1600 | 4.064 | 60 | SC275010000160-60 | ◆ | | | |

Recommended cutting conditions [Page 253](#)

| Saw Dia. (in) | Arbor Hole Dia. (in) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances | |
|---------------|----------------------|---------------|--------------|-------------|-------------------|-------------------|-----------------------------------|---|---|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | | |
| 2-3/4 | 1 | - | 0.1700 | 4.318 | 60 | SC275010000170-60 | ◆ | Saw Dia. +0.005" -0.000" | |
| | | - | 0.1800 | 4.572 | 60 | SC275010000180-60 | ◆ | | |
| | | 3/16 | 0.1875 | 4.763 | 60 | SC275010000188-60 | ◆ | | |
| | | - | 0.1900 | 4.826 | 60 | SC275010000190-60 | ◆ | | |
| | | - | 0.1969 | 5.000 | 60 | SC275010000197-60 | ◆ | Arbor Hole Size +0.0005" -0.0000" | |
| | | - | 0.2000 | 5.080 | 60 | SC275010000200-60 | ◆ | | |
| | | - | 0.2100 | 5.334 | 60 | SC275010000210-60 | ◆ | | |
| | | 7/32 | 0.2188 | 5.556 | 60 | SC275010000219-60 | ◆ | | |
| | | - | 0.2200 | 5.588 | 60 | SC275010000220-60 | ◆ | Side Run-Out < 0.0005" | |
| | | - | 0.2300 | 5.842 | 60 | SC275010000230-60 | ◆ | | |
| | | - | 0.2362 | 6.000 | 60 | SC275010000236-60 | ◆ | | |
| | | - | 0.2400 | 6.096 | 60 | SC275010000240-60 | ◆ | | |
| - | 1/4 | 0.2500 | 6.350 | 60 | SC275010000250-60 | ◆ | Thickness +0.0005" -0.0000" | | |
| 3 | 1 | 1/16 | 0.0625 | 1.588 | 30 | SC300010000063-30 | | ◆ | |
| | | 3/32 | 0.0938 | 2.381 | 30 | SC300010000094-30 | | ◆ | |
| | | 1/8 | 0.1250 | 3.175 | 30 | SC300010000125-30 | | ◆ | |
| | | 5/32 | 0.1563 | 3.969 | 30 | SC300010000156-30 | ◆ | | |
| | | 1/32 | 0.0313 | 0.794 | 60 | SC300010000031-60 | ◆ | | |
| | | 3/64 | 0.0469 | 1.191 | 60 | SC300010000047-60 | ◆ | | |
| | | 1/16 | 0.0625 | 1.588 | 60 | SC300010000063-60 | ◆ | | |
| | | 3/32 | 0.0938 | 2.381 | 60 | SC300010000094-60 | ◆ | | |
| | | 1/8 | 0.1250 | 3.175 | 60 | SC300010000125-60 | ◆ | | |
| | | 5/32 | 0.1563 | 3.969 | 60 | SC300010000156-60 | ◆ | | |
| | | 3/16 | 0.1875 | 4.763 | 60 | SC300010000188-60 | ◆ | | |
| | | 1/4 | 0.2500 | 6.350 | 60 | SC300010000250-60 | ◆ | | |
| | | 4 | 1 | 1/16 | 0.0625 | 1.588 | 36 | SC400010000063-36 | ◆ |
| | | | | 3/32 | 0.0938 | 2.381 | 36 | SC400010000094-36 | ◆ |
| | | | | 1/8 | 0.1250 | 3.175 | 36 | SC400010000125-36 | ◆ |
| | | | | 5/32 | 0.1563 | 3.969 | 36 | SC400010000156-36 | ◆ |
| | | | | 1/4 | 0.2500 | 6.350 | 36 | SC400010000250-36 | ◆ |
| | | | | 1/32 | 0.0313 | 0.794 | 72 | SC400010000031-72 | ◆ |
| 3/64 | 0.0469 | | | 1.191 | 72 | SC400010000047-72 | ◆ | | |
| 1/16 | 0.0625 | | | 1.588 | 72 | SC400010000063-72 | ◆ | | |
| 3/32 | 0.0938 | | | 2.381 | 72 | SC400010000094-72 | ◆ | | |
| 1/8 | 0.1250 | | | 3.175 | 72 | SC400010000125-72 | ◆ | | |
| 5/32 | 0.1563 | | | 3.969 | 72 | SC400010000156-72 | ◆ | | |
| 3/16 | 0.1875 | | | 4.763 | 72 | SC400010000188-72 | ◆ | | |
| 1/4 | 0.2500 | | | 6.350 | 72 | SC400010000250-72 | ◆ | | |

Recommended cutting conditions [Page 253](#)

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

| | Standard Tolerances | Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock | | |
|---------------------|-----------------------------------|---|-------------------------------------|---------------|--------------|-------------|--------------|---------------|---------------|---------------|---|
| | | | | Fraction (in) | Decimal (in) | Metric (mm) | | | | | |
| DRILLS | Saw Dia. +0.1270mm -0.000mm | 20 | 5 | 1/32 | 0.0313 | 0.794 | 10 | SC20050794-10 | ◆ | | |
| | | | | 3/64 | 0.0469 | 1.191 | 10 | SC20051191-10 | ◆ | | |
| | | | | 1/16 | 0.0625 | 1.588 | 10 | SC20051588-10 | ◆ | | |
| | | | | 1/32 | 0.0313 | 0.794 | 20 | SC20050794-20 | ◆ | | |
| | | | | 3/64 | 0.0469 | 1.191 | 20 | SC20051191-20 | ◆ | | |
| | | | | 1/16 | 0.0625 | 1.588 | 20 | SC20051588-20 | ◆ | | |
| | END MILLS | Arbor Hole Size +0.0127mm -0.0000mm | 25 | 8 | - | 0.0080 | 0.203 | 10 | SC25080203-10 | ◆ | |
| | | | | | - | 0.0100 | 0.254 | 10 | SC25080254-10 | ◆ | |
| | | | | | - | 0.0120 | 0.305 | 10 | SC25080305-10 | ◆ | |
| | | | | | - | 0.0140 | 0.356 | 10 | SC25080356-10 | ◆ | |
| | | | | | - | 0.0156 | 0.396 | 10 | SC25080396-10 | ◆ | |
| | | | | | - | 0.0180 | 0.457 | 10 | SC25080457-10 | ◆ | |
| | | ROUTERS | Side Run-Out < 0.0127mm | 25 | 8 | - | 0.0200 | 0.508 | 10 | SC25080508-10 | ◆ |
| | | | | | | - | 0.0230 | 0.584 | 10 | SC25080584-10 | ◆ |
| | | | | | | - | 0.0250 | 0.635 | 10 | SC25080635-10 | ◆ |
| | | | | | | - | 0.0280 | 0.711 | 10 | SC25080711-10 | ◆ |
| - | | | | | | 0.0300 | 0.762 | 10 | SC25080762-10 | ◆ | |
| 1/32 | | | | | | 0.0313 | 0.795 | 10 | SC25080795-10 | ◆ | |
| THREAD MILLS & TAPS | | | Thickness +0.0127mm -0.0000mm | 25 | 8 | - | 0.0350 | 0.889 | 10 | SC25080889-10 | ◆ |
| | | | | | | - | 0.0394 | 1.001 | 10 | SC25081001-10 | ◆ |
| | | | | | | - | 0.0400 | 1.016 | 10 | SC25081016-10 | ◆ |
| | | | | | | 3/64 | 0.0469 | 1.191 | 10 | SC25081191-10 | ◆ |
| | - | | | | | 0.0500 | 1.270 | 10 | SC25081270-10 | ◆ | |
| | - | | | | | 0.0510 | 1.295 | 10 | SC25081295-10 | ◆ | |
| | ENGRAVERS | | | 25 | 8 | - | 0.0600 | 1.524 | 10 | SC25081524-10 | ◆ |
| | | | | | | 1/16 | 0.0625 | 1.588 | 10 | SC25081588-10 | ◆ |
| | | | | | | - | 0.0700 | 1.778 | 10 | SC25081778-10 | ◆ |
| | | | | | | - | 0.0781 | 1.984 | 10 | SC25081984-10 | ◆ |
| | | - | | | | 0.0787 | 1.999 | 10 | SC25081999-10 | ◆ | |
| | | - | | | | 0.0800 | 2.032 | 10 | SC25082032-10 | ◆ | |
| | | BORING BARS | | 25 | 8 | - | 0.0900 | 2.286 | 10 | SC25082286-10 | ◆ |
| | | | | | | 3/32 | 0.0938 | 2.383 | 10 | SC25082383-10 | ◆ |
| | | | | | | - | 0.1000 | 2.540 | 10 | SC25082540-10 | ◆ |
| | | | | | | - | 0.1100 | 2.794 | 10 | SC25082794-10 | ◆ |
| - | | | | | | 0.1181 | 3.000 | 10 | SC25083000-10 | ◆ | |
| - | | | | | | 0.1200 | 3.048 | 10 | SC25083048-10 | ◆ | |
| REAMERS | | | | 25 | 8 | - | 0.1250 | 3.175 | 10 | SC25083175-10 | ◆ |
| | | | | | | - | 0.1300 | 3.302 | 10 | SC25083302-10 | ◆ |
| | | | | | | - | 0.1400 | 3.556 | 10 | SC25083556-10 | ◆ |
| | | | | | | - | 0.1500 | 3.810 | 10 | SC25083810-10 | ◆ |
| | 5/32 | | | | | 0.1563 | 3.970 | 10 | SC25083970-10 | ◆ | |
| | - | | | | | 0.1575 | 4.001 | 10 | SC25084001-10 | ◆ | |
| | SAWS | | | 25 | 8 | - | 0.1600 | 4.064 | 10 | SC25084064-10 | ◆ |
| | | | | | | - | 0.1700 | 4.318 | 10 | SC25084318-10 | ◆ |
| | | | | | | - | 0.1800 | 4.572 | 10 | SC25084572-10 | ◆ |
| | | | | | | 3/16 | 0.1875 | 4.763 | 10 | SC25084763-10 | ◆ |
| | | - | | | | 0.1900 | 4.826 | 10 | SC25084826-10 | ◆ | |
| | | - | | | | 0.1969 | 5.001 | 10 | SC25085001-10 | ◆ | |
| | | TECHNICAL | | 25 | 8 | - | 0.2000 | 5.080 | 10 | SC25085080-10 | ◆ |
| | | | | | | - | 0.2100 | 5.334 | 10 | SC25085334-10 | ◆ |
| | | | | | | - | 0.2188 | 5.558 | 10 | SC25085558-10 | ◆ |
| | | | | | | - | 0.2200 | 5.588 | 10 | SC25085588-10 | ◆ |
| - | | | | | | 0.2300 | 5.842 | 10 | SC25085842-10 | ◆ | |
| - | | | | | | 0.2300 | 5.842 | 10 | SC25085842-10 | ◆ | |
| INDEX | | | | 25 | 8 | - | 0.2300 | 5.842 | 10 | SC25085842-10 | ◆ |

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| Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances |
|---------------|----------------------|---------------|--------------|---------------|--------------|---------------|-------|---|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | |
| 25 | 8 | - | 0.2362 | 5.999 | 10 | SC25085999-10 | ◆ | Saw Dia. +0.1270mm -0.000mm |
| | | - | 0.2400 | 6.096 | 10 | SC25086096-10 | ◆ | |
| | | - | 0.2500 | 6.350 | 10 | SC25086350-10 | ◆ | |
| | | - | 0.0080 | 0.203 | 20 | SC25080203-20 | ◆ | |
| | | - | 0.0100 | 0.254 | 20 | SC25080254-20 | ◆ | Arbor Hole Size +0.0127mm -0.0000mm |
| | | - | 0.0120 | 0.305 | 20 | SC25080305-20 | ◆ | |
| | | - | 0.0140 | 0.356 | 20 | SC25080356-20 | ◆ | |
| | | - | 0.0156 | 0.396 | 20 | SC25080396-20 | ◆ | |
| | | - | 0.0180 | 0.457 | 20 | SC25080457-20 | ◆ | Side Run-Out < 0.0127mm |
| | | - | 0.0200 | 0.508 | 20 | SC25080508-20 | ◆ | |
| | | - | 0.0230 | 0.584 | 20 | SC25080584-20 | ◆ | |
| | | - | 0.0250 | 0.635 | 20 | SC25080635-20 | ◆ | |
| | | - | 0.0280 | 0.711 | 20 | SC25080711-20 | ◆ | Thickness +0.0127mm -0.0000mm |
| | | - | 0.0300 | 0.762 | 20 | SC25080762-20 | ◆ | |
| | | 1/32 | 0.0313 | 0.795 | 20 | SC25080795-20 | ◆ | |
| | | - | 0.0350 | 0.889 | 20 | SC25080889-20 | ◆ | |
| | | - | 0.0394 | 1.001 | 20 | SC25081001-20 | ◆ | |
| | | - | 0.0400 | 1.016 | 20 | SC25081016-20 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 20 | SC25081191-20 | ◆ | |
| | | - | 0.0500 | 1.270 | 20 | SC25081270-20 | ◆ | |
| | | - | 0.0510 | 1.295 | 20 | SC25081295-20 | ◆ | |
| | | - | 0.0600 | 1.524 | 20 | SC25081524-20 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 20 | SC25081588-20 | ◆ | |
| | | - | 0.0700 | 1.778 | 20 | SC25081778-20 | ◆ | |
| | | - | 0.0781 | 1.984 | 20 | SC25081984-20 | ◆ | |
| | | - | 0.0787 | 1.999 | 20 | SC25081999-20 | ◆ | |
| | | - | 0.0800 | 2.032 | 20 | SC25082032-20 | ◆ | |
| | | - | 0.0900 | 2.286 | 20 | SC25082286-20 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 20 | SC25082383-20 | ◆ | |
| | | - | 0.1000 | 2.540 | 20 | SC25082540-20 | ◆ | |
| | | - | 0.1100 | 2.794 | 20 | SC25082794-20 | ◆ | |
| | | - | 0.1181 | 3.000 | 20 | SC25083000-20 | ◆ | |
| | | - | 0.1200 | 3.048 | 20 | SC25083048-20 | ◆ | |
| | | - | 0.1250 | 3.175 | 20 | SC25083175-20 | ◆ | |
| | | - | 0.1300 | 3.302 | 20 | SC25083302-20 | ◆ | |
| | | - | 0.1400 | 3.556 | 20 | SC25083556-20 | ◆ | |
| | | - | 0.1500 | 3.810 | 20 | SC25083810-20 | ◆ | |
| | | 5/32 | 0.1563 | 3.970 | 20 | SC25083970-20 | ◆ | |
| | | - | 0.1575 | 4.001 | 20 | SC25084001-20 | ◆ | |
| | | - | 0.1600 | 4.064 | 20 | SC25084064-20 | ◆ | |
| - | 0.1700 | 4.318 | 20 | SC25084318-20 | ◆ | | | |
| - | 0.1800 | 4.572 | 20 | SC25084572-20 | ◆ | | | |
| 3/16 | 0.1875 | 4.763 | 20 | SC25084763-20 | ◆ | | | |
| - | 0.1900 | 4.826 | 20 | SC25084826-20 | ◆ | | | |
| - | 0.1969 | 5.001 | 20 | SC25085001-20 | ◆ | | | |
| - | 0.2000 | 5.080 | 20 | SC25085080-20 | ◆ | | | |
| - | 0.2100 | 5.334 | 20 | SC25085334-20 | ◆ | | | |
| - | 0.2188 | 5.558 | 20 | SC25085558-20 | ◆ | | | |
| - | 0.2200 | 5.588 | 20 | SC25085588-20 | ◆ | | | |
| - | 0.2300 | 5.842 | 20 | SC25085842-20 | ◆ | | | |
| - | 0.2362 | 5.999 | 20 | SC25085999-20 | ◆ | | | |
| - | 0.2400 | 6.096 | 20 | SC25086096-20 | ◆ | | | |
| - | 0.2500 | 6.350 | 20 | SC25086350-20 | ◆ | | | |

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
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Recommended cutting conditions [Page 253](#)

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
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INDEX

| Standard Tolerances | Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock | | | |
|-----------------------------------|---------------|----------------------|---|---------------|-------------|--------------|---------------|-------|----|---------------|---|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | | | | |
| Saw Dia. +0.1270mm -0.000mm | 30 | 8 | 1/32 | 0.0313 | 0.794 | 16 | SC30080794-16 | ◆ | | | |
| | | | 3/64 | 0.0469 | 1.191 | 16 | SC30081191-16 | ◆ | | | |
| | | | 1/16 | 0.0625 | 1.588 | 16 | SC30081588-16 | ◆ | | | |
| | | | 3/32 | 0.0938 | 2.383 | 16 | SC30082383-16 | ◆ | | | |
| | | | 1/8 | 0.1250 | 3.175 | 16 | SC30083175-16 | ◆ | | | |
| | | | 1/32 | 0.0313 | 0.794 | 32 | SC30080794-32 | ◆ | | | |
| | | | 3/64 | 0.0469 | 1.191 | 32 | SC30081191-32 | ◆ | | | |
| | | | 1/16 | 0.0625 | 1.588 | 32 | SC30081588-32 | ◆ | | | |
| | | | 3/32 | 0.0938 | 2.383 | 32 | SC30082383-32 | ◆ | | | |
| | | | 1/8 | 0.1250 | 3.175 | 32 | SC30083175-32 | ◆ | | | |
| | | | Arbor Hole Size +0.0127mm -0.0000mm | 30 | 8 | 1/32 | 0.0313 | 0.794 | 16 | SC40100794-16 | ◆ |
| | | | | | | 3/64 | 0.0469 | 1.191 | 16 | SC40101191-16 | ◆ |
| 1/16 | 0.0625 | 1.588 | | | | 16 | SC40101588-16 | ◆ | | | |
| 3/32 | 0.0938 | 2.383 | | | | 16 | SC40102383-16 | ◆ | | | |
| 1/8 | 0.1250 | 3.175 | | | | 16 | SC40103175-16 | ◆ | | | |
| 1/32 | 0.0313 | 0.794 | | | | 32 | SC40100794-32 | ◆ | | | |
| 3/64 | 0.0469 | 1.191 | | | | 32 | SC40101191-32 | ◆ | | | |
| 1/16 | 0.0625 | 1.588 | | | | 32 | SC40101588-32 | ◆ | | | |
| 3/32 | 0.0938 | 2.383 | | | | 32 | SC40102383-32 | ◆ | | | |
| 1/8 | 0.1250 | 3.175 | | | | 32 | SC40103175-32 | ◆ | | | |
| Side Run-Out < 0.0127mm | 40 | 10 | | | | - | 0.0080 | 0.203 | 20 | SC50130203-20 | ◆ |
| | | | | | | - | 0.0100 | 0.254 | 20 | SC50130254-20 | ◆ |
| | | | - | 0.0120 | 0.305 | 20 | SC50130305-20 | ◆ | | | |
| | | | - | 0.0140 | 0.356 | 20 | SC50130356-20 | ◆ | | | |
| | | | - | 0.0156 | 0.396 | 20 | SC50130396-20 | ◆ | | | |
| | | | - | 0.0180 | 0.457 | 20 | SC50130457-20 | ◆ | | | |
| | | | - | 0.0200 | 0.508 | 20 | SC50130508-20 | ◆ | | | |
| | | | - | 0.0230 | 0.584 | 20 | SC50130584-20 | ◆ | | | |
| | | | - | 0.0250 | 0.635 | 20 | SC50130635-20 | ◆ | | | |
| | | | - | 0.0280 | 0.711 | 20 | SC50130711-20 | ◆ | | | |
| | | | - | 0.0300 | 0.762 | 20 | SC50130762-20 | ◆ | | | |
| | | | Thickness +0.0127mm -0.0000mm | 40 | 10 | 1/32 | 0.0313 | 0.795 | 20 | SC50130795-20 | ◆ |
| - | 0.0350 | 0.889 | | | | 20 | SC50130889-20 | ◆ | | | |
| - | 0.0394 | 1.001 | | | | 20 | SC50131001-20 | ◆ | | | |
| - | 0.0400 | 1.016 | | | | 20 | SC50131016-20 | ◆ | | | |
| 3/64 | 0.0469 | 1.191 | | | | 20 | SC50131191-20 | ◆ | | | |
| - | 0.0500 | 1.270 | | | | 20 | SC50131270-20 | ◆ | | | |
| - | 0.0510 | 1.295 | | | | 20 | SC50131295-20 | ◆ | | | |
| - | 0.0600 | 1.524 | | | | 20 | SC50131524-20 | ◆ | | | |
| 1/16 | 0.0625 | 1.588 | | | | 20 | SC50131588-20 | ◆ | | | |
| - | 0.0700 | 1.778 | | | | 20 | SC50131778-20 | ◆ | | | |
| - | 0.0781 | 1.984 | | | | 20 | SC50131984-20 | ◆ | | | |
| - | 0.0787 | 1.999 | | | | 20 | SC50131999-20 | ◆ | | | |
| - | 0.0800 | 2.032 | 20 | SC50132032-20 | ◆ | | | | | | |
| - | 0.0900 | 2.286 | 20 | SC50132286-20 | ◆ | | | | | | |
| - | 0.0938 | 2.383 | 20 | SC50132383-20 | ◆ | | | | | | |
| - | 0.1000 | 2.540 | 20 | SC50132540-20 | ◆ | | | | | | |
| - | 0.1100 | 2.794 | 20 | SC50132794-20 | ◆ | | | | | | |
| - | 0.1181 | 3.000 | 20 | SC50133000-20 | ◆ | | | | | | |
| - | 0.1200 | 3.048 | 20 | SC50133048-20 | ◆ | | | | | | |
| - | 0.1250 | 3.175 | 20 | SC50133175-20 | ◆ | | | | | | |
| - | 0.1300 | 3.302 | 20 | SC50133302-20 | ◆ | | | | | | |
| - | 0.1400 | 3.556 | 20 | SC50133556-20 | ◆ | | | | | | |

Recommended cutting conditions [Page 253](#)

| Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances |
|---------------|----------------------|---------------|--------------|---------------|--------------|---------------|-------|--|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | |
| 50 | 13 | - | 0.1500 | 3.810 | 20 | SC50133810-20 | ◆ | Saw Dia. +0.1270mm -0.000mm |
| | | 5/32 | 0.1563 | 3.970 | 20 | SC50133970-20 | ◆ | |
| | | - | 0.1575 | 4.001 | 20 | SC50134001-20 | ◆ | |
| | | - | 0.1600 | 4.064 | 20 | SC50134064-20 | ◆ | |
| | | - | 0.1700 | 4.318 | 20 | SC50134318-20 | ◆ | Arbor Hole Size +0.0127mm -0.000mm |
| | | - | 0.1800 | 4.572 | 20 | SC50134572-20 | ◆ | |
| | | 3/16 | 0.1875 | 4.763 | 20 | SC50134763-20 | ◆ | |
| | | - | 0.1900 | 4.826 | 20 | SC50134826-20 | ◆ | |
| | | - | 0.1969 | 5.001 | 20 | SC50135001-20 | ◆ | Side Run-Out < 0.0127mm |
| | | - | 0.2000 | 5.080 | 20 | SC50135080-20 | ◆ | |
| | | - | 0.2100 | 5.334 | 20 | SC50135334-20 | ◆ | |
| | | - | 0.2188 | 5.558 | 20 | SC50135558-20 | ◆ | |
| | | - | 0.2200 | 5.588 | 20 | SC50135588-20 | ◆ | Thickness +0.0127mm -0.000mm |
| | | - | 0.2300 | 5.842 | 20 | SC50135842-20 | ◆ | |
| | | - | 0.2362 | 5.999 | 20 | SC50135999-20 | ◆ | |
| | | - | 0.2400 | 6.096 | 20 | SC50136096-20 | ◆ | |
| | | - | 0.2500 | 6.350 | 20 | SC50136350-20 | ◆ | |
| | | - | 0.0080 | 0.203 | 40 | SC50130203-40 | ◆ | |
| | | - | 0.0100 | 0.254 | 40 | SC50130254-40 | ◆ | |
| | | - | 0.0120 | 0.305 | 40 | SC50130305-40 | ◆ | |
| | | - | 0.0140 | 0.356 | 40 | SC50130356-40 | ◆ | |
| | | - | 0.0156 | 0.396 | 40 | SC50130396-40 | ◆ | |
| | | - | 0.0180 | 0.457 | 40 | SC50130457-40 | ◆ | |
| | | - | 0.0200 | 0.508 | 40 | SC50130508-40 | ◆ | |
| | | - | 0.0230 | 0.584 | 40 | SC50130584-40 | ◆ | |
| | | - | 0.0250 | 0.635 | 40 | SC50130635-40 | ◆ | |
| | | - | 0.0280 | 0.711 | 40 | SC50130711-40 | ◆ | |
| | | - | 0.0300 | 0.762 | 40 | SC50130762-40 | ◆ | |
| | | 1/32 | 0.0313 | 0.795 | 40 | SC50130795-40 | ◆ | |
| | | - | 0.0350 | 0.889 | 40 | SC50130889-40 | ◆ | |
| | | - | 0.0394 | 1.001 | 40 | SC50131001-40 | ◆ | |
| | | - | 0.0400 | 1.016 | 40 | SC50131016-40 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 40 | SC50131191-40 | ◆ | |
| | | - | 0.0500 | 1.270 | 40 | SC50131270-40 | ◆ | |
| | | - | 0.0510 | 1.295 | 40 | SC50131295-40 | ◆ | |
| | | - | 0.0600 | 1.524 | 40 | SC50131524-40 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 40 | SC50131588-40 | ◆ | |
| | | - | 0.0700 | 1.778 | 40 | SC50131778-40 | ◆ | |
| | | - | 0.0781 | 1.984 | 40 | SC50131984-40 | ◆ | |
| | | - | 0.0787 | 1.999 | 40 | SC50131999-40 | ◆ | |
| - | 0.0800 | 2.032 | 40 | SC50132032-40 | ◆ | | | |
| - | 0.0900 | 2.286 | 40 | SC50132286-40 | ◆ | | | |
| 3/32 | 0.0938 | 2.383 | 40 | SC50132383-40 | ◆ | | | |
| - | 0.1000 | 2.540 | 40 | SC50132540-40 | ◆ | | | |
| - | 0.1100 | 2.794 | 40 | SC50132794-40 | ◆ | | | |
| - | 0.1181 | 3.000 | 40 | SC50133000-40 | ◆ | | | |
| - | 0.1200 | 3.048 | 40 | SC50133048-40 | ◆ | | | |
| - | 0.1250 | 3.175 | 40 | SC50133175-40 | ◆ | | | |
| - | 0.1300 | 3.302 | 40 | SC50133302-40 | ◆ | | | |
| - | 0.1400 | 3.556 | 40 | SC50133556-40 | ◆ | | | |
| - | 0.1500 | 3.810 | 40 | SC50133810-40 | ◆ | | | |
| 5/32 | 0.1563 | 3.970 | 40 | SC50133970-40 | ◆ | | | |
| - | 0.1575 | 4.001 | 40 | SC50134001-40 | ◆ | | | |

Recommended cutting conditions Page 253

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

| Standard Tolerances | Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock |
|---|---------------|----------------------|---------------|--------------|-------------|--------------|---------------|-------|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | |
| Saw Dia. +0.1270mm -0.000mm | 50 | 13 | - | 0.1600 | 4.064 | 40 | SC50134064-40 | ◆ |
| | | | - | 0.1700 | 4.318 | 40 | SC50134318-40 | ◆ |
| | | | - | 0.1800 | 4.572 | 40 | SC50134572-40 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 40 | SC50134763-40 | ◆ |
| | | | - | 0.1900 | 4.826 | 40 | SC50134826-40 | ◆ |
| | | | - | 0.1969 | 5.001 | 40 | SC50135001-40 | ◆ |
| | | | - | 0.2000 | 5.080 | 40 | SC50135080-40 | ◆ |
| | | | - | 0.2100 | 5.334 | 40 | SC50135334-40 | ◆ |
| | | | - | 0.2188 | 5.558 | 40 | SC50135558-40 | ◆ |
| | | | - | 0.2200 | 5.588 | 40 | SC50135588-40 | ◆ |
| | | | - | 0.2300 | 5.842 | 40 | SC50135842-40 | ◆ |
| | | | - | 0.2362 | 5.999 | 40 | SC50135999-40 | ◆ |
| Arbor Hole Size +0.0127mm -0.0000mm | 50 | 13 | - | 0.2400 | 6.096 | 40 | SC50136096-40 | ◆ |
| | | | - | 0.2500 | 6.350 | 40 | SC50136350-40 | ◆ |
| | | | - | 0.0080 | 0.203 | 24 | SC63160203-24 | ◆ |
| | | | - | 0.0100 | 0.254 | 24 | SC63160254-24 | ◆ |
| | | | - | 0.0120 | 0.305 | 24 | SC63160305-24 | ◆ |
| | | | - | 0.0140 | 0.356 | 24 | SC63160356-24 | ◆ |
| | | | - | 0.0156 | 0.396 | 24 | SC63160396-24 | ◆ |
| | | | - | 0.0180 | 0.457 | 24 | SC63160457-24 | ◆ |
| | | | - | 0.0200 | 0.508 | 24 | SC63160508-24 | ◆ |
| | | | - | 0.0230 | 0.584 | 24 | SC63160584-24 | ◆ |
| | | | - | 0.0250 | 0.635 | 24 | SC63160635-24 | ◆ |
| | | | - | 0.0280 | 0.711 | 24 | SC63160711-24 | ◆ |
| Side Run-Out < 0.0127mm | 50 | 13 | - | 0.0300 | 0.762 | 24 | SC63160762-24 | ◆ |
| | | | 1/32 | 0.0313 | 0.795 | 24 | SC63160795-24 | ◆ |
| | | | - | 0.0350 | 0.889 | 24 | SC63160889-24 | ◆ |
| | | | - | 0.0394 | 1.001 | 24 | SC63161001-24 | ◆ |
| | | | - | 0.0400 | 1.016 | 24 | SC63161016-24 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 24 | SC63161191-24 | ◆ |
| | | | - | 0.0500 | 1.270 | 24 | SC63161270-24 | ◆ |
| | | | - | 0.0510 | 1.295 | 24 | SC63161295-24 | ◆ |
| | | | - | 0.0600 | 1.524 | 24 | SC63161524-24 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 24 | SC63161588-24 | ◆ |
| | | | - | 0.0700 | 1.778 | 24 | SC63161778-24 | ◆ |
| | | | - | 0.0781 | 1.984 | 24 | SC63161984-24 | ◆ |
| Thickness +0.0127mm -0.0000mm | 63 | 16 | - | 0.0787 | 1.999 | 24 | SC63161999-24 | ◆ |
| | | | - | 0.0800 | 2.032 | 24 | SC63162032-24 | ◆ |
| | | | - | 0.0900 | 2.286 | 24 | SC63162286-24 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 24 | SC63162383-24 | ◆ |
| | | | - | 0.1000 | 2.540 | 24 | SC63162540-24 | ◆ |
| | | | - | 0.1100 | 2.794 | 24 | SC63162794-24 | ◆ |
| | | | - | 0.1181 | 3.000 | 24 | SC63163000-24 | ◆ |
| | | | - | 0.1200 | 3.048 | 24 | SC63163048-24 | ◆ |
| | | | - | 0.1250 | 3.175 | 24 | SC63163175-24 | ◆ |
| | | | - | 0.1300 | 3.302 | 24 | SC63163302-24 | ◆ |
| | | | - | 0.1400 | 3.556 | 24 | SC63163556-24 | ◆ |
| | | | - | 0.1500 | 3.810 | 24 | SC63163810-24 | ◆ |
| Saw Dia. +0.1270mm -0.000mm | 63 | 16 | 5/32 | 0.1563 | 3.970 | 24 | SC63163970-24 | ◆ |
| | | | - | 0.1575 | 4.001 | 24 | SC63164001-24 | ◆ |
| | | | - | 0.1600 | 4.064 | 24 | SC63164064-24 | ◆ |
| | | | - | 0.1700 | 4.318 | 24 | SC63164318-24 | ◆ |
| | | | - | 0.1800 | 4.572 | 24 | SC63164572-24 | ◆ |
| | | | - | 0.1800 | 4.572 | 24 | SC63164572-24 | ◆ |

Recommended cutting conditions [Page 253](#)

| Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock | Standard Tolerances |
|---------------|----------------------|---------------|--------------|---------------|--------------|---------------|-------|--|
| | | Fraction (in) | Decimal (in) | Metric (mm) | | | | |
| 63 | 16 | 3/16 | 0.1875 | 4.763 | 24 | SC63164763-24 | ◆ | Saw Dia. +0.1270mm -0.000mm |
| | | - | 0.1900 | 4.826 | 24 | SC63164826-24 | ◆ | |
| | | - | 0.1969 | 5.001 | 24 | SC63165001-24 | ◆ | |
| | | - | 0.2000 | 5.080 | 24 | SC63165080-24 | ◆ | |
| | | - | 0.2100 | 5.334 | 24 | SC63165334-24 | ◆ | Arbor Hole Size +0.0127mm -0.000mm |
| | | - | 0.2188 | 5.558 | 24 | SC63165558-24 | ◆ | |
| | | - | 0.2200 | 5.588 | 24 | SC63165588-24 | ◆ | |
| | | - | 0.2300 | 5.842 | 24 | SC63165842-24 | ◆ | |
| | | - | 0.2362 | 5.999 | 24 | SC63165999-24 | ◆ | Side Run-Out < 0.0127mm |
| | | - | 0.2400 | 6.096 | 24 | SC63166096-24 | ◆ | |
| | | - | 0.2500 | 6.350 | 24 | SC63166350-24 | ◆ | |
| | | - | 0.0080 | 0.203 | 48 | SC63160203-48 | ◆ | |
| | | - | 0.0100 | 0.254 | 48 | SC63160254-48 | ◆ | Thickness +0.0127mm -0.000mm |
| | | - | 0.0120 | 0.305 | 48 | SC63160305-48 | ◆ | |
| | | - | 0.0140 | 0.356 | 48 | SC63160356-48 | ◆ | |
| | | - | 0.0156 | 0.396 | 48 | SC63160396-48 | ◆ | |
| | | - | 0.0180 | 0.457 | 48 | SC63160457-48 | ◆ | DRILLS |
| | | - | 0.0200 | 0.508 | 48 | SC63160508-48 | ◆ | |
| | | - | 0.0230 | 0.584 | 48 | SC63160584-48 | ◆ | |
| | | - | 0.0250 | 0.635 | 48 | SC63160635-48 | ◆ | |
| | | - | 0.0280 | 0.711 | 48 | SC63160711-48 | ◆ | END MILLS |
| | | - | 0.0300 | 0.762 | 48 | SC63160762-48 | ◆ | |
| | | 1/32 | 0.0313 | 0.795 | 48 | SC63160795-48 | ◆ | |
| | | - | 0.0350 | 0.889 | 48 | SC63160889-48 | ◆ | |
| | | - | 0.0394 | 1.001 | 48 | SC63161001-48 | ◆ | ROUTERS |
| | | - | 0.0400 | 1.016 | 48 | SC63161016-48 | ◆ | |
| | | 3/64 | 0.0469 | 1.191 | 48 | SC63161191-48 | ◆ | |
| | | - | 0.0500 | 1.270 | 48 | SC63161270-48 | ◆ | |
| | | - | 0.0510 | 1.295 | 48 | SC63161295-48 | ◆ | THREAD MILLS & TAPS |
| | | - | 0.0600 | 1.524 | 48 | SC63161524-48 | ◆ | |
| | | 1/16 | 0.0625 | 1.588 | 48 | SC63161588-48 | ◆ | |
| | | - | 0.0700 | 1.778 | 48 | SC63161778-48 | ◆ | |
| | | - | 0.0781 | 1.984 | 48 | SC63161984-48 | ◆ | ENGRAVERS |
| | | - | 0.0787 | 1.999 | 48 | SC63161999-48 | ◆ | |
| | | - | 0.0800 | 2.032 | 48 | SC63162032-48 | ◆ | |
| | | - | 0.0900 | 2.286 | 48 | SC63162286-48 | ◆ | |
| | | 3/32 | 0.0938 | 2.383 | 48 | SC63162383-48 | ◆ | BORING BARS |
| | | - | 0.1000 | 2.540 | 48 | SC63162540-48 | ◆ | |
| | | - | 0.1100 | 2.794 | 48 | SC63162794-48 | ◆ | |
| | | - | 0.1181 | 3.000 | 48 | SC63163000-48 | ◆ | |
| - | 0.1200 | 3.048 | 48 | SC63163048-48 | ◆ | REAMERS | | |
| - | 0.1250 | 3.175 | 48 | SC63163175-48 | ◆ | | | |
| - | 0.1300 | 3.302 | 48 | SC63163302-48 | ◆ | | | |
| - | 0.1400 | 3.556 | 48 | SC63163556-48 | ◆ | | | |
| - | 0.1500 | 3.810 | 48 | SC63163810-48 | ◆ | SAWS | | |
| 5/32 | 0.1563 | 3.970 | 48 | SC63163970-48 | ◆ | | | |
| - | 0.1575 | 4.001 | 48 | SC63164001-48 | ◆ | | | |
| - | 0.1600 | 4.064 | 48 | SC63164064-48 | ◆ | | | |
| - | 0.1700 | 4.318 | 48 | SC63164318-48 | ◆ | TECHNICAL | | |
| - | 0.1800 | 4.572 | 48 | SC63164572-48 | ◆ | | | |
| 3/16 | 0.1875 | 4.763 | 48 | SC63164763-48 | ◆ | | | |
| - | 0.1900 | 4.826 | 48 | SC63164826-48 | ◆ | | | |
| - | 0.1969 | 5.001 | 48 | SC63165001-48 | ◆ | INDEX | | |

Recommended cutting conditions Page 253

◆ : Usually Ships in 24-48 Hours
Depending on Size and Quantity

| Standard Tolerances | Saw Dia. (mm) | Arbor Hole Dia. (mm) | Saw Width | | | No. of Teeth | Part Number | Stock |
|---|---------------|----------------------|---------------|--------------|-------------|--------------|----------------|-------|
| | | | Fraction (in) | Decimal (in) | Metric (mm) | | | |
| Saw Dia. +0.1270mm -0.000mm | 63 | 16 | - | 0.2000 | 5.080 | 48 | SC63165080-48 | ◆ |
| | | | - | 0.2100 | 5.334 | 48 | SC63165334-48 | ◆ |
| | | | - | 0.2188 | 5.558 | 48 | SC63165558-48 | ◆ |
| | | | - | 0.2200 | 5.588 | 48 | SC63165588-48 | ◆ |
| | | | - | 0.2300 | 5.842 | 48 | SC63165842-48 | ◆ |
| | | | - | 0.2362 | 5.999 | 48 | SC63165999-48 | ◆ |
| | | | - | 0.2400 | 6.096 | 48 | SC63166096-48 | ◆ |
| | | | - | 0.2500 | 6.350 | 48 | SC63166350-48 | ◆ |
| Arbor Hole Size +0.0127mm -0.0000mm | 63 | 16 | - | 0.2300 | 5.842 | 48 | SC63165842-48 | ◆ |
| | | | - | 0.2362 | 5.999 | 48 | SC63165999-48 | ◆ |
| | | | - | 0.2400 | 6.096 | 48 | SC63166096-48 | ◆ |
| | | | - | 0.2500 | 6.350 | 48 | SC63166350-48 | ◆ |
| | | | - | 0.2300 | 5.842 | 48 | SC63165842-48 | ◆ |
| | | | - | 0.2362 | 5.999 | 48 | SC63165999-48 | ◆ |
| | | | - | 0.2400 | 6.096 | 48 | SC63166096-48 | ◆ |
| | | | - | 0.2500 | 6.350 | 48 | SC63166350-48 | ◆ |
| Side Run-Out < 0.0127mm | 80 | 22 | 1/32 | 0.0313 | 0.794 | 30 | SC80220794-30 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 30 | SC80221191-30 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 30 | SC80221588-30 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 30 | SC80222383-30 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 30 | SC80223175-30 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 30 | SC80223969-30 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 30 | SC80224763-30 | ◆ |
| | | | 1/4 | 0.2500 | 6.350 | 30 | SC80226350-30 | ◆ |
| | | | 1/32 | 0.0313 | 0.794 | 60 | SC80220794-60 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 60 | SC80221191-60 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 60 | SC80221588-60 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 60 | SC80222383-60 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 60 | SC80223175-60 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 60 | SC80223969-60 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 60 | SC80224763-60 | ◆ |
| | | | 1/4 | 0.2500 | 6.350 | 60 | SC80226350-60 | ◆ |
| Thickness +0.0127mm -0.0000mm | 100 | 22 | 1/32 | 0.0313 | 0.794 | 40 | SC100220794-40 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 40 | SC100221191-40 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 40 | SC100221588-40 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 40 | SC100222383-40 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 40 | SC100223175-40 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 40 | SC100223969-40 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 40 | SC100224763-40 | ◆ |
| | | | 1/4 | 0.2500 | 6.350 | 40 | SC100226350-40 | ◆ |
| | | | 1/32 | 0.0313 | 0.794 | 80 | SC100220794-80 | ◆ |
| | | | 3/64 | 0.0469 | 1.191 | 80 | SC100221191-80 | ◆ |
| | | | 1/16 | 0.0625 | 1.588 | 80 | SC100221588-80 | ◆ |
| | | | 3/32 | 0.0938 | 2.383 | 80 | SC100222383-80 | ◆ |
| | | | 1/8 | 0.1250 | 3.175 | 80 | SC100223175-80 | ◆ |
| | | | 5/32 | 0.1563 | 3.969 | 80 | SC100223969-80 | ◆ |
| | | | 3/16 | 0.1875 | 4.763 | 80 | SC100224763-80 | ◆ |
| | | | 1/4 | 0.2500 | 6.350 | 80 | SC100226350-80 | ◆ |

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RECOMMENDED CUTTING CONDITIONS

These are general cutting speed recommendations of SFM rates, and may vary from application to application.

| Material* To Be Cut | Hardness Range (Bhn**) | Carbide Saw Cutting Speed SFM / (m/min.) | Material* To Be Cut | Hardness Range (Bhn**) | Carbide Saw Cutting Speed SFM / (m/min.) |
|--|------------------------------|--|--|------------------------------|--|
| Free Machining Carbon Steels-Wrought | 100-425 | 130-555 (40-170) | Malleable Cast Irons | 110-320 | 130-470 (40-145) |
| Carbon Steels- Wrought | 85-425 | 105-530 (35-165) | Chromium-Nickel Alloy Castings | 275-375 | 85-105 (25-35) |
| Carbon & Ferritic Alloy Steels (High Temp. Service) | 150-200 | 320-425 (100-130) | Aluminum Alloys-Wrought | 30-150 | 3400-4250 (1042-1300) |
| Free Machining Alloy Steels-Wrought | 150-425 | 35-470 (11-145) | Aluminum Alloys-Cast | 40-125 | 2125-5315 (640-1615) |
| Alloy Steels, Wrought | 125-425 | 35-425 (11-130) | Magnesium Alloys-Wrought | 40-125 | 5100-6375 (1555-1955) |
| High Strength Steels-Wrought | 225-400 | 35-255 (11-80) | Magnesium Alloys-Cast | 50-90 | 5100-6375 (1555-1955) |
| Maraging Steels- Wrought | 275-425 | 35-215 (11-65) | Titanium Alloys-Wrought | 110-440 | 65-530 (25-165) |
| Tool Steels- Wrought | 100-375 | 35-470 (11-145) | Titanium Alloys-Cast | 150-350 | 170-470 (55-145) |
| Nitriding Steels- Wrought | 200-350 | 150-215 (50-65) | Copper Alloys-Wrought | 10Rb-100Rb | 340-2125 (105-640) |
| Armor Plate, Ship Plate, Aircraft Plate-Wrought | 200-350 | 65-215 (25-65) | Copper Alloys-Cast | 40-200 | 340-1700 (105-510) |
| Structural Steels- Wrought | 100-400 | 35-255 (11-80) | Nickel Alloys- Wrought and Cast | 80-360 | 65-300 (25-90) |
| Free Machining Stainless Steels-Wrought | 135-425 | 150-470 (50-145) | Beryllium Nickel Alloys- Wrought and Cast | 200-425 47-52Rc | 35-215 (11-65) |
| Stainless Steels- Wrought | 135-425 | 35-425 (11-130) | High Temp. Alloys- Wrought and Cast | 140-475 | 35-255 (11-80) |
| Precipitation Hardening Stainless Steels-Wrought | 150-440 | 85-340 (25-105) | Refractory Alloys- Cast, P/M | 170-320 | 150-300 (50-90) |
| Stainless Steels- Cast | 135-425 | 105-425 (35-130) | Zinc Alloys- Cast | 80-100 | 1380-1700 (425-510) |
| Precipitation Hardening Stainless Steels-Cast | 325-450 | 65-130 (25-40) | Lead Alloys- Cast | 5-20 | 1065-1275 (325-385) |
| Carbon Steels- Cast | 100-300 | 170-530 (55-165) | TiN Alloys- Cast | 15-30 | 1065-1275 (325-385) |
| Alloy Steels- Cast | 150-400 | 105-340 (35-105) | Zirconium Alloys- Wrought | 140-280 | 215-255 (65-80) |
| Tool Steels- Cast | 150-375 & 48-50Rc | 35-300 (11-90) | Manganese- Wrought | 140-220 | 105-130 (35-40) |
| Gray Cast Irons | 120-320 | 105-470 (35-145) | P/M Alloys- Copper | 50-70Rf | 170-215 (55-65) |
| Compacted Graphite Cast Irons | 120-330 | 105-170 (35-55) | P/M Alloys- Brasses | 35-81Rh | 215-255 (65-80) |
| Ductile Cast Irons | 120-330 | 85-510 (25-160) | P/M Alloys- Bronzes | 30-75Rf | 170-215 (55-65) |

(Continued on Next Page)

*Materials list from Machining Data Handbook-3rd Edition, published by the Machinability Data Center. For specific metals/materials within each material category, refer to Machining Data Handbook.

**Hardness range listed in Brinell unless otherwise noted. 'Range' covers all metals/materials listed within each material group.

***Thermosetting plastics have various hardness scales. Refer to Machining Data Handbook.

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| Material* To Be Cut | Hardness Range (Bhn**) | Carbide Saw Cutting Speed SFM / (m/min.) |
|---|------------------------------|--|
| P/M Alloys- Copper-Nickel Alloys | 22-100RH | 170-215 55-65 |
| P/M Alloys- Nickel and Nickel Alloys | 70-83 | 170-215 55-65 |
| P/M Alloys- Refractory Metal Base | 101-260 | 405-510 124-160 |
| P/M Alloys- Irons | 50-67 | 215-255 65-80 |
| P/M Alloys- Steels | 101-426 | 150-255 50-80 |
| P/M Alloys- Stainless Steels | 107-285 | 170-215 55-65 |
| P/M Alloys- Aluminum Alloys | 55-98RH | 510-640 160-195 |
| Machinable Carbides | 40-51Rc | 35-45 11-13 |
| Free Machining Magnetic Alloys | 185-240 | 215-340 65-105 |
| Magnetic Alloys | 185-240 | 55-215 16-65 |
| Free Machining Controlled Expansion Alloys | 125-220 | 215-255 65-80 |
| Controlled Expansion Alloys | 125-250 | 35-45 11-13 |
| Carbons and Graphites | 8-100 Shore | 150-215 50-65 |
| Glasses and Ceramics- Machinable | 250 Knoop | 85-105 25-35 |
| Plastics- Thermoplastics | 60-120RM | 1065-1490 325-450 |
| Plastics- Thermosetting | 50-120RR *** | 340-1490 105-450 |

*Materials list from Machining Data Handbook-3rd Edition, published by the Machinability Data Center. For specific metals/materials within each material category, refer to Machining Data Handbook.

**Hardness range listed in Brinell unless otherwise noted. 'Range' covers all metals/materials listed within each material group.

***Thermosetting plastics have various hardness scales. Refer to Machining Data Handbook.

USEFUL METALWORKING FORMULAS

| | | |
|--------------|---|---|
| SFM | = | .262 X (CUTTER DIA. X RPM) (or) (RPM X CUTTER DIA.) ÷ .382 |
| RPM | = | (3.82 X SFPM) ÷ CUTTER DIA. (or) SFPM ÷ (CUTTER DIA. X .262) |
| IPM | = | IPR X (# TEETH X RPM) |
| IPT | = | IPM ÷ (# TEETH X RPM) |
| IPR | = | IPM ÷ RPM |
| CIM | = | IPR X SPD. X DOC |
| HP | = | CIM X UHF |
| FORCE | = | (33,000 X HP) ÷ SFM |

FEED RATES:

Carbide Saws:

.0002"- .0015" (in.per tooth - IPT)
or chip load per tooth - CLPT)

NOTE: This is a conservative recommendation as a starting point for feed rates, and may vary depending on material being cut and cutting speed (SFM).

COATINGS FOR SAWS AND CUTTERS

Cutting tool surface coatings are available upon request. Tool coatings provide tool wear resistance while significantly improving the performance of saws in most applications, particularly when cutting ferrous materials. These coatings are extremely thin, harder than steel and greatly reduce friction and wear. The most common coatings available for carbide saws are:

TiN: Titanium Nitride - General purpose TiN hard coating. Best suited for iron-based materials, unalloyed and alloyed steels and hardened steels.

TiCN: Titanium Carbonitride - Enhanced hardness and wear resistance over TiN with better surface lubricity. Suited for difficult to machine materials such as cast iron, aluminum alloys, tool steels, copper, Inconel, titanium alloys and nonferrous materials.

TiAlN: Titanium Aluminum Nitride - Nano-layered coating, high toughness and oxidation resistance. Recommended for high temperature cutting, and a good choice when coating carbide. Suited for difficult materials like cast iron, aluminum alloys, tool steels and nickel alloys.











AlCrN: Aluminum Chromium Nitride - Expanded performance capabilities over titanium-based coatings. Highest oxidation resistance and hot hardness for high temperature wear resistance. Can be used in wet/dry cutting applications. Well suited for a wide range of materials - cast iron, unalloyed steels, high strength steels, high hardness steels.

| RECOMMENDED CUTTING CONDITIONS | | | 256 - 278 |
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* *Specials*

INCH

INCH CARBIDE MICRO DRILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | |
|---|-------------|----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | | | | Ø < 0.0394" | Ø < 0.0591" | Ø < 0.0787" | Ø < 0.0984" | Ø < 0.1181" |
|  | <70 ksi | 65 ~ 165 | 65 ~ 165 | 0.00138 ~ 0.00177 | 0.00157 ~ 0.00217 | 0.00197 ~ 0.00256 | 0.00236 ~ 0.00295 | 0.00256 ~ 0.00315 |
| | <115 ksi | 65 ~ 165 | 65 ~ 165 | 0.00118 ~ 0.00138 | 0.00138 ~ 0.00177 | 0.00157 ~ 0.00217 | 0.00197 ~ 0.00256 | 0.00217 ~ 0.00276 |
|  | <145 ksi | 50 ~ 115 | 50 ~ 115 | 0.00079 ~ 0.00098 | 0.00098 ~ 0.00138 | 0.00118 ~ 0.00157 | 0.00138 ~ 0.00177 | 0.00157 ~ 0.00197 |
| | <190 ksi | 35 ~ 80 | 35 ~ 80 | 0.00098 ~ 0.00059 | 0.00039 ~ 0.00059 | 0.00059 ~ 0.00079 | 0.00059 ~ 0.00098 | 0.00079 ~ 0.00098 |
|  | 55HRC | 65 ~ 150 | 65 ~ 150 | 0.00059 ~ 0.00079 | 0.00079 ~ 0.00118 | 0.00098 ~ 0.00138 | 0.00118 ~ 0.00157 | 0.00138 ~ 0.00177 |
|  | Austenitic | 50 ~ 130 | 50 ~ 130 | 0.00079 ~ 0.00098 | 0.00098 ~ 0.00138 | 0.00118 ~ 0.00157 | 0.00138 ~ 0.00177 | 0.00157 ~ 0.00197 |
| | Martensitic | 35 ~ 80 | 35 ~ 80 | 0.00098 ~ 0.00039 | 0.00020 ~ 0.00039 | 0.00039 ~ 0.00059 | 0.00039 ~ 0.00059 | 0.00059 ~ 0.00079 |
|  | - | 15 ~ 35 | 15 ~ 35 | 0.00039 ~ 0.00059 | 0.00039 ~ 0.00059 | 0.00059 ~ 0.00079 | 0.00079 ~ 0.00098 | 0.00079 ~ 0.00098 |
|  | <130 ksi | 15 ~ 35 | 15 ~ 35 | 0.00059 ~ 0.00059 | 0.00020 ~ 0.00039 | 0.00039 ~ 0.00059 | 0.00039 ~ 0.00059 | 0.00059 ~ 0.00079 |
| | >130 ksi | | | | | | | |
|  | <8HRC | 80 ~ 215 | 80 ~ 215 | 0.00157 ~ 0.00197 | 0.00177 ~ 0.00256 | 0.00236 ~ 0.00295 | 0.00276 ~ 0.00354 | 0.00315 ~ 0.00374 |
| | >8HRC | 80 ~ 200 | 80 ~ 200 | 0.00157 ~ 0.00197 | 0.00177 ~ 0.00256 | 0.00236 ~ 0.00295 | 0.00276 ~ 0.00354 | 0.00315 ~ 0.00374 |
|  | Aluminum | 165 ~ 500 | 165 ~ 500 | 0.00157 ~ 0.00197 | 0.00177 ~ 0.00256 | 0.00236 ~ 0.00295 | 0.00276 ~ 0.00354 | 0.00315 ~ 0.00374 |
| | Silicon <6% | 150 ~ 360 | 150 ~ 360 | 0.00157 ~ 0.00197 | 0.00177 ~ 0.00256 | 0.00236 ~ 0.00295 | 0.00276 ~ 0.00354 | 0.00315 ~ 0.00374 |
| | Silicon >6% | 150 ~ 360 | 150 ~ 360 | 0.00177 ~ 0.00236 | 0.00217 ~ 0.00295 | 0.00276 ~ 0.00354 | 0.00315 ~ 0.00394 | 0.00354 ~ 0.00472 |
|  | Brass | 160 ~ 300 | 160 ~ 300 | 0.00118 ~ 0.00236 | 0.00236 ~ 0.00394 | 0.00394 ~ 0.00591 | 0.00591 ~ 0.00709 | 0.00709 ~ 0.00787 |
|  | - | 265 ~ 395 | 265 ~ 395 | 0.00118 ~ 0.00236 | 0.00118 ~ 0.00236 | 0.00118 ~ 0.00236 | 0.00118 ~ 0.00236 | 0.00118 ~ 0.00236 |

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METRIC CARBIDE MICRO DRILLS

| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | |
|---|-------------|------------------------|---------------------|---------------|---------------|---------------|---------------|---------------|
| | | | | Ø < 1.0 | Ø < 1.5 | Ø < 2.0 | Ø < 2.5 | Ø < 3.0 |
|  | <500 MPa | 20 ~ 50 | 20 ~ 50 | 0.035 ~ 0.045 | 0.040 ~ 0.055 | 0.050 ~ 0.065 | 0.060 ~ 0.075 | 0.065 ~ 0.080 |
| | <800 MPa | 20 ~ 50 | 20 ~ 50 | 0.030 ~ 0.035 | 0.035 ~ 0.045 | 0.040 ~ 0.055 | 0.050 ~ 0.065 | 0.055 ~ 0.070 |
|  | <1,000 MPa | 15 ~ 35 | 15 ~ 35 | 0.020 ~ 0.025 | 0.025 ~ 0.035 | 0.030 ~ 0.040 | 0.035 ~ 0.045 | 0.040 ~ 0.050 |
| | <1,300 MPa | 10 ~ 25 | 10 ~ 25 | 0.010 ~ 0.015 | 0.010 ~ 0.015 | 0.015 ~ 0.020 | 0.015 ~ 0.025 | 0.020 ~ 0.025 |
|  | 55HRC | 20 ~ 50 | 20 ~ 50 | 0.015 ~ 0.020 | 0.020 ~ 0.030 | 0.025 ~ 0.035 | 0.030 ~ 0.040 | 0.035 ~ 0.045 |
|  | Austenitic | 15 ~ 40 | 15 ~ 40 | 0.020 ~ 0.025 | 0.025 ~ 0.035 | 0.030 ~ 0.040 | 0.035 ~ 0.045 | 0.040 ~ 0.050 |
| | Martensitic | 10 ~ 25 | 10 ~ 25 | 0.005 ~ 0.010 | 0.005 ~ 0.010 | 0.010 ~ 0.015 | 0.010 ~ 0.015 | 0.015 ~ 0.020 |
|  | - | 5 ~ 10 | 5 ~ 10 | 0.010 ~ 0.015 | 0.010 ~ 0.015 | 0.015 ~ 0.020 | 0.020 ~ 0.025 | 0.020 ~ 0.025 |
|  | <900 MPa | 5 ~ 10 | 5 ~ 10 | 0.005 ~ 0.010 | 0.005 ~ 0.010 | 0.010 0.015 | 0.010 ~ 0.015 | 0.015 ~ 0.020 |
| | >900 MPa | | | | | | | |
|  | <180 HB | 25 ~ 65 | 25 ~ 65 | 0.040 ~ 0.050 | 0.045 ~ 0.065 | 0.060 ~ 0.075 | 0.070 ~ 0.090 | 0.080 ~ 0.095 |
| | >180 HB | 25 ~ 60 | 25 ~ 60 | 0.040 ~ 0.050 | 0.045 ~ 0.065 | 0.060 ~ 0.075 | 0.070 ~ 0.090 | 0.080 ~ 0.095 |
|  | Aluminum | 50 ~ 150 | 50 ~ 150 | 0.040 ~ 0.050 | 0.045 ~ 0.065 | 0.060 ~ 0.075 | 0.070 ~ 0.090 | 0.080 ~ 0.095 |
| | Silicon <6% | 45 ~ 110 | 45 ~ 110 | 0.040 ~ 0.050 | 0.045 ~ 0.065 | 0.060 ~ 0.075 | 0.070 ~ 0.090 | 0.080 ~ 0.095 |
| | Silicon >6% | 45 ~ 110 | 45 ~ 110 | 0.045 ~ 0.060 | 0.055 ~ 0.075 | 0.070 ~ 0.090 | 0.080 ~ 0.100 | 0.090 ~ 0.120 |
|  | Brass | 50 ~ 90 | 50 ~ 90 | 0.030 ~ 0.060 | 0.060 ~ 0.100 | 0.100 ~ 0.150 | 0.150 ~ 0.180 | 0.180 ~ 0.200 |
|  | - | 80 ~ 120 | 80 ~ 120 | 0.030 ~ 0.060 | 0.030 ~ 0.060 | 0.030 0.060 | 0.030 ~ 0.060 | 0.030 ~ 0.060 |

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INCH













INCH CARBIDE DRILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | |
|---|---------------|----------------------|-------------------|--------------|----------|----------|----------|----------|
| | | | | Ø0.0787" | Ø0.1575" | Ø0.3150" | Ø0.4724" | Ø0.6299" |
|  | <70 ksi | 330 | 330 | 0.00157 | 0.00236 | 0.00472 | 0.00669 | 0.00906 |
| | <115 ksi | 330 | 330 | 0.00157 | 0.00236 | 0.00472 | 0.00669 | 0.00906 |
|  | <145 ksi | 260 | 260 | 0.00118 | 0.00157 | 0.00315 | 0.00512 | 0.00630 |
| | <190 ksi | 130 | 195 | 0.00079 | 0.00157 | 0.00276 | 0.00433 | 0.00630 |
|  | 55HRC | 20 ~ 35 | 25 ~ 40 | 0.00079 | 0.00118 | 0.00236 | 0.00276 | 0.00315 |
|  | 68HRC | 20 ~ 35 | 25 ~ 40 | 0.00079 | 0.00118 | 0.00236 | 0.00276 | 0.00315 |
|  | Ferritic | 230 | 260 | 0.00118 | 0.00157 | 0.00315 | 0.00512 | 0.00630 |
| | Martensitic | 165 | 195 | 0.00118 | 0.00157 | 0.00315 | 0.00512 | 0.00630 |
| | Austenitic | 150 | 130 | 0.00118 | 0.00157 | 0.00315 | 0.00512 | 0.00630 |
|  | - | 115 | 165 | 0.00079 | 0.00157 | 0.00276 | 0.00433 | 0.00630 |
| | - | 80 | 130 | 0.00079 | 0.00118 | 0.00236 | 0.00276 | 0.00315 |
|  | <130 ksi | 115 | 165 | 0.00118 | 0.00157 | 0.00315 | 0.00512 | 0.00630 |
| | >130 ksi | 80 | 130 | 0.00157 | 0.00236 | 0.00472 | 0.00669 | 0.00906 |
|  | <8HRC | 230 | 260 | 0.00236 | 0.00354 | 0.00787 | 0.00984 | 0.01378 |
| | >8HRC | 195 | 165 | 0.00197 | 0.00315 | 0.00472 | 0.00945 | 0.01102 |
|  | Silicon <10% | 490 | 490 | 0.00197 | 0.00315 | 0.00472 | 0.00945 | 0.01102 |
| | Silicon >10% | 260 | 260 | 0.00197 | 0.00315 | 0.00472 | 0.00945 | 0.01102 |
|  | - | 330 | 330 | 0.00236 | 0.00354 | 0.00787 | 0.00984 | 0.01378 |
|  | thermoplastic | 330 | 330 ~ 655 | 0.00079 | 0.00157 | 0.00276 | 0.00433 | 0.00630 |
| | thermoset | 330 | 330 ~ 655 | 0.00079 | 0.00157 | 0.00276 | 0.00433 | 0.00630 |
|  | - | 330 | 330 ~ 490 | 0.00079 | 0.00157 | 0.00276 | 0.00433 | 0.00630 |

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METRIC










METRIC CARBIDE DRILLS

| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | |
|---|---------------|------------------------|---------------------|---------------|------|------|------|------|
| | | | | Ø2 | Ø4 | Ø8 | Ø12 | Ø16 |
|  | <500 MPa | 100 | 100 | 0.04 | 0.06 | 0.12 | 0.17 | 0.23 |
| | <800 MPa | 100 | 100 | 0.04 | 0.06 | 0.12 | 0.17 | 0.23 |
|  | <1,000 MPa | 80 | 80 | 0.03 | 0.04 | 0.08 | 0.13 | 0.16 |
| | <1,300 MPa | 40 | 60 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 |
|  | 55HRC | 6 ~ 10 | 8 ~ 12 | 0.02 | 0.03 | 0.06 | 0.07 | 0.08 |
|  | 68HRC | 6 ~ 10 | 8 ~ 12 | 0.02 | 0.03 | 0.06 | 0.07 | 0.08 |
|  | Ferritic | 70 | 80 | 0.03 | 0.04 | 0.08 | 0.13 | 0.16 |
| | Martensitic | 50 | 60 | 0.03 | 0.04 | 0.08 | 0.13 | 0.16 |
| | Austenitic | 45 | 40 | 0.03 | 0.04 | 0.08 | 0.13 | 0.16 |
|  | - | 35 | 50 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 |
| | - | 25 | 40 | 0.02 | 0.03 | 0.06 | 0.07 | 0.08 |
|  | <900 MPa | 35 | 50 | 0.03 | 0.04 | 0.08 | 0.13 | 0.16 |
| | >900 MPa | 25 | 40 | 0.04 | 0.06 | 0.12 | 0.17 | 0.23 |
|  | <180 HB | 70 | 80 | 0.06 | 0.09 | 0.20 | 0.25 | 0.35 |
| | >180 HB | 60 | 50 | 0.05 | 0.08 | 0.12 | 0.24 | 0.28 |
|  | Silicon <10% | 150 | 150 | 0.05 | 0.08 | 0.12 | 0.24 | 0.28 |
| | Silicon >10% | 80 | 80 | 0.05 | 0.08 | 0.12 | 0.24 | 0.28 |
|  | - | 100 | 100 | 0.06 | 0.09 | 0.20 | 0.25 | 0.35 |
|  | thermoplastic | 100 | 100 ~ 200 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 |
| | thermoset | 100 | 100 ~ 200 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 |
|  | - | 100 | 100 ~ 150 | 0.02 | 0.04 | 0.07 | 0.11 | 0.16 |

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INCH










INCH CARBIDE CENTER DRILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | |
|---|--------------|----------------------|-------------------|--------------|-------------|-------------|-------------|-------------|
| | | | | Ø < 0.0787" | Ø < 0.1181" | Ø < 0.2362" | Ø < 0.3937" | Ø < 0.6299" |
|  | <70 ksi | 230 ~ 260 | 260 ~ 295 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
| | <115 ksi | 195 ~ 245 | 230 ~ 295 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
|  | <145 ksi | 165 ~ 195 | 195 ~ 230 | 0.0028 | 0.0031 | 0.0059 | 0.0091 | 0.0122 |
| | <190 ksi | 80 ~ 130 | 100 ~ 165 | 0.0024 | 0.0028 | 0.0051 | 0.0079 | 0.0106 |
|  | - | 65 ~ 100 | 100 ~ 130 | 0.0024 | 0.0031 | 0.0059 | 0.0079 | 0.0118 |
|  | - | 65 ~ 80 | 100 ~ 130 | 0.0197 | 0.0276 | 0.0051 | 0.0071 | 0.0106 |
|  | <130 ksi | 65 ~ 100 | 100 ~ 130 | 0.0024 | 0.0031 | 0.0059 | 0.0079 | 0.0118 |
| | >130 ksi | | | | | | | |
|  | <8HRC | 165 ~ 195 | 195 ~ 230 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
| | >8HRC | 115 ~ 165 | 130 ~ 195 | 0.0031 | 0.0039 | 0.0067 | 0.0118 | 0.0157 |
|  | Silicon <10% | 330 ~ 490 | 330 ~ 495 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |
| | Silicon >10% | 230 ~ 295 | 230 ~ 295 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |
|  | - | 230 ~ 295 | 230 ~ 295 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |
|  | - | 490 ~ 655 | 490 ~ 655 | 0.0051 | 0.0059 | 0.0098 | 0.0157 | 0.0197 |

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METRIC

METRIC CARBIDE CENTER DRILLS









| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | |
|---|--------------|------------------------|---------------------|---------------|------|------|------|------|
| | | | | Ø2 | Ø3 | Ø6 | Ø10 | Ø16 |
|  | <500 MPa | 70 ~ 80 | 80 ~ 90 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
| | <800 MPa | 60 ~ 75 | 70 ~ 90 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
|  | <1,000 MPa | 50 ~ 60 | 60 ~ 70 | 0.07 | 0.08 | 0.15 | 0.23 | 0.31 |
| | <1,300 MPa | 25 ~ 40 | 30 ~ 50 | 0.06 | 0.07 | 0.13 | 0.20 | 0.27 |
|  | - | 20 ~ 30 | 30 ~ 40 | 0.06 | 0.08 | 0.15 | 0.20 | 0.30 |
|  | - | 20 ~ 25 | 30 ~ 40 | 0.50 | 0.70 | 0.13 | 0.18 | 0.27 |
|  | <900 MPa | 20 ~ 30 | 30 ~ 40 | 0.06 | 0.08 | 0.15 | 0.20 | 0.30 |
| | >900 MPa | | | | | | | |
|  | <180 HB | 50 ~ 60 | 60 ~ 70 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
| | >180 HB | 35 ~ 50 | 40 ~ 60 | 0.08 | 0.10 | 0.17 | 0.30 | 0.40 |
|  | Silicon <10% | 100 ~ 150 | 100 ~ 150 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |
| | Silicon >10% | 70 ~ 90 | 70 ~ 90 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |
|  | - | 70 ~ 90 | 70 ~ 90 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |
|  | - | 150 ~ 200 | 150 ~ 200 | 0.13 | 0.15 | 0.25 | 0.40 | 0.50 |

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INCH

(Specials)

INCH CARBIDE STEP DRILLS

| Material | Property | Vc : SFM AITiN | Feed : (ipt) | | | | | | | |
|---|----------|-------------------|--------------|----------|----------|----------|----------|----------|----------|----------|
| | | | Ø0.1181" | Ø0.1575" | Ø0.1969" | Ø0.2362" | Ø0.3150" | Ø0.3937" | Ø0.4724" | Ø0.6299" |
|  | <115 ksi | 195 ~ 395 | 0.0028 | 0.0035 | 0.0047 | 0.0055 | 0.0079 | 0.0094 | 0.0114 | 0.0138 |
|  | <145 ksi | 130 ~ 260 | 0.0020 | 0.0024 | 0.0031 | 0.0035 | 0.0047 | 0.0055 | 0.0067 | 0.0091 |
| | <190 ksi | 65 ~ 130 | 0.0016 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 | 0.0043 | 0.0063 |
|  | - | 130 ~ 230 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 | 0.0043 | 0.0051 | 0.0071 |
|  | - | 50 ~ 100 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 | 0.0043 | 0.0051 | 0.0071 |
|  | <130 ksi | 50 ~ 100 | 0.0020 | 0.0024 | 0.0031 | 0.0035 | 0.0047 | 0.0055 | 0.0067 | 0.0091 |
| | >130 ksi | | | | | | | | | |
|  | <8HRC | 130 ~ 330 | 0.0028 | 0.0035 | 0.0047 | 0.0055 | 0.0079 | 0.0094 | 0.0114 | 0.0138 |
| | >8HRC | 130 ~ 260 | 0.0024 | 0.0035 | 0.0043 | 0.0051 | 0.0063 | 0.0083 | 0.0094 | 0.0110 |
|  | - | 395 ~ 490 | 0.0024 | 0.0035 | 0.0043 | 0.0051 | 0.0063 | 0.0083 | 0.0094 | 0.0110 |
|  | Bronze | 195 ~ 330 | 0.0028 | 0.0035 | 0.0047 | 0.0055 | 0.0079 | 0.0094 | 0.0114 | 0.0138 |
| | Brass | 130 ~ 260 | 0.0020 | 0.0024 | 0.0031 | 0.0035 | 0.0047 | 0.0055 | 0.0067 | 0.0091 |

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METRIC

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METRIC CARBIDE STEP DRILLS

| Material | Property | Vc : m/min AlTiN | Feed : (mm/t) | | | | | | | |
|---|------------|---------------------|---------------|------|------|------|------|------|------|------|
| | | | Ø3 | Ø4 | Ø5 | Ø6 | Ø8 | Ø10 | Ø12 | Ø16 |
|  | <800 MPa | 60 ~ 120 | 0.07 | 0.09 | 0.12 | 0.14 | 0.20 | 0.24 | 0.29 | 0.35 |
|  | <1,000 MPa | 40 ~ 80 | 0.05 | 0.06 | 0.08 | 0.09 | 0.12 | 0.14 | 0.17 | 0.23 |
| | <1,300 MPa | 20 ~ 40 | 0.04 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 | 0.11 | 0.16 |
|  | - | 40 ~ 70 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 | 0.11 | 0.13 | 0.18 |
|  | - | 15 ~ 30 | 0.04 | 0.05 | 0.06 | 0.07 | 0.09 | 0.11 | 0.13 | 0.18 |
|  | <900 MPa | 15 ~ 30 | 0.05 | 0.06 | 0.08 | 0.09 | 0.12 | 0.14 | 0.17 | 0.23 |
| | >900 MPa | | | | | | | | | |
|  | <180 HB | 40 ~ 100 | 0.07 | 0.09 | 0.12 | 0.14 | 0.20 | 0.24 | 0.29 | 0.35 |
| | >180 HB | 40 ~ 80 | 0.06 | 0.09 | 0.11 | 0.13 | 0.16 | 0.21 | 0.24 | 0.28 |
|  | - | 120 ~ 150 | 0.06 | 0.09 | 0.11 | 0.13 | 0.16 | 0.21 | 0.24 | 0.28 |
|  | Bronze | 60 ~ 100 | 0.07 | 0.09 | 0.12 | 0.14 | 0.20 | 0.24 | 0.29 | 0.35 |
| | Brass | 40 ~ 80 | 0.05 | 0.06 | 0.08 | 0.09 | 0.12 | 0.14 | 0.17 | 0.23 |

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INCH










INCH CARBIDE SPOTTING DRILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | |
|---|----------|----------------------|-------------------|--------------|----------|----------|----------|----------|
| | | | | Ø0.0787" | Ø0.1181" | Ø0.2362" | Ø0.3937" | Ø0.6299" |
|  | >70 ksi | 260 ~ 330 | 330 ~ 395 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
| | <115 ksi | 195 ~ 295 | 260 ~ 360 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
|  | <145 ksi | 180 ~ 245 | 195 ~ 260 | 0.0028 | 0.0031 | 0.0059 | 0.0091 | 0.0122 |
| | <190 ksi | 100 ~ 165 | 130 ~ 195 | 0.0024 | 0.0028 | 0.0051 | 0.0079 | 0.0106 |
|  | - | 80 ~ 165 | 100 ~ 195 | 0.0024 | 0.0031 | 0.0059 | 0.0079 | 0.0118 |
|  | - | 80 ~ 115 | 100 ~ 130 | 0.0197 | 0.0276 | 0.0051 | 0.0071 | 0.0106 |
|  | <130 ksi | 115 | 100 ~ 130 | 0.0024 | 0.0024 | 0.0059 | 0.0079 | 0.0118 |
| | >130 ksi | | | | | | | |
|  | <8HRC | 260 ~ 330 | 260 ~ 295 | 0.0039 | 0.0047 | 0.0087 | 0.0130 | 0.0177 |
| | >8HRC | 195 ~ 295 | 230 ~ 295 | 0.0031 | 0.0039 | 0.0067 | 0.0118 | 0.0157 |
|  | - | 330 ~ 590 | 490 ~ 655 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |
|  | - | 295 ~ 395 | 360 ~ 460 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |
|  | - | 330 ~ 590 | 490 ~ 655 | 0.0047 | 0.0059 | 0.0079 | 0.0098 | 0.0157 |

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METRIC

METRIC CARBIDE SPOTTING DRILLS












| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | |
|---|------------|------------------------|---------------------|---------------|------|------|------|------|
| | | | | Ø2 | Ø3 | Ø6 | Ø10 | Ø16 |
|  | >500 MPa | 80 ~ 100 | 100 ~ 120 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
| | <800 MPa | 60 ~ 90 | 80 ~ 110 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
|  | <1,000 MPa | 55 ~ 75 | 60 ~ 80 | 0.07 | 0.08 | 0.15 | 0.23 | 0.31 |
| | <1,300 MPa | 30 ~ 50 | 40 ~ 60 | 0.06 | 0.07 | 0.13 | 0.20 | 0.27 |
|  | - | 25 ~ 50 | 30 ~ 60 | 0.06 | 0.08 | 0.15 | 0.20 | 0.30 |
|  | - | 25 ~ 35 | 30 ~ 40 | 0.50 | 0.70 | 0.13 | 0.18 | 0.27 |
|  | <900 MPa | 35 ~ 35 | 30 ~ 40 | 0.06 | 0.06 | 0.15 | 0.20 | 0.30 |
| | >900 MPa | | | | | | | |
|  | <180 HB | 80 ~ 100 | 80 ~ 90 | 0.10 | 0.12 | 0.22 | 0.33 | 0.45 |
| | >180 HB | 60 ~ 90 | 70 ~ 90 | 0.08 | 0.10 | 0.17 | 0.30 | 0.40 |
|  | - | 100 ~ 180 | 150 ~ 200 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |
|  | - | 90 ~ 120 | 110 ~ 140 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |
|  | - | 100 ~ 180 | 150 ~ 200 | 0.12 | 0.15 | 0.20 | 0.25 | 0.40 |

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INCH

(Specials)

INCH CARBIDE CHAMFERING DRILLS












| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | | | | |
|--|------------|----------------------|-------------------|--------------|----------|----------|----------|----------|----------|----------|----------|
| | | | | Ø0.0787" | Ø0.1575" | Ø0.2362" | Ø0.3150" | Ø0.3937" | Ø0.4724" | Ø0.6299" | Ø0.7874" |
|  Steel 30-40HRC | <70 ksi | 230 | 245 | 0.00098 | 0.00197 | 0.00315 | 0.00551 | 0.00551 | 0.00748 | 0.00945 | 0.01102 |
| | <115 ksi | 130 | 195 | 0.00098 | 0.00197 | 0.00315 | 0.00551 | 0.00551 | 0.00748 | 0.00945 | 0.01102 |
|  Steel 30-40HRC | <145 ksi | 115 | 130 | 0.00091 | 0.00177 | 0.00276 | 0.00472 | 0.00472 | 0.00709 | 0.00866 | 0.01102 |
| | <190 ksi | 100 | 115 | 0.00091 | 0.00177 | 0.00276 | 0.00472 | 0.00669 | 0.00669 | 0.00866 | 0.01024 |
|  Hardened Steel -55HRC | 55HRC | 80 | 100 | 0.00079 | 0.00157 | 0.00236 | 0.00433 | 0.00433 | 0.00630 | 0.00866 | 0.00984 |
|  Hardened Steel -68HRC | 68HRC | 80 | 100 | 0.00079 | 0.00157 | 0.00236 | 0.00433 | 0.00433 | 0.00630 | 0.00866 | 0.00984 |
|  Stainless Steel | Ferritic | 80 | 100 | 0.00091 | 0.00177 | 0.00276 | 0.00472 | 0.00669 | 0.00669 | 0.00866 | 0.01024 |
| | Austenitic | 80 | 100 | 0.00079 | 0.00157 | 0.00236 | 0.00433 | 0.00433 | 0.00630 | 0.00866 | 0.00984 |
|  Nickel / Cobalt | - | 65 | 80 | 0.00079 | 0.00157 | 0.00236 | 0.00433 | 0.00433 | 0.00630 | 0.00866 | 0.00984 |
|  Titanium Alloy | <130 ksi | 80 | 100 | 0.00079 | 0.00157 | 0.00236 | 0.00433 | 0.00433 | 0.00630 | 0.00866 | 0.00984 |
| | >130 ksi | | | | | | | | | | |
|  Cast Iron | <8HRC | 115 | 130 | 0.00091 | 0.00177 | 0.00276 | 0.00472 | 0.00472 | 0.00709 | 0.00866 | 0.01102 |
| | >8HRC | 100 | 115 | | | | | | | | |
|  Aluminum | - | 490 | 655 | 0.00098 | 0.00197 | 0.00354 | 0.00591 | 0.00787 | 0.00787 | 0.01063 | 0.01378 |
|  Copper Alloy | - | 260 | 395 | 0.00197 | 0.00394 | 0.00591 | 0.00984 | 0.01181 | 0.01181 | 0.01378 | 0.01772 |
|  Plastic | - | 490 | - | 0.00098 | 0.00197 | 0.00354 | 0.00591 | 0.00787 | 0.00787 | 0.01063 | 0.01378 |

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METRIC

(Specials)







METRIC CARBIDE CHAMFERING DRILLS

| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | | | | |
|---|------------|------------------------|---------------------|---------------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Ø2 | Ø4 | Ø6 | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 |
|  | <500 MPa | 70 | 75 | 0.025 | 0.050 | 0.080 | 0.140 | 0.140 | 0.190 | 0.240 | 0.280 |
| | <800 MPa | 40 | 60 | 0.025 | 0.050 | 0.080 | 0.140 | 0.140 | 0.190 | 0.240 | 0.280 |
|  | <1,000 MPa | 35 | 40 | 0.023 | 0.045 | 0.070 | 0.120 | 0.120 | 0.180 | 0.220 | 0.280 |
| | <1,300 MPa | 30 | 35 | 0.023 | 0.045 | 0.070 | 0.120 | 0.170 | 0.170 | 0.220 | 0.260 |
|  | 55HRC | 25 | 30 | 0.020 | 0.040 | 0.060 | 0.110 | 0.110 | 0.160 | 0.220 | 0.250 |
|  | 68HRC | 25 | 30 | 0.020 | 0.040 | 0.060 | 0.110 | 0.110 | 0.160 | 0.220 | 0.250 |
|  | Ferritic | 25 | 30 | 0.023 | 0.045 | 0.070 | 0.120 | 0.170 | 0.170 | 0.220 | 0.260 |
| | Austenitic | 25 | 30 | 0.020 | 0.040 | 0.060 | 0.110 | 0.110 | 0.160 | 0.220 | 0.250 |
|  | - | 20 | 25 | 0.020 | 0.040 | 0.060 | 0.110 | 0.110 | 0.160 | 0.220 | 0.250 |
|  | <900 MPa | 25 | 30 | 0.020 | 0.040 | 0.060 | 0.110 | 0.110 | 0.160 | 0.220 | 0.250 |
| | >900 MPa | | | | | | | | | | |
|  | <180 HB | 35 | 40 | 0.023 | 0.045 | 0.070 | 0.120 | 0.120 | 0.180 | 0.220 | 0.280 |
| | >180 HB | 30 | 35 | | | | | | | | |
|  | - | 150 | 200 | 0.025 | 0.050 | 0.090 | 0.150 | 0.200 | 0.200 | 0.270 | 0.350 |
|  | - | 80 | 120 | 0.050 | 0.100 | 0.150 | 0.250 | 0.300 | 0.300 | 0.350 | 0.450 |
|  | - | 150 | - | 0.025 | 0.050 | 0.090 | 0.150 | 0.200 | 0.200 | 0.270 | 0.350 |

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INCH







INCH CARBIDE COOLANT MICRO DRILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | |
|---|--------------|----------------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | | | | Ø < 0.0394" | Ø < 0.0591" | Ø < 0.0787" | Ø < 0.0984" | Ø < 0.1181" |
|  | <70 ksi | 65 ~ 165 | 80 ~ 260 | 0.0008 ~ 0.0016 | 0.0008 ~ 0.0016 | 0.0012 ~ 0.0024 | 0.0016 ~ 0.0031 | 0.0016 ~ 0.0031 |
| | <115 ksi | | | | | | | |
|  | <145 ksi | 50 ~ 115 | 80 ~ 260 | 0.0008 ~ 0.0016 | 0.0008 ~ 0.0016 | 0.0012 ~ 0.0024 | 0.0016 ~ 0.0031 | 0.0016 ~ 0.0031 |
| | <190 ksi | 35 ~ 80 | 65 ~ 150 | 0.0008 ~ 0.0016 | 0.0008 ~ 0.0016 | 0.0012 ~ 0.0020 | 0.0016 ~ 0.0024 | 0.0016 ~ 0.0024 |
|  | - | 50 ~ 130 | 50 ~ 115 | 0.0004 ~ 0.0008 | 0.0004 ~ 0.0008 | 0.0008 ~ 0.0016 | 0.0012 ~ 0.0024 | 0.0012 ~ 0.0024 |
| | - | 35 ~ 80 | | | | | | |
|  | <130 ksi | 15 ~ 35 | 50 ~ 115 | 0.0004 ~ 0.0008 | 0.0004 ~ 0.0008 | 0.0008 ~ 0.0016 | 0.0012 ~ 0.0024 | 0.0012 ~ 0.0024 |
| | >130 ksi | | | | | | | |
|  | <8HRC | 80 ~ 215 | 100 ~ 295 | 0.0008 ~ 0.0039 | 0.0008 ~ 0.0039 | 0.0012 ~ 0.0024 | 0.0016 ~ 0.0035 | 0.0016 ~ 0.0035 |
| | >8HRC | 80 ~ 195 | 80 ~ 260 | 0.0039 ~ 0.0059 | 0.0039 ~ 0.0059 | 0.0059 ~ 0.0098 | 0.0079 ~ 0.0118 | 0.0079 ~ 0.0118 |
| Aluminum | 165 ~ 490 | | | | | | | |
|  | Aluminum | 165 ~ 490 | 165 ~ 655 | 0.0012 ~ 0.0024 | 0.0012 ~ 0.0024 | 0.0016 ~ 0.0028 | 0.0028 ~ 0.0047 | 0.0028 ~ 0.0047 |
| | Silicon <12% | 150 ~ 360 | | | | | | |
| | Silicon >12% | 150 ~ 360 | | | | | | |

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METRIC







METRIC CARBIDE COOLANT MICRO DRILLS

| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | |
|---|--------------|------------------------|---------------------|---------------|-------------|-------------|-------------|-------------|
| | | | | Ø < 1.0 | Ø < 1.5 | Ø < 2.0 | Ø < 2.5 | Ø < 3.0 |
|  | <500 MPa | 20 ~ 50 | 25 ~ 80 | 0.02 ~ 0.04 | 0.02 ~ 0.04 | 0.03 ~ 0.06 | 0.04 ~ 0.08 | 0.04 ~ 0.08 |
| | <800 MPa | | | | | | | |
|  | <1,000 MPa | 15 ~ 35 | 25 ~ 80 | 0.02 ~ 0.04 | 0.02 ~ 0.04 | 0.03 ~ 0.06 | 0.04 ~ 0.08 | 0.04 ~ 0.08 |
| | <1,300 MPa | 10 ~ 25 | 20 ~ 45 | 0.02 ~ 0.04 | 0.02 ~ 0.04 | 0.03 ~ 0.05 | 0.04 ~ 0.06 | 0.04 ~ 0.06 |
|  | - | 15 ~ 40 | 15 ~ 35 | 0.01 ~ 0.02 | 0.01 ~ 0.02 | 0.02 ~ 0.04 | 0.03 ~ 0.06 | 0.03 ~ 0.06 |
| | | 10 ~ 25 | | | | | | |
|  | <900 MPa | 5 ~ 10 | 15 ~ 35 | 0.01 ~ 0.02 | 0.01 ~ 0.02 | 0.02 ~ 0.04 | 0.03 ~ 0.06 | 0.03 ~ 0.06 |
| | >900 MPa | | | | | | | |
|  | <180 HB | 25 ~ 65 | 30 ~ 90 | 0.02 ~ 0.05 | 0.02 ~ 0.05 | 0.03 ~ 0.06 | 0.04 ~ 0.09 | 0.04 ~ 0.09 |
| | >180 HB | 25 ~ 60 | 25 ~ 80 | 0.10 ~ 0.20 | 0.10 ~ 0.20 | 0.15 ~ 0.25 | 0.20 ~ 0.30 | 0.02 ~ 0.30 |
|  | Aluminum | 50 ~ 150 | 50 ~ 200 | 0.03 ~ 0.06 | 0.03 ~ 0.06 | 0.04 ~ 0.07 | 0.07 ~ 0.12 | 0.07 ~ 0.12 |
| | Silicon <12% | 45 ~ 110 | | | | | | |
| | Silicon >12% | 45 ~ 110 | | | | | | |

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INCH







INCH CARBIDE HIGH PERFORMANCE COOLANT MICRO DRILLS

| Material | Property | Vc : SFM AITiN | Feed : (ipt) | | | | |
|---|----------|-------------------|--------------|-----------|----------|----------|----------|
| | | | Ø0.1575" | Ø0.03150" | Ø0.4724" | Ø0.6299" | Ø0.7874" |
|  | <70 ksi | 360 | 0.0047 | 0.0059 | 0.0110 | 0.0134 | 0.0161 |
| | <115 ksi | 330 | 0.0071 | 0.0098 | 0.0138 | 0.0150 | 0.0161 |
|  | <145 ksi | 260 | 0.0063 | 0.0087 | 0.0122 | 0.0134 | 0.0146 |
| | <190 ksi | 215 | 0.0063 | 0.0087 | 0.0122 | 0.0134 | 0.0146 |
|  | - | 200 | 0.0039 | 0.0051 | 0.0075 | 0.0087 | 0.0098 |
|  | - | 80 | 0.0039 | 0.0051 | 0.0075 | 0.0087 | 0.0098 |
|  | <130 ksi | 100 | 0.0031 | 0.0043 | 0.0063 | 0.0071 | 0.0079 |
| | >130 ksi | | | | | | |
|  | <8HRC | 295 | 0.0071 | 0.0087 | 0.0138 | 0.0150 | 0.0161 |
| | >8HRC | 260 | 0.0063 | 0.0098 | 0.0122 | 0.0134 | 0.0146 |

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METRIC CARBIDE HIGH PERFORMANCE COOLANT MICRO DRILLS

| Material | Property | Vc : m/min AITiN | Feed : (mm/t) | | | | |
|---|------------|---------------------|---------------|------|------|------|------|
| | | | Ø4 | Ø8 | Ø12 | Ø16 | Ø20 |
|  | <500 MPa | 110 | 0.12 | 0.15 | 0.28 | 0.34 | 0.41 |
| | <800 MPa | 100 | 0.18 | 0.25 | 0.35 | 0.38 | 0.41 |
|  | <1,000 MPa | 80 | 0.16 | 0.22 | 0.31 | 0.34 | 0.37 |
| | <1,300 MPa | 65 | 0.16 | 0.22 | 0.31 | 0.34 | 0.37 |
|  | - | 40 | 0.10 | 0.13 | 0.19 | 0.22 | 0.25 |
|  | - | 25 | 0.10 | 0.13 | 0.19 | 0.22 | 0.25 |
|  | <900 MPa | 30 | 0.08 | 0.11 | 0.16 | 0.18 | 0.20 |
| | >900 MPa | | | | | | |
|  | <180 HB | 90 | 0.18 | 0.22 | 0.35 | 0.38 | 0.41 |
| | >180 HB | 80 | 0.16 | 0.25 | 0.31 | 0.34 | 0.37 |

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INCH










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| Material | Property | Vc : SFM Uncoated | Vc : SFM AITIN | Feed : (ipt) | | | | | | | |
|---|----------|----------------------|-------------------|---|----------|----------|----------|----------|----------|----------|---------|
| | | | | Ø0.0079" | Ø0.0197" | Ø0.0315" | Ø0.0394" | Ø0.0591" | Ø0.0787" | Ø0.1181" | |
|  | <70 ksi | 195 | 260 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
| | <115 ksi | 195 | 260 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | <145 ksi | 195 | 260 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
| | <190 ksi | 130 | 195 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | - | 80 | 150 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | - | - | 80 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | - | - | 80 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | - | 195 | 260 | Slotting ap = 0.0394" ae = 0.0394" | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 | 0.00016 | 0.00024 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00001 | 0.00002 | 0.00002 | 0.00003 | 0.00004 | 0.00004 |
|  | - | 490 | - | Slotting ap = 0.0394" ae = 0.0394" | 0.00008 | 0.00020 | 0.00035 | 0.00047 | 0.00071 | 0.00094 | 0.00142 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00004 | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00016 |
|  | - | 260 | - | Slotting ap = 0.0394" ae = 0.0394" | 0.00008 | 0.00024 | 0.00031 | 0.00047 | 0.00071 | 0.00094 | 0.00142 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00004 | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00016 |
|  | - | 260 | - | Slotting ap = 0.0394" ae = 0.0394" | 0.00008 | 0.00020 | 0.00031 | 0.00039 | 0.00059 | 0.00079 | 0.00118 |
| | | | | Finishing ap = 0.0394" ae = 0.0118" | 0.00001 | 0.00004 | 0.00004 | 0.00004 | 0.00008 | 0.00008 | 0.00012 |

METRIC

METRIC CARBIDE MICRO END MILLS












| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | | | | |
|---|------------|------------------------|---------------------|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Ø0.2 | Ø0.5 | Ø0.8 | Ø1.0 | Ø1.5 | Ø2.0 | Ø3.0 | |
|  | <500 MPa | 60 | 80 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| | <800 MPa | 60 | 80 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | <1,000 MPa | 60 | 80 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| | <1,300 MPa | 40 | 60 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | - | 25 | 45 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | - | - | 25 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | - | - | 25 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | - | 60 | 80 | Slotting ap = 1.0 ae = 1.0 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.004 | 0.006 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
|  | - | 150 | - | Slotting ap = 1.0 ae = 1.0 | 0.002 | 0.005 | 0.009 | 0.012 | 0.018 | 0.024 | 0.036 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.004 |
|  | - | 80 | - | Slotting ap = 1.0 ae = 1.0 | 0.002 | 0.006 | 0.008 | 0.012 | 0.018 | 0.024 | 0.036 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.004 |
|  | - | 80 | - | Slotting ap = 1.0 ae = 1.0 | 0.002 | 0.005 | 0.008 | 0.010 | 0.015 | 0.020 | 0.030 |
| | | | | Finishing ap = 1.0 ae = 0.3 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 |

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
ENGRAVERS
BORING BARS
REAMERS
SAWS
TECHNICAL
INDEX

INCH

INCH CARBIDE MICRO MOLD END MILLS












- DRILLS
- END MILLS
- ROUTERS
- THREAD MILLS & TAPS
- ENGRAVERS
- BORING BARS
- REAMERS
- SAWS
- TECHNICAL
- INDEX

| Material | Property | Vc : SFM AITiN | | Feed : (ipt) | | | | | | |
|---|----------|-------------------|--|--------------|----------|----------|----------|----------|----------|----------|
| | | | | Ø0.0079" | Ø0.0197" | Ø0.0315" | Ø0.0394" | Ø0.0591" | Ø0.0787" | Ø0.1181" |
|  | <70 ksi | 655 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
| | <115 ksi | 655 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | <145 ksi | 655 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
| | <190 ksi | 395 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | < 55HRC | 260 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
|  | < 68HRC | 195 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
|  | - | 330 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | - | 260 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | - | 260 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | - | 655 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00008 | 0.00008 | 0.00016 | 0.00020 | 0.00020 | 0.00024 | 0.00028 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00016 | 0.00020 | 0.00024 |
|  | - | 985 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00004 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00031 | 0.00035 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00028 |
|  | - | 655 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00004 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00031 | 0.00035 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00028 |
|  | - | 395 | High Speed ap = 0.0040" x Ø ae = 0.0394" x Ø | 0.00004 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00031 | 0.00035 |
| | | | Copy Milling | 0.00004 | 0.00008 | 0.00012 | 0.00016 | 0.00020 | 0.00024 | 0.00028 |

ap = Depth of Cut ae = Width of Cut

METRIC

METRIC CARBIDE MICRO MOLD END MILLS

| Material | Property | Vc : m/min AITiN | Feed : (mm/t) | | | | | | | |
|---|----------|---------------------|--|-------|-------|-------|-------|-------|-------|-------|
| | | | Ø0.2 | Ø0.5 | Ø0.8 | Ø1.0 | Ø1.5 | Ø2.0 | Ø3.0 | |
|  | <500 MPa | 200 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
| | <800 MPa | 200 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <500 MPa | 200 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
| | <800 MPa | 120 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <500 MPa | 80 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
|  | <500 MPa | 60 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
|  | <800 MPa | 100 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <500 MPa | 80 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <800 MPa | 80 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <500 MPa | 200 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.002 | 0.002 | 0.004 | 0.005 | 0.005 | 0.006 | 0.007 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.004 | 0.005 | 0.006 |
|  | <800 MPa | 300 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.001 | 0.003 | 0.004 | 0.005 | 0.006 | 0.008 | 0.009 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 |
|  | <500 MPa | 200 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.001 | 0.003 | 0.004 | 0.005 | 0.006 | 0.008 | 0.009 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 |
|  | <800 MPa | 120 | High Speed ap = 0.1 x Ø ae = 1.0 x Ø | 0.001 | 0.003 | 0.004 | 0.005 | 0.006 | 0.008 | 0.009 |
| | | | Copy Milling | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 |

DRILLS
END MILLS
ROUTERS
THREAD MILLS & TAPS
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INCH

INCH CARBIDE END MILLS

| Material | Property | Vc : SFM Uncoated | Vc : SFM AlTiN | Feed : (ipt) | | | | | | | | |
|---|--------------|----------------------|-------------------|--------------|---------|---------|---------|---------|---------|---------|---------|---------|
| | | | | Ø0.157" | Ø0.236" | Ø0.315" | Ø0.394" | Ø0.472" | Ø0.630" | Ø0.787" | Ø0.984" | |
|  | <60 ksi | 330 | 490 | Roughing | 0.00067 | 0.00138 | 0.00181 | 0.00224 | 0.00280 | 0.00346 | 0.00402 | 0.00445 |
| | | | | Finishing | 0.00094 | 0.00189 | 0.00252 | 0.00315 | 0.00390 | 0.00048 | 0.00563 | 0.00626 |
| | | | | Slotting | 0.00047 | 0.00094 | 0.00126 | 0.00157 | 0.00197 | 0.00244 | 0.00087 | 0.00311 |
| | <100 ksi | 330 | 490 | Roughing | 0.00063 | 0.00126 | 0.00165 | 0.00205 | 0.00256 | 0.00319 | 0.00370 | 0.00409 |
| | | | | Finishing | 0.00087 | 0.00173 | 0.00232 | 0.00287 | 0.00358 | 0.00445 | 0.00520 | 0.00575 |
| | | | | Slotting | 0.00043 | 0.00087 | 0.00114 | 0.00146 | 0.00181 | 0.00224 | 0.00260 | 0.00287 |
|  | <145 ksi | 230 | 360 | Roughing | 0.00051 | 0.00102 | 0.00134 | 0.00169 | 0.00209 | 0.00260 | 0.00303 | 0.00335 |
| | | | | Finishing | 0.00071 | 0.00142 | 0.00189 | 0.00236 | 0.00295 | 0.00366 | 0.00425 | 0.00469 |
| | | | | Slotting | 0.00035 | 0.00071 | 0.00094 | 0.00118 | 0.00146 | 0.00181 | 0.00213 | 0.00236 |
| | <190 ksi | 195 | 330 | Roughing | 0.00047 | 0.00091 | 0.00122 | 0.00150 | 0.00185 | 0.00232 | 0.00268 | 0.00299 |
| | | | | Finishing | 0.00063 | 0.00126 | 0.00169 | 0.00209 | 0.00260 | 0.00323 | 0.00378 | 0.00417 |
| | | | | Slotting | 0.00031 | 0.00063 | 0.00083 | 0.00106 | 0.00130 | 0.00161 | 0.00189 | 0.00209 |
|  | 55HRC | 100 | 195 | Roughing | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
| | | | | Finishing | 0.00055 | 0.00110 | 0.00146 | 0.00185 | 0.00228 | 0.00283 | 0.00331 | 0.00366 |
| | | | | Slotting | 0.00028 | 0.00055 | 0.00075 | 0.00091 | 0.00114 | 0.00142 | 0.00165 | 0.00181 |
|  | 68HRC | 65 | 130 | Roughing | 0.00035 | 0.00067 | 0.00091 | 0.00114 | 0.00142 | 0.00173 | 0.00201 | 0.00224 |
| | | | | Finishing | 0.00047 | 0.00094 | 0.00126 | 0.00157 | 0.00197 | 0.00244 | 0.00283 | 0.00311 |
| | | | | Slotting | 0.00024 | 0.00047 | 0.00063 | 0.00079 | 0.00098 | 0.00122 | 0.00142 | 0.00157 |
|  | <130 ksi | 195 | 295 | Roughing | 0.00051 | 0.00102 | 0.00134 | 0.00169 | 0.00209 | 0.00260 | 0.00303 | 0.00335 |
| | | | | Finishing | 0.00071 | 0.00142 | 0.00189 | 0.00236 | 0.00295 | 0.00366 | 0.00425 | 0.00469 |
| | | | | Slotting | 0.00035 | 0.00071 | 0.00094 | 0.00118 | 0.00146 | 0.00181 | 0.00213 | 0.00236 |
| | >130 ksi | 165 | 260 | Roughing | 0.00047 | 0.00091 | 0.00122 | 0.00150 | 0.00185 | 0.00232 | 0.00268 | 0.00299 |
| | | | | Finishing | 0.00063 | 0.00126 | 0.00169 | 0.00209 | 0.00260 | 0.00323 | 0.00378 | 0.00417 |
| | | | | Slotting | 0.00031 | 0.00063 | 0.00083 | 0.00106 | 0.00130 | 0.00161 | 0.00189 | 0.00209 |
|  | <130 ksi | 130 | 195 | Roughing | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
| | | | | Finishing | 0.00055 | 0.00110 | 0.00146 | 0.00185 | 0.00228 | 0.00283 | 0.00331 | 0.00366 |
| | | | | Slotting | 0.00028 | 0.00055 | 0.00075 | 0.00091 | 0.00114 | 0.00142 | 0.00165 | 0.00181 |
| | >130 ksi | 100 | 165 | Roughing | 0.00035 | 0.00067 | 0.00091 | 0.00114 | 0.00142 | 0.00173 | 0.00201 | 0.00224 |
| | | | | Finishing | 0.00047 | 0.00094 | 0.00126 | 0.00157 | 0.00197 | 0.00244 | 0.00283 | 0.00311 |
| | | | | Slotting | 0.00024 | 0.00047 | 0.00063 | 0.00079 | 0.00098 | 0.00122 | 0.00142 | 0.00157 |
|  | <130 ksi | 100 | 165 | Roughing | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
| | | | | Finishing | 0.00055 | 0.00110 | 0.00146 | 0.00185 | 0.00228 | 0.00283 | 0.00331 | 0.00366 |
| | | | | Slotting | 0.00028 | 0.00055 | 0.00075 | 0.00091 | 0.00114 | 0.00142 | 0.00165 | 0.00181 |
| | >130 ksi | 65 | 130 | Roughing | 0.00035 | 0.00067 | 0.00091 | 0.00114 | 0.00142 | 0.00173 | 0.00201 | 0.00224 |
| | | | | Finishing | 0.00047 | 0.00094 | 0.00126 | 0.00157 | 0.00197 | 0.00244 | 0.00283 | 0.00311 |
| | | | | Slotting | 0.00024 | 0.00047 | 0.00063 | 0.00079 | 0.00098 | 0.00122 | 0.00142 | 0.00157 |
|  | <8HRC | 330 | 490 | Roughing | 0.00063 | 0.00126 | 0.00165 | 0.00205 | 0.00256 | 0.00319 | 0.00370 | 0.00409 |
| | | | | Finishing | 0.00087 | 0.00173 | 0.00232 | 0.00287 | 0.00358 | 0.00445 | 0.00520 | 0.00575 |
| | | | | Slotting | 0.00043 | 0.00087 | 0.00114 | 0.00146 | 0.00181 | 0.00224 | 0.00260 | 0.00287 |
| | >8HRC | 260 | 395 | Roughing | 0.00055 | 0.00114 | 0.00150 | 0.00189 | 0.00232 | 0.00291 | 0.00335 | 0.00374 |
| | | | | Finishing | 0.00079 | 0.00157 | 0.00213 | 0.00264 | 0.00327 | 0.00406 | 0.00472 | 0.00520 |
| | | | | Slotting | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
|  | Silicon <10% | 985 | 1640 | Roughing | 0.00067 | 0.00138 | 0.00181 | 0.00224 | 0.00280 | 0.00346 | 0.00402 | 0.00445 |
| | | | | Finishing | 0.00055 | 0.00114 | 0.00150 | 0.00189 | 0.00232 | 0.00291 | 0.00335 | 0.00374 |
| | | | | Slotting | 0.00047 | 0.00094 | 0.00126 | 0.00157 | 0.00197 | 0.00244 | 0.00283 | 0.00311 |
| | Silicon >10% | 655 | 1310 | Roughing | 0.00063 | 0.00126 | 0.00165 | 0.00205 | 0.00256 | 0.00319 | 0.00370 | 0.00409 |
| | | | | Finishing | 0.00087 | 0.00173 | 0.00232 | 0.00287 | 0.00358 | 0.00445 | 0.00520 | 0.00575 |
| | | | | Slotting | 0.00043 | 0.00087 | 0.00114 | 0.00146 | 0.00181 | 0.00224 | 0.00260 | 0.00287 |
|  | Bronze | 330 | 490 | Roughing | 0.00055 | 0.00114 | 0.00150 | 0.00189 | 0.00232 | 0.00291 | 0.00335 | 0.00374 |
| | | | | Finishing | 0.00079 | 0.00157 | 0.00213 | 0.00264 | 0.00327 | 0.00406 | 0.00472 | 0.00520 |
| | | | | Slotting | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
| | Brass | 260 | 395 | Roughing | 0.00055 | 0.00114 | 0.00150 | 0.00189 | 0.00232 | 0.00291 | 0.00335 | 0.00374 |
| | | | | Finishing | 0.00079 | 0.00157 | 0.00213 | 0.00264 | 0.00327 | 0.00406 | 0.00472 | 0.00520 |
| | | | | Slotting | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |
|  | - | 985 | 1640 | Roughing | 0.00055 | 0.00114 | 0.00150 | 0.00189 | 0.00232 | 0.00291 | 0.00335 | 0.00374 |
| | | | | Finishing | 0.00079 | 0.00157 | 0.00213 | 0.00264 | 0.00327 | 0.00406 | 0.00472 | 0.00520 |
| | | | | Slotting | 0.00039 | 0.00079 | 0.00106 | 0.00130 | 0.00161 | 0.00201 | 0.00236 | 0.00260 |

METRIC

METRIC CARBIDE END MILLS

| Material | Property | Vc : m/min Uncoated | Vc : m/min AlTiN | Feed : (mm/t) | | | | | | | | |
|---|--------------|------------------------|---------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | Ø4 | Ø6 | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | |
|  | <400 MPa | 100 | 150 | Roughing | 0.017 | 0.035 | 0.046 | 0.057 | 0.071 | 0.088 | 0.102 | 0.113 |
| | | | | Finishing | 0.024 | 0.048 | 0.064 | 0.080 | 0.099 | 0.12 | 0.143 | 0.159 |
| | | | | Slotting | 0.012 | 0.024 | 0.032 | 0.040 | 0.050 | 0.062 | 0.072 | 0.079 |
| | <700 MPa | 100 | 150 | Roughing | 0.016 | 0.032 | 0.042 | 0.052 | 0.065 | 0.081 | 0.094 | 0.104 |
| | | | | Finishing | 0.022 | 0.044 | 0.059 | 0.073 | 0.091 | 0.113 | 0.132 | 0.146 |
| | | | | Slotting | 0.011 | 0.022 | 0.029 | 0.037 | 0.046 | 0.057 | 0.066 | 0.073 |
|  | <1,000 MPa | 70 | 110 | Roughing | 0.013 | 0.026 | 0.034 | 0.043 | 0.053 | 0.066 | 0.077 | 0.085 |
| | | | | Finishing | 0.018 | 0.036 | 0.048 | 0.060 | 0.075 | 0.093 | 0.108 | 0.119 |
| | | | | Slotting | 0.009 | 0.018 | 0.024 | 0.030 | 0.037 | 0.046 | 0.054 | 0.060 |
| | <1,300 MPa | 60 | 100 | Roughing | 0.012 | 0.023 | 0.031 | 0.038 | 0.047 | 0.059 | 0.068 | 0.076 |
| | | | | Finishing | 0.016 | 0.032 | 0.043 | 0.053 | 0.066 | 0.082 | 0.096 | 0.106 |
| | | | | Slotting | 0.008 | 0.016 | 0.021 | 0.027 | 0.033 | 0.041 | 0.048 | 0.053 |
|  | 55HRC | 30 | 60 | Roughing | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
| | | | | Finishing | 0.014 | 0.028 | 0.037 | 0.047 | 0.058 | 0.072 | 0.084 | 0.093 |
| | | | | Slotting | 0.007 | 0.014 | 0.019 | 0.023 | 0.029 | 0.036 | 0.042 | 0.046 |
|  | 68HRC | 20 | 40 | Roughing | 0.009 | 0.017 | 0.023 | 0.029 | 0.036 | 0.044 | 0.051 | 0.057 |
| | | | | Finishing | 0.012 | 0.024 | 0.032 | 0.040 | 0.050 | 0.062 | 0.072 | 0.079 |
| | | | | Slotting | 0.006 | 0.012 | 0.016 | 0.020 | 0.025 | 0.031 | 0.036 | 0.040 |
|  | <900 MPa | 60 | 90 | Roughing | 0.013 | 0.026 | 0.034 | 0.043 | 0.053 | 0.066 | 0.077 | 0.085 |
| | | | | Finishing | 0.018 | 0.036 | 0.048 | 0.060 | 0.075 | 0.093 | 0.108 | 0.119 |
| | | | | Slotting | 0.009 | 0.018 | 0.024 | 0.030 | 0.037 | 0.046 | 0.054 | 0.060 |
| | >900 MPa | 50 | 80 | Roughing | 0.012 | 0.023 | 0.031 | 0.038 | 0.047 | 0.059 | 0.068 | 0.076 |
| | | | | Finishing | 0.016 | 0.032 | 0.043 | 0.053 | 0.066 | 0.082 | 0.096 | 0.106 |
| | | | | Slotting | 0.008 | 0.016 | 0.021 | 0.027 | 0.033 | 0.041 | 0.048 | 0.053 |
|  | <900 MPa | 40 | 60 | Roughing | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
| | | | | Finishing | 0.014 | 0.028 | 0.037 | 0.047 | 0.058 | 0.072 | 0.084 | 0.093 |
| | | | | Slotting | 0.007 | 0.014 | 0.019 | 0.023 | 0.029 | 0.036 | 0.042 | 0.046 |
| | >900 MPa | 30 | 50 | Roughing | 0.009 | 0.017 | 0.023 | 0.029 | 0.036 | 0.044 | 0.051 | 0.057 |
| | | | | Finishing | 0.012 | 0.024 | 0.032 | 0.040 | 0.050 | 0.062 | 0.072 | 0.079 |
| | | | | Slotting | 0.006 | 0.012 | 0.016 | 0.020 | 0.025 | 0.031 | 0.036 | 0.040 |
|  | <900 MPa | 30 | 50 | Roughing | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
| | | | | Finishing | 0.014 | 0.028 | 0.037 | 0.047 | 0.058 | 0.072 | 0.084 | 0.093 |
| | | | | Slotting | 0.007 | 0.014 | 0.019 | 0.023 | 0.029 | 0.036 | 0.042 | 0.046 |
| | >900 MPa | 20 | 40 | Roughing | 0.009 | 0.017 | 0.023 | 0.029 | 0.036 | 0.044 | 0.051 | 0.057 |
| | | | | Finishing | 0.012 | 0.024 | 0.032 | 0.040 | 0.050 | 0.062 | 0.072 | 0.079 |
| | | | | Slotting | 0.006 | 0.012 | 0.016 | 0.020 | 0.025 | 0.031 | 0.036 | 0.040 |
|  | <180 HB | 100 | 150 | Roughing | 0.016 | 0.032 | 0.042 | 0.052 | 0.065 | 0.081 | 0.094 | 0.104 |
| | | | | Finishing | 0.022 | 0.044 | 0.059 | 0.073 | 0.091 | 0.113 | 0.132 | 0.146 |
| | | | | Slotting | 0.011 | 0.022 | 0.029 | 0.037 | 0.046 | 0.057 | 0.066 | 0.073 |
| | >180 HB | 80 | 120 | Roughing | 0.014 | 0.029 | 0.038 | 0.048 | 0.059 | 0.074 | 0.085 | 0.095 |
| | | | | Finishing | 0.020 | 0.040 | 0.054 | 0.067 | 0.083 | 0.103 | 0.120 | 0.132 |
| | | | | Slotting | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
|  | Silicon <10% | 300 | 500 | Roughing | 0.017 | 0.035 | 0.046 | 0.057 | 0.071 | 0.088 | 0.102 | 0.113 |
| | | | | Finishing | 0.014 | 0.048 | 0.064 | 0.080 | 0.099 | 0.123 | 0.143 | 0.159 |
| | | | | Slotting | 0.012 | 0.024 | 0.032 | 0.040 | 0.050 | 0.062 | 0.072 | 0.079 |
| | Silicon >10% | 200 | 400 | Roughing | 0.016 | 0.032 | 0.042 | 0.052 | 0.065 | 0.081 | 0.094 | 0.104 |
| | | | | Finishing | 0.022 | 0.044 | 0.059 | 0.073 | 0.091 | 0.113 | 0.132 | 0.146 |
| | | | | Slotting | 0.011 | 0.022 | 0.029 | 0.037 | 0.046 | 0.057 | 0.066 | 0.073 |
|  | Bronze | 100 | 150 | Roughing | 0.014 | 0.029 | 0.038 | 0.048 | 0.059 | 0.074 | 0.085 | 0.095 |
| | | | | Finishing | 0.020 | 0.040 | 0.054 | 0.067 | 0.083 | 0.103 | 0.120 | 0.132 |
| | | | | Slotting | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
| | Brass | 80 | 120 | Roughing | 0.014 | 0.029 | 0.038 | 0.048 | 0.059 | 0.074 | 0.085 | 0.095 |
| | | | | Finishing | 0.020 | 0.040 | 0.054 | 0.067 | 0.083 | 0.103 | 0.120 | 0.132 |
| | | | | Slotting | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |
|  | - | 300 | 500 | Roughing | 0.014 | 0.029 | 0.038 | 0.048 | 0.059 | 0.074 | 0.085 | 0.095 |
| | | | | Finishing | 0.020 | 0.040 | 0.054 | 0.067 | 0.083 | 0.103 | 0.120 | 0.132 |
| | | | | Slotting | 0.010 | 0.020 | 0.027 | 0.033 | 0.041 | 0.051 | 0.060 | 0.066 |

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| Material | Property | Vc : m/min AlTiN | Feed : (mm/t) | | | |
|----------|------------|---------------------|---------------|-----------|-----------|-----------|
| | | | Ø < 0.345 | Ø < 0.445 | Ø < 0.545 | Ø < 0.595 |
| | <500 MPa | 20 | 0.010 | 0.015 | 0.020 | 0.030 |
| | <800 MPa | 15 | 0.010 | 0.015 | 0.020 | 0.030 |
| | <1,000 MPa | 10 | 0.010 | 0.015 | 0.020 | 0.030 |
| | <1,300 MPa | | | | | |
| | - | 7 | 0.010 | 0.015 | 0.020 | 0.030 |
| | - | 5 | 0.010 | 0.015 | 0.020 | 0.030 |
| | - | 5 | 0.010 | 0.015 | 0.020 | 0.030 |
| | <180 HB | 15 | 0.010 | 0.015 | 0.020 | 0.035 |
| | >180 HB | 10 | 0.010 | 0.015 | 0.020 | 0.035 |
| | - | 20 | 0.010 | 0.015 | 0.020 | 0.035 |
| | - | 20 | 0.010 | 0.015 | 0.020 | 0.035 |

| Material | Property | Vc : m/min AlTiN | Feed : (mm/t) | | |
|----------|---------------|---------------------|---------------|-------|-------|
| | | | Ø2 | Ø6 | Ø10 |
| | <500 MPa | 25 ~ 40 | 0.150 | 0.150 | 0.250 |
| | <800 MPa | 20 ~ 25 | 0.100 | 0.120 | 0.180 |
| | <1,000 MPa | 12 ~ 18 | 0.080 | 0.100 | 0.180 |
| | <1,300 MPa | 10 ~ 15 | 0.080 | 0.090 | 0.150 |
| | Ferritic | 7 ~ 12 | 0.070 | 0.100 | 0.120 |
| | Martensitic | 7 ~ 12 | 0.070 | 0.100 | 0.120 |
| | Austenitic | 7 ~ 12 | 0.070 | 0.100 | 0.120 |
| | - | 6 ~ 10 | 0.070 | 0.100 | 0.120 |
| | <900 MPa | 6 ~ 10 | 0.070 | 0.100 | 0.120 |
| | >900 MPa | 6 ~ 10 | 0.070 | 0.100 | 0.120 |
| | <180 HB | 30 ~ 40 | 0.100 | 0.120 | 0.200 |
| | >180 HB | 8 ~ 15 | 0.070 | 0.100 | 0.150 |
| | 140-360 MPa | 40 ~ 60 | 0.150 | 0.180 | 0.250 |
| | Sillicon <10% | 15 ~ 25 | 0.080 | 0.200 | 0.380 |
| | Sillicon >10% | 15 ~ 30 | 0.060 | 0.160 | 0.250 |
| | Bronze | 20 ~ 25 | 0.150 | 0.180 | 0.220 |
| | Copper | 25 ~ 30 | 0.120 | 0.180 | 0.200 |
| | Brass | 35 ~ 40 | 0.200 | 0.220 | 0.300 |

METRIC PRE-DRILL DIAMETERS

FOR REAMERS

| Diameter (mm) |  P Steel 30-35HRC |  P Steel 30-40HRC |  M Stainless Steel |  K Cast Iron |  N Aluminum |  N Copper Alloy |  N Thermoset Plastic |  N High Density Plastic |  S Nickel / Cobalt |  S Titanium Alloy |
|---------------|--|--|---|--|---|--|---|--|---|--|
| 0.3 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 |
| 0.4 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 |
| 0.5 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 |
| 0.6 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 |
| 0.8 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 | 0.68 |
| 1.0 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 | 0.85 |
| 2.0 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 | 1.80 |
| 3.0 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 | 2.80 |
| 4.0 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 | 3.80 |
| 5.0 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 | 4.80 |
| 6.0 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 | 5.80 |
| 8.0 | 7.80 | 7.80 | 7.80 | 7.80 | 7.70 | 7.70 | 7.80 | 7.70 | 7.80 | 7.80 |

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COATING GUIDE

| Coating | TiN | TiCN | TiAlCN | TiAlN | AlTiN | AlTiN Nano | ZrN | CrN | CBC | AlTiN / Si ₃ N ₄ | AX | AlCrN / Si ₃ N ₄ | DLC | CVD Diamond |
|--|------------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------|--|-------------------|--|------------------|------------------|
| Nanohardness (Gpa) | 24 | 37 | 28 | 28 | 38 | 38 | 20 | 18 | 20 | 45 | 36 | 42 | 77 | 87 |
| Friction Coefficient (Fretting) | 0.55 | 0.2 | 0.3 | 0.6 | 0.7 | 0.7 | 0.4 | 0.3 | 0.15 | 0.45 | 0.35 | 0.35 | 0.2 | 0.25 |
| Thickness (µm) (Application Dependant) | 1 - 5 | 1 - 4 | 1 - 4 | 1 - 4 | 1 - 3 | 2-4 | 1 - 4 | 1 - 4 | 0.5 - 1.5 | 1 - 4 | 1-4 | 1 - 5 | 1 - 3 | 8 - 12 |
| Maximum Working Temperature | 600 °C (1100 °F) | 400 °C (750 °F) | 500 °C (930 °F) | 700 °C (1290 °F) | 900 °C (1650 °F) | 900 °C (1650 °F) | 550 °C (1020 °F) | 700 °C (1290 °F) | 400 °C (750 °F) | 1200 °C (2190 °F) | 1100 °C (2010 °F) | 1100 °C (2010 °F) | 700 °C (1290 °F) | 800 °C (1470 °F) |
| Color | Golden Yellow | Blue-Gray | Red Copper | Violet | Blue Black | Gray | Pale Yellow | Silver | Charcoal Gray | Blue Black | Silver Gray | Silver Gray | Black | Gray |

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VICKERS HARDNESS CONVERSION CHART

| Rockwell | | | | | | Rockwell Superficial | | | | Brinell | | Vickers | Shore | Approx. Tensile Strength (psi) |
|------------|------------------|-------------|-------------|-----------------|-----------------|----------------------|------------|------------|-----------------|-----------------|-----------------|-----------------|-------------|--------------------------------|
| A | B | C | D | E | F | 15-N | 30-N | 45-N | 30-T | 3000kg | 500kg | 136 | | |
| 60kg Brale | 100kg 1/16" Ball | 150kg Brale | 100kg Brale | 100kg 1/8" Ball | 60kg 1/16" Ball | 15kg Brale | 30kg Brale | 45kg Brale | 30kg 1/16" Ball | 10mm Ball Steel | 10mm Ball Steel | Diamond Pyramid | Scieroscope | |
| 86.5 | - | 70 | 78.5 | - | - | 94.0 | 86.0 | 77.6 | - | - | - | 1076 | 101 | - |
| 86.0 | - | 69 | 77.7 | - | - | 93.5 | 85.0 | 76.5 | - | - | - | 1044 | 99 | - |
| 85.6 | - | 68 | 76.9 | - | - | 93.2 | 84.4 | 75.4 | - | - | - | 940 | 97 | - |
| 85.0 | - | 67 | 76.1 | - | - | 92.9 | 83.6 | 74.2 | - | - | - | 900 | 95 | - |
| 84.5 | - | 66 | 75.4 | - | - | 92.5 | 82.8 | 73.2 | - | - | - | 865 | 92 | - |
| 83.9 | - | 65 | 74.5 | - | - | 92.2 | 81.9 | 72.0 | - | 739 | - | 832 | 91 | - |
| 83.4 | - | 64 | 73.8 | - | - | 91.8 | 81.1 | 71.0 | - | 722 | - | 800 | 88 | - |
| 82.8 | - | 63 | 73.0 | - | - | 91.4 | 80.1 | 69.9 | - | 705 | - | 772 | 87 | - |
| 82.3 | - | 62 | 72.2 | - | - | 91.1 | 79.3 | 68.8 | - | 688 | - | 746 | 85 | - |
| 81.8 | - | 61 | 71.5 | - | - | 90.7 | 78.4 | 67.7 | - | 670 | - | 720 | 83 | - |
| 81.2 | - | 60 | 70.7 | - | - | 90.2 | 77.5 | 66.6 | - | 654 | - | 697 | 81 | - |
| 80.7 | - | 59 | 69.9 | - | - | 89.8 | 76.6 | 65.5 | - | 634 | - | 674 | 80 | - |
| 80.1 | - | 58 | 69.2 | - | - | 89.3 | 75.7 | 64.3 | - | 615 | - | 653 | 78 | - |
| 79.6 | - | 57 | 68.5 | - | - | 88.9 | 74.8 | 63.2 | - | 595 | - | 633 | 76 | - |
| 79.0 | - | 56 | 67.7 | - | - | 88.3 | 73.9 | 62.0 | - | 577 | - | 613 | 75 | - |
| 78.5 | 120 | 55 | 66.9 | - | - | 87.9 | 73.0 | 60.9 | - | 560 | - | 595 | 74 | - |
| 78.0 | 120 | 54 | 66.1 | - | - | 87.4 | 72.0 | 59.8 | - | 543 | - | 577 | 72 | - |
| 77.4 | 119 | 53 | 65.4 | - | - | 86.9 | 71.2 | 58.6 | - | 525 | - | 560 | 71 | - |
| 76.8 | 119 | 52 | 64.6 | - | - | 86.4 | 70.2 | 57.4 | - | 500 | - | 544 | 69 | - |
| 76.3 | 118 | 51 | 63.8 | - | - | 85.9 | 69.4 | 56.1 | - | 487 | - | 528 | 68 | - |
| 75.9 | 117 | 50 | 63.1 | - | - | 85.5 | 68.5 | 55.0 | - | 475 | - | 513 | 67 | - |
| 75.2 | 117 | 49 | 62.1 | - | - | 85.0 | 67.6 | 53.8 | - | 464 | - | 498 | 66 | - |
| 74.7 | 116 | 48 | 61.4 | - | - | 84.5 | 66.7 | 52.5 | - | 451 | - | 484 | 64 | - |
| 74.1 | 116 | 47 | 60.8 | - | - | 83.9 | 65.8 | 51.4 | - | 442 | - | 471 | 63 | - |
| 73.6 | 115 | 46 | 60.0 | - | - | 83.5 | 64.8 | 50.3 | - | 432 | - | 458 | 62 | - |
| 73.1 | 115 | 45 | 59.2 | - | - | 83.0 | 64.0 | 49.0 | - | 421 | - | 446 | 60 | - |
| 72.5 | 114 | 44 | 58.5 | - | - | 82.5 | 63.1 | 47.8 | - | 409 | - | 434 | 58 | - |
| 72.0 | 113 | 43 | 57.7 | - | - | 82.0 | 62.2 | 46.7 | - | 400 | - | 423 | 57 | - |
| 71.5 | 113 | 42 | 56.9 | - | - | 81.5 | 61.3 | 45.5 | - | 390 | - | 412 | 56 | 191,000 |
| 70.9 | 112 | 41 | 56.2 | - | - | 80.9 | 60.4 | 44.3 | - | 381 | - | 402 | 55 | 187,000 |
| 70.4 | 112 | 40 | 55.4 | - | - | 80.4 | 59.5 | 43.1 | - | 371 | - | 392 | 54 | 182,000 |
| 69.9 | 111 | 39 | 54.6 | - | - | 79.9 | 58.6 | 41.9 | - | 362 | - | 382 | 52 | 177,000 |
| 69.4 | 110 | 38 | 53.8 | - | - | 79.4 | 57.7 | 40.8 | - | 353 | - | 372 | 51 | 173,000 |
| 68.9 | 110 | 37 | 53.1 | - | - | 78.8 | 56.8 | 39.6 | - | 344 | - | 363 | 50 | 169,000 |
| 68.4 | 109 | 36 | 52.3 | - | - | 78.3 | 55.9 | 38.4 | - | 336 | - | 354 | 49 | 165,000 |
| 67.9 | 109 | 35 | 51.5 | - | - | 77.7 | 55.0 | 37.2 | - | 327 | - | 345 | 48 | 160,000 |
| 67.4 | 108 | 34 | 50.8 | - | - | 77.2 | 54.2 | 36.1 | - | 319 | - | 336 | 47 | 156,000 |
| 66.8 | 108 | 33 | 50.0 | - | - | 76.6 | 53.3 | 34.9 | - | 311 | - | 327 | 46 | 152,000 |
| 66.3 | 107 | 32 | 49.2 | - | - | 76.1 | 52.1 | 33.7 | - | 301 | - | 318 | 44 | 147,000 |
| 65.8 | 106 | 31 | 48.4 | - | - | 75.6 | 51.3 | 32.5 | - | 294 | - | 310 | 43 | 144,000 |
| 65.3 | 105 | 30 | 47.7 | - | - | 75.0 | 50.4 | 31.3 | - | 286 | - | 302 | 42 | 140,000 |
| 64.7 | 104 | 29 | 47.0 | - | - | 74.5 | 49.5 | 30.1 | - | 279 | - | 294 | 41 | 137,000 |
| 64.3 | 104 | 28 | 46.1 | - | - | 73.9 | 48.6 | 28.9 | - | 271 | - | 286 | 41 | 133,000 |
| 63.8 | 103 | 27 | 45.2 | - | - | 73.3 | 47.7 | 27.8 | - | 264 | - | 279 | 40 | 129,000 |
| 63.3 | 103 | 26 | 44.6 | - | - | 72.8 | 46.8 | 26.7 | - | 258 | - | 272 | 39 | 126,000 |
| 62.8 | 102 | 25 | 43.8 | - | - | 72.2 | 45.9 | 25.5 | - | 253 | - | 266 | 38 | 124,000 |
| 62.4 | 101 | 24 | 43.1 | - | - | 71.6 | 45.0 | 24.3 | - | 247 | - | 260 | 37 | 121,000 |
| 62.0 | 100 | 23 | 42.1 | - | - | 71.0 | 44.0 | 23.1 | 82.0 | 240 | 201 | 254 | 36 | 118,000 |
| 61.5 | 99 | 22 | 41.6 | - | - | 70.5 | 43.2 | 22.0 | 81.5 | 234 | 195 | 248 | 35 | 115,000 |

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| | Rockwell | | | | | | Rockwell Superficial | | | | Brinell | | Vickers | Shore | Approx. Tensile Strength (psi) |
|--|------------|------------------|-------------|-------------|-----------------|-----------------|----------------------|------------|------------|-----------------|-----------------|-----------------|-----------------|-------------|--------------------------------|
| | A | B | C | D | E | F | 15-N | 30-N | 45-N | 30-T | 3000kg | 500kg | 136 | | |
| | 60kg Brale | 100kg 1/16" Ball | 150kg Brale | 100kg Brale | 100kg 1/8" Ball | 60kg 1/16" Ball | 15kg Brale | 30kg Brale | 45kg Brale | 30kg 1/16" Ball | 10mm Ball Steel | 10mm Ball Steel | Diamond Pyramid | Sciencscope | |
| | 61.0 | 98 | 21 | 40.9 | - | - | 69.9 | 42.3 | 20.7 | 81.0 | 228 | 189 | 243 | 35 | 112,000 |
| | 60.5 | 97 | 20 | 40.1 | - | - | 69.4 | 41.5 | 19.6 | 80.5 | 222 | 184 | 238 | 34 | 109,000 |
| | 59.0 | 96 | 18 | - | - | - | - | - | - | 80.0 | 216 | 179 | 230 | 33 | 106,000 |
| | 58.0 | 95 | 16 | - | - | - | - | - | - | 79.0 | 210 | 175 | 222 | 32 | 103,000 |
| | 57.5 | 94 | 15 | - | - | - | - | - | - | 78.5 | 205 | 171 | 213 | 31 | 100,000 |
| | 57.0 | 93 | 13 | - | - | - | - | - | - | 78.0 | 200 | 167 | 208 | 30 | 98,000 |
| | 56.5 | 92 | 12 | - | - | - | - | - | - | 77.5 | 195 | 163 | 204 | 29 | 96,000 |
| | 56.0 | 91 | 10 | - | - | - | - | - | - | 77.0 | 190 | 160 | 196 | 28 | 93,000 |
| | 55.5 | 90 | 9 | - | - | - | - | - | - | 76.0 | 185 | 157 | 192 | 27 | 91,000 |
| | 55.0 | 89 | 8 | - | - | - | - | - | - | 75.5 | 180 | 154 | 188 | 26 | 88,000 |
| | 54.0 | 88 | 7 | - | - | - | - | - | - | 75.0 | 176 | 151 | 184 | 26 | 86,000 |
| | 53.5 | 87 | 6 | - | - | - | - | - | - | 74.5 | 172 | 148 | 180 | 26 | 84,000 |
| | 53.0 | 86 | 5 | - | - | - | - | - | - | 74.0 | 169 | 145 | 176 | 25 | 83,000 |
| | 52.5 | 85 | 4 | - | - | - | - | - | - | 73.5 | 165 | 142 | 173 | 25 | 81,000 |
| | 52.0 | 84 | 3 | - | - | - | - | - | - | 73.0 | 162 | 140 | 170 | 25 | 79,000 |
| | 51.0 | 83 | 2 | - | - | - | - | - | - | 72.0 | 159 | 137 | 166 | 24 | 78,000 |
| | 50.5 | 82 | 1 | - | - | - | - | - | - | 71.5 | 156 | 135 | 163 | 24 | 76,000 |
| | 50.0 | 81 | 0 | - | - | - | - | - | - | 71.0 | 153 | 133 | 160 | 24 | 75,000 |
| | 49.5 | 80 | - | - | - | - | - | - | - | 70.0 | 150 | 130 | - | - | 73,000 |
| | 49.0 | 79 | - | - | - | - | - | - | - | 69.5 | 147 | 128 | - | - | - |
| | 48.5 | 78 | - | - | - | - | - | - | - | 69.0 | 144 | 126 | - | - | - |
| | 48.0 | 77 | - | - | - | - | - | - | - | 68.0 | 141 | 124 | - | - | - |
| | 47.0 | 76 | - | - | - | - | - | - | - | 67.5 | 139 | 122 | - | - | - |
| | 46.5 | 75 | - | - | - | 99.5 | - | - | - | 67.0 | 137 | 120 | - | - | - |
| | 46.0 | 74 | - | - | - | 99.0 | - | - | - | 66.0 | 135 | 118 | - | - | - |
| | 45.5 | 73 | - | - | - | 98.5 | - | - | - | 65.5 | 132 | 116 | - | - | - |
| | 45.0 | 72 | - | - | - | 98.0 | - | - | - | 65.0 | 130 | 114 | - | - | - |
| | 44.5 | 71 | - | - | 100.0 | 97.5 | - | - | - | 64.2 | 127 | 112 | - | - | - |
| | 44.0 | 70 | - | - | 99.5 | 97.0 | - | - | - | 63.5 | 125 | 110 | - | - | - |
| | 43.5 | 69 | - | - | 99.0 | 96.0 | - | - | - | 62.8 | 123 | 109 | - | - | - |
| | 43.0 | 68 | - | - | 98.0 | 95.5 | - | - | - | 62.0 | 121 | 107 | - | - | - |
| | 42.5 | 67 | - | - | 97.5 | 95.0 | - | - | - | 61.4 | 119 | 106 | - | - | - |
| | 42.0 | 66 | - | - | 97.0 | 94.5 | - | - | - | 60.5 | 117 | 104 | - | - | - |
| | 41.8 | 65 | - | - | 96.0 | 94.0 | - | - | - | 60.1 | 116 | 102 | - | - | - |
| | 41.5 | 64 | - | - | 95.5 | 93.5 | - | - | - | 59.5 | 114 | 101 | - | - | - |
| | 41.0 | 63 | - | - | 95.0 | 93.0 | - | - | - | 58.7 | 112 | 99 | - | - | - |
| | 40.5 | 62 | - | - | 94.5 | 92.0 | - | - | - | 58.0 | 110 | 98 | - | - | - |
| | 40.0 | 61 | - | - | 93.5 | 91.5 | - | - | - | 57.3 | 108 | 96 | - | - | - |
| | 39.5 | 60 | - | - | 93.0 | 91.0 | - | - | - | 56.5 | 107 | 95 | - | - | - |
| | 39.0 | 59 | - | - | 92.5 | 90.5 | - | - | - | 55.9 | 106 | 94 | - | - | - |
| | 38.5 | 58 | - | - | 92.0 | 90.0 | - | - | - | 55.0 | 104 | 92 | - | - | - |
| | 38.0 | 57 | - | - | 91.0 | 89.5 | - | - | - | 54.6 | 102 | 91 | - | - | - |
| | 37.8 | 56 | - | - | 90.5 | 89.0 | - | - | - | 54.0 | 101 | 90 | - | - | - |
| | 37.5 | 55 | - | - | 90.0 | 88.0 | - | - | - | 53.2 | 99 | 89 | - | - | - |
| | 37.0 | 54 | - | - | 89.5 | 87.5 | - | - | - | 52.5 | - | 87 | - | - | - |
| | 36.5 | 53 | - | - | 89.0 | 87.0 | - | - | - | 51.8 | - | 86 | - | - | - |
| | 36.0 | 52 | - | - | 88.0 | 86.5 | - | - | - | 51.0 | - | 85 | - | - | - |
| | 35.5 | 51 | - | - | 87.5 | 86.0 | - | - | - | 50.4 | - | 84 | - | - | - |
| | 35.0 | 50 | - | - | 87.0 | 85.5 | - | - | - | 49.5 | - | 83 | - | - | - |
| | 34.8 | 49 | - | - | 86.5 | 85.0 | - | - | - | 49.1 | - | 82 | - | - | - |
| | 34.5 | 48 | - | - | 85.5 | 84.5 | - | - | - | 48.5 | - | 81 | - | - | - |

| Rockwell | | | | | | Rockwell Superficial | | | | Brinell | | Vickers | Shore | Approx. Tensile Strength (psi) |
|------------|------------------|-------------|-------------|-----------------|-----------------|----------------------|------------|------------|-----------------|-----------------|-----------------|-----------------|--------------|--------------------------------|
| A | B | C | D | E | F | 15-N | 30-N | 45-N | 30-T | 3000kg | 500kg | 136 | | |
| 60kg Brale | 100kg 1/16" Ball | 150kg Brale | 100kg Brale | 100kg 1/8" Ball | 60kg 1/16" Ball | 15kg Brale | 30kg Brale | 45kg Brale | 30kg 1/16" Ball | 10mm Ball Steel | 10mm Ball Steel | Diamond Pyramid | Sciero-scope | |
| 34.0 | 47 | - | - | 85.0 | 84.0 | - | - | - | 47.7 | - | 80 | - | - | - |
| 33.5 | 46 | - | - | 84.5 | 83.0 | - | - | - | 47.0 | - | 79 | - | - | - |
| 33.0 | 45 | - | - | 84.0 | 82.5 | - | - | - | 46.2 | - | 79 | - | - | - |
| 32.5 | 44 | - | - | 83.5 | 82.0 | - | - | - | 45.5 | - | 78 | - | - | - |
| 32.0 | 43 | - | - | 82.5 | 81.5 | - | - | - | 44.8 | - | 77 | - | - | - |
| 31.5 | 42 | - | - | 82.0 | 81.0 | - | - | - | 44.0 | - | 76 | - | - | - |
| 31.0 | 41 | - | - | 81.5 | 80.5 | - | - | - | 43.4 | - | 75 | - | - | - |
| 30.8 | 40 | - | - | 81.0 | 79.5 | - | - | - | 43.0 | - | 74 | - | - | - |
| 30.5 | 39 | - | - | 80.0 | 79.0 | - | - | - | 42.1 | - | 74 | - | - | - |
| 30.0 | 38 | - | - | 79.5 | 78.5 | - | - | - | 41.5 | - | 73 | - | - | - |
| 29.5 | 37 | - | - | 79.0 | 78.0 | - | - | - | 40.7 | - | 72 | - | - | - |
| 29.0 | 36 | - | - | 78.5 | 77.5 | - | - | - | 40.0 | - | 71 | - | - | - |
| 28.5 | 35 | - | - | 78.0 | 77.0 | - | - | - | 39.3 | - | 71 | - | - | - |
| 28.0 | 34 | - | - | 77.0 | 76.5 | - | - | - | 38.5 | - | 70 | - | - | - |
| 27.8 | 33 | - | - | 76.5 | 75.5 | - | - | - | 37.9 | - | 69 | - | - | - |
| 27.5 | 32 | - | - | 76.0 | 75.0 | - | - | - | 37.5 | - | 68 | - | - | - |
| 27.0 | 31 | - | - | 75.5 | 74.5 | - | - | - | 36.6 | - | 68 | - | - | - |
| 26.5 | 30 | - | - | 75.0 | 74.0 | - | - | - | 36.0 | - | 67 | - | - | - |
| 26.0 | 29 | - | - | 74.0 | 73.5 | - | - | - | 35.2 | - | 66 | - | - | - |
| 25.5 | 28 | - | - | 73.5 | 73.0 | - | - | - | 34.5 | - | 66 | - | - | - |
| 25.0 | 27 | - | - | 73.0 | 72.5 | - | - | - | 33.8 | - | 65 | - | - | - |
| 24.5 | 26 | - | - | 72.5 | 72.0 | - | - | - | 33.1 | - | 65 | - | - | - |
| 24.2 | 25 | - | - | 72.0 | 71.0 | - | - | - | 32.4 | - | 64 | - | - | - |
| 24.0 | 24 | - | - | 71.0 | 70.5 | - | - | - | 32.0 | - | 64 | - | - | - |
| 23.5 | 23 | - | - | 70.5 | 70.0 | - | - | - | 31.1 | - | 63 | - | - | - |
| 23.0 | 22 | - | - | 70.0 | 69.5 | - | - | - | 30.4 | - | 63 | - | - | - |
| 22.5 | 21 | - | - | 69.5 | 69.0 | - | - | - | 29.7 | - | 62 | - | - | - |
| 22.0 | 20 | - | - | 68.5 | 68.5 | - | - | - | 29.0 | - | 62 | - | - | - |
| 21.5 | 19 | - | - | 68.0 | 68.0 | - | - | - | 28.1 | - | 61 | - | - | - |
| 21.2 | 18 | - | - | 67.5 | 67.0 | - | - | - | 27.4 | - | 61 | - | - | - |
| 21.0 | 17 | - | - | 67.0 | 66.5 | - | - | - | 26.7 | - | 60 | - | - | - |
| 20.5 | 16 | - | - | 66.5 | 66.0 | - | - | - | 26.0 | - | 60 | - | - | - |
| 20.0 | 15 | - | - | 65.5 | 65.5 | - | - | - | 25.3 | - | 59 | - | - | - |
| - | 14 | - | - | 65.0 | 65.0 | - | - | - | 24.6 | - | 59 | - | - | - |
| - | 13 | - | - | 64.5 | 64.5 | - | - | - | 23.9 | - | 58 | - | - | - |
| - | 12 | - | - | 64.0 | 64.0 | - | - | - | 23.5 | - | 58 | - | - | - |
| - | 11 | - | - | 63.5 | 63.5 | - | - | - | 22.6 | - | 57 | - | - | - |
| - | 10 | - | - | 62.5 | 63.0 | - | - | - | 21.9 | - | 57 | - | - | - |
| - | 9 | - | - | 62.0 | 62.0 | - | - | - | 21.2 | - | 56 | - | - | - |
| - | 8 | - | - | 61.5 | 61.5 | - | - | - | 20.5 | - | 56 | - | - | - |
| - | 7 | - | - | 61.0 | 61.0 | - | - | - | 19.8 | - | 56 | - | - | - |
| - | 6 | - | - | 60.5 | 60.5 | - | - | - | 19.1 | - | 55 | - | - | - |
| - | 5 | - | - | 60.0 | 60.0 | - | - | - | 18.4 | - | 55 | - | - | - |
| - | 4 | - | - | 59.0 | 59.5 | - | - | - | 18.0 | - | 55 | - | - | - |
| - | 3 | - | - | 58.5 | 59.0 | - | - | - | 17.1 | - | 54 | - | - | - |
| - | 2 | - | - | 58.0 | 58.0 | - | - | - | 16.4 | - | 54 | - | - | - |
| - | 1 | - | - | 57.5 | 57.5 | - | - | - | 15.7 | - | 53 | - | - | - |
| - | 0 | - | - | 57.0 | 57.0 | - | - | - | 15.0 | - | 53 | - | - | - |

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| METAL | | |
|---|---|-------------------------------------|
| Class | Name of JIS Standard | Symbol |
| Structural Steel | Rolled Steel for Welded Structure | SM |
| | Re-Rolled Steel | SRB |
| | Rolled Steel for General Structure | SS |
| | Light Gauge Steel for General Structure | SSC |
| | Hot-Rolled Steel Plate, Sheet and Strip for Automobile Structural Use | SAPH |
| Steel Sheet | Cold-Rolled Steel Plate, Sheet and Strip | SPC |
| | Hot-Rolled Soft Steel Plate, Sheet and Strip | SPH |
| Steel Pipe | Carbon Steel Pipe for Ordinary Piping | SGP |
| | Carbon Steel Pipe for Boiler / Heat Exchanger | STB |
| | Seamless Steel Pipe for High Pressure Gas Cylinder | STH |
| | Carbon Steel Pipe for General Structural Use | STK |
| | Carbon Steel Pipe for Machine Structural Use | STKM |
| | Alloy Steel Pipe for Structural Use | STKS |
| | Stainless Steel Pipe for Machine Structural Use | SUS-TK |
| | Steel Square Pipe for General Structural Use | STKR |
| | Alloy Steel Pipe for Ordinary Piping | STPA |
| | Carbon Steel Pipe for Pressure Service | STPG |
| | Carbon Steel Pipe for High-Temperature Service | STPT |
| | Carbon Steel Pipe for High-Pressure Service | STS |
| | Stainless Steel Pipe for Ordinary Piping | SUS-TP |
| | Carbon Steel for Machine Structural Use | SxxC, SxxCK |
| | Steel for Machine Structural Use | Aluminium Chromium Molybdenum Steel |
| Chromium Molybdenum Steel | | SCM |
| Chromium Steel | | SCr |
| Nickel Chromium Steel | | SNC |
| Nickel Chromium Molybdenum Steel | | SNCM |
| Manganese Steel and Manganese Chromium Steel for Machine Structural Use | | SMn, SMnC |
| Carbon Tool Steel | | SK |
| Tool Steel | Hollow Drill Steel | SKC |
| | Alloy Tool Steel | SKS, SKD, SKT |
| | High Speed Tool Steel | SKH |
| Special Steel | Free Cutting Carbon Steel | SUM |
| | High Carbon Chromium Bearing Steel | SUJ |
| | Spring Steel | SUP |
| | Stainless Steel Bar | SUS-B |
| Stainless Steel | Hot-Rolled Stainless Steel Plate, Sheet and Strip | SUS-HP, SUS-HS |
| | Cold-Rolled Stainless Steel Plate, Sheet and Strip | SUS-CP, SUS-CS |
| | Heat-Resisting Steel Bar | SUH-B, SUH-CB |
| Heat Resistant Steel | Heat-Resisting Steel Plate and Sheet | SUH-HP, SUH-CP |
| | Corrosion-Resisting and Heat-Resisting Superalloy Bar | NCF-B |
| Super Alloy | Corrosion-Resisting and Heat-Resisting Superalloy Plate and Sheet | NCF-P |
| | Carbon Steel Forging | SF |
| Forged Steel | Chromium Molybdenum Steel Forging | SFCM |
| | Nickel Chromium Molybdenum Steel Forging | SFNCM |
| | Gray Cast Iron | FC |
| Cast Iron | Spheroidal Graphite Cast Iron | FCD |
| | Blackheart Malleable Cast Iron | FCMB |
| | Whiteheart Malleable Cast Iron | FCMW |
| | Pearlitic Malleable Cast Iron | FCMP |
| | Carbon Cast Steel | SC |
| Cast Steel | High Tensile Strength Carbon Cast Steel & Low Alloy Cast Steel | SCC |
| | Stainless Cast Steel | SCS |
| | Heat-Resisting Cast Steel | SCH |
| | High Manganese Cast Steel | SCMnH |
| | Cast Steel for High Temperature and High Pressure Service | SCPH |

| NON-FERROUS METAL | | |
|---|---|---|
| Class | Name of JIS Standard | Symbol |
| Copper | Copper and Copper Alloy Sheet / Strip | CxxxP CxxxPP CxxxR |
| | Copper and Copper Alloy Rod and Bar | CxxxBD CxxxBDS CxxxBE |
| Aluminum Alloy and Aluminum Alloy Expanded Material | Aluminum and Al. Alloy Sheet / Strip | AxxxP AxxxPC |
| | Aluminum and Al. Alloy Rod, Bar, and Wire | AxxxBE AxxxBES AxxxBD AxxxBDS AxxxW AxxxWS |
| | Aluminum and Al. Alloy Extruded Shape | AxxxS |
| | Aluminum and Al. Alloy Forging | AxxxFD AxxxFH |
| Magnesium Alloy Expanded Material | Magnesium Alloy Sheet and Plate | MP |
| | Magnesium Alloy Rod and Bar | MB |
| Nickel Alloy | Nickel Copper Alloy Sheet and Plate | NCuP |
| | Nickel Copper Alloy Rod and Bar | NCuB |
| Titanium Expanded Material | Titanium Rod and Bar | TB |
| Casting | Brass Casting | CAC20x |
| | High Strength Brass Casting | CAC30x |
| | Bronze Casting | CAC40x |
| | Phosphoric Bronze Casting | CAC50x |
| | Aluminum Bronze Casting | CAC70x |
| | Aluminum Alloy Casting | AC |
| | Magnesium Alloy Casting | MC |
| | Zinc Alloy Die Casting | ZDCx |
| | Aluminum Alloy Die Casting | ADC |
| | Magnesium Alloy Die Casting | MD |
| | White Metal | WJ |

| STEEL | | | | | | | | |
|---|---------------------|---|---------------------|----------------|-------------------|--------------|-------------|----|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB | |
| CARBON STEEL FOR MACHINE STRUCTURAL USE | C10E C10R | 040A10 045A10 045M10 | XC10 | | 1010 | S10C | 08 10 | |
| | | 040A12 | XC12 | | 1012 | S12C | | |
| | C15E C15R | 055M15 | | | 1015 | S15C | 15 | |
| | | | XC18 | | 1017 | S17C | | |
| | C22 C22E C22R | 070M20 C22 C22E C22R | C22 C22E C22R | | 1020 | S20C | 20 | |
| | | | | | 1023 | S22C | | |
| | C25 C25E C25R | C25 C25E C22R | C25 C25E C25R | | 1025 | S25C | 25 | |
| | | | | 25Г | 1029 | S28C | | |
| | C30 C30E C30R | 080A30 080M30 C30 C30E C30R | C30 C30E C30R | | 30Г | 1030 | S30C | 30 |
| | | | | 30Г | | S33C | | |
| | C35 C35E C35R | C35 C35E C35R | C35 C35E C35R | | 35Г | 1035 | S35C | 35 |
| | | | | 35Г | 1038 | S38C | | |
| | C40 C40E C40R | 080M40 C40 C40E C40R | C40 C40E C40R | | 40Г | 1039 1040 | S40C | 40 |
| | | 080A42 | | | 40Г | 1042 1043 | S43C | |
| | C45 C45E C45R | C45 C45E C45R | C45 C45E C45R | | 45Г | 1045 1046 | S45C | 45 |
| | | 080A47 | | | 45Г | | S48C | |
| | C50 C50E C50R | 080M50 C50 C50E C50R | C50 C50E C50R | | 50Г | 1049 | S50C | 50 |
| | | | | | 50Г | 1050 1053 | S53C | |
| | C55 C55E C55R | 070M55 C55 C55E C55R | C55 C55E C55R | | | 1055 | S55C | 55 |
| | C60 C60E C60R | C60 C60E C60R | C60 C60E C60R | | 60Г | 1059 1060 | S58C | 60 |
| C10E | 045A10 045M10 | | XC10 | | | S09CK | | |
| C15E | | | XC12 | | | S15CK | 15F | |
| | | | XC18 | | | S20CK | | |

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| STEEL | | | | | | | |
|----------------------------------|-------------------------|---|---------------------|-------------------|------------------------------|--------------|-------------------|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB |
| NICKEL CHROMIUM STEEL | 36NiCr6 | | | 40XH | | SNC236 | |
| | 14NiCr10 | | | | | SNC415 | 12CrNi2 |
| | 36NiCr10 | | | 30XH3A | | SNC631 | 30CrNi3 |
| | 15NiCr13 | 655M13 | | | | SNC815 | 12Cr2Ni4 |
| | 31NiCr14 | | | | | SNC836 | 37CrNi3 |
| NICKEL CHROMIUM MOLYBDENUM STEEL | 20NiCrMo2 20NiCrMoS2 | 805A20 805M20 805A22 805M22 | 20NCD 2 | | 8615 8617 8620 8622 | SNCM220 | 20CrNiMo |
| | 40NiCrMo2-2 | | | | 8637 8640 | SNCM240 | |
| | | | | | | SNCM415 | |
| | 17NiCrMo6-4 | | | 20XH2M (20XHM) | 4320 | SNCM420 | 18CrNiMnMoA |
| | 30CrNiMo8 | | | | | SNCM431 | |
| | 40NiCrMo6 | | | | 4340 | SNCM439 | 40CrNiMoA |
| | 34CrNiMo6 | | | | | SNCM447 | |
| | | | | | | SNCM616 | |
| | | | | | | SNCM625 | |
| | | | | | | SNCM630 | |
| | | | | | SNCM815 | | |
| CHROMIUM STEEL | 17Cr3 17CrS3 | | | 15X 15XA | | SCr415 | 15Cr 15CrA |
| | | | | 20X | 5120 | SCr420 | 20Cr |
| | 34Cr4 34CrS4 | 34Cr4 34CrS4 | 34Cr4 34CrS4 | 30X | 5130 5132 | SCr430 | 30Cr |
| | 37Cr4 37CrS4 | 37Cr4 37CrS4 | 37Cr4 37CrS4 | 35X | 5132 | SCr435 | 35Cr |
| | 41Cr4 41CrS4 | 530M40 41Cr4 41CrS4 | 41Cr4 41CrS4 | 40X | 5140 | SCr440 | 40Cr |
| | | | | 45X | | SCr445 | 45Cr 50Cr |
| CHROMIUM MOLYBDENUM STEEL | 15CrMo4 | | | | | SCM415 | 15CrMo |
| | 18CrMo4 18CrMoS4 | | | 20XM | | SCM418 | 20CrMo |
| | 20CrMo5 | 708M20 | | 20XM | | SCM420 | |
| | | | | | | SCM421 | |
| | | | | 30XM 30XMA | 4131 | SCM430 | 30CrMo 30CrMoA |
| | | | | | | SCM432 | |
| | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | 35XM | 4137 | SCM435 | 35CrMo |
| | 42CrMo4 42CrMoS4 | 708M40 709M40 42CrMo4 42CrMoS4 | 42CrMo4 42CrMoS4 | | 4140 4142 | SCM440 | 42CrMo |
| | | | | | 4145 4147 | SCM445 | |
| | | | | | | SCM822 | |

| STEEL | | | | | | | | |
|--|----------------------------|---------------------|---------------------|----------------|-------------------------|----------------|----------------|---------|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB | |
| MANGANESE CHROMIUM STEEL MANGANESE STEEL | 20Mn5 | 150M19 | | | 1522 | SMn420 | 20Mn2 | |
| | 34Mn5 | 150M36 | | 30Г2 35Г2 | 1534 | SMn433 | 30Mn2 35Mn2 | |
| | 36Mn5 | 150M36 | | 35Г2 40Г2 | 1541 | SMn438 | 40Mn2 | |
| | | | | 40Г2 45Г2 | 1541 | SMn443 | 45Mn2 | |
| | 16MnCr5 | | | | 5115 | SMnC420 | 15CrMn | |
| | | | | | 5140 | SMnC443 | 40CrMn | |
| STRUCTURAL STEEL WITH SPECIFIED HARDENABILITY BAND (H-SHAPE STEEL) | | | | | 1522H | SMn420H | | |
| | | | | | | SMn433H | | |
| | | | | | 1541H | SMn438H | | |
| | | | | | 1541H | SMn443H | | |
| | | | | | | SMnC420H | | |
| | | | | | | SMnC443H | | |
| | 17Cr3 17CrS3 | | | | 15X | SCr415H | 15CrH | |
| | 17Cr3 | | | | 20X | SCr420H | 20Cr1H | |
| | 34Cr4 34CrS3 | 34Cr4 34CrS4 | 34Cr4 34CrS4 | | 30X | 5130H 5132H | SCr430H | |
| | 37Cr4 34CrS4 | 37Cr4 37CrS4 | 37Cr4 37CrS4 | | 35X | 5135H | SCr435H | |
| | 41Cr4 41CrS4 | 41Cr4 41CrS4 | 41Cr4 41CrS4 | | 40X | 5140H | SCr440H | 40CrH |
| | 15CrMo5 | | | | | 4118H | SCN415H | 15CrMoH |
| | 18CrMo4 18CrMoS4 | | | | | | SCM418H | |
| | 18CrMo4 | 708H20 | | | | 4118H | SCM420H | 20CrMoH |
| | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | 34CrMo4 34CrMoS4 | | | 4135H 4137H | SCM435H | |
| | 42CrMo4 42CrMoS4 | 42CrMo4 42CrMoS4 | 42CrMo4 42CrMoS4 | | | 4140H 4142H | SCM440H | |
| | | | | | | 4145H 4147H | SCM445H | |
| | | | | | | | SCM822H | |
| | | | | | | | SNC415H | |
| | | | | | | | SNC631H | |
| 15NiCr13 | 655H13 | | | | | SNC815H | 12Cr2Ni4H | |
| 21NiCrMo2 | 805H17 805H20 805H22 | | 20N CD 2 | | 8617H 8620H 8622H | SNCM220H | 20CrNiMoH | |
| 20NiCrMoS6-4 | | | | | 4320H | SNCM420H | 20CrNi2MoH | |

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| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA | | JAPAN JIS | CHINA GB |
| | | | | | UNS | AISI | | |
| STAINLESS STEEL | | | Z12CMN17-07Az | | S20100 | 201 | SUS 201 | 1Cr17Mn6Ni5N |
| | | 284S16 | | 12X17T9AH4 | S20200 | 202 | SUS 202 | 1Cr18Mn8Ni5N |
| | X12CrNi17 7 | 301S21 | Z11CN17-08 | 07X16H6 | S30100 | 301 | SUS 301 | 1Cr18Mn10Ni5Mo3N 1Cr17Ni7 |
| | | | | | | | SUS 301L | |
| | | | | | | | SUS 301J1 | |
| | | 302S25 | Z12CN18-09 | 12X18H9 | S30200 | 302 | SUS 302 | 1Cr18Ni9 |
| | | | | | S30215 | 302B | SUS 302B | |
| | X10CrNiS18 9 | 303S21 | Z8CNF18-09 | | S30300 | 303 | SUS 303 | Y1Cr18Ni9 |
| | | 303S41 | | 12X18H10E | S30323 | 303Se | SUS 303Se | Y1Cr18Ni9Se |
| | X5CrNi18 10 | 304S31 | Z7CN18-09 | 08X18H10 | S30400 | 304 | SUS 304 | 0Cr18Ni9 |
| | X2CrNi19 11 | 304S11 | Z3CN19-11 | 03X18H11 | S30403 | 304L | SUS 304L | 00Cr18Ni10 |
| | | | Z6CN19-09Az | | S30451 | 304N | SUS 304N1 | 0Cr18Ni9N |
| | | | | | S30452 | | SUS 304N2 | 0Cr19Ni10NbN |
| | X2CrNiN18 10 | | Z3CN18-10Az | | S30453 | 304LN | SUS 304LN | 00Cr18Ni10N |
| | | | | | | | SUS 304J1 | |
| | | | | | | | SUS 304J2 | |
| | | | | | S30431 | S30431 | SUS 304J3 | |
| | X5CrNi18 12 | 305S19 | Z8CN18-12 | 06X18H11 | S30500 | 305 | SUS 305 | 1Cr18Ni12 |
| | | | | | | | SUS 305J1 | |
| | | | Z10CN24-13 | | S30908 | 309S | SUS 309S | 0Cr23Ni13 |
| | | 310S31 | Z8CN25-20 | 10X23H18 | S31008 | 310S | SUS 310S | 0Cr25Ni20 |
| | X5CrNiMo17 12 2 | 316S31 | Z7CND17-12-02 | | S31600 | 316 | SUS 316 | 0Cr17Ni12Mo2 |
| | X5CrNiMo17 13 3 | | Z6CND18-12-03 | | | | | |
| | X2CrNiMo17 13 2 | 316S11 | Z3CND17-12-02 | | S31603 | 316L | SUS 316L | 00Cr17Ni14Mo2 |
| | X2CrNiMo17 14 3 | | Z3CND17-13-03 | 03X17H14M3 | | | | |
| | | | | | S31651 | 316N | SUS 316N | 0Cr17Ni12Mo2N |
| | X2CrNiMoN17 12 2 | | Z3CND17-11Az | | S31653 | 316LN | SUS 316LN | 00Cr17Ni13Mo2N |
| | X2CrNiMoN17 13 3 | | Z3CND17-12Az | | | | | |
| | X6CrNiMoTi17 12 2 | | Z6CNDT17-12 | 08X17H13M2T | S31635 | | SUS 316Ti | |
| | | | | | | | SUS 316J1 | 0Cr18Ni12Mo2Cu2 |
| | | | | | | | SUS 316J1L | 00Cr18Ni14Mo2Cu2 |
| | | 317S16 | | | S31700 | 317 | SUS 317 | 0Cr19Ni13Mo3 |
| X2CrNiMo18 16 4 | 317S12 | Z3CND19-15-04 | | S31703 | 317L | SUS 317L | 00Cr19Ni13Mo3 | |
| | | Z3CND19-14Az | | S31753 | | SUS 317LN | | |
| | | | | | | SUS 317J1 | 0Cr18Ni16Mo5 | |
| | | | | | | SUS 317J2 | | |
| | | | | | | SUS 317J3L | | |
| | | | | N08367 | | SUS 836L | | |
| | 904S14 | Z2NCDU25-20 | | N08904 | N08904 | SUS 890L | | |
| X6CrNiTi18 10 | 321S31 | Z6CNT18-10 | 08X18H10T | S32100 | 321 | SUS 321 | 1Cr18Ni9Ti 0Cr18Ni10Ti | |
| X6CrNiNb18 10 | 347S31 | Z6CNNb18-10 | 08X18H12B | S34700 | 347 | SUS 347 | 0Cr18Ni11Nb | |
| | | Z6CN18-16 | | S38400 | 384 | SUS 384 | | |
| | 394S17 | Z2CNU18-10 | | S30430 | 304Cu | SUS XM7 | 0Cr18Ni9Cu3 | |
| | | Z15CNS20-12 | | S38100 | | SUS XM15J1 | 0Cr18Ni13Si4 | |
| | | | | S32900 | 329 | SUS 329J1 | 0Cr26Ni5Mo2 | |
| | | Z3CNDU22-05Az | 08X21H6M2T | S39240 | S31803 | SUS 329J3L | | |
| | | Z3CNDU25-07Az | | S39275 | S31260 | SUS 329J4L | | |

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| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA | | JAPAN JIS | CHINA GB | |
| | | | | | UNS | AISI | | | |
| STAINLESS STEEL | X6CrAl13 | 405S17 | Z8CA12 | | | S40500 | 405 | SUS 405 | 0Cr13Al 0Cr13 |
| | | | Z3C14 | | | | | SUS 410L | 00Cr12 |
| | | | | | | S42900 | 429 | SUS 429 | |
| | X6Cr17 | 430S17 | Z8C17 | 12X17 | | S43000 | 430 | SUS 430 | 1Cr17 |
| | X7CrMoS18 | | Z8CF17 | | | S43020 | 430F | SUS 430F | Y1Cr17 |
| | X6CrTi17 | | Z4CT17 | | | S43035 | | SUS 430LX | |
| | X6CrNb17 | | Z4CNb17 | | | | | SUS 430J1L | |
| | X6CrMo17 1 | 434S17 | Z8CD17-01 | | | S43400 | 434 | SUS 434 | 1Cr17Mo |
| | | | | | | S43600 | 436 | SUS 436L | |
| | | | | | | | | SUS 436J1L | |
| | | | Z3CDT18-02 | | | S44400 | 444 | SUS 444 | |
| | | | | | | S44700 | | SUS 447J1 | 00Cr30Mo2 |
| | | | Z1CD26-01 | | | S44627 | | SUS XM27 | 00Cr27Mo |
| | | | | | | S40300 | 403 | SUS 403 | 1Cr12 |
| | X10Cr13 | 410S21 | Z13C13 | | | S41000 | 410 | SUS 410 | 1Cr13 |
| | X6Cr13 | 403S17 | Z8C12 | 08X13 | | S41008 | 410S | SUS 410S | |
| | | | | | | | | SUS 410F2 | |
| | X12CrS13 | | | | | S41025 | | SUS 410J1 | 1Cr13Mo 1Cr12Mo |
| | | 416S21 | Z11CF13 | | | S41600 | 416 | SUS 416 | Y1Cr13 |
| | X20Cr13 | 420S29 | Z20C13 | 20X13 | | S42000 | 420 | SUS 420J1 | 2Cr13 |
| | X30Cr13 | 420S37 | Z33C13 | 30X13 | | S42000 | 420 | SUS 420J2 | 3Cr13 |
| | | | Z30CF13 | | | S42020 | 420F | SUS 420F | Y3Cr13 |
| | | | | | | | | SUS 420F2 | |
| | | | | | | | | SUS 429J1 | |
| | X20CrNi17 2 | 431S29 | Z15CN16-02 | 20X17H2 | | S43100 | 431 | SUS 431 | 1Cr17Ni2 |
| | | | Z70C15 | | | S44002 | 440A | SUS 440A | 7Cr17 |
| | | | | | S44003 | 440B | SUS 440B | 8Cr17 | |
| | | Z100CD17 | 95X18 | | S44004 | 440C | SUS 440C | 9Cr18 11Cr17 9Cr18Mo | |
| | | | | | S44020 | S44020 | SUS 440F | Y11Cr17 | |
| X5CrNiCuNb16-4 | | Z6CNU17-04 | | | S17400 | S17400 | SUS 630 | 0Cr17Ni4CuNb | |
| X7CrNiAl17 7 | | Z9CNA17-07 | 09X17H7 IO | | S17700 | S17700 | SUS 631 | 0Cr17Ni7Al | |
| | | | | | | | SUS 632J1 | | |

Representative Classification of Stainless Steel

Stainless Steel (Austenitic Related)

| JIS | |
|----------|-----------|
| SUS201 | SUS309S |
| SUS202 | SUS310S |
| SUS301 | SUS316 |
| SUS302 | SUS316L |
| SUS302B | SUS316N |
| SUS303 | SUS317 |
| SUS303Se | SUS317L |
| SUS304 | SUS321 |
| SUS304L | SUS347 |
| SUS304N1 | SUS384 |
| SUS304N2 | SUSXM7 |
| SUS305 | SUSXM15J1 |
| SUS308 | |

Stainless Steel (Ferritic Related)

| JIS |
|---------|
| SUS405 |
| SUS429 |
| SUS430 |
| SUS430F |
| SUS434 |
| SUSXM27 |

Stainless Steel (Martensitic Related)

| JIS |
|----------|
| SUS403 |
| SUS410 |
| SUS410S |
| SUS416 |
| SUS420J1 |
| SUS420F |
| SUS431 |
| SUS440A |
| SUS440B |
| SUS440C |
| SUS440F |

Stainless Steel (Precipitation Hardened Related)

| JIS |
|--------|
| SUS630 |
| SUS631 |

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|----------------------|----------------|----------|---------------|----------------|--------|---------|--------------|-------------------|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA | | JAPAN JIS | CHINA GB |
| | | | | | UNS | AISI | | |
| HEAT RESISTING STEEL | | 331S42 | Z35CNWS14-14 | 45X14H14B2M | | | SUH 31 | |
| | | 349S52 | Z52CMN21-09Az | | | | SUH 35 | |
| | X53CrMnNi21-9 | 349S54 | Z55CMN21-09Az | 55X20 Г 9AH4 | S63008 | | SUH 36 | 5Cr21Mn9Ni4N |
| | | 381S34 | | | S63017 | | SUH 37 | 2Cr21Ni12N |
| | | | | | | | SUH 38 | |
| | | 309S24 | Z15CN24-13 | | S30900 | 309 | SUH 309 | 2Cr23Ni13 |
| | CrNi2520 | 310S24 | Z15CN25-20 | 20X25H20C2 | S31000 | 310 | SUH 310 | 2Cr25Ni20 |
| | | | Z12NCS35-16 | | N08330 | N08330 | SUH 330 | 1Cr16Ni35 |
| | | | Z6NCTV25-20 | | S66286 | | SUH 660 | 0Cr15Ni25Ti2MoA9V |
| | | | | | R30155 | | SUH 661 | |
| | CrAl1205 | | | | | | SUH 21 | |
| | X6CrTi12 | 409S19 | Z6CT12 | | S40900 | 409 | SUH 409 | |
| | | | Z3CT12 | | | | SUH 409L | |
| | | | Z12C25 | 15X28 | S44600 | 446 | SUH 446 | 2Cr25N |
| | X45CrSi9-3 | 401S45 | Z45CS9 | | S65007 | | SUH 1 | 4Cr9Si2 |
| | | | Z40CSD10 | 40X10C2M | | | SUH 3 | 4Cr10Si2Mo |
| | | 443S65 | Z80CSN20-02 | | | | SUH 4 | 8Cr20Si2Ni |
| | | | | 40X 9C2 | | | SUH 11 | |
| | | | 20X12BHMBФP | | | SUH 600 | 2Cr12MoVNbN | |
| | | | | S42200 | | SUH 616 | 2Cr12NiMoWV | |

Representative Classification of Heat Resisting Steel

Heat Resisting Steel (Austenitic Related)

| JIS |
|--------|
| SUH31 |
| SUH35 |
| SUH36 |
| SUH37 |
| SUH38 |
| SUH309 |
| SUH310 |
| SUH330 |
| SUH660 |
| SUH661 |

Heat Resisting Steel (Ferritic Related)

| JIS |
|--------|
| SUH21 |
| SUH409 |
| SUH446 |

Heat Resisting Steel (Martensitic Related)

| JIS |
|--------|
| SUH1 |
| SUH3 |
| SUH4 |
| SUH11 |
| SUH600 |
| SUH616 |

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|-----------------------|----------------|--------------|------------------|-----------------|-------------------|----------------|--------------------------------|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB |
| CARBON TOOL STEEL | | | C140E3U | Y13 | | SK140 (SK1) | T13 |
| | | | C120E3U | Y12 | W1-11 1/2 | SK120 (SK2) | T12 |
| | C105W1 | | C105E2U | Y11 | W1-10 | SK105 (SK3) | T11 |
| | | | C90E2U | Y10 | W1-9 | SK95 (SK4) | T10 |
| | C80W1 | | C90E2U C80E2U | Y8Г Y9 | W1-8 | SK85 (SK5) | T8Mn T9 |
| | C80W1 | | C80E2U C70E2U | Y8 | | SK75 (SK6) | T8 |
| | C70W2 | | C70E2U | Y7 | | SK65 (SK7) | T7 |
| HIGH SPEED TOOL STEEL | | BT1 | HS18-0-1 | P18 | T1 | SKH2 | W18Cr4V |
| | S18-1-2-5 | BT4 | HS18-1-1-5 | P18K5Φ2 | T4 | SKH3 | W18Cr4VCo5 |
| | | BT5 | HS18-0-2-9 | P18K5Φ | T5 | SKH4 | W18Cr4V2Co8 |
| | S12-1-4-5 | BT15 | HS12-1-5-5 | | T15 | SKH10 | W12Cr4V5Co5 |
| | S6-5-2 | BM2 | HS6-5-2 | P6M5 | M2 | SKH51 | W6Mo5Cr4V2 |
| | | | | P6M5Φ3 | M3-1 | SKH52 | CW6Mo5Cr4V2 W6Mo5Cr4V3 |
| | S6-5-3 | | HS6-5-3 | P6M5Φ3 | M3-2 | SKH53 | CW6Mo5Cr4V3 |
| | | BM4 | HS6-5-4 | | M4 | SKH54 | |
| | S6-5-2-5 | BM35 | HS6-5-2-5HC | P6M5K5 | M35 M41 M36 | SKH55 SKH56 | W6Mo5Cr4V2Co5 W7Mo5Cr4V2Co5 |
| | S10-4-3-10 | BT42 | HS10-4-3-10 | | | SKH57 | |
| | | | HS2-9-2 | | M7 | SKH58 | W2Mo9Cr4V2 |
| S2-10-1-8 | BM42 | HS2-9-1-8 | | M42 | SKH59 | W2Mo9Cr4VCo8 | |
| ALLOY TOOL STEEL | | | | XB4 | F2 | SKS11 | |
| | 105WCr6 | | 105WCr5 | XBГ | | SKS2 | |
| | | | | | | SKS21 | W |
| | | | | | | SKS5 | |
| | | | | | L6 | SKS51 | |
| | | | | | | SKS7 | |
| | | | C140E3UCr4 | 13X | | SKS8 | Cr06 |
| | | | | 6XB2C 5XB2CΦ | S1 | SKS4 | 5CrW2Si 6CrW2Si |
| | | | | 4XB2C | S1 | SKS41 | 4CrW2Si |
| | | BW2 | 100V2 | | W2-9 1/2 W2-8 | SKS43 SKS44 | |
| | | | | 9XBГ | | SKS3 | 9CrWMn |
| | 105WCr6 | | 105WCr5 | XBГ | | SKS31 | CrWMn |
| | | | | | | SKS93 | |
| | | | | | | SKS94 | |
| | | | | | | SKS95 | 8MnSi |
| | X210Cr12 | BD3 | X200Cr12 | X12 | D3 | SKD1 | Cr12 |
| | X153CrMoV12 | | | X12MΦ | D2 | SKD10 | Cr12Mo1V1 |
| | X153CrMoV12 | BD2 | X160CrMoV12 | | D2 | SKD11 | Cr12MoV |
| | | BA2 | X100CrMoV5 | | A2 | SKD12 | Cr5Mo1V |
| | | | X32WCrV3 | | | SKD4 | |
| | X30WCrV9-3 | BH21 | X30WCrV9 | | H21 | SKD5 | 3Cr2W8V |
| | X38CrMoV51 | BH11 | X38CrMoV5 | 4X5MΦC | H11 | SKD6 | 4Cr5MoSiV |
| | X40CrMoV51 | BH13 | X40CrMoV5 | 4X5MΦ1C | H13 | SKD61 | 4Cr5MoSiV1 |
| | BH12 | X35CrWMoV5 | 3X3M3Φ | H12 | SKD62 | | |
| X32CrMoV33 | BH10 | 32CrMoV12-18 | | H10 | SKD7 | 4Cr3Mo3SiV | |
| | BH19 | | | H19 | SKD8 | | |
| | | 55CrNiMoV4 | | | SKT3 | | |
| 55NiCrMoV6 | BH224 / 5 | 55NiCrMoV7 | 5XHМ | | SKT4 | 5CrNiMo | |

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| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB |
| SPRING STEEL | | | | 75 80 85 | 1075 1078 | SUP3 | |
| | 56SiCr7 | | 60Si7 | 60C2 | | SUP6 | 55Si2Mn |
| | 61SiCr7 | | 60Si7 | 60C2Г | 9260 | SUP7 | 60Si2Mn 60Si2MnA |
| | 55Cr3 | | 55Cr3 | | 5155 | SUP9 | 55CrMnA |
| | 55Cr3 | | 60Cr3 | | 5160 | SUP9A | 60CrMnA |
| | 50CrV4 | 735A51, 735H51 | 51CrV4 | XΦA50XΓΦA | 6150 | SUP10 | 50CrVA |
| | 51CrV4 | | | 50XΓP | 51B60 | SUP11A | 60CrMnBA |
| | 54SiCr6 | 685A57, 685H57 | 54SiCr6 | | 9254 | SUP12 | |
| 60CrMn3-2 | 705A60, 705H60 | 60CrMo4 | | 4161 | SUP13 | 60CrMnMoA | |
| FREE CUTTING CARBON STEEL | | | | | 1110 | SUM11 | |
| | | | | | 1108 | SUM12 | Y12 |
| | | | | | 1212 | SUM21 | |
| | 9SMn28 | (230M07) | S250 | | 1213 | SUM22 | Y15 |
| | 9SMnPb28 | | S250Pb | | 12L13 | SUM22L | Y12Pb |
| | | | | | 1215 | SUM23 | |
| | | | | | | SUM23L | |
| | 9SMnPb28 | | S250Pb | | 12L14 | SUM24L | Y15Pb |
| | 9SMn36 | | S300 | | | SUM25 | |
| | 15S10 | | | | 1117 | SUM31 | |
| | | | | | | SUM31L | |
| | | 210M15, 210A15 | (13MF4) | | | SUM32 | Y20 |
| | | | (35MF6) | | 1137 | SUM41 | Y30 Y35 |
| | | | (45MF6.1) | | 1141 | SUM42 | Y40Mn |
| | (226M44) | (45MF6.3) | | 1144 | SUM43 | | |
| CARBON CHROMIUM BEARING STEEL | | | | | 51100 | SUJ1 | GCr4 |
| | 100Cr6 | | 100Cr6 | ИЦХ15 | 52100 | SUJ2 | GCr5 |
| | | | | | ASTM A 485 Grade 1 | SUJ3 | GCr15SiMn |
| | | | | | | SUJ4 | GCr15SiMo |
| | | | | | | SUJ5 | GCr18Mo |

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| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB |
| GRAY CAST IRON | | 100 | | CY10 | NO.20 | FC100 | HT100 |
| | GG15 | 150 | FGL150 | CY15 | NO.30 | FC150 | HT150 |
| | GG20 | 200 | FGL200 | CY20 | NO.35 | FC200 | HT200 |
| | GG25 | 250 | FGL250 | CY25 | NO.45 | FC250 | HT250 |
| | GG30 | 300 | FGL300 | CY30 | NO.50 | FC300 | HT300 |
| | GG35 | 350 | FGL350 | CY35 | NO.60 | FC350 | HT350 |
| | GG40 | | FGL400 | CY40 | | | |
| NODULAR CAST IRON | GGG40 | 400/17 | FGS370-17 | BY40 | 60-40-18 | FCD400 | QT400-18 |
| | | 420/12 | FGS400-12 | BY45 | 65-45-12 | FCD450 | QT450-10 |
| | GGG50 | 500/7 | FGS500-7 | BY50 | 70-50-05 | FCD500 | QT500-7 |
| | GGG60 | 600/7 | FGS600-2 | BY60 | 80-60-03 | FCD600 | QT600-3 |
| | GGG70 | 700/2 | FGS700-2 | BY70 | 100-70-03 | FCD700 | QT700-2 |
| | GGG80 | 800/2 | FGS800-2 | BY80 | 120-90-02 | FCD800 | QT800-2 |
| | | 900/2 | | BY100 | | | QT900-2 |

| NON-FERROUS METAL | | | | | | | |
|------------------------|----------------|----------|--------------|----------------|-------------------|--------------|--------------|
| CLASS | GERMANY DIN | UK BS | FRANCE NF | RUSSIA ГОСТ | USA AISI / SAE | JAPAN JIS | CHINA GB |
| ALUMINUM ALLOY | A199.99R | | | A99 | 1199 | | 1A99 |
| | A199.98R | | | A97 | | | 1A97 |
| | | | | A95 | | | 1A95 |
| | A199.90 | 1080(1A) | 1080A | A8 | | A1080 | 1A80 |
| | A199.50 | 1050(1B) | 1050A | A5 | 1050 | A1050 | 1A50 |
| | AlMg2.5 | NS4 | 5052 | Amg | 5052 | A5052 | 5A02 |
| | | NS5 | | AMg3 | | | 5A03 |
| | AlMg5 | NB6 | | AMg5V | 5056 | A5056 | 5A05 |
| | | NG61 | 5957 | | 5456 | A5556 | 5A30 |
| | AlCu2.5Mg0.5 | | 2117 | D18 | 2036 | A2117 | 2A01 |
| | AlCuMg1 | HF15 | 2017S | D1 | | A2017 | 2A11 |
| | AlCuMg2 | | 2024 | D16AVTV | 2124 | A2024 | 2A12 |
| | | | | | 2319 | | 2B16 |
| | | | | AK4 | | A2N01 | 2A80 |
| | | | | AK2 | 2218 | A2018 | 2A90 |
| | AlCuSiMn | | 2014 | AK8 | 2014 | A2014 | 2A14 |
| | | 6061 | 6061 | | 6061 | A6061 | |
| | AlZnMgCu1.5 | | 7075 | V95P | 7175 | A7075 | 7A09 |
| ALUMINUM ALLOY CASTING | G-AISi7Mg | LM25 | | | 356.2 | AC4C | ZAISi7Mn |
| | G-Al12 | LM6 | A-S12-Y4 | AL2 | 413.2 | AC3A | ZAISi12 |
| | | | | AL5 | 355.2 | | ZAISi5Cu1Mg |
| | G-Al12(Cu) | | | | 413.0 | AC8A | ZAISi2Cu2Mg1 |
| | | | | AL19 | | | ZAlCu5Mn |
| | | | | | 201.0 | | ZAlCu5MnCdVA |
| | G-AlMg10 | LM10 | AG11 | AL8 | 520.2 | | ZAlMg10 |
| | G-AlMg5Si | | | AL13 | | | ZAlMg5Si |

DRILLS
 END MILLS
 ROUTERS
 THREAD MILLS & TAPS
 ENGRAVERS
 BORING BARS
 REAMERS
 SAWS
 TECHNICAL
 INDEX



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CUSTOM DRILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

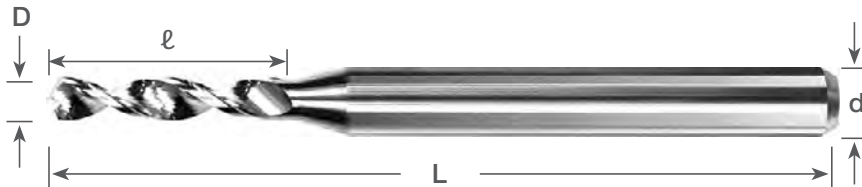
Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRc): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Reach "L₁" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Point Angle: _____ Point Geometry: _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM REVERSE SHANK DRILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

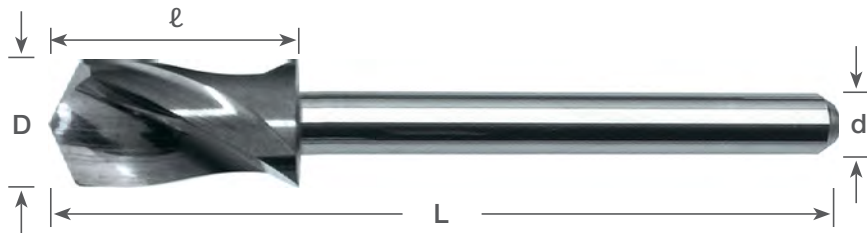
Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Point Angle: _____ Point Geometry: _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM COOLANT FED DRILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Point Angle: _____ Point Geometry: _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM STEP DRILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____

Diameter "D" _____ Diameter "D₁" _____ Step Angle "A" _____

LOC "ℓ" _____ Reach "L₁" _____ Shank Diameter "d" _____

OAL "L" _____ # Flutes: _____ Point Angle: _____ Point Geometry: _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM SQUARE END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

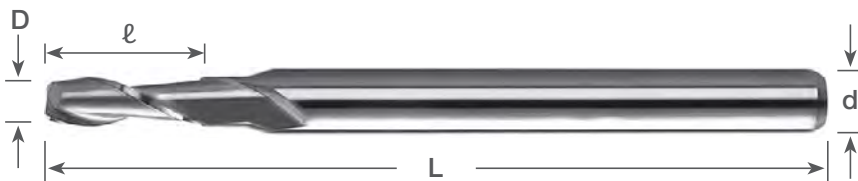
Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM BALL NOSE END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRc): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____

Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____

OAL "L" _____ # Flutes: _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM EXTENDED REACH SQUARE END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

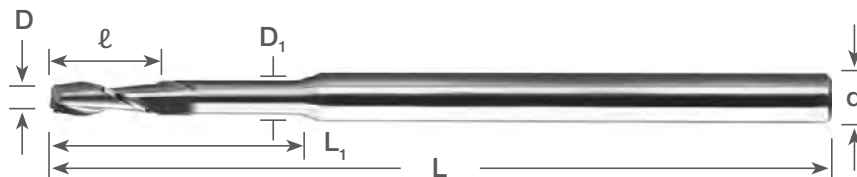
TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Reach "L₁" _____ Neck Diameter "D₁" _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM EXTENDED REACH BALL NOSE END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

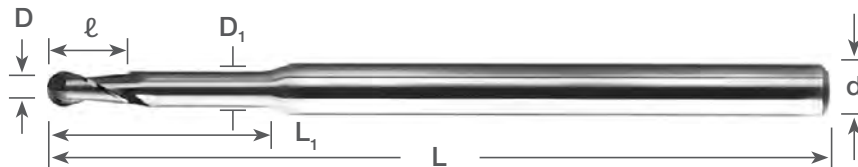
Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Reach "L₁" _____ Neck Diameter "D₁" _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM CORNER RADIUS END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

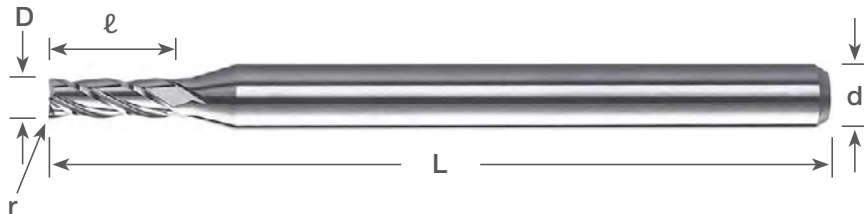
Company Name: _____ Phone: _____
 Contact: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State: _____ Zip: _____ Country: _____
 Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____
 Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____
 Similar to Other Supplier Part Number: _____
 Coating Type: _____ Coating Length from Tip: _____
 Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____
 OAL "L" _____ # Flutes: _____ Corner Radius "r" _____
 End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____
 Additional Information Not Specified Elsewhere:





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CUSTOM TAPERED END MILL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____

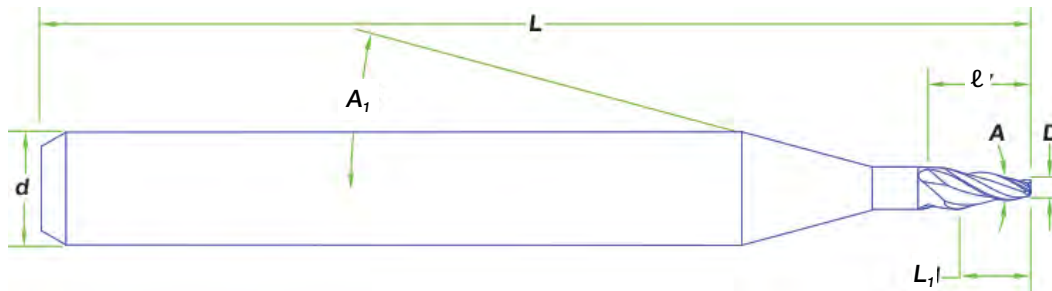
Diameter "D" _____ Taper Angle "A": _____ Shoulder Angle "A₁" 15°

LOC "ℓ" _____ Taper Length "L₁" _____ Shank Diameter "d" _____

OAL "L" _____ # Flutes: _____ Helix Angle: Variable End Style: Square

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM REAMER REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRC): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____

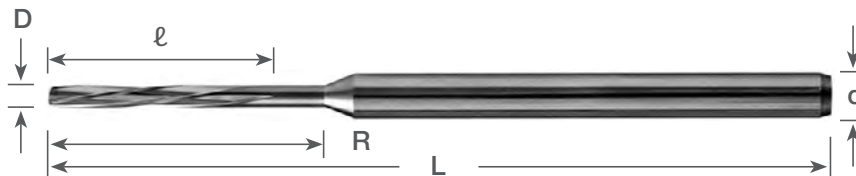
Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____

OAL "L" _____ # Flutes: _____ Reach "R" _____

Direction of Cut: _____ Direction of Spiral: _____ Coolant Holes: _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM ROUTER REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRc): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

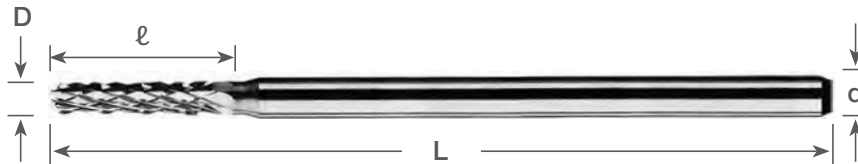
Coating Type: _____ Coating Length from Tip: _____

Diameter "D" _____ LOC "ℓ" _____ Shank Diameter "d" _____

OAL "L" _____ Pattern: _____ Cut: _____ End Style: _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





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CUSTOM BORING BAR TOOL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness (HRc): _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____ Radius: _____

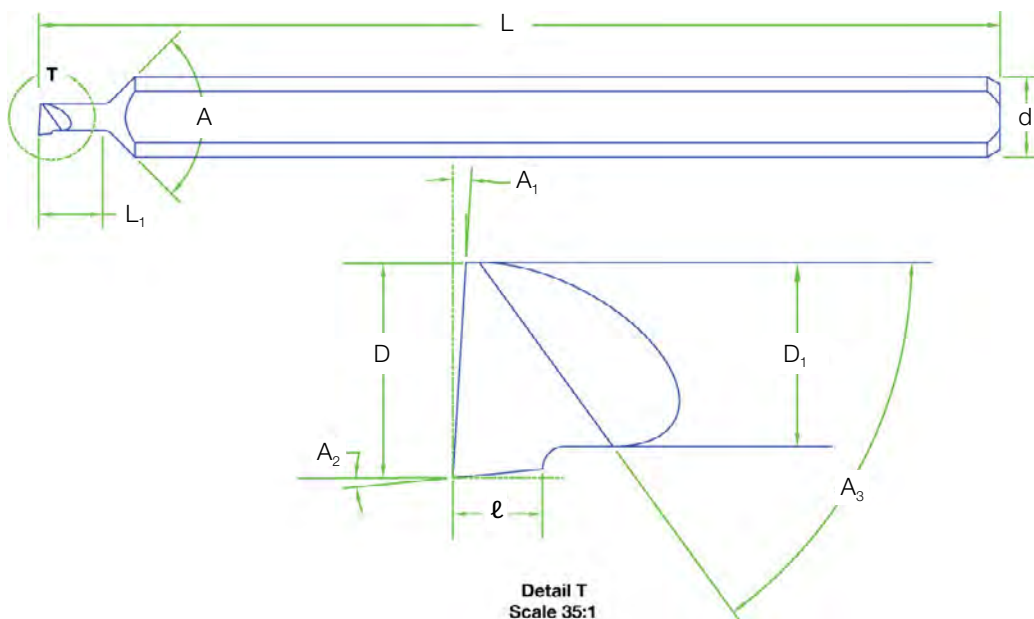
Tip Diameter "D" _____ Body Diameter "D₁" _____ Shank Diameter "d" _____

OAL "L" _____ Reach "L₁" _____ Tip Length "ℓ" _____

Shoulder Angle "A" _____ End Angle "A₁" _____ Side Angle "A₂" _____ Split Angle "A₃" _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:





CUSTOM GROOVE TOOL REQUEST

Date: _____ Inquiry or RFQ#: _____

CUSTOMER INFORMATION

Company Name: _____ Phone: _____

Contact: _____ Fax: _____

Address: _____ Email: _____

City: _____ State: _____ Zip: _____ Country: _____

Kyocera Distributor Name: _____

TECHNICAL INFORMATION

Work Piece Information: _____ Material Code: _____ Hardness [HRc]: _____

Type Holder: _____ Special Tolerance? : _____

TOOL INFORMATION

Similar to Kyocera Part Number: _____

Similar to Other Supplier Part Number: _____

Coating Type: _____ Coating Length from Tip: _____ Groove Type 1, 2, 3: _____

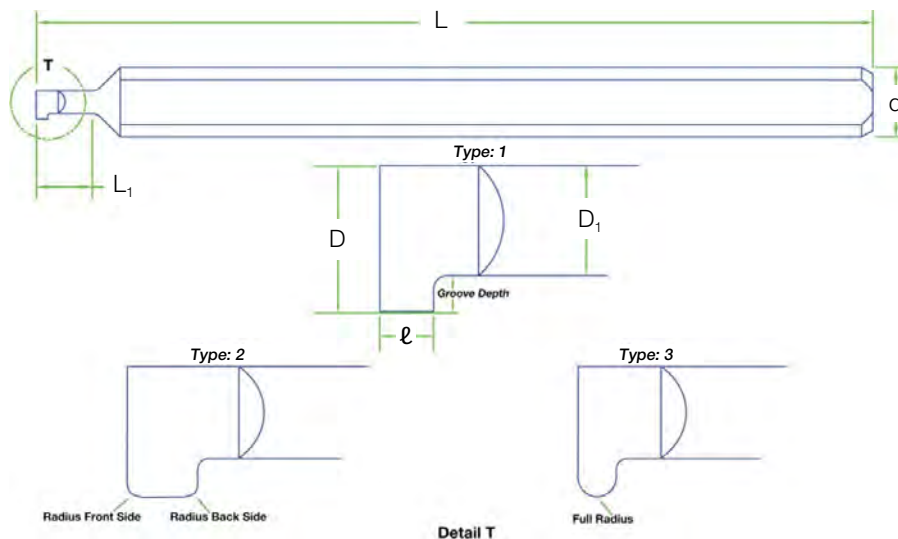
Tip Diameter "D" _____ Body Diameter "D₁" _____ Shank Diameter "d" _____

OAL "L" _____ Reach "L₁" _____ Tip Width "ℓ" _____ Side Clearance: _____

Groove Depth: _____ Radius Front Side: _____ Radius Back Side: _____ Full Radius: _____

End User: _____ Est. Yearly Consumption: _____ Quantity to Quote: _____

Additional Information Not Specified Elsewhere:



For groove shapes not shown above, please submit a sketch of the shape of groove desired.



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Listed in Alphanumeric Order

Part Numbers in Alphanumeric Order

○ : NUMBER □ : LETTER

- ...○○.○○... → Uncoated
- ...○○○○○○... → DLC Coating
- ...○○○○○○... → AlTiN Coating
- ...○○○○○○... → AlTiN NANO Coating
- ...○○○○○○... → AX Coating
- ...○○○○○○... → CVD Diamond

| Part Number | Page | Category |
|------------------------|-----------|--|
| 080 -○○○○.90 | 18 | Spotting Drill (90° Point) |
| 080 -○○○○.130 | 18 | Spotting Drill (130° Point) |
| 081 -○○○○L90 | 19 | Spotting Drill |
| 081 -○○○○L130 | 19 | Spotting Drill |
| 105 -○○○○.○○○ | 20 - 25 | Micro Drill |
| 105 -○○○○○○○○○ | 20 - 25 | Micro Drill |
| 14 ○○○ | 164 - 181 | Special Taps |
| 155 -○○○○.○○○ | 26 - 29 | Inverse Dia. Micro Drill |
| 160 -○○○○AG○○○(○) | 30 | Pilot Drill |
| 1610 -○○○○.○○○ | 69 - 72 | Standard Length Square End Mill (2 Flute) |
| 1610 -○○○○○○○○○ | 69 - 71 | Standard Length Square End Mill (2 Flute) |
| 1610 -○○○○○○○○○ | 69 - 72 | Standard Length Square End Mill (2 Flute) |
| 1611 -○○○○.○○○CR | 131 | Standard Length X-Small Corner Radius End Mill (2 Flute) |
| 1611 -○○○○○○○○○CR | 131 | Standard Length X-Small Corner Radius End Mill (2 Flute) |
| 1611 -○○○○○○○○○CR | 131 | Standard Length X-Small Corner Radius End Mill (2 Flute) |
| 1612 -○○○○.○○○CR | 132 | Standard Length Small Corner Radius End Mill (2 Flute) |
| 1612 -○○○○○○○○○CR | 132 | Standard Length Small Corner Radius End Mill (2 Flute) |
| 1612 -○○○○○○○○○CR | 132 | Standard Length Small Corner Radius End Mill (2 Flute) |
| 1612 -○○○○○○○○○CR | 132 | Standard Length Small Corner Radius End Mill (2 Flute) |
| 1613 -○○○○.○○○CR | 133 | Standard Length Standard Corner Radius End Mill (2 Flute) |
| 1613 -○○○○○○○○○CR | 133 | Standard Length Standard Corner Radius End Mill (2 Flute) |
| 1613 -○○○○○○○○○CR | 133 | Standard Length Standard Corner Radius End Mill (2 Flute) |
| 1613 -○○○○○○○○○CR | 133 | Standard Length Standard Corner Radius End Mill (2 Flute) |
| 1614 -○○○○.○○○CR | 134 | Standard Length Large Corner Radius End Mill (2 Flute) |
| 1614 -○○○○○○○○○CR | 134 | Standard Length Large Corner Radius End Mill (2 Flute) |
| 1614 -○○○○○○○○○CR | 134 | Standard Length Large Corner Radius End Mill (2 Flute) |
| 1614 -○○○○○○○○○CR | 134 | Standard Length Large Corner Radius End Mill (2 Flute) |
| 1616 -○○○○.○○○(○)C(R) | 134 | Standard Length X-Large Corner Radius End Mill (2 Flute) |
| 1616 -○○○○○○○○○(○)C(R) | 134 | Standard Length X-Large Corner Radius End Mill (2 Flute) |
| 1616 -○○○○○○○○○(○)C(R) | 134 | Standard Length X-Large Corner Radius End Mill (2 Flute) |
| 1616 -○○○○○○○○○(○)C(R) | 134 | Standard Length X-Large Corner Radius End Mill (2 Flute) |
| 1617 -○○○○.○○○CR | 135 | Standard Length XX-Large Corner Radius End Mill (2 Flute) |
| 1617 -○○○○○○○○○CR | 135 | Standard Length XX-Large Corner Radius End Mill (2 Flute) |
| 1617 -○○○○○○○○○CR | 135 | Standard Length XX-Large Corner Radius End Mill (2 Flute) |
| 1617 -○○○○○○○○○CR | 135 | Standard Length XX-Large Corner Radius End Mill (2 Flute) |
| 1618 -○○○○.○○○(○)C(R) | 135 | Standard Length XXX-Large Corner Radius End Mill (2 Flute) |
| 1618 -○○○○○○○○○(○)C(R) | 135 | Standard Length XXX-Large Corner Radius End Mill (2 Flute) |
| 1618 -○○○○○○○○○(○)C(R) | 135 | Standard Length XXX-Large Corner Radius End Mill (2 Flute) |
| 1618 -○○○○○○○○○(○)C(R) | 135 | Standard Length XXX-Large Corner Radius End Mill (2 Flute) |
| 1620 -○○○○.○○○ | 73 - 76 | Stub Length Square End Mill (2 Flute) |
| 1620 -○○○○○○○○○ | 73 - 75 | Stub Length Square End Mill (2 Flute) |
| 1620 -○○○○○○○○○ | 73 - 76 | Stub Length Square End Mill (2 Flute) |
| 1625 -○○○○.○○○ | 101 - 104 | Standard Length Ball Nose End Mill (2 Flute) |
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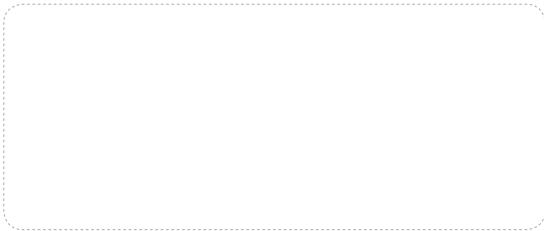
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